PRODUCT CATALOG 2023

Embedded Platforms

Your Smart Computing Partner

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Established in 1992, AAEON is one of the leading designers and manufacturers of professional intelligent IoT solutions and advanced industrial computing platforms today. Committed to innovative engineering, AAEON provides integrated solutions including industrial motherboards and systems, industrial displays, rugged tablets, embedded controllers, network appliances and related accessories. We also work with premier OEM/ODMs and system integrators around the world. Offering x86-based platforms from Intel® Atom™ all the way to Intel® Xeon processors, and in desktop, 1U and 2U form factors, AAEON’s team of experienced engineers has helped dozens of companies around the globe deploy reliable appliances with faster times to market and lower development costs based on state-of-the-art hardware platforms, unmatched service quality and long-term support.

As an Associate Member of the Intel® Internet of Things Solutions Alliance, AAEON offers customized end-to-end services from initial product conceptualization and board product development to mass manufacturing and after-sales service programs.

At AAEON, we take the environment seriously, and all of our products are compliant with RoHS regulations. We are dedicated to the sustainability of the Earth, and all of our products conform to applicable laws and regulations.

AAEON Core Values

Reliability:
Delivering dependable products in a timely manner

Integrity:
Valuing business integrity and ethics

Innovation:
Turning cutting-edge concepts into reality
System Level Products

AAEON is committed to delivering high-quality intelligent system products, such as Rugged Panel PCs, Expandable Industrial Computers, Full HD Infotainment Displays, Rugged Tablets, Embedded PCs and related accessories, for use in all aspects of sectors including Digital Signage, Transportation, Industrial Automation, Healthcare, Hospitality, Harbor/Marine, Military/Government, Public Safety and Energy.

AAEON has the capability to customize services for a range of embedded computers and system products according to customer requirements and specifications. To help large customers with volume production, AAEON also provides an end-to-end Design Manufacturing Service (DMS) that begins with design and goes through to contract manufacturing. Quality assurance of our system products ensures excellent product performance and is the key to our success and growing global customer base.

Board Level Products

Embedded boards are the beating heart of every computer system. AAEON offers a diverse range of different embedded boards to consolidate your systems. Our products include Compact Boards, 3.5" Sub-Compact Boards, EPIC boards, PICO-ITX boards, COM Express Modules, PC/104 Modules, PC/104 Peripheral Modules, IoT Node/Gateway Boards, and full-sized & half-sized SBCs.

With the advent of the fourth industrial revolution, more commonly known as Industry 4.0, the optimization of automation processes and productivity is becoming more relevant than ever before. Embedded single boards provide an easily configurable and efficient solution to consolidating industrial platforms and infrastructure in fields such as smart cities, smart building management, smart transportation, energy-efficient grids, POS and digital signage, and the medical industry.

AAEON’s boards are designed for superior environmental resilience. The WiTAS (Wide Temperature Assurance Services) line can be used within a temperature range of -40°C~85°C and is specifically built to combat harsh environments, operating at peak efficiency in both bitterly cold and blisteringly hot spaces. Our WiTAS products are also ideal for IoT uses and are designed for minimum maintenance and maximum ruggedness.
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>AAEON established its first office in Taipei, Taiwan</td>
</tr>
<tr>
<td>1997</td>
<td>AAEON was listed as an OTC (Over The Counter) stock company. The AAEON Foundation was established to promote humanitarian work and technological education.</td>
</tr>
<tr>
<td>1998</td>
<td>AAEON Technology Inc. was established in Su Zhou, China. AAEON became a publicly traded company on the Taiwan Stock Exchange. AAEON set up a European office in Limburg, Germany.</td>
</tr>
<tr>
<td>1999</td>
<td>AAEON was awarded the 14th Taiwan Symbol of Excellence Award. AAEON became an Associate Member of the Intel® Embedded Alliance.</td>
</tr>
<tr>
<td>2000</td>
<td>AAEON acquired Astech Technology Inc. to form the core of its panel PC Division. AAEON technology was awarded the Siemens Star Supplier 2011 Award. AAEON established sales offices in Europe and China.</td>
</tr>
<tr>
<td>2001</td>
<td>AAEON Technology USA, the premier off-shore branch office was established in New Jersey.</td>
</tr>
<tr>
<td>2002</td>
<td>AAEON was awarded the 2002 Best Choice of the Year Award. AAEON established a U.S. West Coast sales office in Brea, California. AAEON moved its European branch to the Netherlands.</td>
</tr>
<tr>
<td>2003</td>
<td>AAEON was listed on the Taiwan Stock Exchange. AAEON was awarded the 15th MOEA’s Joint Award.</td>
</tr>
<tr>
<td>2004</td>
<td>AAEON Technology (Su Zhou factory) received 3C and ISO-9001 certification. AAEON set up a Singapore office.</td>
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<tr>
<td>2005</td>
<td>AAEON was awarded the 16th Taiwan Symbol of Excellence Award. AAEON was awarded the INFO TECH 100 TAIWAN Award.</td>
</tr>
<tr>
<td>2006</td>
<td>AAEON was awarded the Computex Taipei 2006 Best Choice of the Year Award. AAEON was awarded the Intel® Marketing Development Funds Award of Excellence. AAEON was awarded the Intel® Greatest Co-Selling Growth Award of Excellence.</td>
</tr>
<tr>
<td>2007</td>
<td>AAEON was awarded the Computex Taipei 2007 Best Choice of the Year Award. AAEON was awarded the Computex Taipei Best Choice of the Year Award.</td>
</tr>
<tr>
<td>2008</td>
<td>AAEON was listed as an OTC (Over The Counter) stock company. AAEON was awarded the 17th Taiwan Symbol of Excellence Award. AAEON was awarded the 17th MOEA’s Joint Award.</td>
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<tr>
<td>2009</td>
<td>AAEON was awarded the 21st Taiwan Symbol of Excellence Award. AAEON was awarded the Microsoft Silver Partner Award.</td>
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<tr>
<td>2010</td>
<td>AAEON was awarded the Taiwan Superior Brand Award. AAEON was awarded the Computex Taipei 2010 Best Choice of the Year Award.</td>
</tr>
<tr>
<td>2011</td>
<td>AAEON was awarded the Computex Taipei 2011 Best Choice of the Year Award. AAEON joined ASUSTek Computer Inc. (ASUS).</td>
</tr>
<tr>
<td>2012</td>
<td>AAEON was awarded the Computex Taipei 2012 Best Choice of the Year Award. AAEON was awarded the 19th Taiwan Symbol of Excellence Award. AAEON was awarded the Siemens Star Supplier 2011 Award.</td>
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<tr>
<td>2013</td>
<td>AAEON was awarded the Computex Taipei 2013 Best Choice of the Year Award. AAEON was awarded the Microsoft Research &amp; Development Award. AAEON was awarded the Outstanding Business Achievement Award.</td>
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<td>2014</td>
<td>AAEON was awarded the Computex Taipei 2014 Best Choice of the Year Award. AAEON was awarded the Computex Taipei 2014 Best Choice of the Year Award.</td>
</tr>
<tr>
<td>2015</td>
<td>AAEON was awarded the Computex Taipei 2015 Best Choice of the Year Award. AAEON was awarded the Computex Taipei 2015 Best Choice of the Year Award.</td>
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<tr>
<td>2016</td>
<td>AAEON was awarded the Computex Taipei 2016 Best Choice of the Year Award. AAEON was awarded the Computex Taipei 2016 Best Choice of the Year Award.</td>
</tr>
<tr>
<td>2017</td>
<td>AAEON was awarded the Computex Taipei 2017 Best Choice of the Year Award. AAEON was awarded the Computex Taipei 2017 Best Choice of the Year Award.</td>
</tr>
<tr>
<td>2018</td>
<td>AAEON was awarded the Computex Taipei 2018 Best Choice of the Year Award. AAEON was awarded the Computex Taipei 2018 Best Choice of the Year Award.</td>
</tr>
<tr>
<td>2019</td>
<td>AAEON was awarded the Computex Taipei 2019 Best Choice of the Year Award. AAEON was awarded the Computex Taipei 2019 Best Choice of the Year Award.</td>
</tr>
<tr>
<td>2020</td>
<td>AAEON was awarded the Computex Taipei 2020 Best Choice of the Year Award. AAEON was awarded the Computex Taipei 2020 Best Choice of the Year Award.</td>
</tr>
<tr>
<td>2021</td>
<td>AAEON was awarded the 2021 System Integration Outbound Award. AAEON was awarded the 2021 COMPUTEX d&amp;i Awards. AAEON was awarded the 28th Taiwan Symbol of Excellence Award.</td>
</tr>
<tr>
<td>2022</td>
<td>AAEON was awarded the 22nd Taiwan Symbol of Excellence Award. AAEON was awarded the Microsoft Partner of Year 2015 Award. AAEON was awarded the Outstanding Business Achievement Award.</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
A member of the ASUS Group: A strong high-tech conglomerate

ASUS Technology and Financing
AAEON Design Flexibility and Domain Know-how

OEM/ODM Capability

The OEM/ODM service has been a key factor in AAEON’s phenomenal growth over the past 10 years. AAEON offers design services for full custom requirements as well as modification services for its off-the-shelf products. Whatever you need, AAEON has the experience and expertise to help you create or modify products to perfectly fit your requirements.
Core Competence

Product Innovation

AAEON’s integration expertise is integral to product designs that have the most desirable built-in features, saving customers valuable design and customization time. AAEON’s OEM/ODM capabilities help us meet customers’ exact specifications and requirements. In addition, AAEON has invested aggressively in R&D capabilities and will continue to do so to maintain a competitive advantage for new designs. In cooperation with premier technology vendors, AAEON participates in vendor early access programs to provide the latest technology to its customers.

R&D Strength

AAEON takes great pride in its World Class R&D aptitudes. With more than 20% of AAEON’s workforce employed in R&D and 10% of annual sales revenue invested in this field, AAEON is prepared to handle the most demanding designs based on the latest technologies. With our strong background in innovation, AAEON has been granted a raft of design patents around the world.

Design Capability

From our core competence of single board computer design, AAEON has expanded its capabilities to award-winning Panel PC System Design, BIOS Engineering with multi-vendor expertise, Mechanical Design, Peripheral Device Design, Design Verification and in-house EMI/EMC Debugging.

Market Focus

AAEON has established a worldwide reputation for exceptional domain know-how. This expertise has enabled AAEON to secure a solid position in Machine and Factory Automation, as well as the Chemical Industry. Additionally, AAEON’s cutting edge products meet the specific requirements of the Digital Signage, Transportation, Industrial Automation, Medical, Harbor/Marine, Military/Government, Public Safety and Energy sectors.

Manufacturing Capability

AAEON has manufacturing facilities located in Taipei, Taiwan and Suzhou, China. To become the leading supplier of Industrial Computers, AAEON has created manufacturing facilities with flexible layouts and expansion capabilities to easily address the demand for increased production capacity. Drawing upon the skills of its professional and experienced personnel to develop an efficient production system, AAEON has the ability to respond rapidly to customer requests for standard or customized IPC products.
Quality Assurance

AAEON’s Quality Assurance Closed Loop Feedback System provides solid and consistent feedback through the design, manufacturing and service stages to ensure continuous progress and meet customer expectations. The three stages of the Quality Assurance System are Design Quality Assurance (DQA), Manufacturing Quality Assurance (MQA) and Service Quality Assurance (SQA).

DQA

Design Quality Assurance starts at the conceptual stage of a project and covers the product development stage to ensure the utmost quality throughout the process. AAEON’s safety and environmental test labs ensure our products meet the requirements of CE/UL/FCC/CCC standards. All AAEON products go through an extensive and comprehensive test plan for compatibility, function, performance and usability. Therefore, AAEON customers can always expect to receive well-designed, high-quality products.

MQA

Manufacturing Quality Assurance is carried out in accordance with ISO 9001, ISO 13485, ISO 14001 certification standards. All AAEON products are built using production and quality testing equipment in a static-free environment. Additionally, these products go through rigorous tests on the production line and dynamic aging in the burn-in room. AAEON’s Total Quality Control (TQC) program includes Incoming Quality Control (IQC), In-Process Quality Control (IPQC) and Final Quality Control (FOC). Periodic training, auditing and facility calibration are strictly implemented to ensure all quality standards are followed to meet customers’ requirements. The Quality Control Team constantly communicates with R&D to improve product performance and compatibility.

SQA

Service Quality Assurance includes technical support and a repair service. With SQA, AAEON can serve its customers and also receive their feedback and work with R&D and Manufacturing to strengthen AAEON’s response time in resolving customer concerns and improve service levels.

Technical Support

The backbone of customer support is a team of professional Application Engineers who provide customers with real-time technical support. Their expertise is shared through internal knowledge management and links to the website for online nonstop service and solutions.

Repair Service

With an efficient eRMA system and RMA service policy, AAEON’s RMA Team is able to ensure prompt, high-quality product repair and replacement services with a short turnaround time.

Quality Certification

AAEON has acquired many official certifications to maintain its quality system.

ISO 9001: 2015 QMS
ISO 13485: 2016 Medical Devices-QMS
ISO 14001: 2015 EMS
ISO 27001: 2013 ISMS
3C: China Compulsory Certification
CE/FCC: All AAEON products undergo and meet CE and FCC test standards which prove their design quality and integrity
Introduction

To keep ahead of the ever-growing markets and demand for AI hardware solutions, AAEON is pleased to announce our new webpage, AAEON.ai. AAEON.ai offers developers and systems integrators a centralized resource for finding the latest AI edge computing technology from AAEON.

Market analysts have consistently pointed to expanded growth and deployment of Industry 4.0 technologies, especially AI edge computing, in various vertical markets. AAEON.ai collects all of AAEON’s rugged, compact, industrial grade AI edge solutions in one convenient location. From boards and systems to AI accelerator modules, AI developers and systems integrators can easily find the platforms that meet their project, budget and performance needs. AAEON.ai will also feature solutions partners, allowing visitors to connect with local vendors and software providers, and building an AI ecosystem designed to make creating and deploying AI applications easier than ever. Visitors to AAEON.ai will also have a chance to learn about the latest news and browse a library of application stories and white papers of real-world applications using AAEON technology.

Visit AAEON.ai today and explore the latest in AI Edge technology from AAEON!
Shop Online for Prompt Global Service

AAEON eShop offers customers a convenient way to quickly place orders from a selection of our latest and most popular IPC, AI and Edge Computing platforms. Orders are processed and shipped within two working days on all in stock items, with 50% off worldwide shipping on all orders over US$500. Customers can also order any accessories or configurations listed on the AAEON.com product page through eShop. Registering an account on eShop allows customers access to benefits including managing multiple shipping addresses, order tracking, price drop and in stock notifications and more! Visit AAEON eShop today at eshop.aaeon.com.

AAEON eShop Benefits

- **Fast Processing**
  eShop brings you the convenience of fast order processing. Orders are processed and shipped within two working days for all in-stock items.

- **Easy Payment**
  eShop supports payment options including credit card, PayPal™ and even wire transfer. (Advanced notification is needed when using wire transfer.)

- **50% off Shipping**
  Save more when you shop more with eShop! Receive 50% off global shipping on all eShop orders over US$500.

- **Official Warranty**
  All products sold on eShop are backed by the same official warranty and industry leading support offered on every AAEON product.

- **Flexible Service**
  Purchase any product accessory or configuration listed on the AAEON.com product page, including processor, memory, storage and more. Contact AAEON eShop service representatives for more details (eShop@aaeon.com).

Note: All specifications are subject to change without notice.
Design Manufacturing Service

Design Manufacturing Service (DMS) offers exceptional end-to-end services from product conceptualization, product development to manufacturing and service programs. All services are linked together through a comprehensive process and closely monitored by dedicated professionals to guarantee the highest level in product quality, reliability and durability.

Collaboration Models

- Product Conceptualization
- Electronic Circuit Development
- PCB Layout
- Component Qualification
- Mechanical Design
- Prototype building
- Compatibility, Reliability and Qualification testing
- Certification and processing (Agency Approvals)
- Manufacturing Design
- Packaging and Enclosure Design
- PCBA Assembly
- System Manufacturing
- Component and Subsystem Assembly
- Functional Testing
- Engineering Change Management
- BTO (Build to Order)
- Supplier Qualification
- Warehousing
- Failure Analysis

Customers can consign to AAEON the manufacturing of their existing products, customize existing AAEON COTS products, or joint develop new products with the expertise of a dedicated project team that oversees the project from product conceptualization to on-time delivery of the goods. AAEON DMS handles Large-volume as well as Low-Volume-High-Mix projects, satisfying the need of our customers for every kind of computing platform requirements.

Areas of Expertise

- Retail
- Transportation
- Energy
- Automation
- Medical and Healthcare
- Networking

Contract Manufacturing (CM)
- Customer-owned design
- AAEON provides manufacturing and engineering service

Commercial off-the-shelf (COTS)
- Based on AAEON standard product & technology roadmap
- With optional minor changes

Customized COTS
- Based on AAEON standard product & technology roadmap
- Modify according to customer’s request

Joint Development (JDM)
- Strategic Partnership
- Co-architected design based on common IP from technology roadmap

Original Design Manufacturing (ODM)
- Customer driven design
- Based on customer driven product and technology roadmap

Note: All specifications are subject to change without notice.
What is Q Service Plus?

Q Service is a Quick and Quality Service for reducing the time spent on troubleshooting and expediting the development process. With COM technology getting more and more complex and versatile, product failure can originate from numerous sources and may be difficult to identify. AAEON's Q Service Plus helps our customers to improve new products' times to market with AAEON's full support from Hardware, Software and Firmware R&D resources.

Q Service Plus Commitment:

• Quick carrier board schematic review within FIVE working days -Absolutely FREE!
• Quick delivery of a bring up BIOS - within FIVE working days, absolutely FREE!
• Quick compatibility and reliability debug services and feedback within 72 hours
• Quick arrangement for on-site service and consultation

Benefits:

• Worry-free upgrades
• Faster time to market
• Cost savings
• Reduced design risks
• Long-term support

AAEON Carrier Board Design Service

With over 20 years of quality design and manufacturing experience, AAEON provides professional carrier board design services according to the customer’s specifications and passes all compatibility and functional tests required in the process. There are also default carrier boards available for evaluation purposes.
Wide Temperature Assurance Service (WiTAS)

Wide Temperature Embedded Computing

Applications of embedded computing systems continue to improve the quality and convenience of our lives. As the global population increases, there are greater demands on resources, and the need for automation and computing capability in remote regions will grow. To address a demand for computers that operate in extreme environments, platforms must follow design methodologies for wide temperature range use. In addition, testing and product qualification must follow more stringent criteria to assure continuous operation. As the core of any embedded system, the CPU board plays perhaps the most critical role and, therefore, requires careful design and validation for wide temperature capabilities.

AAEON has been designing and manufacturing quality embedding products for over two decades. Our accumulated experience in all aspects of the embedded electronics market puts us in a strong position to develop wide temperature CPU boards and systems.

AAEON’s WiTAS (Wide Temperature Assurance Service) program produces boards in two temperature range categories:

-20°C to 70°C (-4°F ~ 158°F) = WiTAS 1
-40°C to 85°C (-40°F ~ 185°F) = WiTAS 2

Processes for WiTAS Production

WiTAS 1 Production

Boards that pass -20°C to 70°C (-4°F ~ 158°F) thermal tests are given a WiTAS 1 designation, and boards that endure -40°C to 85°C (-40°F ~ 185°F) tests are assigned a WiTAS 2 designation, as part of AAEON’s special service assurance of wide temperature durability and reliability. This, in conjunction with the use of durable components throughout the duration of testing, allows AAEON to enhance the longevity of its boards and systems.

Application

Applications for WiTAS CPU boards can be found in a range of industries and markets:

- Transportation: Trains, Ships, Airplanes and Traffic Surveillance Systems
- Factory Automation: Power Stations, Steel Manufacturing
- Military: Field Electronic Devices, Controllers
- Energy: Windmill Controllers, Solar Energy Controllers
- Environmental: Climate, Water, Air Quality
- Anti-dust, Fanless Applications: Medical, Chemical and Pharmaceutical Factories

Note: All specifications are subject to change without notice.
The BIO interface, or board-to-board I/O interface, is AAEON's latest innovation in product customization. The BIO board is designed with compactness in mind and is highly customizable for a plethora of add-on features such as MiniCards, USBs, COM and PoE (Power over Ethernet) ports.

While there are many ways in which a product can be customized, AAEON recommends the BIO daughterboards, a series of daughterboards equipped with AAEON's Board-to-board Interface for AAEON's Standard Products. Simple in design and made to order, these boards take the time and effort out of customization by bypassing the traditional process of re-specifying, building, and testing. Just pick the features you want, build the board, connect it to the motherboard and your solution is ready. No fuss, no muss.

Some key features include:
- Universal screw holes on both the motherboard and daughterboard
- Flexible to demands of vertical markets
- Easy thermal and system assembly

Customization Made Easy

AAEON Single Board

Standard Product
- Immediate availability
- Simple expansion

Designed by AAEON
- Custom specification
- Costs at least 70% less than a new project

Designed by Customer
- Easy custom specification
- Co- & Sell development
- Secured domain knowledge

Fast Delivery for Expansions

Ready in 2 weeks!
Ready in 4 weeks!
AAEON’s Embedded OS Solution

AAEON provides Embedded OS Solutions to customers who are in need of OS customization. AAEON’s Embedded OS Solutions are designed to shorten times to market and save our customers’ time and R&D resources.

Windows® Embedded Products

Windows 10 IoT

Windows 10 IoT Enterprise LTSC 1607/1809/ 2021

Windows Embedded 7

Windows Embedded Enterprise 7  Windows Embedded POSReady 7  Windows Embedded Standard 7

AAEON Embedded OS Solution

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel® 7th KabyLake (Q170/H110/C236)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>✓</td>
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<tr>
<td>Intel® 6th SkyLake (Q170/H110/C236)</td>
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<td>Intel® 5th Broadwell (5010U/5350U/S650U/D1548/D1518)</td>
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<td>Intel® 4th Haswell (QM87/Q87/H81)</td>
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<td>Intel® 3rd IvyBridge (QM77/Q77/HM76/B75)</td>
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<td>Intel® Braswell (N3060/N3160/X5-E8000/N3710)</td>
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<td>Intel® Baytrail (J1900/N2000/E3800)</td>
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<td>Intel® TunnelCreek (E620/E640/E660/E680)</td>
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<td>Intel® Pinewview (N450/D410/D510/D525/N455/D425)</td>
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<td>Intel® Cedarview (D2550/N2800/N2600)</td>
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<td>AMD Geode (LX700/LX800/LX900)</td>
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<td>AMD T56N/T40R/T40E/T16R</td>
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<td>✓</td>
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</tbody>
</table>

Note 1: Former Windows® Embedded XP
Note 2: Former Windows® Embedded

Note: All specifications are subject to change without notice.
# Embedded OS Main Features

<table>
<thead>
<tr>
<th>OS Family</th>
<th>Windows® Embedded Standard</th>
<th>Windows® Embedded POS Ready</th>
<th>Windows® Embedded Enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td>Full Customization</td>
<td>Simple Installation</td>
<td>Full Function</td>
</tr>
<tr>
<td>Windows® Product Sku</td>
<td>Windows® Embedded Standard 2009</td>
<td>WEPOS 1.1</td>
<td>Windows® 7 Professional</td>
</tr>
<tr>
<td></td>
<td>Windows® Embedded Standard 7</td>
<td>POSReady 7</td>
<td>Windows® 8.1 Professional</td>
</tr>
<tr>
<td></td>
<td>Windows® Embedded Standard 8</td>
<td>POSReady 2009</td>
<td>Windows® 10 IoT Enterprise LTSC 1607/1809/2021</td>
</tr>
<tr>
<td>CPU Type</td>
<td>x86</td>
<td>x86</td>
<td>x86</td>
</tr>
<tr>
<td>Development Tool</td>
<td>Customization Image</td>
<td>CD Installation</td>
<td>CD Installation</td>
</tr>
<tr>
<td>Development Time</td>
<td>Short</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Maintenance Cost</td>
<td>Middle</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Embedded Features</td>
<td>Custom Shell/ EWF/ FBWF/ USB Boot/ HORM</td>
<td>Custom Shell/ FBWF/ USB Boot</td>
<td>Standard Shell/ UWF</td>
</tr>
</tbody>
</table>

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# AAEON Hi-Supervisor

Hi-Supervisor is a remote hardware monitor application for Windows based on MQTT protocol. This software allows users to get device status and set device configurations like GPIO, Fan, Watch Dog Timer, SMBus, .., etc. It supports remote reboot and shutdown, too. Hi-Supervisor supports AAEON Windows platforms which support Hi-Safe. Users can set warning thresholds to acknowledge users abnormal conditions by e-mail.

## Hi-Supervisor Advantages

- Support Hi-Safe full functions remotely
- Customized support
- Support Azure IoT Central

---

**Hardware Monitor:**
Retrieves fan, temperature and voltage data

**Hard Disk:**
obtain hard disk S.M.A.R.T information

**Remote Control Fan**
Hi-Safe is a powerful, free program which provides SDKs for systems and UIs running Microsoft® Windows® operating systems. Hi-Safe controls system hardware by utilizing the Windows Management Interface, providing a safe and standard interface for Windows machines. Hi-Safe allows end users to easily develop their own UI software to monitor vital system components such as the processor, RAM and display. It also provides interface and functionality for Hardware Monitor, Digital I/O, Watchdog timer, Smart Fan settings, SM Bus, and backlight controller for LVDS and eDP. With the SDK user interface, no coding is needed, and customers can create their own user interface by using the function codes provided by AAEON. Customers can download the Hi-Safe V3 application directly from the Microsoft Store.

**Hi-Safe V3 Advantages**

- Modern and Flexible User Interface
- Easy and Friendly to Use
- Safe Operation Control for Windows

**System Information:**
Receives CPU, display and RAM information

**Smart Fan:**
Supports multi-stage adjustment of temperature and speed controls

**Hardware Monitor:**
Receives super I/O, fan, temperature and voltage data

**SM Bus:**
Reads and writes to SMBus device and detects SMBus base address automatically

**DIO:**
Obtains DIO information: sets the pin direction and pin data

**Backlight Controller:**
Controls LVDS or eDP display

**Watchdog:**
Sets the system reboot timer

Note: All specifications are subject to change without notice.
Hi-Manager is a tool based on the Intel® Active Management Technology 12.0 (iAMT 12.0) and has backward compatibility with earlier versions of iAMT. This allows users to locate all iAMT devices within the intranet, power On/Off target devices remotely, set power On/Off scheduling, arrange device groupings for better management, offer event logs and timer settings to wake up devices at specified times, recover systems that have crashed from virtual CD-ROM, remote KVM management and access to target device hardware information for asset management. Hi-Manager can be installed on all AAEON platforms and can remotely manage AAEON client devices that use Intel® M67/ Q77/ QM77/ HM76/ B75A/Q87/QM87/QM170/Q370/C246 chipsets and run Microsoft® Windows® XP, Windows® 7, and Windows® 10 Operating Systems.

Hi-Manager Advantages

▶ Easy to use and build custom applications
▶ Supports AAEON products with iAMT
▶ In-depth technical support

Network Discovery: AMT device discovery

Power Control: Powers On/Off the target device

Group Management: Arrange devices in this function

Event Log: Logs boot records of the selected device

Alarm Clock: Sets timer to wake up a sleeping device

Remote Recovery: Mounts boot image or physical CD-Rom to target device

KVM: Controls remotely from the target device

Schedule: Schedules the power On/Off target devices

Device Information: Shows target device assets

Intel® Active Management Technology Features

<table>
<thead>
<tr>
<th>Intel® Chipset</th>
<th>M67/ Q77/ QM77/ HM76/ B75A/ Q87/ QM87/QM170/Q370/Q470/C246</th>
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</thead>
<tbody>
<tr>
<td>Intel® AMT Version</td>
<td>7.0/8.0/9.0/10.0/11.0/12.0/14.0</td>
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<tr>
<td>HW Inventory</td>
<td>✓</td>
</tr>
<tr>
<td>SW Inventory</td>
<td>✓</td>
</tr>
<tr>
<td>Power State Management</td>
<td>✓</td>
</tr>
<tr>
<td>System Defense</td>
<td>✓</td>
</tr>
<tr>
<td>Remote Configuration</td>
<td>✓</td>
</tr>
<tr>
<td>Remote Boot Option</td>
<td>✓</td>
</tr>
<tr>
<td>KVM Redirection</td>
<td>✓</td>
</tr>
<tr>
<td>KVM Remote Control</td>
<td>✓</td>
</tr>
<tr>
<td>ME Wake on LAN</td>
<td>✓</td>
</tr>
<tr>
<td>Proactive Security Block, HW-Based and Remote Management Recovery</td>
<td>✓</td>
</tr>
<tr>
<td>Host-Based Provisioning</td>
<td>✓</td>
</tr>
<tr>
<td>Enhanced System Defense Filters</td>
<td>✓</td>
</tr>
</tbody>
</table>
BIOX is a BIOS customization SaaS solution for AAEON products. Most field applications and deployments require BIOS customization for platforms and systems to meet a customer's requirements. Often this requires constant communication with vendors, possibly delaying deployment or slowing down maintenance. With BIOX, the end user can customize the BIOS on their own, anytime, in five simple steps, without the need to contact a service rep.

**BIOX Advantages**

**Modern and Flexible User Interface**
- Logo
- Boot Order
- Setup Values
- SMBIOS Strings
- Password Management

**Version Control Access**
- Retrievable
- Re-customizable
- History Traceable

**AAEON Software Support Portal:**
https://aaeoncm.github.io/
AI Edge Computing Solutions
Accelerate your project with AI Edge Computing modules from AAEON. AAEON offers two series of AI Edge Computing solutions; the AI Core X family with Intel® Movidius™ Myriad™ X VPU, and the AAEON Deep Learning series of modules with Kneron KL520 NPU.

Pico-ITX Boards
AAEON Pico-ITX boards are ideal for fanless, low power consumption and space limited equipment in the Embedded Market. It is equipped with the most standard I/O connectors along the rear I/O edge and rich features, such as HDMI, USB, COM, SATA, and Mini Card, to reduce the cost of system integration.

COM Express CPU Modules
The PICMG standard for Computer-On-Modules (COMs) is based on serial differential signaling technology and legacy PC peripheral interfaces. Besides PCI, LPC and IDE, COM Express incorporates interfaces including PCI Express, Serial ATA, USB 2.0/3.0, LVDS and Serial DVO. COM Express delivers performance, flexibility, quick time to market, safeguards R&D investment and lowers the total cost of ownership.

UP Series
AAEON’s UP Board family of SBCs provide a compact solution for applications in Edge Computing, IoT, AI and more. Featuring energy efficient Intel® processors, UP Board SBCs offer greater processing power over traditional “maker boards” while operating in mobile applications. UP Board SBCs are designed for ultimate flexibility, making integration into your projects even easier.

EPIC Boards
The EPIC form factor embedded single board computer is designed to fulfill increasing high performance demands and flexible expansions. The size of the EPIC board (4.53” x 6.50”) makes it an ideal size to fit into space-constrained applications requiring stackable I/O expansions. EPIC also offers features such as low power consumption and PC/104+ slots to satisfy varying customer requirements.

SubCompact Boards
AAEON’s expertise in space constrained design helped to create these small yet powerful computer boards. At just 5.75” x 3.5”, AAEON’s SubCompact boards are uniquely suited for mobile and low-power devices.
Board Product Lines

**de next**
With extreme power in an unprecedentedly small board measuring just 84mm x 55mm, AAEON continues to push the limits of innovation with the new de next series.

**Compact Boards**
8” x 5.25” compact-sized computer boards apply advanced embedded technology, providing stable and solid computing engines for Factory Automation, KIOSK and POS (Point of Sale) markets.

**PC/104 Modules**
These ultra-compact stackable computer modules come with PC/104, PC/104+ or PCI-104 connectors for flexible function expansion. AAEON offers different performance levels of PC/104 CPU modules and a variety of PC/104 peripherals to meet your application requirements. Furthermore, the cutting-edge PCI/104-Express interface CPU module will provide for the next era of applications.

**Smart Display Modules**
Intel® Smart Display Modules, or SDMs, are changing the face of the digital display industry. Their slim form factor gives developers greater flexibility when panel design and enables a new generation of ultraslim devices. With SDMs sharing a standard design specification, system upgrades and modifications can be achieved by simply plugging in a new module, and their ease of use also helps to reduce maintenance costs.

**Industrial Motherboards**
AAEON’s Industrial Motherboard line focuses on the most popular form factors: Nano ITX, Mini-ITX, MicroATX and ATX. These form factors are ideal in the KIOSK, POS, Panel PC, Vending Machine, Banking Machine, Medical and Gaming industries. PCI, PCI-E, Mini-Card, M.2 and Mini-PCI bus interfaces are provided. In addition, more standard I/O connectors are arranged at the rear/front I/O to save cost and ease in-system design.

**Peripheral Modules**
The Mini-PCI, Mini Card form factor Peripheral Modules provide easy and cost-effective function expansion for things such as serial ports, LAN ports, USB ports, IEEE-1394a ports, SATA ports, Capture functions, TTL/DVI Conversion module, and CAN bus.

Note: All specifications are subject to change without notice.
AI Edge Computing Solutions
## Specifications

**SYSTEM**

<table>
<thead>
<tr>
<th>FORM FACTOR</th>
<th>PICO-ITX</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Intel® Celeron® Processor: Pentium N4200 (4C/4T, 1.10GHz, up to 2.50GHz, TDP 6W)</td>
</tr>
<tr>
<td>CHIPSET</td>
<td>Integrated with Intel® SoC</td>
</tr>
<tr>
<td>MEMORY TYPE</td>
<td>Onboard DDR3L 4GB</td>
</tr>
<tr>
<td>WAKE ON LAN</td>
<td>Yes</td>
</tr>
<tr>
<td>WATCHDOG TIMER</td>
<td>255 Levels</td>
</tr>
<tr>
<td>SECURITY</td>
<td>—</td>
</tr>
<tr>
<td>RTC Battery</td>
<td>Lithium Battery 3V/240mAh</td>
</tr>
<tr>
<td>DIMENSION</td>
<td>3.94” x 2.84” (100mm x 72mm)</td>
</tr>
<tr>
<td>Gross Weight</td>
<td>0.18 lbs. (0.08 kg)</td>
</tr>
<tr>
<td>OS Support</td>
<td>Windows 10 (64 bit)</td>
</tr>
</tbody>
</table>

**POWER**

| POWER REQUIREMENT | +12V |
| POWER SUPPLY TYPE | ATX |
| POWER CONSUMPTION | Intel® N4200 processor, DDR3L 4GB, 1.1A@12V |

**DISPLAY**

| CONTROLLER | Intel® HD Graphics 505 |
| LVDS/eDP | — |
| Display Interface | HDMI 1.4b x 1 (up to 3840 x 2160@30Hz) |
| Multiple Display | 1 Simultaneous Displays |

**AUDIO**

| CODEC | — |
| AUDIO INTERFACE | — |
| Speaker | — |

**EXTERNAL I/O**

| ETHERNET | Realtek 8111 Gigabit Ethernet 10/100/1000Base, RJ-45 x 1 |
| USB | USB 3.2 Gen 1 x 2 |
| SERIAL PORT | — |
| VIDEO | HDMI 1.4b (up to 3840 x 2160@30Hz) |

**INTERNAL I/O**

| USB | USB 2.0 x 2 (Internal, co-use with FAN connector) |
| SERIAL PORT | COM1 (RS232) |
| VIDEO | eDP x 1 (up to 3840x2160@60Hz, Optional) |
| SATA | SATA II x 1 |
| AUDIO | — |
| DIO/GPIO | 4-bit |
| SMBus/I2C | I2C/SMBus x 1 (I2C as default) |
| Touch | — |
| FAN | — |
| SIM | — |
| Front Panel | HDD LED, PWR LED, Power Button, Buzzer, Reset |
| Others | — |

**EXPANSION**

| Mini PCI-E/EmSATA | — |
| M.2 | M.2 E-Key 2230 x 1 (PCIe/USB) |
| M.2 B-Key 2280 x 1 (SATA/USB) |
| Others | — |

**ENVIRONMENT & CERTIFICATION**

| OPERATING TEMP | 32°F ~ 140°F (0°C ~ 60°C) |
| STORAGE TEMP | -40°F ~ 185°F (-40°C ~ 85°C) |
| OPERATING HUMIDITY | 0% ~ 90% relative humidity, non-condensing |
| MTBF (HOURS) | 110,000 |
| EMC | CE/FCC Class A |

Note: All specifications are subject to change without notice.
Packing List

- PICO-APL3
- M2AI-2280-520
- EverFocus Full HD Camera EUA1200

Ordering Information

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>PICO-APL3-A10-FAI1</td>
<td>Celeron® N4200 (Quad Core)</td>
<td>Onboard DDR3L 4GB</td>
<td>w/ Heatsink</td>
<td>HDMI x 1</td>
<td>SATA 3.0 x 1</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 1</td>
<td>—</td>
<td>M.2 2230 (E Key)</td>
<td>+12V (DC Jack)</td>
<td>0°C – 60°C</td>
<td>—</td>
<td>DIO 4 bit</td>
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<td>M.2 2230 (B Key) x 1</td>
<td>4-WAY</td>
<td>USB 3.0 x 2</td>
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<td></td>
<td></td>
<td></td>
<td>4-WAY 1 x 2 (Internal)</td>
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Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty</th>
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<tbody>
<tr>
<td>1709070500</td>
<td>(TF) SATA Cable, 50cm</td>
<td>1</td>
</tr>
<tr>
<td>1702150155</td>
<td>(TF) SATA Power Cable, 15cm</td>
<td>1</td>
</tr>
<tr>
<td>1700040151</td>
<td>(TF) USB Cable, 15cm</td>
<td>1</td>
</tr>
<tr>
<td>170109122</td>
<td>(TF) Flat Cable, D-Sub 9P(M), 9P 1.0mm Housing, 12cm</td>
<td>2</td>
</tr>
<tr>
<td>125530040C</td>
<td>(TF) Power Adapter, 12V, 40W, FSP/FSP040-DHAN3</td>
<td>1</td>
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<tr>
<td>1702031802</td>
<td>Power Cord (US Type)</td>
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<td>1702031803</td>
<td>Power Cord (European Type)</td>
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<tr>
<td>170203180E</td>
<td>Power Cord (Japan Type)</td>
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</tbody>
</table>

Note: All specifications are subject to change without notice.
M2AI-2242-520
AI Edge Computing Module with Kneron KL520 NPU

Features
- Kneron KL520 NPU (Designed by ARM architecture)
- Mini card (USB2.0 interface, Full size)
- Accelerator for AI Edge Computing
- Good for people monitoring, retail application

Specifications
- IC: Kneron KL520
- Type: Integrated SoC
- Support Framework: ONNX, TensorFlow, Keras, Caffe
- Support Model: Vgg16, Resnet, GoogleNet, YOLO, Tiny YOLO, Lenet, MobileNet, DenseNet
- Memory Type: LPDDR2
- NPU Performance: 0.35 TOPS
- Overall Power Consumption: 0.5 W
- Operating Temperature: 32°F ~ 158°F (0°C ~ 70°C)
- Storage Temperature: -40°F ~ 185°F (-40°C ~ 85°C)
- Operating Humidity: 0% ~ 90% relative humidity, non-condensing
- Certification: CE/FCC Class A

Packing List
- M3 screw x 2
- M2AI-2242-520 x 1

Optional Accessories
- EverFocus Full HD Camera EVA1200

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PER-T520-M2AI-A11-0421</td>
<td>AI.NPU 520.M.2 2242(USB interface).A1.1</td>
</tr>
<tr>
<td>PER-T520-M2AI-A11-K421</td>
<td>AI.NPU KL520.M.2 2242.w/ HD Camera.A1.1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
### Features
- Kneron KL520 NPU (Designed by ARM architecture)
- M.2 B Key (22x80mm)
- Accelerator for AI Edge Computing
- Good for people monitoring, retail application

### Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC</td>
<td>Kneron KL520</td>
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<tr>
<td>Type</td>
<td>Integrated SoC</td>
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<tr>
<td>Support Framework</td>
<td>ONNX, TensorFlow, Keras, Caffe</td>
</tr>
<tr>
<td>Support Model</td>
<td>Vgg16, Resnet, GoogleNet, YOLO, Tiny YOLO, Lenet, MobileNet, DenseNet</td>
</tr>
<tr>
<td>Memory Type</td>
<td>LPDDR2</td>
</tr>
<tr>
<td>NPU Performance</td>
<td>0.35 TOPS</td>
</tr>
<tr>
<td>Overall Power Consumption</td>
<td>0.5 W</td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 158°F (0°C ~ 70°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F ~ 185°F (-40°C ~ 85°C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>CE/FCC Class A</td>
</tr>
</tbody>
</table>

### Packing List
- M3 screw x 1
- M2AI-2280-520 x 1

### Optional Accessories
- EverFocus Full HD Camera EUA1200

### Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>PER-T520-M2AI-A11-K801</td>
<td>AI.NPU KL520.M.2 2280.w/ HD Camera.A1.1</td>
</tr>
</tbody>
</table>
Mini-AL-520
AI Edge Computing Module with Kneron KL520 NPU

Features
- Kneron KL520 NPU (Designed by ARM architecture)
- Mini card (USB2.0 interface, Full size)
- Accelerator for AI Edge Computing
- Good for people monitoring, retail application

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Kneron KL520</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Integrated SoC</td>
</tr>
<tr>
<td>Support Framework</td>
<td>ONNX, TensorFlow, Keras, Caffe</td>
</tr>
<tr>
<td>Support Model</td>
<td>Vgg16, Resnet, GoogleNet, YOLO, Tiny YOLO, Lenet, MobileNet, DenseNet</td>
</tr>
<tr>
<td>Memory Type</td>
<td>LPDDR2</td>
</tr>
<tr>
<td>NPU Performance</td>
<td>0.35 TOPS</td>
</tr>
<tr>
<td>Overall Power Consumption</td>
<td>0.5 W</td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 158°F (0°C ~ 70°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F ~ 185°F (-40°C ~ 85°C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
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<tr>
<td>Certification</td>
<td>CE/FCC Class A</td>
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</table>

Packing List
- M3 screw x 2
- Mini-AL-520 x 1

Optional Accessories
- EverFocus Full HD Camera EUA1200

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>PER-T520-MIAI-A11-0001</td>
<td>AI.NPU 520 full size mini Card(USB interface).A1.1</td>
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<tr>
<td>PER-T520-MIAI-A11-K001</td>
<td>AI.NPU KL520. Full size Mini Card w/ HD Camera.A1.1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
AI Edge Computing Module with Kneron KL720 NPU

Features
- Kneron KL720 NPU
- Compliant to M.2 2242 B-key (USB2.0 or USB3.0 interface)
- Breakable PCB to support 3 sizes: 2242, 2260 and 2280
- Support 620 x 620, higher resolution recognition

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC</td>
<td>Kneron KL720</td>
</tr>
<tr>
<td>Type</td>
<td>ARM CM &amp; DSP</td>
</tr>
<tr>
<td>Support Framework</td>
<td>Pytorch, ONNX, Tensorflow 1.6, Tensorflow lite, Keras, Caffe</td>
</tr>
<tr>
<td>Support Model</td>
<td>Resnet, GoogleNet, YOLO, Tiny YOLO, MobileNet-SSD, DenseNet, RNN, LSTM</td>
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<tr>
<td>Memory Type</td>
<td>128MB LPDDR3</td>
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<td>NPU Performance</td>
<td>1.4 TOP/s</td>
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<tr>
<td>Overall Power Consumption</td>
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<thead>
<tr>
<th>Others</th>
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<tbody>
<tr>
<td>Operating Temperature</td>
<td>-32°F~122°F (0°C ~ 50°C with cooler 5m/s)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-32°F~158°F (0°C ~ 70°C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>CE/FCC Class A</td>
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Packing List
- M3 screw x 2
- M2AI-2242-720 x 1

Optional Accessories
- PER-T720-M2AI-FAN01

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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<tr>
<td>PER-T720-M2AI-A10-0421</td>
<td>AI.NPU 720 M.2 B Key 2242(USB interface).A1.0</td>
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</table>

Note: All specifications are subject to change without notice.
M2AI-2280-720
AI Edge Computing Module with Kneron KL720 NPU

Features
- Kneron KL720 NPU
- Compliant to M.2 2280 B-M key (PCIe interface)
- Support 620 x 620, higher resolution recognition

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Dual Kneron KL720</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>ARM CM &amp; DSP</td>
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<tr>
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</tr>
<tr>
<td>Support Model</td>
<td>ResNet, GoogLeNet, YOLO, Tiny YOLO, MobileNet-SSD, DenseNet, RNN, LSTM</td>
</tr>
<tr>
<td>Memory Type</td>
<td>128MB LPDDR3</td>
</tr>
<tr>
<td>NPU Performance</td>
<td>1.4 TOP/s x2</td>
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<tr>
<td>Overall Power Consumption</td>
<td>5W</td>
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</table>

Others

- Operating Temperature: 32°F–122°F(0°C ~ 50°C with cooler 5m/s)
- Storage Temperature: 32°F–158°F(0°C ~ 70°C)
- Operating Humidity: 0% ~ 90% relative humidity, non-condensing
- Certification: CE/FCC Class A

Packing List

- M3 screw x 1
- M2AI-2280-720 x 1

Optional Accessories

- PER-T720-M2AI-FAN02

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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<tr>
<td>PER-T720-M2AI-A10-0801</td>
<td>AI.NPU 720 M.2 B-M Key 2280(PCIe[x1] interface), A1.0</td>
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</tbody>
</table>

Note: All specifications are subject to change without notice.
Mini-AI-720
Al Edge Computing Module with Kneron KL720 NPU

Features
- Kneron KL720 NPU (Designed by ARM architecture)
- Mini card (PCIe[x1] interface, Full size)
- Accelerator for AI Edge Computing
- Enhanced performance to process high resolution video and graphic related computing

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>IC</th>
<th>Kneron KL720</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>ARM CM &amp; DSP</td>
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<tr>
<td>Support Framework</td>
<td>Pytorch, ONNX, TensorFlow 1.6, Tensorflow lite, Keras, Caffe</td>
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<td>Support Model</td>
<td>Resnet, GoogleNet, YOLO, Tiny YOLO, MobileNet-SSD, DenseNet, RNN, LSTM</td>
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<td>Memory Type</td>
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<td>NPU Performance</td>
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<tr>
<td>Operating Temperature</td>
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<tr>
<td>Storage Temperature</td>
<td>32°F<del>158°F (0°C</del>70°C)</td>
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<tr>
<td>Operating Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
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<td>Certification</td>
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</table>

Packing List
- M3 screw x 2
- PER-T720-MIAI-A10-0001 x 1

Optional Accessories
- PER-T720-MINI-FAN01

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PER-T720-MIAI-A10-0001</td>
<td>AI.NPU 720.full size mini Card (PCIe[x1] interface), A1.0</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
02

Gateway Board & Expansion Board
Standard Gateway Board With Onboard ARM Cortex-A8 800 MHz RISC Processor

Features
- ARM Cortex-A8 800 MHz RISC Processor
- Onboard DDR3L 1 GB / eMMC 16GB
- Gigabit Ethernet port x 2
- USB2.0 x 1, RS-485 x 2
- 4 LED lights controlled through GPIO
- RTC x 1, Micro SD Slot x 1, SIM Slot x 1
- Mini PCIe connector (For RF Module) x 1
- NB-IoT connector x 1
- Micro USB Debug Port x 1
- DC9-30V Power Input
- Pre-Install Linux Debian

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>ARM Cortex-A8 800 MHz RISC Processor</td>
</tr>
<tr>
<td>Memory</td>
<td>Onboard DDR3L 1GB</td>
</tr>
<tr>
<td>Storage</td>
<td>eMMC 16GB</td>
</tr>
<tr>
<td>Real Time Clock</td>
<td>RTC, with 3V CR2032 Lithium battery x 1</td>
</tr>
<tr>
<td>Security</td>
<td>—</td>
</tr>
<tr>
<td>Indicators</td>
<td>Programmable LED control x 4</td>
</tr>
<tr>
<td>Cellular</td>
<td>Mini PCIe Connector x 1</td>
</tr>
<tr>
<td>Wireless Lan</td>
<td>—</td>
</tr>
<tr>
<td>Operating System</td>
<td>Debian 9</td>
</tr>
<tr>
<td>Support Protocol</td>
<td>—</td>
</tr>
<tr>
<td>I/O Interfaces</td>
<td></td>
</tr>
<tr>
<td>Serial Port</td>
<td>RS-485, Phoenix Connector x 2</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Gigabit Ethernet, RJ-45 x 2</td>
</tr>
<tr>
<td>USB</td>
<td>USB 2.0, Type A x 1</td>
</tr>
<tr>
<td>ADC</td>
<td>—</td>
</tr>
</tbody>
</table>

Packing List

- SRT-3352

Optional Accessories

- 1255300368
  Power Adapter; AC/DC 100-240VAC, 12VDC/3A, 36W (phoenix connector)
- 9741EC25E0
  PCIe mini card 4G LTE module kit with cable & Antenna, EC25-E
- 9741EG25G0
  PCIe mini card 4G LTE module kit, Global Band W/SIM holder, W/Cable & antenna, EG25-G

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>COM</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operation Temp.</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRT-3352-A10-A002</td>
<td>ARM Cortex A8 800MHz</td>
<td>Onboard DDR3L 1GB</td>
<td>Fakess</td>
<td>RS-485 x2 (phoenix)</td>
<td>eMMC 16GB, MicroSD x1</td>
<td>GbE x 2</td>
<td>USB 2.0 x 1</td>
<td>Micro USB x 1</td>
<td>Mini PCIe slot x 1, SIM card socket x 1</td>
<td>DC9-30V</td>
<td>0°C ~ 60°C @ 0.5 m/s airflow</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
SRT-3352C
Compact Gateway Board With Onboard ARM Cortex-A8 800 MHz RISC Processor

Features
- ARM Cortex-A8 800 MHz RISC Processor
- Onboard DDR3L 1 GB / eMMC 16GB
- Gigabit Ethernet port x 2
- USB2.0 x 2, RS-485 x 2
- 4 LED lights controlled through GPIO
- RTC x 1, Micro SD Slot x 1, SIM Slot x 1
- Mini PCIe connector (For RF Module) x 1
- NB-IoT connector x 1
- Board to Board connector x 1
- Micro USB Debug Port x 1
- RS-485 termination resistor switch
- DC9-30V Power Input
- Onboard WiFi/Bluetooth Module
- Pre-Install Linux Debian

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>ARM Cortex-A8 800 MHz RISC Processor</td>
</tr>
<tr>
<td>Memory</td>
<td>Onboard DDR3L 1GB</td>
</tr>
<tr>
<td>Storage</td>
<td>eMMC 16G</td>
</tr>
<tr>
<td>Real Time Clock</td>
<td>RTC, with 3V CR2032 Lithium battery x 1</td>
</tr>
<tr>
<td>Indicators</td>
<td>Programmable LED control x 4</td>
</tr>
<tr>
<td>Cellular</td>
<td>Mini PCIe Connector x 1</td>
</tr>
<tr>
<td>Wireless Lan</td>
<td>Onboard WiFi 802.11 b/g/n, Bluetooth 4.2 / BLE</td>
</tr>
<tr>
<td>Operating System</td>
<td>Debian 10</td>
</tr>
<tr>
<td>Support Protocol</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I/O Interfaces</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial Port</td>
<td>RS-485 x 2, wafer box</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Gigabit Ethernet, RJ-45 x 2</td>
</tr>
<tr>
<td>USB</td>
<td>USB 2.0, Type A x 2</td>
</tr>
<tr>
<td>ADC</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I/O Interfaces</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>UART</td>
<td>—</td>
</tr>
<tr>
<td>Micro-SD</td>
<td>—</td>
</tr>
<tr>
<td>NB-IoT</td>
<td>—</td>
</tr>
<tr>
<td>DC9-30V</td>
<td>—</td>
</tr>
<tr>
<td>LAN x 2</td>
<td>—</td>
</tr>
<tr>
<td>Reset Button</td>
<td>—</td>
</tr>
<tr>
<td>RS-485 x 2</td>
<td>—</td>
</tr>
<tr>
<td>Micro-US</td>
<td>—</td>
</tr>
<tr>
<td>USB 2.0 x 2</td>
<td>—</td>
</tr>
<tr>
<td>SIM card slot</td>
<td>—</td>
</tr>
<tr>
<td>Mini PCIe slot</td>
<td>—</td>
</tr>
<tr>
<td>SIM card slot</td>
<td>—</td>
</tr>
<tr>
<td>NB-IoT connector</td>
<td>—</td>
</tr>
<tr>
<td>Board to Board connector</td>
<td>—</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>DC9-30V</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>3.36 W (Full Loading)</td>
</tr>
<tr>
<td>MTBF (Hours)</td>
<td>855590</td>
</tr>
</tbody>
</table>

Environmental and Mechanical

| Dimension       | 3.94” x 3.78” (100 x 96mm)                  |
| Weight          | 1.54lb (70 g)                                |
| Mount Options   | —                                            |
| Operation Temperature | 32 °F – 140 °F (0 °C – 60 °C)              |
| Storage Temperature | -40 °F – 176 °F (-40 °C – 80 °C)            |
| Operation Humidity | 10% – 95% relative humidity, non-condensing |

Packing List
- SRT-3352C

Optional Accessories
- 1255300366
  Power Adapter. AC/DC. 100-240VAC. 12VDC/3A.36W.
- 9741EC25E
  PCIe mini card.4G LTE module kit with cable & Antenna, EC25-E
- 9741EG25G0

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>COM</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operation Temp.</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRT-3352C-A10-A001</td>
<td>ARM Cortex-A8 800MHz onboard DDR3L 1G</td>
<td>Fanless</td>
<td>RS-485 x 2, MicroSD x 1</td>
<td>GbE x 2</td>
<td>USB 2.0 x 2, Micro USB x 1, mini PCIe slot x 1, SIM card slot x 1</td>
<td>DC 9-30V</td>
<td>0°C ~ 60°C @ 0.5 m/s airflow</td>
<td>3G/4G LTE module (optional)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Gateway Board & Expansion Board

Standard IoT Gateway with ARM i.MX8M Plus Quad-Core Cortex-A53 1.6GHz Processor

Features
- i.MX 8M Plus Quad Cortex-A53 1.6 GHz RISC Processor
- Onboard DDR4L 2GB / eMMC 16GB (Optional 4GB RAM/ eMMC 32GB)
- USB 3.0 x 2
- Gigabit Ethernet port x 2
- CAN-FD x 2CH
- Mini PCIe connector (For RF Module) x 2
- Micro SD Card Slot x 1
- Support RTC, TPM 2.0
- Wide Voltage DC 9V-36V
- Wide Temperature -20 °C ~ 70 °C
- Pre-Install Linux Debian

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>ARM NXP i.MX8M Plus Quad-Core Cortex-A53 1.6GHz Processor (NPU Optional)</td>
</tr>
<tr>
<td>Memory</td>
<td>Onboard DDR4L 2GB (Optional 4GB)</td>
</tr>
<tr>
<td>Storage</td>
<td>eMMC 16GB (Optional 32GB)</td>
</tr>
<tr>
<td>Real Time Clock</td>
<td>RTC x 1, with 3V CR2032 Lithium battery</td>
</tr>
<tr>
<td>Indicators</td>
<td>Programmable LED control x 7</td>
</tr>
<tr>
<td>Security</td>
<td>TPM 2.0</td>
</tr>
<tr>
<td>Cellular</td>
<td>Mini PCIe Connector x 1 (USB signal)</td>
</tr>
<tr>
<td>Wireless Lan</td>
<td>Mini PCIe Connector x 1 (USB signal)</td>
</tr>
<tr>
<td>Operating System</td>
<td>Debian 10</td>
</tr>
<tr>
<td>Support Protocol</td>
<td>---</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I/O Interfaces</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial Port</td>
<td>RS-232/422/485 switchable x 2, Phoenix Connector</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Gigabit Ethernet x 2, RJ-45</td>
</tr>
<tr>
<td>USB</td>
<td>USB 3.0 Type-A x 2</td>
</tr>
<tr>
<td>ADC</td>
<td>---</td>
</tr>
</tbody>
</table>

Packing List
- SRT-IMX8P

Optional Accessories
- 9741EG25G0 PCIe mini card, 4G LTE, module kit, Global Band W/SIM holder, Wi/Cable & antenna. Quectel, EG25-G
- 9741EC25E0 PCIe mini card, 4G LTE, module kit, Wi/Cable & Antenna. Quectel, EC25-E
- 9741236A00 Mini card Wifi Kit 802.11ac/a/b/g/n, BT4.2, W/Cable & Antenna. SparkLAN, WPET-236ACX87
- 1255300611 Power Adaptor, DC 100/240V/12V/5A/60W, 2P Phoenix Pin ø=3.81mm.
- 1702031802 POWER CORD, 3P-125V 10A, 1.8M.JPN
- 1702031803 POWER CORD, 3P-250V 10A, 1.8M, USA
- 170203180J POWER CORD, 3P-250V 13A, 1.8M, UK
- 1702031811 POWER CORD, 3P-125V 10A, 1.8M, TWN
- 170203180E POWER CORD, 3P-125V 7A, 1.8M, JPN

Note: All specifications are subject to change without notice.
Gateway Board & Expansion Board

Block Diagram

Dimension
Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>NPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>Ports</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operation Temp.</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRT-IMX8P-A10-0216</td>
<td>ARM NXP i.MX8M Plus Quad-Core Cortex-A53 1.6GHz Processor</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>RS-232/232/485 x 2, Phoenix HDMI x 2 (Display), CAN-FD x 2 Din, Phoenix</td>
<td>uMVIC 16GB, MicroSD x1</td>
<td>GBE x 2</td>
<td>USB 3.0 x 2</td>
<td>Mini PCIe slot x 2 SM card socket x 1</td>
<td>DC 9-36V</td>
<td>-20°C ~ 70°C @ 0.5 m/s airflow</td>
<td>3G/4G LTE module with SIM (optional)</td>
</tr>
<tr>
<td>SRT-IMX8P-A10-0432</td>
<td>ARM NXP i.MX8M Plus Quad-Core Cortex-A53 1.6GHz Processor</td>
<td>1x</td>
<td>—</td>
<td>—</td>
<td>RS-232/232/485 x 2, Phoenix HDMI x 2 (Display), CAN-FD x 2 Din, Phoenix</td>
<td>uMVIC 32GB, MicroSD x1</td>
<td>GBE x 2</td>
<td>USB 3.0 x 2</td>
<td>Mini PCIe slot x 2 SM card socket x 1</td>
<td>DC 9-36V</td>
<td>-20°C ~ 70°C @ 0.5 m/s airflow</td>
<td>3G/4G LTE module with SIM (optional)</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
**SRT-TG01**

Standard IoT Gateway System with 11th Generation Intel® Core™ i7/i5/i3/Celeron® Processor SoC

---

**Features**

- 11th Generation Intel Core i7/i5/i3/Celeron Processor SoC
- DDR4 3200MHz, SO-DIMM x 2, up to 64GB
- USB 3.2 Gen 1 x 3, USB 3.2 Gen 2 x 1
- HDMI 2.0b x 1 (Output)
- GbE x2 (Intel I219, I211) + 2.5 GbE x1 (Intel I225)
- M.2 3052 B Key x1, M.2 2280 M Key x1, M.2 2230 E Key x1
- DC 9 ~ 36V Power Input
- 100 pin board to board connector x 2
- PCIE, USB3.0, USB2.0, UART, GPIO, I2C, DDI, SPI

---

**I/O Interfaces**

<table>
<thead>
<tr>
<th>Serial Port</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-232/422/485 x 4</td>
<td>Serial Bus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ethernet</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel 6/811-LM/T0/100/100Base x 1</td>
<td>RJ45</td>
</tr>
<tr>
<td>Intel 6/821-LM/T0/100/100Base x 1</td>
<td>RJ45</td>
</tr>
<tr>
<td>Intel 6/825-LM/T0/100/100Base x 1, RJ45</td>
<td>Support Vpro</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>USB</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB3.2 Gen 2 x 1, Type A</td>
<td>USB3.2 Gen 1 x 3, Type A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADC</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 bit, Phoenix Connector</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Display</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDMI 2.0b x 1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power Connector</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Pin 3.81mm Pitch Phoenix Connector</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expansion Slot</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro SIM slot x 1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Interface</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATA 3.0 x 1</td>
<td>SATA Power connector x 1 (5V)</td>
</tr>
<tr>
<td>100 pin board to board connector x 2</td>
<td></td>
</tr>
<tr>
<td>PCIE, USB3.0, USB2.0, UART, GPIO, I2C, DDI, SPI</td>
<td></td>
</tr>
</tbody>
</table>

**Power Supply**

- Power Requirement: DC 9 ~ 36V (Optional DC12V), AT Type
- Power Consumption: 67 W (Full Loading)
- MTBF (Hours): 306,575

**Environmental and Mechanical**

- Dimension: 6.69” x 5.74” (170 x 146 mm)
- Weight: 1.4lb (650g)
- Mount Options: —
- Operation Temperature: 32 °F ~ 122 °F (0 °C ~ 50 °C)
- Storage Temperature: -40 °F ~ 176 °F (-40 °C ~ 80 °C)
- Operation Humidity: 10% ~ 95% relative humidity, non-condensing

---

**Specifications**

<table>
<thead>
<tr>
<th>System</th>
<th>11th Generation Core Intel® i7-1185G7E SoC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>11th Generation Core Intel® i5-1145G7E SoC</td>
</tr>
<tr>
<td>Memory</td>
<td>11th Generation Core Intel® i3-1115G4E SoC</td>
</tr>
<tr>
<td>Storage</td>
<td>11th Generation Core Intel® Celeron 6305E SoC</td>
</tr>
<tr>
<td>TDP</td>
<td>DC 9 ~ 36V Power Input</td>
</tr>
<tr>
<td>SO-DIMM x 2, 2. Up to 64GB</td>
<td></td>
</tr>
<tr>
<td>Real Time Clock</td>
<td>100 pin board to board connector x 2</td>
</tr>
<tr>
<td>Security</td>
<td>PCIE, USB3.0, USB2.0, UART, GPIO, I2C, DDI, SPI</td>
</tr>
<tr>
<td>Indicators</td>
<td>Processor</td>
</tr>
<tr>
<td>Cellular</td>
<td>11th Generation Core Intel® i5-1145G7E SoC</td>
</tr>
<tr>
<td>Wireless Lan</td>
<td>11th Generation Core Intel® i3-1115G4E SoC</td>
</tr>
<tr>
<td>Operating System</td>
<td>11th Generation Core Intel® Celeron 6305E SoC</td>
</tr>
<tr>
<td>Support Protocol</td>
<td>TDP 12W Only</td>
</tr>
<tr>
<td>Memory</td>
<td>TDP 12W Only</td>
</tr>
<tr>
<td>Storage</td>
<td>TDP 12W Only</td>
</tr>
<tr>
<td>Real Time Clock</td>
<td>TDP 12W Only</td>
</tr>
<tr>
<td>Security</td>
<td>TDP 12W Only</td>
</tr>
<tr>
<td>Indicators</td>
<td>TDP 12W Only</td>
</tr>
<tr>
<td>Cellular</td>
<td>TDP 12W Only</td>
</tr>
<tr>
<td>Wireless Lan</td>
<td>TDP 12W Only</td>
</tr>
<tr>
<td>Operating System</td>
<td>TDP 12W Only</td>
</tr>
<tr>
<td>Support Protocol</td>
<td>TDP 12W Only</td>
</tr>
</tbody>
</table>

---

**Packing List**

- SRT-TG01

**Optional Accessories**

- 1255300611 Power Adapter DC:100/240V 12/5A 60W 2p phoenix P=3.81mm FSP FSP060-DHAN3/9NA0608085
- 9686Y00124 M.2 3042 LTE Cat4 module, for global market. SIMCOM SIM7600G-H with LTE antenna
- 9741364A00 M.2 2230 Wireless.802.11 ac/a/b/g/n + BT 5.0,2T2R,Enli QCNFA364A.w/2 sets of cable and antenna
- 1702031802 POWER CORD:3P-250V 10A 180D.1.8M.TWN/BSMI.FANJET.YP12/YC12 Certificate
- 1702031803 POWER CORD:3P-250V 10A 180D.1.8M.EU.FANJET.YP22/YC12
- 170203180J POWER CORD:3P-250V 13A.1830mm UK type
- 170203180E Power cord:3P.125V/7A 1.8M.PSE YP12/YC12

---

**Note:** All specifications are subject to change without notice.
Block Diagram

Dimension
Unit: mm

Ordering Information
Standard IoT Gateway Board with Intel Atom X5-E3940 Processor SoC

Features
- Intel Atom X5-E3940 Quad Core 1.6GHz
- Onboard LPDDR4 4 GB / eMMC 32G
- Built-in Micro SD Card Slot x 1
- HDMI output x1
- Gigabit Ethernet RJ-45 x 1 LAN port
- USB 3.0 x 1
- 2 x 100 pin board to board connector

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel Atom X5-E3940 Processor SoC / Intel HD 500 Graphics</td>
</tr>
<tr>
<td>Memory</td>
<td>Onboard LPDDR4 1866MHz 4GB / 8GB (Optional)</td>
</tr>
<tr>
<td>Storage</td>
<td>eMMC 5.1 32GB / 64GB (Optional)</td>
</tr>
<tr>
<td>Real Time Clock</td>
<td>RTC x 1, with 3V CR2032 Lithium battery</td>
</tr>
<tr>
<td>Security</td>
<td>—</td>
</tr>
<tr>
<td>Indicators</td>
<td>—</td>
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<tr>
<td>Cellular</td>
<td>—</td>
</tr>
<tr>
<td>Wireless Lan</td>
<td>—</td>
</tr>
<tr>
<td>Operating System</td>
<td>Windows 10 IoT Enterprise / Linux (by request)</td>
</tr>
<tr>
<td>Support Protocol</td>
<td>—</td>
</tr>
<tr>
<td>I/O Interfaces</td>
<td>—</td>
</tr>
<tr>
<td>Serial Port</td>
<td>—</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Gigabit Ethernet x 1, RJ-45</td>
</tr>
<tr>
<td>USB</td>
<td>USB 3.0 x 1, Type A</td>
</tr>
<tr>
<td>ADC</td>
<td>—</td>
</tr>
</tbody>
</table>

Packing List
- SRT-APLC

Optional Accessories
- 1255300409 Power Adapter AC Input 90~264V, DC output 12V/3.4A
- 1702031802 POWER CORD.3P-125V 10A 180D.1.8M, USA, FANJET, YP12/YC-12
- 1702031803 POWER CORD.3P-250V 10A 180D.1.8M, EU, FANJET, YP20/YC-12
- 170203180J POWER CORD.3P-250V 13A, UK type, 1830mm
- 1702031811 POWER CORD.3P-125V 10A, 180D.1.8M, TWN, BSMI, FANJET, YP-12/YC-12
- 170203180E Power cord.3P-125V/7A 1.8M, PSE YP12/YC12

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>Ports</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>Expansion Skin</th>
<th>Power</th>
<th>Operation Temp.</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRT-APLC-A10-0432</td>
<td>Intel Atom X5-E3940, 1.6GHz</td>
<td>Onboard LPDDR4 1866MHz 4GB</td>
<td>Fanless</td>
<td>HDMI x 1 (Output)</td>
<td>eMMC 32GB, MicroSD x1</td>
<td>GE x 1</td>
<td>USB 3.0 x 1</td>
<td>DC 12V</td>
<td>0°C ~ 60°C @ 0.5 m/s airflow</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>SRT-APLC-A10-0632</td>
<td>Intel Atom X5-E3940, 1.6GHz</td>
<td>Onboard LPDDR4 1866MHz 8GB</td>
<td>Fanless</td>
<td>HDMI x 1 (Output)</td>
<td>eMMC 32GB, MicroSD x1</td>
<td>GE x 1</td>
<td>USB 3.0 x 1</td>
<td>DC 12V</td>
<td>0°C ~ 60°C @ 0.5 m/s airflow</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>SRT-APLC-A10-0464</td>
<td>Intel Atom X5-E3940, 1.6GHz</td>
<td>Onboard LPDDR4 1866MHz 4GB</td>
<td>Fanless</td>
<td>HDMI x 1 (Output)</td>
<td>eMMC 64GB, MicroSD x1</td>
<td>GE x 1</td>
<td>USB 3.0 x 1</td>
<td>DC 12V</td>
<td>0°C ~ 60°C @ 0.5 m/s airflow</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>SRT-APLC-A10-0864</td>
<td>Intel Atom X5-E3940, 1.6GHz</td>
<td>Onboard LPDDR4 1866MHz 8GB</td>
<td>Fanless</td>
<td>HDMI x 1 (Output)</td>
<td>eMMC 64GB, MicroSD x1</td>
<td>GE x 1</td>
<td>USB 3.0 x 1</td>
<td>DC 12V</td>
<td>0°C ~ 60°C @ 0.5 m/s airflow</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>
Pico-ITX Boards
PICO-V2K4
Pico-ITX Board with AMD RYZEN™ V2000 embedded Processor Family

Features
- **AMD RYZEN™ V2000 embedded Processor Family (V2718/V2516)**
- **LPDDR4x onboard memory, up to 32 GB**
- **Intel® i226, 10/100/2500Base x 1**
- **Intel® i210, 10/100/1000Base x 1**
- **HDMI x 2 (4Kx2K, 2.0b x 1, 1.4 x 1)**
- **Type C to DP x 1; LVDS/eDP x 1**
- **M.2 2280 M key (PCIE x 4 GEN3/SATA) x 1**
- **Full size mPCIe/mSATA x 1**
- **USB 3.2 Gen 2 x 2, USB 3.2 Gen 2 Type C x 1 , USB 2.0 x 4**
- **RS-232/422/485 x 4**

**Specifications**

**SYSTEM**
- **Form Factor**: PICO-ITX
- **CPU**: AMD RYZEN™ V2000 embedded Processor Family
  - V2718 (8C/16T, 1.7~4.15 GHz, TDP 10-25W)
  - V2516 (6C/12T, 2.1~3.95 GHz, TDP 10-25W)
- **Chipset**: AMD RYZEN™ V2000 embedded Processor Family
- **Memory Type**: LPDDR4x 32GB (3200Mhz onboard memory)
- **BIOS**: UEFI
- **Wake on LAN**: Yes
- **Watchdog Timer**: 255 Levels
- **RTC Battery**: Lithium Battery 3V/240mAh
- **Dimension**: 3.94" x 2.84" (100mm x 72mm)
- **Gross Weight**: 0.18 lbs (0.08 kg)

**Power**
- **Power Requirement**: +12V
- **Power Supply Type**: AT/ATX
- **Connector**: Phoenix 2-pin Connector (Default)
  - Lockable DC Jack Connector (colay)
- **Power Consumption**: V2718, LPDDR4x onboard 32GB, 4.24A @ +12V (Typical)
  - V2718, LPDDR4x onboard 32GB, 4.82A @ +12V (Max)

**Display**
- **Controller**: AMD Radeon 6, 7 Graphics (Fenor)
- **LVDS/eDP**: eDP or LVDS x 1 (eDP 1.4: 3840x2160, 60Hz; LVDS: 12V/3.3V, 18-24 bit, single channel)
- **Display Interface**: Type C to DP x 1
  - HDMI 2.0b x 1, 4K x 2K 60Hz
  - HDMI 1.4 x 1, 4K x 2K 30Hz (3840 x 2160)
- **Multiple Display**: Up to 4 Simultaneous Displays

**Audio**
- **Codec**: Realtek ALC269 (Optional)
- **Audio Interface**: High Definition Audio Interface, Line-in/Line-out/MIC (Optional)
- **Speaker**: —

**Ethernet**
- **Controller**: Intel® i226, 10/100/2500Base x 1
- **USB**: USBS.2 Gen2 Type C x 1
  - USB3.2 Gen2 x 2
- **Serial Port**: —

**Expansion**
- **Mini PCI-E/mSATA**: mini-PCIeFull x 1 (PCIe [x1] x 1/USB2.0 as default, mSATA supported by HW BOM)
- **M.2**: M.2 2280 M-key (PCIe Gen3 x 4 as default, SATA selected by BIOS) x 1

**Environment & Certification**
- **Operating Temp**: 32°F ~ 140°F (0°C ~ 60°C)
- **WITAS -40°F ~ 185°F (-40°C ~ 85°C)
- **Storage Temp**: -40°F ~ 185°F (-40°C ~ 85°C)
- **Operating Humidity**: 0% ~ 90% relative humidity, non-condensing
- **MTBF (Hours)**: 407,784
- **EMC**: FCC Class A

**Packing List**
- **PICO-V2K4**

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700000287</td>
<td>Front Panel cable</td>
<td>1</td>
</tr>
<tr>
<td>1700000317</td>
<td>COM *4port cable</td>
<td>1</td>
</tr>
<tr>
<td>1700000390</td>
<td>USBS.2 *4port cable</td>
<td>1</td>
</tr>
<tr>
<td>1709070500</td>
<td>(TF)SATA CABLE, 7P Pitch 1.27mm,50cm</td>
<td>1</td>
</tr>
<tr>
<td>1700000322</td>
<td>SATA power cable</td>
<td>1</td>
</tr>
<tr>
<td>1700000156</td>
<td>Audio cable</td>
<td>1</td>
</tr>
<tr>
<td>PICO-V2K4-FAN01</td>
<td>Cooler</td>
<td>1</td>
</tr>
<tr>
<td>PICO-V2K4-HSP01</td>
<td>Heat Spreader</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Block Diagram

Dimension Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>Memory</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/422/485</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Audio</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-V2K4-A11-0002</td>
<td>V2516</td>
<td>4GB</td>
<td>Type C to DP x 1 HDMI x 2</td>
<td>SATAIII x 1</td>
<td>GbE x 2</td>
<td>USB 2.0 x 4</td>
<td>4</td>
<td>M.2 2280 M-key x 1 (max-PCIe/Full) x 1</td>
<td>+12V (Terminal block)</td>
<td>0~60˚C</td>
<td>—</td>
<td>SMBUS x 1 (I2C Optional) TPM2.0</td>
</tr>
<tr>
<td>PICO-V2K4-A11-0003</td>
<td>V2516</td>
<td>8GB</td>
<td>Type C to DP x 1 HMDI x 2</td>
<td>SATAIII x 1</td>
<td>GbE x 2</td>
<td>USB 2.0 x 4</td>
<td>4</td>
<td>M.2 2280 M-key x 1 (max-PCIe/Full) x 1</td>
<td>+12V (Terminal block)</td>
<td>0~60˚C</td>
<td>—</td>
<td>SMBUS x 1 (I2C Optional) TPM2.0</td>
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<tr>
<td>PICO-V2K4-A11-0004</td>
<td>V2718</td>
<td>8GB</td>
<td>Type C to DP x 1 HDMI x 2</td>
<td>SATAIII x 1</td>
<td>GbE x 2</td>
<td>USB 2.0 x 4</td>
<td>4</td>
<td>M.2 2280 M-key x 1 (max-PCIe/Full) x 1</td>
<td>+12V (Terminal block)</td>
<td>0~60˚C</td>
<td>—</td>
<td>SMBUS x 1 (I2C Optional) TPM2.0</td>
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<tr>
<td>PICO-V2K4-A11-0005</td>
<td>V2718</td>
<td>16GB</td>
<td>Type C to DP x 1 HDMI x 2</td>
<td>SATAIII x 1</td>
<td>GbE x 2</td>
<td>USB 2.0 x 4</td>
<td>4</td>
<td>M.2 2280 M-key x 1 (max-PCIe/Full) x 1</td>
<td>+12V (Terminal block)</td>
<td>0~60˚C</td>
<td>—</td>
<td>SMBUS x 1 (I2C Optional) TPM2.0</td>
</tr>
<tr>
<td>PICO-V2K4-A11-0006</td>
<td>V2718</td>
<td>32GB</td>
<td>Type C to DP x 1 HDMI x 2</td>
<td>SATAIII x 1</td>
<td>GbE x 2</td>
<td>USB 2.0 x 4</td>
<td>4</td>
<td>M.2 2280 M-key x 1 (max-PCIe/Full) x 1</td>
<td>+12V (Terminal block)</td>
<td>0~60˚C</td>
<td>—</td>
<td>SMBUS x 1 (I2C Optional) TPM2.0</td>
</tr>
<tr>
<td>PICO-V2K4W2-A11-0006</td>
<td>V2718</td>
<td>32GB</td>
<td>Type C to DP x 1 HDMI x 2</td>
<td>SATAIII x 1</td>
<td>GbE x 2</td>
<td>USB 2.0 x 4</td>
<td>4</td>
<td>M.2 2280 M-key x 1 (max-PCIe/Full) x 1</td>
<td>+12V (Terminal block)</td>
<td>-40~85˚C</td>
<td>—</td>
<td>SMBUS x 1 (I2C Optional) TPM2.0</td>
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Note: All specifications are subject to change without notice.
PICO-V2K4-SEMI
PICO-SEMI with AMD RYZEN™ V2000 embedded Processor Family

Specifications

SYSTEM
FORM FACTOR PICO-SEMI
CPU AMD RYZEN™ V2000 embedded Processor Family
V2718 (8C/16T, 1.7~4.15 GHz, TDP 10-25W)
V2516 (6C/12T, 2.1~3.95 GHz, TDP 10-25W)
CHIPSET AMD RYZEN™ V2000 embedded Processor Family
MEMORY TYPE LPDDR4x 3733 MHz onboard memory
BIOS UEFI
WAKE ON LAN Yes
WATCHDOG TIMER 255 Levels
SECURITY TPM2.0
RTC Battery Lithium Battery 3V/240mAh
DIMENSION 4.80” x 3.18” x 2.13” (122mm x 80.8mm x 54 mm)
Gross Weight 0.84 lbs (0.38 kg)
OS Support Windows 10 (64 bit), Linux Ubuntu 20.04.3/Kernel 5.11

POWER
POWER REQUIREMENT +12V
POWER SUPPLY TYPE ATX
CONNECTOR DC Jack Connector
POWER CONSUMPTION V2718, LPDDR4x onboard 32GB, 4.24A @ +12V (TYPICAL)
V2718, LPDDR4x onboard 32GB, 4.82A @ +12V (MAX)

DISPLAY
CONTROLLER AMD Radeon 6, 7 Graphics (Renoir)
LVDS/eDP —
Display Interface Type C to DP x 1
HDMI 2.0b x 1, 4K x 2K 60Hz
HDMI 1.4 x 1, 4K x 2K 30Hz (3840 x 2160)
Multiple Display Up to 3 Simultaneous Displays

AUDIO
CODEC Realtek ALC269 (Optional)
AUDIO INTERFACE Line-out (Optional)
Speaker —

EXTERNAL I/O
ETHERNET Intel® i226, 10/100/2500Base x 1
USB 3.2 Gen2 Type C x 1
USB 3.2 Gen2 x 2
USB 2.0 x 2 (Optional)

Features
- AMD RYZEN™ V2000 embedded Processor Family (V2718/V2516)
- Onboard NVME SSD 64GB
- LPDDR4x onboard memory, up to 32 GB
- Intel® i226, 10/100/2500Base x 1
- Intel® i210, 10/100/1000Base x 1
- HDMI x 2 (4Kx2K, 2.0b x 1, 1.4 x 1), Type C to DP x 1
- M.2 2280 M key (PCIE x4 GEN3/SATA) x 1
- Full size mPCIe/mSATA x 1
- USB 3.2 Gen 2 x 2, USB 3.2 Gen 2 Type C x 1, USB 2.0 x 2(Optional)
- RS-232/422/485 x 2 (Optional)

Packing List
- PICO-V2K4-SEMI

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1702031802</td>
<td>Power Cord (US Type)</td>
<td>1</td>
</tr>
<tr>
<td>1702031803</td>
<td>Power Cord (Europe Type)</td>
<td>1</td>
</tr>
<tr>
<td>1702031805</td>
<td>Power Cord (Japan)</td>
<td>1</td>
</tr>
<tr>
<td>1255201200</td>
<td>Power Adapter 12V/10A 120W FSP120-AHAN3 w/o Lock</td>
<td>1</td>
</tr>
<tr>
<td>1255301033</td>
<td>Power Adapter 12V/12.5A 150W DPS-150AB-15 w/ Lock</td>
<td>1</td>
</tr>
<tr>
<td>1700000568</td>
<td>Dual COM port cable</td>
<td>1</td>
</tr>
<tr>
<td>1700000576</td>
<td>Dual USB2.0 port cable</td>
<td>1</td>
</tr>
<tr>
<td>1700000482</td>
<td>Audio cable</td>
<td>1</td>
</tr>
<tr>
<td>170-0024-SERIES-1</td>
<td>PICO-V2K4-SEMI VESA bracket kit</td>
<td>1</td>
</tr>
<tr>
<td>170-0024-WMT1</td>
<td>PICO-V2K4-SEMI Wallmount bracket kit</td>
<td>1</td>
</tr>
<tr>
<td>170-0024-DIN1</td>
<td>Din rail kit</td>
<td>1</td>
</tr>
</tbody>
</table>
Block Diagram

PICO-V2K4-SEMI

Dimension

Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>Memory</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/422/485</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Audio</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-V2K4-SEMI-A11-5001</td>
<td>V2518</td>
<td>8GB</td>
<td>Type C to DP x 1</td>
<td>HDMI x 2</td>
<td>Onboard NVME SSD 64GB x 1</td>
<td>USB 3.2 Gen 2 x 2, USB 3.2 Gen 2 Type C x 1</td>
<td>—</td>
<td>M. 2 2230 M-key x 1 mini-PCIE(x1)</td>
<td>+12V (ATX)</td>
<td>0~50°C</td>
<td>—</td>
<td>SMBUS x 1 (I2C Optional)</td>
</tr>
<tr>
<td>PICO-V2K4-SEMI-A11-5002</td>
<td>V2718</td>
<td>16GB</td>
<td>Type C to DP x 1</td>
<td>HDMI x 2</td>
<td>Onboard NVME SSD 64GB x 1</td>
<td>USB 3.2 Gen 2 x 2, USB 3.2 Gen 2 Type C x 1</td>
<td>—</td>
<td>M. 2 2280 M-key x 1 mini-PCIE(x1)</td>
<td>+12V (ATX)</td>
<td>0~50°C</td>
<td>—</td>
<td>SMBUS x 1 (I2C Optional)</td>
</tr>
<tr>
<td>PICO-V2K4-SEMI-A11-5003</td>
<td>V2718</td>
<td>32GB</td>
<td>Type C to DP x 1</td>
<td>HDMI x 2</td>
<td>Onboard NVME SSD 64GB x 1</td>
<td>USB 3.2 Gen 2 x 2, USB 3.2 Gen 2 Type C x 1</td>
<td>—</td>
<td>M. 2 2280 M-key x 1 mini-PCIE(x1)</td>
<td>+12V (ATX)</td>
<td>0~50°C</td>
<td>—</td>
<td>SMBUS x 1 (I2C Optional)</td>
</tr>
</tbody>
</table>
**PICO-TGU4**
Pico-ITX Board with 11th Generation Intel® Core™ i7/i5/i3/Celeron® U-Series Processor SoC

**Features**
- 11th Gen Intel® Core™ i7/i5/i3/Celeron Processor SoC
- LPDDR4x Onboard memory, Max. 32 GB
- 2.5GbE Intel i225 + 1GbE Intel i219
- HDMI2.0b x 1, 4Kx2K + eDP, up to HBR3 8K
- M.2 2280 M key(PCIe by4 GEN4/SATA) x 1
- SATA 6.0 Gb/s x 1
- Full size mPCIe/mSATA x 1
- USB 3.2 Gen 2 x 2, USB 3.2 Gen 1 x 2, USB 2.0 x 4
- RS-232/422/485 x 2
- Line-in/Line-out/MIC (Optional)
- DIO 8 bit

**Specifications**

**Features**
- 11th Gen Intel® Core™ i7/i5/i3/Celeron Processor SoC
- LPDDR4x Onboard memory, Max. 32 GB
- 2.5GbE Intel i225 + 1GbE Intel i219
- HDMI2.0b x 1, 4Kx2K + eDP, up to HBR3 8K
- M.2 2280 M key(PCIe by4 GEN4/SATA) x 1
- SATA 6.0 Gb/s x 1
- Full size mPCIe/mSATA x 1
- USB 3.2 Gen 2 x 2, USB 3.2 Gen 1 x 2, USB 2.0 x 4
- RS-232/422/485 x 2
- Line-in/Line-out/MIC (Optional)
- DIO 8 bit

**Packing List**
- PICO-TGU4

**Optional Accessories**

**Part Number** | **Description** | **Qty.**
--- | --- | ---
170X000285 | USB3.2 Gen 1 cable | 1
170X000284 | USB2.0 x 4 + COM x 2 + DIO 4bit + 1 cable | 1
170X000287 | Front panel cable | 1
170X000156 | 250mm Audio cable | 1
1709070500 | (TF) SATA CABLE 7P Pitch 1.27mm 50cm | 1
170X000322 | SATA power cable | 1
PICO-TGU4-FAN01 | Integrated Cooler for PICO-TGU4, assemble with PICO-TGU4 directly | 1
PICO-TGU4-HSP01 | Integrated Heat spreader for PICO-TGU4, assemble with PICO-TGU4 directly | 1

**Note:** All specifications are subject to change without notice.
### Block Diagram

[Image of the block diagram showing the layout of the components and connections.]

### Dimension

Unit: mm

[Image showing the physical dimensions of the PICO-TGU4 board.]

### Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Memory</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>Expansion Slot</th>
<th>Power Temp</th>
<th>Audio</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-TGU4-A10-0001</td>
<td>Celeron® B3355E</td>
<td>4G</td>
<td>HDMI x 1</td>
<td>SATAIII x 1</td>
<td>2.5GbE x 1</td>
<td>USB3.2 [Gen2 x 2 (Rear), USB2.0 x 4 (header)]</td>
<td>M.2 2280 M-key x 1 mini-PCIeFull x 1</td>
<td>0°C ~ 60°C</td>
<td>DIO, SMBUS/eSPI x 1 (I2C optional)</td>
<td></td>
</tr>
<tr>
<td>PICO-TGU4-A10-0002</td>
<td>i3-1115G4E</td>
<td>4G</td>
<td>HDMI x 1</td>
<td>SATAIII x 1</td>
<td>2.5GbE x 1</td>
<td>USB3.2 [Gen2 x 2 (Rear), USB2.0 x 4 (header)]</td>
<td>M.2 2280 M-key x 1 mini-PCIeFull x 1</td>
<td>0°C ~ 60°C</td>
<td>DIO, SMBUS/eSPI x 1 (I2C optional)</td>
<td></td>
</tr>
<tr>
<td>PICO-TGU4-A10-0003</td>
<td>i3-1115G4E</td>
<td>8G</td>
<td>HDMI x 1</td>
<td>SATAIII x 1</td>
<td>2.5GbE x 1</td>
<td>USB3.2 [Gen2 x 2 (Rear), USB2.0 x 4 (header)]</td>
<td>M.2 2280 M-key x 1 mini-PCIeFull x 1</td>
<td>0°C ~ 60°C</td>
<td>DIO, SMBUS/eSPI x 1 (I2C optional)</td>
<td></td>
</tr>
<tr>
<td>PICO-TGU4-A10-0004</td>
<td>i5-1145G7E</td>
<td>8G</td>
<td>HDMI x 1</td>
<td>SATAIII x 1</td>
<td>2.5GbE x 1</td>
<td>USB3.2 [Gen2 x 2 (Rear), USB2.0 x 4 (header)]</td>
<td>M.2 2280 M-key x 1 mini-PCIeFull x 1</td>
<td>0°C ~ 60°C</td>
<td>DIO, SMBUS/eSPI x 1 (I2C optional)</td>
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<tr>
<td>PICO-TGU4-A10-0005</td>
<td>i5-1145G7E</td>
<td>16G</td>
<td>HDMI x 1</td>
<td>SATAIII x 1</td>
<td>2.5GbE x 1</td>
<td>USB3.2 [Gen2 x 2 (Rear), USB2.0 x 4 (header)]</td>
<td>M.2 2280 M-key x 1 mini-PCIeFull x 1</td>
<td>0°C ~ 60°C</td>
<td>DIO, SMBUS/eSPI x 1 (I2C optional)</td>
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<tr>
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<td>i5-1145G7E</td>
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<td>SATAIII x 1</td>
<td>2.5GbE x 1</td>
<td>USB3.2 [Gen2 x 2 (Rear), USB2.0 x 4 (header)]</td>
<td>M.2 2280 M-key x 1 mini-PCIeFull x 1</td>
<td>0°C ~ 60°C</td>
<td>DIO, SMBUS/eSPI x 1 (I2C optional)</td>
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<tr>
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<td>i7-1185G7E</td>
<td>16G</td>
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<td>SATAIII x 1</td>
<td>2.5GbE x 1</td>
<td>USB3.2 [Gen2 x 2 (Rear), USB2.0 x 4 (header)]</td>
<td>M.2 2280 M-key x 1 mini-PCIeFull x 1</td>
<td>0°C ~ 60°C</td>
<td>DIO, SMBUS/eSPI x 1 (I2C optional)</td>
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<tr>
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<td>i7-1185G7E</td>
<td>32G</td>
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<td>SATAIII x 1</td>
<td>2.5GbE x 1</td>
<td>USB3.2 [Gen2 x 2 (Rear), USB2.0 x 4 (header)]</td>
<td>M.2 2280 M-key x 1 mini-PCIeFull x 1</td>
<td>0°C ~ 60°C</td>
<td>DIO, SMBUS/eSPI x 1 (I2C optional)</td>
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<td>PICO-TGU4-A10-0009</td>
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<td>64G</td>
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<td>2.5GbE x 1</td>
<td>USB3.2 [Gen2 x 2 (Rear), USB2.0 x 4 (header)]</td>
<td>M.2 2280 M-key x 1 mini-PCIeFull x 1</td>
<td>0°C ~ 60°C</td>
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<td>0°C ~ 60°C</td>
<td>DIO, SMBUS/eSPI x 1 (I2C optional)</td>
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</table>

**Note:** All specifications are subject to change without notice.

www.aaeon.com
PICO-SEMI Embedded with 11th Generation Intel® Core™ i7/i5/i3/Celeron® U-Series Processor SoC

Specifications

Features

- 11th Gen Intel® Core™ i7/i5/i3/Celeron Processor SoC
- LPDDR4x onboard memory, up to 32 GB
- 2.5GHz Intel i225 + 1GbE Intel i219
- HDMI 2.0 x 1, 4K x 2K
- M.2 2280 M key (PCIe Gen4 x 4 as default) x 1
- Full size mPCIe/mSATA x 1
- USB 3.2 Gen 2 x 2
- RS-232/422/485 x 2 (Optional)
- Line-out (Optional)

Packing List

<table>
<thead>
<tr>
<th>Description</th>
<th>Qty.</th>
</tr>
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<tbody>
<tr>
<td>PICO-TGU4-SEMI</td>
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Optional Accessories

<table>
<thead>
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<th>Description</th>
<th>Qty.</th>
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<tbody>
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<td>Power Cord (US Type)</td>
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<td>1702031803</td>
<td>Power Cord (Europe Type)</td>
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<td>170203180E</td>
<td>Power Cord (Japan)</td>
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<td>1255201200</td>
<td>Power Adapter 12V/10A 120W FSP120-AHAN3/9NA1206701</td>
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<td>170X000482</td>
<td>Line out cable</td>
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<tr>
<td>170X000483</td>
<td>Dual COM port cable</td>
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<td>PICO-TGU4-SEMI-VE SA</td>
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<td>PICO-TGU4-SEMI-VESA bracket kit</td>
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<td>PICO-TGU4-SEMI-WMT1</td>
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<td>PICO-TGU4-SEMI-WMT2</td>
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<tr>
<td>PICO-TGU4-SEMI-DIN1</td>
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</table>
Note: All specifications are subject to change without notice.

Block Diagram

Dimension Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>Display</th>
<th>LAN</th>
<th>USB</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
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</thead>
<tbody>
<tr>
<td>PICO-TGU4-SEMI-A10-0001</td>
<td>Celeron 8305E</td>
<td>4GB</td>
<td>Cooler</td>
<td>HDMI x 1</td>
<td>2.5GBe x 1, GbE x 1</td>
<td>USB3.2 Gen 2 x 2</td>
<td>M.2 2280 M-key x 1</td>
<td>12V ATX</td>
<td>0~50˚C</td>
<td>SMBUS/eSPI x 1 (I2C Optional)</td>
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<tr>
<td>PICO-TGU4-SEMI-A10-0002</td>
<td>i3-1115G4E</td>
<td>8GB</td>
<td>Cooler</td>
<td>HDMI x 1</td>
<td>2.5GBe x 1, GbE x 1</td>
<td>USB3.2 Gen 2 x 2</td>
<td>M.2 2280 M-key x 1</td>
<td>12V ATX</td>
<td>0~50˚C</td>
<td>SMBUS/eSPI x 1 (I2C Optional)</td>
</tr>
<tr>
<td>PICO-TGU4-SEMI-A10-0003</td>
<td>i5-1145G7E</td>
<td>8GB</td>
<td>Cooler</td>
<td>HDMI x 1</td>
<td>2.5GBe x 1, GbE x 1</td>
<td>USB3.2 Gen 2 x 2</td>
<td>M.2 2280 M-key x 1</td>
<td>12V ATX</td>
<td>0~50˚C</td>
<td>SMBUS/eSPI x 1 (I2C Optional)</td>
</tr>
<tr>
<td>PICO-TGU4-SEMI-A10-0004</td>
<td>i7-1185G7E</td>
<td>8GB</td>
<td>Cooler</td>
<td>HDMI x 1</td>
<td>2.5GBe x 1, GbE x 1</td>
<td>USB3.2 Gen 2 x 2</td>
<td>M.2 2280 M-key x 1</td>
<td>12V ATX</td>
<td>0~50˚C</td>
<td>SMBUS/eSPI x 1 (I2C Optional)</td>
</tr>
</tbody>
</table>
PICO-WHU4
Pico-ITX Board with 8th Generation Intel® Core™ i7/i5/i3/Celeron® U-Series Processor SoC

Features
- 8th Gen Intel® Core™ i7/i5/i3/Celeron Processor SoC
- Non-ECC DDR4 SODIMM Slot x 1, up to 32GB
- Dual HDMI ports (HDMI 1.4b)
- GbE x 2, SATA 6.0 Gb/s x 1, GPIO x 4
- USB 3.2 Gen 2 x 2 (Rear), USB 2.0 x 2 Pin header, RS-232/422/485 x 2
- Full size mSATA/mPCIe x 1 (Select by BIOS), M.2 2230 (E key) x 1
- 12V Only (Terminal block and DC barrel co-design)

Specifications

SYSTEM
- FORM FACTOR: PICO-ITX
- CPU: Intel® 8th Generation Core™ i7/i5/i3/Celeron SoC
  - i7-8665UE (4C/8T, 1.7GHz, up to 4.4GHz, TDP 15W)
  - i5-8365UE (4C/8T, 1.6GHz, up to 4.1GHz, TDP 15W)
  - i3-8145UE (2C/4T, 2.2GHz, up to 3.9GHz, TDP 15W)
  - Celeron® 4305UE (2C/2T, 2GHz, TDP 15W)
- CHIPSET: Intel® 8th Generation Core™ i7/i5/i3/Celeron SoC
- MEMORY TYPE: DDR4 up to 2400MHz SODIMM x 1, up to 32GB, Non-ECC
- BIOS: UEFI
- WAKE ON LAN: Yes
- WATCHDOG TIMER: 255 Levels
- SECURITY: TPM2.0 (Optional by accessory card)
- RTC Battery: Lithium Battery 3V/40mAh
- DIMENSION: 3.94” x 2.84” (100mm x 72mm)
- Gross Weight: 0.18 lbs. (0.08 kg)
- OS Support: Windows 10 (64 bit) / Ubuntu 18.04.3

POWER
- POWER REQUIREMENT: +12V
- POWER SUPPLY TYPE: ATX
- CONNECTOR: Phoenix 2-pin Connector (Default) / Lockable DC Jack Connector (colay)
- POWER CONSUMPTION: Intel® i7-8665UE @ DDR4 16GB, 2.23A @ +12V (TYPICAL)

DISPLAY
- CONTROLLER: Intel® UHD Graphics 610/620
- LVDS/eDP: —
- Display interface: HDMI 1.4b x 2 (up to 3840 x 2160)
- Multiple Display: Up to 2 Simultaneous Displays

AUDIO
- CODEC: —
- AUDIO INTERFACE: —
- Speaker: —

EXTERNAL I/O
- ETHERNET: Realtek 8111 Gigabit Ethernet 10/100/1000Base, RJ-45 x 2
- USB: USB 3.2 Gen 2 x 2
- SERIAL PORT: —
- VIDEO: HDMI 1.4b x 2 (up to 3840 x 2160)

Packing List
- PICO-WHU4

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1702150155</td>
<td>(TF)Power Cable.15P SATA(F)/2P 2.0mm Housing(PH).15cm</td>
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<td>1709070500</td>
<td>(TF)SATA CABLE.7P Pitch 1.27mm 50cm</td>
<td>1</td>
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<tr>
<td>1701200102</td>
<td>(TF)SERIAL Cable.WL1010H-2*10P 1.0mm Housing.Dual DB9(M)/10cm</td>
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<tr>
<td>170010010D</td>
<td>USB cable (2 Port), 10cm</td>
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<tr>
<td>1702030176</td>
<td>(TF)Power Cable.3P DC jack.TERMINAL*2.17cm.TKS-G21-LN05</td>
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<tr>
<td>PICO-WHU4-FAN01</td>
<td>Integrated Cooler for PICO-WHU4, assemble with PICO-WHU4 directly</td>
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<tr>
<td>PER-T457-A01-0002</td>
<td>TPM Board TPM 2.0.x/LPC cable</td>
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</table>
Block Diagram

Block Diagram

Dimension

Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/422/485</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-WHU4-A11-0001</td>
<td>Celeron 4305UE</td>
<td>HDMI x 2</td>
<td>mSATA x 1</td>
<td>GbE 2</td>
<td>USB 2.0 Gen 2 x 2</td>
<td>2</td>
<td>M.2 E-Key x 1</td>
<td>+12V (Terminal block)</td>
<td>0°C – 60°C</td>
<td>—</td>
</tr>
<tr>
<td>PICO-WHU4-A11-0002</td>
<td>i3-8145UE</td>
<td>HDMI x 2</td>
<td>mSATA x 1</td>
<td>GbE 2</td>
<td>USB 2.0 Gen 2 x 2</td>
<td>2</td>
<td>M.2 E-Key x 1</td>
<td>+12V (Terminal block)</td>
<td>0°C – 60°C</td>
<td>—</td>
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<tr>
<td>PICO-WHU4-A11-0003</td>
<td>i5-8365UE</td>
<td>HDMI x 2</td>
<td>mSATA x 1</td>
<td>GbE 2</td>
<td>USB 2.0 Gen 2 x 2</td>
<td>2</td>
<td>M.2 E-Key x 1</td>
<td>+12V (Terminal block)</td>
<td>0°C – 60°C</td>
<td>—</td>
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<tr>
<td>PICO-WHU4-A11-0004</td>
<td>i7-8565UE</td>
<td>HDMI x 2</td>
<td>mSATA x 1</td>
<td>GbE 2</td>
<td>USB 2.0 Gen 2 x 2</td>
<td>2</td>
<td>M.2 E-Key x 1</td>
<td>+12V (Terminal block)</td>
<td>0°C – 60°C</td>
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<tr>
<td>PICO-WHU4-A11-0005</td>
<td>i3-8145UE</td>
<td>HDMI x 2</td>
<td>mSATA x 1</td>
<td>GbE 2</td>
<td>USB 2.0 Gen 2 x 2</td>
<td>2</td>
<td>M.2 E-Key x 1</td>
<td>+12V (DC Jack)</td>
<td>0°C – 60°C</td>
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<td>i7-8665UE</td>
<td>HDMI x 2</td>
<td>mSATA x 1</td>
<td>GbE 2</td>
<td>USB 2.0 Gen 2 x 2</td>
<td>2</td>
<td>M.2 E-Key x 1</td>
<td>+12V (Terminal block)</td>
<td>-40°C – 85°C</td>
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</table>
PICO-SEMI Embedded with 8th Generation Intel® Core™ i7/i5/i3/Celeron® U-Series Processor SoC

**Features**
- 8th Intel® Core™ i7/i5/i3/Celeron Processor SoC
- Non-ECC DDR4 SODIMM Slot x 1, up to 32GB
- Dual HDMI ports (HDMI 1.4b), GbE x 2
- SATA 6.0 Gb/s x 1, support 2.5” SSD
- Full size mSATA/mPCIe x 1 (Select by BIOS), M.2 2230 (E key) x 1
- USB 3.2 Gen 2 x 2, USB 2.0 x 2
- RS-232/422/485 x 2 (Optional)
- Lockable DC 12V

**Specifications**

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>FORM FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PICO-SEMI</td>
</tr>
</tbody>
</table>

**CPU**
- Intel® 8th Generation Core™ i7/i5/i3/Celeron SoC
  - i7-8665UE (4C/8T, 1.7GHz, up to 4.4GHz, TDP 15W)
  - i5-8365UE (4C/8T, 1.6GHz, up to 4.1GHz, TDP 15W)
  - i3-8145UE (2C/4T, 2.2GHz, up to 3.9GHz, TDP 15W)
  - Celeron® 4305UE (2C/2T, 2GHz, TDP 15W)

**CHIPSET**
- Intel® 8th Generation Core™ i7/i5/i3/Celeron SoC

**MEMORY TYPE**
- DDR4 up to 2400MHz SODIMM x 1, up to 32GB, Non-ECC

**BIOS**
- UEFI

**WAKE ON LAN**
- Yes

**WATCHDOG TIMER**
- 255 Levels

**RTC Battery**
- Lithium Battery 3V/240mAh

**DIMENSION**
- 5.90” x 3.94” x 2.36” (150mm x 100mm x 60mm)

**GROSS WEIGHT**
- 1.41 lbs. (0.64 kg)

**OS Support**
- Windows 10 (64 bit)
- Ubuntu 18.04.3/Kernel 5.0

**POWER REQUIREMENT**
- 12V only

**POWER SUPPLY TYPE**
- ATX

**CONNECTOR**
- DC Jack Connector

**POWER CONSUMPTION**
- Intel® i7-8665UE @ DDR4 16GB, 2.23A@ +12V (TYPICAL)

**DISPLAY**
- Controller: Intel® UHD Graphics 610/620
- Display Interface: HDMI 1.4b x 2 (up to 3840 x 2160)
- Multiple Display: Up to 2 Simultaneous Displays

**AUDI O**
- CODEC: —
- AUDIO INTERFACE: —
- Speaker: —

**EXTERNAL I/O**
- Ethernet: Realtek 8111 Gigabit Ethernet 10/100/1000Base, RJ-45 x 2
- USB: 2.0 x 2
- SERIAL PORT: —
- VIDEO: HDMI 1.4b x 2 (up to 3840 x 2160)

**INTERNAL I/O**
- USB: —

**EXPANSION**
- Mini PCI-E/mSATA: Full size mSATA/mPCIe or USB2.0 x 1 (PCIe as default, mSATA selected by BIOS)
- M.2: M.2 E-Key 2230 x 1 (for WIFI/BT, PCIe/USB signal only)
- Others: SMBUS/I2C/LPC/eSPI x 1

**ENVIRONMENT & CERTIFICATION**
- OPERATING TEMP: 32°F – 122°F (0°C – 50°C) with airflow 0.5m/s for SSD SKU
- STORAGE TEMP: -40°F – 185°F (-40°C – 85°C)
- OPERATING HUMIDITY: 0% – 90% relative humidity, non-condensing
- MTBF (HOURS): 298,762
- EMC: CE/FCC Class A

**Packing List**
- PICO-WHU4-SEMI
- Optional Accessories:
  - Part Number | Description |
  - 1701200102 | (TF)SERIAL Cable.WL1010H-2*10P 1.0mm Housing.Dual D9(M),10cm |
  - 1255300960 | Power Adapter 12V/8A 96W FSP096-AHAN3 |
  - 1702031802 | Power Cord (US Type) |
  - 1702031803 | Power Cord (Europe Type) |
  - 170203180E | Power Cord (Japan) |
  - PICO-WHU4-SEMI-VESta1 | PICO-WHU4-SEMI VESA bracket kit |
  - PICO-WHU4-SEMI-WMtal1 | PICO-WHU4-SEMI Wallmount bracket kit |

**Optional Accessories**

**Note:** All specifications are subject to change without notice.
**Block Diagram**

**Dimension**

Unit: mm

**Ordering Information**

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>Memory</th>
<th>FAN/ FANLESS</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/422/485</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
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<tbody>
<tr>
<td>PICO-WHU4-SEMI-A11-S001</td>
<td>Celeron 4305UE</td>
<td>DDR4 Socket</td>
<td>Cooler</td>
<td>HDMI x 2</td>
<td>SATA x 1</td>
<td>GbE x 2</td>
<td>USB 3.2 Gen 2 x 2</td>
<td>M.2 2230 E-key x 1</td>
<td>+12V (ATX)</td>
<td>0~50˚C</td>
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<td>i3-8145UE</td>
<td>DDR4 Socket</td>
<td>Cooler</td>
<td>HDMI x 2</td>
<td>SATA x 1</td>
<td>GbE x 2</td>
<td>USB 3.2 Gen 2 x 2</td>
<td>M.2 2230 E-key x 1</td>
<td>+12V (ATX)</td>
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<td>DDR4 Socket</td>
<td>Cooler</td>
<td>HDMI x 2</td>
<td>SATA x 1</td>
<td>GbE x 2</td>
<td>USB 3.2 Gen 2 x 2</td>
<td>M.2 2230 E-key x 1</td>
<td>+12V (ATX)</td>
<td>0~50˚C</td>
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<td>i7-8665UE</td>
<td>DDR4 Socket</td>
<td>Cooler</td>
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<td>SATA x 1</td>
<td>GbE x 2</td>
<td>USB 3.2 Gen 2 x 2</td>
<td>M.2 2230 E-key x 1</td>
<td>+12V (ATX)</td>
<td>0~50˚C</td>
<td>—</td>
<td></td>
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<tr>
<td>PICO-WHU4-SEMI-A11-S005</td>
<td>i7-8665UE, 8GB DDR4</td>
<td>DDR4 SO-DIMM</td>
<td>Cooler</td>
<td>HDMI x 2</td>
<td>SATA x 1</td>
<td>GbE x 2</td>
<td>USB 3.2 Gen 2 x 2</td>
<td>M.2 2230 E-key x 1</td>
<td>+12V (ATX)</td>
<td>0~50˚C</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Pico-ITX Board with 7th Generation Intel® Core™ i7/i5/i3/Celeron® U-Series Processor SoC

Features

- 7th Generation Intel® Core™ i7/i5/i3/Celeron® Processor SoC
- DDR4 SODIMM Slot x 1, up to 16 GB
- Dual Gigabit Ethernet Support
- HDMI 1.4b, LVDS 2CH Display
- USB 3.2 Gen 1 x 2, USB 2.0 x 2, SATA 6.0Gb/s x 1
- M.2 B Key (2242) x 1, M.2 E Key (2230) x 1
- BIO (Optional)

Specifications

- SYSTEM
  - FORM FACTOR: PICO-ITX
  - CPU: Intel® 7th Generation Core™ (Celeron Processor:
    - Intel®i7-7600U (2C/4T, 2.80GHz, up to 3.90GHz, TDP-up 25W)
    - Intel®i5-7300U (2C/4T, 2.60GHz, up to 3.50GHz, TDP-up 25W)
    - Intel®i3-7100U (2C/4T, 2.40GHz, TDP-up 25W)
    - Intel® Celeron 3965U (2C/2T, 2.20GHz, TDP-up 15W)
  - CHIPSET: Integrated with Intel® SoC
  - MEMORY TYPE: DDR4 up to 2133MHz, SODIMM x 1, up to 16GB, Non-ECC
  - BIOS: UEFI
  - WAKE ON LAN: Yes
  - WATCHDOG TIMER: 255 Levels
  - SECURITY: —
  - RTC Battery: Lithium Battery 3V/240mAh
  - DIMENSION: 3.94” x 2.84” (100mm x 72mm)
  - Gross Weight: 0.18 lb (0.08 kg)
  - OS Support: Windows 10 (64 bit)

- POWER
  - POWER REQUIREMENT: +12V
  - POWER SUPPLY TYPE: AT/ATX
  - CONNECTOR: Phoenix 2-pin Connector (Default)
  - Lockable DC Jack Connector (colay)
  - POWER CONSUMPTION: Intel® i7-7600, DDR4 16GB, 2.3A@ +12V(TYPICAL)

- DISPLAY
  - CONTROLLER: Intel® HD Graphics 510/620
  - LVDS/eDP: LVDS (18/24-bit 2CH) 1920 x 1200
  - Display interface: HDMI 1.4b x 1 (up to 4096 x 2304)
  - DDI (BIO, Optional)
  - Multiple Display: Up to 3 Simultaneous Displays
  - AUDIO
    - CODEC: Realtek ALC269
    - AUDIO INTERFACE: Line-out
    - Speaker: —
  - EXTERNAL I/O
    - ETHERNET: Realtek 8111 Gigabit Ethernet 10/100/1000Base, RJ-45 x 2
    - USB: USB 3.2 Gen 1 x 2
    - SERIAL PORT: —
    - VIDEO: HDMI 1.4b x 1 (up to 4096 x 2304)

- ENVIRONMENT & CERTIFICATION
  - OPERATING TEMP: 32°F ~ 140°F (0°C ~ 60°C)
  - STORAGE TEMP: -40°F ~ 185°F (-40°C ~ 85°C)
  - OPERATING HUMIDITY: 0% ~ 90% relative humidity, non-condensing
  - MTBF (HOURS): 163,000
  - EMC: CE/FCC Class A

Optional Accessories

- PICO-KBU4

Packing List

- BIO (Optional)

Note: All specifications are subject to change without notice.
**Block Diagram**

![Block Diagram of Pico-ITX Boards](image)

**Dimension**

*Unit: mm*

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Memory</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Power Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-KBU4-A10-0001</td>
<td>Celeron® 3965</td>
<td>DDR4 Socket</td>
<td>HDMI x 1</td>
<td>SATAIII x 1</td>
<td>M.2 2242 (B Key) x 1</td>
<td>QDE x 2</td>
<td>USB 3.2 Gen 1 x 2(Rear)</td>
<td>1</td>
<td>1</td>
<td>M.2 2230 (E Key) x 1</td>
<td>+12V (Terminal block)</td>
<td>0°C ~ 60°C</td>
</tr>
<tr>
<td>PICO-KBU4-A10-0002</td>
<td>i3-7100U</td>
<td>DDR4 Socket</td>
<td>HDMI x 1</td>
<td>SATAIII x 1</td>
<td>M.2 2242 (B Key) x 1</td>
<td>QDE x 2</td>
<td>USB 3.2 Gen 1 x 2(Rear)</td>
<td>1</td>
<td>1</td>
<td>M.2 2230 (E Key) x 1</td>
<td>+12V (Terminal block)</td>
<td>0°C ~ 60°C</td>
</tr>
<tr>
<td>PICO-KBU4-A10-0003</td>
<td>i5-7300U</td>
<td>DDR4 Socket</td>
<td>HDMI x 1</td>
<td>SATAIII x 1</td>
<td>M.2 2242 (B Key) x 1</td>
<td>QDE x 2</td>
<td>USB 3.2 Gen 1 x 2(Rear)</td>
<td>1</td>
<td>1</td>
<td>M.2 2230 (E Key) x 1</td>
<td>+12V (Terminal block)</td>
<td>0°C ~ 60°C</td>
</tr>
<tr>
<td>PICO-KBU4-A10-0004</td>
<td>i7-7600U</td>
<td>DDR4 Socket</td>
<td>HDMI x 1</td>
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<td>M.2 2242 (B Key) x 1</td>
<td>QDE x 2</td>
<td>USB 3.2 Gen 1 x 2(Rear)</td>
<td>1</td>
<td>1</td>
<td>M.2 2230 (E Key) x 1</td>
<td>+12V (Terminal block)</td>
<td>0°C ~ 60°C</td>
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<tr>
<td>PICO-KBU4-A10-0005</td>
<td>(6th Gen)</td>
<td>Celeron® 3955</td>
<td>DDR4 Socket</td>
<td>HDMI x 1</td>
<td>SATAIII x 1</td>
<td>M.2 2242 (B Key) x 1</td>
<td>QDE x 2</td>
<td>USB 3.2 Gen 1 x 2(Rear)</td>
<td>1</td>
<td>1</td>
<td>M.2 2230 (E Key) x 1</td>
<td>+12V (Terminal block)</td>
</tr>
<tr>
<td>PICO-KBU4-A10-0006</td>
<td>i3-7100U</td>
<td>DDR4 Socket</td>
<td>HDMI x 1</td>
<td>SATAIII x 1</td>
<td>M.2 2242 (B Key) x 1</td>
<td>QDE x 2</td>
<td>USB 3.2 Gen 1 x 2(Rear)</td>
<td>1</td>
<td>1</td>
<td>M.2 2230 (E Key) x 1</td>
<td>+12V (DC Jack)</td>
<td>0°C ~ 60°C</td>
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<tr>
<td>PICO-KBU4-A10-0007</td>
<td>(6th Gen)</td>
<td>i5-6300U</td>
<td>DDR4 Socket</td>
<td>HDMI x 1</td>
<td>SATAIII x 1</td>
<td>M.2 2242 (B Key) x 1</td>
<td>QDE x 2</td>
<td>USB 3.2 Gen 1 x 2(Rear)</td>
<td>1</td>
<td>1</td>
<td>M.2 2230 (E Key) x 1</td>
<td>+12V (Terminal block)</td>
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<tr>
<td>PICO-KBU4-A10-0008</td>
<td>i7-7800U</td>
<td>DDR4 Socket</td>
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<td>SATAIII x 1</td>
<td>M.2 2242 (B Key) x 1</td>
<td>QDE x 2</td>
<td>USB 3.2 Gen 1 x 2(Rear)</td>
<td>1</td>
<td>1</td>
<td>M.2 2230 (E Key) x 1</td>
<td>+12V (Terminal block)</td>
<td>-20°C ~ 70°C</td>
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</table>

Note: All specifications are subject to change without notice.
PICO-KBU4-SEMI
Pico-SEMI TurnKit with 7th Generation Intel® Core™ i7/i5/i3/Celeron® U-Series Processor SoC

Specifications

SYSTEM
FORM FACTOR PICO-SEMI
CPU
- Intel® 7th Generation Core™ (Celeron Processor:
  Intel® i7-7600U (2C/4T, 2.80GHz, up to 3.90GHz, TDP-up 25W)
  Intel® i5-7300U (2C/4T, 2.60GHz, up to 3.50GHz, TDP-up 25W)
  Intel® i3-7100U (2C/4T, 2.40GHz, TDP-up 25W)
  Intel® Celeron 3965U (2C/2T, 2.20GHz, TDP-up 15W)
CHIPSET Integrated with Intel® SoC
MEMORY TYPE DDR4 up to 2133MHz, SODIMM x 1, up to 16GB, Non-ECC
BIOS UEFI
WAKE ON LAN Yes
WATCHDOG TIMER 255 Levels
SECURITY —
RTC Battery Lithium Battery 3V/240mAh
DIMENSION 4.80” x 3.18” x 1.98” (122 mm x 80.8 mm x 50.4 mm)
Gross Weight 0.88 lb (0.4 kg)
OS Support Windows 10 (64 bit)

POWER
POWER REQUIREMENT 12V only
POWER SUPPLY TYPE ATX
CONNECTOR Lockable DC Jack Connector
POWER CONSUMPTION
- Intel® i7-7600, DDR4 16GB, 2.3A@ +12V (TYPICAL)

DISPLAY
CONTROLLER Intel® HD Graphics 510/620
LVDS/eDP —
Display Interface HDMI 1.4b x 1 (up to 4096 x 2304)
Multiple Display 1 Simultaneous Display

AUDIO
CODEC Realtek ALC269 (Optional)
AUDIO INTERFACE Line-out (Optional)
Speaker —

EXTERNAL I/O
ETHERNET Realtek 8111 Gigabit Ethernet 10/100/1000Base, RJ-45 x 2
USB USB 3.2 Gen 1 x 2
SERIAL PORT COM1: RS-232 x 1 (Optional)
  COM2: RS-232/422/485 x 1 (Ring/ +5V/ +12V) (Optional)
VIDEO HDMI 1.4b x 1 (up to 4096 x 2304)

INTERNAL I/O
USB —

Features
- Extreme light system, easy to adopt everywhere
- DDR4 Non-ECC SODIMM Slot x 1, up to 16GB
- GbE x 2, HDMI x 1.4
- M.2 2242 B key for storage
- M.2 2230 E key for wireless Module
- COM x 2 (Optional)
- USB 3.2 Gen 1 x 2 (Rear IO)
- Lockable DC 12V

Packing List

- PICO-KBU4-SEMI

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>125530040C</td>
<td>(TF)-Power Adapter 12V 40W, FSP/FSP040-RHAN3</td>
<td>1</td>
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<tr>
<td>125530060Z</td>
<td>Power Adapter 12V/5A 60W FSP060-DHAN3</td>
<td>1</td>
</tr>
<tr>
<td>1702031802</td>
<td>Power Cord (US)</td>
<td>1</td>
</tr>
<tr>
<td>1702031803</td>
<td>Power Cord (European Type)</td>
<td>1</td>
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<tr>
<td>170203180E</td>
<td>Power Cord (Japan Type)</td>
<td>1</td>
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<tr>
<td>1701200101</td>
<td>M.2 2242-D2-B-M.64GB.SATA3,MLC</td>
<td>1</td>
</tr>
<tr>
<td>9761SEM101</td>
<td>Din Rail Kit</td>
<td>1</td>
</tr>
<tr>
<td>9761SEM100</td>
<td>Wall mount Kit</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
**Block Diagram**

**Dimension**
Unit: mm

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Power Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-KBU4-SEMI-A10-B001</td>
<td>Celeron 3965</td>
<td>DDR4 Socket</td>
<td>w/Cooler</td>
<td>HDMI x 1</td>
<td>SATA x 1</td>
<td>GE x 2</td>
<td></td>
<td></td>
<td>M.2 2242 (B Key) x 1</td>
<td>12V (ATX)</td>
<td>0°C – 50°C</td>
<td>DIO 4 bit</td>
</tr>
<tr>
<td>PICO-KBU4-SEMI-A10-B002</td>
<td>i3-7100U</td>
<td>DDR4 Socket</td>
<td>w/Cooler</td>
<td>HDMI x 1</td>
<td>SATA x 1</td>
<td>GE x 2</td>
<td></td>
<td></td>
<td>M.2 2242 (B Key) x 1</td>
<td>12V (ATX)</td>
<td>0°C – 50°C</td>
<td>DIO 4 bit</td>
</tr>
<tr>
<td>PICO-KBU4-SEMI-A10-B003</td>
<td>i5-7500U</td>
<td>DDR4 Socket</td>
<td>w/Cooler</td>
<td>HDMI x 1</td>
<td>SATA x 1</td>
<td>GE x 2</td>
<td></td>
<td></td>
<td>M.2 2242 (B Key) x 1</td>
<td>12V (ATX)</td>
<td>0°C – 50°C</td>
<td>DIO 4 bit</td>
</tr>
<tr>
<td>PICO-KBU4-SEMI-A10-B004</td>
<td>i7-7600U</td>
<td>DDR4 Socket</td>
<td>w/Cooler</td>
<td>HDMI x 1</td>
<td>SATA x 1</td>
<td>GE x 2</td>
<td></td>
<td></td>
<td>M.2 2242 (B Key) x 1</td>
<td>12V (ATX)</td>
<td>0°C – 50°C</td>
<td>DIO 4 bit</td>
</tr>
<tr>
<td>PICO-KBU4-SEMI-A10-B005 (8th Gen)</td>
<td>Celeron 3955</td>
<td>DDR4 Socket</td>
<td>w/Cooler</td>
<td>HDMI x 1</td>
<td>SATA x 1</td>
<td>GE x 2</td>
<td></td>
<td></td>
<td>M.2 2242 (B Key) x 1</td>
<td>12V (ATX)</td>
<td>0°C – 50°C</td>
<td>DIO 4 bit</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
PICO-EHL4
Pico-ITX Board with Intel® Atom® x6000E Series, Intel® Pentium®, and Celeron® N and J series processors

Pico-ITX Board with Intel® Atom® x6000E Series, Intel® Pentium®, and Celeron® N and J series processors (formerly Elkhart Lake)

- HDMI2.0b x 2 + LVDS/eDP1.3 x 1
- GbE x 2
- 2 x USB 3.2 Gen 2, 2 x USB2.0
- LPDDR4x onboard memory, In-Band ECC
- eMMC x 1, SATA x 1
- COM x 2 Full, CANBUS x 2 (optional), mSATA x 1, M.2 E-Key 2230 x 1

**Features**

- Up to 4-bit DIO
- LVDS backlight
- Front Panel
- HDMI x 2
- LAN x 2
- USB 3.2 Gen 2 x 2

**Specifications**

**SYSTEM**
- Form Factor: PICO-ITX

**CPU**
- Intel® Atom® x6425RE (4C, 1.9GHz, TDP 12W)
- Intel® Atom® x6414RE (4C, 1.5GHz, TDP 9W)
- Intel® Atom® x6212RE (2C, 1.2GHz, TDP 6W)
- Intel® Atom® x6425E (4C, 2.0GHz, up to 3GHz, TDP 12W)
- Intel® Atom® x6413E (4C, 1.5GHz, up to 3GHz, TDP 9W)
- Intel® Pentium® J6426 (4C, 2.0GHz, up to 3GHz, TDP unlim)
- Intel® Pentium® N6415 (4C, 1.2GHz, up to 3GHz, TDP 6.5W)
- Intel® Celeron® J6412 (4C, 2.0GHz, up to 2.6GHz, TDP unlim)
- Intel® Celeron® N6210 (2C, 1.3GHz, up to 3GHz, TDP 6.5W)

**CHIPSET**
- Intel® Elkhart Lake SoC Processor

**MEMORY TYPE**
- LPDDR4x up to 3200MHz, up to 16GB

**BIOS**
- UEFI

**WATCHDOG TIMER**
- 255 Levels

**SECURITY**
- Intel® PTT (Integrated TPM)
- RTC Battery 3V/240mAh

**DIMENSION**
- 3.94” x 2.84” (100mm x 72mm)

**Gross Weight**
- 0.18 lbs (0.08 kg)

**OS Support**
- Windows 10 (64 bit)
- Ubuntu 20.04.3(IOT)/Kernel 5.13

**POWER**
- Power Requirement: +12V
- Power Supply Type: AT/ATX
- Connector: Phoenix 2-pin Connector (Default), Lockable DC Jack Connector (optional)
- Power Consumption:
  - Intel® Atom™ x6425E, LPDDR4x onboard 16GB, 2.48A@ +12V (TYPICAL)
  - Intel® Atom™ x6425E, LPDDR4x onboard 16GB, 2.62A@ +12V (MAX)

**DISPLAY**
- Controller: Intel® UHD Graphics for 10th Gen Intel® Processors
- LVDS/eDP: eDP (up to HBR3, 8K x 4K 30Hz)
- Display Interface: HDMI 2.0b x 2 (4K x 2K 60Hz)
- Multiple Display: Up to 3 Simultaneous Displays

**AUDIO**
- Codec: —

**EXTERNAL I/O**
- Ethernet: Realtek RTL8111H-CG, 1G/10G/100G Base-TX, RJ-45 x 2
- USB: USB 3.2 Gen 2 x 2
- Serial Port: COM1, COM2 (RS232/422/485, supports 5V/12V/Ri)
- Video: HDMI 2.0b x 2 (4K x 2K 60Hz)

**INTERNAL I/O**
- USB: USB 2.0 x 2
- Serial Port: COM1, COM2 (RS232/422/485, supports 5V/12V/Ri)
- Video: HDMI 2.0b x 2 (4K x 2K 60Hz)

**ENVIRONMENT & CERTIFICATION**
- Operating Temp: 32°F ~ 140°F (0°C ~ 60°C)
- Storage Temp: -40°F ~ 185°F (-40°C ~ 85°C)
- Operating Humidity: 0% ~ 90% relative humidity, non-condensing
- MTBF (Hours): 489,999
- EMC: CE/FCC Class A

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>170010010D</td>
<td>USB2.0 cable</td>
<td>1</td>
</tr>
<tr>
<td>170970500</td>
<td>SATA cable</td>
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<td>1702150155</td>
<td>SATA power cable</td>
<td>1</td>
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<tr>
<td>1703120130</td>
<td>eSPI/SMBUS/2IC cable</td>
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<tr>
<td>1709100100</td>
<td>Front panel cable</td>
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</tr>
<tr>
<td>PICO-EHL4-HSP01</td>
<td>Heat Spreader AL.100<em>72</em>8.8mm for Pentium/Celeron of PICO-EHL4</td>
<td>1</td>
</tr>
<tr>
<td>PICO-EHL4-HSP02</td>
<td>Heat Spreader AL.100<em>72</em>5.8mm for Atom series of PICO-EHL4</td>
<td>1</td>
</tr>
<tr>
<td>PICO-EHL4-HSK01</td>
<td>Heat Sink 100<em>72</em>15.5mm,Silver.To be used with HSP</td>
<td>1</td>
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<tr>
<td>PICO-EHL4-FAN01</td>
<td>Cooler.100<em>72</em>20.3mm for Pentium/Celeron of PICO-EHL4</td>
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<td>PICO-EHL4-FAN02</td>
<td>Cooler.100<em>72</em>19.3mm for Atom series of PICO-EHL4</td>
<td>1</td>
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</table>

Note: All specifications are subject to change without notice.
Block Diagram

Dimension
Unit: mm

Packing List
• PICO-EHL4

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>Memory</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/422/485</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
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</thead>
<tbody>
<tr>
<td>PICO-EHL4-A11-0001</td>
<td>N6210</td>
<td>4GB</td>
<td>HDMI x 2</td>
<td>SATAI x 1</td>
<td>eMMC 32GB</td>
<td>GigE x 2</td>
<td>USB3.2 Gen 2 x 2</td>
<td>16G E-key x 1</td>
<td>+12V</td>
<td>0°C ~ 60°C</td>
<td>DIO 4 bit</td>
</tr>
<tr>
<td>PICO-EHL4-A11-0002</td>
<td>J6412</td>
<td>4GB</td>
<td>HDMI x 2</td>
<td>SATAI x 1</td>
<td>eMMC 32GB</td>
<td>GigE x 2</td>
<td>USB3.2 Gen 2 x 2</td>
<td>16G E-key x 1</td>
<td>+12V</td>
<td>0°C ~ 60°C</td>
<td>DIO 4 bit</td>
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<tr>
<td>PICO-EHL4-A11-0003</td>
<td>J6412</td>
<td>4GB</td>
<td>HDMI x 2</td>
<td>SATAI x 1</td>
<td>eMMC 64GB</td>
<td>GigE x 2</td>
<td>USB3.2 Gen 2 x 2</td>
<td>16G E-key x 1</td>
<td>+12V</td>
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<td>SATAI x 1</td>
<td></td>
<td>GigE x 2</td>
<td>USB3.2 Gen 2 x 2</td>
<td>16G E-key x 1</td>
<td>+12V</td>
<td>0°C ~ 60°C</td>
<td>DIO 4 bit</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
**Features**

- Intel® Atom®/ Pentium® N4200/ Celeron® N3350 Processor SoC
- DDR3L 1866, Single Channel SODIMM x 1, Non-ECC (Max. 8GB, up to 1600MHz)
- 18/24-bit Dual Channel LVDS LCD (Optional)
- Supports Triple Display (Optional)
- HDMI 1.4b Supports 3840 x 2160 (4K x 2K)
- SATA 6.0Gb/s x 1, mSATA (Full Size) x 1
- Intel® Gigabit Ethernet x 1, RJ-45 x 1
- USB 3.2 Gen 1 x 2, USB 2.0 x 1
- RS-232 x 1, RS-232/422/485 x 1 (Optional by Cable)
- Mini-Card x 1 (Half-Size)
- Digital I/O 4-bit
- BIO Connector for Daughter Board (Optional)

---

### Packing List

- 1703200153 (Optional by model)
  - COM x 2, Line-out Cable
  - PICO-APL1

### Optional Accessories

- **Part Number**
- **Description**
- **Qty.**
  - 1709070500
  - SATA CABLE.7P Pitch 1.27mm.50cm
  - 1
  - 1702150155
  - SATA Power Cable
  - 1
  - 1703200153
  - COM x 2, line-out cable
  - 1
  - PICO-APL1-HSP01
  - Heat-spreaders for PICO-APL1 N4200/N3350 SKUs
  - 1
  - PICO-APL1-HSP02
  - Heat-spreaders for PICO-APL1 N3350/N3950/590 SKUs
  - 1
  - PICO-APL1-HSK02
  - Heat-sink for all PICO-APL1 series, to be used with Heat-spreaders
  - 1
**Block Diagram**

**Dimension**

Unit: mm

**Ordering Information**

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>FAN/FANLESS</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-422/485</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-APL1-A11-F0A1</td>
<td>N4200</td>
<td>W/o Heat-spreader</td>
<td>LVDS x 1</td>
<td>mSATA (Full size) x 1</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 1 x 2</td>
<td>1</td>
<td>USB 2.0 x 1</td>
<td>(Optional the COM cable)</td>
<td>miniCard x 1 (Half-size)</td>
<td>12V Phoenix Terminal</td>
<td>0°C – 60°C</td>
</tr>
<tr>
<td>PICO-APL1-A11-FDA2</td>
<td>N3350</td>
<td>W/o Heat-spreader</td>
<td>HDIM x 1</td>
<td>mSATA (Full size) x 1</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 1 x 2</td>
<td>1</td>
<td>USB 2.0 x 1</td>
<td>(Optional the COM cable)</td>
<td>miniCard x 1 (Half-size)</td>
<td>12V DC-Jack</td>
<td>0°C – 60°C</td>
</tr>
<tr>
<td>PICO-APL1-A11-F0A3</td>
<td>N3350</td>
<td>W/o Heat-spreader</td>
<td>LVDS x 1</td>
<td>mSATA (Full size) x 1</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 1 x 2</td>
<td>1</td>
<td>USB 2.0 x 1</td>
<td>(Optional the COM cable)</td>
<td>miniCard x 1 (Half-size)</td>
<td>12V Phoenix Terminal</td>
<td>0°C – 60°C</td>
</tr>
<tr>
<td>PICO-APL1-A11-F0A4</td>
<td>E3940</td>
<td>W/o Heat-spreader</td>
<td>LVDS x 1</td>
<td>mSATA (Full size) x 1</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 1 x 2</td>
<td>1</td>
<td>USB 2.0 x 1</td>
<td></td>
<td>miniCard x 1 (Half-size)</td>
<td>12V Phoenix Terminal</td>
<td>0°C – 60°C</td>
</tr>
</tbody>
</table>

Remark: Heatspreader and cooler is recommended as the thermal solution.

Note: All specifications are subject to change without notice.

www.aaeon.com
PICO-APL1-SEMI
PICO-SEMI Embedded Barebone Kit with Intel® Atom® Processor SoC

Features
- 270g Extreme Light System, Easy To Adapter Everywhere
- Gigabit Ethernet for Networking Connection
- USB 3.2 Gen 1 Connectivity
- HDMI
- mSATA and miniCard Slot for WiFi/3G/4G Bluetooth Module
- Fix Holes for Antenna, Wallmount, DIN-Rail Kit Optional
- Lockable 12V DC Input

Specifications
- Power Input
- USB 3.2 Gen 1 x 2
- LAN
- Antenna (Optional)
- Line-out (optional)
- HDMI
- Power Button
- COM (optional)

Packing List
- PICO-APL1 SBC x 1
- SEMI Top Chassis x 1
- SEMI Bottom Chassis x 1
- SEMI Heatsink x 1
- SEMI power button cable x 1
* Customer assembly required.

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>125530040C</td>
<td>(TF)Power Adapter.12V.40W.FSP.FSP040-DHAN3</td>
<td>1</td>
</tr>
<tr>
<td>1702031802</td>
<td>Power Cord (US Type)</td>
<td>1</td>
</tr>
<tr>
<td>1702031803</td>
<td>Power Cord (European Type)</td>
<td>1</td>
</tr>
<tr>
<td>170203180E</td>
<td>Power Cord (Japan Type)</td>
<td>1</td>
</tr>
<tr>
<td>1703200052</td>
<td>COM x 2 + LINE_OUT</td>
<td>1</td>
</tr>
<tr>
<td>988C01650V</td>
<td>SATA DOM 16GB (0°C ~ 70°C)</td>
<td>1</td>
</tr>
<tr>
<td>9761SEM000</td>
<td>Wallmount Kit</td>
<td>1</td>
</tr>
<tr>
<td>9761SEM0101</td>
<td>DIN-Rail Mount Kit</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Note: All specifications are subject to change without notice.

**PICO-APL1-SEMI**

### Dimension
Unit: mm

![Dimension Illustration]

### Installation Scenario

**DIN-Rail Mount Illustration**

**Wall Mount Illustration**

*Photos show assembled product. DIN Rail and Wall Mount kit are optional parts.*

### Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Memory</th>
<th>Fan/Fanless</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-APL1-SEMI-A10-FB02</td>
<td>N3350</td>
<td>DDR3L SO-DIMM Socket</td>
<td>Fanless</td>
<td>HDMI</td>
<td>SATA x 1, mSATA x 1 (Full-size)</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 1 x 2, USB2.0 x 1</td>
<td>miniCard x 1 (Half-Size)</td>
<td>12V DC Jack</td>
<td>0°C ~ 50°C @ 0.5 m/s airflow</td>
<td>COM Port optional</td>
</tr>
</tbody>
</table>

* This is a barebones kit, customer assembly is required.
PICO-APL2
Pico-ITX Board with Intel Atom® E3900 series/ Pentium® N4200/ Celeron® N3350 Processor SoC

Features
- Intel Atom® E3900/ Pentium® N4200/ Celeron® N3350 Processor SoC
- DDR3L 1866, Single Channel SODIMM x 1, Non-ECC (Max.8GB, up to 1600MHz)
- 18/24-bit Dual Channel LVDS LCD
- HDMI1.4 x 1, Pin header (up to 2K @30Hz)
- SATA 6.0Gb/s x 1, mSATA (Full Size) x 1
- Intel® i210AT/i210IT, 10/100/1000Base x 1 (Pin header) *LED in separated pin header
- USB 3.2 Gen 1 x 2, USB 2.0 x 1
- RS-232 x 1, RS-232/422/485 x 1
- Mini-Card x 1 (Half-Size, PCIe/USB)
- SMBus/I2C x 1 (default SMBus)
- Digital I/O 4-bit
- BIO Connector for Daughter Board (Optional)

Specifications

SYSTEM
- FORM FACTOR: Pico-ITX
- CPU:
  - Intel® Pentium® N4200 (4C, 1.1GHz, up to 2.5GHz, TDP 6W)
  - Intel® Celeron® N3350 (2C, 1.1GHz, up to 2.4GHz, TDP 6W)
- CHIPSET: Intel® Atom® E3900/ Pentium® N4200/ Celeron® N3350 Processor SoC
- MEMORY TYPE:
  - DDR3L 1866, Single Channel SODIMM x 1, Non-ECC (Max.8GB, up to 1600MHz)

POWER
- POWER REQUIREMENT: +12V
- POWER SUPPLY TYPE: AT/ATX (Pin header)
- CONNECTOR: 2-pin Connector (Pin header)
- POWER CONSUMPTION:
  - Intel® Pentium® N4200, DDR3L 8GB x 1, 2.16A@ +12V(TYPICAL)
  - Intel® Pentium® N4200, DDR3L 8GB x 1, 2.28A@ +12V(MAX)

DISPLAY
- CONTROLLER: Intel® HD Graphics 500/505
- LVDS/eDP: LVDS (18/24bit 2CH)
- Display Interface:
  - HDMI 1.4 x 1 (2K @30Hz) (Pin header type)
  - DDI (BIo, Optional)
- Multiple Display: Up to 2 Simultaneous Displays

AUDIO
- CODEC: Realtek 888/997
- AUDIO INTERFACE: Line out
- Speaker: ---

EXTERNAL I/O
- ETHERNET:
  - Intel® i210AT/i210IT, 10/100/1000Base x 1 (Pin header) *LED in separated pin header
- USB: USB 3.2 Gen 1 x 2
- SERIAL PORT: ---
- VIDEO: HDMI 1.4 x 1 (2K @30Hz) (Pin header type)

INTERNAL I/O
- USB: USB2.0 x 1
- SERIAL PORT: COM1: RS-232 x 1
- COM2: RS-232/422/485 x 1 (Ring/ +5V/ +12V)
- VIDEO: ----
- SATA: SATA III x 1
- AUDIO: Line-out x 1
- DIO/I2C: 4-bit
- SMBus/I2C: SMBus/I2C x 1 (SMBus as default, I2C selected by HW BOM)
- Touch: ----
- FAN: ----
- SIM: ----
- FRONT PANEL: HDD LED, PWR LED, Power Button, Buzzer, Reset
- Others: ----

EXPANSION
- Mini PCI-E/mSATA: Full size Mini Card mPCIe/ mSATA or USB2.0 x 1 (SATA as default, mPCIe selected by HW BOM)
- M.2: Half-size Mini Card x 1 (mPCIe as default)
- Others: BIO x 1 (Optional) SMBus/I2C x 1 (SMBus as default, I2C selected by HW BOM)

ENVIRONMENT & CERTIFICATION
- OPERATING TEMP: 32 °F ~ 140 °F (0°C ~ 60°C)
- STORAGE TEMP: -40 °F ~ 176 °F (-40°C ~ 80°C)
- OPERATING HUMIDITY: 0% ~ 90% relative humidity, non-condensing
- MTBF (HOURS): 525,137
- EMC: CE/FCC Class A

Packing List
- PICO-APL2

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1709010500</td>
<td>SATA CABLE, 1P Pitch 1.27mm 50cm</td>
<td>1</td>
</tr>
<tr>
<td>1702010555</td>
<td>SATA Power Cable</td>
<td>1</td>
</tr>
<tr>
<td>170850297</td>
<td>USB cable 20cm</td>
<td></td>
</tr>
<tr>
<td>1703200153</td>
<td>COM x 2, line-out cable</td>
<td></td>
</tr>
<tr>
<td>PICO-APL2-HSP01</td>
<td>Heat-sink for PICO-APL2 N4200/N3350 SKUs</td>
<td>1</td>
</tr>
<tr>
<td>PICO-APL2-HSP02</td>
<td>Heat-sink for PICO-APL2 E3950/E3940/E3930 SKUs</td>
<td>1</td>
</tr>
<tr>
<td>PICO-APL2-HSK02</td>
<td>Heat-sink for all PICO-APL2 series, to be used with Heat-sink/Refrigerator</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Block Diagram

PICO-APL2

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>Memory</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/422/485</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-APL2-A10-0001</td>
<td>N4200</td>
<td>8GB</td>
<td>HDMI x 1</td>
<td>SATAII x 1</td>
<td>2.5 GbE x 1</td>
<td>USB3.2 Gen 1 x 2, USB2.0 x 1</td>
<td>Full-size mSATA/HP or USB2.0 x 1</td>
<td>+12V</td>
<td>0°C–80°C</td>
<td>DIO 4-bit SMBus/12C x 1</td>
<td></td>
</tr>
<tr>
<td>PICO-APL2-A10-0002</td>
<td>N3350</td>
<td>8GB</td>
<td>HDMI x 1</td>
<td>SATAII x 1</td>
<td>2.5 GbE x 1</td>
<td>USB3.2 Gen 1 x 2, USB2.0 x 1</td>
<td>Full-size mSATA/HP or USB2.0 x 1</td>
<td>+12V</td>
<td>0°C–80°C</td>
<td>DIO 4-bit SMBus/12C x 1</td>
<td></td>
</tr>
<tr>
<td>PICO-APL2-A10-0003</td>
<td>E3950</td>
<td>8GB</td>
<td>HDMI x 1</td>
<td>SATAII x 1</td>
<td>2.5 GbE x 1</td>
<td>USB3.2 Gen 1 x 2, USB2.0 x 1</td>
<td>Full-size mSATA/HP or USB2.0 x 1</td>
<td>+12V</td>
<td>0°C–80°C</td>
<td>DIO 4-bit SMBus/12C x 1</td>
<td></td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
PICO-APL3

Pico-ITX Board with Intel® Pentium® N4200/ Celeron® N3350/ Atom® Processor SoC

**Features**
- Intel® Pentium® N4200/ Celeron® N3350/ Atom® Processor SoC
- Onboard Storage eMMC 32GB (Optional to 16GB/64GB/128GB)
- Onboard DDR3L 2GB or 4GB
- Single Gigabit Ethernet Support
- HDMI 1.4b, eDP for Display
- BIO Reserved (Optional)
- USB 3.2 Gen 1 x 2, USB 2.0 x 2, SATA 6.0Gb/s x 1
- M.2 B Key (2280) x 1, M.2 E Key (2230) x 1
- Onboard HDA Audio Supports (Line in, Line-out, MIC)
- MIPI-CSI 2 Lanes x 1 for 2M Camera (Optional)
- MIPI-CSI 4 Lanes x 1 for 8M Camera (Optional)

**Specifications**

**SYSTEM**
- FORM FACTOR: PICO-ITX
- CPU: Intel® Atom®/Celeron®/Pentium® Processor:
  - Pentium N4200 (4C/4T, 1.10GHz, up to 2.50GHz, TDP 6W)
  - Celeron N3350 (2C/2T, 1.10GHz, up to 2.40GHz, TDP 6W)
  - Atom E3950 (4C/4T, 1.60GHz, up to 2.00GHz, TDP 12W)
  - Atom E3940 (4C/4T, 1.60GHz, up to 1.80GHz, TDP 9.5W)
  - Atom E3930 (2C/2T, 1.30GHz, up to 1.80GHz, TDP 6.5W)

**CHIPSET**
- Integrated with Intel® SoC

**MEMORY TYPE**
- Onboard DDR3L 2GB (Optional to 4GB)

**BIOS**
- UEFI
- WAKE ON LAN: Yes
- WATCHDOG TIMER: 255 Levels
- SECURITY:
  - TPM2.0 (Optional)
  - RTC Battery: Lithium Battery 3V/240mAh

**DIMENSION**
- 3.94” x 2.84” (100mm x 72mm)
- Gross Weight: 0.18 lbs (0.08 kg)
- OS Support: Windows 10 (64 bit)

**POWER**
- POWER REQUIREMENT: +12V
- POWER SUPPLY TYPE: AT/ATX
- CONNECTOR: Phoenix 2-pin Connector (Default)
- LOCKABLE DC Jack Connector (coyly)
- POWER CONSUMPTION:
  - Intel® N4200 processor, DDR3L 4GB, 1.1A@12V

**DISPLAY**
- CONTROLLER: Intel® HD Graphics 500/505
- LVDS/eDP:
  - eDP x 1 up to 3840x2160@60Hz (Optional)
- Display Interface:
  - HDMI 1.4b x 1 (up to 3840 x 2160@30Hz)
  - Display Interface (BIO, Optional)
- Multiple Display: Up to 3 Simultaneous Displays

**AUDIO**
- CODEC: Realtek ALC269
- AUDIO INTERFACE:
  - Line-in/Line-out/MIC
- Speaker: Amplifier Header

**EXTERNAL I/O**
- ETHERNET: Realtek 8111 Gigabit Ethernet 10/100/1000Base, RJ-45 x 1
- USB: USB 3.2 Gen 1 x 2
- SERIAL PORT: —
- VIDEO: HDMI 1.4b x 1 (up to 3840 x 2160@30Hz)

**Packing List**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>170907000</td>
<td>(TF) SATA Cable, 50cm</td>
<td>1</td>
</tr>
<tr>
<td>1702150121</td>
<td>(TF) SATA Power Cable, 15cm</td>
<td>1</td>
</tr>
<tr>
<td>PICO-APL3-HSK01</td>
<td>Heatsink, used with heat spreader</td>
<td>1</td>
</tr>
<tr>
<td>PICO-APL3-HSP01</td>
<td>Heat Spreader</td>
<td>1</td>
</tr>
<tr>
<td>1700040151</td>
<td>(TF) USB Cable, 15cm</td>
<td>2</td>
</tr>
<tr>
<td>1701090122</td>
<td>(TF) Flat Cable, 0-Sub 9P(M), 9P 1.0mm Housing, 12cm</td>
<td>2</td>
</tr>
<tr>
<td>1709150034</td>
<td>(TF) Phone Jack Cable, 25cm</td>
<td>1</td>
</tr>
<tr>
<td>3253500408</td>
<td>(TF) Power Adapter, 12V, 40W, FSP, FSP040-RHAN2,9NA048990, ESD</td>
<td>1</td>
</tr>
<tr>
<td>1702030176</td>
<td>(TF) Power Cable, 3P CJ, TERMINAL*2.17cm, TKS-E21-LN05</td>
<td>1</td>
</tr>
</tbody>
</table>

*Please refer to PICO-APL3-SEMI page for further option.
*eDP cable custom by required.

Note: All specifications are subject to change without notice.
Block Diagram

Dimension
Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/422/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Temp.</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-APL3-A10-F001</td>
<td>Celeron® N3350 (Dual Core)</td>
<td>Onboard DDR3L 2GB</td>
<td>W/o Heatspreader</td>
<td>HDMI x 1</td>
<td>SATA 3.0 x 1 M.2 2280 (B Key) x 1 eMMC 32GB</td>
<td>GBE x 1</td>
<td>USB 3.2 Gen 1 x 2 (Rear)</td>
<td>USB 2.0 x 2 (Internal)</td>
<td>M.2 2230 (E Key) x 1</td>
<td>0°C ~ 60°C</td>
<td></td>
<td>DIO 4 bit Full Audio with Amp</td>
</tr>
<tr>
<td>PICO-APL3-A10-F002</td>
<td>Celeron® N3350 (Dual Core)</td>
<td>Onboard DDR3L 4GB</td>
<td>W/o Heatspreader</td>
<td>HDMI x 1</td>
<td>SATA 3.0 x 1 M.2 2280 (B Key) x 1 eMMC 32GB</td>
<td>GBE x 1</td>
<td>USB 3.2 Gen 1 x 2 (Rear)</td>
<td>USB 2.0 x 2 (Internal)</td>
<td>M.2 2230 (E Key) x 1</td>
<td>0°C ~ 60°C</td>
<td></td>
<td>DIO 4 bit Full Audio with Amp</td>
</tr>
<tr>
<td>PICO-APL3-A10-F003</td>
<td>Pentium® N4200 (Quad Core)</td>
<td>Onboard DDR3L 4GB</td>
<td>W/o Heatspreader</td>
<td>HDMI x 1</td>
<td>SATA 3.0 x 1 M.2 2280 (B Key) x 1 eMMC 32GB</td>
<td>GBE x 1</td>
<td>USB 3.2 Gen 1 x 2 (Rear)</td>
<td>USB 2.0 x 2 (Internal)</td>
<td>M.2 2230 (E Key) x 1</td>
<td>0°C ~ 60°C</td>
<td></td>
<td>DIO 4 bit Full Audio with Amp</td>
</tr>
<tr>
<td>PICO-APL3-A10-FD04</td>
<td>Celeron® N3350 (Dual Core)</td>
<td>On-board DDR3L 2GB</td>
<td>W/o Heatspreader</td>
<td>HDMI x 1</td>
<td>SATAIII x 1 M.2 2280 (B Key) x 1 eMMC 32GB</td>
<td>GBE x 1</td>
<td>USB 3.2 Gen 1 x 2 (Rear)</td>
<td>USB 2.0 x 2 (Internal)</td>
<td>M.2 2230 (E Key) x 1</td>
<td>0°C ~ 60°C</td>
<td></td>
<td>DC Jack</td>
</tr>
</tbody>
</table>
PICO-APL3-SEMI
PICO-SEMI Embedded Barebone Kit with Intel® Celeron/Pentium Processor SoC

Features
- 180g Extreme Light System, Easy To Adapter Everywhere
- Gigabit Ethernet for Networking Connection
- USB 3.2 Gen 1 Connectivity
- HDMI
- M.2 2280 (B) M.2 2230 (E) Slot for WiFi/3G/4G Bluetooth Module
- Fix Holes for Antenna, Wallmount, DIN-Rail Kit Optional
- Lockable 12V DC Input

Specifications

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>PICO-SEMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORM FACTOR</td>
<td>PICO-SEMI</td>
</tr>
<tr>
<td>CPU</td>
<td>Intel® Celeron®/Pentium® Processor: Pentium N4200 (4C/4T,1.10GHz up to 2.50GHz, TDP 6W) Celeron N3350 (2C/2T,1.10GHz up to 2.40GHz, TDP 6W)</td>
</tr>
<tr>
<td>CHIPSET</td>
<td>Integrated with Intel® SoC</td>
</tr>
<tr>
<td>MEMORY TYPE</td>
<td>Onboard DDR3L up to 4GB</td>
</tr>
<tr>
<td>BIOS</td>
<td>UEFI</td>
</tr>
<tr>
<td>WAKE ON LAN</td>
<td>Yes</td>
</tr>
<tr>
<td>WATCHDOG TIMER</td>
<td>255 Levels</td>
</tr>
<tr>
<td>SECURITY</td>
<td>—</td>
</tr>
<tr>
<td>RTC Battery</td>
<td>Lithium Battery 3V/240mAh</td>
</tr>
<tr>
<td>DIMENSION</td>
<td>W/O heat sink: 4.8” x 3.15” x 1.18” (122 x 80 x 30 mm) W/ heat sink: 4.8” x 3.15” x 1.73” (122 x 80 x 44 mm)</td>
</tr>
<tr>
<td>Gross Weight</td>
<td>W/O heat sink: 0.38 lb (0.17 kg) W/ heat sink: 0.91 lb (0.41 kg)</td>
</tr>
<tr>
<td>OS Support</td>
<td>Windows 10 (64 bit)</td>
</tr>
<tr>
<td>POWER REQUIREMENT</td>
<td>+12V</td>
</tr>
<tr>
<td>POWER SUPPLY TYPE</td>
<td>ATX</td>
</tr>
<tr>
<td>POWER CONSUMPTION</td>
<td>Intel® N4200 processor, DDR3L 4GB, eMMC 32GB, 1.1A@+12V(TYPICAL)</td>
</tr>
<tr>
<td>DISPLAY</td>
<td>Intel® HD Graphics 500/505</td>
</tr>
<tr>
<td>LVDS/eDP</td>
<td>—</td>
</tr>
<tr>
<td>Display Interface</td>
<td>HDMI 1.4b x 1 (up to 3840 x 2160@30Hz)</td>
</tr>
<tr>
<td>Multiple Display</td>
<td>1 Simultaneous Display</td>
</tr>
<tr>
<td>AUDIO</td>
<td>—</td>
</tr>
<tr>
<td>CODEC</td>
<td>Realtek ALC269 (Optional)</td>
</tr>
<tr>
<td>AUDIO INTERFACE</td>
<td>Line-out (Optional)</td>
</tr>
<tr>
<td>Speaker</td>
<td>Amplifier Header (Optional)</td>
</tr>
<tr>
<td>EXTERNAL I/O</td>
<td>—</td>
</tr>
<tr>
<td>ETHERNET</td>
<td>Realtek 8111 Gigabit Ethernet 10/100/1000Base, RJ-45 x 1</td>
</tr>
<tr>
<td>USB</td>
<td>USB 3.2 Gen 1 x 2</td>
</tr>
<tr>
<td>SERIAL PORT</td>
<td>COM1, COM2 (RS232) (Optional)</td>
</tr>
<tr>
<td>VIDEO</td>
<td>HDMI 1.4b x 1 (up to 3840 x 2160@30Hz)</td>
</tr>
<tr>
<td>INTERNAL I/O</td>
<td>—</td>
</tr>
<tr>
<td>USB</td>
<td>—</td>
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</table>

Packaging List

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>125530040C</td>
<td>Power Adapter,12V,40W, FSP, FSP040-Dihan3</td>
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<tr>
<td>125530060Z</td>
<td>Power Adapter,12V,5A,60W, FSP060-Dihan3</td>
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<tr>
<td>170203180230</td>
<td>Power Cord, (US Type)</td>
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<tr>
<td>170203180231</td>
<td>Power Cord, (European Type)</td>
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<tr>
<td>170203180234</td>
<td>Power Cord, (Japan Type)</td>
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<td>1701090123</td>
<td>COM Port Cable</td>
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<td>1703100884</td>
<td>Audio Line-out</td>
<td>1</td>
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<tr>
<td>9761SEM0100</td>
<td>Wallmount Kit</td>
<td>1</td>
</tr>
<tr>
<td>9761SEM0101</td>
<td>DIN-Rail Kit</td>
<td>1</td>
</tr>
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</table>

Optional Accessories

Note: All specifications are subject to change without notice.
Note: All specifications are subject to change without notice.

**Ordering Information**

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-APL3-SEMI-A10-FS01</td>
<td>N3350</td>
<td>Onboard DDR3L 2GB</td>
<td>W/ heat sink</td>
<td>HDMI x 1</td>
<td>SATA x 1</td>
<td>eMMC 32GB</td>
<td>GBE x 1</td>
<td>USB3.2 Gen 1 x 2</td>
<td>M.2 2280 B-key x 1</td>
<td>0~50˚C</td>
<td>I2C x 1</td>
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<tr>
<td>PICO-APL3-SEMI-A10-FS02</td>
<td>N3350</td>
<td>Onboard DDR3L 4GB</td>
<td>W/ heat sink</td>
<td>HDMI x 1</td>
<td>SATA x 1</td>
<td>eMMC 32GB</td>
<td>GBE x 1</td>
<td>USB3.2 Gen 1 x 2</td>
<td>M.2 2280 B-key x 1</td>
<td>0~50˚C</td>
<td>I2C x 1</td>
</tr>
<tr>
<td>PICO-APL3-SEMI-A10-FS03</td>
<td>N4250</td>
<td>Onboard DDR3L 4GB</td>
<td>W/ heat sink</td>
<td>HDMI x 1</td>
<td>SATA x 1</td>
<td>eMMC 32GB</td>
<td>GBE x 1</td>
<td>USB3.2 Gen 1 x 2</td>
<td>M.2 2280 B-key x 1</td>
<td>0~50˚C</td>
<td>I2C x 1</td>
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<tr>
<td>PICO-APL3-SEMI-A10-FS04</td>
<td>N3350</td>
<td>Onboard DDR3L 2GB</td>
<td>W/O heat sink</td>
<td>HDMI x 1</td>
<td>SATA x 1</td>
<td>eMMC 32GB</td>
<td>GBE x 1</td>
<td>USB3.2 Gen 1 x 2</td>
<td>M.2 2280 B-key x 1</td>
<td>0~50˚C</td>
<td>I2C x 1</td>
</tr>
<tr>
<td>PICO-APL3-SEMI-A10-FS05</td>
<td>N3350</td>
<td>Onboard DDR3L 4GB</td>
<td>W/O heat sink</td>
<td>HDMI x 1</td>
<td>SATA x 1</td>
<td>eMMC 32GB</td>
<td>GBE x 1</td>
<td>USB3.2 Gen 1 x 2</td>
<td>M.2 2280 B-key x 1</td>
<td>0~50˚C</td>
<td>I2C x 1</td>
</tr>
<tr>
<td>PICO-APL3-SEMI-A10-FS06</td>
<td>N4200</td>
<td>Onboard DDR3L 4GB</td>
<td>W/O heat sink</td>
<td>HDMI x 1</td>
<td>SATA x 1</td>
<td>eMMC 32GB</td>
<td>GBE x 1</td>
<td>USB3.2 Gen 1 x 2</td>
<td>M.2 2280 B-key x 1</td>
<td>0~50˚C</td>
<td>I2C x 1</td>
</tr>
</tbody>
</table>
Features

- Intel® Atom® / Pentium® N4200 / Celeron® N3350 Processor SoC
- Onboard DDR3L 2GB (Optional to 4GB)
- Onboard Storage eMMC 32GB (optional to 16GB/64GB/128GB)
- Dual Gigabit Ethernet Support
- HDMI 1.4b, eDP (Optional) for Display
- BIO Reserved (Optional)
- USB 3.2 Gen 1 x 2, USB 2.0 x 2, SATA 6.0Gb/s x 1
- M.2 B Key (2280) x 1, M.2 E Key (2230) x 1

Specifications

- **CPU**
  - Intel® Atom®/Celeron®/Pentium® Processor:
    - Pentium N4200 (4C/4T, 1.10GHz, up to 2.50GHz, TDP 6W)
    - Celeron N3350 (2C/2T, 1.10GHz, up to 2.40GHz, TDP 6W)
    - Atom E3950 (4C/4T, 1.60GHz, up to 2.00GHz, TDP 12W)
    - Atom E3940 (4C/4T, 1.60GHz, up to 1.80GHz, TDP 9.5W)
    - Atom E3930 (2C/2T, 1.30GHz, up to 1.80GHz, TDP 6.5W)

- **Chipset**
  - Integrated with Intel® SoC

- **Memory Type**
  - Onboard DDR3L 2GB (Optional to 4GB)

- **BIOS**
  - UEFI

- **Watchdog Timer**
  - 255 Levels

- **Security**
  - RTC Battery
  - Lithium Battery 3V/240mAh

- **Dimensions**
  - 3.94" x 2.84" (100mm x 72mm)

- **Weight**
  - 0.18 lbs. (0.08 kg)

- **OS Support**
  - Windows 10 (64 bit)

- **Power Requirement**
  - +12V

- **Power Supply Type**
  - AT/ATX

- **Connector**
  - Phoenix 2-pin Connector (Default)
  - Lockable DC Jack Connector (colay)

- **Power Consumption**
  - Intel®N4200 processor, DDR3L 4GB, 1.43A@12V

- **Display Controller**
  - Intel® HD Graphics 500/505

- **Display Interface**
  - HDMI 1.4b x 1 (up to 3840x2160@30Hz, Optional)

- **Multiple Display**
  - Up to 3 Simultaneous Displays

- **Environmental Certification**
  - Operating Temp: 32°F ~ 140°F (0°C ~ 60°C)
  - Storage Temp: -40°F ~ 185°F (-40°C ~ 85°C)
  - Operating Humidity: 0% ~ 90% relative humidity, non-condensing

- **MTBF (Hours)**
  - 191,895

- **EMC**
  - CE/FCC Class A

Packing List

- **Part Number**
  - Description
  - Qty

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1709970500</td>
<td>(TF) SATA Cable, 50cm</td>
<td>1</td>
</tr>
<tr>
<td>1702150155</td>
<td>(TF) SATA Power Cable, 12cm</td>
<td>1</td>
</tr>
<tr>
<td>PICO-APL4-HSK01</td>
<td>Heat Sink, 100<em>72</em>15.5mm.Silver,used with HSP</td>
<td>1</td>
</tr>
<tr>
<td>PICO-APL4-HSP01</td>
<td>Heat Spreader, 100 * 72 x 8.5 mm, Silver</td>
<td>1</td>
</tr>
<tr>
<td>1700040151</td>
<td>(TF) USB Cable, 15cm</td>
<td>2</td>
</tr>
<tr>
<td>1701090122</td>
<td>(TF) Flat Cable, D-Sub 9P(M), 9P 1.0mm Housing, 12cm</td>
<td>2</td>
</tr>
<tr>
<td>PICO-APL4-FAN01</td>
<td>CPU Cooler, 100<em>72</em>15.5mm, Silver, use w/HSP</td>
<td>1</td>
</tr>
</tbody>
</table>

*FAN Solution will be via one of internal USB port without FAN speed control.
*Please refer to PICO-APL4-SEMI for further option.
*eDP cable custom by required.
### Block Diagram

![Block Diagram](image)

### Dimension

Unit: mm

![Dimension](image)

### Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB 3.2 Gen 1</th>
<th>RS-232/422/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Temp.</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-APL4-A10-F001</td>
<td>Celeron® N3350 (Dual Core)</td>
<td>Onboard DDR3L 2GB</td>
<td>W/o Heatspreader</td>
<td>HDMI x 1</td>
<td>SATA E, SD x 1, M.2 2280 (B Key) x 1, eMMC 32GB</td>
<td>GbE x 2</td>
<td>USB 2.0 x 2 (Internal)</td>
<td>M.2 2230 (E Key) x 1</td>
<td>+12V (Phoenix Terminal)</td>
<td>0°C – 60°C</td>
<td>DIO 4 bit</td>
<td></td>
</tr>
<tr>
<td>PICO-APL4-A10-F002</td>
<td>Celeron® N3350 (Dual Core)</td>
<td>Onboard DDR3L 4GB</td>
<td>W/o Heatspreader</td>
<td>HDMI x 1</td>
<td>SATA E, SD x 1, M.2 2280 (B Key) x 1, eMMC 32GB</td>
<td>GbE x 2</td>
<td>USB 2.0 x 2 (Internal)</td>
<td>M.2 2230 (E Key) x 1</td>
<td>+12V (Phoenix Terminal)</td>
<td>0°C – 60°C</td>
<td>DIO 4 bit</td>
<td></td>
</tr>
<tr>
<td>PICO-APL4-A10-F003</td>
<td>Pentium® N4200 (Quad Core)</td>
<td>Onboard DDR3L 4GB</td>
<td>W/o Heatspreader</td>
<td>HDMI x 1</td>
<td>SATA E, SD x 1, M.2 2280 (B Key) x 1, eMMC 32GB</td>
<td>GbE x 2</td>
<td>USB 2.0 x 2 (Internal)</td>
<td>M.2 2230 (E Key) x 1</td>
<td>+12V (Phoenix Terminal)</td>
<td>0°C – 60°C</td>
<td>DIO 4 bit</td>
<td></td>
</tr>
<tr>
<td>PICO-APL4-A10-F004</td>
<td>Celeron® N3350 (Dual Core)</td>
<td>Onboard DDR3L 2GB</td>
<td>W/o Heatspreader</td>
<td>HDMI x 1</td>
<td>SATA E, SD x 1, M.2 2280 (B Key) x 1, eMMC 32GB</td>
<td>GbE x 2</td>
<td>USB 2.0 x 2 (Internal)</td>
<td>M.2 2230 (E Key) x 1</td>
<td>+12V (DC Jack)</td>
<td>0°C – 60°C</td>
<td>DIO 4 bit</td>
<td></td>
</tr>
</tbody>
</table>

Remark: cooler is recommended as the thermal solution.
PICO-APL4-SEMI
PICO-SEMI TurnKit with Intel® Pentium® N4200/Celeron® N3350 Processor SoC

Specifications

SYSTEM
FORM FACTOR
CPU
Chipset
MEMORY TYPE
BIOS
WAKE ON LAN
WATCHDOG TIMER
SECURITY
RTC Battery
DIMENSION
GROSS WEIGHT
OS Support
POWER
POWER REQUIREMENT
POWER SUPPLY TYPE
CONNECTOR
POWER CONSUMPTION
DISPLAY
CONTROLLER
LVDS/eDP
Display Interface
Multiple Display
AUDIO
CODEC
AUDIO INTERFACE
Speaker
EXTERNAL I/O
ETHERNET
USB
SERIAL PORT
VIDEO
INTERNAL I/O
USB
SERIAL PORT
VIDEO

Features
- Extreme light system, easy to adopt everywhere
- Onboard DDR3L 2GB/4G
- Onboard Storage eMMC 32GB
- GbE x 2, HDMI x 1.4
- M.2 2280 B key for storage
- M.2 2230 E key for wireless Module
- COM x 2 (Optional)
- USB 3.2 Gen 1 x 2 (Rear IO), USB2.0 x 1 (Optional)
- Lockable DC 12V

Packing List

- PICO-APL4-SEMI
- Optional Accessories

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>125530040C</td>
<td>Power Adapter, 12V/40W FSP/FSP040-DHAN3</td>
<td>1</td>
</tr>
<tr>
<td>125530060Z</td>
<td>Power Adapter, 12V/5A 60W FSP060-DHAN3</td>
<td>1</td>
</tr>
<tr>
<td>1702031802</td>
<td>Power Cord (US Type)</td>
<td>1</td>
</tr>
<tr>
<td>1702031803</td>
<td>Power Cord (European Type)</td>
<td>1</td>
</tr>
<tr>
<td>170203180E</td>
<td>Power Cord (Japan Type)</td>
<td>1</td>
</tr>
<tr>
<td>1701090122</td>
<td>COM Port Cable</td>
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<tr>
<td>9761SEMI01</td>
<td>Din Rail Kit</td>
<td>1</td>
</tr>
<tr>
<td>9761SEMI00</td>
<td>Wall mount Kit</td>
<td>1</td>
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</tbody>
</table>

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-APL4-SEMI-A10-FS01</td>
<td>N3350</td>
<td>Onboard DDR3L 2GB, W/Cooler</td>
<td>HDMI x 1</td>
<td>SATAIII x 1, eMMC 32GB</td>
<td>GbE x 2, USB3.2 Gen1 x 2</td>
<td>M.2 2280 B-key x 1, M.2 2230 E-key x 1</td>
<td>+12V (ATX)</td>
<td>0~50°C</td>
<td>DC x 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PICO-APL4-SEMI-A10-FS03</td>
<td>N4200</td>
<td>Onboard DDR3L 4GB, W/Cooler</td>
<td>HDMI x 1</td>
<td>SATAIII x 1, eMMC 32GB</td>
<td>GbE x 2, USB3.2 Gen1 x 2</td>
<td>M.2 2280 B-key x 1, M.2 2230 E-key x 1</td>
<td>+12V (ATX)</td>
<td>0~50°C</td>
<td>DC x 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
PICO-BT01
Pico-ITX Board with Intel® Atom®/Celeron® Processor SoC

Features
- Onboard Intel® Atom® E3800/ Celeron® J1900/N2807 Processor SoC
- DDR3L 1066/1333 MHz SODIMM x 1, Up to 8 GB
- 18/24-bit LVDS LCD, CRT Co-lay Display Port
- SATA 3.0Gb/s x 1, Mini-Card (Full size)/mSATA (default) x 1
- USB 3.2 Gen 1 x 1, USB 2.0 x 2
- Gigabit Ethernet x 1, RJ-45 x 1
- RS-232 x 1, RS-232/422/485 x 1
- Mini-card x 1 (Half size)
- 4-Bit Digital I/O
- BIO Connector for Daughter Board Optional

Specifications

SYSTEM
FORM FACTOR PICO-ITX
CPU
Intel® Atom®/Celeron® Processor:
- Celeron® J1900 (4C/4T, 2.00GHz, up to 2.42GHz, TDP 10W)
- Celeron® N2807 (2C/2T, 1.58GHz, up to 2.16GHz, TDP 4.3W)
- Atom™ E3845 (4C/4T, 1.91 GHz, TDP 10W)
- Atom™ E3825 (2C/2T, 1.33 GHz, TDP 6W)
CHIPSET Integrated with Intel® SoC
MEMORY TYPE DDR3L up to 2133MHz, SODIMM x 1, up to 8GB, Non-ECC
BIOS UEFI
WAKE ON LAN Yes
WATCHDOG TIMER 255 Levels
SECURITY
RTC Battery Lithium Battery 3V/240mAh
DIMENSION
3.94” x 2.84” (100mm x 72mm)
Gross Weight 0.18 lbs (0.08 kg)
OS Support
- Windows 10 (64 bit)
- Windows 7 (64 bit)
- Ubuntu 21.04.3/Kernel 5.11
POWER
POWER REQUIREMENT +12V
POWER SUPPLY TYPE AT/ATX
CONNECTOR Phoenix 2-pin Connector (Default)
- Lockable DC Jack Connector (color)
POWER CONSUMPTION
- Intel® J1900, DDR3L 1333MHz 8GB 1.14A@+12V (TYPICAL)
DISPLAY
CONTROLER Intel® HD Graphics for Intel Atom® Processor 23700 Series
LVDS/EDP LVDS (18/24-bit) up to 1400 x 900 @60Hz
Display Interface VGA up to 2048 x 1152 @60Hz or DP up to 2560 x 1400 @60Hz
Multiple Display Up to 2 Simultaneous Displays
AUDIO
CODEC Realtek ALC297/892
AUDIO INTERFACE Line-out
- Speaker —
EXTERNAL I/O
ETHERNET Intel® i210, 10/100/1000Base, RJ-45 x 1
USB USB 3.2 Gen 1 x 1
- USB 2.0 x 1
SERIAL PORT —
VIDEO VGA up to 2048 x 1152 @60Hz or DP up to 2560 x 1400 @60Hz

Packing List
- PICO-BT01-HSP01 Heat Spreader
- 1703200153 COM x 2, Line-out Cable
- PICO-BT01

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1709070500</td>
<td>SATA Cable</td>
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<tr>
<td>1702150155</td>
<td>SATA Power Cable</td>
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</tr>
<tr>
<td>1702040167</td>
<td>Power/FAN Cable 16cm</td>
<td>1</td>
</tr>
<tr>
<td>1700050207</td>
<td>USB Cable 20cm</td>
<td>1</td>
</tr>
<tr>
<td>PICO-BT01-FAN01</td>
<td>CPU Cooler.84 x 53 x 22.2mm.Silver used with HSP</td>
<td>1</td>
</tr>
<tr>
<td>PICO-BT011-W1-HSK01</td>
<td>Heatsink for E3845.WiTAS. To be used with heat spreader</td>
<td>1</td>
</tr>
<tr>
<td>PICO-BT01-HSK01</td>
<td>Heatsink. 84 x 53 x 12mm. To be used with heat spreader</td>
<td>1</td>
</tr>
<tr>
<td>PICO-BT01-HSK02</td>
<td>Heatsink. 100 x 72 x 15.5mm. To be used with heat spreader</td>
<td>1</td>
</tr>
</tbody>
</table>
Block Diagram

Dimension

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>Memory</th>
<th>FAN/FANLESS</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-422/485</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-BT01-A12-00A2</td>
<td>N2807</td>
<td>DDR3L, Max. 4GB</td>
<td>Heat-spread</td>
<td>LVDS x 1</td>
<td>SATA x 1 mSATA (Full size) x 1</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 1 x 1 USB 3.0 x 2</td>
<td>1</td>
<td>1</td>
<td>miniCard x 1 (half size)</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>Line-out, DIO</td>
</tr>
<tr>
<td>PICO-BT01-A12-00A3</td>
<td>E3845</td>
<td>DDR3L, Max. 8GB</td>
<td>Heat-spread</td>
<td>LVDS x 1</td>
<td>SATA x 1 mSATA (Full size) x 1</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 1 x 1 USB 2.0 x 2</td>
<td>1</td>
<td>1</td>
<td>miniCard x 1 (half size)</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>BIO, Line-out, DIO</td>
</tr>
<tr>
<td>PICO-BT01-A12-00A4</td>
<td>E3825</td>
<td>DDR3L, Max. 8GB</td>
<td>Heat-spread</td>
<td>LVDS x 1</td>
<td>SATA x 1 mSATA (Full size) x 1</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 1 x 1 USB 2.0 x 2</td>
<td>1</td>
<td>1</td>
<td>miniCard x 1 (half size)</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>Line-out, DIO</td>
</tr>
<tr>
<td>PICO-BT01-A12-00A5</td>
<td>J1900</td>
<td>DDR3L, Max. 8GB</td>
<td>Heat-spread</td>
<td>LVDS x 1</td>
<td>SATA x 1 mSATA (Full size) x 1</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 1 x 1 USB 2.0 x 2</td>
<td>1</td>
<td>1</td>
<td>miniCard x 1 (half size)</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>Line-out, DIO</td>
</tr>
<tr>
<td>PICO-BT01W2-A12-0003</td>
<td>E3845</td>
<td>DDR3L, Max. 8GB</td>
<td>Heat-spread</td>
<td>LVDS x 1</td>
<td>SATA x 1 mSATA (Full size) x 1</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 1 x 1 USB 2.0 x 2</td>
<td>1</td>
<td>1</td>
<td>miniCard x 1 (half size)</td>
<td>12V</td>
<td>-40°C – 85°C</td>
<td>BIO, Line-out, DIO</td>
</tr>
<tr>
<td>PICO-BT01W2-A12-0004</td>
<td>E3825</td>
<td>DDR3L, Max. 8GB</td>
<td>Heat-spread</td>
<td>LVDS x 1</td>
<td>SATA x 1 mSATA (Full size) x 1</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 1 x 1 USB 2.0 x 2</td>
<td>1</td>
<td>1</td>
<td>miniCard x 1 (half size)</td>
<td>12V</td>
<td>-40°C – 85°C</td>
<td>Line-out, DIO</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
## PICO-EHL1

Pico-ITX Board with Intel Atom® x6000E Series, and Intel® Pentium® and Celeron® N and J Series Processors

### Features
- DDR4 3200MHz SODIMM x 1, up to 32GB
- eDP 1.3/LVDS x 1 (2CH 18/24-bit)
- HDMI 1.4b x 1
- Realtek RTL8111H-CC x 1
- Line-in/Line-out/MIC (Optional)
- TPM 2.0 (Optional)
- Full Size mPCIe/mSATA x 1
- M.2 2242 B-Key x 1
- USB 3.2 Gen 2 x 2, USB 2.0 x 2
- RS-232/422/485 x 2
- BIO (PCIe [x2], line out, DDI, GPIO, LPC, SMBUS, USB 3.0/2.0)

### Specifications

#### System
- **Form Factor**: PICO-ITX
- **CPU**:
  - Intel® Atom® x6000E series, Pentium®, and Celeron® N and J series Processors:
    - Intel® Atom® x6000E Series/Pentium® and Celeron® N and J Series Processors:
      - Intel® Celeron® Processor J6412 (4C/4T, 2.0 GHz, 10W)
      - Intel® Celeron® Processor N6210 (2C/2T, 1.2 GHz, 6.5W)
    - Intel Atom® x6425E (4C/4T, 2.0 GHz, 12W)
    - Intel Atom® x6211E (2C/2T, 1.3 GHz, 6W)
- **Chipset**: Integrated with Intel® SoC
- **Memory Type**: DDR4 3200MHz SODIMM x 1, up to 32GB
- ** BIOS**: UEFI
- **Watchdog Timer**: 255 Levels
- **Security**: TPM 2.0 (Optional)
- **RTC Battery**: Lithium Battery 3V/240mAh
- **Dimension**: 3.94” x 2.84” (100mm x 72mm)
- **Gross Weight**: 0.18 lbs (0.08 kg)
- **OS Support**: Windows® 10 (64-bit)
- **Power Requirement**: +12V
- **Power Supply Type**: AT/ATX
- **Connector**: Phoenix 2-pin Connector (Default)
- **Power Consumption**: 4.2A @ +12V (Typical)
- **Display Interface**: HDMI 1.4 x 1, 3480 x 2160 @60Hz
- **Multiple Display**: Up to 2 Simultaneous Displays
- **Audio CODEC**: Realtek ALC269 (Optional)
- **Audio Interface**: Line-in/Line-out/MIC (Optional)
- **Speaker**: —
- **Environment & Certification**: Temperature: 32°F – 140°F (0°C ~ 60°C)
  - Storage: 32°F – 185°F (-40°C ~ 85°C)
  - Humidity: 0% ~ 90% relative humidity, non-condensing
  - MTBF: 489,989 hours
  - EMC: CE/FCC Class A

### Packing List

- **PIC0-EHL1**
- **Optional Accessories**

### Note: All specifications are subject to change without notice.
**Block Diagram**

**Intel® Atom™ x6000E series, Pentium® and Celeron® (N / J series) processors**

**Ordering Information**

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICO-EHL1-A10-0001</td>
<td>Intel® Celeron® Processor N6210</td>
<td>HDMI x 1, LVDS x 1</td>
<td>SATA III x 1</td>
<td>GbE x 1</td>
<td>USB 2.0 x 2, USB 3.2 Gen 2 x 2</td>
<td>2 M.2 2242 B-Key x 1, Full Size Mini Card x 1</td>
<td>+12V (Terminal block)</td>
<td>0~60°C</td>
<td>DIO</td>
</tr>
<tr>
<td>PICO-EHL1-A10-0002</td>
<td>Intel® Celeron® Processor J6412</td>
<td>HDMI x 1, LVDS x 1</td>
<td>SATA III x 1</td>
<td>GbE x 1</td>
<td>USB 2.0 x 2, USB 3.2 Gen 2 x 2</td>
<td>2 M.2 2242 B-Key x 1, Full Size Mini Card x 1</td>
<td>+12V (Terminal block)</td>
<td>0~60°C</td>
<td>DIO</td>
</tr>
<tr>
<td>PICO-EHL1-A10-0003</td>
<td>Intel Atom® x6211E</td>
<td>HDMI x 1, LVDS x 1</td>
<td>SATA III x 1</td>
<td>GbE x 1</td>
<td>USB 2.0 x 2, USB 3.2 Gen 2 x 2</td>
<td>2 M.2 2242 B-Key x 1, Full Size Mini Card x 1</td>
<td>+12V (Terminal block)</td>
<td>0~60°C</td>
<td>DIO</td>
</tr>
<tr>
<td>PICO-EHL1-A10-0004</td>
<td>Intel Atom® x6425E</td>
<td>HDMI x 1, LVDS x 1</td>
<td>SATA III x 1</td>
<td>GbE x 1</td>
<td>USB 2.0 x 2, USB 3.2 Gen 2 x 2</td>
<td>2 M.2 2242 B-Key x 1, Full Size Mini Card x 1</td>
<td>+12V (Terminal block)</td>
<td>0~60°C</td>
<td>DIO</td>
</tr>
</tbody>
</table>
**BIO-ST01-L1U2**

2.5” BIO Daughter Board with Gigabit LAN and USB

---

### Features
- Gigabit Ethernet x 1, RJ-45 x 1
- USB 2.0 x 2
- Speaker Out with 2W Amp
- SMBus x 1
- LPC (Optional)

---

### Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>2.5” Board</td>
</tr>
<tr>
<td>BIO</td>
<td>80-Pin high speed board to board connector</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>Power Supplied from MB via board to board connector</td>
</tr>
<tr>
<td>Dimension</td>
<td>3.94” x 2.84” (100mm x 72mm)</td>
</tr>
<tr>
<td>Gross Weight</td>
<td>0.44 lb (0.2 kg)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40 °F ~ 176°F (-40°C ~ 80°C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>—</td>
</tr>
<tr>
<td>OS support</td>
<td>Windows 10 (64 bit)</td>
</tr>
<tr>
<td>I/O</td>
<td>Ethernet Realtek 8111E, 10/100/1000Base-TX, RJ-45 x 1</td>
</tr>
<tr>
<td>Audio</td>
<td>USB 2.0 x 2 on rear I/O</td>
</tr>
<tr>
<td>Expansion Interface</td>
<td>SMBus x 1</td>
</tr>
<tr>
<td>PCIe</td>
<td>—</td>
</tr>
<tr>
<td>Serial Port</td>
<td>—</td>
</tr>
<tr>
<td>SIM</td>
<td>—</td>
</tr>
<tr>
<td>BIO</td>
<td>—</td>
</tr>
</tbody>
</table>

### Packing List

- Accessory Kit
- BIO-ST01-L1U2

### Ordering Information

<table>
<thead>
<tr>
<th>P/N</th>
<th>LAN</th>
<th>USB</th>
<th>Expansion Slot</th>
<th>Temp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO-ST01-L1U2-A11-0001</td>
<td>GbE x 1</td>
<td>USB 2.0 x 1</td>
<td>Speaker Out with 2W Amp, SMBus*1</td>
<td>0°C ~ 60°C</td>
</tr>
</tbody>
</table>

---

### Dimension

![Dimension Diagram]

---

*Note: All specifications are subject to change without notice.*
**Features**
- Mini-Card (Full Size) x 1, SIM slot x 1
- USB 2.0 x 1
- Speaker Out with 2W Amp
- SMBus x 1, GPIO x 1
- LPC (Optional)

**Specifications**

<table>
<thead>
<tr>
<th>System</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>2.5&quot; Board</td>
</tr>
<tr>
<td>BIO</td>
<td>80-Pin high speed board to board connector</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>Power Supplied from MB via board to board connector</td>
</tr>
<tr>
<td>Dimension</td>
<td>3.94&quot; x 2.84&quot; (100mm x 72mm)</td>
</tr>
<tr>
<td>Gross Weight</td>
<td>0.44 lb (0.2 kg)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F ~ 176°F (-40°C ~ 80°C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% ~ 95% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>—</td>
</tr>
<tr>
<td>OS support</td>
<td>Windows 10 (64 bit)</td>
</tr>
</tbody>
</table>

**I/O**

| Ethernet | — |
| USB | USB 2.0 x 1 on rear I/O |
| Audio | Speaker Out with 2W Amp |
| Expansion Interface | SMBus x 1 |
| PCIe | Mini-Card x 1 |
| Serial Port | — |
| SIM | SIM Slot x 1 |
| BIO | — |

**Ordering Information**

<table>
<thead>
<tr>
<th>P/N</th>
<th>USB</th>
<th>Expansion Slot</th>
<th>Power Temp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO-ST01-M1U1-A11-0001</td>
<td>USB 2.0 x 1</td>
<td>Mini-Card x 1, SIM x 1, Speaker Out with 2W Amp, x 1, SMBus</td>
<td>0°C ~ 60°C</td>
</tr>
</tbody>
</table>

**Packing List**

- Accessory kit
- BIO-ST01-M1U1

**Notes:**
- All specifications are subject to change without notice.

www.aaeon.com
**BIO-ST02-C4M1**

2.5” BIO Daughter Board with COM x 4, Mini-Card, SIM and USB

---

### Features
- RS-232 x 4
- Mini-Card (Full Size) x 1
- SIM slot x 1
- USB 2.0 x 1

---

### Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Form Factor</th>
<th>2.5” Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO</td>
<td>80-Pin high speed Board to board connector</td>
<td></td>
</tr>
<tr>
<td>Power Requirement</td>
<td>Power Supplied from MB via board to board connector</td>
<td></td>
</tr>
<tr>
<td>Dimension</td>
<td>3.94” x 2.84” (100mm x 72mm)</td>
<td></td>
</tr>
<tr>
<td>Gross Weight</td>
<td>0.44 lb (0.2 Kg)</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F ~ 176°F (-40°C ~ 80°C)</td>
<td></td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
<td></td>
</tr>
<tr>
<td>Certification</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>OS support</td>
<td>Windows 10 (64 bit)</td>
<td></td>
</tr>
</tbody>
</table>

### Packing List

- Accessory Kit
- COM Port Cables
- BIO-ST02-C4M1

### Ordering Information

<table>
<thead>
<tr>
<th>P/N</th>
<th>USB</th>
<th>RS-232</th>
<th>Expansion Slot</th>
<th>Temp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO-ST02-C4M1-A10-01*</td>
<td>4</td>
<td>Mini-Card x 1, SIM x 1</td>
<td>0°C ~ 60°C</td>
<td></td>
</tr>
</tbody>
</table>

* Customized BIOS is required.
* For mini-card module expansion (via USB2.0 signal), suggest to use PICO-BT01 only.

### Dimension

![Diagram of BIO-ST02-C4M1](image)

---

Note: All specifications are subject to change without notice.
Note: All specifications are subject to change without notice.

BIO-ST03-P2U1
3.5" BIO Daughter Board with PoE, USB 3.2 Gen 1

Features
- Intel® i210, 10/100/1000Base-TX x 2 (Supports PoE 802.3af)
- USB 3.2 Gen 1 x 1
- 9–36V DC-in (+12V Only, Optional)
- Supports GENE-SKU6 and Pico-ITX Series BIO Daughter Board

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>3.5&quot; Board</td>
</tr>
<tr>
<td>BIO</td>
<td>—</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>12V or +9 – 36V input (external power supply)</td>
</tr>
<tr>
<td>Dimension</td>
<td>5.25&quot; x 4&quot; (146mm x 101.6mm)</td>
</tr>
<tr>
<td>Gross Weight</td>
<td>0.44 lb (0.2 kg)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F – 140°F (0°C – 60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F – 176°F (-40°C – 80°C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% – 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>CE/FCC</td>
</tr>
<tr>
<td>OS support</td>
<td>Windows 10 (64 bit)</td>
</tr>
</tbody>
</table>

I/O

| Ethernet        | Intel® i210/i211, 10/100/1000Base-TX x 2 (support PoE 802.3af) |
| USB             | USB 3.2 Gen 1 x 1 |
| Audio           | —        |
| Expansion Interface | —      |
| PCIe            | —        |
| Serial Port     | —        |
| SIM             | —        |
| DIO             | —        |

Packing List

- Accessory Kit
- BIO-ST03-P2U1

Ordering Information

<table>
<thead>
<tr>
<th>P/N</th>
<th>LAN</th>
<th>USB</th>
<th>Power</th>
<th>Temp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO-ST03-P2U1</td>
<td>PoE x 2</td>
<td>USB 3.2 Gen 1 x 1</td>
<td>9–36V</td>
<td>0°C – 60°C</td>
</tr>
</tbody>
</table>

* Customized BIOS is required.

Dimension

Unit: mm
BIO-ST02-C14-D32

2.5” BIO Daughter Board with 14 COM, 32bit DIO, LAN and USB 3.2 Gen 1

Features

- COM x 14, RS-232 only
- 32-bit DIO
- Intel® i211 Giga LAN x 1
- PCI-E [x1] Slot x 1 (Optional)
- USB 3.2 Gen 1 & USB 2.0 x 3
- Speaker w/2W Amp.
- LPT x 1

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>2.5” Board</td>
</tr>
<tr>
<td>BIO</td>
<td>80-Pin high speed board to board connector</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>Power Supplied from MB via board to board connector</td>
</tr>
<tr>
<td>Dimension</td>
<td>3.94” x 2.84” (100mm x 72mm)</td>
</tr>
<tr>
<td>Gross Weight</td>
<td>0.44 lb (0.2 kg)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
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</tr>
<tr>
<td>Operating Humidity</td>
<td>0% ~ 95% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>CE, FCC</td>
</tr>
<tr>
<td>OS support</td>
<td>Windows 10 (64 bit)</td>
</tr>
</tbody>
</table>

I/O

- Ethernet: Intel® i211, 10/100/1000Base-Tx x 1
- USB: USB 3.2 Gen 1 x 1 & USB 2.0 x 3 or USB 2.0 x5(for PICO-BT01)
- Audio: Speaker output with 2W Amp.
- Expansion Interface: PCIe [x1] (optional), LPT x 1
- Serial Port: COM x14, RS-232 by Pin Header
- SIM: —
- DIO: 32 bits

Packing List

• 9697BIO0000
  Accessory Kit (w/ Copper Stud and Screws)
• BIO-ST02-C14D32

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>COM</th>
<th>DIO</th>
<th>LAN</th>
<th>PCIe</th>
<th>USB</th>
<th>LPT</th>
<th>Temp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO-ST02-C14D32-A10-0001</td>
<td>RS-232 x14</td>
<td>x32 bit</td>
<td>GbE x 1</td>
<td>PCIe[x1]</td>
<td>USB 3.2 Gen 1 x 1</td>
<td>USB 2.0 x 3</td>
<td>x1</td>
</tr>
</tbody>
</table>

* Customized BIOS is required.

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1701090150</td>
<td>COM Cable 15cm</td>
<td>14</td>
</tr>
<tr>
<td>1700850207</td>
<td>USB cable 20cm</td>
<td>3 or 5</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Launched in Q1

Specifications

**SYSTEM**

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORM FACTOR</td>
<td>PICO-SEMI</td>
</tr>
<tr>
<td>CPU</td>
<td>Intel® Atom® x6000E series, Intel® Pentium®, and Celeron® N and J series processors: Intel® Atom® x6425RE (4C, 1.9GHz, TDP-up 12W) Intel® Atom® x6425E (4C, 2.0GHz, up to 3GHz, TDP-up 12W) Intel® Atom® x6211E (2C, 1.2GHz, up to 3GHz, TDP-up 6W) Intel® Pentium® J6426 (4C, 2.0GHz, up to 3GHz, TDP-up 10W) Intel® Celeron® J6412 (4C, 2.0GHz, up to 3GHz, TDP-up 10W) Intel® Celeron® N6210 (2C, 1.2GHz, up to 3GHz, TDP-up 6.5W) (Intel® Atom® x6414RE/x6413E/x6427FE/x6200FE/N6415 by customer’s request)</td>
</tr>
</tbody>
</table>

**CHIPSET**

Intel® Elkhart Lake SoC Processor

**MEMORY TYPE**

LPDDR4x up to 3200MHz, up to 16GB

**BIOS**

UEFI

**WAKE ON LAN**

Yes

**WATCHDOG TIMER**

255 Levels

**SECURITY**

—

**RTC Battery**

Lithium Battery 3V/240mAh

**DIMENSION**

TBD

**Gross Weight**

TBD

**OS Support**

Windows 10 (64 bit)

Ubuntu 20.04.3 (32/64)/Kernel 5.13

**POWER**

**POWER REQUIREMENT**

12V only

**POWER SUPPLY TYPE**

ATX

**CONNECTOR**

DC Jack Connector

**POWER CONSUMPTION**

- Intel® Atom™ x6425E, LPDDR4x onboard 16GB, 2.48A@ +12V (TYPICAL)
- Intel® Atom™ x6425E, LPDDR4x onboard 16GB, 2.62A@ +12V (MAX)

**DISPLAY**

**CONTROLLER**

Intel® UHD Graphics for 10th Gen Intel® Processors

**LVDS/EdP**

—

**Display Interface**

HDMI 2.0b x 2 (4K x 2K 60Hz)

**Multiple Display**

Up to 2 Simultaneous Displays

**AUDIO**

**CODEC**

—

**AUDIO INTERFACE**

—

**Speaker**

—

**EXTERNAL I/O**

**ETHERNET**

Realtek 8111 Gigabit Ethernet 10/100/1000Base, RJ-45 x 2

**USB**

USB 3.2 Gen 2 x 2

**ENVIRONMENT & CERTIFICATION**

**OPERATING TEMP**

32°F ~ 122°F (0°C ~ 50°C)

**STORAGE TEMP**

-40°F ~ 185°F (-40°C ~ 85°C)

**OPERATING HUMIDITY**

0% ~ 90% relative humidity, non-condensing

**MTBF (HOURS)**

489,989

**EMC**

CE/FCC Class A

**Features**

- Intel® Atom® x6000E series, Intel® Pentium®, and Celeron® N and J series processors (formerly Elkhart Lake)
- LPDDR4x on board memory, In-Band ECC
- HDMI 2.0b x 2
- GbE x 2
- USB 3.2 GEN2 x 2
- mini-PCIe x 1/M.2 E-Key 2230 x 1
- eMMC up to 128GB x 1 (Optional)
- COM x 2 Full/CANBUS x 2 (Optional)

**Optional Accessories**

- TBD

**Ordering Information**

- TBD

**Launching in Q1**
COM Express Type 6 with 11th Gen Intel® Core™/Xeon® W Processors

Features

- DDR4 3200MHz SODIMM x 2, up to 64GB
- VGA x 1, LVDS x 1, DDI x 3
- USB 2.0 x 8, USB 3.2 Gen 2 x 4
- PCIe [x1] x 8, PCIe [x16] x 1
- Intel® I225-LM 2.5GbE x 1
- COM Express Type 6, 4.92” x 3.75” (125mm x 95mm)

Specifications

System

Form Factor
COM Express Basic Size, Type 6

CPU

- 11th Generation Intel® Core™ Processors:
  - Intel® Core™ i7-11850HE (8C/16T, 2.1 GHz, 35W)
  - Intel® Core™ i5-11500HE (6C/12T, 2.1 GHz, 35W)
  - Intel® Core™ i3-11100HE (4C/8T, 1.9 GHz, 35W)

- Intel® Xeon® W Processors:
  - Intel® Xeon® W-11865MRE (8C/16T, 2.1 GHz, 35W)
  - Intel® Xeon® W-11865MLE (8C/16T, 1.5 GHz, 25W)

Chipset
Intel® QM580E
Intel® RM590E

Memory
DDR4 3200MHz SODIMM x 2, up to 64GB (ECC by SKU)

Onboard Storage
—

BIOS
AMI UEFI

Watchdog Timer
255 Levels

Dimension
4.92” x 3.75” (125mm x 95mm)

Power

Power Requirement
+12V and +5VSB for ATX, +12V for AT

Power Type
AT/ATX

Power Consumption
(exemplary)
Intel® Xeon® W-11865MRE, 5.26A @+12V

Display

Graphics Controller
Intel® UHD Graphics

Video Output
5 Simultaneous Displays:
  - DDI x 1, up to 3840 x 2160
  - LVDS/eDP x 1, up to 1920 x 1080
  - VGA x 1, up to 1920 x 1080

I/O

Ethernet
Intel® I225-LM 2.5GbE x 2

Audio
High Definition Audio Interface

USB Port
USB 2.0 x 8, USB 3.2 Gen 2 x 4

Serial Port
2-Wire UART x 2 (Tx/Rx)

HDD Interface
SATA III x 4

Expansion
PEG 4.0 [x16] x 1
PCIe 3.0 [x1] x 8
LPC x 1

GPIO
8-bit

SMBus/IO/2C
I2C x 1, SMBus x 1

Environment

Operating Temperature
32°F ~ 140°F (0°C ~ 60°C)

Storage Temperature
-40°F ~ 185°F (-40°C ~ 85°C)

Operating Humidity
0% ~ 90% relative humidity, non-condensing

EMC
CE/FCC Class A

OS Support
Windows® 10 (64-bit)
Linux Ubuntu 20.04.4/Kernel 5.13

Weight
0.33 lb. (0.15Kg)

Packing List

- COM-TGHB6-A10

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECB-920A-A11-0001</td>
<td>COMe Type 6/10, Carrier Board, ATX 2.5GbE, 8USB, 2COM, 4SATA, PCIe AT/ATX, Rev.A1.1</td>
<td>1</td>
</tr>
<tr>
<td>COM-TGHB6-HSP01</td>
<td>Heat Spreader, 125mm x 95mm x 11mm, Black</td>
<td>1</td>
</tr>
<tr>
<td>COM-TGHB6-FAN01</td>
<td>Cooler, 125mm x 95mm x 30mm, 4pin</td>
<td>1</td>
</tr>
<tr>
<td>COM-FAN01</td>
<td>Cooler, 125mm x 95mm x 26.4mm, 3pin, w/HSP</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
COM Express CPU Modules

**Block Diagram**

Unit: mm

**Dimension**

Unit: mm

With Active Cooler

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>COM Express Type</th>
<th>CPU</th>
<th>Memory</th>
<th>ECC support</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>UART</th>
<th>Expansion</th>
<th>Power</th>
<th>Temperature</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM-TGHB6-A10-0001</td>
<td>Type 6</td>
<td>Intel® Core™ i7-11850H</td>
<td>DDR4 SODIMM x 2</td>
<td>—</td>
<td>VGA x 1, LVDS x 1, DDI x 3</td>
<td>SATA III x 4</td>
<td>Intel® I225-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe x8 (x16)</td>
<td>PCIe x 16</td>
<td>12V</td>
</tr>
<tr>
<td>COM-TGHB6-A10-0002</td>
<td>Type 6</td>
<td>Intel® Core™ i5-11500H</td>
<td>DDR4 SODIMM x 2</td>
<td>—</td>
<td>VGA x 1, LVDS x 1, DDI x 3</td>
<td>SATA III x 4</td>
<td>Intel® I225-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe x8 (x16)</td>
<td>PCIe x 16</td>
<td>12V</td>
</tr>
<tr>
<td>COM-TGHB6-A10-0003</td>
<td>Type 6</td>
<td>Intel® Core™ i3-11100H</td>
<td>DDR4 SODIMM x 2</td>
<td>—</td>
<td>VGA x 1, LVDS x 1, DDI x 3</td>
<td>SATA III x 4</td>
<td>Intel® I225-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe x8 (x16)</td>
<td>PCIe x 16</td>
<td>12V</td>
</tr>
<tr>
<td>COM-TGHB6-A10-0004</td>
<td>Type 6</td>
<td>Intel® Xeon® W-11865MRE</td>
<td>DDR4 SODIMM x 2</td>
<td>Yes</td>
<td>VGA x 1, LVDS x 1, DDI x 3</td>
<td>SATA III x 4</td>
<td>Intel® I225-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe x8 (x16)</td>
<td>PCIe x 16</td>
<td>12V</td>
</tr>
<tr>
<td>COM-TGHB6-A10-0005</td>
<td>Type 6</td>
<td>Intel® Xeon® W-11865MLE</td>
<td>DDR4 SODIMM x 2</td>
<td>Yes</td>
<td>VGA x 1, LVDS x 1, DDI x 3</td>
<td>SATA III x 4</td>
<td>Intel® I225-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe x8 (x16)</td>
<td>PCIe x 16</td>
<td>12V</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.

www.aaeon.com
COM-CFHB6

COM Express Type 6 Basic Size with 8th/9th Gen Intel® Core™/Xeon® E Processors

Features
- DDR4 2666MHz SODIMM x 3, up to 96GB (ECC by SKU)
- VGA 1, LVDS 1, DDI 2
- USB 2.0 x 8, USB 3.2 Gen 2 x 4
- PCIe [x1] 8, PCIe [x16] x 1
- Intel® I219-LM GbE x 1
- COM Express Type 6, 4.92” x 3.75” (125mm x 95mm)

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>COM Express Basic Size, Type 6</td>
</tr>
<tr>
<td>CPU</td>
<td>9th Generation Intel® Core™ Processors:</td>
</tr>
<tr>
<td></td>
<td>- Intel® Core™ i7-9850H (6C/12T, 2.10 GHz, 25W)</td>
</tr>
<tr>
<td></td>
<td>- Intel® Core™ i7-8850H (6C/12T, 2.10 GHz, 25W)</td>
</tr>
<tr>
<td></td>
<td>8th Generation Intel® Core™ Processors:</td>
</tr>
<tr>
<td></td>
<td>- Intel® Core™ i7-9850H (6C/12T, 2.60 GHz, 45W)</td>
</tr>
<tr>
<td></td>
<td>- Intel® Core™ i5-8400H (4C/8T, 2.50 GHz, 45W)</td>
</tr>
<tr>
<td></td>
<td>- Intel® Xeon® E-2176M (6C/12T, 2.70 GHz, 45W)</td>
</tr>
<tr>
<td></td>
<td>- Intel® Xeon® E-2276ME Processor (6C/12T, 2.80 GHz, 45W)</td>
</tr>
<tr>
<td></td>
<td>Chipset</td>
</tr>
<tr>
<td></td>
<td>- Intel® QM370</td>
</tr>
<tr>
<td></td>
<td>- Intel® CM246</td>
</tr>
<tr>
<td>Memory</td>
<td>DDR4 2666MHz SODIMM x 3, up to 96GB (ECC by SKU)</td>
</tr>
<tr>
<td>Onboard Storage</td>
<td>—</td>
</tr>
<tr>
<td>BIOS</td>
<td>AMI UEFI</td>
</tr>
<tr>
<td>Wake on LAN</td>
<td>Yes</td>
</tr>
<tr>
<td>Dimension</td>
<td>4.92” x 3.75” (125mm x 95mm)</td>
</tr>
<tr>
<td>Security</td>
<td>TPM 2.0 (Optional)</td>
</tr>
<tr>
<td>Power</td>
<td>Power Requirement</td>
</tr>
<tr>
<td></td>
<td>+12V and +5VSB for ATX, +12V for AT</td>
</tr>
<tr>
<td></td>
<td>Power Type</td>
</tr>
<tr>
<td></td>
<td>ATATX</td>
</tr>
<tr>
<td></td>
<td>Power Consumption (Typical)</td>
</tr>
<tr>
<td></td>
<td>Intel® Xeon® E-2276ME, 4.65A @+12V</td>
</tr>
<tr>
<td>Display</td>
<td>Graphics Controller</td>
</tr>
<tr>
<td></td>
<td>- Intel® UHD Graphics 630</td>
</tr>
<tr>
<td></td>
<td>- Intel® UHD Graphics P630</td>
</tr>
<tr>
<td>Video Output</td>
<td>3 Simultaneous Displays:</td>
</tr>
<tr>
<td></td>
<td>- 18/24-bit Single/Dual-Channel LVDS x 1, up to 1920 x 1080</td>
</tr>
<tr>
<td></td>
<td>- DDI 2, up to 3840 x 2160</td>
</tr>
<tr>
<td></td>
<td>- VGA x 1, up to 1920 x 1080</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I/O</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td>Intel® I219-LM GbE x 1</td>
</tr>
<tr>
<td>Audio</td>
<td>High Definition Audio Interface</td>
</tr>
<tr>
<td>USB Port</td>
<td>USB 2.0 x 8, USB 3.2 Gen 2 x 4</td>
</tr>
<tr>
<td>Serial Port</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
</tr>
<tr>
<td>HDD Interface</td>
<td>SATA III x 4</td>
</tr>
<tr>
<td>Expansion</td>
<td>PCIe 3.0 [x1] x 1, PCIe 3.0 [x1] x 8, LPC x 1</td>
</tr>
<tr>
<td>GPIO</td>
<td>8-bit</td>
</tr>
<tr>
<td>SMBus/I2C</td>
<td>I2C x 1, SMBus x 1</td>
</tr>
</tbody>
</table>

Environment
- Operating Temperature: 32°F – 140°F (0°C – 60°C)
- Storage Temperature: -40°F – 185°F (-40°C – 85°C)
- Operating Humidity: 0% – 90% relative humidity, non-condensing
- EMC: CE/FCC Class A
- OS Support: Windows® 10 (64-bit), Linux Ubuntu 18.04.3, Kernel 5.0
- Weight: 0.44 lb. (0.20Kg)

Packing List
- COM-CFHB6-A11

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
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<tbody>
<tr>
<td>ECB-920A-A11-0001</td>
<td>COMe Type 6/10.Carrier Board, ATX.2.5GbE, USB 3.2COM, 4 SATA, PCIe ATATX. Rev.A1.1</td>
<td>1</td>
</tr>
<tr>
<td>COM-CFHB6-FAN01</td>
<td>Cooler, 125mm x 95mm x 42mm, 3pin for COM-CFHB6</td>
<td>1</td>
</tr>
<tr>
<td>COM-CFHB6-HSP01</td>
<td>Heat Spreader, 125mm x 95mm x 11mm, Black</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
COM Express CPU Modules

**COM-CFHB6**

**Block Diagram**

Unit: mm

![Block Diagram](image)

**Dimension**

Unit: mm

![Dimension](image)

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>COM Express Type</th>
<th>CPU</th>
<th>Memory</th>
<th>ECC support</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>UART</th>
<th>Expansion</th>
<th>Power</th>
<th>Temperature</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM-CFHB6-A11-0001</td>
<td>Type 6</td>
<td>Intel® Xeon® E-2176M</td>
<td>DDR4 SODIMM x 3</td>
<td>Yes</td>
<td>VGA x 1, DVI x 2</td>
<td>SATA III x 4</td>
<td>Intel® I219-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2-Way SATA x 2</td>
<td>PCIe [x16] x 1</td>
<td>PEG [x16] x 1</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
</tr>
<tr>
<td>COM-CFHB6-A11-0002</td>
<td>Type 6</td>
<td>Intel® Core™ i7-8850H</td>
<td>DDR4 SODIMM x 3</td>
<td>—</td>
<td>VGA x 1, DVI x 2</td>
<td>SATA III x 4</td>
<td>Intel® I219-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2-Way SATA x 2</td>
<td>PCIe [x16] x 1</td>
<td>PEG [x16] x 1</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
</tr>
<tr>
<td>COM-CFHB6-A11-0003</td>
<td>Type 6</td>
<td>Intel® Core™ i5-8400H</td>
<td>DDR4 SODIMM x 3</td>
<td>—</td>
<td>VGA x 1, DVI x 2</td>
<td>SATA III x 4</td>
<td>Intel® I219-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2-Way SATA x 2</td>
<td>PCIe [x16] x 1</td>
<td>PEG [x16] x 1</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
</tr>
<tr>
<td>COM-CFHB6-A11-0004</td>
<td>Type 6</td>
<td>Intel® Xeon® E-2276M</td>
<td>DDR4 SODIMM x 3</td>
<td>Yes</td>
<td>VGA x 1, DVI x 2</td>
<td>SATA III x 4</td>
<td>Intel® I219-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2-Way SATA x 2</td>
<td>PCIe [x16] x 1</td>
<td>PEG [x16] x 1</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
</tr>
<tr>
<td>COM-CFHB6-A11-0005</td>
<td>Type 6</td>
<td>Intel® Xeon® E-2276M</td>
<td>DDR4 SODIMM x 3</td>
<td>—</td>
<td>VGA x 1, DVI x 2</td>
<td>SATA III x 4</td>
<td>Intel® I219-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2-Way SATA x 2</td>
<td>PCIe [x16] x 1</td>
<td>PEG [x16] x 1</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
</tr>
<tr>
<td>COM-CFHB6-A11-0006</td>
<td>Type 6</td>
<td>Intel® Core™ i7-9850H</td>
<td>DDR4 SODIMM x 3</td>
<td>—</td>
<td>VGA x 1, DVI x 2</td>
<td>SATA III x 4</td>
<td>Intel® I219-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2-Way SATA x 2</td>
<td>PCIe [x16] x 1</td>
<td>PEG [x16] x 1</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
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<tr>
<td>COM-CFHB6-A11-0007</td>
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<td>Intel® Core™ i7-9850H</td>
<td>DDR4 SODIMM x 3</td>
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<td>VGA x 1, DVI x 2</td>
<td>SATA III x 4</td>
<td>Intel® I219-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2-Way SATA x 2</td>
<td>PCIe [x16] x 1</td>
<td>PEG [x16] x 1</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.

www.aaeon.com
COM-TGUC6

COM Express Type 6 Compact Size with 11th Gen Intel® Core™/Celeron® Processor 6000 Series Processors

Features
- DDR4 3200MHz SODIMM x 2, up to 64GB (ECC by SKU)
- VGA x 1, LVDS x 1, DDI x 2
- USB 2.0 x 8, USB 3.2 Gen2 x 4
- PCIe [x1] x 5, PCIe [x4] x1
- Intel® I225-LM 2.5GbE x 1
- COM Express Type 6, 3.74" x 3.74" (95mm x 95mm)

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>COM Express Compact Size, Type 6</td>
</tr>
<tr>
<td>CPU</td>
<td>11th Generation Intel® Core™ Processors: Intel® Core™ i7-1185G7E (4C/8T, 1.8 GHz, 15W) Intel® Core™ i7-1185GRE (4C/8T, 1.80 GHz, 15W) Intel® Core™ i5-1145G7E (4C/8T, 1.5 GHz, 15W) Intel® Core™ i5-1145GRE (4C/8T, 1.50 GHz, 15W) Intel® Core™ i3-1115G4E (2C/4T, 2.0 GHz, 15W) Intel® Core™ i3-1115GRE (2C/4T, 2.20 GHz, 15W) Intel® Celeron® Processor 6000 Series: Intel® Celeron® Processor 6305E Processor (2C/2T 1.80 GHz, 15W)</td>
</tr>
<tr>
<td>Chipset</td>
<td>Integrated with Intel® SoC</td>
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<tr>
<td>Memory</td>
<td>DDR4 3200MHz SODIMM x 2, up to 64GB (In-Band ECC by SKU)</td>
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<tr>
<td>Onboard Storage</td>
<td>—</td>
</tr>
<tr>
<td>BIOS</td>
<td>AMI UEFI</td>
</tr>
<tr>
<td>Wake on LAN</td>
<td>Yes</td>
</tr>
<tr>
<td>Dimension</td>
<td>3.74&quot; x 3.74&quot; (95mm x 95mm)</td>
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<tr>
<td>Security</td>
<td>TPM 2.0 (Optional)</td>
</tr>
<tr>
<td>Power</td>
<td>Power Requirement: +12V and +5VSB for ATX, +12V for AT</td>
</tr>
<tr>
<td>Power Type</td>
<td>AT/ATX</td>
</tr>
<tr>
<td>Power Consumption (Typical)</td>
<td>Intel® Core™ i7-1185GRE, 3.5A @+12V</td>
</tr>
<tr>
<td>Video Output</td>
<td>4 Simultaneous Displays: DVI x 2, up to 3840 x 2160 18/24-bit Single/Dual-Channel LVDS/eDP x 1, up to 3840 x 2160/1920 x 1080 VGA x 1, up to 1920 x 1080</td>
</tr>
<tr>
<td>I/O</td>
<td>Ethernet</td>
</tr>
<tr>
<td>Audio</td>
<td>High Definition Audio Interface</td>
</tr>
<tr>
<td>USB Port</td>
<td>USB 2.0 x 8, USB 3.2 Gen 2 x 4</td>
</tr>
<tr>
<td>Serial Port</td>
<td>2-Wire UART x 2 (TxD/Rx)</td>
</tr>
<tr>
<td>HDD Interface</td>
<td>SATA III x 2</td>
</tr>
<tr>
<td>Expansion</td>
<td>PCIe 4.0 [x4] x 1 PCIe 3.0 [x1] x 5 LPC x 1</td>
</tr>
<tr>
<td>GPIO</td>
<td>8-bit</td>
</tr>
<tr>
<td>SMBus/12C</td>
<td>12C x 1, 512B x 1</td>
</tr>
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Environmental
- Operating Temperature: 32°F ~ 140°F (0°C ~ 60°C)
- Storage Temperature: -40°F ~ 185°F (-40°C ~ 85°C)
- Operating Humidity: 0% ~ 90% relative humidity, non-condensing
- EMC: CE/FCC Class A
- OS Support: Windows® 10 (64-bit), Linus Ubuntu 20.04.2/Kernel 5.8
- Weight: 0.44 lb. (0.20Kg)

Packing List
- COM-TGUC6-A10

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
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<tbody>
<tr>
<td>ECB-920A-A11-0001</td>
<td>COMe Type 6/10.Carrier Board.ATX.2.5GbE.USB.2.COM.4.SATA. PCIe AT/ATX.Rev.A1.1</td>
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<tr>
<td>COM-TGUC6-FAN01</td>
<td>Cooler.95mm x 95mm x 24mm.4pin</td>
<td>1</td>
</tr>
<tr>
<td>COM-TGUC6-HSP01</td>
<td>Heat Spreader.95mm x 95mm x 11mm.Black</td>
<td>1</td>
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<tr>
<td>COM-FAN02</td>
<td>cooler.95mm x 95mm x 26.5mm.3pin.w/HSP</td>
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Note: All specifications are subject to change without notice.

**Block Diagram**  Unit: mm

**Dimension**  Unit: mm

**Ordering Information**

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<thead>
<tr>
<th>Part Number</th>
<th>COM Express Type</th>
<th>CPU</th>
<th>Memory</th>
<th>ECC support</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>UART</th>
<th>Expansion</th>
<th>Power</th>
<th>Temperature</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM-TGUC6-A10-0001</td>
<td>Type 6</td>
<td>Intel® Core™ i7-1185G7E</td>
<td>DDR4 5000MHz x 2</td>
<td>—</td>
<td>VGA x 1, LVDS x 1, DDI x 2</td>
<td>SATA III x 2</td>
<td>Intel® I225-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2-Wire UART x 2</td>
<td>PCIe [x1] x 5</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, GPIO 8-bit, DC, SMBus, SPI</td>
</tr>
<tr>
<td>COM-TGUC6-A10-0002</td>
<td>Type 6</td>
<td>Intel® Core™ i7-1145G7E</td>
<td>DDR4 5000MHz x 2</td>
<td>—</td>
<td>VGA x 1, LVDS x 1, DDI x 2</td>
<td>SATA III x 2</td>
<td>Intel® I225-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2-Wire UART x 2</td>
<td>PCIe [x1] x 5</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, GPIO 8-bit, DC, SMBus, SPI</td>
</tr>
<tr>
<td>COM-TGUC6-A10-0003</td>
<td>Type 6</td>
<td>Intel® Core™ i5-1145G7E</td>
<td>DDR4 4800MHz x 2</td>
<td>—</td>
<td>VGA x 1, LVDS x 1, DDI x 2</td>
<td>SATA III x 2</td>
<td>Intel® I225-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2-Wire UART x 2</td>
<td>PCIe [x1] x 5</td>
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<td>0°C – 60°C</td>
<td>LPC, GPIO 8-bit, DC, SMBus, SPI</td>
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<tr>
<td>COM-TGUC6-A10-0004</td>
<td>Type 6</td>
<td>Intel® Core™ i5-1145G7E</td>
<td>DDR4 4800MHz x 2</td>
<td>—</td>
<td>VGA x 1, LVDS x 1, DDI x 2</td>
<td>SATA III x 2</td>
<td>Intel® I225-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2-Wire UART x 2</td>
<td>PCIe [x1] x 5</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, GPIO 8-bit, DC, SMBus, SPI</td>
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<tr>
<td>COM-TGUC6-A10-0005</td>
<td>Type 6</td>
<td>Intel® Core™ i5-1145G7E</td>
<td>DDR4 4800MHz x 2</td>
<td>—</td>
<td>VGA x 1, LVDS x 1, DDI x 2</td>
<td>SATA III x 2</td>
<td>Intel® I225-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2-Wire UART x 2</td>
<td>PCIe [x1] x 5</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, GPIO 8-bit, DC, SMBus, SPI</td>
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<tr>
<td>COM-TGUC6-A10-0006</td>
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<td>Intel® Core™ i3-1115G4E</td>
<td>DDR4 4800MHz x 2</td>
<td>—</td>
<td>VGA x 1, LVDS x 1, DDI x 2</td>
<td>SATA III x 2</td>
<td>Intel® I225-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2-Wire UART x 2</td>
<td>PCIe [x1] x 5</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, GPIO 8-bit, DC, SMBus, SPI</td>
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<tr>
<td>COM-TGUC6-A10-0007</td>
<td>Type 6</td>
<td>Intel® Celeron® 6305E Processor</td>
<td>DDR4 4800MHz x 2</td>
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<td>VGA x 1, LVDS x 1, DDI x 2</td>
<td>SATA III x 2</td>
<td>Intel® I225-LM x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2-Wire UART x 2</td>
<td>PCIe [x1] x 5</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, GPIO 8-bit, DC, SMBus, SPI</td>
</tr>
</tbody>
</table>

www.aaeon.com
COM-WHUC6

COM Express Type 6 Compact Size with 8th Gen Intel® Core™/Celeron® Processor 4000 Series Processors

Features
- DDR4 2400MHz SODIMM x 2, up to 64GB
- VGA x 1, LVDS x 1, DDI x 1
- USB 2.0 x 8, USB 3.2 Gen 2 x 4
- PCIe [x1] x 8
- Intel® I219-LM GbE x 1
- COM Express Type 6, 3.74" x 3.74" (95mm x 95mm)

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>COM Express Compact Size, Type 6</td>
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<tr>
<td>CPU</td>
<td>8th Generation Intel® Core™ Processors:</td>
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<tr>
<td></td>
<td>- Intel® Core™ i7-8665UE (4C/8T, 1.70 GHz, 15W)</td>
</tr>
<tr>
<td></td>
<td>- Intel® Core™ i5-8365UE (4C/8T, 1.60 GHz, 15W)</td>
</tr>
<tr>
<td></td>
<td>- Intel® Core™ i3-8145UE (2C/4T, 2.20 GHz, 15W)</td>
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<tr>
<td></td>
<td>- Intel® Celeron® Processor 4000 Series:</td>
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<tr>
<td></td>
<td>- Intel® Celeron® Processor 4300UE (2C/2T, 2.00 GHz, 15W)</td>
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<tr>
<td>Chipset</td>
<td>Integrated with Intel® SoC</td>
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<tr>
<td>Memory</td>
<td>DDR4 2400MHz SODIMM x 2, up to 64GB (non-ECC)</td>
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<tr>
<td>Onboard Storage</td>
<td>eMMC, up to 64GB (Optional)</td>
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<tr>
<td>BIOS</td>
<td>AMI UEFI</td>
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<tr>
<td>Watchdog Timer</td>
<td>255 Levels</td>
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<tr>
<td>Dimension</td>
<td>3.74&quot; x 3.74&quot; (95mm x 95mm)</td>
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<tr>
<td>Security</td>
<td>TPM 2.0 (Optional)</td>
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<tr>
<td>Power</td>
<td>Power Requirement</td>
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<tr>
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<td>+12V and +5VSB for ATX, +12V for AT</td>
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<tr>
<td>Power Type</td>
<td>AT/ATX</td>
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<tr>
<td>Power Consumption</td>
<td>Intel® Core™ i7-8665UE, 2.61A @+12V</td>
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<tr>
<td>Display</td>
<td>Graphics Controller</td>
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<td></td>
<td>Intel® UHD Graphics 620</td>
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<td>Intel® UHD Graphics 610</td>
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<td>Video Output</td>
<td>3 Simultaneous Displays:</td>
</tr>
<tr>
<td></td>
<td>- DDI x 1, up to 3840 x 2160</td>
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<tr>
<td></td>
<td>- 18/24-bit Single/Dual-Channel LVDS/eDP x 1, up to 1920 x 1080</td>
</tr>
<tr>
<td></td>
<td>- VGA x 1, up to 2048 x 1152</td>
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<tr>
<td>I/O</td>
<td>Ethernet</td>
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<tr>
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<td>Intel® I219-LM GbE x 1</td>
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<tr>
<td>Audio</td>
<td>High Definition Audio Interface</td>
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<tr>
<td>USB Port</td>
<td>USB 2.0 x 8, USB 3.2 Gen 2 x 4</td>
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<td>Serial Port</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
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<td>HDD Interface</td>
<td>SATA III x 2</td>
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<tr>
<td>Expansion</td>
<td>PCIe 3.0 [x1] x 4</td>
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<td>PCIe 3.0 [x4] x 1</td>
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<td></td>
<td>LPC x 1</td>
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<td>GPIO</td>
<td>8-bit</td>
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<tr>
<td>SMBus/I2C</td>
<td>i2C x 1, SMBus x 1</td>
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<tr>
<td>Environment</td>
<td>Operating Temperature</td>
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<td>32°F ~ 140°F (0°C ~ 60°C)</td>
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<td></td>
<td>Storage Temperature</td>
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<tr>
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<td>-40°F ~ 185°F (-40°C ~ -85°C)</td>
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<td></td>
<td>Operating Humidity</td>
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<td>0% ~ 90% relative humidity, non-condensing</td>
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<td></td>
<td>EMC</td>
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<td></td>
<td>CE/FCC Class A</td>
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<tr>
<td>OS Support</td>
<td>Windows® 10 (64-bit)</td>
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<tr>
<td></td>
<td>Linux (Ubuntu 18.04.2/Kernel 4.18)</td>
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<tr>
<td>Weight</td>
<td>0.44 lb. (0.20Kg)</td>
</tr>
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</table>

Packing List
- COM-WHUC6-A10

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECB-920A-A11-0001</td>
<td>COMe Type 6/10. Carrier Board ATX 2.50Gbe.8USB.2COM.4SATA.</td>
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</tr>
<tr>
<td>COM-WHUC6-HSP01</td>
<td>Heat Spreader.95mm x 95mm x 11mm.Black</td>
<td>1</td>
</tr>
<tr>
<td>COM-WHUC6-FAN01</td>
<td>Cooler.95mm x 95mm x 38mm.3pin</td>
<td>1</td>
</tr>
<tr>
<td>COM-FAN02</td>
<td>cooler.95mm x 95mm x 26.5mm.3pin.w/HSP</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
**COM-WHUC6**

**Block Diagram**

**Unit: mm**

![Block Diagram](image)

**Dimension**

**Unit: mm**

![Dimension](image)

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>COM Express Type</th>
<th>CPU</th>
<th>Memory</th>
<th>ECC support</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>UART</th>
<th>Expansion</th>
<th>Power</th>
<th>Temperature</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM-WHUC6-A10-0001</td>
<td>Type 6</td>
<td>Intel® Core™ i7-8665UE</td>
<td>DDR4 512MB x2</td>
<td>—</td>
<td>VGA x 1, LVDS x 1, DDI x 1</td>
<td>SATA III x 2, 64GB eMMC</td>
<td>Intel® I219-LM x 1</td>
<td>USB 3.0 Gen 2 x 4</td>
<td>2-Wire UART x 2</td>
<td>PCIe [x1] x 8</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, GPIO 8-bit, DC, SMBus, SPI</td>
</tr>
<tr>
<td>COM-WHUC6-A10-0002</td>
<td>Type 6</td>
<td>Intel® Core™ i5-8365UE</td>
<td>DDR4 512MB x2</td>
<td>—</td>
<td>VGA x 1, LVDS x 1, DDI x 1</td>
<td>SATA III x 2, 64GB eMMC</td>
<td>Intel® I219-LM x 1</td>
<td>USB 3.0 Gen 2 x 4</td>
<td>2-Wire UART x 2</td>
<td>PCIe [x1] x 8</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, GPIO 8-bit, DC, SMBus, SPI</td>
</tr>
<tr>
<td>COM-WHUC6-A10-0003</td>
<td>Type 6</td>
<td>Intel® Core™ i3-8145UE</td>
<td>DDR4 512MB x2</td>
<td>—</td>
<td>VGA x 1, LVDS x 1, DDI x 1</td>
<td>SATA III x 2, 64GB eMMC</td>
<td>Intel® I219-LM x 1</td>
<td>USB 3.0 Gen 2 x 4</td>
<td>2-Wire UART x 2</td>
<td>PCIe [x1] x 8</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, GPIO 8-bit, DC, SMBus, SPI</td>
</tr>
<tr>
<td>COM-WHUC6-A10-0004</td>
<td>Type 6</td>
<td>Intel® Celeron® Processor 4305UE</td>
<td>DDR4 512MB x2</td>
<td>—</td>
<td>VGA x 1, LVDS x 1, DDI x 1</td>
<td>SATA III x 2, 64GB eMMC</td>
<td>Intel® I219-LM x 1</td>
<td>USB 3.0 Gen 2 x 4</td>
<td>2-Wire UART x 2</td>
<td>PCIe [x1] x 8</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, GPIO 8-bit, DC, SMBus, SPI</td>
</tr>
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</table>
COM-ICDB7

COM Express Type 7 with Intel® Xeon® D Processors

Features
- DDR4 2400MHz SODIMM x 2, up to 64GB
- USB 2.0 x 4, USB 3.2 Gen 1 x 4
- PCIe [x2] x 8, PEG [x16] x 1
- Intel® I210-IT GbE x 1, Intel® X557-AT4 10GbE x 4
- COM Express Type 7, 4.92” x 3.75” (125mm x 95mm)

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>COM Express Basic Size, Type 6</td>
</tr>
<tr>
<td>CPU</td>
<td>Intel® Xeon® D Processors: Intel® Xeon® D-1746TER (10C/20T, 2.00 GHz, 67W) Intel® Xeon® D-1735TR (8C/16T, 2.20 GHz, 59W) Intel® Xeon® D-1732TE (6C/12T, 3.90 GHz, 52W) Intel® Xeon® D-1715TER (4C/8T, 2.40 GHz, 50W) Intel® Xeon® D-1712TR (4C/8T, 2.00 GHz, 40W)</td>
</tr>
<tr>
<td>Chipset</td>
<td>Integrated with Intel® SoC</td>
</tr>
<tr>
<td>Memory</td>
<td>DDR4 2400MHz SODIMM x 2, up to 64GB</td>
</tr>
<tr>
<td>Onboard Storage</td>
<td>—</td>
</tr>
<tr>
<td>BIOS</td>
<td>AMI UEFI</td>
</tr>
<tr>
<td>Wake on LAN</td>
<td>Yes</td>
</tr>
<tr>
<td>Watchdog Timer</td>
<td>255 Levels</td>
</tr>
<tr>
<td>Dimension</td>
<td>4.92” x 3.75” (125mm x 95mm)</td>
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<tr>
<td>Security</td>
<td>TPM 2.0</td>
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<tr>
<td>Power</td>
<td>Power Requirement: +12V and +5VSB for ATX, +12V for AT Power Type: AT/ATX Power Consumption (Typical): Intel® Xeon® D-1746TER, 7.75A @+12V</td>
</tr>
<tr>
<td>Display</td>
<td>Graphics Controller: — Video Output: —</td>
</tr>
<tr>
<td>I/O</td>
<td>Ethernet: Intel® I210-IT GbE x 1 10GbE x 4 (Base-KR to Carrier Board) Audio: — USB Port: USB 2.0 x 4, USB 3.2 Gen 1 x 4 Serial Port: 2-Wire UART x 2 (Tx/Rx) HDO Interface: SATA III x 2 Expansion: PEG 4.0 [x16] x 1 PCIe 3.0 [x2] x 8 LPC x 1 GPIO: 8-bit SMBus/12C: 12C x 1 (Windows® 10 Ready), SMBus x 1</td>
</tr>
</tbody>
</table>

Environment
- Operating Temperature: 32°F – 140°F (0°C – 60°C) Storage Temperature: -40°F – 185°F (-40°C – 85°C) Operating Humidity: 0% – 90% relative humidity, non-condensing
- EMC: CE/FCC Class A
- OS Support: Windows® 10 (64-bit), Linux Ubuntu 20.04/Kernel 5.4
- Weight: 0.44 lb. (0.20Kg)

Packing List

- COM-ICDB7-A10

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECB-927A-A10-0001</td>
<td>COMe T7.Cr Rel. 4x10G via x557. 4USB3. PEG+PCL-ECC, COM Express AT/ATX Rev 1.0</td>
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<td>COM-ICDB7-HSP01</td>
<td>Heat Spreader: 125mm x 95mm x 11mm; Black</td>
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</tr>
<tr>
<td>COM-ICDB7-FAN01</td>
<td>Cooler: 125mm x 95mm x 50mm; 4pin</td>
<td>1</td>
</tr>
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</table>

Note: All specifications are subject to change without notice.
COM Express CPU Modules

Block Diagram  Unit: mm

Dimension  Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>COM Express Type</th>
<th>CPU</th>
<th>Memory</th>
<th>ECC support</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>UART</th>
<th>Expansion</th>
<th>Power</th>
<th>Temperature</th>
<th>Others</th>
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</thead>
<tbody>
<tr>
<td>COM-ICDB7-T7-A10-0001</td>
<td>Type 7</td>
<td>Intel® Xeon® D-1746TER</td>
<td>DDR4 SODIMM x 2</td>
<td>Yes</td>
<td>SATA III x 2</td>
<td>Intel® Q190-IT x 1 10G Base-KR x 4</td>
<td>USB 3.2 Gen 1 x 4</td>
<td>USB 2.0 x 4</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe (x2)</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, SPI Gro, DC, SMBus, SPI</td>
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<tr>
<td>COM-ICDB7-T7-A10-0002</td>
<td>Type 7</td>
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<td>DDR4 SODIMM x 2</td>
<td>Yes</td>
<td>SATA III x 2</td>
<td>Intel® Q190-IT x 1 10G Base-KR x 4</td>
<td>USB 3.2 Gen 1 x 4</td>
<td>USB 2.0 x 4</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe (x2)</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, SPI Gro, DC, SMBus, SPI</td>
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<td>USB 2.0 x 4</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe (x2)</td>
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<tr>
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<td>DDR4 SODIMM x 2</td>
<td>Yes</td>
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<td>Intel® Q190-IT x 1 10G Base-KR x 4</td>
<td>USB 3.2 Gen 1 x 4</td>
<td>USB 2.0 x 4</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe (x2)</td>
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<td>0°C – 60°C</td>
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<td>Intel® Q190-IT x 1 10G Base-KR x 4</td>
<td>USB 3.2 Gen 1 x 4</td>
<td>USB 2.0 x 4</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe (x2)</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, SPI Gro, DC, SMBus, SPI</td>
</tr>
</tbody>
</table>
NanoCOM-TGU
COM Express Type 10 with 11th Gen Intel® Core™ Processors

Features
- Onboard LPDDR4, up to 16GB
- SATA III x 2, Onboard PCIe SSD x 1
- eDP x 1, DDI x 1
- USB 2.0 x 8, USB 3.2 Gen 2 x 2
- PCIe 3.0 [x1] x 4
- Intel® I225-LM 2.5GbE x 1
- COM Express Type 10, 3.31” x 2.17” (84mm x 55mm)

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
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<tbody>
<tr>
<td>Form Factor</td>
<td>COM Express Mini Size, Type 10</td>
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<table>
<thead>
<tr>
<th>CPU</th>
<th>Description</th>
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<tbody>
<tr>
<td>11th Generation Intel® Core™ Processors:</td>
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<tr>
<td>Intel® Core™ i7-1185G7E (4C/8T, 1.80 GHz, 15W)</td>
<td></td>
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<tr>
<td>Intel® Core™ i5-1145G7E (4C/8T, 1.50 GHz, 15W)</td>
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</tr>
<tr>
<td>Intel® Core™ i3-1115G4E (2C/4T, 2.20 GHz, 15W)</td>
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<tr>
<td>Intel® Core™ i7-1185GRE (4C/8T, 1.80 GHz, 15W)</td>
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<tr>
<td>Intel® Core™ i5-1145GRE (4C/8T, 1.80 GHz, 15W)</td>
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<td>Intel® Core™ i3-1115GRE (2C/4T, 1.80 GHz, 15W)</td>
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<thead>
<tr>
<th>Chipset</th>
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<thead>
<tr>
<th>Memory</th>
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<td>Onboard LPDDR4 4267MHz, up to 16GB</td>
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<th>Onboard Storage</th>
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<td>NVMe, up to 256GB (Optional)</td>
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<tr>
<th>BIOS</th>
<th>Description</th>
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<tr>
<td>AMI UEFI</td>
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<table>
<thead>
<tr>
<th>Wake on LAN</th>
<th>Description</th>
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<table>
<thead>
<tr>
<th>Watchdog Timer</th>
<th>Description</th>
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<tr>
<td>255 Levels</td>
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<tr>
<th>Dimension</th>
<th>Description</th>
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<td>3.31” x 2.17” (84mm x 55mm)</td>
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<th>Security</th>
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<td>fTPM</td>
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<th>Power</th>
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<tr>
<td>Power Requirement:</td>
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<td>&lt;12V and +5VSB for ATX, +12V for AT</td>
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<table>
<thead>
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<th>Description</th>
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<td>ATx</td>
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<th>Power Consumption (Typical)</th>
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<tr>
<td>Intel® Core™ i7-1185G7E, 2.75A @+12V</td>
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<table>
<thead>
<tr>
<th>Display</th>
<th>Description</th>
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<tbody>
<tr>
<td>Graphics Controller</td>
<td>Intel® UHD Graphics for 11th Gen Intel® Processors</td>
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<tr>
<td>Intel® Iris® Xe Graphics</td>
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<table>
<thead>
<tr>
<th>Video Output</th>
<th>Description</th>
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<tbody>
<tr>
<td>Dual Display:</td>
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<tr>
<td>DDI x 1, up to 3840 x 2160</td>
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<tr>
<td>eDP x 1, up to 3840 x 2160</td>
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<table>
<thead>
<tr>
<th>I/O</th>
<th>Description</th>
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<tbody>
<tr>
<td>Ethernet</td>
<td>Intel® I225-LM 2.5GbE x 1</td>
</tr>
<tr>
<td>Audio</td>
<td>High Definition Audio Interface</td>
</tr>
<tr>
<td>USB Port</td>
<td>USB 2.0 x 8, USB 3.2 Gen 2 x 2</td>
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<tr>
<td>Serial Port</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
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<tr>
<th>Environment</th>
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<tbody>
<tr>
<td>Operating Temperature</td>
<td>32°F – 140°F (0°C – 60°C)</td>
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<tr>
<td>Storage Temperature</td>
<td>-40°F – 185°F (-40°C – 85°C)</td>
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<td>Operating Humidity</td>
<td>0% – 90% relative humidity, non-condensing</td>
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<tr>
<th>EMC</th>
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<td>CE/FCC Class A</td>
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<tr>
<th>OS Support</th>
<th>Description</th>
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<tr>
<td>Windows® 10 (64-bit)</td>
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<td>Linux Ubuntu 20.04.4/Kernel 5.13.0</td>
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<table>
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<tr>
<th>Weight</th>
<th>Description</th>
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<tr>
<td>0.15 lb. (0.07Kg)</td>
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### Packing List

**NANOCOM-TGU-A10**

**Part Number**

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<thead>
<tr>
<th>Description</th>
<th>QTY</th>
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<tbody>
<tr>
<td>ECB-920A-A11-0001</td>
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<tr>
<td>NanoCOM-TGU-Fan01</td>
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<tr>
<td>NanoCOM-TGU-HSP01</td>
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### Optional Accessories

**Part Number**

<table>
<thead>
<tr>
<th>Description</th>
<th>QTY</th>
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<tbody>
<tr>
<td>COMe Type 6/10 Carrier Board.ATX.2.5GbE.8USB.2COM.4SATA. PCIe AT/ATx.Rev.A1.1</td>
<td>1</td>
</tr>
<tr>
<td>Cooler.84 x 55 x 16 mm.4pin.</td>
<td>1</td>
</tr>
<tr>
<td>Heat Spreader. 84 x 55 x 11 mm.Black</td>
<td>1</td>
</tr>
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</table>

Note: All specifications are subject to change without notice.
**NanoCOM-TGU**

### Block Diagram

**Unit: mm**

![Block Diagram](image)

**11th Gen Intel® Core Processor (Tiger Lake-UP3)**

- Intel® i725
- DWC: eDP
- TBT: DDI
- LPC, GPIO
- I2C, SMBus
- 2-Wire UART (Tx/Rx)
- PCIe® [x1] x 4
- 2.5 GbiE
- LPDDR4X
- DDIA_eDP

**COM Express Type 10 ROW A/B**

- SATA3.0 x 2
- USB 3.2 Gen2 x 2
- USB 2.0 x 8
- SMBus
- PCIe[x1] Gen 3 x 4
- 2.5 GbE
- DDIA_eDP
- LPC
- I2C, TX/Rx x 2

**ITE IT8528**

**Inband ECC Supported by sku**

**Channel A**

- LPDDR4X
- PCIe [x2]
- NVMe
- SPI
- BIOS

**Dimension**

**Unit: mm**

![Dimension](image)

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>COM Express Type</th>
<th>CPU</th>
<th>ECC support</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>UART</th>
<th>Expansion</th>
<th>Power</th>
<th>Temperature</th>
<th>Others</th>
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<tbody>
<tr>
<td>NANO-CTGU-A10-0001</td>
<td>Type 10</td>
<td>Intel® Core™ i7-1187G7E</td>
<td>16GB Onboard DDR4</td>
<td>eDP x 1, DDI x 1</td>
<td>SATA III x 2, 64GB NVM</td>
<td>Intel® i225-LM x 1</td>
<td>USB 3.2 Gen2 x 2 USB 2.0 x 8</td>
<td>PCIe 3.0 [x1] x 4</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, GPIO 8-bit, I2C, SMBus</td>
<td></td>
</tr>
<tr>
<td>NANO-CTGU-A10-0002</td>
<td>Type 10</td>
<td>Intel® Core™ i5-1145G7E</td>
<td>16GB Onboard DDR4</td>
<td>eDP x 1, DDI x 1</td>
<td>SATA III x 2, 64GB NVM</td>
<td>Intel® i225-LM x 1</td>
<td>USB 3.2 Gen2 x 2 USB 2.0 x 8</td>
<td>PCIe 3.0 [x1] x 4</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, GPIO 8-bit, I2C, SMBus</td>
<td></td>
</tr>
<tr>
<td>NANO-CTGU-A10-0003</td>
<td>Type 10</td>
<td>Intel® Core™ i3-1115G4E</td>
<td>8GB Onboard DDR4</td>
<td>eDP x 1, DDI x 1</td>
<td>SATA III x 2, 64GB NVM</td>
<td>Intel® i225-LM x 1</td>
<td>USB 3.2 Gen2 x 2 USB 2.0 x 8</td>
<td>PCIe 3.0 [x1] x 4</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, GPIO 8-bit, I2C, SMBus</td>
<td></td>
</tr>
<tr>
<td>NANO-CTGU-A10-0005</td>
<td>Type 10</td>
<td>Intel® Core™ i7-1185GRE</td>
<td>16GB Onboard DDR4</td>
<td>eDP x 1, DDI x 1</td>
<td>SATA III x 2, 64GB NVM</td>
<td>Intel® i225-LM x 1</td>
<td>USB 3.2 Gen2 x 2 USB 2.0 x 8</td>
<td>PCIe 3.0 [x1] x 4</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, GPIO 8-bit, I2C, SMBus</td>
<td></td>
</tr>
</tbody>
</table>

**Temperature Note:** For SATA only, no include onboard PCIe NVMe. Please contact technical team if any question.

---

**Note:** All specifications are subject to change without notice.

www.aaeon.com
**Features**

- Onboard LPDDR4, up to 8GB
- Onboard eMMC, up to 64GB (Optional)
- eDP x 1, DDI x 1
- USB 2.0 x 8, USB 3.2 Gen 2 x 2
- PCIe 3.0 [x1] x 4
- Intel® I219-LM GbE x 1
- COM Express Type 10, 3.31” x 2.17” (84mm x 55mm)

**Specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>System</td>
<td>COM Express Mini Size, Type 10</td>
</tr>
<tr>
<td>Form Factor</td>
<td>COM Express CPU Modules</td>
</tr>
<tr>
<td>CPU</td>
<td>8th Generation Intel® Core™ Processors:</td>
</tr>
<tr>
<td></td>
<td>- Intel® Core™ i5-8365U (4C/8T, 1.60 GHz, 15W)</td>
</tr>
<tr>
<td></td>
<td>- Intel® Core™ i3-8145U (2C/4T, 2.20 GHz, 15W)</td>
</tr>
<tr>
<td>Chipset</td>
<td>Integrated with Intel® SoC</td>
</tr>
<tr>
<td>Memory</td>
<td>Onboard LPDDR4 2400MHz, up to 8GB</td>
</tr>
<tr>
<td>Onboard Storage</td>
<td>eMMC, up to 64GB (Optional)</td>
</tr>
<tr>
<td>BIOS</td>
<td>AMI UEFI</td>
</tr>
<tr>
<td>Wake on LAN</td>
<td>Yes</td>
</tr>
<tr>
<td>Watchdog Timer</td>
<td>255 Levels</td>
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<tr>
<td>Dimension</td>
<td>3.31” x 2.17” (84mm x 55mm)</td>
</tr>
<tr>
<td>Security</td>
<td>iTPM</td>
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<tr>
<td>Power</td>
<td>+12V and +5VSB for ATX, +12V for AT</td>
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<td>Power Type</td>
<td>AT/ATX</td>
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<td>Power Consumption (Typical)</td>
<td>Intel® Core™ i5-8365U, 2.3A @+12V</td>
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<td>Graphics Controller</td>
<td>Intel® UHD Graphics 610</td>
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<td>Intel® UHD Graphics 620</td>
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<td>Video Output</td>
<td>Dual Display:</td>
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<td></td>
<td>- eDP x 1, up to 1086 x 768</td>
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<td></td>
<td>- DDI x 1, up to 2560 x 2160</td>
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<tr>
<td>I/O</td>
<td>Ethernet Intel® I219-LM GbE x 1</td>
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<tr>
<td>Audio</td>
<td>High Definition Audio Interface</td>
</tr>
<tr>
<td>USB Port</td>
<td>USB 2.0 x 8, USB 3.2 Gen 2 x 2</td>
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<tr>
<td>Serial Port</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
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<td>HDD Interface</td>
<td>SATA III x 2</td>
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**Packaging List**

- **NanoCOM-WHU-A10 x 1**

**Optional Accessories**

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<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
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<tr>
<td>ECB-920A-A11-0001</td>
<td>COMe Type 6/10.Carrier Board.ATX.2.5GbE.8USB.2COM.4SATA. PCIe/AT/ATX.Rev. A1.1</td>
<td>1</td>
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<tr>
<td>NanoCOM-WHU-HSP01</td>
<td>Heat Spreader. 84 x 55 x 11 mm. Black</td>
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<td>NanoCOM-WHU-RAN01</td>
<td>Cooler.84 x 55 x 18 mm.4pin.</td>
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Note: All specifications are subject to change without notice.
**NanoCOM-WHU**

**COM Express CPU Modules**

**Block Diagram**  Unit: mm

![Block Diagram](image)

**Dimension**  Unit: mm

![Dimension](image)

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>COM Express Type</th>
<th>CPU</th>
<th>Memory</th>
<th>ECC support</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>UART</th>
<th>Expansion</th>
<th>Power</th>
<th>Temperature</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>NANOCOM-WHU-A10-0002</td>
<td>Type 10</td>
<td>Intel® Core™ i5-8365U</td>
<td>8GB</td>
<td>—</td>
<td>eDP x 1, DDI x 1</td>
<td>SATA 8 Gb x 2</td>
<td>USB 3.2 Gen 2 x 2</td>
<td>GBE</td>
<td>USB 3.2 Gen 2 (x4)</td>
<td>2-Wire UART x 2</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, GPIO 8-bit, 10-pin, SMBus</td>
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</tbody>
</table>

Note: All specifications are subject to change without notice.
## NanoCOM-WHU Rev.B

COM Express Type 10 with 8th Gen Intel® Core™/Celeron® Processor 4000 Series Processors

### Features
- Onboard LPDDR4, up to 8GB
- LVDS x 1, DDI x 1
- USB 2.0 x 8, USB 3.2 Gen 2 x 2
- SATA III x 2
- PCIe [x1] x 4
- Intel® I219-LM GbE x 1
- COM Express Type 10, 3.31” x 2.17” (84mm x 55mm)

### Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Form Factor</td>
<td>COM Express Mini Size, Type 10</td>
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<tr>
<td>CPU</td>
<td>8th Generation Intel® Core™ Processors:</td>
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<td>Intel® Core™ i7-8665U (4C/8T, 1.70 GHz, 15W)</td>
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<td>Intel® Core™ i5-8365U (4C/8T, 1.60 GHz, 15W)</td>
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<td></td>
<td>Intel® Core™ i3-8145U (2C/4T, 2.20 GHz, 15W)</td>
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<td>Intel® Celeron® Processor 4305U (2C/2T, 2.00 GHz, 15W)</td>
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<td>Chipset</td>
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<td>Memory</td>
<td>Onboard LPDDR4 2400MHz, up to 8GB</td>
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<td>BIOS</td>
<td>AMI UEFI</td>
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<td>Yes</td>
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<td>Watchdog Timer</td>
<td>255 Levels</td>
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<td>ITPM</td>
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<td>Power</td>
<td>Power Requirement: +12V and +5VSB for ATX, +12V for AT</td>
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<tr>
<td></td>
<td>Power Type: AT/ATX</td>
</tr>
<tr>
<td></td>
<td>Power Consumption (Typical): Intel® Core™ i7-8665U, 2.10A @ +12V</td>
</tr>
<tr>
<td>Display</td>
<td>Graphics Controller:</td>
</tr>
<tr>
<td></td>
<td>Intel® UHD Graphics 610</td>
</tr>
<tr>
<td></td>
<td>Intel® UHD Graphics 620</td>
</tr>
<tr>
<td>Video Output</td>
<td>Dual Display: DDI x 1, up to 3840 x 2160</td>
</tr>
<tr>
<td></td>
<td>18/24-bit Single-Channel LVDS/eDP x 1</td>
</tr>
<tr>
<td>I/O</td>
<td>Ethernet: Intel® I219-LM GbE x 1</td>
</tr>
<tr>
<td>Audio</td>
<td>High Definition Audio Interface</td>
</tr>
<tr>
<td>USB Port</td>
<td>USB 2.0 x 8, USB 3.2 Gen 2 x 2</td>
</tr>
<tr>
<td>Serial Port</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
</tr>
<tr>
<td>Environment</td>
<td>Operating Temperature: 32°F<del>140°F (0°C</del>60°C)</td>
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<tr>
<td></td>
<td>Storage Temperature: -40°F<del>185°F (-40°C</del>85°C)</td>
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<tr>
<td></td>
<td>Operating Humidity: 0%~90% relative humidity, non-condensing</td>
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<tr>
<td></td>
<td>EMC: CE/FCC Class A</td>
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<tr>
<td></td>
<td>OS Support: Windows® 10 (64-bit)</td>
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<tr>
<td></td>
<td>Linux Ubuntu 18.04.3/Kernel 5.0.0</td>
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<tr>
<td>Weight</td>
<td>0.15 lb. (0.07Kg)</td>
</tr>
</tbody>
</table>

### Packing List

- **NanoCOM-WHU-B10**

### Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECB-920A-A11-0001</td>
<td>COMe Type 6/10.Carrier Board.ATX.2.5GbE.8USB.2COM.4SATA. PCIe AT/ATX Rev. A1.1</td>
<td>1</td>
</tr>
<tr>
<td>NanoCOM-WHU-HSP01</td>
<td>Heat Spreader. 84 x 55 x 11 mm. Black</td>
<td>1</td>
</tr>
<tr>
<td>NanoCOM-WHU-FAN01</td>
<td>Cooler.84 x 55 x 16 mm.4pin.</td>
<td>1</td>
</tr>
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</table>

Note: All specifications are subject to change without notice.
**Block Diagram**

**Unit: mm**

Optional: eDP → LVDS to eDP

---

**Dimension**

**Unit: mm**

WITH HEAT SPREADER

Heat Spreader: NANOCOM-WHU-HSP01

---

WITH ONE-PIECE COOLER

Cooler: NANOCOM-WHU-FAN01

---

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>COM Express Type</th>
<th>CPU</th>
<th>Memory</th>
<th>ECC support</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>UART</th>
<th>Expansion</th>
<th>Power</th>
<th>Temperature</th>
<th>Others</th>
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<tbody>
<tr>
<td>NANOCOM-WHU-A10-0003</td>
<td>Type 10</td>
<td>Intel® Core™ i3-8145UE</td>
<td>8GB Onboard DDR4</td>
<td>--</td>
<td>eDP x 1, DDI x 1</td>
<td>SATA III x 2, 4x USB eMMC</td>
<td>Intel® Gigabit-LM x 1</td>
<td>USB 3.2 Gen 2 x 2, 2x USB 2.0 x 1</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe 3.0 x 1</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, GPIO 8-bit, I2C, SMBus</td>
</tr>
<tr>
<td>NANOCOM-WHU-A10-0004</td>
<td>Type 10</td>
<td>Intel® Celeron® Processor 4305UE</td>
<td>4GB Onboard DDR4</td>
<td>--</td>
<td>eDP, DDI x 1</td>
<td>SATA III x 2, 3x USB eMMC</td>
<td>Intel® Gigabit-LM x 1</td>
<td>USB 3.2 Gen 2 x 2, 2x USB 2.0 x 1</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe 3.0 x 1</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, GPIO 8-bit, I2C, SMBus</td>
</tr>
<tr>
<td>NANOCOM-WHU-B10-0001</td>
<td>Type 10</td>
<td>Intel® Core™ i7-8665UE</td>
<td>8GB Onboard DDR4</td>
<td>--</td>
<td>eDP, DDI x 1</td>
<td>SATA III x 2</td>
<td>Intel® Gigabit-LM x 1</td>
<td>USB 3.2 Gen 2 x 2, 2x USB 2.0 x 1</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe 3.0 x 1</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, GPIO 8-bit, I2C, SMBus</td>
</tr>
</tbody>
</table>

---

Note: All specifications are subject to change without notice.

www.aaeon.com
NanoCOM-EHL

COM Express Type 10 with Intel Atom® X/Pentium® Processor J/Celeron® Processor J & N Series Processors

Features
- Onboard DDR3L, up to 2GB
- Onboard eMMC, up to 8GB
- LVDS x 1, DDI x 1
- USB 2.0 x 7, USB 3.2 Gen 1 x 1
- PCIe [x1] x 3
- Intel® I210-AT GbE x 1
- COM Express Type 10, 3.31” x 2.17” (84mm x 55mm)

Specifications

System

Form Factor
COM Express Mini Size, Type 10

CPU

Intel® Atom® Processor X Series:
- x6400E (1.30 GHz, 6W)
- x6410E (2.00 GHz, 9W)
- x6420E (2.00 GHz, 12W)
Intel® Pentium® Processor J Series:
- x6414E (1.35 GHz, 6W)
- x6420E (2.00 GHz, 12W)
Intel® Celeron® Processor J Series:
- x3515E (1.05 GHz, 5W)
- x3512E (1.00 GHz, 4W)

Chipset
Integrated with Intel® SoC

Memory
Onboard LPDDR4 3733MHz, up to 16GB

BIOS
AMI UEFI

Wake on LAN
Yes

Watchdog Timer
255 Levels

Dimension
3.31” x 2.17” (84mm x 55mm)

Security
ITPMM

Power

Power Requirement
+12V and +5VSB for ATX, +12V for AT

Power Type
AT/ATX

Power Consumption (Typical)
Intel® Atom® x6420E, 1.44A @+12V

Display

Graphics Controller
Intel® UHD Graphics for 10th Gen Intel® Processors

Video Output
DDI x 1, up to 3840 x 2160

I/O

Ethernet
Intel® I226-IT 2.5GbE x 1

Audio
High Definition Audio Interface

USB Port
USB 2.0 x 8, USB 3.2 Gen 2 x 2

Serial Port
2-Wire UART x 2 (1x/9x)

HDD Interface
SATA III x 2

Expansion
PCIe 3.0 [x1] x 4

GPIO
8-bit

SMbus/I2C
I2C x 1, SMBus x 1

Environment

Operating Temperature
32°F ~ 140°F (0°C ~ 60°C)

Storage Temperature
-40°F ~ 185°F (-40°C ~ 85°C)

Operating Humidity
0% ~ 90% relative humidity, non-condensing

EMC
CE/FCC Class A

OS Support
Windows® 10 (64-bit)
Linux Ubuntu 20.04.3/Kernel 5.13.0

Weight
0.15 lb. (0.07Kg)

Packing List

NANOCOM-EHL-A11

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
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<tbody>
<tr>
<td>ECB-920A-A11-0001</td>
<td>COM Express Type 6/10.Carrier Board.ATX.2.5GbE.8USB.2COM.4SATA. PCIe AT/ATX.Rev. A1.1</td>
<td>1</td>
</tr>
<tr>
<td>NanoCOM-EHL-FAN01</td>
<td>Cooler.84 x 55 x 18mm.4pin NanoCOM-EHL for x600E series</td>
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<tr>
<td>NanoCOM-EHL-FAN02</td>
<td>Cooler.84 x 55 x 18mm.4pin NanoCOM-EHL for N, J series</td>
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Note: All specifications are subject to change without notice.
Block Diagram

Unit: mm

Elkhart Lake x6000E

NANOCOM-EHLW2-A11-0006
Type 10
Intel® Atom®
x6425E
8GB Onboard DDR4
—
LVDS x 1, DDI x 1
SATA III x 2, 64GB eMMC
Intel® I226-IT x 1
USB 3.2 Gen 2 x 2
USB 2.0 x 8
2-Wire UART x 2 (Tx/Rx)
PCIe 3.0 [x1] x 4
12V
-40°C ~ 85°C
LPC, GPIO 8-bit, I2C, SMBus

Dimension

Unit: mm

Cooler
NANOCOM-EHL-FAN01

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>COM Express Type</th>
<th>CPU</th>
<th>Memory</th>
<th>ECC support</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>UART</th>
<th>Expansion</th>
<th>Power</th>
<th>Temperature</th>
<th>Others</th>
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<tbody>
<tr>
<td>NANOCOM-EHL-A11-0002</td>
<td>Type 10</td>
<td>Intel® Celeron® Processor J6412</td>
<td>8GB Onboard DDR4</td>
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<td>LVDS x 1, DDI x 1</td>
<td>SATA III x 2, 32GB eMMC</td>
<td>Intel® I226-IT x 1</td>
<td>USB 3.2 Gen 2 x 2, USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe 3.0 [x1] x 4</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, GPIO 8-bit, I2C, SMBus</td>
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<tr>
<td>NANOCOM-EHL-A11-0003</td>
<td>Type 10</td>
<td>Intel® Pentium® Processor J6426</td>
<td>16GB Onboard DDR4</td>
<td>—</td>
<td>LVDS x 1, DDI x 1</td>
<td>SATA III x 2, 64GB eMMC</td>
<td>Intel® I226-IT x 1</td>
<td>USB 3.2 Gen 2 x 2, USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe 3.0 [x1] x 4</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, GPIO 8-bit, I2C, SMBus</td>
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<tr>
<td>NANOCOM-EHL-A11-0004</td>
<td>Type 10</td>
<td>Intel Atom® x6211E</td>
<td>16GB Onboard DDR4</td>
<td>—</td>
<td>LVDS x 1, DDI x 1</td>
<td>SATA III x 2, 32GB eMMC</td>
<td>Intel® I226-IT x 1</td>
<td>USB 3.2 Gen 2 x 2, USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe 3.0 [x1] x 4</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, GPIO 8-bit, I2C, SMBus</td>
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<td>NANOCOM-EHL-A11-0005</td>
<td>Type 10</td>
<td>Intel Atom® x6413E</td>
<td>8GB Onboard DDR4</td>
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<td>LVDS x 1, DDI x 1</td>
<td>SATA III x 2, 64GB eMMC</td>
<td>Intel® I226-IT x 1</td>
<td>USB 3.2 Gen 2 x 2, USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe 3.0 [x1] x 4</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, GPIO 8-bit, I2C, SMBus</td>
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<tr>
<td>NANOCOM-EHL-A11-0006</td>
<td>Type 10</td>
<td>Intel Atom® x6425E</td>
<td>8GB Onboard DDR4</td>
<td>—</td>
<td>LVDS x 1, DDI x 1</td>
<td>SATA III x 2, 64GB eMMC</td>
<td>Intel® I226-IT x 1</td>
<td>USB 3.2 Gen 2 x 2, USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe 3.0 [x1] x 4</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, GPIO 8-bit, I2C, SMBus</td>
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<tr>
<td>NANOCOM-EHLW2-A11-0006</td>
<td>Type 10</td>
<td>Intel® Atom® x6425E</td>
<td>8GB Onboard DDR4</td>
<td>—</td>
<td>LVDS x 1, DDI x 1</td>
<td>SATA III x 2, 64GB eMMC</td>
<td>Intel® I226-IT x 1</td>
<td>USB 3.2 Gen 2 x 2, USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe 3.0 [x1] x 4</td>
<td>12V</td>
<td>-40°C ~ 85°C</td>
<td>LPC, GPIO 8-bit, I2C, SMBus</td>
</tr>
</tbody>
</table>
## NanoCOM-APL-B10
COM Express Type 10 CPU Module with Onboard Intel® Atom®/Celeron®/Pentium® Processor

### Features
- Onboard LPDDR4, up to 8GB
- Onboard eMMC, up to 64GB (Optional)
- LVDS x 1, DDI x 1
- USB 2.0 x 8, USB 3.2 Gen 1 x 2
- PCIe [x1] x 4
- Intel® I226-IT 2.5GbE x 1
- COM Express Type 10, 3.31” x 2.17” (84mm x 55mm)

### Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>COM Express Mini Size, Type 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>Intel® Processor X Series:</td>
</tr>
<tr>
<td>CPU</td>
<td>Intel® Atom® x7-E3950 (4C/4T, 1.60 GHz, 12W)</td>
</tr>
<tr>
<td>Memory</td>
<td>Intel® Atom® x5-E3940 (4C/2T, 1.60 GHz, 9.5W)</td>
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<tr>
<td>Memory</td>
<td>Intel® Atom® x5-E3930 (2C/2T, 1.30 GHz, 6.5W)</td>
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<tr>
<td>Memory</td>
<td>Intel® Celeron® Processor N Series:</td>
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<tr>
<td>Memory</td>
<td>Intel® Celeron® Processor N3350 (2C/2T, 1.30 GHz, 6W)</td>
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<tr>
<td>Memory</td>
<td>Intel® Pentium® Processor N Series:</td>
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<tr>
<td>Memory</td>
<td>Intel® Pentium® Processor N4200 (4C/4T, 1.10 GHz, 6W)</td>
</tr>
<tr>
<td>Chipset</td>
<td>Integrated with Intel® SoC</td>
</tr>
<tr>
<td>Memory</td>
<td>Onboard LPDDR4 1866MHz, up to 8GB</td>
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<tr>
<td>Onboard Storage</td>
<td>eMMC, up to 64GB (Optional)</td>
</tr>
<tr>
<td>BIOS</td>
<td>AMI UEFI</td>
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<tr>
<td>Wake on LAN</td>
<td>Yes</td>
</tr>
<tr>
<td>Watchdog Timer</td>
<td>255 Levels</td>
</tr>
<tr>
<td>Dimension</td>
<td>3.31” x 2.17” (84mm x 55mm)</td>
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<tr>
<td>Security</td>
<td>TPM</td>
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<tr>
<td>Power</td>
<td>+12V and +5VSB for ATX, +12V for AT</td>
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<tr>
<td>Power Type</td>
<td>ATX</td>
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<tr>
<td>Power Consumption (Typical)</td>
<td>Intel® Pentium® Processor N4200, 0.6A @+12V</td>
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<tr>
<td>Graphics Controller</td>
<td>Intel® HD Graphics 500</td>
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<tr>
<td>Video Output</td>
<td>Dual Display: DDI x 1, up to 3840 x 2160</td>
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<tr>
<td>Video Output</td>
<td>18/24-bit Single-Channel LVDS/eDP x 1, up to 1920 x 1080</td>
</tr>
<tr>
<td>I/O</td>
<td>Ethernet: Intel® I226-IT 2.5GbE x 1</td>
</tr>
<tr>
<td>I/O</td>
<td>Audio: High Definition Audio Interface</td>
</tr>
<tr>
<td>USB Port</td>
<td>USB 2.0 x 8, USB 3.2 Gen 1 x 2</td>
</tr>
<tr>
<td>Serial Port</td>
<td>2-Wire UART x 2 (1x/Rx)</td>
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<td>HD/Interface</td>
<td>SATA B x 2</td>
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<tr>
<td>Expansion</td>
<td>PCIe [x4] x 4</td>
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<tr>
<td>Expansion</td>
<td>LPC x 1</td>
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<tr>
<td>GPIO</td>
<td>8-bit</td>
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<tr>
<td>SMBus/I2C</td>
<td>I2C x 1, SMBus x 1</td>
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<tr>
<td>Operating Temperature</td>
<td>32°F – 140°F (0°C – 60°C)</td>
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<tr>
<td>Storage Temperature</td>
<td>-40°F – 185°F (-40°C – 85°C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% – 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>EMC</td>
<td>CE/FCC Class A</td>
</tr>
<tr>
<td>OS Support</td>
<td>Windows® 10 (64-bit)</td>
</tr>
<tr>
<td>Weight</td>
<td>0.15 lb. (0.07Kg)</td>
</tr>
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</table>

### Packing List
- **NANOCOM-APL-B10**

### Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECB-920A-A11-0001</td>
<td>COMe Type 6/10.Carrier Board.ATX.2.5GbE.8USB.2COM.4SATA, PCIe,AT/ATX.Rev. A1.1</td>
<td>1</td>
</tr>
<tr>
<td>NanoCOM-APL-E-HSP01</td>
<td>Heat Spreader.84 x 55 x 11 mm.Black.NanoCOM-APL For E39xx CPU only</td>
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<td>NanoCOM-APL-N-HSP01</td>
<td>Heat Spreader.84 x 55 x 11 mm.Black.NanoCOM-APL For Nxxx CPU only</td>
<td>1</td>
</tr>
<tr>
<td>NanoCOM-APL-E-FAN01</td>
<td>Cooler.84 x 55 x 18mm.4pin.NanoCOM-APL E38XX Series</td>
<td>1</td>
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</tbody>
</table>

Note: All specifications are subject to change without notice.
**NanoCOM-APL-B10**

**Block Diagram**
Unit: mm

**Dimension**
Unit: mm

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>COM Express Type</th>
<th>CPU</th>
<th>Memory</th>
<th>ECC support</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>UART</th>
<th>Expansion</th>
<th>Power</th>
<th>Temperature</th>
<th>Others</th>
</tr>
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<tbody>
<tr>
<td>NANOCOM-APL-B10-0001</td>
<td>Type 10</td>
<td>Intel® Pentium® Processor N4200</td>
<td>8GB</td>
<td>Onboard LPDDR4</td>
<td>LVDS x 1, DDI x 1</td>
<td>SATA III x 2, 64GB eMMC</td>
<td>Intel® I226-IT x 1</td>
<td>USB 3.2 Gen 1 x 2, USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe [x1] x 4</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, SPI 8-bit, I2C, SMBus</td>
</tr>
<tr>
<td>NANOCOM-APL-B10-0002</td>
<td>Type 10</td>
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<td>4GB</td>
<td>Onboard LPDDR4</td>
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<td>SATA III x 2, 64GB eMMC</td>
<td>Intel® I226-IT x 1</td>
<td>USB 3.2 Gen 1 x 2, USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe [x1] x 4</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, SPI 8-bit, I2C, SMBus</td>
</tr>
<tr>
<td>NANOCOM-APL-B10-0003</td>
<td>Type 10</td>
<td>Intel® Atom™ x7-E3950</td>
<td>8GB</td>
<td>Onboard LPDDR4</td>
<td>LVDS x 1, DDI x 1</td>
<td>SATA III x 2, 64GB eMMC</td>
<td>Intel® I226-IT x 1</td>
<td>USB 3.2 Gen 1 x 2, USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe [x1] x 4</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, SPI 8-bit, I2C, SMBus</td>
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<tr>
<td>NANOCOM-APL-B10-0004</td>
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<td>4GB</td>
<td>Onboard LPDDR4</td>
<td>LVDS x 1, DDI x 1</td>
<td>SATA III x 2, 32GB eMMC</td>
<td>Intel® I226-IT x 1</td>
<td>USB 3.2 Gen 1 x 2, USB 2.0 x 8</td>
<td>2-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe [x1] x 4</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, SPI 8-bit, I2C, SMBus</td>
</tr>
<tr>
<td>NANOCOM-APL-B10-0005</td>
<td>Type 10</td>
<td>Intel® Atom™ x5-E3930</td>
<td>4GB</td>
<td>Onboard LPDDR4</td>
<td>LVDS x 1, DDI x 1</td>
<td>SATA III x 2, 32GB eMMC</td>
<td>Intel® I226-IT x 1</td>
<td>USB 3.2 Gen 1 x 2, USB 2.0 x 8</td>
<td>3-Wire UART x 2 (Tx/Rx)</td>
<td>PCIe [x1] x 4</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>LPC, SPI 8-bit, I2C, SMBus</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.

www.aaeon.com
NanoCOM-APL

COM Express Type 10 with Intel Atom® X/Celeron® Processor N/Pentium® Processor N Series Processors

Features

- Onboard LPDDR4, up to 8GB
- Onboard eMMC, up to 64GB (Optional)
- LVDS x 1, DDI x 1
- USB 2.0 x 8, USB 3.2 Gen 1 x 2
- PCIe [x1] x 4
- Intel® I211-AT GbE x 1
- COM Express Type 10, 3.31” x 2.17” (84mm x 55mm)

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>COM Express Mini Size, Type 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>Intel Atom® Processor X Series:</td>
</tr>
<tr>
<td></td>
<td>Intel Atom® x7-E3950 (4C/4T, 1.60 GHz, 12W)</td>
</tr>
<tr>
<td></td>
<td>Intel Atom® x5-E3940 (4C/4T, 1.60 GHz, 9.5W)</td>
</tr>
<tr>
<td></td>
<td>Intel Atom® x5-E3930 (2C/2T, 1.30 GHz, 6.5W)</td>
</tr>
<tr>
<td></td>
<td>Intel® Celeron® Processor N Series:</td>
</tr>
<tr>
<td></td>
<td>Intel® Celeron® Processor N3350 (2C/2T, 1.10 GHz, 6W)</td>
</tr>
<tr>
<td></td>
<td>Intel® Pentium® Processor N Series:</td>
</tr>
<tr>
<td></td>
<td>Intel® Pentium® Processor N4200 (4C/4T, 1.10 GHz, 6W)</td>
</tr>
<tr>
<td>Chipset</td>
<td>Integrated with Intel® SoC</td>
</tr>
<tr>
<td>Memory</td>
<td>Onboard LPDDR4 1866MHz, up to 8GB</td>
</tr>
<tr>
<td>Onboard Storage</td>
<td>eMMC, up to 64GB (Optional)</td>
</tr>
<tr>
<td>BIOS</td>
<td>AMI UEFI</td>
</tr>
<tr>
<td>Wake on LAN</td>
<td>Yes</td>
</tr>
<tr>
<td>Watchdog Timer</td>
<td>255 Levels</td>
</tr>
<tr>
<td>Dimension</td>
<td>3.31” x 2.17” (84mm x 55mm)</td>
</tr>
<tr>
<td>Security</td>
<td>TPM</td>
</tr>
<tr>
<td>Power</td>
<td>+12V and +5VSB for ATX, +12V for AT</td>
</tr>
<tr>
<td>Power Type</td>
<td>AT/ATX</td>
</tr>
<tr>
<td>Power Consumption (Typical)</td>
<td>Intel Atom® x7-E3950, 0.82A @12V</td>
</tr>
</tbody>
</table>

Display

| Graphics Controller     | Intel® HD Graphics 500           |
| Video Output            | DDI x 1, up to 3840 x 2160       |
|                         | 18/24-bit Single-Channel LVDS/eDP x 1, up to 1366 x 768 |

I/O

| Ethernet                | Intel® I211-AT GbE x 1           |
| Audio                   | High Definition Audio Interface |

USB Port                   | USB 2.0 x 8, USB 3.2 Gen 1 x 2   |
Serial Port                | 2-Wire UART x 2 (Tx/Rx)          |
HDD Interface              | SATA B x 2                       |
Expansion                  | PCIe [x1] x 4                    |
GPIO                      | 8-bit                            |
SMBus/I2C                  | I2C x 1, SMBus x 1               |

Environment

| Operating Temperature   | 32°F – 140°F (0°C – 60°C)        |
| Storage Temperature     | -40°F – 185°F (-40°C – 85°C)     |
| Operating Humidity      | 0% – 90% relative humidity, non-condensing |
| EMC                     | CE/FCC Class A                   |
| OS Support              | Windows® 10 (64-bit)             |
|                         | Linux Ubuntu 20.04.3/Kernel 5.11.0 |
| Weight                  | 0.15 lb. (0.07kg)                |

Packing List

- **NANOCOM-APL-A11**

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECB-920A-A11-0001</td>
<td>COMe Type 6/10.Carrier Board,ATX 2.5GbE,USB 2.0/COM 4SATA, PCle/ATX,Rev.A1.1</td>
<td>1</td>
</tr>
<tr>
<td>NanoCOM-APL-E-HSP01</td>
<td>Heat Spreader,B4 x 55 x 11 mm. Black NanoCOM-APL For E39xx CPU only</td>
<td>1</td>
</tr>
<tr>
<td>NanoCOM-APL-N-HSP01</td>
<td>Heat Spreader,B4 x 55 x 11 mm.Black NanoCOM-APL For Nxxx CPU only</td>
<td>1</td>
</tr>
<tr>
<td>NANOCONOM-APL-E-FAN01</td>
<td>Cooler,B4 x 55 x 18mm,4pin NanoCOM-APL E39XX Series</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Note: All specifications are subject to change without notice.
COM Express CPU Modules

**COM HPC Client Size C with 12th/13th Gen Intel® Core™ Processors**

**Features**
- DDR5 4800MHz SODIMM x 2, up to 64GB
- USB 2.0 x 8, USB 3.2 Gen 2 x 5
- PCIe [x1] x 8, PCIe [x4] x 3, PEG [x16] x 1
- Intel® I226-LM 2.5GbE x 2
- M.2 2280 M-Key x 1
- COM HPC Client Type, Size C, 6.30" x 4.72" (160mm x 120mm)

**Specifications**

<table>
<thead>
<tr>
<th>System</th>
<th>Form Factor</th>
<th>COM HPC Client Size C</th>
</tr>
</thead>
</table>
| CPU    | 13th Generation Intel® Core™ Processors: | Intel® Core™ i9-13900E (24C/32T, P-core 1.80 GHz, E-core 1.30 GHz, 65W)  
                  Intel® Core™ i9-13900 (24C/32T, P-core 2.00 GHz, E-core 1.50 GHz, 65W)  
                  Intel® Core™ i7-13700E (16C/24T, P-core 1.90 GHz, E-core 1.30 GHz, 65W)  
                  Intel® Core™ i5-13500E (14C/20T, P-core 2.40 GHz, E-core 1.50 GHz, 65W)  
                  12th Generation Intel® Core™ Processors:  
                  Intel® Core™ i9-12900E (16C/24T, P-core 2.30 GHz, E-core 1.70 GHz, 65W)  
                  Intel® Core™ i7-12700E (12C/20T, P-core 2.10 GHz, E-core 1.60 GHz, 65W)  
                  Intel® Core™ i7-12700 (12C/20T, P-core 2.10 GHz, E-core 1.60 GHz, 65W) |
| Chipset | Intel® R680E |
| Memory | DDR4 4800MHz SODIMM x 2, up to 64GB (32GB ECC) |
| Onboard Storage | — |
| BIOS | AMI UEFI |
| Wake on LAN | Yes |
| Watchdog Timer | 255 Levels |
| Dimension | 6.30" x 4.72" (160mm x 120mm) |
| Security | TPM 2.0 |
| Power | Power Requirement: +12V & +5VSB for AT, +12V for ATX |
| Power Type | AT/ATX |
| Power Consumption (Typical) | Intel® Core™ i9-13900E, 7.13A @+12V |
| Display | Graphics Controller: Intel® UHD Graphics 770  
                  Video Output: 4 Simultaneous Displays: eDP x 1, up to 3840 x 2160 @60Hz  
                  DDI x 3, up to 3840 x 2160 @144Hz |
| I/O | Ethernet: Intel® I226-LM 2.5GbE x 2  
                  Audio: —  
                  USB Port: USB 2.0 x 8, USB 3.2 Gen 2 x 8  
                  Serial Port: 4-Wire UART x 2 (Tx/Rx)  
                  HDD Interface: SATA III x 2 |
| Expansion | PEG 5.0 [x16] x 1  
                  PCIe 4.0 [x4] x 3  
                  PCIe 3.0 [x1] x 8  
                  eSPI x 1  
                  LPC x 1 |
| GPIO | 12-bit |
| SMBus/I2C | I2C x 1, SMBus x 1 |
| Environment | Operating Temperature: 32°F ~ 140°F (0°C ~ 60°C)  
                  Storage Temperature: -40°F ~ 185°F (-40°C ~ 85°C)  
                  Operating Humidity: 0% ~ 90% relative humidity, non-condensing |
| EMC | CE/FCC Class A  
                  OS Support: Windows® 10 (64-bit)  
                  Linux Ubuntu 20.04.1/Kernel 5.15  
                  Weight: 0.66 lb. (0.30Kg) |

**Packing List**
- HPC-RPSC-A10

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECB-9804-A10-0001</td>
<td>COM HPC Client Carrier Size A/B/C/HDMI, DP/2xGbe/EUIB/TypeC, 2SATA, PClE, ATX, 1.0</td>
<td>1</td>
</tr>
<tr>
<td>HPC-RPSC-FAN01</td>
<td>600mm x 90mm x 50mm, 4pin</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
### Block Diagram

Unit: mm

![Block Diagram of COM Express CPU Modules](image)

### Dimension

Unit: mm

![Dimension of COM Express CPU Modules](image)

### Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>COM Express Type</th>
<th>CPU</th>
<th>Memory</th>
<th>ECC support</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>UART</th>
<th>Expansion</th>
<th>Power</th>
<th>Temperature</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPC-RPSC-A10-0001</td>
<td>HPC Client Size C</td>
<td>12th/13th Gen Intel® Core™ Series</td>
<td>DDI 500MX x 2</td>
<td>Yes</td>
<td>eDP 1, DDI x 3</td>
<td>SATA III x 2</td>
<td>Intel® i226-LM x 2</td>
<td>USB 2.0 x 8</td>
<td>4-Wire UART x 2</td>
<td>PCIe [x16] x 1</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>LPC, GPIO 12-bit, DC, 56kVBus, SPI</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
ECB-920A-A11  
COM Express Evaluation Carrier Board (Type 6/Type 10)

Features

- ATX Form Factor (305mm × 244mm)
- Supports COM Express Rev3.0, Pin out Type 6/Type 10
- PCIe [x4] x 2, PCIe [x16] x 1
- VGA Port x 1, LVDS, eDP, Display Port x 3
- USB 2.0 x 4, USB 3.2/2.0 x 4
- SATA III x 4
- RJ-45 GbE x 1, Supports up to 2.5GbE
- High Definition Audio
- LPC/eSPI Slot, GPIO/SDIO, SMBus x 1, I2C x 1
- COM Port x 2 (2-Wire UART Tx/Rx), GPIO 8-bit

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>ATX</td>
</tr>
<tr>
<td>COM Express Connector</td>
<td>x 2 (Row A, B &amp; Row C, D)</td>
</tr>
<tr>
<td>I/O Chipset</td>
<td>―</td>
</tr>
<tr>
<td>Front Panel Control</td>
<td>10-pin Header (6x2)</td>
</tr>
<tr>
<td>Ethernet</td>
<td>10/100/1000/2500 Base-TX, RJ45 x 1 (From CPU Module)</td>
</tr>
<tr>
<td>Expansion Interface</td>
<td>PCIe [x4] x 2, PCIe [x16] x 1</td>
</tr>
<tr>
<td>Power Supply Type</td>
<td>ATX</td>
</tr>
<tr>
<td>CMOS Battery</td>
<td>RTC Battery Socket x 1</td>
</tr>
<tr>
<td>Board Size</td>
<td>12” x 9.6” (304mm x 244mm)</td>
</tr>
<tr>
<td>Gross Weight</td>
<td>1.32 lb. (0.6Kg)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F ~ 185°F (~40°C ~ 85°C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>MTBF (Hours)</td>
<td>―</td>
</tr>
<tr>
<td>Display</td>
<td></td>
</tr>
<tr>
<td>DVT/CRT/VGA</td>
<td>D-SUB15 Connector x 1</td>
</tr>
<tr>
<td>LVDS / eDP</td>
<td>LVDS: 40-pin Dual-Channel LVDS Connector (20x2) eDP: 30-pin Board Wire Connector</td>
</tr>
<tr>
<td>SDVO</td>
<td>―</td>
</tr>
<tr>
<td>DDI</td>
<td>Display Port x 3 (Dual x 1, Single x 1)</td>
</tr>
<tr>
<td>I/O</td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>SATA III x 4</td>
</tr>
<tr>
<td>Serial Port</td>
<td>COM Port x 2 (2-Wire UART Tx/Rx)</td>
</tr>
<tr>
<td>USB</td>
<td>USB 2.0 x 4 (Type-A), USB 3.2/2.0 x 4 (Type-A)</td>
</tr>
<tr>
<td>Audio</td>
<td>Audio Jack, supports Line-in, Line-out, Microphone</td>
</tr>
<tr>
<td>PS/2 Port</td>
<td>―</td>
</tr>
<tr>
<td>GPIO</td>
<td>8-bit Programmable</td>
</tr>
<tr>
<td>Switch/ButtonClick</td>
<td>Power Button x 1 / Reset Button x 1</td>
</tr>
<tr>
<td>Debug LED</td>
<td>80 PORT</td>
</tr>
<tr>
<td>I2C</td>
<td>1</td>
</tr>
<tr>
<td>Expansion Interface</td>
<td>LPC, SMBus, eSPI, CAN Bus, 4 pin fan connector, Micro SD Card Slot x 1</td>
</tr>
</tbody>
</table>

* I/O functions according to the type of module installed, please refer to function table.

Optional Accessories

- ECB-920A-A11-BRKT01
  ECB-920A-A11J0 Bracket
- 170X000324
  5V Power cable 1x4P to ATX 2x2P 200mm

Note: All specifications are subject to change without notice.
Block Diagram  Unit: mm

Dimension  Unit: mm

Packing List

- PER-T603 (COM Express Type Converter Board) x 1
- PER-T604 (PCIe [x4] to PCIe [x1] x 4 Card) x 1
- Cable Kit x 1 (Including SATA Cable x 2, COM Port Cable x 2)
- ECB-920A-A11 x 1

Ordering Information

- ECB-920A-A11-0001
  COMe Type 6/10. Carrier Board. ATX. 2.5GbE. USB3.2. COM. PCIe. AT/ATX. Rev. A1.1

Type 6/10 Function Table

<table>
<thead>
<tr>
<th>COM Type</th>
<th>Type 6</th>
<th>Type 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCIe [x16]</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PCIe [x4]</td>
<td>1 (Lane 0 – Lane 3)</td>
<td>1 (Lane 0 – Lane 3)</td>
</tr>
<tr>
<td>PCIe [x1]</td>
<td>1 (Lane 4 – Lane 7)</td>
<td>—</td>
</tr>
<tr>
<td>VGA</td>
<td>1</td>
<td>—</td>
</tr>
<tr>
<td>DDI</td>
<td>3 (DDI1 – DDI3)</td>
<td>1</td>
</tr>
<tr>
<td>LVDS</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>LAN</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>SATA III</td>
<td>4 (Lane 0 – Lane 3)</td>
<td>2 (Lane 0 – Lane 1)</td>
</tr>
<tr>
<td>Serial Port (Tx/Rx)</td>
<td>4 (Lane 0 – Lane 3)</td>
<td>2 (Lane 0 – Lane 1)</td>
</tr>
<tr>
<td>USB 3.2</td>
<td>8 (Lane 0 – Lane 7)</td>
<td>8 (Lane 0 – Lane 7)</td>
</tr>
<tr>
<td>USB 2.0</td>
<td>8 (Lane 0 – Lane 7)</td>
<td>8 (Lane 0 – Lane 7)</td>
</tr>
<tr>
<td>GPIO/SDIO</td>
<td>1 (GPIO 8 bits)</td>
<td>1 (GPIO 8 bits)</td>
</tr>
</tbody>
</table>
ECB-927A
COM Express Evaluation Carrier Board (Type 7)

Features

- ATX Form Factor
- Supports COM Express Type 7 Basic Size
- PEG + PCIe [x8] + PCIe [x4] x 2
- Display via Console or 3rd Party Graphic Solution
- USB 3.2 Gen 2 x 4
- SATA III x 2
- 10GbE x 4 (Intel® Ethernet Connection X557-AT4)

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>COM Express Basic Size Type 7 Carrier Board in ATX Form Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>COM Express Connector x 2 (Row A8 and Row CD, Type 7 pin-out)</td>
</tr>
<tr>
<td>I/O Chipset</td>
<td>—</td>
</tr>
<tr>
<td>Front Panel Control</td>
<td>10-pin Header (5x2)</td>
</tr>
<tr>
<td>Ethernet</td>
<td>10GbE x 4 (Intel® Ethernet Connection X557-AT4)</td>
</tr>
<tr>
<td>Power Supply Type</td>
<td>Standard 24-pin ATX + 4-pin 12V</td>
</tr>
<tr>
<td>CMOS Battery</td>
<td>CR2032 Holder x 1</td>
</tr>
<tr>
<td>BIOS</td>
<td>—</td>
</tr>
<tr>
<td>Board Size</td>
<td>12&quot; x 9.6&quot; (305mm x 244mm)</td>
</tr>
<tr>
<td>Gross Weight</td>
<td>1.54 lb. (0.7Kg)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F ~ 176°F (-40°C ~ 80°C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>MTBF (Hours)</td>
<td>—</td>
</tr>
</tbody>
</table>

Display

- DVI/CRT/VGA: N/A. via PCIe Graphic card
- LVDS / eDP: N/A. via PCIe Graphic card
- SDVO: N/A. via PCIe Graphic card
- DDI: N/A. via PCIe Graphic card

I/O

- Storage: SATA x 2
- Serial Port: 2-wire UART x 2 (TX/RX)
- USB: USB 3.2 x 4
- Audio: N/A
- PS/2 Port: —
- GPIO: 8-bit
- Switch/Button: Power Button x 1 / Reset Button x 1
- Debug LED: 7-SEG LED X2 80 PORT POST CODE INDICATOR
- I²C: —
- Expansion Interface: SMBus, LPC/eSPI slot

Optional Accessories

- TBD

Note: All specifications are subject to change without notice.
**Block Diagram**  Unit: mm

![Diagram showing the layout of the ECB-927A board with various connectors and slots.](image)

**Dimension**  Unit: mm

![Diagram showing the dimensions of the ECB-927A board.](image)

**Packing List**
- COM Port Cable x 2
- ECB-927A-A10 x 1

**Ordering Information**
- ECB-927A-A10-0001
  COMe Type7 Carrier Board: 4x10GbE, 4xUSB2.0, 2xSATA, PCIe, ATX, A1.0

---

Note: All specifications are subject to change without notice.
**ECB-980A**

COM HPC Client Carrier board for Size A/B/C

---

**Features**

- **ATX Form Factor**
- **Supports COM HPC Client Size A/B/C, J1 and J2**
- **PEG x 2, PCIe [x4] x 2 + M.2 2280 M-Key x 2 (NVMe)**
- **DP x 2, HDMI x 1, eDP x 1**
- **USB Type C x 3, USB Type A x 4**
- **RJ-45 x 2, SATA III x 2**

---

**Specifications**

<table>
<thead>
<tr>
<th>System</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>COM HPC Client Size A/B/C</td>
</tr>
<tr>
<td>COM Express Connector</td>
<td>x 2 (J1 and J2)</td>
</tr>
<tr>
<td>I/O Chipset</td>
<td>—</td>
</tr>
<tr>
<td>Front Panel Control</td>
<td>10-pin Header (2x5P)</td>
</tr>
<tr>
<td>Ethernet</td>
<td>2.5 GbE x 1</td>
</tr>
<tr>
<td></td>
<td>10 GbE x 1</td>
</tr>
<tr>
<td>Expansion Interface</td>
<td>PCIe [x4] x 2 (Group 0, Lane 0 – 7)</td>
</tr>
<tr>
<td></td>
<td>PCIe [x16] x 2 (one PCIe [x16] only supports PCIe [x4])</td>
</tr>
<tr>
<td>Power Supply Type</td>
<td>Standard 24-pin ATX + 8-pin 12V</td>
</tr>
<tr>
<td>CMOS Battery</td>
<td>CR2032 Holder x 1</td>
</tr>
<tr>
<td>BIOS</td>
<td>—</td>
</tr>
<tr>
<td>Board Size</td>
<td>12” x 9.6” (310mm x 244mm)</td>
</tr>
<tr>
<td>Gross Weight</td>
<td>1.54 lb. (0.7Kg)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F ~ 158°F (-40°C ~ 80°C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>MTBF (Hours)</td>
<td>CE/FCC Class A</td>
</tr>
</tbody>
</table>

**Display**

- DVT/CRT/VGA: HDMI x 1, DP x 2
- LVDS / eDP: eDP x 1
- SDVO: —
- DDI: —

**I/O**

- Storage: SATA x 2, M.2 2280 M-Key x 2 (PCIe Gen 4 [x4] for NVMe)
- Serial Port: 4-wire UART x 2
- USB: USB 3.2 x 2 (20Gbps, up to Gen 2 x 2 support)
  - USB 3.2 x 2 (10Gbps, up to Gen 2 x 1 support)
  - USB 3.2 x 2 (5Gbps, up to Gen 1 x 1 support)
- Audio: —
- PS/2 Port: —
- GPIO: 12-bit
- Switch/Button: Power Button x 1 / Reset Button x 1
- Debug LED: 7-Segment Display LED x 2 (80 Port Post Code Indicator)
- I2C: x 1
- Expansion Interface: SMBus, LPC/eSPI slot

---

Note: All specifications are subject to change without notice.
**Block Diagram**  
Unit: mm

**Dimension**  
Unit: mm

**Packing List**
- COM Port Cable x 2
- ECB-980A-A10 x 1

**Ordering Information**
- ECB-980A-A10-0001
  COM HPC Client Carrier. Size A/B/C. HDMI. DP. 2GbE. 3USB (Type C). 2SATA. PCIe. ATX. A1.0

---

Note: All specifications are subject to change without notice.
05

EPIC Boards
EPIC-ADS7

EPIC Board with 12th Generation Intel® Core™ i-S series Processor (Socket type)

Features
- 12th Gen. Intel® Core™ Series Processor
- DDR5 SODIMM x 2 (up to 64GB, 4800 MT/s)
- HDMI 2.0b x 1, DP++ 1.4a x 2, LVDS (Dual Channel) or eDP x 1
- SATA3 x 2
- RJ45 (2.5GbE) x 1, RJ45 (Gbe) x 1
- USB3.2 Gen2x2 (Type C) x 1, USB3.2 Gen2 x 4, USB2.0 x 4
- M.2 3052 B-key x 1, M.2 2280 M-key x 1, M.2 2230 E-key x 1
- PCIe Gen5 [x8] slot x 1, PCIe Gen3 [x4] FPC slot x 1
- COM Port x 4, DIO 8 bit x 1, DC+12V

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>4&quot; EPIC Board</td>
</tr>
<tr>
<td>CPU</td>
<td>12th Generation Intel® Core™ Series Processor (TDP : 35W/65W)</td>
</tr>
<tr>
<td>CPU Frequency</td>
<td>12C/20T (up to 4.8 GHz)</td>
</tr>
<tr>
<td>Chipset</td>
<td>Intel® 600 Series Desktop Chipsets</td>
</tr>
<tr>
<td>Memory Type</td>
<td>DDR5 SODIMM x 2, up to 4800MT/s</td>
</tr>
<tr>
<td>Max. Memory Capacity</td>
<td>Up to 64GB</td>
</tr>
<tr>
<td>BIOS</td>
<td>AMI</td>
</tr>
<tr>
<td>Wake on LAN</td>
<td>Yes</td>
</tr>
<tr>
<td>Watchdog Timer</td>
<td>255 Levels</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>+12V</td>
</tr>
<tr>
<td>Power Supply Type</td>
<td>AT/ATX</td>
</tr>
<tr>
<td>Power Consumption (Typical)</td>
<td>TBD</td>
</tr>
<tr>
<td>Dimensions (L x W)</td>
<td>4.53” x 6.50” (115mm x 165mm)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F – 140°F (0°C – 60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F – 178°F (-40°C – 80°C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>6% – 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>MTBF (Hours)</td>
<td>TBD</td>
</tr>
<tr>
<td>Certification</td>
<td>CE/FCC ClassA</td>
</tr>
</tbody>
</table>

Display
- VGA/LCD Controller: Intel® UHD Graphics 770 / Intel® UHD Graphics 730 (by CPU sku)
- Video Output: Dual Channel (24/48bit) LVDS or eDP x 1, DP++ x 1, LVDS (dual Channel) or eDP x 1
- Backlight Inverter Supply: 12V

I/O
- Ethernet: Intel® i255, 10/100/1000/2500Base, RJ-45 x 1
- Audio Interfaces: Line in / Line Out / Mic (Pin header)

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1253X00063</td>
<td>AC/DC Adapter 100-240V/150W DC JACK</td>
<td>1</td>
</tr>
<tr>
<td>1702031803</td>
<td>Power cord for EU</td>
<td>1</td>
</tr>
<tr>
<td>1702031802</td>
<td>Power cord for US</td>
<td>1</td>
</tr>
<tr>
<td>1702031801</td>
<td>Power cord for UK</td>
<td>1</td>
</tr>
<tr>
<td>170203180D</td>
<td>Power cord for China</td>
<td>1</td>
</tr>
<tr>
<td>1702031811</td>
<td>Power cord for Taiwan</td>
<td>1</td>
</tr>
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</table>

Note: All specifications are subject to change without notice.

www.aaeon.com
Block Diagram

![Block Diagram of EPIC-ADS7](image-url)

**Dimension**  
Unit: mm

![Dimension Diagram of EPIC-ADS7](image-url)

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Chipset</th>
<th>Display</th>
<th>LAN</th>
<th>USB</th>
<th>Rs-232/422/485</th>
<th>Storage</th>
<th>Expansion Slot</th>
<th>TPM</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPIC-ADS7-A10-TBD (sku1)</td>
<td>12th Gen Intel(R) Core(TM) Processor LGA 1700</td>
<td>Intel(R) 600 Series Chipset PCH R680E Q670E H610E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPIC-ADS7-A10-TBD (sku2)</td>
<td>12th Gen Intel(R) Core(TM) Processor LGA 1700</td>
<td>Intel(R) 600 Series Chipset PCH R680E Q670E H610E</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>EPIC-ADS7-A10-TBD (sku3)</td>
<td>12th Gen Intel(R) Core(TM) Processor LGA 1700</td>
<td>Intel(R) 600 Series Chipset PCH R680E Q670E H610E</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.

www.aaeon.com
EPIC-ADS7-PUC
EPIC System with 12th Generation Intel® Core™ Processor

Features
- 12th Generation Intel® Core™ Processor
- DDR5 SODIMM x 2, up to 32GB
- 3 Simultaneous Displays: DP 1.4a x 2, HDMI 2.1 x 1
- SATA III x 2 (2.5” SSD x 2)
- 2.5GbE x 1, GbE x 3
- USB 3.2 Gen 2 x 2 (Type-C x 1), USB 3.2 Gen 2 x 4, USB 2.0 x 2
- M.2 3052 B-Key x 1, M.2 2280 M-Key x 1, M.2 2230 E-Key x 1
- COM Port x 2, DIO 8-bit x 1
- DC Jack 12V in

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>EPIC System</td>
<td></td>
</tr>
<tr>
<td>CPU</td>
<td>12th Generation Intel® Core™ Series Processor, up to 65W</td>
<td></td>
</tr>
<tr>
<td>CPU Frequency</td>
<td>Up to i7-12700E, up to 4.8GHz</td>
<td></td>
</tr>
<tr>
<td>Memory Type</td>
<td>DDR5 4800 SODIMM x 2</td>
<td></td>
</tr>
<tr>
<td>Max. Memory Capacity</td>
<td>up to 32GB (Each SODIMM up to 16GB)</td>
<td></td>
</tr>
<tr>
<td>BIOS</td>
<td>UEFI</td>
<td></td>
</tr>
<tr>
<td>Wake on LAN</td>
<td>Yes (I219LM + I225LM RJ-45 support only)</td>
<td></td>
</tr>
<tr>
<td>Watchdog Timer</td>
<td>255 Levels</td>
<td></td>
</tr>
<tr>
<td>Power Requirement</td>
<td>DC in +12V</td>
<td></td>
</tr>
<tr>
<td>Power Supply Type</td>
<td>AT/ATX</td>
<td></td>
</tr>
<tr>
<td>Power Consumption (Typical)</td>
<td>with i7-12700E CPU + R680E Chipset Peak : +12V/0.15A, 217.8W during 100% loading test Steady State : +12V/0.11.15A, 133.8W</td>
<td></td>
</tr>
<tr>
<td>Dimension (L x W)</td>
<td>10.2” x 6.3” x 2.1” (260mm x 160mm x 55mm)</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 122°F (-3°C ~ 50°C) with 0.5 m/s airflow</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F ~ 122°F (-40°C ~ 80°C)</td>
<td></td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
<td></td>
</tr>
<tr>
<td>MTBF (Hours)</td>
<td>380,264</td>
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<tr>
<td>Certification</td>
<td>CE/FCC Class A, LVD</td>
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</table>

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>12530006X3</td>
<td>AC/DC Adapter.100-240V/150W DC JACK</td>
<td>1</td>
</tr>
<tr>
<td>1702001803</td>
<td>Power cord for EU</td>
<td>1</td>
</tr>
<tr>
<td>1702001802</td>
<td>Power cord for US</td>
<td>1</td>
</tr>
<tr>
<td>1702001802J</td>
<td>Power cord for UK</td>
<td>1</td>
</tr>
<tr>
<td>1702001805E</td>
<td>Power cord for Japan</td>
<td>1</td>
</tr>
<tr>
<td>1702001805B</td>
<td>Power cord for China</td>
<td>1</td>
</tr>
<tr>
<td>1702001811</td>
<td>Power cord for Taiwan</td>
<td>1</td>
</tr>
<tr>
<td>EPIC-ADS7-FAN01</td>
<td>CPU cooler for EPIC-ADS7 series use</td>
<td>1</td>
</tr>
</tbody>
</table>

Packing List
- EPIC-ADS7-PUC x 1
- SATA Cable x 2
- SATA Power Cable x 2
- Screw, thermal pads and accessories kit x 1
- CPU Cooler Backplate x 2

*(Please note that the packing list may be different based on SKU, check order information or contact AAEON if any question.)

Note: All specifications are subject to change without notice.
**EPIC Boards**

**Block Diagram**

![Block Diagram](image)

**Dimension**

Unit: mm

![Dimension](image)

**HSIO Function Table Matrix**

<table>
<thead>
<tr>
<th>Sku</th>
<th>SATA3</th>
<th>USB3.2 Gen2 x 2 Type C</th>
<th>USB3.2 Type A</th>
<th>M.2 3002 B key</th>
<th>M.2 2280 M key</th>
<th>M.2 2230 E key</th>
<th>Ethernet (RJ45)</th>
<th>TCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>R680E sku</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes (2 ports)</td>
</tr>
<tr>
<td>Q670E sku</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes (2 ports)</td>
</tr>
<tr>
<td>H610E sku</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes (2 ports)</td>
</tr>
</tbody>
</table>

*Note: EPIC-ADS7-PUC-A11-0003 & 0004 (Barebone) don't include CPU Cooler inside, please order EPIC-ADS7-FAN01 together with barebone to achieve the best performance.*

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Chipset</th>
<th>Fanless</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-422/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Power Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPIC-ADS7-PUC-A11-0003 (Barebone)</td>
<td>Socket Type (LGA1700)</td>
<td>R680E</td>
<td>4 Pin-FAN Connector</td>
<td>DP = 1.4a x 2</td>
<td>SATA 3 x 2</td>
<td>2.5Gbe (RJ45) x 1</td>
<td>USB3.2 Gen2 (Type A) x 4, USB2.0 (Type A) x 2</td>
<td>---</td>
<td>2</td>
<td>M.2 2280 M key x 1 (with Nano SIM Slot)</td>
<td>+12V DC</td>
<td>+12V DC</td>
<td>50°F – 122°F (0°C – 50°C)</td>
</tr>
<tr>
<td>EPIC-ADS7-PUC-H610E (Barebone)</td>
<td>Socket Type (LGA1700)</td>
<td>H610E</td>
<td>4 Pin-FAN Connector</td>
<td>DP = 1.4a x 2</td>
<td>SATA 3 x 2</td>
<td>2.5Gbe (RJ45) x 1</td>
<td>USB3.2 Gen2 (Type A) x 4, USB2.0 (Type A) x 2</td>
<td>---</td>
<td>2</td>
<td>M.2 2280 M key x 1 (with Nano SIM Slot)</td>
<td>+12V DC</td>
<td>+12V DC</td>
<td>50°F – 122°F (0°C – 50°C)</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Specifications

**System**
- Form Factor: 4" EPIC Board
- CPU: 11th Generation Intel® 11th Xeon™ / Core™ Processor
- CPU Frequency: Xeon W-11865MRE (8C/16T, 2.60GHz, up to 4.70GHz)
  - i7-11850HE (8C/16T, 2.60GHz, up to 4.70GHz)
  - i5-11500HE (6C/12T, 2.60GHz, up to 4.50GHz)
  - i3-11100HE (4C/8T, 2.40GHz, up to 4.40GHz)
  - Celeron 6600HE (2C/2T, 2.60GHz)
- Chipset: Intel® 500 Series Mobile Chipset (RM590E / HM570E)
- Memory Type: DDR4 3200 SODIMM x 2 (ECC supported by Xeon only)
- Max. Memory Capacity: Up to 64GB
- BIOS: AMI
- Wake on LAN: Yes
- Watchdog Timer: 255 Levels
- Power Requirement: +9-24V
- Power Supply Type: AT/ATX
- Power Consumption (Typical): 12V@32A with Xeon W-11865MRE, with 100% full loading steady status.
- Dimension (L x W): 4.53" x 6.50" (115mm x 165mm)
- Operating Temperature: 32°F ~ 140°F (0°C ~ 60°C)
- Storage Temperature: -40°F ~ 176°F (-40°C ~ 80°C)
- Operating Humidity: 0% ~ 90% relative humidity, non-condensing
- MTBF (Hours): —
- Certification: CE/FCC ClassA

**Display**
- VGA/LCD Controller: Intel® UHD Graphics for 11th Gen Intel® Processors
- Video Output: Dual Channel 24/48bit LVDS (Default) or eDP x 2, HDMI x 1, DP +2 x 1
- Backlight Inverter Supply: 12V/5V (Default : 5V)

**I/O**
- Ethernet: Intel® i225, 10/100/1000/2500Base, RJ-45 x 1
- Audio: Realtek ALC269 (2W Amplifier)

**Features**
- 11th Gen. Intel Xeon / Core Processor
- DDR4 3200 SODIMM x 2 , up to 64GB
- HDMI 2.0b x 1 , DP++ 1.2a x 2 , LVDS (dual Channel) or eDP x 1, VGA x 1
- SATA3 x 2
- RJ45 (2.5GbE) x 1, RJ45 (GbE) x 1
- USB3.2 Gen2 x 4, USB2.0 x 4
- M.2 3052 B key x 1 , M.2 2280 M key x 1, MiniCard x 1
- PCIe Gen4 [x8] slot x 1, PCIe [x4] by FPC slot x 1
- COM Port x 6 , DIO 16 bit x 1
- Support +9V to +24Vin (Wide Voltage Input)

**Packaging List**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPIC-TGH7</td>
<td>EPIC-TGH7 Board</td>
<td>1</td>
</tr>
<tr>
<td>9707ECDD01</td>
<td>Screw kit</td>
<td>1</td>
</tr>
</tbody>
</table>

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1701000151</td>
<td>VGA cable 15cm</td>
<td>1</td>
</tr>
<tr>
<td>1702100155</td>
<td>SATA power cable 15cm</td>
<td>2</td>
</tr>
<tr>
<td>1709020150</td>
<td>SATA cable 15cm</td>
<td>2</td>
</tr>
<tr>
<td>1700000231</td>
<td>Dual COM cable 30cm</td>
<td>3</td>
</tr>
<tr>
<td>170204101R</td>
<td>Double 4P power cable 10cm</td>
<td>1</td>
</tr>
<tr>
<td>1700002007</td>
<td>Front panel cable 10cm</td>
<td>1</td>
</tr>
<tr>
<td>1700000156</td>
<td>Audio cable 25cm</td>
<td>1</td>
</tr>
<tr>
<td>1700000525</td>
<td>USB2.0/4 Cable, 25cm</td>
<td>1</td>
</tr>
<tr>
<td>EPIC-TGH7-FAN01</td>
<td>CPU cooler 60<em>60</em>31.6mm with Backplane, for EPIC-TGH7 Use</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Block Diagram

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/RS-232/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPIC-TGH7-A10-0001</td>
<td>W-11865MRE (with HM570E PCH)</td>
<td>DDR4 SODIMM x 2</td>
<td>Fan</td>
<td>LVDS x 1, DP x 2, HDMI x 1, VGA x 1</td>
<td>SATA 3 x 2</td>
<td>2.5GBE x 1, GbE x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>USB 2.0 x 4</td>
<td>M.2 B key 3052 x 1, M.2 M key 2280 x 1, Mini Card (Half Size) x 1</td>
<td>+9V to +24V</td>
<td>0°C ~ 65°C</td>
<td>Audio, DIO x 16 NanoSIM x 1 Touch</td>
</tr>
<tr>
<td>EPIC-TGH7-A10-0002</td>
<td>i7-11850HE (with HM570E PCH)</td>
<td>DDR4 SODIMM x 2</td>
<td>Fan</td>
<td>LVDS x 1, DP x 2, HDMI x 1, VGA x 1</td>
<td>SATA 3 x 2</td>
<td>2.5GBE x 1, GbE x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>USB 2.0 x 4</td>
<td>M.2 B key 3052 x 1, M.2 M key 2280 x 1, Mini Card (Half Size) x 1</td>
<td>+9V to +24V</td>
<td>0°C ~ 65°C</td>
<td>Audio, DIO x 16 NanoSIM x 1 Touch</td>
</tr>
<tr>
<td>EPIC-TGH7-A10-0003</td>
<td>i5-11500HE (with HM570E PCH)</td>
<td>DDR4 SODIMM x 2</td>
<td>Fan</td>
<td>LVDS x 1, DP x 2, HDMI x 1, VGA x 1</td>
<td>SATA 3 x 2</td>
<td>2.5GBE x 1, GbE x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>USB 2.0 x 4</td>
<td>M.2 B key 3052 x 1, M.2 M key 2280 x 1, Mini Card (Half Size) x 1</td>
<td>+9V to +24V</td>
<td>0°C ~ 65°C</td>
<td>Audio, DIO x 16 NanoSIM x 1 Touch</td>
</tr>
<tr>
<td>EPIC-TGH7-A10-0004</td>
<td>i3-11100HE (with HM570E PCH)</td>
<td>DDR4 SODIMM x 2</td>
<td>Fan</td>
<td>LVDS x 1, DP x 2, HDMI x 1, VGA x 1</td>
<td>SATA 3 x 2</td>
<td>2.5GBE x 1, GbE x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>USB 2.0 x 4</td>
<td>M.2 B key 3052 x 1, M.2 M key 2280 x 1, Mini Card (Half Size) x 1</td>
<td>+9V to +24V</td>
<td>0°C ~ 65°C</td>
<td>Audio, DIO x 16 NanoSIM x 1 Touch</td>
</tr>
</tbody>
</table>
EPIC System with 11th Generation Intel® Xeon/Core™ Processor

Features
- Onboard 11th Gen. Intel® Xeon / Core™ Processor
- DDR4 3200 SODIMM x 2 (up to 64GB)
- HDMI 2.0b x 1, DP++ 1.2a x 2, VGA x 1
- SATA3 x 2 (up to 2.5" SSD x 2 containable)
- RJ45 (2,5Gbe) x 1, RJ45 (GbE) x 3
- USB3.2 Gen2 x 4, USB2.0 x 2
- M.2 3052 B key x 1, M.2 2280 M key x 1, Mini Card (Half size) x 1
- COM Port x 2, DIO 16 bit x 1
- DC Jack 9V to 24V

Specifications

System
Form Factor 4" EPIC System
CPU 11th Generation Intel® Xeon / Core™ Processor
  Xeon W-11865MRE (8C/16T, 2.60GHz, up to 4.70GHz)
  (7-11850HRE (8C/16T, 2.60GHz, up to 4.70GHz)
  (5-11500HE (8C/12T, 2.60GHz, up to 4.50GHz)
  (3-11000HE (8C/8T, 2.40GHz, up to 4.40GHz)
CPU Frequency Up to 4.70 GHz
Chipset Intel® 500 Series Chipsets
Memory Type DDR4 3200 SODIMM x 2
Max. Memory Capacity up to 64GB
BIOS UEFI
Wake on LAN Yes
Watchdog Timer 255 Levels
Power Requirement +9V to +24V
Power Supply Type AT/ATX, DC Jack Connector
Power Consumption (Typical) TBD

Display
VGA/LCD Controller Intel® UHD Graphics for 11th Gen. Intel Processor
Video Output DP + 1.2a x 2, HDMI 2.0b x 1, VGA x 1
4 Simultaneous Displays
Backlight Inverter Supply —

I/O
Ethernet
  Intel® I211AT, 10/100/1000Base, RJ45 x2
  Intel® I219LM, 10/100/1000Base, RJ45 x1
  Intel® I225LM, 10/100/2500Base, RJ45 x1
Audio —
USB Port
  USB3.2 Gen 2 (Type A) x 4,
  USB2.0 (Type A) x 2
Serial Port
  COM RS232/422/485 x 2
Parallel Port (printer port) —

HDD Interface —
SSD SATA III x 2 (2.5" SSD x 2 containable)
+5V SATA Power Connector x 1 (Total up to +5V/0A limitation for 2 SATA SSD use)
Expansion Slot
  M.2 3052 B key x 1
  M.2 2280 M key x 1
  Mini Card (Half Size) x 1
DIO 16 bits
TPM TPM 2.0
Touch —
SIM NanoSIM x 1

Optional Accessories
Part Number Description QTY
1255300063 AC/DC Adapter 100-240V/150W DC JACK 1
1720201803 Power cord for EU 1
1720201802 Power cord for US 1
1720201801 Power cord for UK 1
1720201806 Power cord for Japan 1
1720201808 Power cord for China 1
1720201811 Power cord for Taiwan 1

Packing List
- EPIC-TGH7-PUC x 1

Note: All specifications are subject to change without notice.
Block Diagram

11th Gen Intel® Core™ Processor

Intel® 500 Series Mobile Chipset

Super I/O

Ordering Information
- TBD

Note: All specifications are subject to change without notice.
www.aaeon.com
**EPIC-KBS9**

EPIC Board with 6th/7th Generation Intel® Core™ i-S series Processor (Socket Type)

---

**Features**
- 6th/7th Generation Intel® Core™ i-S series Processor (Socket Type)
- DDR4 (Non-ECC) SODIMM x 2, 2133MHz, up to 32G
- VGA (Internal)/HDMI Display
- USB 3.2 Gen 1 x 2 (Rear IO), USB 2.0 x 2 (Internal)
- mSATA/Mini-PCIe Full Size x 1 (Default: mSATA, Optional for Mini-PCIe by BOM Change)
- Audio Codec with Amp, SATA 6.0 Gb/s x 2, GPIO x 8, RS-232/422/485 x 2 (Internal)
- 12V Only

---

**Specifications**

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>4&quot; EPIC Board</td>
</tr>
<tr>
<td>CPU</td>
<td>CPU Socket Type</td>
</tr>
<tr>
<td>CPU Frequency</td>
<td>6th/7th Generation Intel® Core™ i3/i5/i7/Celeron® (Support up to 65W SKU)</td>
</tr>
<tr>
<td>Chipset</td>
<td>H110/Q170 (6W)</td>
</tr>
<tr>
<td>Memory Type</td>
<td>DDR4 (Non-ECC) SODIMM x 2, 2133MHz, up to 32G</td>
</tr>
<tr>
<td>Max. Memory Capacity</td>
<td>Up to 32GB</td>
</tr>
<tr>
<td>BIOS</td>
<td>AMI</td>
</tr>
<tr>
<td>Wake on LAN</td>
<td>Yes</td>
</tr>
<tr>
<td>Watchdog Timer</td>
<td>255 Levels</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>+12V, AT/ATX</td>
</tr>
<tr>
<td>Power Supply Type</td>
<td>AT/ATX</td>
</tr>
<tr>
<td>Power Consumption (Typical)</td>
<td>Power consumption: <a href="mailto:12V@7.2A">12V@7.2A</a>, total 86W (with i7-7700U, during 100% loading)</td>
</tr>
<tr>
<td>Dimension (L x W)</td>
<td>4.53&quot; x 6.50&quot; (115 mm x 165 mm)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F ~ 178°F (40°C ~ 80°C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>5% ~ 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>MTBF (Hours)</td>
<td>135,399 Hours</td>
</tr>
<tr>
<td>Certification</td>
<td>CE/FCC</td>
</tr>
</tbody>
</table>

**Display**

| VGA/LED Controller      | 6th/7th Generation Intel® Core™ i3/i5/i7/Celeron®                           |
| Video Output            | HDMI (Rear), VGA (Internal Only)                                            |
| Backlight Inverter Supply | —                             |

**I/O**

| Ethernet                | Intel® i211 Gigabit Ethernet x 4                                           |
| Audio                   | ALC269 (With Amp)                                                          |
| USB Port                | USB 3.2 Gen 1 x 2 (Real IO) USB2.0 x 2 (Internal)                           |
| Serial Port             | COM x 2 (All Internal), RS-232/422/485                                     |
| Parallel Port (printer port) | —                             |
| HDD Interface           | SATA 3.0 x 2                                                               |
| SSD                     | mSATA x 1 (Full size)                                                      |
| Expansion Slot          | Mini-card x 1 (Full Size) (No SIM) PCIe Type Slot x 1                      |
| DIO                     | 8-bit                                                                      |
| TPM                     | —                                                                          |
| Touch                   | —                                                                          |
| SIM                     | —                                                                          |

---

**Packing List**

- SATA Cable, Length 50cm (1709070500)
- SATA Power Cable, Length 15cm (1702150155)
- Jumper Cap (9657666600)
- EPIC-KBS9

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1702002010</td>
<td>Power Cable (2pin), Length 10cm</td>
<td>1</td>
</tr>
<tr>
<td>1708100254</td>
<td>Audio Cable (3pin), Length 25cm</td>
<td>1</td>
</tr>
<tr>
<td>1700050207</td>
<td>USB Cable (ES), Length 25cm</td>
<td>2</td>
</tr>
<tr>
<td>1701090150</td>
<td>COM Cable (db9), Length 15cm</td>
<td>2</td>
</tr>
<tr>
<td>1704150153</td>
<td>Internal VGA Cable</td>
<td>1</td>
</tr>
<tr>
<td>EPIC-KBS9-FA001</td>
<td>CPU Cooler, for LOA115X, 12VIV PWM, AL, for EPIC-KBS9</td>
<td>1</td>
</tr>
</tbody>
</table>

---

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPIC-KBS9-A10-0001 (H110)</td>
<td>LGA1151 (Socket Type)</td>
<td>DDR4 x 2 (Max 32G)</td>
<td>FAN</td>
<td>HDMI (Real) x 1 VGA (Internal) x 1</td>
<td>SATA x 2</td>
<td>8-bit DIO</td>
<td>2</td>
<td>4</td>
<td>mSATA/MiniCard x 1 (Full) (by BIOS change for mPCIe)</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>Audio, DIO x 8</td>
<td></td>
</tr>
<tr>
<td>EPIC-KBS9-A10-0003 (Q170)</td>
<td>LGA1151 (Socket Type)</td>
<td>DDR4 x 2 (Max 32G)</td>
<td>FAN</td>
<td>HDMI (Real) x 1 VGA (Internal) x 1</td>
<td>SATA x 2</td>
<td>8-bit DIO</td>
<td>2</td>
<td>4</td>
<td>mSATA/MiniCard x 1 (Full) (by BIOS change for mPCIe)</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>Audio, DIO x 8</td>
<td></td>
</tr>
</tbody>
</table>
**EPIC-KBS7**

EPIC Board with 6th/7th Generation Intel® Core™ i-S series Processor (Socket Type)

**Specifications**

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>4” EPIC Board</td>
</tr>
<tr>
<td>CPU</td>
<td>6th/7th Generation CPU (Socket Type, TDP 35W, 54W Only)</td>
</tr>
<tr>
<td>CPU Frequency</td>
<td>6th/7th Generation Intel® Core™ i3/i5/i7/Celeron®</td>
</tr>
<tr>
<td>Chipset</td>
<td>H110, Q170 (6W)</td>
</tr>
<tr>
<td>Memory Type</td>
<td>DDR4 (Non-ECC), 2133MHz</td>
</tr>
<tr>
<td>Max. Memory Capacity</td>
<td>Up to 16GB</td>
</tr>
<tr>
<td>BIOS</td>
<td>AMI</td>
</tr>
<tr>
<td>Wake on LAN</td>
<td>Yes</td>
</tr>
<tr>
<td>Watchdog Timer</td>
<td>255 Levels</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>12V or 9-24V (Default)</td>
</tr>
<tr>
<td>Power Supply Type</td>
<td>AT/ATX</td>
</tr>
<tr>
<td>Power Consumption (Typical)</td>
<td>50W@Full loading</td>
</tr>
<tr>
<td>Dimension (L x W)</td>
<td>4.53” x 6.50” (115mm x 165mm)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F ~ 176°F (-40°C ~ 80°C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>5% ~ 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>MTBF (Hours)</td>
<td>110,000</td>
</tr>
<tr>
<td>Certification</td>
<td>CE/FCC</td>
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</tbody>
</table>

**Display**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VGA/LCD Controller</td>
<td>6th/7th Generation Intel® Core™ i3/i5/i7/Celeron®</td>
</tr>
<tr>
<td>CRT/HD/SD/HD</td>
<td></td>
</tr>
</tbody>
</table>

**Part Number**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700050207</td>
<td>USB Cable (5pin), Length 20cm</td>
<td>2</td>
</tr>
<tr>
<td>1701090150</td>
<td>COM Cable (9pin), Length 15cm</td>
<td>10</td>
</tr>
<tr>
<td>1702002010</td>
<td>Power Cable (2pin), Length 10cm</td>
<td>1</td>
</tr>
<tr>
<td>1708100254</td>
<td>Audio Cable (3pin), Length 25cm</td>
<td>1</td>
</tr>
<tr>
<td>1700500207</td>
<td>USB Cable (5pin), Length 20cm</td>
<td>2</td>
</tr>
</tbody>
</table>

**Features**

- 6th/7th Generation Intel® Core™ i-S series Processor (Socket Type)
- 12V, 9-24V Wide Voltage, Non-ECC DDR4 SODIMM x 1 (Up to 16 GB)
- Basic VGA/HDMI/LVDS Display
- USB 3.2 Gen 1 x 4, USB 2.0 x 2, Good for Machine Vision
- mSATA/Mini-PCIe Full Size x 1 (Default: mSATA, BOM change for H110)
- mSATA/Mini-PCIe Full Size x 1 (Default: mSATA, BIOS Selection for Q170)
- HDA, SATA x 2, GPIO x 8, COM x 4

**Packing List**

- SATA Cable, Length 50cm (1709070500)
- SATA Power Cable, Length 15cm (1702150155)
- Jumper Cap (9657666600)
- EPIC-KBS7

**Optional Accessories**

- EPIC-KBS7-FA001: 79*79*16mm. Silver. Recommended for operating temperature 0°C ~ 60°C (54W/35W)
- EPIC-KBS7-FA002: 60*60*30mm. Silver. Recommended for operating temperature 0°C ~ 50°C (54W)
**Block Diagram**

![Block Diagram](image)

**Dimension**  
Unit: mm

- **EPIC-KBS7-FAN01**
  - Dimensions: (70.40) 1.80 (9.20) 165.00
  - Unit: mm

- **EPIC-KBS7-FAN02**
  - Dimensions: (36.84) 1.80 (9.20) 165.00
  - Unit: mm

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>Display</th>
<th>LVDS</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232 /422/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPIC-KBS7-A10-0001 (Standard, H110)</td>
<td>LGA1151 (Socket Type)</td>
<td>DDR4 (Max 16G)</td>
<td>FAN</td>
<td>VGA + HDMI</td>
<td>—</td>
<td>SATA x 2</td>
<td>GBE x 2</td>
<td>USB 3.2 Gen 1 x 4</td>
<td>1</td>
<td>USB2.0 x 2</td>
<td>mSATA x 1 (Mini PCIe by BOM Change)</td>
<td>9-24V 3°C – 60°C</td>
<td>DIO x 8</td>
<td></td>
</tr>
<tr>
<td>EPIC-KBS7-A10-0002 (Advanced, Q170)</td>
<td>LGA1151 (Socket Type)</td>
<td>DDR4 (Max 16G)</td>
<td>FAN</td>
<td>VGA + LVDS + HDMI</td>
<td>SATA x 2</td>
<td>GBE x 2</td>
<td>USB 3.2 Gen 1 x 4</td>
<td>USB2.0 x 2</td>
<td>2</td>
<td>1</td>
<td>mSATAminiCard x 1</td>
<td>9-24V 3°C – 60°C</td>
<td>Micro-SD, DIO x 8</td>
<td></td>
</tr>
</tbody>
</table>

*BIOS is ready for 6th Gen. and 7th Gen. chipset, please make sure to use the latest BIOS on website.*
EPIC-BT07

EPIC Board with Intel® Atom®/ Celeron® Processor SoC

### Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>4” EPIC Board</td>
</tr>
<tr>
<td>CPU</td>
<td>Intel® Atom® E3845/Celeron® J1900/N2807</td>
</tr>
<tr>
<td>CPU Frequency</td>
<td>Up to 2.0 GHz</td>
</tr>
<tr>
<td>Chipset</td>
<td>Intel® Atom®/ Celeron® SoC</td>
</tr>
<tr>
<td>Memory Type</td>
<td>DDR3L 1333, SODIMM x 1</td>
</tr>
<tr>
<td>Max. Memory Capacity</td>
<td>Up to 8GB</td>
</tr>
<tr>
<td>BIOS</td>
<td>AMI</td>
</tr>
<tr>
<td>Wake on LAN</td>
<td>Yes</td>
</tr>
<tr>
<td>Watchdog Timer</td>
<td>255 Levels</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>4 Pin Connector (Default)</td>
</tr>
<tr>
<td></td>
<td>2-pin Phoenix Connector (Option)</td>
</tr>
<tr>
<td>Power Supply Type</td>
<td>AT/ATX</td>
</tr>
<tr>
<td>Power Consumption (Typical)</td>
<td>12W</td>
</tr>
<tr>
<td>Dimension (L x W)</td>
<td>4.53” x 6.50” (115mm x 165mm)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C) or WiTAS 2 (E3845 sku , -40°C ~ 85°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F ~ 185°F (-40°C ~ 85°C)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>MTBF (Hours)</td>
<td>358,806 hrs</td>
</tr>
<tr>
<td>Certification</td>
<td>CE/FCC</td>
</tr>
</tbody>
</table>

### Display

| VGA/LCD Controller      | Intel® Atom™/ Celeron® SoC       |
| Video Output            | CRT, LVDS, HDMI                  |
| Backlight Inverter Supply | Max. 12V                        |

<table>
<thead>
<tr>
<th>I/O</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td>Intel® i211 Gigabit Ethernet, RJ-45 x 2</td>
</tr>
<tr>
<td>Audio</td>
<td>High Definition Audio Interface</td>
</tr>
<tr>
<td>USB Port</td>
<td>USB 2.0 x 5</td>
</tr>
<tr>
<td></td>
<td>USB 3.2 Gen 1 x 1</td>
</tr>
<tr>
<td>Parallel Port</td>
<td>COM1 x 1</td>
</tr>
<tr>
<td></td>
<td>COM2 x 2</td>
</tr>
<tr>
<td></td>
<td>COM3 x 4</td>
</tr>
<tr>
<td></td>
<td>COM4 x 2</td>
</tr>
<tr>
<td>HDD Interface</td>
<td>SATA 2.0 x 1</td>
</tr>
<tr>
<td></td>
<td>mSATA x 1 (Share with full-size Mini-Card by BOM)</td>
</tr>
</tbody>
</table>

### Expansion Slot

| Full-size mPCIe x 1     |                                  |
| Full size mSATA/mPCIe x 1 | (Default mSATA, select by BOM Change) |
| Micro-SD x 1 (Optional, only E3800 series) |
| PCI-104 x 1 (optional, only E3800 series) |
| 16-bit DIO or LPT       |                                  |
| SMBus x 1, I2C x 1 (optional), PS/2 x 1 |

### Power

| 9 ~ 24VDC Wide Range or 12VDC Power Input |
| SoC Processor on Solder Side Design     |

### Features

- Onboard Intel® Atom™ E3845/ Celeron® J1900, N2807 Processor
- DDR3L 1333MHz SODIMM x 1, Up to 8GB
- Dual Display Configuration: VGA+ LVDS, VGA + HDMI or HDMI + LVDS
- SATA 3.0Gb/s x 1, mSATA/ Mini-Card x 1, Micro-SD Slot x 1 (E3800 Series Only)
- USB 3.2 Gen 1 x 1, USB2.0 x 5, RS-232 x 4, RS-232/242/485 x 2 (COM2, COM3)
- Mini-Card x 1, SIM x 1, PCI-104 (Optional)
- 16-bit Digital IO/LPT, SMBus x 1, I2C (Optional)
- Audio 2CH, 2W Audio Amp., TPM (Optional), Touch Controller (Optional)

### Packing List

- 1709070500 SATA Cable
- 1702150155 SATA Power Cable
- M10BT07010 Heat-Spreader
- EPIC-BT07

### Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>170204010R</td>
<td>2-Pin Power in to 4-Pin Housing Cable</td>
<td>1</td>
</tr>
<tr>
<td>1709100254</td>
<td>Audio Cable</td>
<td>1</td>
</tr>
<tr>
<td>1701260200</td>
<td>DI/O/LPT Cable</td>
<td>1</td>
</tr>
<tr>
<td>1700050207</td>
<td>USB Cable</td>
<td>4</td>
</tr>
<tr>
<td>1700060155</td>
<td>PS/2 KB/Mouse Cable</td>
<td>1</td>
</tr>
<tr>
<td>1700900150</td>
<td>COM Cable</td>
<td>4</td>
</tr>
<tr>
<td>EPIC-BT07-H5010</td>
<td>Metal, Al, Heat Sink, 165<em>85</em>14mm, Silver, EPIC-BT07 (Used with heatspreader)</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
### Ordering Information

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>CPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>Display</th>
<th>LVDS</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Power Temp</th>
<th>Others</th>
</tr>
</thead>
</table>
| EPIC-BT07-A13-0001 | Atom E38xx | DDR3L | Heat Spreader | VGA, HDMI, 2CH LVDS | SATA | 1GB x 2 | 4 | 2 | Mini-Cent 1 | 4-pin Power Connector | 0-60°C | EPIC EPIC-BT07-A13-0001, Audio (2CH), SIM, Option, Touch Controller (Optional), PCI-104
| EPIC-BT07-A13-0002 | Celeron J2900 | DDR3L | Heat Spreader | VGA, HDMI, 2CH LVDS | SATA | 1GB x 2 | 4 | 2 | Mini-Cent 1 | 4-pin Power Connector | 0-60°C | EPIC EPIC-BT07-A13-0001, Audio (2CH), SIM, Option, Touch Controller (Optional), PCI-104
| EPIC-BT07-A13-0003 | Celeron J2900 | DDR3L | Heat Spreader | VGA, HDMI, 2CH LVDS | SATA | 1GB x 2 | 4 | 2 | Mini-Cent 1 | 4-pin Power Connector | 0-60°C | EPIC EPIC-BT07-A13-0001, Audio (2CH), SIM, Option, Touch Controller (Optional), PCI-104
| EPIC-BT07-A13-0005 | Atom E38xx | DDR3L | Heat Spreader | VGA, HDMI, 2CH LVDS | SATA | 1GB x 2 | 4 | 2 | Mini-Cent 1 | 4-pin Power Connector | 0-60°C | EPIC EPIC-BT07-A13-0001, Audio (2CH), SIM, Option, Touch Controller (Optional), PCI-104
| EPIC-BT07-A13-0006 | Atom E38xx | DDR3L | Heat Spreader | VGA, HDMI, 2CH LVDS | SATA | 1GB x 2 | 4 | 2 | Mini-Cent 1 | 4-pin Power Connector | 0-60°C | EPIC EPIC-BT07-A13-0001, Audio (2CH), SIM, Option, Touch Controller (Optional), PCI-104

Note: All specifications are subject to change without notice.

www.aaeon.com
Specifications

**SYSTEM**
- FORM FACTOR: 4” EPIC Board
- CPU: Intel® Atom® x7000E Series/Intel® Processor N Series/Intel® Core™ i3-N305 Processors:
  - Intel® Core™ i3-N305 (8C/8T, up to 3.8 GHz, TDP 15W)
  - Intel® Processor N97 (4C/4T, up to 3.6 GHz, TDP 12W)
  - Intel® Processor N50 (2C/2T, up to 3.4 GHz, TDP 6W)
- CHIPSET: Integrated with Intel® SoC
- MEMORY TYPE: DDR4 3200MHz Single-Channel SODIMM x 1, up to 16GB
- BIOS: UEFI
- WAKE ON LAN: Yes
- WATCHDOG TIMER: 255 Levels
- SECURITY: TPM 2.0 (Optional)
- RTC Battery: Lithium Battery 3V/240mAh
- DIMENSION: 4.53” x 6.50” (115mm x 165mm)
- OS Support: Windows® 10 (64-bit), Ubuntu 22.04.2 LTS/Kernel 5.19

**POWER**
- POWER REQUIREMENT: +9-24V or +12V
- POWER SUPPLY TYPE: AT/ATX
- POWER CONSUMPTION:
  - Intel® Core™ i3-N305, DDR4 16GB, 1.87 A +24V (Typical)
  - Intel® Core™ i3-N305, DDR4 16GB, 2.66A +24V (Max)
- DISPLAY
  - CONTROLLER: Intel® UHD Graphics
  - LVDS/eDP: 24/48-bit Dual-Channel LVDS x 1, up to 1920 x 1080
  - Display Interface:
    - HDMI 1.4 x 1, up to 3840 x 2160 @60Hz
    - DP 1.2 or VGA x 1
    - OP 1.2 x 1, up to 3840 x 2160 @144Hz
    - VGA x 1, up to 1920 x 1080
  - Multiple Display: Up to 3 Simultaneous Displays
- AUDIO
  - CODEC: Realtek ALC897
  - AUDIO INTERFACE: Line-In / Line-Out / MIC
  - Speaker: SW Amp (Optional)
- EXTERNAL I/O
  - ETHERNET: RJ-45 for Intel® I226-V 2.5GbE x 2 (Standard: 2 Ports, Advanced: 4 Ports)
  - USB: USB 3.2 Gen 2 x 2
  - SERIAL PORT: COM 1, COM 2 (RS-232-422-485, support 5V/12V/RI)
  - VIDEO: HDMI 1.4 x 1, DP 1.2 x 1
- INTERNAL I/O
  - USB: USB 2.0 x 4

**SERIAL PORT**
- COM 3, COM 4, COM 5, COM 6 (RS-232, support RI only)

**VIDEO**
- LVDS x 1
- Inverter x 1 (3V/12V/92A)
- SODIMM x 1

**RTC**
- Battery: Lithium Battery 3V/240mAh

**DIMENSION**
- 4.53” x 6.50” (115mm x 165mm)

**ENVIRONMENT & CERTIFICATION**
- OPERATING TEMP: 32°F ~ 140°F (0°C ~ 60°C)
- STORAGE TEMP: -40°F ~ 176°F (-40°C ~ 80°C)
- OPERATING HUMIDITY: 0% ~ 90% relative humidity, non-condensing
- MTBF (HOURS): TBD
- EMC: CE/FCC Class A

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPIC-ADN9-HSK01</td>
<td>Heat sink, 165<em>101.4</em>20mm, Silver</td>
<td>1</td>
</tr>
</tbody>
</table>

Features

- Intel® Atom® x7000E Series, Intel® Processor N Series, and Intel® Core™ i3-N305 Processors
- DDR4 3200MHz SODIMM x 1, up to 16GB
- HDMI 1.4b x 1, Dual-Channel LVDS x 1, DP or VGA x 1
- Full Size mSATA x 1 + SATA III x 1
- Intel® I226-V 2.5GbE x 2 (Optional: Intel® I226-V 2.5GbE x 4)
- USB 3.2 Gen 2 x 2, USB 2.0 x 4
- M.2 2242 B-Key x 1, NanoSIM x 1
- COM Port x 6, GPIO 16-bit x 1
- Supports +9V ~ +24V Wide Voltage Input

Packing List

- EPIC-ADN9 x 1
- Screw kit x 1

Note: All specifications are subject to change without notice.
**Block Diagram**

- DDR4 SO-DIMM
- Intel Atom® x7000E/Processor N Series/Intel® Core™ i3-N305 SoC
- VGA
- HDMI 1.4

**Dimension**

Unit: mm

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Memory</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>COM Port</th>
<th>Expansion</th>
<th>TPM</th>
<th>Power</th>
<th>Operating Temperature</th>
<th>Others</th>
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<tbody>
<tr>
<td>EPIC-ADN9-A10-0001</td>
<td>Intel® Core™ i3-N305</td>
<td>SO-DIMM x 1</td>
<td>LVDS x 1, DP x 1, HDMI x 1</td>
<td>SATA x 1</td>
<td>USB 3.0 Gen 2 x 2, USB 2.0 x 4</td>
<td>RS232/485/426 x 2, RS232 x 4</td>
<td>Full Size mPCIe x 1, Full Size mSATA x 1, M.2 2242 B-key x 1</td>
<td>Optional</td>
<td>+9V to +24V (2 Pin Phoenix Connector)</td>
<td>0°C – 60°C</td>
<td>NanoSIM x 1, GPIO 16 bits</td>
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</tr>
<tr>
<td>EPIC-ADN9-A10-0002</td>
<td>Intel® Atom® x7425E</td>
<td>SO-DIMM x 1</td>
<td>LVDS x 1, DP x 1, HDMI x 1</td>
<td>SATA x 1</td>
<td>USB 3.0 Gen 2 x 2, USB 2.0 x 4</td>
<td>RS232/485/426 x 2, RS232 x 4</td>
<td>Full Size mPCIe x 1, Full Size mSATA x 1, M.2 2242 B-key x 1</td>
<td>Optional</td>
<td>+9V to +24V (2 Pin Phoenix Connector)</td>
<td>0°C – 60°C</td>
<td>NanoSIM x 1, GPIO 16 bits</td>
<td></td>
</tr>
<tr>
<td>EPIC-ADN9-A10-0003</td>
<td>Intel® Processor N97</td>
<td>SO-DIMM x 1</td>
<td>LVDS x 1, DP x 1, HDMI x 1</td>
<td>SATA x 1</td>
<td>USB 3.0 Gen 2 x 2, USB 2.0 x 4</td>
<td>RS232/485/426 x 2, RS232 x 4</td>
<td>Full Size mPCIe x 1, Full Size mSATA x 1, M.2 2242 B-key x 1</td>
<td>Optional</td>
<td>+9V to +24V (2 Pin Phoenix Connector)</td>
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<td>NanoSIM x 1, GPIO 16 bits</td>
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<tr>
<td>EPIC-ADN9-A10-0004</td>
<td>Intel® Processor N50</td>
<td>SO-DIMM x 1</td>
<td>LVDS x 1, DP x 1, HDMI x 1</td>
<td>SATA x 1</td>
<td>USB 3.0 Gen 2 x 2, USB 2.0 x 4</td>
<td>RS232/485/426 x 2, RS232 x 4</td>
<td>Full Size mPCIe x 1, Full Size mSATA x 1, M.2 2242 B-key x 1</td>
<td>Optional</td>
<td>+9V to +24V (2 Pin Phoenix Connector)</td>
<td>0°C – 60°C</td>
<td>NanoSIM x 1, GPIO 16 bits</td>
<td></td>
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<tr>
<td>EPIC-ADN9-A10-0007</td>
<td>Intel® Processor N97</td>
<td>SO-DIMM x 1</td>
<td>LVDS x 1, VGA x 1, HDMI x 1</td>
<td>SATA x 1</td>
<td>USB 3.0 Gen 2 x 2, USB 2.0 x 4</td>
<td>RS232/485/426 x 2, RS232 x 4</td>
<td>Full Size mPCIe x 1, Full Size mSATA x 1, M.2 2242 B-key x 1</td>
<td>Optional</td>
<td>+12VDC</td>
<td>0°C – 60°C</td>
<td>NanoSIM x 1, GPIO 16 bits</td>
<td></td>
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</tbody>
</table>

Note: All specifications are subject to change without notice.
06
SubCompact Boards
### Specifications

**SYSTEM**
- **FORM FACTOR**: 3.5” SubCompact Board
- **CPU**: Intel® 12th Generation Core™/Celeron CPU
  - i7-1270PE (12C/16T, 3.30GHz, up to 4.50GHz, 28W, TDP-up 64W)
  - i7-1265UE (10C/12T, 3.50GHz, up to 4.70GHz, 15W, TDP-up 55W)
  - i5-1250PE (12C/16T, 3.20GHz, up to 4.40GHz, 28W, TDP-up 64W)
  - i3-1220PE (8C/12T, 3.10GHz, up to 4.20GHz, 28W, TDP-up 64W)
  - Celeron® 7305E (5C/5T, 1.00GHz, 15W)
- **CHIPSET**: Integrated with Intel® SoC
- **MEMORY TYPE**: DDR5 4800 MHz, Dual Channel SODIMM x 2, up to 64GB
- **BIOS**: UEFI
- **WATCHDOG TIMER**: 255 Levels
- **RTC BATTERY**: Lithium Battery 3V/240mAh
- **DIMENSION**: 5.75” x 4” (146mm x 101.7mm)
- **OS SUPPORT**: Windows 10/11 (64bit), Linux Ubuntu 22.04/Kernel 5.15
- **POWER REQUIREMENT**: +9-36V or +12V
- **POWER CONSUMPTION**: Intel® Core™ i7-1270 PE, DDR5 32GB x 2, 5.72A@ +12V (TYPICAL), Intel® Core™ i7-1270 PE, DDR5 32GB x 2, 7.95A@ +12V (MAX)
- **DISPLAY INTERFACE**: HDMI 2.1 x 1, up to 8K x 4K@60Hz or 4K@120Hz
- **MULTIPLE DISPLAY**: Up to 4 Simultaneous Displays
- **AUDIO CODEC**: Realtek ALC897
- **AUDIO INTERFACE**: Line-in/Line-out/MIC
- **SPEAKER**: —
- **EXTERNAL I/O**: Ethernet Intel® i219, 10/100/1000Base, Intel® i226, 10/100/1000/2500Base
- **USB**: USB3.2 Gen 2 x 3, USB Type-C x 1 (DP1.4a, P0 5V/3A)
- **SERIAL PORT**: —
- **VIDEO**: HDMI 2.1 x 1, DP1.4a x 1

### Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
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</thead>
<tbody>
<tr>
<td>170204010R</td>
<td>Power Cable, 10cm</td>
<td>1</td>
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<tr>
<td>1700000156</td>
<td>Audio Cable, 25cm</td>
<td>1</td>
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<tr>
<td>1709100108</td>
<td>FRONT PANEL Cable, 10cm</td>
<td>1</td>
</tr>
<tr>
<td>1700000231</td>
<td>COM Port Cable, 30cm</td>
<td>2</td>
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<tr>
<td>170010010D</td>
<td>USB 2.0 Cable, 10cm</td>
<td>1</td>
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</table>

### Packing List

<table>
<thead>
<tr>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENE-ADP6 MB</td>
<td>1</td>
</tr>
</tbody>
</table>

**Note**: All specifications are subject to change without notice.
Note: All specifications are subject to change without notice.
GENESYSM-ADP6

3.5" SubCompact Board System with 12th Generation Intel® Core™ i7/i5/i3/Celeron® Processor SoC

Features

- 12th Gen Intel® Core™ i7/i5/i3/Celeron Processor
- DDR5 4800MHz SO-DIMM x 2, up to 64GB
- DP 1.4 x 1, HDMI 2.0 x 1, Type C DP x 1
- 2.5GbE x 1, GbE x 1, SATA III x 1, DIO x 8bit
- USB 3.2 Gen2 x 3, USB 2.0 x 2, USB Type C x 1
- M.2 2280 M key x 1, M.2 2230 E key x 1, M.2 3052 x 1
- Wide DC Input 9-36V

Specifications

SYSTEM

- FORM FACTOR: 3.5" SubCompact Board System
- CPU: Intel® 12th Generation Core™/Celeron CPU
  - i7-1270PE (12C/16T, 3.30GHz, up to 4.50GHz, TDP 28W, up to 64W)
  - i5-1250PE (12C/16T, 3.20GHz, up to 4.40GHz, TDP 28W, up to 64W)
  - i3-1220PE (8C/12T, 3.10GHz, up to 4.20GHz, TDP 28W, up to 64W)

CHIPSET

- Integrated with Intel® SoC

MEMORY TYPE

- DDR5 4800 MHz, Dual Channel SO-DIMM x 2, up to 64GB

BIOS

- UEFI

WAKE ON LAN

- Yes

WATCHDOG TIMER

- 255 Levels

SECURITY

- TPM2.0 (NPCT750AABYX)
- RTC BATTERY: Lithium Battery 3V/240mAh

DIMENSION

- 7.00" x 5.28" x 1.69" (178mm x 134.1mm x 43mm)

OS SUPPORT

- Windows 10/11 (64bit)
- Linux Ubuntu 20.04/Kernel 5.15

POWER

- POWER REQUIREMENT: +9-36V
- POWER SUPPLY TYPE: ATX

CONNECTOR

- DC Jack Connector

POWER CONSUMPTION

- Intel® Core™ i7-1270 PE, DDR5 32GB x 2, 5.72A@ +12V (TYPICAL)
- Intel® Core™ i7-1270 PE, DDR5 32GB x 2, 7.95A@ +12V (MAX)

DISPLAY

- CONTROLLER: Intel® Xe Graphics
- LVDS/DP

DISPLAY INTERFACE

- HDMI 2.1 x 1, up to 8K x 4K@60Hz or 4K@120Hz
- DP1.4a (Support DP++) x 1, up to 7680 x 4320 60Hz 30bpp
- Type C DP1.4a

MULTIPLE DISPLAY

- Up to 3 Simultaneous Displays

AUDIO

- CODEC: Realtek ALC897
- AUDIO INTERFACE: Line-in/Line-out/MIC
- SPEAKER: —

EXTERNAL I/O

- ETHERNET: Intel® i219, 10/100/1000Base
  - Intel® i226, 10/100/2500Base
- USB: USB3.2 Gen 2 x 3
  - USB Type C x 1 (USB4.0, DP1.4a, PD 5V/3A)
  - USB2.0 x 2

ENVIRONMENT & CERTIFICATION

- OPERATING TEMP.: 32°F ~ 122°F (0°C ~ 50°C) 0.5 m/s air flow
- STORAGE TEMP.: -40°F ~ 185°F (-40°C ~ 85°C)
- OPERATING HUMIDITY: 0% ~ 90% relative humidity, non-condensing
- MTBF (HOURS): 344,735
- EMC: CE/FCC Class A

Optional Accessories

Part Number | Description | QTY per Board
--- | --- | ---
1702031802 | Power Cord (US Type) | 1
1702031803 | Power Cord (Europe Type) | 1
1702031805 | Power Cord (Japan) | 1
1255X00063 | Power Adapter 12V/12.5A 150W w/Lock 1800.DELTA.DPS-150AB-15 | 1
GENESYSM-ADP6-HDD1 | HDD Kit. For GENESYSM-ADP6 | 1
GENESYSM-ADP6-VESA1 | VESA Mount Kit. For GENESYSM-ADP6 | 1
GENESYSM-ADP6-WMT1 | Wall Mount Kit. For GENESYSM-ADP6 | 1

Packing List

<table>
<thead>
<tr>
<th>Description</th>
<th>QTY</th>
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</thead>
<tbody>
<tr>
<td>GENESYSM-ADP6</td>
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</table>

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Fan/Fanless</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/422/485</th>
<th>Expansion Slot</th>
<th>TPM</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENESYSM-ADP6-A10-0001</td>
<td>i7-1270PE</td>
<td>Cooler</td>
<td>HDMI x 1</td>
<td>SATA x 1</td>
<td>USB x 1</td>
<td>USB Type-C</td>
<td>B-Key 3052 x 1</td>
<td>M-Key 2280 x 1</td>
<td>E-Key 2230 x 1</td>
<td>2.0</td>
<td>9~36V</td>
<td>0~50˚C</td>
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<tr>
<td>GENESYSM-ADP6-A10-0002</td>
<td>i5-1250PE</td>
<td>Cooler</td>
<td>HDMI x 1</td>
<td>SATA x 1</td>
<td>USB x 1</td>
<td>USB Type-C</td>
<td>B-Key 3052 x 1</td>
<td>M-Key 2280 x 1</td>
<td>E-Key 2230 x 1</td>
<td>2.0</td>
<td>9~36V</td>
<td>0~50˚C</td>
</tr>
<tr>
<td>GENESYSM-ADP6-A10-0003</td>
<td>i3-1220PE</td>
<td>Cooler</td>
<td>HDMI x 1</td>
<td>SATA x 1</td>
<td>USB x 1</td>
<td>USB Type-C</td>
<td>B-Key 3052 x 1</td>
<td>M-Key 2280 x 1</td>
<td>E-Key 2230 x 1</td>
<td>2.0</td>
<td>9~36V</td>
<td>0~50˚C</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
3.5” SubCompact Board with 11th Generation Intel® Core™ i7/i5/i3/Celeron CPU

**Features**
- DDR4 SODIMM Slot x 2, up to 64GB, support IBECC
- HDMI 2.0b x 1, DP1.4 x 2, Type C DP x 1, LVDS/eDP x 1
- 2.5GbE x 1, GbE x 1
- USB 3.2 Gen2 x 4, USB2.0 x 2, USB Type C x 1
- M.2 2280 M key x 1, M.2 2230 E key x 1
- Wide DC Input 9-36V (Optional: 12V Only)

**Specifications**

**FORM FACTOR**
- 3.5” SubCompact Board

**CPU**
- Intel® 11th Generation Core™/Celeron CPU:
  - i7-1185G7E (4C, 1.8GHz, up to 4.4GHz, TDP-up 28W)
  - i5-1145G7E (4C, 1.5GHz, up to 4.1GHz, TDP-up 28W)
  - i3-1115G4E (2C, 2.2GHz, up to 3.9GHz, TDP-up 28W)
  - Celeron® 6305E (2C, 1.8GHz, TDP 15W)

**CHIPSET**
- Integrated with Intel® SoC

**MEMORY TYPE**
- DDR4 3200MHz, Dual Channel SODIMM x 2, up to 64GB, Support IBECC (select SKUs)

**BIOS**
- UEFI

**WATCHDOG TIMER**
- Yes

**SECURITY**
- TPM2.0

**DIMENSION**
- 5.75” x 4” (146mm x 101.7mm)

**OS SUPPORT**
- Windows 10 (64bit)
- Linux Ubuntu 20.04.2/Kernel 5.8

**POWER REQUIREMENT**
- +9-36V (Optional: +12V)

**POWER SUPPLY TYPE**
- AT/ATX

**CONNECTOR**
- Phoenix 2-pin Connector

**POWER CONSUMPTION**
- Intel® i7-1185G7E, DDR4 3200MHz 32GB x2, 4.96A@ +12V (TYPICAL) [329,884]
- Intel® i7-1185G7E, DDR4 3200MHz 32GB x2, 7.32A@ +12V (MAX)

**DISPLAY INTERFACE**
- HDMI 2.0b x 1, up to 4K x 2K 60Hz
- DP1.4 x 2, up to 4K x 2K 60Hz
- Type C DP1.4a x 1, up to 4K x 2K 60Hz

**MULTIPLE DISPLAY**
- Up to 4 Simultaneous Displays

**AUDIO**
- Realtek ALC897/892

**AUDIO INTERFACE**
- Line-in/Line-out/MIC

**SPEAKER**
- —

**EXTERNAL I/O**
- Intel® i219LM, 10/100/1000Base, RJ-45 x 1
- Intel® i225LM, 10/100/2500Base, RJ-45 x 1

**USB**
- USB3.2 Gen 2 x 4
- USB2.0 x 2

**SERIAL PORT**
- COM1, COM3, COM4 (RS232/422/485)
- COM2 (RS232/422/485, supports 5V/12V/RI)

**VIDEO**
- LVDS/eDP x 1 (Default: LVDS)

**OPERATING TEMP.**
- 32°F ~ 140°F (0°C ~ 60°C), WiTAS1 -4°F ~ 158 °F (-20°C ~ 70°C), WiTAS2 -40°F ~ 185°F (-40°C ~ 85°C)

**STORAGE TEMP.**
- -40°F ~ 185°F (-40°C ~ 85°C)

**OPERATING HUMIDITY**
- 0% ~ 90% relative humidity, non-condensing

**ENVIRONMENT & CERTIFICATION**
- CE/FCC Class A

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY per Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700150155</td>
<td>SATA HDD Power, Cable 15cm</td>
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<td>1702040180</td>
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<td>1700000156</td>
<td>Audio Cable, 25cm</td>
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<tr>
<td>1700000231</td>
<td>COM Port Cable, 30cm</td>
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<tr>
<td>170010010D</td>
<td>USB 2.0 Cable, 10cm</td>
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<tr>
<td>GENE-TGU6-FAN01</td>
<td>CPU Cooler.3600RPM.Smart FAN</td>
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</tr>
<tr>
<td>GENE-TGU6-HSK01</td>
<td>Heatsink</td>
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<tr>
<td>GENE-TGU6-HSP01</td>
<td>HeatSpreader</td>
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**Packing List**

<table>
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<th>Description</th>
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<td>GENE-TGU6 MB</td>
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**Note:** All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Display</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
<th>Storage</th>
<th>Expansion Slot</th>
<th>TPM</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
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<tbody>
<tr>
<td>GENE-TGU6-A10-0011</td>
<td>i7-1185G7E</td>
<td>DP x2, TypeC DP x1</td>
<td>HDMI x1, LVDS x1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>—</td>
<td>M.2 Key 2300 x 1</td>
<td>SATA 1</td>
<td>M.2 M Key 2280 x 1</td>
<td>2.0</td>
<td>0-36V</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8, nano SIM, Touch Controller</td>
</tr>
<tr>
<td>GENE-TGU6-A10-0012</td>
<td>i7-1185G7E</td>
<td>DP x1, TypeC DP x1</td>
<td>HDMI x1, LVDS x1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>—</td>
<td>M.2 Key 2300 x 1</td>
<td>SATA 1</td>
<td>M.32 Key 2280 x 1</td>
<td>—</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8, nano SIM</td>
</tr>
<tr>
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<td>i7-1185G7E</td>
<td>DP x2, TypeC DP x1</td>
<td>HDMI x1, LVDS x1</td>
<td>USB 3.2 Gen 2 x 4</td>
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<td>M.2 Key 2300 x 1</td>
<td>SATA 1</td>
<td>M.2 M Key 2300 x 1</td>
<td>2.0</td>
<td>0-36V</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8, nano SIM, Touch Controller</td>
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<td>M.2 Key 2300 x 1</td>
<td>SATA 1</td>
<td>M.32 Key 2280 x 1</td>
<td>2.0</td>
<td>0-36V</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8, nano SIM</td>
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<td>i7-1185G4E</td>
<td>DP x2, TypeC DP x1</td>
<td>HDMI x1, LVDS x1</td>
<td>USB 3.2 Gen 2 x 4</td>
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<td>M.2 Key 2300 x 1</td>
<td>SATA 1</td>
<td>M.2 M Key 2280 x 1</td>
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<td>0-36V</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8, nano SIM, Touch Controller</td>
</tr>
<tr>
<td>GENE-TGU6-A10-0016</td>
<td>i7-1185G4E</td>
<td>DP x1, TypeC DP x1</td>
<td>HDMI x1, LVDS x1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>—</td>
<td>M.2 Key 2300 x 1</td>
<td>SATA 1</td>
<td>M.2 M Key 2300 x 1</td>
<td>2.0</td>
<td>0-36V</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8, nano SIM, Touch Controller</td>
</tr>
<tr>
<td>GENE-TGU6-A10-0017</td>
<td>Celeron 6305E</td>
<td>DP x2, TypeC DP x1</td>
<td>HDMI x1, LVDS x1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>—</td>
<td>M.2 Key 2300 x 1</td>
<td>SATA 1</td>
<td>M.2 M Key 2300 x 1</td>
<td>2.0</td>
<td>0-36V</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8, nano SIM</td>
</tr>
<tr>
<td>GENE-TGU6W1-A10-0012</td>
<td>i7-1185G7E</td>
<td>DP x2, TypeC DP x1</td>
<td>HDMI x1, LVDS x1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>—</td>
<td>M.2 Key 2300 x 1</td>
<td>SATA 1</td>
<td>M.2 M Key 2280 x 1</td>
<td>—</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8, nano SIM</td>
</tr>
<tr>
<td>GENE-TGU6W2-A10-0018</td>
<td>i7-1185G8E</td>
<td>DP x3, TypeC DP x1</td>
<td>HDMI x1, LVDS x1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>—</td>
<td>M.2 Key 2300 x 1</td>
<td>SATA 1</td>
<td>M.32 Key 2280 x 1</td>
<td>12V</td>
<td>0-40°C</td>
<td>-20°C ~ 70°C</td>
<td>DIO x 8, nano SIM</td>
</tr>
</tbody>
</table>
GENEYSYM-TGU6
3.5” SubCompact Board System with 11th Generation Intel® Core™ i7/i5/i3/Celeron CPU

Features
- 11th Gen Intel® Core™ i7/i5/i3/Celeron Processor
- DDR4 SODIMM x 2, up to 64GB
- DP 1.4a x 2, HDMI 2.0b x 1, Type C DP x 1
- 2.5GBE x 1, GbE x 1, SATA III x 1, DIO x 8bit
- USB 3.2 Gen2 x 4, USB 2.0 x 2, USB Type C x 1
- M.2 2280 M key x 1, M.2 2230 E key x 1, Full size mSATA/mPCIe x 1
- Wide DC Input 9-36V
- Line-in/Line-out/MIC (Optional)

Specifications

SYSTEM
FORM FACTOR 3.5” SubCompact Board System

CPU
Intel® 11th Generation Core™/Celeron CPU
- i7-1185G7E (4C/8T, 1.80GHz, up to 4.40GHz, TDP-up 28W)
- i5-1145G7E (4C/8T, 1.50GHz, up to 4.10GHz, TDP-up 28W)
- i3-1115G4E (2C/4T, 2.20GHz, up to 3.90GHz, TDP-up 28W)
- Celeron® 6305E (2C/2T, 1.80GHz, TDP 15W)

CHIPSET
Integrated with Intel® SoC

MEMORY TYPE
DDR4 up to 3200MHz, Dual Channel SODIMM x 2, up to 64GB, Support IBECC (select SKUs)

BIOS
UEFI

WAKE ON LAN
Yes

WATCHDOG TIMER
255 Levels

SECURITY
TPM 2.0

RTC Battery
Lithium Battery 3V/240mAh

DIMENSION
7.00” x 5.28” x 1.97” (178.0mm x 134.1mm x 50.0mm)

OS Support
Windows 10 (64bit)
Linux Ubuntu 20.04.3 (IOT)/Kernel 5.13

POWER
POWER REQUIREMENT
+9-36V (Optional: +12V)

POWER SUPPLY TYPE
ATX

CONNECTOR
DC Jack Connector

POWER CONSUMPTION
Intel® i7-1185G7E, DDR4 3200MHz 32GB x 2, 4.96A@ +12V (TYPICAL)
Intel® i7-1185G7E, DDR4 3200MHz 32GB x 2, 7.32A@ +12V (MAX)

DISPLAY
CONTROLLER
Intel® Iris® Xe Graphics

LVDS/eDP
- 

Display Interface
HDMI 2.0b x 1
DP 1.4a x 2
Type-C DP 1.4a x 1

Multiple Display
Up to 4 Simultaneous Displays

AUDIO
CODEC
Realtek ALC897/892

AUDIO INTERFACE
Line-in/Line-out/MIC (Optional)

Speaker
- 

EXTERNAL I/O
ETHERNET
Intel® i219, 10/100/1000Base.RJ-45 x 1
Intel® i225/226, 10/100/2500Base.RJ-45 x 1

Packaging List
- GENESYSM-TGU6 x 1

Optional Accessories
- GENESYSM-TGU6-HDD1
- GENESYSM-TGU6-VESA1
- GENESYSM-TGU6-WMT1

Note: All specifications are subject to change without notice.
Block Diagram

Dimension Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>Fan/Fanless</th>
<th>Display</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/422/485</th>
<th>Storage</th>
<th>Expansion slot</th>
<th>TPM</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENESYSM-TGU6-A10-0001</td>
<td>i7-1185G7E</td>
<td>Cooler</td>
<td>DP x 2</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2</td>
<td>SATA 1</td>
<td>M.2 M Key 2280</td>
<td>2.0</td>
<td>9~36V</td>
<td>0~50˚C</td>
<td>nano SIM</td>
</tr>
<tr>
<td>GENESYSM-TGU6-A10-0002</td>
<td>i5-1145G7E</td>
<td>Cooler</td>
<td>DP x 2</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2</td>
<td>SATA 1</td>
<td>M.2 M Key 2280</td>
<td>2.0</td>
<td>9~36V</td>
<td>0~50˚C</td>
<td>nano SIM</td>
</tr>
<tr>
<td>GENESYSM-TGU6-A10-0003</td>
<td>i3-1115G4E</td>
<td>Cooler</td>
<td>DP x 2</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2</td>
<td>SATA 1</td>
<td>M.2 M Key 2280</td>
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<td>9~36V</td>
<td>0~50˚C</td>
<td>nano SIM</td>
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<td>Celeron® 6305E</td>
<td>Cooler</td>
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<td>GbE x 1</td>
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<td>2</td>
<td>SATA 1</td>
<td>M.2 M Key 2280</td>
<td>2.0</td>
<td>9~36V</td>
<td>0~50˚C</td>
<td>nano SIM</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
## Specifications

**SYSTEM**
- **FORM FACTOR**: 3.5” SubCompact Board
- **CPU**: Intel® 10th Generation Core™/Pentium®/Celeron® processor:
  - i7-10700TE (8C/16T, 2.00 GHz, up to 4.40 GHz, TDP-up 35W)
  - i5-10500TE (6C/12T, 2.30 GHz, up to 3.70 GHz, TDP-up 35W)
  - i3-10100TE (4C/8T, 2.30 GHz, up to 3.60 GHz, TDP-up 35W)
  - G6400TE (2C/4T, 3.20 GHz, TDP-up 35W)
  - G5900TE (2C/2T, 3.00 GHz, TDP-up 35W)
- **CHIPSET**: Intel® Q470E / H420E / Q470
- **MEMORY TYPE**: DDR4 up to 2933MHz Dual Channel,SODIMM x 2,up to 64GB,Non-ECC
- **BIOS**: UEFI
- **WATCHDOG TIMER**: 255 Levels
- **RTC BATTERY**: Lithium Battery 3V/240mAH
- **DIMENSION**: 5.75” x 4” (146mm x 101.7mm)
- **OS SUPPORT**: Windows 10 (64bit)
- **POWER REQUIREMENT**: +12V
- **POWER SUPPLY TYPE**: AT/ATX
- **POWER CONSUMPTION**: Intel® i7-10700TE, DDR4 3200Mhz 32GB x2, 5.64A @ +12V (Typical)
- **DISPLAY**
  - **CONTROLLER**: Intel® HD Graphics 610/630
  - **LVDS/eDP**: LVDS Dual Channel 18/24bit x 1, up to 1920 x 1080
  - **MULTIPLE DISPLAY**: 3 Simultaneous Displays
- **AUDIO**
  - **CODEC**: Realtek ALC897/892
  - **AUDI0 INTERFACE**: Line-in/Line-out/MIC
  - **SPEAKER**: —
- **EXTERNAL I/O**
  - **ETHERNET**: Intel® i210/i211.10/100/1000Base, RJ45 x1
  - **USB**: USB3.2 Gen 2 x 2 (Gen 2 for G470/G470E only)
- **SERIAL PORT**: COM1, COM2 (RS232/422/485, supports 5V/12V/Rl)
- **VIDEO**: LVDS x 1
- **SATA**: SATA III x 2 +5V SATA Power Connector x 1
- **AUDIO**: Audio Header x 1
- **DIO/GPIO**: 8-bit
- **SMBus/I2C**: I2C/SMBus x 1 (Default: I2C)
- **TOUCH**: —
- **FAN**: 4pins Smart Fan x1
- **SIM**: —
- **FRONT PANEL**: HDD LED, PWR LED, Power Button, Buzzer, Reset
- **OTHERS**: FPC x 1 (For Q470/Q 470E only)
- **EXPANSION**
  - **Mini PCI-EmSATA**: —
  - **M.2**: M-Key 2280 x 1 (PCIe x4,SATA)
  - **OTHERS**: —
- **ENVIRONMENT & CERTIFICATION**
  - **OPERATING TEMP.**: 32°F ~ 140°F (0°C ~ 60°C)
  - **STORAGE TEMP.**: -40°F ~ 176°F (-40°C ~ 80°C)
  - **OPERATING HUMIDITY**: 0% ~ 90% relative humidity, non-condensing
  - **MTBF (HOURS)**: 380,571
  - **EMC**: CE/FCC Class A

### Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY per Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>1709070460</td>
<td>SATA Cable, W/LOCK, 46cm</td>
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<tr>
<td>1702150155</td>
<td>Power Cable, 15cm</td>
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<tr>
<td>170010010D</td>
<td>USB Cable, 10cm</td>
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<tr>
<td>1701090122</td>
<td>COM Cable, 12cm</td>
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<tr>
<td>1709100254</td>
<td>Audio Jack Cable, 25cm</td>
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### Packing List

<table>
<thead>
<tr>
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<th>Description</th>
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<td>TH1CM5010</td>
<td>CPU Cooler</td>
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<tr>
<td>TH6CM5010</td>
<td>CPU Cooler Backplate</td>
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Note: All specifications are subject to change without notice.
**Block Diagram**

**Dimension**
Unit: mm

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>PCH</th>
<th>Display</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/422/485</th>
<th>Storage</th>
<th>Expansion slot</th>
<th>TPM</th>
<th>Power</th>
<th>Operating Temp</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENE-CML5-A10-0011</td>
<td>FCLGA1400 (Socket Type, TPD up to 35W)</td>
<td>Q470E</td>
<td>DP + x1 VGA 1</td>
<td>QGE x 2</td>
<td>USB2.0 Gen2 x 2 USB3.0 x 1</td>
<td>SATA x 2</td>
<td>M.2 2280 M Key x 1 PCI<a href="x1">4</a></td>
<td>TPM2.0</td>
<td>12V</td>
<td>0°C ~60°C</td>
<td></td>
</tr>
<tr>
<td>GENE-CML5-A10-0012</td>
<td>FCLGA1400 (Socket Type, TPD up to 35W)</td>
<td>H420E</td>
<td>DP + x1 VGA 1</td>
<td>QGE x 2</td>
<td>USB2.0 Gen2 x 2 USB3.0 x 1</td>
<td>SATA x 2</td>
<td>M.2 2280 M Key x 1 PCI<a href="x1">4</a></td>
<td>TPM2.0</td>
<td>12V</td>
<td>0°C ~60°C</td>
<td></td>
</tr>
</tbody>
</table>
GENESYS-CML5

3.5” SubCompact Board System with 10th Generation Intel® Core™ i7/i5/i3/Pentium®/Celeron® Processor SoC

Specifications

SYSTEM
FORM FACTOR 3.5” SubCompact Board System

CPU
Intel® 10th Generation Core™/Pentium/Celeron SoC
- i7-10700TE (8C/16T, 2.00 GHz, up to 4.40 GHz, TDP 35W)
- i5-10500TE (6C/12T, 2.30 GHz, up to 3.70 GHz, TDP 35W)
- i3-10100TE (4C/8T, 2.30 GHz, up to 3.60 GHz, TDP 35W)
- G6400TE (2C/4T, 3.20 GHz, TDP 35W)
- G5900TE (2C/2T, 3.00 GHz, TDP 35W)

CHIPSET
Integrated with Intel® SoC

MEMORY TYPE
DDR4 up to 2933MHz Dual Channel, SODIMM x 2, up to 64GB, Non-ECC

BIOS
UEFI

WATCHDOG TIMER
255 Levels

SECURITY
TPM2.0

RTC Battery
Lithium Battery 3V/240mAH

DIMENSION
8.27" x 5.28" x 3.23" (210mm x 134mm x 82mm)

OS Support
Windows 10 (64bit)
Linux Ubuntu 20.04.1/Kernel 5.4

POWER
POWER REQUIREMENT +12V

POWER SUPPLY TYPE ATX

CONNECTOR
DC Jack Connector

POWER CONSUMPTION
Intel® i7-10700TE, DDR4 3200MHz 32GB x 2, 5.64A @ +12V (Typical)
Intel® i7-10700TE, DDR4 3200MHz 32GB x 2, 10.63A @ +12V (Max)

DISPLAY
CONTROLLER Intel® HD Graphics 610/630

VIDEO INTERFACE —

MULTIPLE DISPLAY 2 Simultaneous Displays

AUDIO
CODEC —

AUDIO INTERFACE —

SPEAKER —

EXTERNAL I/O
ETHERNET Intel® i210/10/100/1000Base, RJ45 x 1
Intel® i219/10/100/1000Base, RJ45 x 1 [support vPro on i5/i7 processors with Q470E]

ENVIRONMENT & CERTIFICATION
OPERATING TEMP 32°F ~ 122°F (0°C ~ 50°C)

STORAGE TEMP -40°F ~ 185°F (-40°C ~ 85°C)

OPERATING HUMIDITY 0% ~ 90% relative humidity, non-condensing

MTBF (HOURS) 380,571

EMC CE/FCC Class A

Optional Accessories

Part Number Description QTY
968C128G3N 2.5 SSD SATA 128GB 1
968D4008GL 8GB DDR4 2400MHz SODIMM 2
1255201201 Power Adapter 12V/10A, 120W 1
1702031802 Power Cord (US) 1
1702031803 Power Cord (Europe) 1
170203180E Power Cord (Japan) 1
GENESYS-CML5-COM1 COM Port Kit (Single Port) 1
GENESYS-CML5-USB1 USB2.0 Kit (Dual Port) 1
GENESYS-CML5-HDD1 HDD Kit (cable only) 1
GENESYS-CML5-WMT1 Wall Mount Kit 1
GENESYS-CML5-VESA1 VESA Mount Kit 1

Packing List
- GENESYS-CML5
- GENESYS-CML5-COM1
- GENESYS-CML5-USB1
- GENESYS-CML5-HDD1
- GENESYS-CML5-WMT1
- GENESYS-CML5-VESA1

Note: All specifications are subject to change without notice.

Features
- Non-ECC DDR4 SODIMM Slot x 2, up to 64GB
- Gbe x 2, SATA III x 2
- USB 3.2 Gen 2 x 2 (Rear I/O), USB 2.0 x 4 (Optional)
- RS-232/422/485 x 2 (Optional)
- M.2 M Key 2280 PCIe[x4]/SATA[x1] x 1
- PCIe[x4] x 1 (Q470E only)

Part Number Description QTY
968D4008GL 8GB DDR4 2400MHz SODIMM 2
1255201201 Power Adapter 12V/10A, 120W 1
1702031802 Power Cord (US) 1
1702031803 Power Cord (Europe) 1
170203180E Power Cord (Japan) 1
GENESYS-CML5-COM1 COM Port Kit (Single Port) 1
GENESYS-CML5-USB1 USB2.0 Kit (Dual Port) 1
GENESYS-CML5-HDD1 HDD Kit (cable only) 1
GENESYS-CML5-WMT1 Wall Mount Kit 1
GENESYS-CML5-VESA1 VESA Mount Kit 1

Packing List
- GENESYS-CML5
- GENESYS-CML5-COM1
- GENESYS-CML5-USB1
- GENESYS-CML5-HDD1
- GENESYS-CML5-WMT1
- GENESYS-CML5-VESA1

Note: All specifications are subject to change without notice.
Block Diagram

Intel® Comet Lake S LGA 1200 Socket

Intel® PCH Q470E/H420E

Handling

Dimension

Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>PCH</th>
<th>Memory</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/422/485</th>
<th>Expansion slot</th>
<th>TPM</th>
<th>Power</th>
<th>Operating Temp</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENESYS-CML5-A10-0001</td>
<td>FCLGA1200 (Socket Type, TDP up to 10W)</td>
<td>Q470E</td>
<td>Memory Slot x 2</td>
<td>VGA x 1</td>
<td>SATA x 1</td>
<td>IDE x 2</td>
<td>USB2.2 Gen2 x 2</td>
<td>0</td>
<td>M.2 2280 M Key x 1</td>
<td>TPM2.0</td>
<td>12V</td>
<td>0°C – 50°C</td>
</tr>
<tr>
<td>GENESYS-CML5-A10-0002</td>
<td>FCLGA1200 (Socket Type, TDP up to 10W)</td>
<td>H420E</td>
<td>Memory Slot x 2</td>
<td>VGA x 1</td>
<td>SATA x 1</td>
<td>IDE x 2</td>
<td>USB2.2 Gen2 x 2</td>
<td>0</td>
<td>M.2 2280 M Key x 1</td>
<td>TPM2.0</td>
<td>12V</td>
<td>0°C – 50°C</td>
</tr>
<tr>
<td>GENESYS-CML5-A10-AI03</td>
<td>FCLGA1200 (Socket Type, TDP up to 10W)</td>
<td>Q470E</td>
<td>DDR4 x 2</td>
<td>VGA x 1</td>
<td>128GB SSD x 1</td>
<td>IDE x 2</td>
<td>USB3.2 Gen2 x 2/USB2.0 x 4</td>
<td>2</td>
<td>M.2 2280 x 1</td>
<td>TPM2.0</td>
<td>12V</td>
<td>0°C – 50°C</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
GENE-WHU6

3.5” SubCompact Board with 8th Generation Intel® Core™ i7/i5/i3/Celeron® Processor SoC

Features
- LVDS/eDP x 1 (Default: LVDS), VGA x 1, HDMI 2.0 x 1
- GbE x 2, SATA III x 1, DIO x 8bit
- USB 3.2 Gen 2 x 4 (Up to Gen 2), RS-232/422/485 x 2
- Full size mSATA/mPCIe Slot x 1 (With Nano-SIM)
- M.2 2280 B key x 1, M.2 2230 E key x 1
- Wide DC Input 9-36V (Optional: 12V Only)

Specifications

SYSTEM
FORM FACTOR 3.5” SubCompact Board
CPU Intel® 8th Generation Core™ /Celeron Processor:
  - Core i7-8665UE (4C/8T, 1.7GHz, up to 4.40GHz, TDP-up 25W)
  - Core i5-8365UE (4C/8T, 1.6GHz, up to 4.10GHz, TDP-up 25W)
  - Core i3-8145UE (2C/4T, 2.2GHz, up to 3.90GHz, TDP-up 25W)
  - Celeron 4305UE (2C/2T, 2.00GHz, TDP-up 15W)
CHIPSET Integrated with Intel® SoC
MEMORY TYPE DDR4 up to 2400MHz Dual Channel,SODIMM x 2, up to 64GB, Non-ECC
BIOS UEFI
WAKE ON LAN Yes
WATCHDOG TIMER 255 Levels
SECURITY —
RTC BATTERY Lithium Battery 3V/240mAh
DIMENSION 5.75” x 4” (146mm x 101.7mm)
OS SUPPORT Windows 10 (64bit)
Linux Ubuntu 21.04.0/Kernel 5.10

POWER
POWER REQUIREMENT +9-36V (Optional: +12V)
POWER SUPPLY TYPE AT/ATX
CONNECTOR Phoenix 2-pin Connector
POWER CONSUMPTION Intel® i7-8665UE, DDR4 2400MHz 16GB x2, 4.83A@ +12V (TYPICAL)
  - Intel® i7-8665UE, DDR4 2400MHz 16GB x2, 7.3A@ +12V (MAX)
DISPLAY CONTROLLER Intel® UHD Graphics 610/620
LVDS/eDP LVDS Dual Channel 18/24bit x 1, up to 1920 x 1080
  - Optional: eDP1.4, up to 1920X1200
DISPLAY INTERFACE HDMI x 2, up to 3840 x 2160
VGA x 1, up to 1920 x 1200
MULTIPLE DISPLAY Up to 3 Simultaneous Displays
AUDIO CODEC Realtek ALC892/892
AUDIO INTERFACE Line-in/Line-out/MIC
SPEAKER —
EXTERNAL I/O ETHERNET Intel® i210/i211 & i219, 10/100/1000Base, RJ-45 x 2
SERIAL PORT 3.2 Gen2 x 4
VIDEO HDMI2.0a x 1, VGA x 1
INTERNAL I/O USB 3.2 Gen 2 x 4
LAN x 2, HDMI, VGA
USB 3.2 Gen 2 x 4

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY per Board</th>
</tr>
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<tbody>
<tr>
<td>1702150155</td>
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<tr>
<td>1709070500</td>
<td>SATA CABLE, 50cm</td>
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<td>170204010R</td>
<td>Power Cable, 15cm</td>
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<td>1709100254</td>
<td>Audio Jack Cable, 25cm</td>
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<td>170220020B</td>
<td>ATX Power Cable, 20cm</td>
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<td>1700100150</td>
<td>CDM Cable, 15cm</td>
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<tr>
<td>1700050207</td>
<td>USB CABLE, 20cm</td>
<td>2</td>
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<tr>
<td>GEN-WHU6-FAN01</td>
<td>CPU Cooler, 146x75.6x23.5mm, 3P, 3600RPM</td>
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<tr>
<td>GEN-WHU6-FAN02</td>
<td>CPU Cooler, 146x75.5x17.5mm, 3P, 4800RPM</td>
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<td>GEN-WHU6-HSK01</td>
<td>Heatsink, 16x101.6x32.5mm, Silver for i3 &amp; Celeron</td>
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<tr>
<td>GEN-WHU6-HSK02</td>
<td>Heatsink, 72x28x10mm, SODIMM DDR4</td>
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<td>Heatsink, 146x101.6x45.5mm</td>
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Packing List

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<thead>
<tr>
<th>Part Number</th>
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<th>QTY</th>
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<td>SENE-WHU6 MB</td>
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<tr>
<td>M10WHU6000</td>
<td>Heat spreader</td>
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Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Display</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/422/485</th>
<th>Storage</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
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</thead>
<tbody>
<tr>
<td>GENE-WHU6-A11-0001</td>
<td>Intel® Core i7-8665U</td>
<td>VGA+HDMI+LVDS</td>
<td>2Rx x 2</td>
<td>2x 3.2 Gen 2 x 4</td>
<td>2</td>
<td>SATA x 1 + mSATA</td>
<td>M.2 2280 B Key</td>
<td>9-36V</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8, nano SIM, Touch Controller</td>
</tr>
<tr>
<td>GENE-WHU6-A11-0002</td>
<td>Intel® Core i5-8365U</td>
<td>VGA+HDMI+LVDS</td>
<td>2Rx x 2</td>
<td>2x 3.2 Gen 2 x 4</td>
<td>2</td>
<td>SATA x 1 + mSATA</td>
<td>M.2 2280 B Key</td>
<td>9-36V</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8, nano SIM, Touch Controller</td>
</tr>
<tr>
<td>GENE-WHU6-A11-0003</td>
<td>Intel® Core i3-8145U</td>
<td>VGA+HDMI+LVDS</td>
<td>2Rx x 2</td>
<td>2x 3.2 Gen 2 x 4</td>
<td>2</td>
<td>SATA x 1 + mSATA</td>
<td>M.2 2280 B Key</td>
<td>9-36V</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8, nano SIM, Touch Controller</td>
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<tr>
<td>GENE-WHU6-A11-0004</td>
<td>Intel® Celeron 4305U</td>
<td>VGA+HDMI+LVDS</td>
<td>2Rx x 2</td>
<td>2x 3.2 Gen 2 x 4</td>
<td>2</td>
<td>SATA x 1 + mSATA</td>
<td>M.2 2280 B Key</td>
<td>9-36V</td>
<td>0°C ~ 60°C</td>
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<td>Intel® Core i7-8665U</td>
<td>VGA+HDMI+LVDS</td>
<td>2Rx x 2</td>
<td>2x 3.2 Gen 2 x 4</td>
<td>2</td>
<td>SATA x 1 + mSATA</td>
<td>M.2 2280 B Key</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8, nano SIM, Touch Controller</td>
</tr>
</tbody>
</table>
GENESYS-WHU6

3.5” SubCompact Board System with 8th Generation Intel® Core™ i7/i5/i3/Celeron® Processor SoC

Features
- Intel® Core™ i7/i5/i3/Celeron Processor SoC
- Non-ECC DDR4 SODIMM Slot x 2, up to 64GB
- VGA x 1, HDMI 2.0 x 1
- GbE x 2, SATA III x 1
- USB 3.2 Gen 2 x 4 (Up to Gen 2), RS-232/422/485 x 2
- Full size mSATA/mPCIe Slot x 1 (With Nano-SIM)
- M.2 B Key 2280 x 1, M.2 E Key 2230 x 1
- Wide DC Input 9-36V (Optional: 12V Only)

Specifications

SYSTEM
- FORM FACTOR: 3.5” SubCompact Board System
- CPU: Intel® 8th Generation Core™ i7/i5/i3/Celeron SoC
  - i7-8665UE (4C/8T, 1.7GHz, up to 4.4GHz, TDP 15W)
  - i5-8365UE (4C/8T, 1.6GHz, up to 4.1GHz, TDP 15W)
  - i3-8145UE (2C/4T, 2.2GHz, up to 3.9GHz, TDP 15W)
  - Celeron® 4305UE (2C/2T, 2GHz, TDP 15W)
- CHIPSET: Integrated with Intel® SoC
- MEMORY TYPE: DDR4 up to 2400MHz Dual Channel, SODIMM x 2, up to 64GB, Non-ECC
- BIOS: UEFI
- WAKE ON LAN: Yes
- WATCHDOG TIMER: 255 Levels
- SECURITY:
  - RTC Battery: Lithium Battery 3V/240mAh
  - DIMENSION: 7.00” x 5.28” x 1.69” (178mm x 134.1mm x 43mm)
  - OS Support: Windows 10 (64bit), Linux Ubuntu 21.04.0/Kernel 5.1
- POWER
  - POWER REQUIREMENT: +9-36V (Optional: +12V)
  - POWER SUPPLY TYPE: ATX
  - CONNECTOR: DC Jack Connector
  - POWER CONSUMPTION: Intel® i7-8665UE, DDR4 2400 MHz 16GB, 2.8A@ +12V (Typical)
- DISPLAY
  - CONTROLLER: Intel® UHD Graphics 610/620
  - LVDS/eDP —
  - Display Interface: HDMI2.0a x 1
  - VGA x 1
  - MULTIPLE DISPLAY: Up to 2 Simultaneous Displays
- AUDIO
  - CODEC: Realtek ALC892/892
  - AUDIO INTERFACE: Line-in/Line-out/MIC (Optional)
  - Speaker —
- EXTERNAL I/O
  - ETHERNET: Intel® i210/i211 & i219, 10/100/1000Base, RJ-45 x 2
  - USB: USB 3.2 Gen2 x 4
  - SERIAL PORT —
  - VIDEO: HDMI2.0a x 1, VGA x 1

INTERNAL I/O
- USB: USB 2.0 x 2
- SERIAL PORT: COM1(RS232/422/485, supports RI)
- COM2 (RS232/422/485, supports 5V/12V/RI)
- VIDEO —
- SATA: SATA III x 1
- SMBus/I2C: I2C/ SMBus x 1 (Default: I2C)
- AUDIO: Audio Header x 1 (optional)
- DIO/GPIO —
- FAN: DC Fan x 1 (optional: Smart Fan)
- SIM: Nano SIM x 1
- Front Panel: PWR LED, Power Button

PACKING LIST
- GENESYS-WHU6
- GENESYS-WHU6-HDD1
- GENESYS-WHU6-WMT1
- GENESYS-WHU6-VESA1

Optional Accessories

Part Number | Description | QTY
--- | --- | ---
968D4004GN | (TF)DDR4.4GB DDR4 SODIMM 2666MT/s.512MBx8 Samsung K4A4G085WX.260P.INNODISK.M4S0-4GSSNCIK-26 | 1
968D4008GW | (TF)DDR4.8GB SODIMM.2666MT/s.260Pin.512Mx8 Samsung K4A4G085WX.InnoDisk.M4S0-8GSSOCIK-26 | 1
968C256G22 | 2.5” SATA SSD 256GB. MLC,-10~80C.Transcend TS256GSSD420K-AA | 1
968C512G06 | 2.5” SATA SSD 512GB. MLC,-10~80C.Transcend TS512GSSD420K-AA | 1
125530060Z | Power Adapter. 12V.5A.60W. FSP060-DHAN3 | 1
1255300960 | Power Adapter. 12V.5A.96W. FSP096-DHAN3 | 1
1702031802 | Power Cord (US) | 1
1702031803 | Power Cord (Europe) | 1
170203180E | Power Cord (Japan) | 1
968C512G06HDD | HDD Kit. For GENESYS-WHU6 | 1
968C512G06-WMT1 | Wall Mount Kit. For GENESYS-WHU6 | 1
968C512G06-VEESAT | VESA Mount Kit. For GENESYS-WHU6 | 1

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Fan/Fanless</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Power Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENESYS-WHU6-A11-0001</td>
<td>i3-8145U</td>
<td>Cooling</td>
<td>VGA x 1</td>
<td>ssSATA&lt;in/&gt;Pcix x 1 (Full size)</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2</td>
<td>M.2 key 2230 x 1</td>
<td>9 ~ 16V</td>
<td>0°C ~ 50°C</td>
<td>Nano SW</td>
<td></td>
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<tr>
<td>GENESYS-WHU6-A11-0002</td>
<td>i5-8365U</td>
<td>Cooling</td>
<td>VGA x 1</td>
<td>ssSATA&lt;in/&gt;Pcix x 1 (Full size)</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2</td>
<td>M.2 key 2230 x 1</td>
<td>9 ~ 16V</td>
<td>0°C ~ 50°C</td>
<td>Nano SW</td>
<td></td>
</tr>
<tr>
<td>GENESYS-WHU6-A11-0003</td>
<td>i7-8665U</td>
<td>Cooling</td>
<td>VGA x 1</td>
<td>ssSATA&lt;in/&gt;Pcix x 1 (Full size)</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2</td>
<td>M.2 key 2230 x 1</td>
<td>9 ~ 16V</td>
<td>0°C ~ 50°C</td>
<td>Nano SW</td>
<td></td>
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<tr>
<td>GENESYS-WHU6-A11-0004</td>
<td>4305U</td>
<td>Cooling</td>
<td>VGA x 1</td>
<td>ssSATA&lt;in/&gt;Pcix x 1 (Full size)</td>
<td>GbE x 1</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>2</td>
<td>M.2 key 2230 x 1</td>
<td>9 ~ 16V</td>
<td>0°C ~ 50°C</td>
<td>Nano SW</td>
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</tbody>
</table>
### GENE-KBU6

**3.5” SubCompact Board with 7th Generation Intel® Core™ i7/i5/i3/Celeron® Processor SoC**

---

#### Features
- DVI, 18/24-bit Dual-Channel LVDS
- SATA 6.0 Gb/s x 1 & mSATA (Share with Half-size Mini-Card and Selective by BIOS)
- Supports 8-bit Digital I/O, USB 2.0 x 2, USB 3.2 Gen 1 x 4
- Mini-Card Slot x 1 (Full size), TPM, SIM
- Wide DC Support 9~36V, +12V Only (Optional)
- BIO Connector for Daughter Board
- Solder Design for System Assembly and Thermal

---

#### Specifications

**SYSTEM**
- **FORM FACTOR**: 3.5” SubCompact Board
- **CPU**:
  - Intel® 7th Generation Core™ /Celeron Processor:
    - Intel® i7-7600U (2C/4T, 2.80GHz, up to 3.90GHz, TDP-up 25W)
    - Intel® i5-7300U (2C/4T, 2.60GHz, up to 3.50GHz, TDP-up 25W)
    - Intel® i3-7100U (2C/4T, 2.30GHz, TDP-up 25W)
    - Intel® Celeron 3965U (2C/2T, 2.20GHz, TDP-up 15W)
- **CHIPSET**: Integrated with Intel® SoC
- **MEMORY TYPE**:
  - DDR4 up to 2133MHz, SODIMM x 1, up to 16GB, Non-ECC
- **BIOS**: UEFI
- **WAKE ON LAN**: Yes
- **WATCHDOG TIMER**: 255 Levels
- **SECURITY**: TPM 2.0 (Optional)
- **RTC BATTERY**: Lithium Battery 3V/240mAh
- **DIMENSION**: 5.75” x 4” (146mm x 101.7mm)
- **OS SUPPORT**: Windows 10 (64bit)

**POWER**
- **POWER REQUIREMENT**:
  - +9-36V (Optional: +12V)
- **POWER SUPPLY TYPE**: ATX
- **CONNECTOR**: Phoenix 2-pin Connector
- **POWER CONSUMPTION**:
  - Intel® i7-7600U, DDR4 2666MHz 32GB, 3.26A@ +12V(TYPICAL)
  - Intel® i7-7600U, DDR4 2666MHz 32GB, 4.22A@ +12V(MAX)

---

#### Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY per Board</th>
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<tbody>
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<td>1700050027</td>
<td>USB Cable, 60cm</td>
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<td>COM Cable, 8cm</td>
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<td>1709700024</td>
<td>PHONE JACK Cable, 25cm</td>
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<td>SATA Cable, 15cm</td>
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<td>ATX Power Cable, 20cm</td>
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<td>1702200038</td>
<td>Power Cable, 10cm</td>
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<td>GENE-KBU6-FAN01</td>
<td>CPU Cooler, 3P, 5000RPM</td>
<td>1</td>
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<tr>
<td>GENE-KBU6-HSK02</td>
<td>Heatsink, 146 x 101.6 x 29mm</td>
<td>1</td>
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<tr>
<td>GENE-KBU6-HSK03</td>
<td>Heatsink for DDR4 SO-DIMM,72 x 26 x 10mm.</td>
<td>1</td>
</tr>
</tbody>
</table>

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#### Packing List

<table>
<thead>
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<th>Part Number</th>
<th>Description</th>
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<td>M105KU6000</td>
<td>Heat Spreader</td>
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Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

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<thead>
<tr>
<th>Part Number</th>
<th>CPU Type</th>
<th>Display</th>
<th>LAN Type</th>
<th>USB Type</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
<th>Storage Type</th>
<th>Expansion Slot</th>
<th>TPM Type</th>
<th>Power Range</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENE-KBU6-A11-0001</td>
<td>Intel® Core™ i7-7600U</td>
<td>DP+LVDS+DVI-D</td>
<td>Intel® KABYLAKE-U 15W</td>
<td>DDR4 SODIMM 16GB</td>
<td>1 3</td>
<td>SATA x 1, mSATA x 1 (half size)</td>
<td>MiniCard x 1 (Full)</td>
<td>2.0</td>
<td>9–36V</td>
<td>0°C – 60°C</td>
<td>Touch Controller, SIM, DI O x 8, SMBUS</td>
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<tr>
<td>GENE-KBU6-A11-0002</td>
<td>Intel® Core™ i5-7300U</td>
<td>DP+LVDS+DVI-D</td>
<td>Intel® KABYLAKE-U 15W</td>
<td>DDR4 SODIMM 16GB</td>
<td>1 3</td>
<td>SATA x 1, mSATA x 1 (half size)</td>
<td>MiniCard x 1 (Full)</td>
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<td>9–36V</td>
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<td>Touch Controller, SIM, DI O x 8, SMBUS</td>
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<td>GENE-KBU6-A11-0003</td>
<td>Intel® Core™ i3-7100U</td>
<td>DP+LVDS+DVI-D</td>
<td>Intel® KABYLAKE-U 15W</td>
<td>DDR4 SODIMM 16GB</td>
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<td>SATA x 1, mSATA x 1 (half size)</td>
<td>MiniCard x 1 (Full)</td>
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<td>9–36V</td>
<td>0°C – 60°C</td>
<td>Touch Controller, SIM, DI O x 8, SMBUS</td>
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Note: All specifications are subject to change without notice.
GENESYS-KBU6
3.5" SubCompact Board System with 7th Generation Intel® Core™ i7/i5/i3/Celeron® Processor SoC

Features
- 7th Generation Intel® Core™ i7/i5/i3/Celeron® Processor SoC
- DDR4 1866/2133, SODIMM x 1
- DVI x 1, DP x 1
- SATA 6.0 Gb/s x 1 & mSATA
- USB 2.0 x 2, USB 3.2 Gen 1 x 4
- COM x 2 (RS-232 x 1, RS-232/422/485 x 1)
- Mini-Card Slot x 2, TPM, SIM
- Wide DC Support 9~36V, +12V Only (Optional)
- Solder Design for System Assembly and Thermal

Specifications

SYSTEM
FORM FACTOR 3.5" SubCompact Board System

CPU
Intel® 7th Generation Core™/Celeron Processor:
- Intel® i7-7600U (2C/4T, 2.80GHz, up to 3.90GHz, TDP-up 25W)
- Intel® i5-7300U (2C/4T, 2.60GHz, up to 3.50GHz, TDP-up 25W)
- Intel® i3-7100U (2C/4T, 2.40GHz, TDP-up 25W)
- Intel® Celeron 3965U (2C/2T, 2.20GHz, TDP-up 15W)

CHIPSET
Integrated with Intel® SoC

MEMORY TYPE
DDR4 up to 2133MHz, SODIMM x 1, up to 16GB, Non-ECC

BIOS
UEFI

WATCHDOG TIMER
255 Levels

SECURITY
TPM 2.0 (Optional)

RTC Battery
Lithium Battery 3V/240mAh

DIMENSION
6.69" x 5.39" x 1.91" (170mm x 137mm x 48.5mm)

OS Support
Windows 10 (64bit), Linux Ubuntu 21.04.0/Kernel 5.10

POWER
POWER REQUIREMENT
+9-36V (Optional: +12V)

POWER SUPPLY TYPE
ATX

CONNECTOR
DC Jack Connector

POWER CONSUMPTION
Intel® i7-7600U, DDR4 2400MHz 16GB, 1.85A@ +12V (Typical)

DISPLAY
CONTROLLER Intel® HD Graphics 610/620
LVDS/eDP —

MULTIPLE DISPLAY Up to 2 Simultaneous Displays

AUDIO
CODEC —

AUDIO INTERFACE —

FAN
Fanless

SIM
Micro SIM x 1 (Optional)

FRONT PANEL HDD LED, PWR LED, Power Button

OTHERS —

EXPANSION
Mini PCI-E/mSATA Full-size mPCIe x 1
Half size mSATA/mPCIe x 1 (Default mSATA, select by BIOS)

M.2 —

OTHERS —

ENVIRONMENT & CERTIFICATION
OPERATING TEMP
32°F – 122°F (0°C ~ 50°C)

STORAGE TEMP
-40°F ~ 185°F (-40°C ~ 85°C)

OPERATING HUMIDITY
0~90% relative humidity, non-condensing

MTBF (HOURS)
123,000

EMC CE/FCC Class A

Packaging List
- GENESYS-KBU6

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>968D4004GB</td>
<td>TF/8GB-DDR4 2133MHz:500MM 260Pin 512M® 8.0~85C Non ECC: Transcend TS128GSSD000AA</td>
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<tr>
<td>968D4004GO</td>
<td>TF/4GB-DDR4 2133MHz:500MM 260Pin 512M® 8.Samsung K4A4G085WX.0~85 deg C.Transcend TS64GSSD000AA</td>
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<tr>
<td>968C032G3P</td>
<td>TF/Half size mSATA:32GB MLC 3ME3 15mm 0~70 °C.InnoDisk. DEMSM-32G090C10C-26</td>
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<tr>
<td>968C064G3D</td>
<td>TF/Half size mSATA:64GB MLC 3ME3 15mm 0~70 °C.InnoDisk. DEMSM-64G090C10C-26</td>
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<td>968C128G1Q</td>
<td>TF/Half size mSATA:128GB MLC-40 ~ 85 C.Transcend TS256GSSD360I</td>
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<tr>
<td>968C256G22</td>
<td>2.5&quot; SATA SSD:256GB,MLC-10 ~ 80C.Transcend TS256GSSD420K-AA</td>
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<tr>
<td>968C512G06</td>
<td>2.5&quot; SATA SSD:512GB,MLC-10 ~ 80C.Transcend TS512GSSD420K-AA</td>
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<tr>
<td>125553000G2</td>
<td>Power Adapter: 12V, 6.0A. FSP106-DAN3</td>
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<tr>
<td>1702031802</td>
<td>Power Cord (US)</td>
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<tr>
<td>1702031803</td>
<td>Power Cord (Europe)</td>
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<tr>
<td>170203180E</td>
<td>Power Cord (Japan)</td>
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<td>GENESYS-KBU6-HDD1</td>
<td>HDD Kit For GENESYS-KBU6</td>
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<tr>
<td>GENESYS-KBU6-WMT1</td>
<td>Wall Mount Kit For GENESYS-KBU6</td>
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<tr>
<td>GENESYS-KBU6-VESA1</td>
<td>VESA Mount Kit For GENESYS-KBU6</td>
<td>1</td>
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</tbody>
</table>
Block Diagram

Intel® KABYLAKE -U
15W

DDR4 SODIMM
16GB
USB3.0*4
USB2.0*2
SATA 6.0Gb/s*1
Mini Card (Full)

PTN1305
DVI-D

DVI
DP
RS-232*1
RS-232/422/485*1
WatchDog,
H/W Monitor
Mini Card or
mSATA (Half,
Default)
Giga LAN*2

PTN1305

Block Diagram

Dimension

Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Fan/Fanless</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Power Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENESYS-KBU6-A10-0001</td>
<td>i7-7600U</td>
<td>Fanless</td>
<td>DP x 1</td>
<td>SATA x 1</td>
<td>USB 3.2 Gen 1 x 4, USB 2.0 x 2</td>
<td>1</td>
<td>1</td>
<td>MiniCard x 1 (Full)</td>
<td>9~36V</td>
<td>0°C ~ 50°C</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>GENESYS-KBU6-A10-0002</td>
<td>i7-7300U</td>
<td>Fanless</td>
<td>DP x 1</td>
<td>SATA x 1</td>
<td>USB 3.2 Gen 1 x 4, USB 2.0 x 2</td>
<td>1</td>
<td>1</td>
<td>MiniCard x 1 (Full)</td>
<td>9~36V</td>
<td>0°C ~ 50°C</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>GENESYS-KBU6-A10-0003</td>
<td>i3-7100U</td>
<td>Fanless</td>
<td>DP x 1</td>
<td>SATA x 1</td>
<td>USB 3.2 Gen 1 x 4, USB 2.0 x 2</td>
<td>1</td>
<td>1</td>
<td>MiniCard x 1 (Full)</td>
<td>9~36V</td>
<td>0°C ~ 50°C</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
GENE-SKU6
3.5” SubCompact Board with Intel® Core™ i7/i5/i3/Celeron® Processor SoC

Features
- DVI, 18/24-bit Dual-Channel LVDS
- SATA 6.0 Gb/s x 1 & mSATA (Share with Half-size Mini-Card and Selective by BIOS)
- Supports 8-bit Digital I/O, USB 2.0 x 2, USB 3.2 Gen 1 x 4
- Mini-Card Slot x 1 (Full size), TPM, SIM
- Wide DC Support 9~36V, +12V Only (Optional)
- BIO Connector for Daughter Board
- Solder Design for System Assembly and Thermal

Specifications

SYSTEM
Form Factor 3.5” SubCompact Board
CPU Intel® 6th Generation Core™/Celeron Processor:
- Intel® i7-6600U (2C/4T, 2.6GHz, up to 3.4GHz, TDP-up 25W)
- Intel® i5-6300U (2C/4T, 2.4GHz, up to 3.0GHz, TDP-up 25W)
- Intel® i3-6100U (2C/4T, 2.3GHz, TDP-up 25W)
- Intel® Celeron 3955U (2C/2T, 2.20GHz, TDP-up 15W)
Chipset Integrated with Intel® SoC
Memory Type DDR4 up to 2133MHz, SODIMM x 1, up to 16GB, Non-ECC
BIOS UEFI
Wake On LAN Yes
Watchdog Timer 255 Levels
Security TPM 2.0 (Optional)
RTC Battery Lithium Battery 3V/240mAh
Dimension 5.75” x 4” (146mm x 101.7mm)
OS Support Windows 7/10 (64bit)
Linux Ubuntu 21.04.0/Kernel 5.10
Power
Power Requirement +9-36V (Optional: +12V)
Power Supply Type ATX
Connector Phoenix 2-pin Connector
Power Consumption
- Intel® i7-6600U, DDR4 2666MHz 32GB, 3.42A@ +12V(TYPICAL)
- Intel® i7-6600U, DDR4 2666MHz 32GB, 4.24A@ +12V(MAX)
Display Controller Intel® HD Graphics 510/520
LVDS/eDP LCD Dual Channel 18/24bit x 1, up to 1920 x 1080
Display Interface
- Default: DP1.x 1 (up to 3840 x 2160) + DVI-D x 1
- Optional: DVI-I x 1(with VGA signal)
- Up to 3 Simultaneous Displays
Audio Codec Realtek ALC897/892
Audio Interface Line-in/Line-out/UMIC
Speaker —
External I/O
Ethernet Intel® i210/i211, 10/100/1000Base-TX, RJ-45 x 2
USB USB 3.2 Gen 1 x 4
Serial Port —
Video DP1.x 1, DVI-I x 1
Internal I/O
USB USB 2.0 x 2
Serial Port COM1/RS232, COM2, COM3, COM4(RS232/422/485, support 5V/12V/RL)
Video LVDS x 1

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY per Board</th>
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</thead>
<tbody>
<tr>
<td>1700000207</td>
<td>USB Cable, 20cm</td>
<td>2</td>
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<tr>
<td>1701000100</td>
<td>Com Cable, 15cm</td>
<td>4</td>
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<tr>
<td>1709000254</td>
<td>PHONE JACK Cable, 25cm</td>
<td>1</td>
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<tr>
<td>1702150555</td>
<td>SATA Power Cable, 15cm</td>
<td>1</td>
</tr>
<tr>
<td>170220020B</td>
<td>ATX Power Cable, 20cm</td>
<td>1</td>
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<tr>
<td>1702004010</td>
<td>Power Cable, 10cm</td>
<td>1</td>
</tr>
<tr>
<td>GENE-SKU6-FAN01</td>
<td>CPU Cooler, 3P, 5000RPM</td>
<td>1</td>
</tr>
<tr>
<td>GENE-SKU6-HSK01</td>
<td>Heatsink, 146 x 146 x 29mm</td>
<td>1</td>
</tr>
<tr>
<td>GENE-SKU6-HSK02</td>
<td>Heatsink, 146 x 146 x 29mm</td>
<td>1</td>
</tr>
<tr>
<td>GENE-SKU6-HSK03</td>
<td>Heatsink for DDR4 SO-DIMM, 72 x 26 x 10mm</td>
<td>1</td>
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</tbody>
</table>

Packing List

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
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<td>GENE-SKU6</td>
<td>GENE-SKU6 MB</td>
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<tr>
<td>M10SKU6000</td>
<td>Heat Spreader</td>
<td>1</td>
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Note: All specifications are subject to change without notice.
Block Diagram

Dimension Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Display</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/423/485</th>
<th>Storage</th>
<th>Expansion Slot</th>
<th>TPM</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENE-SKU6-A11-0001</td>
<td>Intel® Core™ i7-6600U</td>
<td>DP+LVDS+DVI-D</td>
<td>DP x 2</td>
<td>USB 3.0(x4)</td>
<td>1</td>
<td>3</td>
<td>SATA x 1</td>
<td>MiniCard x 1 (Full)</td>
<td>2.0</td>
<td>9~36V</td>
<td>0°C ~ 60°C</td>
<td>Touch Controller, SIM, DIO x 8, SMBUS</td>
</tr>
<tr>
<td>GENE-SKU6-A11-0002</td>
<td>Intel® Core™ i5-6300U</td>
<td>DP+LVDS+DVI-D</td>
<td>DP x 2</td>
<td>USB 3.0(x4)</td>
<td>1</td>
<td>3</td>
<td>SATA x 1</td>
<td>MiniCard x 1 (Full)</td>
<td>2.0</td>
<td>9~36V</td>
<td>0°C ~ 60°C</td>
<td>Touch Controller, SIM, DIO x 8, SMBUS</td>
</tr>
<tr>
<td>GENE-SKU6-A11-0003</td>
<td>Intel® Core™ i3-6100U</td>
<td>DP+LVDS+DVI-D</td>
<td>DP x 2</td>
<td>USB 3.0(x4)</td>
<td>1</td>
<td>3</td>
<td>SATA x 1</td>
<td>MiniCard x 1 (Full)</td>
<td>2.0</td>
<td>9~36V</td>
<td>0°C ~ 60°C</td>
<td>Touch Controller, SIM, DIO x 8, SMBUS</td>
</tr>
<tr>
<td>GENE-SKU6-A11-0001</td>
<td>Intel® Core™ i7-6600U</td>
<td>DP+LVDS+DVI-D</td>
<td>DP x 2</td>
<td>USB 3.0(x4)</td>
<td>1</td>
<td>3</td>
<td>SATA x 1</td>
<td>MiniCard x 1 (Full)</td>
<td>2.0</td>
<td>12V</td>
<td>-20°C ~ 70°C</td>
<td>Touch Controller, SIM, DIO x 8, SMBUS</td>
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</table>
### GENE-SKU6 Rev. B

#### SubCompact Boards

**3.5” SubCompact Board with Intel® Core™ i7/i5/i3/Celeron® Processor SoC**

#### Features
- **Intel® Core™ i7/i5/i3/Celeron® Processor SoC**
- **DDR4 1866/2133, SODIMM x 1**
- **VGA, HDMI, 18/24-bit Dual Channel LVDS**
- **2 CH Audio, 3W Speaker**
- **SATA 6.0 Gb/s x 1 & mSATA (Shared with Half-size Mini-Card and Selected by BIOS)**
- **Supports 8-bit Digital I/O, USB 2.0 x 2, USB 3.2 Gen 1 x 4**
- **COM x 4 (RS-232 x 1, RS-232/422/485 x 3)**
- **Mini-Card Slot x 1 (Shared with full-size mATA and Selected by BIOS), TPM**
- **Wide DC Support 9–36V, +12V Only (Optional)**
- **4/5/8-wire Resistive Touch Screen Controller**
- **BIO Connector for Daughter Board (Optional)**
- **Solder Design for System Assembly and Thermal**

#### Specifications

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>FORM FACTOR</th>
<th>3.5” SubCompact Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Intel® 6th Generation Core™ /Celeron Processor: Intel® i7-6600U (2C/4T, 2.6GHz, up to 3.4GHz, TDP-up 25W) Intel® i5-6300U (2C/4T, 2.4GHz, up to 3.0GHz, TDP-up 25W) Intel® i3-6100U (2C/4T, 2.3GHz, TDP-up 25W) Intel® Celeron 3955U (2C/2T, 2.20GHz, TDP-up 15W)</td>
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<tr>
<td>CHIPSET</td>
<td>Integrated with Intel® SoC</td>
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<tr>
<td>MEMORY TYPE</td>
<td>DDR4 up to 2133MHz, SODIMM x 1, up to 16GB, Non-ECC</td>
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<tr>
<td>BIOS</td>
<td>UEFI</td>
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<tr>
<td>WAKE ON LAN</td>
<td>Yes</td>
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<tr>
<td>WATCHDOG TIMER</td>
<td>255 Levels</td>
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<td>SECURITY</td>
<td>TPM 2.0 (Optional)</td>
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<td>RTC BATTERY</td>
<td>Lithium Battery 3V/240mAh</td>
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<tr>
<td>DIMENSION</td>
<td>5.75” x 4” (146mm x 101.7mm)</td>
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<tr>
<td>OS SUPPORT</td>
<td>Windows 7/10 (64bit) Linux Ubuntu 21.04.0/Kernel 5.10</td>
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<tr>
<td>POWER</td>
<td>+9–36V (Optional: -12V)</td>
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<td>POWER SUPPLY TYPE</td>
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<td>CONNECTOR</td>
<td>Phoenix 2-pin Connector</td>
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<tr>
<td>POWER CONSUMPTION</td>
<td>Intel® i7-6600U, 6600U, DDR4 2400MHz 16GB, 0.73A at +36V</td>
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<tr>
<td>DISPLAY</td>
<td>Controller Intel® HD Graphics 510/520</td>
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<tr>
<td>LVDS/eDP</td>
<td>LVDS Dual Channel 18/24bit x 1, up to 1920 x 1080</td>
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<tr>
<td>DISPLAY INTERFACE</td>
<td>VGA x1, Up to 1920 x 1200</td>
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<tr>
<td>MULTIPLE DISPLAY</td>
<td>HDMI1.4 x1, up to 4096 x 2304</td>
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<tr>
<td>AUDIO</td>
<td>Up to 3 Simultaneous Displays</td>
<td></td>
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<td>CODEC</td>
<td>Realtek ALC882/897</td>
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<tr>
<td>AUDIO INTERFACE</td>
<td>Line-in/Line-out/MIC</td>
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<tr>
<td>SPEAKER</td>
<td>3W Amplifier (Optional)</td>
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<tr>
<td>EXTERNAL I/O</td>
<td>Ethernet Intel® i210, 10/100/1000Base-TX, RJ-45 x 2</td>
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<tr>
<td>USB</td>
<td>USB 3.2 Gen 1 x 4</td>
<td></td>
</tr>
<tr>
<td>SERIAL PORT</td>
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<tr>
<td>VIDEO</td>
<td>HDMI 1.4 x 1</td>
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</tr>
<tr>
<td>INTERNAL I/O</td>
<td>VGA x 1</td>
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<tr>
<td>USB</td>
<td>USB 2.0 x 2</td>
<td></td>
</tr>
<tr>
<td>SERIAL PORT</td>
<td>COM1 (RS232) COM2, COM3, COM4 (RS232/422/485, support 5V/12V/RI)</td>
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</tr>
<tr>
<td>VIDEO</td>
<td>LVDS x 1</td>
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#### Packing List

- **GENE-SKU6 with Heatspreader**

#### Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700050207</td>
<td>(TF)USB CABLE 1*5P Pitch=1.25mm Housinh.20cm for PFM-945C</td>
<td>2</td>
</tr>
<tr>
<td>1701981550</td>
<td>(TF)Flat Cable D-Sub 9Pin.9P Housing.9P 1.25mm pitch Housinh.15cm</td>
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<tr>
<td>1708001516</td>
<td>(TF)Cable 12P Pitch=1.0mm 250mm.FLYINGWAY.FWAA-1345.Audio cable</td>
<td>1</td>
</tr>
<tr>
<td>1702150155</td>
<td>(TF)Power Cable 15P SATA/F.2P 2.0mm Housing(Pb).15cm</td>
<td>1</td>
</tr>
<tr>
<td>170220020B</td>
<td>(TF)Power Cable 20P ATX(M) 4P 5.0mm Housing(F).+3P 2.5mm Housing(XH).20cm</td>
<td>1</td>
</tr>
<tr>
<td>1702002010</td>
<td>(TF)Power Cable 1*2P Pitch=0.5mm Housinh.10cm for PFM-945C.(12V only)</td>
<td>1</td>
</tr>
<tr>
<td>GENE-SKU6-FAN01</td>
<td>CPU Cooler. 3P. 5000RPM. A1.0. REV. A1.0</td>
<td>1</td>
</tr>
<tr>
<td>GENE-SKU6-HSK02</td>
<td>Heatsink. 146 x 101.6 x 29mm. Silver. for GENE-SKU6</td>
<td>1</td>
</tr>
<tr>
<td>GENE-SKU6-HSK03</td>
<td>Heat Sink. 72<em>28</em>10mm.GENE-SKU6.SODIMM DDR4</td>
<td>1</td>
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</tbody>
</table>

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>Fan/Fanless</th>
<th>Display</th>
<th>LVDS</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/885</th>
<th>Expansion slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENE-SKU6-B12-0001</td>
<td>Intel® i7-6600U</td>
<td>Fanless</td>
<td>VGA+HDMI+LVDS</td>
<td>18/24-bit, 2CH</td>
<td>SATA x 1</td>
<td>mSATA x 1</td>
<td>USB 3.2 Gen1 x 4</td>
<td>1</td>
<td>3 miniCard x 1 (Full-size)</td>
<td>9 – 36V</td>
<td>0°C – 60°C</td>
<td></td>
<td>Fan x 8, Touch Controller, TPM</td>
</tr>
<tr>
<td>GENE-SKU6-B12-0002</td>
<td>Intel® i5-6300U</td>
<td>Fanless</td>
<td>VGA+HDMI+LVDS</td>
<td>18/24-bit, 2CH</td>
<td>SATA x 1</td>
<td>mSATA x 1</td>
<td>USB 3.2 Gen1 x 4</td>
<td>1</td>
<td>3 miniCard x 1 (Full-size)</td>
<td>9 – 36V</td>
<td>0°C – 60°C</td>
<td></td>
<td>Fan x 8, Touch Controller, TPM</td>
</tr>
<tr>
<td>GENE-SKU6-B12-0003</td>
<td>Intel® i3-6100U</td>
<td>Fanless</td>
<td>VGA+HDMI+LVDS</td>
<td>18/24-bit, 2CH</td>
<td>SATA x 1</td>
<td>mSATA x 1</td>
<td>USB 3.2 Gen1 x 4</td>
<td>1</td>
<td>3 miniCard x 1 (Full-size)</td>
<td>9 – 36V</td>
<td>0°C – 60°C</td>
<td></td>
<td>Fan x 8, Touch Controller, TPM</td>
</tr>
</tbody>
</table>
Gene-EHL5
SubCompact Board with Intel® Atom® x6000E Series, and Intel® Pentium® and Celeron® N and J Series Processors

Features
- DDR4 SODIMM Slot x 1, up to 32GB, support IBECC
- LVDS/eDP x 1 (Default: LVDS), DP1.4 x 1 (Optional VGA x 1), HDMI 2.0b x 1
- SATA III x 1, eMMC x 1
- USB 3.2 Gen2 x 2 (Rear I/O), USB2.0 x 4 (Pin header)
- M.2 B Key 2280 PCIe x 1, M.2 B-Key 2242 PCIe x 1, M.2 E Key 2230 x 1, M.2 B Key 3052 x 1
- Wide DC Input 9-36V (Optional: 12V Only)

TEMPEST
- Power Requirement: +9-36V (Optional: +12V)
- Power Supply Type: ATX
- Connector: Phoenix 2-pin Connector
- Power Consumption: Intel® Atom™ x6425E, DDR4 32GB, 3.26A@ +12V (Typical)
- Display Controller: Intel® UHD Graphics for 10th Gen Intel® Processors
- LVDS/eDP: LVDS Dual Channel 18/24bit x 1, up to 1920 x 1080 (Optional: eDP x 1, up to 4K 60Hz, DP1.4 x 1, up to 4K x 2K 60Hz)
- Multiple Displays: 3 Simultaneous Displays
- Audio Codec: RealTek ALC269
- Audio Interface: Line-in/Line-out/MIC
- Speaker: 2W Speaker
- Ethernet: Intel® i210, 10/100/1000Base x 2

Specifications

SYSTEM
- Form Factor: 3.5” SubCompact Board
- CPU: Intel® Atom® x6000E series, Intel® Pentium®, and Celeron® N and J series processors:
  - Intel® Atom® x6425RE (4C, 1.9GHz, TDP-up 12W)
  - Intel® Atom® x6425E (4C, 2.0GHz, up to 3GHz, TDP-up 12W)
  - Intel® Atom® x6211E (2C, 1.2GHz, up to 3GHz, TDP-up 6W)
  - Intel® Pentium® J6426 (4C, 2.0GHz, up to 3GHz, TDP-up 10W)
  - Intel® Celeron® J6412 (4C, 2.0GHz, up to 3GHz, TDP-up 10W)
  - Intel® Celeron® N6210 (2C, 1.2GHz, up to 3GHz, TDP-up 6.5W)

- Chipset: Integrated with Intel® SoC
- Memory Type: DDR4 3200 MHz, SODIMM x 1, Up to 32GB, Support IBECC (select SKUs)
- BIOS: UEFI
- Wake On LAN: Yes
- Watchdog Timer: 255 Levels
- Security: TPM 2.0
- RTC Battery: Lithium Battery 3V/240mAh
- Dimension: 5.75” x 4” (146mm x 101.7mm)
- OS Support: Windows 10 (64bit), Linux Ubuntu 20.04.3(IOT)/Kernel 5.13
- Power Requirement: +9-36V (Optional: +12V)
- Power Supply Type: ATX
- Power Consumption:
  - Intel® Atom™ x6425E, DDR4 32GB, 3.26A@ +12V (Typical)
  - Intel® Atom™ x6425E, DDR4 32GB, 3.26A@ +12V (balance)

DISPLAY
- Controller: Intel® UHD Graphics for 10th Gen Intel® Processors
- LVDS/eDP: LVDS Dual Channel 18/24bit x 1, up to 1920 x 1080 (Optional: eDP x 1, up to 4K 60Hz, DP1.4 x 1, up to 4K x 2K 60Hz)
- Display Interface: HDMI2.0b x 1, up to 4K 60Hz, DP1.4 x 1, up to 4K x 2K 60Hz (Optional: VGA x 1)
- Multiple Displays: 3 Simultaneous Displays

AUDIO
- Codec: RealTek ALC269
- Audio Interface: Line-in/Line-out/MIC
- Speaker: 2W Speaker

Expansion
- Mini PC/EmSATA
- M.2
  - E-Key 2230 x 1 (PCIe, USB2.0)
  - B-Key 2242 x 1 (PCIe x 2/PCIe x 1, SATA x 1, USB2.0) Default: PCIe x 2, PCIe x 1 select by BIOS, SATA select by BOM
  - B-Key 2280 x 1 (PCIe x 1, USB2.0) Default: PCIe x 1, PCIe x 2 select by BIOS

- Other External I/O
  - Touch: 4/5/8-wire Touch Controller x 1 (optional)
  - Fan: 4 wire SmartFan x 1
  - SIM: Nano SIM x 1
  - Front Panel: HD LED, PWR LED, Power Button, Buzzer, Reset

- Others: eMMC 5.1 32GB

Environmental & Certification
- Operating Temp.: 32°F ~ 140°F (0°C ~ 60°C), WiTAS2 -40°F ~ 185°F (-40°C ~ 85°C)
- Storage Temp.: -40°F ~ 185°F (-40°C ~ 85°C)
- Operating Humidity: 0% ~ 90% relative humidity, non-condensing
- MTBF (Hours): 335,427
- EMC: CE/FCC Class A

Optional Accessories

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<th>Description</th>
<th>QTY per Board</th>
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<td>1709970500</td>
<td>SATA Cable, 50cm</td>
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<td>SATA HDD Power, Cable 15cm</td>
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<td>170204001D</td>
<td>Power Cable, 10cm</td>
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<td>1702000317</td>
<td>COM cable, 15cm</td>
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<td>170220022B</td>
<td>ATX Power Cable, 20cm</td>
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Packing List

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<th>Description</th>
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<td>M16BT07020</td>
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**Ordering Information**

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<th>Display</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/422/485</th>
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<th>Expansion Slot</th>
<th>TPM</th>
<th>Power</th>
<th>Temp</th>
<th>Others</th>
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<td>Celeron N6210</td>
<td>DP x 1, HDMI x 1, LVDS x 1</td>
<td>GBE x 2</td>
<td>USB 3.2 Gen 2 x 2</td>
<td>x 2</td>
<td>SATA x 1</td>
<td>M.2 B-Key 2230 x 1, M.2 B-Key 2242 x 1</td>
<td>2.0</td>
<td>9~36V</td>
<td>0°C – 60°C</td>
<td>DIO x 16, nano SIM, Touch Controller, SMBUS</td>
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<td>x 2</td>
<td>SATA x 1</td>
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<td>12V</td>
<td>0°C – 60°C</td>
<td>DIO x 16, nano SIM, SMBUS</td>
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<tr>
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<td>Celeron J4412</td>
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<td>x 2</td>
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<td>M.2 B-Key 2230 x 1, M.2 B-Key 2242 x 1</td>
<td>2.0</td>
<td>9~36V</td>
<td>0°C – 60°C</td>
<td>DIO x 16, nano SIM, Touch Controller, SMBUS</td>
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<td>DIO x 16, nano SIM, SMBUS</td>
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<td>Pentium J6420</td>
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<td>x 2</td>
<td>SATA x 1</td>
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<td>12V</td>
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<td>DIO x 16, nano SIM, SMBUS</td>
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<tr>
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<td>x 2</td>
<td>SATA x 1</td>
<td>M.2 B-Key 2230 x 1, M.2 B-Key 2242 x 1</td>
<td>2.0</td>
<td>9~36V</td>
<td>0°C – 60°C</td>
<td>DIO x 16, nano SIM, Touch Controller, SMBUS</td>
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<tr>
<td>GENE-EHL5-A10-0008</td>
<td>Atom x6420E</td>
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<td>x 2</td>
<td>SATA x 1</td>
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<td>NA</td>
<td>12V</td>
<td>0°C – 60°C</td>
<td>DIO x 16, nano SIM, SMBUS</td>
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<tr>
<td>GENE-EHL5-A10-0009</td>
<td>Atom x6420E</td>
<td>DP x 1, HDMI x 1, LVDS x 1</td>
<td>GBE x 2</td>
<td>USB 3.2 Gen 2 x 2</td>
<td>x 2</td>
<td>SATA x 1</td>
<td>M.2 B-Key 2230 x 1, M.2 B-Key 2242 x 1</td>
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<td>9~36V</td>
<td>0°C – 60°C</td>
<td>DIO x 16, nano SIM, SMBUS</td>
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<td>x 2</td>
<td>SATA x 1</td>
<td>M.2 B-Key 2230 x 1, M.2 B-Key 2242 x 1</td>
<td>NA</td>
<td>12V</td>
<td>-40°C – 85°C</td>
<td>DIO x 16, nano SIM, SMBUS</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.

www.aaeon.com
GENESYSM-EHL5

3.5" SubCompact Board System with Intel® Atom® x6000E Series, and Intel® Pentium® and Celeron® N and J Series Processors

Features
- DDR4 SODIMM Slot x 1, up to 32GB, support IBECC
- HDMI 2.0b x 1, VGA x 1
- SATA III x 1, eMMC 32GB x 1
- USB 3.2 Gen2 x 2, USB2.0 x 2
- M.2 B Key 2280 PCIe x 1, M.2 B-Key 2242 PCIe x 1, M.2 E Key 2230 x 1, M.2 B Key 3052 x 1
- Wide DC Input 9-36V

Specifications

SYSTEM
- FORM FACTOR: 3.5" SubCompact Board System
- CPU: Intel® Atom® x6425E (4C, 2.0GHz, up to 3GHz, TDP-up 12W)
  Intel® Celeron® J6412 (4C, 2.0GHz, up to 3GHz, TDP-up 10W)
  Intel® Celeron® N6210 (2C, 1.2GHz, up to 3GHz, TDP-up 6.5W)
- CHIPSET: Integrated with Intel® SoC
- MEMORY TYPE: DDR4 up to 3200 Hz, SODIMM x 1, up to 32GB, in band ECC
- BIOS: UEFI
- WAKE ON LAN: Yes
- WATCHDOG TIMER: 255 Levels
- SECURITY: TPM2.0
- RTC BATTERY: Lithium Battery 3V/240mAh
- DIMENSION: 7.00" x 5.28" x 2.08" (178mm x 134.1mm x 53mm)
- OS SUPPORT: Windows 10 (64bit), Linux Ubuntu 20.04.3(IOT)/Kernel 5.13
- POWER REQUIREMENT: +12V/+9-36V
- POWER CONNECTOR: DC Jack Connector
- POWER CONSUMPTION: Intel® AtomTM x6425E, DDR4 32GB, 3.26A@ +12V (balance), 3.26A@ +12V (Typical), 3.42A@ +12V (Max)
- DISPLAY: Intel® UHD Graphics for 10th Gen Intel® Processors
- CODEC: Realtek ALC897
- AUDIO INTERFACE: Line-in/Line-out/MIC
- SPEAKER: 2W Speaker
- ETHERNET: Intel® i210, 10/100/1000Base x 2
- USB: USB3.2 Gen2 x 2, USB2.0 x 2
- SERIAL PORT: COM1, COM2 (RS232/422/485, supports 5V/12V/RI)

Optional Accessories
- TBD

Packing List
- GENESYSM-EHL5

Note: All specifications are subject to change without notice.
SubCompact Board System

Notes:
- All specifications are subject to change without notice.

Block Diagram

Ordering Information

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<th>Part Number</th>
<th>CPU</th>
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<th>Display 1</th>
<th>Storage 1</th>
<th>LAN 1</th>
<th>USB 1</th>
<th>Expansion slot</th>
<th>TPM</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
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<tbody>
<tr>
<td>GENESYS-EHL5-A10-0001</td>
<td>N6210</td>
<td>Heatsink</td>
<td>HDMI x 1 VGA x 1</td>
<td>SATA x 1</td>
<td>GbE x 2</td>
<td>USB 3.2 Gen 2 x 2 USB 2.0 x 2</td>
<td>2</td>
<td>M.2 E-Key 2230 x 1 M.2 B-Key 2242 x 1 M.2 B-Key 2280 x 1 M.2 B-Key 3052 x 1</td>
<td>2.0</td>
<td>12V</td>
<td>0~–50°C</td>
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<tr>
<td>GENESYS-EHL5-A10-0002</td>
<td>J6412</td>
<td>Heatsink</td>
<td>HDMI x 1 VGA x 1</td>
<td>SATA x 1</td>
<td>GbE x 2</td>
<td>USB 3.2 Gen 2 x 2 USB 2.0 x 2</td>
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<td>M.2 E-Key 2230 x 1 M.2 B-Key 2242 x 1 M.2 B-Key 2280 x 1 M.2 B-Key 3052 x 1</td>
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<td>2</td>
<td>M.2 E-Key 2230 x 1 M.2 B-Key 2242 x 1 M.2 B-Key 2280 x 1 M.2 B-Key 3052 x 1</td>
<td>2.0</td>
<td>9~36V</td>
<td>0~–50°C</td>
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</table>
GENE-APL5

3.5" SubCompact Board with Intel® Pentium® N4200/ Celeron® N3350 Processor SoC

Features

- Intel® Pentium® N4200/ Celeron® N3350 Processor SoC
- DDR3L 1866, Single Channel SODIMM x 1, Non-ECC (Max. 8GB, up to 1600MHz)
- VGA/LVDS/LVDS2 (HDMI Co-layout with LVDS2 Optional)
- 2 CH Audio, SATA 6.0 Gb/s x 1
- Supports 8-bit Digital I/O, USB 2.0 x 4, USB 3.2 Gen 1 x 2, COM x 4
- Mini Card x 1 (Half-size), mSATA x 1 (Full size)
- DC 12V Only or +9~19V (Optional), AT/ATX Mode
- Supports TPM (Optional)
- 4/5/8-wire Resistive Touch Screen Controller (Optional)

Specifications

- DDR3L 1866, Single Channel SODIMM x 1, Non-ECC (Max. 8GB, up to 1600MHz)
- Supports 8-bit Digital I/O, USB 2.0 x 4, USB 3.2 Gen 1 x 2, COM x 4
- Mini Card x 1 (Half-size), mSATA x 1 (Full size)
- DC 12V Only or +9~19V (Optional), AT/ATX Mode
- Supports TPM (Optional)
- 4/5/8-wire Resistive Touch Screen Controller (Optional)

Packing List

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<tr>
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<td>Heatsink</td>
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Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Unit: mm

Ordering Information

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<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
<th>Storage</th>
<th>Expansion Slot</th>
<th>TPM</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
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<td>MiniCard x 1 (Full-size)</td>
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GENE-APL6
3.5” SubCompact Board with Intel® Pentium® N4200/ Celeron® N3350 Processor SoC

Specifications

Features
- DDR3L 1866, Single Channel SODIMM x 1, Non-ECC (Max.8GB, up to 1600MHz)
- VGA/LVDS/LVDS2 (HDMI Co-layout with LVDS2 Optional)
- 2 CH Audio, SATA 6.0 Gb/s x 1, eMMC up to 64G (Optional)
- Supports 8-bit Digital I/O, USB 2.0 x 2, USB 3.2 Gen 1 x 2, COM x 4
- Mini Card x 1 (Full-size), mSATA x 1 (Half-size)
- 9~36V wide DC input or +12V only (Optional), AT/ATX Mode
- Supports TPM (Optional)

Multiple Display
- Up to 3 Simultaneous Displays

Audio
- CODEC: Realtek ALC897/892
- AUDIO INTERFACE: Line-in/Line-out/MIC
- SPEAKER: —

External I/O
- ETHERNET: Intel® i210/i211, 10/100/1000Base, RJ-45 x 2
- USB: USB3.2 Gen 1 x 2
- SERIAL PORT: COM1 (RS232)
- VIDEO: VGA x 1

Internal I/O
- USB: USB 2.0 x 2
- SERIAL PORT: COM2, COM3 (RS232/422/485, support 5V/12V/R0)
- VIDEO: LVDS1 x 1
- SATA: SATA III x 1
- AUDIO: Audio Header x 1
- DIO/GPIO: 8-bit
- SMBus/I2C: I2C/SMBus x 1 (Default: I2C)
- TOUCH: 4/5/8-wire Touch Controller x 1 (optional)
- FAN: DC Fan x 1 (optional: Smart Fan)
- SIM: Micro SIM x 1 (Optional)
- Front Panel: HDD LED, PWR LED, Power Button, Buzzer, Reset
- OTHERS: eMMC 16G/32G/64G (optional)
- Parallel PortOCP/EPDP/VPDC x 1 (optional, select by BIOS)

Expansion
- Mini PCI-Express: Full-size mPCIe x 1
- M.2: —
- OTHERS: —

Environment & Certification
- OPERATING TEMP.: 32°F ~ 140°F (0°C ~ 60°C), WiTAS2 -40°F ~ 185°F (-40°C ~ 85°C)
- STORAGE TEMP.: -40°F ~ 185°F (-40°C ~ 85°C)
- OPERATING HUMIDITY: 0% ~ 90% relative humidity, non-condensing
- MTBF (HOURS): 374,567
- EMC: CE/FCC Class A

Optional Accessories

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<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY per Board</th>
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<td>Audio Jack Cable, 25cm</td>
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<td>1702040010</td>
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<td>GENE-APL6-HSK01</td>
<td>HeatSink.140X90X14mm.GENE-APL6.(used with heat spreader)</td>
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</tbody>
</table>

Note: All specifications are subject to change without notice.
Block Diagram

- Intel® Apollo Lake / SoC
- DDR3L SO-DIMM Up to 8GB
- INTEL GbE Ethernet (2/1/210)
- RJ-45
- Touch
- SATA III
- Realtek Codec: ALC897/892
- BIOS
- mSATA
- HDMI
- PCIe [x1] *1
- USB 2.0 *2 (Rear I/O)
- USB 3.2 Gen1 *2
- USB 2.0 *2
- USB2.0 *2 (Pin Header)
- mSATA
- SATA III
- HDA
- Realtek Codec: ALC897/892
- Line Out
- Parallel or DIO
- Super I/O
- TPM
- DP to LVDS
- TP7517
- CRT
- 18/24-bit Dual LVDS
- 18/24-bit Dual LVDS
- USB 3.2/USB2.0 *2 (Rear I/O)
- USB2.0 *2 (Pin Header)
- Mini-card
- HW Monitor
- FAN
- COM1 ~ 4
- CH7517
- 9~36V
- 0°C ~ 60°C
- Touch Controller, SIM, DIO x 8
- Standard
- With HDMI, Optional

Dimension

Unit: mm

Packing List

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
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<tbody>
<tr>
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<td>GENE-APL6 MB</td>
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<tr>
<td>TH3APL6010</td>
<td>Heat spreader for CPU N Series</td>
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</tr>
<tr>
<td>M16APL6001</td>
<td>Heat spreader for CPU E Series</td>
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</tr>
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Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Display</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/242/485</th>
<th>Storage</th>
<th>Expansion Slot</th>
<th>TPM</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
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</thead>
<tbody>
<tr>
<td>GENE-APL6-A11-F001</td>
<td>N3350</td>
<td>VGA, LVDS, LVDS2</td>
<td>Qe x 2</td>
<td>USB 3.2 Gen x 2</td>
<td>2</td>
<td>2</td>
<td>SATA x 1</td>
<td>MiniCard x 1 (Full)</td>
<td>1 -</td>
<td>9~36V</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8</td>
</tr>
<tr>
<td>GENE-APL6-A11-F002</td>
<td>N3350</td>
<td>VGA, LVDS, LVDS2</td>
<td>Qe x 2</td>
<td>USB 3.2 Gen x 2</td>
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<td>2</td>
<td>SATA x 1</td>
<td>MiniCard x 1 (Full)</td>
<td>2.0 -</td>
<td>9~36V</td>
<td>0°C ~ 60°C</td>
<td>Touch Controller, SIM, DIO x 8</td>
</tr>
<tr>
<td>GENE-APL6-A11-F003</td>
<td>N4200</td>
<td>VGA, LVDS, LVDS2</td>
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<td>USB 3.2 Gen x 2</td>
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<td>2</td>
<td>SATA x 1</td>
<td>MiniCard x 1 (Full)</td>
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<td>0°C ~ 60°C</td>
<td>DIO x 8</td>
</tr>
<tr>
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<td>N4200</td>
<td>VGA, LVDS, LVDS2</td>
<td>Qe x 2</td>
<td>USB 3.2 Gen x 2</td>
<td>2</td>
<td>2</td>
<td>SATA x 1</td>
<td>MiniCard x 1 (Full)</td>
<td>2.0 -</td>
<td>9~36V</td>
<td>0°C ~ 60°C</td>
<td>Touch Controller, SIM, DIO x 8</td>
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<tr>
<td>GENE-APL6-A11-F005</td>
<td>E3950</td>
<td>VGA, LVDS, HDMI</td>
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<td>2</td>
<td>SATA x 1</td>
<td>MiniCard x 1 (Full)</td>
<td>2.0 -</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>M16A2</td>
</tr>
</tbody>
</table>
**Gene-APL7**

3.5" SubCompact Board with Intel® Pentium® N4200/ Celeron® N3350 Processor SoC

**Features**
- Intel® Pentium® N4200/ Celeron® N3350 Processor SoC
- DDR3L 1866, Single Channel SODIMM x 1, Non-ECC (Max.8GB, up to 1600MHz)
- VGA/LVDS1/LVDS2 (LVDS1 Co-design with eDP)
- SATA 6.0 Gb/s x 1, GPIO x 8
- USB 3.2 Gen 1 x 2, USB 2.0 x 8, COM x 12
- mSATA x 1 (Full size), Mini Card x 1 (Full size) with uSIM
- DC 12V Only, AT/ATX Mode

**Specifications**

**SYSTEM**
- **Form Factor**: 3.5" SubCompact Board
- **CPU**: Intel® Atom®/Celeron®/Pentium® Processor:
  - Pentium N4200 (4C/4T,1.10GHz, up to 2.50GHz, 6W)
  - Celeron N3350 (2C/2T,1.10GHz, up to 2.40GHz, 6W)
  - Atom E3950 (4C/4T,1.60GHz, up to 2.00GHz, 9.5W)
  - Atom E3940 (4C/4T,1.60GHz, up to 1.80GHz, 9.5W)
  - Atom E3930 (2C/2T,1.30GHz, up to 1.80GHz, 6.5W)
- **Chipset**: Integrated with Intel® SoC
- **Memory Type**: DDR3L 1866, Single Channel SODIMM x 1, Non-ECC (Max.8GB, up to 1600MHz)
- **BIOS**: UEFI
- **Watchdog Timer**: 255 Levels
- **RTC Battery**: Lithium Battery 3V/240mAh
- **Dimension**: 5.75" x 4" (146mm x 101.7mm)
- **OS Support**: Windows 10 (64bit), Linux Ubuntu 21.04.0/Kernel 5.10

**Power**
- **Power Requirement**: 12V Only
- **Power Supply Type**: AT/ATX
- **Power Consumption**: Intel® E3950, DDR3L 1866MHz 8GB, 4.15A @+12V (TYPICAL)
  - Intel® E3950, DDR3L 1866MHz 8GB, 4.29A @+12V (MAX)

**Display**
- **Controller**: Intel® HD Graphics 500/505
- **LVDS/eDP**: LVDS1 Dual Channel 18/24bit x 1 (Optional: eDP1.3, up to 3840 x 2160)
  - LVDS2 Dual Channel 18/24bit x 1, up to 1920 x 1080
- **Display Interface**: VGA x 1, up to 1920 x 1200
- **Multiple Display**: Up to 3 Simultaneous Displays

**Audio**
- **Codec**: Realtek ALC897/892
- **Audio Interface**: Line-in/Line-out/MIC
- **Speaker**: 2W Amplifier (Optional)

**External I/O**
- **Ethernet**: Realtek RTL8119-CG, 10/100/1000Base, RJ-45 x 2
- **USB**: USB 3.2 Gen x 1
- **Serial Port**: COM1 (RS232)
- **GPIO**: 8-bit
- **Power Connector**: Phoenix 2-pin Connector
- **Fan**: DC Fan x 1 (Optional: Smart Fan)
- **SIM**: Micro SIM x 1 (Optional)
- **Front Panel**: HDD LED, PWR LED, Power Button, Buzzer, Reset

**Expansion**
- **Mini PCI-E/mSATA**: Full-size mPCIe x 1
- **mSATA**: Full-size mSATA/mPCIe x 1 (Default mSATA, BOM Option: mPCIe)
- **M.2**
- **Others**: —

**Environment & Certification**
- **Operating Temp.**: 32°F ~ 140°F (0°C ~ 60°C)
- **Storage Temp.**: -40°F ~ 185°F (-40°C ~ 85°C)
- **Operating Humidity**: 0% ~ 90% relative humidity, non-condensing
- **MTBF (Hours)**: 409,108
- **EMC**: CE/FCC Class A

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700050207</td>
<td>USB Cable, 20cm</td>
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<tr>
<td>1701090150</td>
<td>COM Cable, 15cm</td>
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<tr>
<td>1709100254</td>
<td>Audio Jack Cable, 25cm</td>
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<tr>
<td>1702150155</td>
<td>SATA Power Cable, 15cm</td>
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<td>170204010R</td>
<td>Power Cable, 16cm</td>
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<td>1709150151</td>
<td>CRT Cable, 15cm (VGA D-SUB connector co-layout with internal pin header by order)</td>
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<tr>
<td>GENE-APL7-HSK01</td>
<td>Heatsink</td>
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**Packing List**

<table>
<thead>
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<th>Description</th>
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<tr>
<td>GENE-APL7</td>
<td>GENE-APL7 MB</td>
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Note: All specifications are subject to change without notice.
**Block Diagram**

![Block Diagram](image)

**Dimension**

Unit: mm

![Dimension](image)

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Display</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/423/485</th>
<th>Storage</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENE-APL7-A11-F001</td>
<td>N3350</td>
<td>VGA/LVDS</td>
<td>PCIe x 2</td>
<td>USB 3.2 Gen 1 x 2 USB 2.0 x 8</td>
<td>5</td>
<td>1</td>
<td>SATA x 1 mSATA x 1 (full size)</td>
<td>MiniCard x 1 (Full)</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>Audio, DIO x 8</td>
</tr>
<tr>
<td>GENE-APL7-A11-F002</td>
<td>N3350</td>
<td>VGA/LVDS/LVDS2</td>
<td>PCIe x 2</td>
<td>USB 3.2 Gen 1 x 2 USB 2.0 x 8</td>
<td>11</td>
<td>1</td>
<td>SATA x 1 mSATA x 1 (full size)</td>
<td>MiniCard x 1 (Full)</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>Micro SIM, DIO x 8, Audio, 2W AMP</td>
</tr>
<tr>
<td>GENE-APL7-A11-F003</td>
<td>N4200</td>
<td>VGA/LVDS/vDP</td>
<td>PCIe x 2</td>
<td>USB 3.2 Gen 1 x 2 USB 2.0 x 8</td>
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<td>1</td>
<td>SATA x 1 mSATA x 1 (full size)</td>
<td>MiniCard x 1 (Full)</td>
<td>12V</td>
<td>0°C ~ 60°C</td>
<td>Micro SIM, DIO x 8, Audio, 2W AMP</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
## Specifications

### SYSTEM
- **FORM FACTOR**: 3.5" SubCompact Board System
- **CPU**: Intel® Atom®/Celeron®/Pentium® Processor: Pentium N4200 (4C/4T, 1.10GHz, up to 2.50GHz, TDP 6W)
  - Celeron N3350 (2C/2T, 1.10GHz, up to 2.40GHz, TDP 6W)
- **CHIPSET**: Integrated with Intel® SoC
- **MEMORY TYPE**: DDR3L 1866, Single Channel SODIMM x 1, Non-ECC (Max.8GB, up to 1600MHz)
- **BIOS**: UEFI
- **WAKE ON LAN**: Yes
- **WATCHDOG TIMER**: 255 Levels
- **SECURITY**: —
  - **RTC Battery**: Lithium Battery 3V/240mAH
- **DIMENSION**: 7.00" x 5.28" x 1.69" (178mm x 134.1mm x 43mm)
- **OS Support**: Windows 10 (64bit)
  - Linux Ubuntu 21.04.0/Kernel 5.10
- **POWER REQUIREMENT**: +12V
- **POWER SUPPLY TYPE**: ATX
- **CONNECTOR**: DC Jack Connector
- **POWER CONSUMPTION**: Intel® N4200, DDR3L 1600MHz 8GB, 1.61A @+12V (Typical)

### DISPLAY
- **CONTROLLER**: Intel® HD Graphics 500/505
- **Display Interface**: VGA x 1
- **Multiple Display**: —
- **AUDIO CODEC**: —
- **AUDIO INTERFACE**: —
- **Speaker**: —

### EXTERNAL I/O
- **ETHERNET**: Realtek RTL8119-CG, 10/100/1000Base, RJ-45 x 2
- **USB**: 3.2 Gen 1 x 2
- **SERIAL PORT**: COM1 (RS232)
- **VIDEO**: VGA x 1

### INTERNAL I/O
- **USB**: 2.0 x 2
- **SERIAL PORT**: Optional: COM3, COM4/RS232, COM3~COM5 support 5V/12V
t

### ENVIRONMENT & CERTIFICATION
- **OPERATING TEMP**: 32°F ~ 122°F (0°C ~ 50°C)
- **STORAGE TEMP**: -40°F ~ 185°F (-40°C ~ 85°C)
- **OPERATING HUMIDITY**: 0% ~ 90% relative humidity, non-condensing
- **MTBF (HOURS)**: 126,000
- **EMC**: CE/FCC Class A

### EXPANSION
- **Mini PCI-E/mSATA**: Full-size mPCIe x 1
  - Full-size mSATA/mPCIe x 1 (Default mSATA, BOM Option: mPCIe)
- **M.2**: —
- **Others**: —

### Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
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<tbody>
<tr>
<td>968D3004G6</td>
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<td>968D3008G7</td>
<td>8GB DDR3L-1600, 204Pin SO-DIMM.1.35V.512Mx8. Samsung. K4B4G0846X. Transcend. TS1GSK64W6H</td>
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<td>968C032G32</td>
<td>Full-size mSATA. 32GB. Transcend. TS32GMSA370</td>
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<tr>
<td>968C128G2K</td>
<td>Full-size mSATA. 128GB. Transcend. TS128GMSA370</td>
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</tr>
<tr>
<td>968C256G22</td>
<td>2.5” SATA SSD. 256GB. MLC. -10~80°C. Transcend. TS256GSSD420K- AA</td>
<td>1</td>
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<tr>
<td>1255300402</td>
<td>Power Adapter. 12V.5A.60W. FSP060-DHAN3</td>
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<tr>
<td>1255300960</td>
<td>Power Adapter. 12V.5A.96W. FSP096-DHAN3</td>
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<tr>
<td>1700231802</td>
<td>Power Cord (US)</td>
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<td>1700231803</td>
<td>Power Cord (Europe)</td>
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<tr>
<td>170023180E</td>
<td>Power Cord (Japan)</td>
<td>1</td>
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<tr>
<td>GENESYS-APL7-WMT1</td>
<td>Wall Mount Kit. For GENESYS-APL7</td>
<td>1</td>
</tr>
<tr>
<td>GENESYS-APL7-VESA1</td>
<td>VESA Mount Kit. For GENESYS-APL7</td>
<td>1</td>
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<tr>
<td>GENESYS-APL7-HDD1</td>
<td>HDD Kit. For GENESYS-APL7</td>
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<tr>
<td>GENESYS-APL7-COM1</td>
<td>COM Extension Kit. w/ 1 Cable. For GENESYS-APL7</td>
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</tbody>
</table>
### Block Diagram

**Intel® Apollo Lake SoC**

- **DDR3L SO-DIMM**
- **PCIe[x1]**
- **USB 3.0 *2**
- **USB 2.0**
- **USB HUB**
- **BIOS**
- **FAN**
- **COM 1, 3, 4**
- **HW Monitor**
- **COM 9~12**

**SubComponents**

- **Realtek GbE Ethernet RTL-8111E**
- **RJ-45**
- **PCIe[x1]**
- **Fintek Super I/O F81866D-I**
- **Mini Card (Full size)**
- **mSATA (Full size)**
- **USB 2.0 *2**
- **SPI**
- **DP to VGA**
- **Chrontel CH7517A**
- **GBE**
- **SATA**
- **USB 3.0**
- **VGA**
- **Intel® Apollo Lake SoC**
- **Realtek GbE Ethernet RTL-8111E**
- **RJ-45**
- **PCIe[x1]**
- **Fintek Super I/O F81866D-I**
- **Mini Card (Full size)**
- **mSATA (Full size)**
- **USB 2.0 *2**
- **SPI**
- **DP to VGA**
- **Chrontel CH7517A**
- **GBE**
- **SATA**
- **USB 3.0**
- **VGA**

### Dimension

**Unit: mm**

**Standard Version**

**Advanced Version**

### Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Fan/Fanless</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Power Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENESYS-APL7-A10-FS01</td>
<td>N3350</td>
<td>w/HS, Fan</td>
<td>VGA</td>
<td>SATA x 1, mSATA x 1 (Full size)</td>
<td>GbE x 2</td>
<td>USB 3.2 Gen 1 x 2, USB 2.0 x 2</td>
<td>1</td>
<td>—</td>
<td>MiniCard x 1 (Full)</td>
<td>12V</td>
<td>0°C ~ 50°C</td>
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<tr>
<td>GENESYS-APL7-A10-FS02</td>
<td>N4200</td>
<td>w/HS, Fan</td>
<td>VGA</td>
<td>SATA x 1, mSATA x 1 (Full size)</td>
<td>GbE x 2</td>
<td>USB 3.2 Gen 1 x 2, USB 2.0 x 2</td>
<td>1</td>
<td>—</td>
<td>MiniCard x 1 (Full)</td>
<td>12V</td>
<td>0°C ~ 50°C</td>
<td>—</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
GENE-BSW5

3.5" SubCompact Board with Intel® Pentium & Celeron® N3000 Series Processor SoC

Features
- Onboard Intel® Pentium®/Celeron® N3000 Series Processor SoC
- DDR3L 1600 SODIMM x 1, Up to 8 GB
- Gigabit Ethernet x 2
- VGA, LVDS1, LVDS2/HDMI (Co-design)
- 2CH HD Audio
- Mini-Card x 1 (Full-Size)
- mSATA x 1 (Shared with Mini-Card, Half-size)
- USB 3.2 Gen 1 x 2, USB2.0 x 3, COM x 6, Digital I/O 8-bit
- +12V DC, AT/ATX

Specifications

System
- 3.5" SubCompact Board
- Intel® Celeron® N Processor: Intel® Celeron® N3160 (4C/4T, 1.60GHz, up to 2.24GHz)

Chipset
- Integrated with Intel® SoC

Memory Type
- DDR3L up to 1600MHz, SODIMM x 1, up to 8GB, Non-ECC

BIOS
- UEFI

Watchdog Timer
- 255 Levels

Security
- —

RTC Battery
- Lithium Battery 3V/240mAh

Dimensions
- 5.75" x 4" (146mm x 101.7mm)

OS Support
- Windows 7/10 (64bit)
- Linux Ubuntu 21.04.0/Kernel 5.10

Power
- Power Requirement: +12V Only
- Power Supply Type: AT/ATX

Power Consumption
- Intel® N3160, DDR3L 1600MHz 8GB, 1.63A @+12V (TYPICAL)
- Intel® N3160, DDR3L 1600MHz 8GB, 1.95A @+12V (MAX)

Display
- Controller: Intel® HD Graphics for Intel® Celeron® Processor N3000 Series
- LVDS/eDP: LVDS1 Dual Channel 18/24bit x 1, up to 1920 x 1080
- LVDS2 Dual Channel 18/24bit x 1 (Optional: HDMI1.4b)
- Display Interface: VGA x 1, up to 1920 x 1200

External I/O
- Audio: Realtek ALC897/892
- Audio Interface: Line-in/Line-out/MIC

Expansion
- M.2
- SATA: SATA III x 1
- USB 3.2 Gen 1 x 2, USB 2.0 x 3

Environment & Certification
- Operating Temp.: 32°F ~ 140°F (0°C ~ 60°C)
- Storage Temp.: -40°F ~ 176°F (-40°C ~ 80°C)
- Operating Humidity: 0% ~ 90% relative humidity, non-condensing
- MTBF (HOURS): 325,391

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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<tbody>
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<td>1702150155</td>
<td>SATA Power Cable, 15cm</td>
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<tr>
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<td>ATX Power Cable, 20cm</td>
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<tr>
<td>1709070500</td>
<td>SATA Cable, 50cm</td>
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<tr>
<td>170204100R</td>
<td>Power Cable, 10cm</td>
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<td>1709100254</td>
<td>Audio JACK Cable, 25cm</td>
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<tr>
<td>1701090150</td>
<td>COM Cable, 15cm</td>
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<tr>
<td>1700050207</td>
<td>USB Cable, 20cm</td>
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<tr>
<td>1700060152</td>
<td>PS/2 KB/MS Cable, 15cm</td>
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<tr>
<td>175118901M</td>
<td>BATTERY 3.0W/Wire 110mm, MITSUBISHI, CR2032-HAT00(MLF)</td>
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</table>

Packing List

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENE-BSW5</td>
<td>GENE-BSW5 MB</td>
</tr>
<tr>
<td>M16BT05000</td>
<td>Heatsink</td>
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Note: All specifications are subject to change without notice.
Block Diagram

Block Diagram

Dimension
Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Display</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
<th>Storage</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENE-BSW5-A12-0001</td>
<td>N3160</td>
<td>VGA+LVDS</td>
<td>2 x 2</td>
<td>USB 3.2 Gen 1 x 2</td>
<td>2</td>
<td>2</td>
<td>SATA x 1</td>
<td>Mini Card x 1/Full-Size</td>
<td>+12V</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8</td>
</tr>
<tr>
<td>GENE-BSW5-A12-0002</td>
<td>N3160</td>
<td>VGA+LVDS</td>
<td>2 x 2</td>
<td>USB 3.2 Gen 1 x 2</td>
<td>4</td>
<td>2</td>
<td>SATA x 1</td>
<td>Mini Card x 1/Full-Size</td>
<td>+12V</td>
<td>0°C ~ 60°C</td>
<td>Touch Controller, SIM, DIO x 8</td>
</tr>
</tbody>
</table>
GENE-BT04
3.5" SubCompact Board with Intel® Celeron® J1900/N2807 Processor SoC

Features
- Intel® Celeron® J1900/ N2807 Processor SoC
- DDR3L 1333 SODIMM slot x1, Max. up to 8GB
- HDMI x 2: HDMI 1 (w/ Audio), HDMI 2 (w/o Audio)
- USB 2.0 x 2, USB 3.2 Gen 1 x 1, COM x 1
- Mini-Card x 1 (Full-size)
- SATA 2.0 x 1
- DC 12V ATX Mode
- 12 ~ 24V DC Input, ATX Mode

Specifications

**SYSTEM**
- **FORM FACTOR**: 3.5" SubCompact Board
- **CPU**: Intel® Atom®/ Celeron® Processor:
  - Celeron® J1900 (4C/4T, 2.00GHz, up to 2.42GHz, 10W)
  - Celeron® N2807 (2C/2T, 1.58GHz, up to 2.16GHz, 4.3W)
- **CHIPSET**: Integrated with Intel® SoC
- **MEMORY TYPE**: DDR3L up to 1333MHz, SODIMM x 1, up to 8GB, Non-ECC
- **BIOS**: UEFI
- **WATCHDOG TIMER**: 255 Levels
- **RTC BATTERY**: Lithium Battery 3V/240mAh
- **DIMENSION**: 5.75” x 4” (146mm x 101.7mm)
- **OS SUPPORT**: Windows 7/10 (64bit), Linux Ubuntu 20.04.3/Kernel 5.11
- **POWER**:
  - **POWER REQUIREMENT**: +12~24V
  - **POWER SUPPLY TYPE**: ATX
  - **CONNECTOR**: DC Jack Connector
  - **POWER CONSUMPTION**: Intel® N2807, DDR3L 1600MHz 4G, 0.65A @ +12V (TYPICAL)
- **DISPLAY**:
  - **CONTROLLER**: Intel® HD Graphics for Intel Atom® Processor Z3700 Series
  - **LVDS/eDP**: —
  - **DISPLAY INTERFACE**: HDMI x 2: HDMI 1(w/Audio), HDMI 2(w/o Audio)
  - **MULTIPLE DISPLAY**: Up to 2 Simultaneous Displays
- **AUDIO**:
  - **CODEC**: —
  - **AUDIO INTERFACE**: —
  - **SPEAKER**: —
- **EXTERNAL I/O**:
  - **ETHERNET**: Intel® i210, 10/100/1000Base, RJ-45 x 4
  - **USB**: USB 2.0 x 2, USB 3.2 Gen 1 x 1
  - **SERIAL PORT**: COM1 (RS232)
  - **VIDEO**: HDMI x 2
- **INTERNAL I/O**:
  - **USB**: —
  - **SERIAL PORT**: —
  - **VIDEO**: —
  - **SATA**: SATA III x 1
  - **+5V SATA Power Connector**: x 1
  - **AUDIO**: —

Packing List

<table>
<thead>
<tr>
<th>Description</th>
<th>QTY</th>
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<tbody>
<tr>
<td>GENE-BT04 MB</td>
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<tr>
<td>M10BT04010 (Heat spreader)</td>
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</tr>
<tr>
<td>Power cable</td>
<td>1</td>
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</table>

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
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<tbody>
<tr>
<td>1709970500</td>
<td>SATA Cable, 50cm</td>
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<tr>
<td>1702150155</td>
<td>SATA HDD Power Cable, 15cm</td>
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OS Support

<table>
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<tr>
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<th>Description</th>
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</thead>
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<tr>
<td>OS-W10R-600-00000-EN</td>
<td>Windows 10 IoT Enterprise for Retail or ThinClients.64bit MultiLang. (EngFreCNCHNCntKor)</td>
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Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Fan/Fanless</th>
<th>Display</th>
<th>LVDS</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Power Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENE-BT04-A12-0001</td>
<td>Intel® Celeron® N2807</td>
<td>Fanless</td>
<td>HDMI x 2</td>
<td>—</td>
<td>SATA x 1</td>
<td>GBE x 4</td>
<td>USB 3.2 Gen 1 x 1, USB 2.0 x 2</td>
<td>1</td>
<td>—</td>
<td>Mini-Card x 1 (Full)</td>
<td>12V – 24V</td>
<td>0°C – 60°C</td>
<td>DIO x 4</td>
</tr>
<tr>
<td>GENE-BT04-A12-0002</td>
<td>Intel® Celeron® J1900</td>
<td>Fanless</td>
<td>HDMI x 2</td>
<td>—</td>
<td>SATA x 1</td>
<td>GBE x 4</td>
<td>USB 3.2 Gen 1 x 1, USB 2.0 x 2</td>
<td>1</td>
<td>—</td>
<td>Mini-Card x 1 (Full)</td>
<td>12V – 24V</td>
<td>0°C – 60°C</td>
<td>DIO x 4</td>
</tr>
</tbody>
</table>
## GENE-BT05

### 3.5” SubCompact Board with Intel® Atom® and Celeron® Processor SoC

#### Specifications

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>3.5” SubCompact Board</th>
</tr>
</thead>
</table>
| CPU    | Intel® Atom®/ Celeron® Processor:  
Celeron® J1900 (4C/4T, 2.00GHz, up to 2.42GHz, 10W)  
Celeron® N2930 (4C/4T, 1.83GHz, up to 2.16GHz, 7.5W)  
Celeron® N2807 (2C/2T, 1.58GHz, up to 2.16GHz, 4.3W)  
Atom® E3845 (4C/4T, 1.91 GHz, 10W)  
Atom® E3825 (2C/2T, 1.33 GHz, 6W) |
| CHIPSET | Integrated with Intel® SoC |
| MEMORY TYPE | DDR3L up to 1333MHz, SODIMM x 1, up to 8GB, Non-ECC |
| BIOS | UEFI |
| WAKE ON LAN | Yes |
| WATCHDOG TIMER | 255 Levels |
| SECURITY | TPM 1.2(Optional) |
| RTC BATTERY | Lithium Battery 3V/240mAh |
| DIMENSION | 5.75” x 4” (146mm x 101.7mm) |
| OS SUPPORT | Windows 7/10 (64bit)  
Linux Ubuntu 20.04.3/Kernel 5.11 |
| POWER |  | |
| POWER REQUIREMENT | +12V Only |
| POWER SUPPLY TYPE | ATX |
| CONNECTOR | Phoenix 2-pin Connector |
| POWER CONSUMPTION | Intel® J1900, DDR3L 1600MHz 8GB, 1.73A @ +12V(TYPICAL)  
Intel® J1900, DDR3L 1600MHz 8GB, 1.88A @ +12V(MAX) |
| DISPLAY | Intel® HD Graphics for Intel Atom® Processor 23700 Series  
LVDS x1P  
LVDS Dual Channel 18/24bit x 1, up to 1920 x 1080  
DISPLAY INTERFACE HDMI 1.4a x 1, up to 3840 x 2160  
VGA x 1, up to 1920 x 1200  
MULTIPLE DISPLAY Up to 3 Simultaneous Displays |
| AUDIO | Realtek ALC897/892  
AUDI INTERFACE Line-in Line-out/MIC  
SPEAKER DIO/GPIO  
SMBus/12C |
| EXTENSION | CFast™ x 1 (Optional, Share Mini-Card Interface)  
Onboard Trusted Platform Module (Optional) |
| ENVIROMENT & CERTIFICATION | OPERATING TEMP. 32°F – 140°F (-0°C ~ 60°C) or WiTAS 2 (E3825)  
STORAGE TEMP. -49°F ~ 176°F (-40°C ~ 80°C)  
OPERATING HUMIDITY 0% ~ 90% relative humidity, non-condensing  
MTBF (HOURS) 344,859 |
| EMC | CE/FCC Class A |

#### Features

- Onboard Intel® Atom® and Celeron® Processor SoC
- DDR3L 1066/1333 MHz SODIMM x 1, Up to 8 GB
- Gigabit Ethernet x 2, RJ-45 x 2
- CRT, 18/24-bit Dual-Channel LVDS LCD, HDMI
- 2CH HD Audio
- SATA 3.0 Gb/s x 1, CFast™ x 1
- USB 3.2 Gen 1 x 1, USB2.0 x 3, COM x 4, 8-bit Digital I/O
- Mini-Card x 2 (Full-size x 1, Half-size x 1)
- DC 12V, AT/ATX Mode
- Onboard 4/5/8-wire Resistive Touch Screen Controller (Optional)
- AAEON Hi-Safe/SDK/Utility Supported
- mSATA x 1 (Optional, Share Mini-Card Interface)

#### Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY per Board</th>
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<tbody>
<tr>
<td>1700050207</td>
<td>USB Cable, 20cm</td>
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<tr>
<td>1701090150</td>
<td>COM Cable, 15cm</td>
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<tr>
<td>1709100254</td>
<td>Audio Jack Cable, 25cm</td>
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<tr>
<td>1709070500</td>
<td>SATA CABLE, 50cm</td>
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<td>170204010R</td>
<td>Power Cable, 10cm</td>
<td>1</td>
</tr>
<tr>
<td>1702150155</td>
<td>SATA Power Cable, 15cm</td>
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<tr>
<td>170220020B</td>
<td>ATX Power Cable, 20cm</td>
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#### Packing List

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
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<td>GENE-BT05 MB</td>
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<tr>
<td>M16BT07620</td>
<td>Heatsink</td>
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Note: All specifications are subject to change without notice.
Block Diagram

Dimension Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Display</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-422/485</th>
<th>Storage</th>
<th>Expansion Slot</th>
<th>TPM</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENE-BT05-A12-0001</td>
<td>Intel®Celeron® N2930</td>
<td>CRT + LVDS + HDMI + CRT</td>
<td>Gbe x 2</td>
<td>USB3.0 x 1</td>
<td>USB2.0 x 3</td>
<td>2</td>
<td>SATA x 1</td>
<td>CFast x 1</td>
<td>1.2</td>
<td>12V, AT/ATX</td>
<td>0°C ~ 60°C</td>
<td>Touch, SIM, DIO x 8</td>
</tr>
<tr>
<td>GENE-BT05-A12-0002</td>
<td>Intel®Celeron® N2930</td>
<td>CRT + LVDS + HDMI + CRT</td>
<td>Gbe x 2</td>
<td>USB3.0 x 1</td>
<td>USB2.0 x 3</td>
<td>2</td>
<td>SATA x 1</td>
<td>CFast x 1</td>
<td>1.2</td>
<td>12V, AT/ATX</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8</td>
</tr>
<tr>
<td>GENE-BT05-A12-0003</td>
<td>Intel®Celeron® N2930</td>
<td>CRT + LVDS + HDMI + CRT</td>
<td>Gbe x 2</td>
<td>USB3.0 x 1</td>
<td>USB2.0 x 3</td>
<td>2</td>
<td>SATA x 1</td>
<td>CFast x 1</td>
<td>1.2</td>
<td>12V, AT/ATX</td>
<td>0°C ~ 60°C</td>
<td>Touch, SIM, DIO x 8</td>
</tr>
<tr>
<td>GENE-BT05-A12-0004</td>
<td>Intel®Celeron® N2930</td>
<td>CRT + LVDS + HDMI + CRT</td>
<td>Gbe x 2</td>
<td>USB3.0 x 1</td>
<td>USB2.0 x 3</td>
<td>2</td>
<td>SATA x 1</td>
<td>CFast x 1</td>
<td>1.2</td>
<td>12V, AT/ATX</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8</td>
</tr>
<tr>
<td>GENE-BT05-A12-0005</td>
<td>Intel® Atom™ E3845</td>
<td>CRT + LVDS + HDMI + CRT</td>
<td>Gbe x 2</td>
<td>USB3.0 x 1</td>
<td>USB2.0 x 3</td>
<td>2</td>
<td>SATA x 1</td>
<td>CFast x 1</td>
<td>1.2</td>
<td>12V, AT/ATX</td>
<td>0°C ~ 60°C</td>
<td>Touch, SIM, DIO x 8</td>
</tr>
<tr>
<td>GENE-BT05-A12-0006</td>
<td>Intel® Atom™ E3845</td>
<td>CRT + LVDS + HDMI + CRT</td>
<td>Gbe x 2</td>
<td>USB3.0 x 1</td>
<td>USB2.0 x 3</td>
<td>2</td>
<td>SATA x 1</td>
<td>CFast x 1</td>
<td>1.2</td>
<td>12V, AT/ATX</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8</td>
</tr>
<tr>
<td>GENE-BT05-A12-0007</td>
<td>Intel® Atom™ E3845</td>
<td>CRT + LVDS + HDMI + CRT</td>
<td>Gbe x 2</td>
<td>USB3.0 x 1</td>
<td>USB2.0 x 3</td>
<td>2</td>
<td>SATA x 1</td>
<td>CFast x 1</td>
<td>1.2</td>
<td>12V, AT/ATX</td>
<td>0°C ~ 60°C</td>
<td>Touch, SIM, DIO x 8</td>
</tr>
<tr>
<td>GENE-BT05-A12-0008</td>
<td>Intel® Atom™ E3845</td>
<td>CRT + LVDS + HDMI + CRT</td>
<td>Gbe x 2</td>
<td>USB3.0 x 1</td>
<td>USB2.0 x 3</td>
<td>2</td>
<td>SATA x 1</td>
<td>CFast x 1</td>
<td>1.2</td>
<td>12V, AT/ATX</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8</td>
</tr>
<tr>
<td>GENE-BT05-A12-0009</td>
<td>Intel® Celeron® J1900</td>
<td>CRT + LVDS + HDMI + CRT</td>
<td>Gbe x 2</td>
<td>USB3.0 x 1</td>
<td>USB2.0 x 3</td>
<td>2</td>
<td>SATA x 1</td>
<td>CFast x 1</td>
<td>1.2</td>
<td>12V, AT/ATX</td>
<td>0°C ~ 60°C</td>
<td>Touch, SIM, DIO x 8</td>
</tr>
<tr>
<td>GENE-BT05-A12-0010</td>
<td>Intel® Celeron® J1900</td>
<td>CRT + LVDS + HDMI + CRT</td>
<td>Gbe x 2</td>
<td>USB3.0 x 1</td>
<td>USB2.0 x 3</td>
<td>2</td>
<td>SATA x 1</td>
<td>CFast x 1</td>
<td>1.2</td>
<td>12V, AT/ATX</td>
<td>0°C ~ 60°C</td>
<td>DIO x 8</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
### Specifications

#### SYSTEM
- **FORM FACTOR**: 3.5” SubCompact Board System

#### CPU
- Intel® Atom®/Celeron® Processor: Celeron® J1900 (4C/4T, 2.00GHz, up to 2.42GHz, TDP 10W)
- Celeron® N2930 (4C/4T, 1.83GHz, up to 2.16GHz, TDP 7.5W)
- Celeron® N2807 (2C/2T, 1.58GHz, up to 2.16GHz, TDP 4.3W)
- Atom® E3845 (4C/4T, 1.91 GHz, TDP 10W)
- Atom® E3825 (2C/2T, 1.33 GHz, TDP 6W)

#### CHIPSET
- Integrated with Intel® SoC

#### MEMORY TYPE
- DDR3L up to 1333MHz, SODIMM x 1, up to 8GB, Non-ECC

#### BIOS
- UEFI

#### SECURITY
- TPM 1.2 (Optional)
- RTC Battery: Lithium Battery 3V/240mAh

#### DIMENSION
- 7.00” x 5.28” x 1.69” (178mm x 134.1mm x 43mm)

#### OS Support
- Windows 7/10 (64bit)
- Linux Ubuntu 20.04.3/Kernel 5.11

#### POWER
- **POWER REQUIREMENT**: +12V Only
- **POWER SUPPLY TYPE**: ATX
- **CONNECTOR**: DC Jack Connector
- **POWER CONSUMPTION**: 8.0VA @ +12V (Typical)

#### DISPLAY
- **CONTROLLER**: Intel® HD Graphics for Intel Atom® Processor Z3700 Series
- **LVDS/eDP**: —
- **Display Interface**: HDMI 1.4a x 1
- **VIDEO**: VGA x 1
- **Multi-Display**: Up to 2 Simultaneous Displays

#### AUDIO
- **CODEC**: —
- **AUDIO INTERFACE**: —
- **Speaker**: —

#### ETHERNET
- Intel® i210, 10/100/1000Base, RJ-45 x 2
- **USB 3.2 Gen 1 x 2, USB 2.0 x 1**

#### POWER Button

### Features
- Onboard Intel® Atom® and Celeron® Processor SoC
- DDR3L up to 1333 MHz SODIMM x 1, Up to 8 GB
- Gigabit Ethernet x 2, RJ-45 x 2
- CRT, HDMI
- Mini-Card x 2, SATA III x 1, CFast™ x 1 (Optional)
- USB 3.2 Gen 1 x 1, USB2.0 x 3, COM x 3
- Onboard Trusted Platform Module (Optional)
- DC 12V, ATX Mode

### Packing List

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<thead>
<tr>
<th>Description</th>
<th>QTY</th>
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### Optional Accessories

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<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>125530096Z</td>
<td>Power Adapter, 12V 5A 60W, FSP060-DHAN3</td>
<td>1</td>
</tr>
<tr>
<td>1255300960</td>
<td>Power Adapter, 12V 5A 96W, FSP096-DHAN3</td>
<td>1</td>
</tr>
<tr>
<td>1702031832</td>
<td>Power Cord (US)</td>
<td>1</td>
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<tr>
<td>1702031833</td>
<td>Power Cord (Europe)</td>
<td>1</td>
</tr>
<tr>
<td>170203183E</td>
<td>Power Cord (Japan)</td>
<td>1</td>
</tr>
<tr>
<td>GENESYS-BT05-WMT1</td>
<td>Wall Mount Kit. For GENESYS-BT05</td>
<td>1</td>
</tr>
<tr>
<td>GENESYS-BT05-VESA1</td>
<td>VESA Mount Kit. For GENESYS-BT05</td>
<td>1</td>
</tr>
<tr>
<td>GENESYS-BT05-HDB1</td>
<td>HDD Kit. For GENESYS-BT05</td>
<td>1</td>
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<tr>
<td>GENESYS-BT05-COM1</td>
<td>COM Extension Kit, w/1 Cable. For GENESYS-BT05</td>
<td>1</td>
</tr>
</tbody>
</table>
Block Diagram

SubCompact Board System

GENESYS-BT05

Intel® Atom E38xx series / Celeron N2930, N2807, J1900

Block Diagram

Dimension

Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Display</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>Storage</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENESYS-BT05-A12-0002</td>
<td>N2807</td>
<td>VGA</td>
<td>Gbe x 2</td>
<td>USB2.0 * 2</td>
<td></td>
<td>SATA x 1 mSATA x 1 (Half Size)</td>
<td>Mini Card x 1 (Full Size)</td>
<td>+12V, ATX</td>
<td>0°C ~ 50°C</td>
<td>—</td>
</tr>
<tr>
<td>GENESYS-BT05-A12-0004</td>
<td>J1900</td>
<td>VGA</td>
<td>Gbe x 2</td>
<td>USB2.0 * 2</td>
<td></td>
<td>SATA x 1</td>
<td>Mini Card x 1 (Full Size)</td>
<td>+12V, ATX</td>
<td>0°C ~ 50°C</td>
<td>—</td>
</tr>
</tbody>
</table>
### Specifications

**SYSTEM**

**FORM FACTOR**

3.5” SubCompact Board

**CPU**

Intel® Atom® / Celeron® Processor:
- Celeron® J1900 (4C/4T, 2.00GHz, up to 2.42GHz, 10W)
- Celeron® N2930 (4C/4T, 1.83GHz, up to 2.16GHz, 7.5W)
- Celeron® N2807 (2C/2T, 1.58GHz, up to 2.16GHz, 4.3W)
- Atom® E3845 (4C/4T, 1.91 GHz, 10W)
- Atom® E3825 (2C/2T, 1.33 GHz, 6W)

**CHIPSET**

Integrated with Intel® SoC

**MEMORY TYPE**

On Board DDR3L 1066/1333MHz, up to 4GB, Non-ECC

**BIOS**

UEFI

**WAKE ON LAN**

Yes

**WATCHDOG TIMER**

255 Levels

**SECURITY**

TPM 2.0 (BOM optional)

**RTC BATTERY**

Lithium Battery 3V/240mAh

**DIMENSION**

5.75” x 4” (146mm x 101.7mm)

**OS SUPPORT**

Windows 7/10 (64bit)

**POWER**

**POWER REQUIREMENT**

+9~24V

**POWER SUPPLY TYPE**

ATATX

**CONNECTOR**

Phoenix 2-pin Connector

**POWER CONSUMPTION**

Intel® E3845, DDR3L on board RAM 4GB, 2.10A @ +12V (TYPICAL)

**DISPLAY**

**CONTROLLER**

Intel® HD Graphics for Intel Atom® Processor Z3700 Series

**LVDS/eDP**

LVDS Dual Channel 18/24bit x 1, up to 1920 x 1080

**DISPLAY INTERFACE**

HDMI 1.4a, up to 3840 x 2160 (Optional: DP1.1a)

**MULTIPLE DISPLAY**

Up to 3 Simultaneous Displays

**AUDIO**

**CODEC**

Realtek ALC957/92

**AUDIO INTERFACE**

Line-in/Line-out/MIC

**SPEAKER**

2W Amplifier(Optional)

**EXTERNAL I/O**

**ETHERNET**

Intel® i210, 10/100/1000Base, RJ-45 x 2

**USB**

USB 3.2 Gen 1 x 1, USB2.0 x 1

**SERIAL PORT**

COM1 (RS232/422/485, supports 5V/12V) x 1

**SATA**

SATA II x 1, +5V SATA Power Connector x 1

**Audio Header x 1**

**GPIO/PINIO**

8-bit

**SMBus/IOC**

SMBus x 1

**TOUCH**

4/5/8 wire Touch Controller x 1 (Optional)

**FAN**

DC Fan x 1 (optional: Smart Fan)

**SIM**

SIM x 1

**FRONT PANEL**

HDD LED, PWR LED, Power Button, Buzzer, Reset

**OTHERS**

—

**EXPANSION**

**Mini PCI-E/mSATA**

Full-size mPCIe/USB2.0 x 1

**M.2**

—

**OTHERS**

—

**ENVIROMENT & CERTIFICATION**

**OPERATING TEMP.**

32°F ~ 140°F (0°C ~ 60°C) or WiTAS 2 -40°F ~ 185°F (-40°C ~ 85°C)

**STORAGE TEMP.**

-40°F ~ 176°F (-40°C ~ 80°C)

**OPERATING HUMIDITY**

0% ~ 90% relative humidity, non-condensing

**MTBF (HOURS)**

403,079

**EMC**

CE/FCC Class A

---

### Features

- Onboard DDR3L Memory Max. 4 GB
- CRT, 18/24-bit Dual-Channel LVDS LCD, HDMI (DP Sharded with HDMI/CRT, Optional)
- Mini-Card Slot x 2 (Full-size x 1, Half-size x 1)
- Wide DC Support 9~24V
- Supports TPM (Optional)
- Solder Design For System Assembly and Thermal

### Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY per Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700550097</td>
<td>USB CABLE, 20cm</td>
<td>2</td>
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<tr>
<td>1701000150</td>
<td>COM Cable, 15cm</td>
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<td>1709100294</td>
<td>Audio Jack Cable, 25cm</td>
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<td>1702150155</td>
<td>SATA Power Cable, 15cm</td>
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<td>170220020B</td>
<td>ATX Power Cable, 20cm</td>
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<td>17024010R</td>
<td>Power Cable, 10cm</td>
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### Packing List

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
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<tr>
<td>GEN0-BT06</td>
<td>GEN0-BT06 MB</td>
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<tr>
<td>M10BTO6010</td>
<td>Heat spreader</td>
<td>1</td>
</tr>
</tbody>
</table>
Block Diagram

![Block Diagram Image]

Dimension

Unit: mm

Ordering Information

| Part Number       | CPU               | Memory | Display        | LAN            | USB            | RS-232         | RS-222/422/485 | Storage                  | Expansion Slot | TPM         | Power     | Operating Temp | Others                  |
|-------------------|-------------------|--------|----------------|----------------|----------------|----------------|----------------|----------------|---------------------------|----------------|-------------|-----------|----------------|-------------------------|
| GENE-BT06-A12-0001 | Intel® Celeron® N2930 | Onboard 4GB | VGA, LVDS, HDMI | GbE x 2        | USB 3.0 x 1/2  | SATA x 1       | mSATA x 1      | MiniCard x 1 (Full)     | —              | 9-24V       | 0°C ~ 60°C | 0°C ~ 60°C       | DIO x 8                  |
| GENE-BT06-A12-0002 | Intel® Celeron® J1900 | Onboard 4GB | VGA, LVDS, HDMI | GbE x 2        | USB 3.0 x 1    | SATA x 1       | mSATA x 1 (half size) | MiniCard x 1 (Full) | 2.0          | 9-24V       | 0°C ~ 60°C       | Touch Controller, SIM, DIO x 8 |
| GENE-BT06-A12-0003 | Intel® Atom™ E3825 | Onboard 2GB | VGA + LVDS     | GbE x 2        | USB 3.0 x 1    | SATA x 1       | mSATA x 1 (half size) | MiniCard x 1 (Full) | —            | 9-24V       | 0°C ~ 60°C       | DIO x 8                  |
| GENE-BT06-A12-0004 | Intel® Atom™ E3845 | Onboard 4GB | VGA, LVDS, HDMI | GbE x 2        | USB 3.0 x 1    | SATA x 1       | mSATA x 1 (half size) | MiniCard x 1 (Full) | 2.0          | 9-24V       | 0°C ~ 60°C       | Touch Controller, SIM, DIO x 8 |
| GENE-BT06-A12-0005 | Intel® Atom™ E3845 | Onboard 4GB | VGA + LVDS     | GbE x 2        | USB 3.0 x 1    | SATA x 1       | mSATA x 1 (half size) | MiniCard x 1 (Full) | —            | 9-24V       | 0°C ~ 60°C       | DIO x 8                  |
| GENE-BT06-A12-0006 | Intel® Atom™ E3845 | Onboard 4GB | VGA, LVDS, HDMI | GbE x 2        | USB 3.0 x 1    | SATA x 1       | mSATA x 1 (half size) | MiniCard x 1 (Full) | 2.0          | 9-24V       | 0°C ~ 60°C       | Touch Controller, SIM, DIO x 8 |
| GENE-BT06W2-A12-0003 | Intel® Atom™ E3845 | Onboard 4GB | VGA + LVDS     | GbE x 2        | USB 3.0 x 1    | SATA x 1       | mSATA x 1 (half size) | MiniCard x 1 (Full) | —            | 12V         | —         | MTTR-2 (-40°C~85°C) | Touch Controller, SIM, DIO x 8 |
| GENE-BT06W2-A12-0006 | Intel® Atom™ E3845 | Onboard 4GB | VGA, LVDS, HDMI | GbE x 2        | USB 3.0 x 1    | SATA x 1       | mSATA x 1 (half size) | MiniCard x 1 (Full) | 2.0          | 12V         | —         | MTTR-2 (-40°C~85°C) | Touch Controller, SIM, DIO x 8 |

Note: All specifications are subject to change without notice.
GENE-5315 Rev. A
3.5” SubCompact Board with AMD Geode™ LX Series Processor

Features
- Onboard AMD Geode™ LX800 Processor
- AMD Geode™ LX + CS5536
- DDR 333 MHz SODIMM, Up to 1 GB or DDR 400 MHz SODIMM, Up to 512 MB
- 10/100Base-TX Ethernet x 2, RJ-45 x 2
- Up to 24-bit Single Channel LVDS/ TTL LCD & CRT
- AC97 Codec 2CH Audio
- EIDE x 1, Floppy Disk Drive x 1, CompactFlash™ x 1
- COM x 2, Parallel x 1, USB2.0 x 4, 8-bit Digital I/O
- Mini-PCI And PC/104 Expansions
- +5V Only Operation

Specifications

**SYSTEM**
- **FRAME FACTOR**: 3.5” SubCompact Board
- **CPU**: AMD Geode™ LX800 Processor
  AMD Geode™ LX 800 (500MHz, 3.6W)
- **CHIPSET**: CS5536
- **MEMORY TYPE**: DDR333 SODIMM x 1 (DDR400 optional), up to 1GB
- **BIOS**: Award 1MB
- **WAKE ON LAN**: Yes
- **WATC HD TIMER**: 255 Levels
- **SECURITY**: —
- **RTC BATTERY**: Lithium Battery 3V/240mAh
- **DIMENSION**: 5.75” x 4” (146mm x 101.7mm)
- **OS SUPPORT**: Windows XP 32-bit

**POWER**
- **POWER REQUIREMENT**: +5V
- **POWER SUPPLY TYPE**: AT/ATX
- **CONNECTOR**: 4Pin Connector
- **POWER CONSUMPTION**: LX 800 500 MHz, DDR400 1 GB, 1.17A@+5V(Typical)

**DISPLAY**
- **CONTROLLER**: AMD Geode™
- **LVDS/eDP**: Up to 24-bit Single Channel LVDS/ TTL LCD
- **DISPLAY INTERFACE**: VGA x1, up to 1920 x 1200
- **MULTIPLE DISPLAY**: Up to 2 Simultaneous Displays

**AUDIO**
- **CODEC**: High Definition Audio Interface
- **AUDIO INTERFACE**: Line-in/Line-out/MIC/CD-in
- **SPEAKER**: —

**EXTERNAL I/O**
- **ETHERNET**: 10/100Base-TX x 2, Realtek RTL 8139DL
- **USB**: —
- **SERIAL PORT**: COM1(RS-232)
- **VIDEO**: VGA x1

**INTERNAL I/O**
- **USB**: USB2.0 x 4
- **SERIAL PORT**: COM2(RS-232/422/485)
- **VIDEO**: TTL LCD x1, LVDS LCD x1
- **SATA**: —
- **AUDIO**: Audio Header x1
- **DIO/GPIO**: 8-bit
- **SMBus/I2C**: —
- **TOUCH**: —

**ENVIRONMENT & CERTIFICATION**
- **OPERATING TEMP.**: 32°F ~ 140°F (0°C ~ 60°C)
- **STORAGE TEMP.**: -40°F ~ 176°F (-40°C ~ 80°C)
- **OPERATING HUMIDITY**: 0% ~ 90% relative humidity, non-condensing
- **MTBF (HOURS)**: 90,000
- **EMC**: CE/FCC Class A

Packing List

- **9681531501**
  Cable Kit for GENE-5315
  1700600192 Keyboard & Mouse Cable
  1709100201 USB Cable
  1701440500 IDE Cable

- **9657666600**
  Jumper Cap

**GENE-5315 Rev. A**

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1702200205</td>
<td>Conversion Cable for ATX Power Supply, Length 20cm</td>
<td>1</td>
</tr>
<tr>
<td>1709140181</td>
<td>Audio Cable, Length 18cm</td>
<td>1</td>
</tr>
<tr>
<td>1709100208</td>
<td>USB Cable, Length 20cm</td>
<td>1</td>
</tr>
<tr>
<td>1701100206</td>
<td>COM Port Cable, 9P DB Male, Length 20cm</td>
<td>1</td>
</tr>
<tr>
<td>1701260201</td>
<td>Parallel Port Cable, Length 20 cm</td>
<td>1</td>
</tr>
<tr>
<td>1701340600</td>
<td>Floppy Cable, Length 60 cm</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Fan/Fanless</th>
<th>Display</th>
<th>LVDS</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Power Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENE-5315-A13</td>
<td>AMD Geode™ LX800</td>
<td>Fanless</td>
<td>CRT + LVDS</td>
<td>24-bit</td>
<td>EIDE x 1</td>
<td>FE x 2</td>
<td>1</td>
<td>1</td>
<td>Mini-PCI x 1</td>
<td>+5V, AT/ATX</td>
<td>0°C – 60°C</td>
<td>DIO x 8</td>
<td></td>
</tr>
<tr>
<td>GENE-5315-A15</td>
<td>AMD Geode™ LX800</td>
<td>Fanless</td>
<td>CRT + LVDS</td>
<td>18/24-bit</td>
<td>EIDE x 1</td>
<td>FE x 2</td>
<td>1</td>
<td>1</td>
<td>Mini-PCI x 1</td>
<td>+5V, AT/ATX</td>
<td>0°C – 60°C</td>
<td>DIO x 8</td>
<td></td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
GENE-5315 Rev. B
3.5” SubCompact Board with AMD Geode™ LX Series Processor

Features
- Onboard AMD Geode™ LX800 Processor
- AMD Geode™ LX + CS5536
- DDR 333 MHz SODIMM x 1, Up to 1 GB or DDR 400 MHz SODIMM x 1, Up to 512 MB
- 10/100Base-TX Ethernet x 2, RJ-45 x 2
- Up to 24-bit Single Channel LVDS/ TTL LCD & CRT
- AC97 Codec 2CH Audio
- EIDE x 1, Floppy Disk Drive x 1, CompactFlash™ x 1
- COM x 5, Parallel x 1, USB2.0 x 4, 8-bit Digital I/O
- Mini-PCI x 1
- +5V Only Operation

Specifications

SYSTEM
- FORM FACTOR: 3.5” SubCompact Board
- CPU: AMD Geode™ LX 800 (500MHz, 3.6W)
- CHIPSET: CS5536
- MEMORY TYPE: DDR333 SODIMM x 1 (DDR400 optional), up to 1GB
- BIOS: Award 1MB
- WAKE ON LAN: Yes
- WATCHDOG TIMER: 255 Levels
- RTC BATTERY: Lithium Battery 3V/240mAh
- DIMENSION: 5.75” x 4” (146mm x 101.7mm)
- OS SUPPORT: Windows XP 32-bit

POWER
- POWER REQUIREMENT: +5V
- POWER SUPPLY TYPE: AT/ATX
- CONECTOR: 4Pin Connector
- POWER CONSUMPTION: LX 800 = 500 MHz, DDR400 1 GB, 1.17A@+5V (Typical)

DISPLAY
- CONTROLLER: AMD Geode™
- LVDS/eDP: Up to 24-bit Single Channel LVDS/ TTL LCD
- DISPLAY INTERFACE: VGA x1, up to 1920 x 1200
- MULTIPLE DISPLAY: Up to 2 Simultaneous Displays

AUDIO
- CODEC: High Definition Audio Interface
- AUDIO INTERFACE: Line-in/Line-out/MIC/CD-in
- SPEAKER: —

EXTERNAL I/O
- ETHERNET: 10/100Base-TX x 2, Realtek RTL 8139DL
- USB: —
- SERIAL PORT: COM1(RS-232)
- VIDEO: VGA x 1

INTERNAL I/O
- USB: USB2.0 x 4
- VIDEO: TTL LCD x 1, LVDS LCD x 1
- SATA: —
- AUDIO: Audio Header x 1
- DIO/GPIO: 8-bit
- SMBus/I2C: —
- TOUCH: —

FAN: System Fan x 1
SIM: —
FRONT PANEL: HDD LED, PWR LED, Power Button, Buzzer, Reset
OTHERS: SPP/EPP/ECP x 1, CompactFlash x 1, USB2.0 x 4

ENVIRONMENT & CERTIFICATION
- OPERATING TEMP.: 32°F ~ 140°F (0°C ~ 60°C), Witas 1 -4°F ~ 158°F (-20°C ~ 70°C)
- STORAGE TEMP.: -40°F ~ 185°F (-40°C ~ 85°C)
- OPERATING HUMIDITY: 0% ~ 90% relative humidity, non-condensing
- MTBF (HOURS): 90,000
- EMC: CE/FCC Class A

Optional Accessories

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<tr>
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<td>Conversion Cable for ATX Power Supply, Length 20cm</td>
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<tr>
<td>170940181</td>
<td>Audio Cable, Length 18cm</td>
<td>1</td>
</tr>
<tr>
<td>1709100208</td>
<td>USB Cable, Length 20cm</td>
<td>1</td>
</tr>
<tr>
<td>1701100206</td>
<td>COM Port Cable, 9P DB Male, Length 20cm</td>
<td>1</td>
</tr>
<tr>
<td>1701260201</td>
<td>Parallel Port Cable, Length 20 cm</td>
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</tr>
<tr>
<td>1701340600</td>
<td>Floppy Cable, Length 60 cm</td>
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Packing List

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<thead>
<tr>
<th>Part Number</th>
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<th>QTY per Board</th>
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<tbody>
<tr>
<td>GENE-5315</td>
<td>GENE-5315 Rev. B MB</td>
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<td>9681531501</td>
<td>Cable Kit for GENE-5315(Keyboard &amp; Mouse Cable, USB Cable, IDE Cable)</td>
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<tr>
<td>9657666600</td>
<td>Jumper Cap</td>
<td>1</td>
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</tbody>
</table>

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**Block Diagram**

**Dimension**  
Unit: mm

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
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<th>Fan/Fanless</th>
<th>Display</th>
<th>LVDS</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
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<th>Power</th>
<th>Power Temp</th>
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</thead>
<tbody>
<tr>
<td>GENE-5315-B13</td>
<td>AMD Geode™ LX800</td>
<td>Fanless</td>
<td>CRT + LVDS CRT + TTL</td>
<td>24-bit, 1CH</td>
<td>EIDE x 1 Floppy x 1 CompactFlash™ x 1</td>
<td>FE x 2</td>
<td>USB2.0 x 4</td>
<td>4</td>
<td>1</td>
<td>Mini-PCI x 1</td>
<td>+5V, AT/ATX</td>
<td>0°C – 60°C</td>
<td>DIO x 8</td>
</tr>
<tr>
<td>GENE-5315-B15-01</td>
<td>AMD Geode™ LX800</td>
<td>Fanless</td>
<td>CRT + LVDS CRT + TTL</td>
<td>18-bit, 1CH</td>
<td>EIDE x 1 Floppy x 1 CompactFlash™ x 1</td>
<td>FE x 2</td>
<td>USB2.0 x 4</td>
<td>4</td>
<td>1</td>
<td>Mini-PCI x 1</td>
<td>+5V, AT/ATX</td>
<td>0°C – 60°C</td>
<td>DIO x 8</td>
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<tr>
<td>GENE-5315W1-B13</td>
<td>AMD Geode™ LX800</td>
<td>Fanless</td>
<td>CRT + LVDS CRT + TTL</td>
<td>24-bit, 1CH</td>
<td>EIDE x 1 Floppy x 1 CompactFlash™ x 1</td>
<td>FE x 2</td>
<td>USB2.0 x 4</td>
<td>4</td>
<td>1</td>
<td>Mini-PCI x 1</td>
<td>+5V, AT/ATX</td>
<td>0°C – 60°C</td>
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<tr>
<td>GENE-5315W1-B13-01</td>
<td>AMD Geode™ LX800</td>
<td>Fanless</td>
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<td>USB2.0 x 4</td>
<td>4</td>
<td>1</td>
<td>Mini-PCI x 1</td>
<td>+5V, AT/ATX</td>
<td>0°C – 60°C</td>
<td>DIO x 8</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
**Specifications**

**SYSTEM**
- FORM FACTOR: 86mm x 55mm, Single board computer
- CPU: Onboard 11th Gen. Intel® Core™ Processor  
  - i7-1185G7E (4C/8T, 1.80GHz, up to 4.40GHz)  
  - i5-1145G7E (4C/8T, 1.50GHz, up to 4.10GHz)  
  - i3-1115G4E (2C/4T, 2.20GHz, up to 3.90GHz)
- CPU TDP: 15W, (TDP up to 28W)
- CHIPSET: Integrated with Intel® SoC
- MEMORY TYPE: Onboard LPDDR4x, 3733, up to 16GB
- BIOS: UEFI
- WAKE ON LAN: Yes
- WATCHDOG TIMER: 255 Levels
- SECURITY: TPM
- RTC Battery: Lithium Battery 3V/240mAh
- DIMENSION (L X W): 3.38” x 2.17” (86 mm x 55 mm)
- POWER REQUIREMENT: DC in +12V
- POWER SUPPLY TYPE: AT/ATX
- POWER CONSUMPTION: With i7-1185G7E + LPDDR4x 16GB : 12V@7A, 84W (Peak during full loading)  
  With i7-1185G7E + LPDDR4x 16GB + 12V@4.58A, 55W (steady state during full loading)
- DISPLAY CONTROLLER: Intel® UHD Graphics for 11th Gen Intel® Processors
- LVDS/eDP: eDP only, up to 3840 x 2160 Resolution  
  - Display Interface: eDP x 1  
  - HDMI 1.4b x 1
- Multiple Display: Up to 2 Simultaneous Displays
- CODEC: —
- AUDIO INTERFACE: —
- Speaker: —
- EXTERNAL I/O
  - ETHERNET: 
    - Intel®-i219LM, 10/100/1000Base RJ-45 x 1  
    - Intel®-i225LM, 10/100/2500Base RJ-45 x 1
  - USB: USB3.2 Gen 2 x 2 (Type A)
  - SERIAL PORT: —
  - VIDEO: HDMI 1.4b x 1

**Features**
- Onboard 11th Gen. Intel Core Series Processor (Formerly Tiger Lake-UP3)
- Onboard LPDDR4x 3733 up to 16GB
- HDMI 1.4b x 1, eDP x 1
- 2.5 GbE RJ45 x 1, 1 GbE RJ45 x 1
- USB 3.2 Gen2 x 2, USB 2.0 x 4
- M.2 M key 2280 (PCIe[x2] x 1, PCIe[x4] Gen3 x 1 (by FPC)
- SATA 3 x 1
- DC Jack. 12V in

**Packing List**
- Optional Accessories
  - Mini PCI-E/sSATA
  - M.2 M-Key 2280 x 1 (PCIe[x2])
  - M.2 M 2280 adapter card to M.2 B key 2242 & M.2 E key 2230
  - M.2 M 2280 adapter card to M.2 B key 3052
  - 40 pin cable for USB2.0 x 4, COM Port x 2, DIO 8 bit
  - 20 pin cable for USB 2.0 x 2, COM Port x 2, DIO 8 bit, adapter card connector
  - 40 pin cable for USB2.0 x 4, COM Port x 2, DIO 8 bit, adapter card connector
  - CPU cooler for de next

**Note:** All specifications are subject to change without notice.
Block Diagram

Intel Tiger Lake-UP3 SoC (Up to 28W)

Dimension

Ordering Information

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>CPU</th>
<th>MEMORY</th>
<th>THERMAL</th>
<th>DISPLAY</th>
<th>STORAGE</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
<th>EXPANSION SLOT</th>
<th>POWER</th>
<th>OPERATING TEMP</th>
<th>OTHERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DENTGUB-A10-0001</td>
<td>i7-1185G7E</td>
<td>Onboard LPDDR4x 16GB</td>
<td>Fan</td>
<td>eDP x 1, HDMI x 1</td>
<td>SATA3 x 1</td>
<td>2.5GbE x 1, GbE x 1</td>
<td>USB 3.2 Gen 2 x 2, USB 2.0 x 4</td>
<td>2</td>
<td>M.2 M Key 2280 x 1</td>
<td>+12V in (DC Jack)</td>
<td>0°C ~ 60°C</td>
<td>DIO 8 bit</td>
<td></td>
</tr>
<tr>
<td>DENTGUB-A10-0002</td>
<td>i5-1145G7E</td>
<td>Onboard LPDDR4x 16GB</td>
<td>Fan</td>
<td>eDP x 1, HDMI x 1</td>
<td>SATA3 x 1</td>
<td>2.5GbE x 1, GbE x 1</td>
<td>USB 3.2 Gen 2 x 2, USB 2.0 x 4</td>
<td>2</td>
<td>M.2 M Key 2280 x 1</td>
<td>+12V in (DC Jack)</td>
<td>0°C ~ 60°C</td>
<td>DIO 8 bit</td>
<td></td>
</tr>
<tr>
<td>DENTGUB-A10-0003</td>
<td>i3-1115G4E</td>
<td>Onboard LPDDR4x 16GB</td>
<td>Fan</td>
<td>eDP x 1, HDMI x 1</td>
<td>SATA3 x 1</td>
<td>2.5GbE x 1, GbE x 1</td>
<td>USB 3.2 Gen 2 x 2, USB 2.0 x 4</td>
<td>2</td>
<td>M.2 M Key 2280 x 1</td>
<td>+12V in (DC Jack)</td>
<td>0°C ~ 60°C</td>
<td>DIO 8 bit</td>
<td></td>
</tr>
</tbody>
</table>
de next-V2K8
86mm x 55mm Single Board with AMD Ryzen™ Embedded V2000 Series Processors

Specifications

SYSTEM
FORM FACTOR 86mm x 55mm, Single Board Computer
CPU AMD Ryzen™ Embedded V2718 with Radeon™ Graphics, AMD Ryzen™ Embedded V2516 with Radeon™ Graphics
CPU TDP 10W TDP, up to 25W: V2718/V2516
CHIPSET Integrated with AMD Ryzen™ Embedded SoC
MEMORY TYPE Onboard LPDDR4x 3200MHz up to 16GB
BIOS UEFI
WAKE ON LAN Yes
WATCHDOG TIMER 255 Levels
SECURITY fTPM
RTC Battery Lithium Battery 3V/240mAh
DIMENSION (L X W) 3.38” x 2.17” (86mm x 55mm)

POWER
POWER REQUIREMENT DC in +12V
POWER SUPPLY TYPE ATX
CONNECTOR DC Jack (Optional - 2pin Phoenix Connector)
POWER CONSUMPTION AMD Ryzen™ V2718 Processor, LPDDR4 3200MHz 16GB, 3.93A @12V, 47.04W, during full loading test (Peak)

DISPLAY
CONTROLLER AMD Radeon™ Graphics
LVDS/eDP eDP only, up to 3840 x 2160 Resolution
Display Interface eDP x 1 HDMI 1.4b x 1
Multiple Displays Up to 2 Simultaneous Displays

AUDIO
CODEC —
AUDIO INTERFACE —
Speaker —

EXTERNAL I/O
ETHERNET de next-V2K6-A10: Realtek RTL8111H, 10/100/1000Base, RJ-45 x 1, Intel® i225LM, 10/100/2500Base, RJ-45 x 1
de next-V2K6-A11: Realtek RTL8111H, 10/100/1000Base, RJ-45 x 1, Intel® i226LM, 10/100/2500Base, RJ-45 x 1
USB USB 3.2 Gen 2 x 2 (Type-A)
SERIAL PORT —
VIDEO HDMI 1.4b x 1

Optional Accessories

— 170X000512 de next 40 pin cable for USB2.0 x 4, COM Port x 2, DIO 8 bit
— 170X000603 Front Panel Cable for de next use, Length 10cm
— 1709070200 SATA Cable, 180D, Length 20cm
— 170X000322 SATA Power Cable, Length 6cm
— 170X000577 de next cable for USB 2.0 x 2, COM Port x 2, DIO 8 bit, adapter card connector
— DENEXT-FAN01 CPU cooler for de next-TG88 / de next-V2K8
— DENEXT-BRKT01 Easy bracket for de next series use
— DENEXT-HSP01 Heatspreader for de next-TG95/V2K8
— PER-T642-A03-0001 M.2 M 2280 adaptor card to M.2 B key 2242 & M.2 E key 2230 (Only support DENEXT-V2K8-A11)
— PER-T643-A01-0001 M.2 M 2280 adaptor card to M.2 B key 2242 & M.2 B key 3052 (Only support DENEXT-V2K8-A11)

Packing List
— de next-V2K8 x 1
— Copper Stud M2.5 x 4
Block Diagram

Internal I/O

- M.2 2280 M key
- PCIe Gen3 [x2]
- FPC (PCIe Gen3 [x4])
- PCIe Gen3 [x4]
- eDP
- DDI
- SATA (w/Power)
- SATA3
- Coin Battery
- USB2.0 x 4
- USB2.0 x 4

AMD V2000 Processor (up to 25W)

- USB3.2 / 2.0 x2
- HDMI1.4
- HDMI
- PCIe Gen3 x 1
- PCIe Gen3 x 1
- RTL8111H
- I226-LM
- 2.5GbE
- RJ45 Dual Port

Rear I/O

- Super I/O
- FAN CTRL
- 4 pin FAN Ctrl

Note: Intel® i226LM is only supported by de next-V2K8-A11.

Dimension

Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Memory</th>
<th>Thermal</th>
<th>Display</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/224/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>Operating Temp</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>DENEXT-V2K8-A10-0001</td>
<td>V2718</td>
<td>Onboard LPDDR4x 16GB</td>
<td>Fan</td>
<td>eDP x 1, HDMI x 1</td>
<td>SATA3 x 1</td>
<td>2.5Gbps(0255) x 1, GBE x 1</td>
<td>USB 3.2 Gen 2 x 2 USB 2.0 x 4</td>
<td>—</td>
<td>2</td>
<td>M.2 M key 2280 x 1 PCIe(x4) 6x3 (via PCIE)</td>
<td>+12V in (DC Jack)</td>
<td>0°C ~ 60°C</td>
<td>DIO 8 bit DC Jack</td>
</tr>
<tr>
<td>DENEXT-V2K8-A10-0002</td>
<td>V2516</td>
<td>Onboard LPDDR4x 16GB</td>
<td>Fan</td>
<td>eDP x 1, HDMI x 1</td>
<td>SATA3 x 1</td>
<td>2.5Gbps(0255) x 1, GBE x 1</td>
<td>USB 3.2 Gen 2 x 2 USB 2.0 x 4</td>
<td>—</td>
<td>2</td>
<td>M.2 M key 2280 x 1 PCIe(x4) 6x3 (via PCIE)</td>
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<td>Fan</td>
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<td>SATA3 x 1</td>
<td>2.5Gbps(0256) x 1, GBE x 1</td>
<td>USB 3.2 Gen 2 x 2 USB 2.0 x 4</td>
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<td>M.2 M key 2280 x 1 PCIe(x4) 6x3 (via PCIE)</td>
<td>+12V in (DC Jack)</td>
<td>0°C ~ 60°C</td>
<td>DIO 8 bit PER-T642/643 adaptor card DC Jack</td>
</tr>
<tr>
<td>DENEXT-V2K8-A11-0002</td>
<td>V2516</td>
<td>Onboard LPDDR4x 16GB</td>
<td>Fan</td>
<td>eDP x 1, HDMI x 1</td>
<td>SATA3 x 1</td>
<td>2.5Gbps(0256) x 1, GBE x 1</td>
<td>USB 3.2 Gen 2 x 2 USB 2.0 x 4</td>
<td>—</td>
<td>2</td>
<td>M.2 M key 2280 x 1 PCIe(x4) 6x3 (via PCIE)</td>
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<td>DIO 8 bit PER-T642/643 adaptor card DC Jack</td>
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<tr>
<td>DENEXT-V2K8-A11-0003</td>
<td>V2718</td>
<td>Onboard LPDDR4x 16GB</td>
<td>Fan</td>
<td>eDP x 1, HDMI x 1</td>
<td>SATA3 x 1</td>
<td>2.5Gbps(0256) x 1, GBE x 1</td>
<td>USB 3.2 Gen 2 x 2 USB 2.0 x 4</td>
<td>—</td>
<td>2</td>
<td>M.2 M key 2280 x 1 PCIe(x4) 6x3 (via PCIE)</td>
<td>+12V in (DC Jack)</td>
<td>0°C ~ 60°C</td>
<td>DIO 8 bit PER-T642/643 adaptor card DC Jack</td>
</tr>
<tr>
<td>DENEXT-V2K8-A11-0004</td>
<td>V2516</td>
<td>Onboard LPDDR4x 16GB</td>
<td>Fan</td>
<td>eDP x 1, HDMI x 1</td>
<td>SATA3 x 1</td>
<td>2.5Gbps(0256) x 1, GBE x 1</td>
<td>USB 3.2 Gen 2 x 2 USB 2.0 x 4</td>
<td>—</td>
<td>2</td>
<td>M.2 M key 2280 x 1 PCIe(x4) 6x3 (via PCIE)</td>
<td>+12V in (DC Jack)</td>
<td>0°C ~ 60°C</td>
<td>DIO 8 bit PER-T642/643 adaptor card DC Jack</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.

www.aaeon.com
UP Boards
UP Board

UP Developer Board with Intel® Atom® x5-Z8350 Processor SoC

Features

- Intel® Atom® x5-Z8350 SoC
- Onboard DDR3L Memory up to 4GB
- Onboard eMMC Storage up to 64GB
- Gigabit LAN x 1, USB 2.0 x 4, USB 3.0 x 1, HDMI x 1
- 5V DC-in
- 40 pin GPIO x 1
- DSI/eDP x 1
- MIPI-CSI x 1

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel® Atom® x5-Z8350 Processor SoC</td>
</tr>
<tr>
<td>Graphics</td>
<td>Intel® HD 400 Graphics, 12 EU GEN 8, up to 500MHz Support DX<em>11.1/12, Open GL</em>42, Open CL* 1.2 DGL ES3.0, H.264, HEVC(decode), VP8</td>
</tr>
<tr>
<td>I/O</td>
<td>HDMI x 1, USB 2.0 x 4, USB 2.0 pin header (10 pins in total) x 2, USB 3.0 OTG x 1</td>
</tr>
<tr>
<td>Camera</td>
<td>MIPI-CSI (4 MEGA pixel)</td>
</tr>
<tr>
<td>USB</td>
<td>USB 2.0 x 4, USB 3.0 OTG x 1</td>
</tr>
<tr>
<td>Expansion</td>
<td>40 pin General Purpose bus, supported by Altera Max V, ADC 8-bit@188ksos</td>
</tr>
<tr>
<td>RTC</td>
<td>Yes</td>
</tr>
<tr>
<td>Power</td>
<td>5V DC-in @ 4A 5.5/2.1mm jack</td>
</tr>
<tr>
<td>Dimension</td>
<td>3.34” x 2.20” (85mm x 56mm)</td>
</tr>
<tr>
<td>Memory</td>
<td>1GB/ 2GB/ 4GB DDR3L-1600</td>
</tr>
<tr>
<td>Storage</td>
<td>eMMC 16GB / 32GB/ 64GB</td>
</tr>
<tr>
<td>Display Interface</td>
<td>DSI/eDP</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Gb Ethernet (full speed) RJ-45 x 1</td>
</tr>
<tr>
<td>OS Support</td>
<td>Win 10, Linux (ubinux, Ubuntu, Yocto)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>Operation Humidity</td>
<td>10% ~ 80% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>CE/FCC Class A, RoHS Compliant</td>
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Note: All specifications are subject to change without notice.
Block Diagram

Dimension Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP-CHT01-A20-0116-A11</td>
<td>UP board with x5-Z8300 CPU, 1GB RAM+16GB eMMC, passive heatsink</td>
</tr>
<tr>
<td>UP-CHT01-A20-0216-A11</td>
<td>UP board with x5-Z8300 CPU, 2GB RAM+16GB eMMC, passive heatsink</td>
</tr>
<tr>
<td>UP-CHT01-A20-0232-A11</td>
<td>UP board with x5-Z8300 CPU, 2GB RAM+32GB eMMC, passive heatsink</td>
</tr>
<tr>
<td>UP-CHT01-A20-0432-A11</td>
<td>UP board with x5-Z8300 CPU, 4GB RAM+32GB eMMC, passive heatsink</td>
</tr>
<tr>
<td>UP-CHT01-A20-0464-A11</td>
<td>UP board with x5-Z8300 CPU, 4GB RAM+64GB eMMC, passive heatsink</td>
</tr>
</tbody>
</table>

Packing List

- UP-CHT01 with Heatsink

Note: All specifications are subject to change without notice.
UP 4000
UP Developer Board with Intel® Celeron® N3350/ Intel® Pentium® N4200/ Intel Atom® x7-E3950 Processor SoC

Features
- Onboard LPDDR4 Memory up to 8GB
- Onboard eMMC Storage up to 64GB
- Dual displays up to 4K at 60Hz
- Support M.2 2230 E-Key / M.2 2280 M-Key / M.2 3052 B-Key (via carrier board)
- 40 pin GPIO x 1
- 6 pin wafer for Audio x 1
- TPM 2.0

Specifications

System

| Processor | Intel® Celeron® N3350/ Intel® Pentium® N4200/ Intel Atom® x7-E3950 Processor SoC |
| Graphics | Intel® Gen 9 HD, supporting 4K Codec Decode and Encode for HEVC4, H.264,VP8 |
| I/O | 2 pin wafer for Fan (12V) x 1  
2 pin wafer for RTC Battery x 1  
6 pin wafer for Audio (Line out + MIC in) x 1  
10 pin wafer (2 USB2.0 + 1 HSUART) x 1  
HAT 40 pin header x 1  
4pin wafer power button for front panel x 1  
41 pin FPC connector for high speed expend x 1 power button x 1 |
| Camera | — |
| USB | USB 3.2 Gen 1 (Type A) x 3  
USB 2.0 pin header (10 pins in total) x 2  
USB 3.2 Gen 1 OTG via USB Type-C x 1 |
| Expansion | 40 pin GPIO x 1  
via carrier board: M.2 2230/2242/2280 x 1  
M.2 3052 x 1 |
| RTC | Yes |
| Power | 12V DC-in @5A (Phoenix Terminal co-lay) |
| Dimension | 3.34” x 2.20” (85mm x 56mm) |
| Memory | Onboard LPDDR4 max to 8GB |
| Storage | 16GB/32GB/64GB eMMC |
| Display Interface | HDMI1:4x1  
DP 1.2 via USB TYPE-C Connector |
| Ethernet | 1 Gb Ethernet (full speed) RJ-45 x 1 |
| OS Support | Microsoft Windows 10 (full), Windows IOT Core  
Yocto project 3.1 Kernel 5.4  
Ubuntu 18.04 |
| Operating Temperature | 32°F ~ 140°F (-0°C ~ 60°C), 0.5m/s airflow |
| Operating Humidity | 10% ~ 80% relative humidity, non-condensing |
| Certification | CE/FCC Class A, RoHS Compliant |

Note: All specifications are subject to change without notice.
### Block Diagram

#### DC Input
- DC Input: 12V
  - 2x1.35mm 20AWG

#### CPU
- Intel Celeron N3350
- Intel Pentium N4200
- Intel Atom x7-E3950

#### Memory
- 2GB (2ICs)
- 2x32b

#### Storage
- eMMC
- 16/32/64/128 GB

#### Power
- 3.3V
- 5V
- 12V

#### Expansion Ports
- HDMI 1.4b
- USB Type C
- Rear USB 2.0x2
- HSUART0
- SPI Programing

#### Connectors
- 6 Pin Header
- 2 Pin Connector
- 6 PIN WAFER
- ALC888

#### GPIO
- LED-Yellow / Red / Green
- LED-Blue
- GPIO

#### Optional Accessories
- Part Number
- Description

#### Ordering Information
- Part number
- CPU
- Memory
- Storage
- TPM 2.0
- Gbe LAN
- Audio wafer

#### Packing List
- UP 4000 with Heatsink

Note: All specifications are subject to change without notice.
UP 7000 Developer Board with Intel® Processor N-series Processor (formerly Alder Lake-N)

Features

■ Intel® Processor N-series
■ Onboard LPDDR5 Memory, up to 8GB
■ Onboard eMMC Storage, up to 64GB
■ Gigabit LAN x 1
■ HDMI 1.4b x 1
■ USB 3.2 Gen 2 (Type-A) x 3, 10-pin USB 2.0 x 2/UART x 1
■ 40-pin GPIO x 1
■ 12V DC-in, 5A
■ TPM 2.0

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel® Processor N97, N100, N50 (formerly Alder Lake-N)</td>
</tr>
<tr>
<td>Graphics</td>
<td>Intel® UHD Graphics</td>
</tr>
<tr>
<td>Memory</td>
<td>Dual-Channel LPDDR5, up to 8GB</td>
</tr>
<tr>
<td>Storage</td>
<td>Up to 64GB eMMC</td>
</tr>
<tr>
<td>I/O</td>
<td>2-pin Fan Wafer x 1 (12V), 2-pin RTC Battery Wafer x 1, HDMI 1.4b/USB 3.2 Gen 2 STACK Connector x 1 (Type-A), 4-pin Front Panel x 1</td>
</tr>
<tr>
<td>Camera</td>
<td>—</td>
</tr>
<tr>
<td>USB</td>
<td>USB 3.2 Gen 2 (Type-A) x 3, 10-pin USB 2.0 x 2/UART x 1</td>
</tr>
<tr>
<td>Expansion</td>
<td>40-pin GPIO x 1</td>
</tr>
<tr>
<td>Display Interface</td>
<td>HDMI 1.4b x 1</td>
</tr>
<tr>
<td>Ethernet</td>
<td>1GbE RJ-45 x 1 (Realtek RTL8111H CG)</td>
</tr>
<tr>
<td>Security</td>
<td>Onboard TPM 2.0</td>
</tr>
<tr>
<td>RTC</td>
<td>Yes</td>
</tr>
<tr>
<td>OS Support</td>
<td>Windows® 10 Enterprise LTSC 2021/IoT Core, Linux: Ubuntu 22.04 LTS/Kernel 5.15, Yocto 4.0</td>
</tr>
</tbody>
</table>

Power Requirement

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>12V DC-in, 5A</td>
</tr>
<tr>
<td>Power Supply Type</td>
<td>AT (default)/ATX</td>
</tr>
<tr>
<td>Power Consumption (Typical)</td>
<td>TBD</td>
</tr>
</tbody>
</table>

Mechanical

| Dimension | 3.34” x 2.20” (85mm x 56mm) |
| Net Weight | 0.33 lb. (0.15Kg) |
| Gross Weight | 0.44 lb. (0.20Kg) |

Environment

| Operating Temperature | 32°F – 140°F (0°C – 60°C) / 0.5 airflow |
| Operation Humidity | 0% – 90% relative humidity, non-condensing |
| MTBF | TBD |
| Certification | CE/FCC Class A, RoHS Compliant, REACH |

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

Optional Accessories

Packing List

• UP 7000 with Passive Heatsink

Note: All specifications are subject to change without notice.
UP Squared
UP Squared Developer Board with Intel® Pentium® N4200/ Celeron® N3350 Processor SoC

Features
- Intel® Pentium® N4200/Celeron® N3350 Processor SoC
- Onboard LPDDR4 Memory up to 8GB
- Onboard eMMC Storage up to 128GB
- Gigabit LAN x 2, USB 2.0 x 2, USB 3.0 (Type A) x 3
- 5V DC-in, 4-6A
- 40 pin GPIO x 1
- DP/eDP/HDMI x 1
- MIPI-CSI (4-Lane & 2-Lane) x 1
- Mini-PCIe /M.2 2230 x 1
- SATA3 x 1
- 60pin EXHAT

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel® Pentium® N4200/ Celeron® N3350/ Atom™ E3940/ E3950 Processor SoC</td>
</tr>
<tr>
<td>Graphics</td>
<td>Intel® Gen 9 HD, supporting 4K Codec Decode and Encode for HEVC4, H.264, VP9</td>
</tr>
<tr>
<td>I/O</td>
<td>HDMI x 1, DP x 1, I2S Audio Port</td>
</tr>
<tr>
<td>Camera</td>
<td>CSI 2-Lane + CSI 4-Lane</td>
</tr>
<tr>
<td>USB</td>
<td>USB 2.0 x 2, USB3.0 OTG x 1, USB3.0 (Type A) x 3</td>
</tr>
<tr>
<td>Expansion</td>
<td>40 pin GPIO x 1, Full-sized Mini-PCIe x 1 (PCIe &amp; SATA + USB2.0), M.2 2230 x 1, SATA3 x 1, 60pin EXHAT x 1</td>
</tr>
<tr>
<td>RTC</td>
<td>Yes</td>
</tr>
<tr>
<td>Power</td>
<td>5V DC-in @ 4A-6A</td>
</tr>
<tr>
<td>Dimension</td>
<td>3.37” x 3.54” (85.6 mm × 90 mm)</td>
</tr>
<tr>
<td>Memory</td>
<td>2GB (single channel) LPDDR4, 4GB/8GB (dual channel) LPDDR4</td>
</tr>
<tr>
<td>Storage</td>
<td>eMMC 32 GB / 64 GB / 128 GB</td>
</tr>
<tr>
<td>Display Interface</td>
<td>eDP</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Gb Ethernet (full speed) RJ-45 x 2</td>
</tr>
<tr>
<td>OS Support</td>
<td>Microsoft Windows 10 (full), Windows IOT Core, Linux (Ubuntu, Ubuntu, Yocto), Android Nougat</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>Operation Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>CE/FCC Class A, RoHS Compliant, REACH</td>
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</table>

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### Ordering Information

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</thead>
<tbody>
<tr>
<td>UPS-APLC2F-A20-0232</td>
<td>UP² (UP Squared) board with Intel® Celeron® Dual Core N3350(F1) up to 2.4GHz, on board 2GB DDR4, 32GB eMMC</td>
</tr>
<tr>
<td>UPS-APLC2F-A20-0432</td>
<td>UP² (UP Squared) board with Intel® Celeron® Dual Core N3350(F1) up to 2.4GHz, on board 4GB DDR4, 32GB eMMC</td>
</tr>
<tr>
<td>UPS-APLP4F-A20-0432</td>
<td>UP² (UP Squared) board with Intel® Pentium® N4200(F1) Quad Core up to 2.5 GHz, on board 4GB DDR4, 32GB eMMC</td>
</tr>
<tr>
<td>UPS-APLP4F-A20-0864</td>
<td>UP² (UP Squared) board with Intel® Pentium® N4200(F1) Quad Core up to 2.5 GHz, on board 8GB DDR4, 64GB eMMC</td>
</tr>
<tr>
<td>UPS-APLP4F-A20-08128</td>
<td>UP² (UP Squared) board with Intel® Pentium® N4200(F1) Quad Core up to 2.5 GHz, on board 8GB DDR4, 128GB eMMC</td>
</tr>
<tr>
<td>UPS-APLX5F-A20-0432</td>
<td>UP² (UP Squared) board with Intel® Atom™ E3940(F1) 4G memory 32G eMMC.Rev.1.0</td>
</tr>
<tr>
<td>UPS-APLX7F-A20-0464</td>
<td>UP² (UP Squared) board with Intel® Atom™ E3950(F1) 4G memory 64G eMMC.Rev.1.0</td>
</tr>
<tr>
<td>UPS-APLX7F-A20-0864</td>
<td>UP² (UP Squared) board with Intel® Atom™ E3950(F1) 8G memory 64G eMMC.Rev.1.0</td>
</tr>
</tbody>
</table>

### Packing List

- UPS-APL with Heatsink

### Optional Accessories

- PER-TAICX-A10-001
  AI Core X mPCIe card with 30 mm heat sink
- PER-TAICX-A10-002
  AI Core X mPCIe card with 15 mm heat sink with FAN
- 1702020910
  Power cord for EU
- 1702020911
  Power cord for US
- 1255300362
  30W 5VDC/6A power adapter
UP Squared V2
UP Squared V2 Developer Board with Intel® Pentium® Celeron® Processor SoC

Features
- Intel® Pentium® Celeron® Processor SoC
- Onboard LPDDR4 Memory up to 16GB
- Onboard eMMC Storage up to 64GB
- Gb Ethernet (full speed) RJ-45 x 2
- USB 3.2 Type A x 3
- 40 pin GPIO x 1
- DP 1.2 / HDMI 1.4b / eDP 1.3
- RS232/422 pin header x 1
- M.2 2230 E-Key x 1
- M.2 2280 M-Key x 1
- SATA3 x 1
- TPM 2.0
- 12V DC-in, 5A

Specifications

System
- Processor
  - Intel® Celeron® N6210 Processor SoC
  - Intel® Celeron® J6412 Processor SoC
  - Intel® Pentium® J6426 Processor SoC
- Graphics
  - Intel® UHD Graphics
- Memory
  - Up to 16GB LPDDR4
- Storage
  - Up to 64GB eMMC
- I/O
  - HDMI 1.4b x 1
  - DP 1.2 x 1
  - eDP 1.3 x 1
  - Audio 6 pin wafer (Line out + MIC in) x 1
  - RS-232/422 6 pin header x 1
- Camera
  - —
- USB
  - USB 2.0 x 2 (from 10 pin wafer x 1)
  - USB 3.2 Gen 2 Type A x 3
- Expansion
  - 40 pin GPIO x 1
  - M.2 2230 E-Key x 1 (PCIe x2, USB2.0 x1)
  - M.2 2280 M-key x 1 (PCIe x2)
  - SATA3 x 1
- Display Interface
  - HDMI 1.4b x 1
  - DP 1.2 x 1
  - eDP 1.3 x 1
- Ethernet
  - Gb Ethernet (full speed) RJ-45 x 2
- Security
  - Onboard TPM 2.0
- RTC
  - Yes
- OS Support
  - Microsoft Windows 10 (full)
  - Windows IOT Core
  - Ubuntu 20.04 LTS
  - Yocto 3.1

Power Requirement
- Power
  - 12V DC-in, 5A
- Power Supply Type
  - AT/ATX
- Power Consumption (Typical)
  - 30~38W

Mechanical
- Dimension
  - 3.37” x 3.54” (85.6 mm x 90 mm)
- Net Weight
  - 0.41 lbs (0.19kg)
- Gross Weight
  - 0.66 lbs (0.3kg)

Environment
- Operating Temperature
  - 32°F ~ 140°F (0°C ~ 60°) / 0.5 airflow
- Operation Humidity
  - 0% ~ 90% relative humidity, non-condensing
- MTBF
  - 465,586
- Certification
  - CE/FCC Class A, RoHS Compliant, REACH
Block Diagram

Dimension
Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU Description</th>
<th>Memory</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPS-EHLBN2-A10-0232</td>
<td>Intel® Celeron® N6010 Processor SoC</td>
<td>2GB</td>
<td>32GB</td>
</tr>
<tr>
<td>UPS-EHLBN2-A10-0432</td>
<td>Intel® Celeron® N6010 Processor SoC</td>
<td>4GB</td>
<td>32GB</td>
</tr>
<tr>
<td>UPS-EHLBN2-A10-0832</td>
<td>Intel® Celeron® J6412 Processor SoC</td>
<td>8GB</td>
<td>64GB</td>
</tr>
<tr>
<td>UPS-EHLBN2-A10-1664</td>
<td>Intel® Pentium® J6426 Processor SoC</td>
<td>16GB</td>
<td>64GB</td>
</tr>
</tbody>
</table>

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>125530060L</td>
<td>12V, 5A, 60W Power Adapter w/ multi-country plugs</td>
</tr>
<tr>
<td>1700070500</td>
<td>SATA cable</td>
</tr>
<tr>
<td>1702150555</td>
<td>SATA power cable (15cm)</td>
</tr>
<tr>
<td>1702150506</td>
<td>SATA power cable (30cm)</td>
</tr>
<tr>
<td>170010015G</td>
<td>UART to USB cable</td>
</tr>
<tr>
<td>9651920601</td>
<td>M.2 2230 WiFi Kit, 802.11ac/a/b/g/n, Bluetooth w/ cable &amp; antenna</td>
</tr>
<tr>
<td>974364400</td>
<td>Wireless LAN card, 802.11ac/a/b/g/n + Bluetooth, with 2 sets of cable &amp; antenna</td>
</tr>
<tr>
<td>170X000382</td>
<td>Audio cable for audio wafer</td>
</tr>
<tr>
<td>170X000556</td>
<td>COM cable for RS232 wafer</td>
</tr>
</tbody>
</table>

Packing List

• UP Squared V2 with heatsink
UP Squared Pro
Developer Board with Intel® Pentium® N4200/ Celeron® N3350/ Atom® E3950 Processor SoC

Features
- Intel® Pentium® N4200/ Celeron® N3350/ Atom® E3950 Processor SoC
- Onboard LPDDR4 Memory up to 8GB
- Onboard eMMC Storage up to 64GB
- Gigabit LAN x 2, USB 2.0 x 2, USB 3.2 Gen 1 (Type A) x 3
- 12-24VDC-in , 6A
- 40 pin GPIO x 1
- DP/eDP/HDMI x 1
- M.2 2230 E-key x 1
- M.2 2280 M-key x 1
- SATA3 x 1
- M.2 3042/3052 B-key x 1

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel® Pentium® N4200/ Celeron® N3350/ Atom® E3950 Processor SoC</td>
</tr>
<tr>
<td>Graphics</td>
<td>Intel® Gen 9 HD, supporting 4K Codec Decode and Encode for HEVC4, H.264, VP8</td>
</tr>
<tr>
<td>I/O</td>
<td>HDMI x 1, DP x 1, COM port (RS422/RS232/RS485) x 2, Audio Jack x 1</td>
</tr>
<tr>
<td>Camera</td>
<td>—</td>
</tr>
<tr>
<td>USB</td>
<td>USB 2.0 x 2, USB 3.2 Gen 1 OTG x 1, USB 3.2 Gen 1 (Type A) x 3</td>
</tr>
<tr>
<td>Expansion</td>
<td>UART pin header, 40 pin GPIO x 1, M.2 2230 E-key x 1, M.2 2280 M-key x 1, SATA3 x 1, M.2 3042/3052 B-key x 1</td>
</tr>
<tr>
<td>RTC</td>
<td>Yes</td>
</tr>
<tr>
<td>Power</td>
<td>12V-24V DC-in (Lockable plug/ Phoenix connector (optional))</td>
</tr>
<tr>
<td>Dimension</td>
<td>10.16cm x 10.16cm</td>
</tr>
<tr>
<td>Memory</td>
<td>2GB (single channel) LPDDR4, 4GB/8GB (dual channel) LPDDR4</td>
</tr>
<tr>
<td>Storage</td>
<td>eMMC 32 GB / 64 GB</td>
</tr>
<tr>
<td>Display Interface</td>
<td>HDMI1.4 x 1, DP1.2 x 1, eDP x 1</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Gb Ethernet (full speed) RJ-45 x 2</td>
</tr>
<tr>
<td>OS Support</td>
<td>Microsoft Windows 10 (64-bit), Windows IOT Core, Linux: Ubuntu 18.04.5, Ubuntu 20.04.1, Yocto 3.1</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>with Fan: 32°F - 140°F (0°C ~ 60°C, with airflow 0.5m/s)</td>
</tr>
<tr>
<td>Operation Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>CE/FCC Class A, RoHS Compliant, REACH</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPN-APL23F-A10-0232</td>
<td>UPN-APL01.CPU N3350(F1).Memory 2GB.eMMC 32GB.REV.A1.0</td>
</tr>
<tr>
<td>UPN-APL23F-A10-0432</td>
<td>UPN-APL01.CPU N3350(F1).Memory 4GB.eMMC 32GB.REV.A1.0</td>
</tr>
<tr>
<td>UPN-APL23F-A10-0463</td>
<td>UPN-APL01.CPU N4200(F1).Memory 4GB.eMMC 64GB.REV.A1.0</td>
</tr>
<tr>
<td>UPN-APL23F-A10-0464</td>
<td>UPN-APL01.CPU N4200(F1).Memory 8GB.eMMC 64GB.REV.A1.0</td>
</tr>
<tr>
<td>UPN-APL23F-A10-0464</td>
<td>UPN-APL01.CPU E3950(F1).Memory 4GB.eMMC 64GB.REV.A1.0</td>
</tr>
</tbody>
</table>

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1255X08032</td>
<td>12VDC/8A Adapter</td>
</tr>
<tr>
<td>1702031803</td>
<td>Power cord for EU</td>
</tr>
<tr>
<td>1702031802</td>
<td>Power cord for US</td>
</tr>
<tr>
<td>PER-7410X2-A10-2280</td>
<td>Ai Core XM M.2 2280 B+M key card 15mm heatsink with fan</td>
</tr>
<tr>
<td>9651926001</td>
<td>M.2 2230 WiFi Kit 802.11ac:2.4G/5G,W/BT w/2 cable &amp; antenna</td>
</tr>
<tr>
<td>9741364A00</td>
<td>Wireless LAN Kit M.2 2230 B02.11ac/a/b/g/n + BT4.0,2T2R,with 2 sets of cable &amp; antenna</td>
</tr>
</tbody>
</table>

Packing List

- UPN-APL01 with heatsink
UP Squared 6000
UP Squared 6000 Developer Board with Intel® Atom® x6000E Pentium® Celeron® Processor SoC

Features
- Intel® Atom® x6000E Pentium® Celeron® Processor SoC
- Onboard LPDDR4 Memory up to 8GB
- Onboard eMMC Storage up to 64GB
- GbE x 1, 2.5GbE x 1 (Intel® i210, i225)
- USB 3.2 x 3 (Type A x 2, Type C x 1)
- 40 pin GPIO x 1
- DP 1.2 / HDMI 2.0b / eDP x 1
- RS232 / 422 wafer x 1
- M.2 2230 E-Key / M.2 2280 M-Key / M.2 3052 B-Key x 1
- SATA3 x 1
- TPM 2.0
- 12V DC-in, 6A

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel® Atom® X6413E / X6425RE, Celeron® N6210 (no PSE), Pentium® J6426 Processor SoC</td>
</tr>
<tr>
<td>Graphics</td>
<td>Intel® UHD Graphics</td>
</tr>
<tr>
<td>I/O</td>
<td></td>
</tr>
<tr>
<td>HDMI 2.0b x 1</td>
<td></td>
</tr>
<tr>
<td>DP 1.2 x 1</td>
<td></td>
</tr>
<tr>
<td>eDP x 1 (Limited to Atom series)</td>
<td></td>
</tr>
<tr>
<td>Audio wafer x 1</td>
<td></td>
</tr>
<tr>
<td>RS-232/422 x 1 (Limited to Atom series)</td>
<td></td>
</tr>
<tr>
<td>Camera</td>
<td></td>
</tr>
<tr>
<td>USB</td>
<td></td>
</tr>
<tr>
<td>USB 2.0 x 2 (from wafer x 1)</td>
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<tr>
<td>USB 3.2 Gen 2 Type A x 2</td>
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<tr>
<td>USB 3.2 Gen 2 Type C (support OTG) x 1 (Limited to Atom series)</td>
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</tr>
<tr>
<td>Expansion</td>
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</tr>
<tr>
<td>40 pin GPIO x 1</td>
<td></td>
</tr>
<tr>
<td>M.2 2230 E-key x 1</td>
<td></td>
</tr>
<tr>
<td>M.2 2280 PCIe Gen3.0x2 M-key x 1</td>
<td></td>
</tr>
<tr>
<td>SATA3 x 1</td>
<td></td>
</tr>
<tr>
<td>M.2 3052 B-key x 1</td>
<td></td>
</tr>
<tr>
<td>Nano SIM slot x 1</td>
<td></td>
</tr>
<tr>
<td>100 pin high speed board-board connector x 1 (Limited to Atom series)</td>
<td></td>
</tr>
<tr>
<td>TPM 2.0 (Limited to Atom series)</td>
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<tr>
<td>RTC</td>
<td>Yes</td>
</tr>
<tr>
<td>Power</td>
<td>12V DC-in (Lockable plug)</td>
</tr>
<tr>
<td>Dimension</td>
<td>4&quot; x 4&quot; (101.6mm x 101.6mm )</td>
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<tr>
<td>Memory</td>
<td>Up to 8GB DDR4</td>
</tr>
<tr>
<td>Storage</td>
<td>Up to 64GB eMMC</td>
</tr>
<tr>
<td>Display Interface</td>
<td></td>
</tr>
<tr>
<td>HDMI 2.0b x 1</td>
<td></td>
</tr>
<tr>
<td>DP 1.2 x 1</td>
<td></td>
</tr>
<tr>
<td>eDP x 1 (Limited to Atom series)</td>
<td></td>
</tr>
<tr>
<td>Ethernet</td>
<td></td>
</tr>
<tr>
<td>GbE x 1, 2.5GbE x 1</td>
<td></td>
</tr>
<tr>
<td>100 pin high speed board-board connector x 1 (Limited to Atom series)</td>
<td></td>
</tr>
<tr>
<td>OS Support</td>
<td>Microsoft Windows 10 (full), Windows IOT Core Linux: Ubuntu 20.04 LTS, Yocto 3.1</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>With Heatsink: 32°F ~ 140°F (0°C ~ 60°C) / 0.5 airflow</td>
</tr>
<tr>
<td>Operation Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>CE/FCC Class A, RoHS Compliant, REACH</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU description</th>
<th>Memory</th>
<th>Storage</th>
<th>USB 3.2 Type C</th>
<th>RS232 / 422 wafer</th>
<th>eDP</th>
<th>TPM 2.0</th>
<th>LAN</th>
<th>100 pin board-board connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPN-EHLCD2-A10-0232</td>
<td>PC Client: N6270 (No PSE)</td>
<td>2GB</td>
<td>32GB</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>I211-AT / I225-V</td>
<td>No</td>
</tr>
<tr>
<td>UPN-EHLPJ4-A10-0432</td>
<td>PC Client: J6426</td>
<td>4GB</td>
<td>32GB</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>I211-AT / I225-V</td>
<td>No</td>
</tr>
<tr>
<td>UPN-EHLX4E-A10-0432</td>
<td>Embedded: X6413E</td>
<td>4GB</td>
<td>32GB</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>I210-IT / I225-IT</td>
<td>Yes</td>
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<tr>
<td>UPN-EHLX4RE-A10-0864</td>
<td>Industrial: X6425RE</td>
<td>8GB</td>
<td>64GB</td>
<td>Yes</td>
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<td>I210-IT / I225-IT</td>
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Packing List

- UP Squared 6000 with heatsink

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1255400032</td>
<td>12V DC/6A Adapter</td>
<td>UART to USB cable</td>
</tr>
<tr>
<td>1702631803</td>
<td>Power cord for EU</td>
<td>PER-14362-A10-2280</td>
</tr>
<tr>
<td>1702631802</td>
<td>Power cord for US</td>
<td>9651926001</td>
</tr>
<tr>
<td>170263180J</td>
<td>Power cord for UK</td>
<td>9741364A00</td>
</tr>
<tr>
<td>170265180E</td>
<td>Power cord for Japan</td>
<td></td>
</tr>
<tr>
<td>1702631808</td>
<td>Power cord for China</td>
<td></td>
</tr>
<tr>
<td>1702631811</td>
<td>Power cord for Taiwan</td>
<td></td>
</tr>
<tr>
<td>1709970500</td>
<td>SATA cable</td>
<td></td>
</tr>
<tr>
<td>170215055S</td>
<td>SATA power cable(15cm)</td>
<td></td>
</tr>
<tr>
<td>1702150306</td>
<td>SATA power cable(30cm)</td>
<td></td>
</tr>
<tr>
<td>170910015G</td>
<td>UART to USB cable</td>
<td></td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
UP Squared i12 Developer Board with 12th Generation Intel® Core™ i7/i5/i3/Celeron® Processor SoC (formerly Alder Lake-P)

**Features**
- 12th Generation Intel® Core™ i7/i5/i3/Celeron® Processor SoC
- Up to 8GB Onboard LPDDR5
- M.2 2230 E-Key/M.2 2280 M-Key/SATA III x 1
- GbE x 2
- HDMI 1.4b/DP 1.2 Connector x 1, DP 1.4a via USB Type-C x 1
- USB 3.2 Gen 2 (Type-A) x 2, USB 3.2 Gen 2 (Type-C) x 1, 10-pin USB 2.0 x 2/UART x 1
- Audio Jack x 1 (Line out + Mic in)
- 40-pin GPIO x 1
- 12V DC-in
- TPM 2.0

**Specifications**

**System**

| Processor | 12th Gen Intel® Core™ Processor SoC  
| Intel® Core™ i7-1270PE (28W)  
| Intel® Core™ i5-1250PE (28W)  
| Intel® Core™ i3-1220PE (28W)  
| Intel® Celeron® Processor 7305E (15W) |
| Graphics | Intel® UHD Graphics |
| Memory | Up to 8GB Onboard LPDDR5 |
| Storage | M.2 2280 M-Key x 1 (PCIe Gen 4.0 x 4)  
| SATA III x 1 |
| I/O | 2-pin Fan Wafer x 1 (12V)  
| 2-pin RTC Battery Wafer x 1  
| 6-pin Audio Wafer x 1 (Line out + MIC in)  
| SATA II Connector x 1  
| M.2 2280 M-Key x 1  
| M.2 2230 E-Key x 1  
| HDMI 1.4b/DP 1.2 STACK Connector x 1  
| DP 1.4a x 1 (via USB Type-C)  
| USB 3.2 Gen 2 (Type-A) x 2, USB 3.2 Gen 2 (Type-C) x 1  
| 10-pin USB 2.0 x 2/UART x 1  
| 6-pin Front Panel x 1  
| HAT 40-pin Header x 1 |
| Camera | MIPI-CSI via 61-Pin FPC connector |
| USB | 10-pin USB 2.0 x 2/UART x 1  
| USB 3.2 Gen 2 (Type-A) x 2  
| USB 3.2 Gen 2 (Type-C for DP 1.4) x 1 |
| Expansion | 40-pin GPIO x 1  
| M.2 2230 E-Key x 1 (CNVI & PCIe Gen 3.0 [x1])  
| M.2 2280 M-Key x 1 (PCIe Gen 4.0 [x4])  
| SATA III x 1 |
| Display Interface | HDMI 1.4b/DP 1.2 STACK Connector x 1  
| DP 1.4a x 1 (via USB Type-C) |
| Ethernet | 1GbE RJ45 x 2 (Dual Stacked) (Realtek 8111H C8) |
| RTC | Yes |
| OS Support | Windows®10 IoT Enterprise LTSC 2021  
| Ubuntu 22.04  
| Yocto 4.0 |

**Power Requirement**

| Power | 12V DC-in |
| Power Supply Type | AT/ATX (AT as default) |
| Power Consumption (Typical) | 26W~39W |

**Mechanical**

| Dimension | 3.37” x 3.54” (85.6mm x 90mm) |
| Net Weight | 0.59 lbs (0.27kg) |
| Gross Weight | 0.84 lbs (0.38kg) |

**Environment**

| Operating Temperature | 32°F ~ 140°F (0°C ~ 60°C) / 0.5 airflow |
| Operation Humidity | 0% ~ 90% relative humidity, non-condensing |
| MTBF | 522,716 Hours |
| Certification | CE/FCC Class A, RoHS Compliant, REACH |

Note: All specifications are subject to change without notice.
**UP Squared i12**

**Block Diagram**

**Dimension**

Unit: mm

**Ordering Information**

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>CPU</th>
<th>CORE</th>
<th>MEMORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPS-ADLPCR-A10-0800</td>
<td>Intel® Celeron® Processor 7500E</td>
<td>1P + 4E</td>
<td>8GB</td>
</tr>
<tr>
<td>UPS-ADLPCR-A10-0800</td>
<td>Intel® Celeron® Processor 7500E</td>
<td>1P + 4E</td>
<td>8GB</td>
</tr>
<tr>
<td>UPS-ADLPCR-A10-0800</td>
<td>Intel® Celeron® Processor 7500E</td>
<td>1P + 4E</td>
<td>8GB</td>
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<tr>
<td>UPS-ADLPCR-A10-0800</td>
<td>Intel® Celeron® Processor 7500E</td>
<td>1P + 4E</td>
<td>8GB</td>
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<tr>
<td>UPS-ADLPCR-A10-0800</td>
<td>Intel® Celeron® Processor 7500E</td>
<td>1P + 4E</td>
<td>8GB</td>
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</table>

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1702031803</td>
<td>Power cord for EU.(TF)POWER CORD.3P-250V 10A 1800.1M.VDE.FAN-JET.YP-22/YC-12</td>
</tr>
<tr>
<td>1702031802</td>
<td>Power cord for US.(TF)POWER CORD.3P-125V 10A 1800.1M.U.S.A.FAN-JET.YP12/YC-12</td>
</tr>
<tr>
<td>1702031804</td>
<td>Power cord for UK.(TF)Power Cord.3P 250V 10A UK type.1830mm</td>
</tr>
<tr>
<td>1702031805</td>
<td>Power cord for Japan.(TF)Power cord.3P 125V/250V 10A 1800.1M.USA.FAN-JET.</td>
</tr>
<tr>
<td>1702031806</td>
<td>Power cord for China.(TF)POWER CORD.3P(M).3P(F).1.8m.250V 10A 1800.CHINA.FAN-JET.</td>
</tr>
<tr>
<td>1709070550</td>
<td>SATA cable.(TF)SATA CABLE.15P 7P Pitch 1.27mm.50cm</td>
</tr>
<tr>
<td>1701050058</td>
<td>SATA power cable(15cm),(TF)Power Cable.15P SATA(F).2P 2.0mm Housing(PH).50cm</td>
</tr>
<tr>
<td>1701050059</td>
<td>SATA power cable(30cm),(TF)Power Cable.15P SATA(F).2P 2.0mm Housing(PH).30cm</td>
</tr>
<tr>
<td>1700050059</td>
<td>UART to USB cable.(TF)USB Cable.15P 1.0mm Housing USB Adf</td>
</tr>
<tr>
<td>974164A000</td>
<td>Wireless LAN Kit M.2.2230.802.11ac/n/b/g/n + B14.0,872K,with 2 sets of cable &amp; antenna.</td>
</tr>
<tr>
<td>9651926001</td>
<td>Wireless BT Kit (TF).M.2.2330 WIFI KIT.802.11ac/n/b/g/n + B14.0,872K,with 2 sets of cable &amp; antenna.</td>
</tr>
</tbody>
</table>

**Packing List**

- UP Squared i12 with Active Heatsink

Note: All specifications are subject to change without notice.
# UP Squared Pro 7000

**UP Squared Pro 7000 Developer Board with Intel Atom® x7000E Series, Intel® Processor N-series, and Intel® Core™ i3-N305 Processor (formerly Alder Lake-N)**

## Features
- Intel Atom® x7000E Series, Intel® Processor N-series, and Intel® Core™ i3-N305 Processor (formerly Alder Lake-N)
- Onboard LPDDR5 Memory up to 16GB
- Onboard eMMC Storage up to 64GB
- 2.5GbE x 2 (Intel® I226-IT)
- USB 3.2 x 3 (Type A x 2, Type C x 1)
- 40-pin GPIO x 1
- DP 1.2 x 1/DP 1.4a x 1/HDMI 2.0b x 1
- RS232/422/485 Wafer x 2
- M.2 2230 E-Key/M.2 2280 M-Key/M.2 3052 B-Key x 1
- SATA III x 1
- TPM 2.0
- 12V DC-in, 6A

## Specifications

### System

<table>
<thead>
<tr>
<th>Processor</th>
<th>Intel® Core™ i3-N305</th>
<th>Intel Atom® x7425E</th>
<th>Intel® Processor N97</th>
<th>Intel® Processor N50 (formerly Alder Lake-N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphics</td>
<td>Intel® UHD Graphics for 12th Gen Intel® Processors</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Memory</td>
<td>Up to 16GB LPDDR5</td>
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<td></td>
<td></td>
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<tr>
<td>Storage</td>
<td>Up to 64GB eMMC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I/O</td>
<td>HDMI 2.0b x 1</td>
<td>DP 1.2 x 1</td>
<td>DP 1.4a via USB Type-C</td>
<td>Audio Jack x 1 (Mic-in+Line-out)</td>
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<tr>
<td>Camera</td>
<td>MIPI-CSI via 61-Pin FPC Connector</td>
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<tr>
<td>USB</td>
<td>USB 2.0 x 2 (via 10 Pin Header x 1)</td>
<td>USB 3.2 Gen 2 x 2 (Type-A)</td>
<td>USB 3.2 Gen 2 x 1 (Type-C)</td>
<td></td>
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<tr>
<td>Expansion</td>
<td>40-pin GPIO x 1</td>
<td>M.2 2230 E-Key x 1 (CNVI, PCIe Gen 3 x1, USB 2.0)</td>
<td>M.2 2280 M-Key x 1 (PCIe Gen 3 x2, USB 2.0)</td>
<td>M.2 3052 B-Key x 1 (USB 3.2 Gen 2)</td>
</tr>
<tr>
<td>Display Interface</td>
<td>HDMI 2.0b x 1</td>
<td>DP 1.2 x 1</td>
<td>DP 1.4a via USB Type C</td>
<td></td>
</tr>
<tr>
<td>Ethernet</td>
<td>2.5GbE x 2 (Intel® I226-IT)</td>
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<tr>
<td>Security</td>
<td>Onboard TPM 2.0</td>
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<tr>
<td>RTC</td>
<td>Yes</td>
<td></td>
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<tr>
<td>OS Support</td>
<td>Windows 10 IoT Enterprise</td>
<td>Ubuntu 22.04 LTS</td>
<td>Yocto 4</td>
<td></td>
</tr>
</tbody>
</table>

### Power Requirement
- 12V DC-in, 6A
- Power Supply Type: AT/ATX
- Power Consumption (Typical): 26W~35W

### Mechanical
- Dimension: 4” x 4” (101.6mm x 101.6mm)
- Net Weight: 0.44 lb. (0.20Kg)
- Gross Weight: 0.77 lb. (0.35Kg)

### Environment
- Operating Temperature: 32°F ~ 140°F (0°C ~ 60°C) / 0.5 airflow, WiTAS1 ~4°F ~ 158°F (-20°C ~70°C)
- Operation Humidity: 0% ~ 90% relative humidity, non-condensing
- MTBF: 422,053
- Certification: CE/FCC Class A, RoHS Compliant, REACH

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>Memory</th>
<th>Storage</th>
<th>Operating Temp</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPN-ADLN50-A10-0432</td>
<td>Intel® Processor N50</td>
<td>4GB</td>
<td>32GB</td>
<td>0°C – 60°C</td>
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<tr>
<td>UPN-ADLN57-A10-0432</td>
<td>Intel® Processor N57</td>
<td>4GB</td>
<td>32GB</td>
<td>0°C – 60°C</td>
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<tr>
<td>UPN-ADLN57-A10-0432</td>
<td>Intel® Processor N57</td>
<td>4GB</td>
<td>32GB</td>
<td>-25°C – 70°C</td>
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<tr>
<td>UPN-ADLN57-A10-0864</td>
<td>Intel® Processor N57</td>
<td>6GB</td>
<td>64GB</td>
<td>0°C – 60°C</td>
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<tr>
<td>UPN-ADLN57-A10-0864</td>
<td>Intel® Processor N57</td>
<td>6GB</td>
<td>64GB</td>
<td>0°C – 60°C</td>
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<tr>
<td>UPN-ADLN23E-A10-0864</td>
<td>Intel® Atom® x7435E</td>
<td>6GB</td>
<td>64GB</td>
<td>0°C – 60°C</td>
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<tr>
<td>UPN-ADLN37-A10-0864</td>
<td>Intel® Core™ i3-N305</td>
<td>6GB</td>
<td>64GB</td>
<td>0°C – 60°C</td>
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Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1255X00032</td>
<td>12VDC/8A Adapter</td>
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<tr>
<td>1702031803</td>
<td>Power cord for EU</td>
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<tr>
<td>1702031802</td>
<td>Power cord for US</td>
</tr>
<tr>
<td>1702031800J</td>
<td>Power cord for UK</td>
</tr>
<tr>
<td>170203180E</td>
<td>Power cord for Japan</td>
</tr>
<tr>
<td>170203180B</td>
<td>Power cord for China</td>
</tr>
<tr>
<td>1702031811</td>
<td>Power cord for Taiwan</td>
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<tr>
<td>1709070006</td>
<td>SATA cable</td>
</tr>
<tr>
<td>1702150555</td>
<td>SATA power cable (15cm)</td>
</tr>
<tr>
<td>1702150506</td>
<td>SATA power cable (30cm)</td>
</tr>
<tr>
<td>1701100180</td>
<td>COM Cable</td>
</tr>
</tbody>
</table>

Packing List

- UP Squared Pro 7000 with heatsink

Note: All specifications are subject to change without notice.
UP Xtreme

UP Xtreme developer board with Intel® WHL-U Core™ i7/i5/i3/Celeron® Processor SoC

Features
- Intel® WHL-U Core i7/i5/i3/Celeron® Processor SoC
- Onboard DDR4 memory, Max 16GB
- eMMC 64GB
- 40Pin HAT Connector
- 100pin docking connector
- SATA 6.0Gb/s x 3
- Mini-card slot x 1
- M.2 2280 M Key x 1
- M.2 2230 E key x 1
- Audio Jack x 1 (line out + Mic)
- Lockable DC connector

Specifications

System
- Processor: 8th generation Intel® Core i7/i5/i3/Celeron® Processor SoC
- Graphics: Intel® Graphics, GEN 9
- I/O:
  - RJ45 Ethernet Connector x 2
  - HDMI/DP STACK Connector x 1
  - USB 3.2 Gen 2 x 2
  - Power Button / LED x 1
  - Audio Jack (Line out + Mic) x 1
  - DC connector (Lockable) x 1
  - eDP with Backlight control Header x 1
  - 10pin 1x1SB2.0 x 1 / HSUART (TTL) x 1
  - SATA Connector with power connector (5V, GND) x 1
  - 4pin Fan connector x 1
  - Power Button header x 1
  - Reset Pin header x 1
  - M.2 2230 E Key x 1
  - M.2 2280 M Key x 1
  - 40pin HAT connector x 1
  - mPCIe slot x 1
  - M.2 2280 M Key x 1
  - 40pin HAT

Camera
- USB 3.2 Gen 2 STACK Connector for 2 ports (Front) x 1
- USB 3.2 Gen 2 STACK Connector for 2 ports (Rear) x 1

Expansion
- M.2 2230 E Key x 1
- M.2 2280 M key x 1
- mPCIe slot x 1
- 100pin connector x 1
- 40pin HAT

RTC
- RTC battery, CR2032 x 1

Power
- 12V - 60VDC
- Dimension: 122 x 120 mm

Memory
- Onboard DDR4 memory, Max 16GB
- Single Channel: 4GB
- Dual Channel: 8GB, 16GB

Storage
- SATA3 (6Gb/s) x 3:
  - a. SATA connector x 1
  - b. M.2 2280 SATA option (auto detect) x 1
  - c. minicard mSATA option (auto detect) x 1

Display Interface
- HDMI2:0.0 x 1
- eDP x 1
- CEC support with STM32 on HDMI x 1

Ethernet
- i7/i5 SKU LAN (i210 AT) x 1, LAN (i219 LM) x 1
- i3/Celeron® LAN (i210 AT) x 1, LAN (i219 V) x 1

OS Support
- Win 10
- Linux Ubuntu 18.04 with Kernel 5.0
- Linux Yocto 2.7 with Kernel 4.19

Operating Temperature
- 32°F ~ 140°F (-0°C ~ 60°C)

Operation Humidity
- 0% ~ 90% relative humidity, non-condensing

Certification
- CE/FCC class A, RoHS Compliant, REACH

Note: All specifications are subject to change without notice.
Block Diagram

Dimension
Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>UPX-WHLCR-A20-04064</td>
<td>Celeron 4305UE</td>
<td>4GB</td>
<td>64GB</td>
<td>GbE</td>
<td>x 2</td>
<td>USB 3.2 Gen 2</td>
<td>2 Mini card x 1, M.2 2280 B + M key x 1, M.2 2230 E key x 1</td>
<td>12-60V</td>
<td>32°F ~140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>UPX-WHLIT1-A20-16064</td>
<td>Core i7-8565U</td>
<td>16GB</td>
<td>64GB</td>
<td>GbE</td>
<td>x 2</td>
<td>USB 3.2 Gen 2</td>
<td>2 Mini card x 1, M.2 2280 B + M key x 1, M.2 2230 E key x 1</td>
<td>12-60V</td>
<td>32°F ~140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>UPX-WHLIT3-A20-08064</td>
<td>Core i3-8145UE</td>
<td>8GB</td>
<td>64GB</td>
<td>GbE</td>
<td>x 2</td>
<td>USB 3.2 Gen 2</td>
<td>2 Mini card x 1, M.2 2280 B + M key x 1, M.2 2230 E key x 1</td>
<td>12-60V</td>
<td>32°F ~140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>UPX-WHLIT5-A20-08064</td>
<td>Core i5-8365UE</td>
<td>8GB</td>
<td>64GB</td>
<td>GbE</td>
<td>x 2</td>
<td>USB 3.2 Gen 2</td>
<td>2 Mini card x 1, M.2 2280 B + M key x 1, M.2 2230 E key x 1</td>
<td>12-60V</td>
<td>32°F ~140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>UPX-WHLIT7-A20-16064</td>
<td>Core i7-8665UE</td>
<td>16GB</td>
<td>64GB</td>
<td>GbE</td>
<td>x 2</td>
<td>USB 3.2 Gen 2</td>
<td>2 Mini card x 1, M.2 2280 B + M key x 1, M.2 2230 E key x 1</td>
<td>12-60V</td>
<td>32°F ~140°F (0°C ~ 60°C)</td>
</tr>
</tbody>
</table>

Packing List
• UPX-WHL01 with Heatsink + cooler

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>125530065A</td>
<td>19Wdc/3.42A.65W power adapter</td>
</tr>
<tr>
<td>1762031830</td>
<td>Power cord for USA</td>
</tr>
<tr>
<td>9741364000</td>
<td>Wireless LAN Kit M.2 2230 B:2.11ac/a/b/g/n + BT4.0,2T2R,with 2 sets of cable &amp; antenna (Enlit,QCNFA364A)</td>
</tr>
<tr>
<td>9741159000</td>
<td>TF(Wireless LAN Kit IEEE 802.11.b/g/n/BT 4.0/3.0.(AzureWave,AWS-4B159H),w/cable,antenna (mini card)</td>
</tr>
<tr>
<td>PER-TAKX2-A10-2280</td>
<td>AI Core XM2280.M.2 2280 B+M key card with Dual Myriad X.15 mm heat sink with FAN</td>
</tr>
<tr>
<td>UPOC-CR-VPX3-A10-001</td>
<td>Vision Plus X w/ 3x Myriad X 2485 fan heatsink.REV:A1.0</td>
</tr>
<tr>
<td>UPOC-CPL3-A11-001</td>
<td>Connect Plus.211-AT for UP core Plus/IP Xtreme</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
UP Xtreme i11
UP Xtreme i11 developer board with 11th generation Intel® Core™ i7/i5/i3/Celeron® Processor SoC (formerly Tiger Lake UP3)

Features

- 11th generation Intel® Core™ i7/i5/i3/Celeron® Processor SoC (formerly Tiger Lake UP3)
- DDR4 SO-DIMM Slot x 2 (up to 64GB)
- 40-pin HAT Connector
- Support 4 independent Displays
- Support 5G module via M.2 3052 B key
- Support AI module via M.2 2280
- Support Intel AX210 WiFi 6 via M.2 2230
- Support USB 4.0
- PCIe x 4 slot

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>11th Gen Intel® Core™ Processor SoC</th>
</tr>
</thead>
</table>
| Processor | Core i7-1185G7E  
Core i7-1185GRE  
Core i5-1145 G7E  
Core i5-1145GRE  
Core i3-1115GRE  
Celeron® 6305E |
| Graphics | Intel® Iris® Xe graphics |
| I/O | RJ45 Ethernet Connector x 2  
HDMI/DP Stack Connector x 1  
Power Button / LED x 1  
DC Connector (Lockable) x 1  
10-pin USB 2.0 x 2 / HSIUART x 1  
SATA Connector with Power Connector (5V, GND) x 1  
4pin Fan Connector x1  
6pin Front Panel Header  
M.2 2230 E Key x 1  
M.2 2280 M Key x 1  
USB 4.0 |
| Camera | — |
| USB | USB 3.2 Gen 2 Type A x 3  
USB 2.0 x 1  
USB4.0 x 1 Type-C |
| Expansion | M.2 2230 E Key x 1  
M.2 2280 M Key x 1  
M.2 3052 B Key x 1  
40-pin HAT Connector x 1  
PCIe x 4 Slot |
| RTC | RTC battery, CR2032 x 1 |
| Power | 12V |
| Dimension | 120.35 x 122.5 mm |
| Memory | DDR4 SO-DIMM Slot x 2 (up to 64GB 3200Mhz) |
| Storage | SATA3(6Gb/s) x 1:  
a. SATA Connector x 1  
b. M.2 2280 M Key NVMe(PCIe [x2]) |
| Display Interface | HDMI 2.0 x 1  
DP 1.4 x 1 + eDP x 1, 4K at 60Hz internal panel |
| Ethernet | Intel® i225IT x 1, Intel® i219 (vPRO) x 1 |
| OS Support | Win 10/10T  
Linux Ubuntu 20.04.02  
Linux Yocto 3.1 |
| Operating Temperature | 32°F ~ 140°F (0°C ~ 60°C) |
| Operation Humidity | 0% ~ 90% relative humidity, non-condensing |
| Certification | CE/FCC class A, RoHS Compliant, REACH |
Block Diagram

Dimension

Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>Core</th>
<th>LAN</th>
<th>Memory</th>
<th>USB</th>
<th>RS-232/422/485</th>
<th>Display</th>
<th>Power</th>
<th>Operation Temp</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPX-TGL7-A10-0000</td>
<td>Intel Core i7-1165G7E</td>
<td>4</td>
<td>GBE x 2</td>
<td>3200MHz (8Gx4)</td>
<td>2</td>
<td>M.2 2280 M key x 1, M.2 2210 B key x 1, M.2 2230 E key x 1, M.2 3052 B key x 1</td>
<td>DP, DP</td>
<td>12V</td>
<td>32°F ~ 140°F</td>
</tr>
<tr>
<td>UPX-TGL5-A10-0000</td>
<td>Intel Core i5-1145G7E</td>
<td>4</td>
<td>GBE x 2</td>
<td>3200MHz (8Gx4)</td>
<td>2</td>
<td>M.2 2280 M key x 1, M.2 2210 B key x 1, M.2 2230 E key x 1, M.2 3052 B key x 1</td>
<td>DP, DP</td>
<td>12V</td>
<td>32°F ~ 140°F</td>
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<tr>
<td>UPX-TGL3-A10-0000</td>
<td>Intel Core i3-1115G7E</td>
<td>4</td>
<td>GBE x 2</td>
<td>3200MHz (8Gx4)</td>
<td>2</td>
<td>M.2 2280 M key x 1, M.2 2210 B key x 1, M.2 2230 E key x 1, M.2 3052 B key x 1</td>
<td>DP, DP</td>
<td>12V</td>
<td>32°F ~ 140°F</td>
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Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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<tr>
<td>125530960</td>
<td>(TF)Power Adapter 100-240VAC/50-60Hz 12V/9A 36W</td>
</tr>
<tr>
<td>125530960</td>
<td>(TF)Power Adapter 100-240VAC/50-60Hz 12V/9A 36W</td>
</tr>
<tr>
<td>1702031802</td>
<td>(TF)POWER CORD 3P-125V 10A 180D.1.8M.USA.FANJET.YP-22/YC-12 (for USA)</td>
</tr>
<tr>
<td>1702031803</td>
<td>(TF)POWER CORD 3P-250V 10A 180D.1.8M.USA.FANJET.YP-22/YC-12 (for USA)</td>
</tr>
<tr>
<td>1702031805</td>
<td>(TF)Power cord 3P-250V 10A 180D.1.8M.USA.FANJET.YP-22/YC-12 (for USA)</td>
</tr>
<tr>
<td>9741364A00</td>
<td>Wireless Lan Kit M.2 2230 8G/2112a/b/g/n + BT4.0, w/2 sets of cable &amp; antenna (Enli,QCNFA364A)</td>
</tr>
<tr>
<td>9651926001</td>
<td>(TF)M.2 2230 WiFi Kit 8G/2112a/b/g/n + BT4.0, w/2 sets of cable &amp; antenna (Enli,QCNFA364A)</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
UP Xtreme i12

UP Xtreme i12 developer board with 12th generation Intel® Core™ i7/i5/i3/Celeron® Processor SoC (Alder Lake-P)

Features
- 12th generation Intel® Core™ i7/i5/i3/Celeron® Processor SoC
- On board Dual Channel LPDDR5 up to 32GB
- Support 4 independent Displays up to 4K at 60Ghz
- Support 2 x M.2 2280 KEY M (PCIE Gen4)
- Support 5G via M.2 3052
- Support Intel AX210 WiFi 6
- TPM2.0
- 40pin HAT connector
- USB4.0 type C
- Up to 2.5Gbps LAN speed

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>12th Gen Intel® Core™ Processor SoC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Core i7-1270PE</td>
</tr>
<tr>
<td>Core i5-1250PE</td>
<td></td>
</tr>
<tr>
<td>Core i3-1220PE</td>
<td></td>
</tr>
<tr>
<td>Celeron® 7305E</td>
<td></td>
</tr>
<tr>
<td>Graphics</td>
<td>Intel® Iris® Xe graphics</td>
</tr>
<tr>
<td>Memory</td>
<td>Up to 32GB on board LPDDR5 4800MHz (Dual Channel)</td>
</tr>
<tr>
<td>Storage</td>
<td>M.2 2280 (PCle Gen4.0 x 4) M-key x 2</td>
</tr>
<tr>
<td>Sata3 x 1</td>
<td></td>
</tr>
<tr>
<td>I/O</td>
<td>10-pin USB 2.0 x 2 / HSUART x 1</td>
</tr>
<tr>
<td></td>
<td>4pin Fan Connector x1</td>
</tr>
<tr>
<td></td>
<td>6pin Front Panel Header x 1</td>
</tr>
<tr>
<td></td>
<td>10-pin RS232/422/485 Pin Header x 2</td>
</tr>
<tr>
<td></td>
<td>DC Connector x 1</td>
</tr>
<tr>
<td></td>
<td>Power Button/LED x 1</td>
</tr>
<tr>
<td></td>
<td>Audio Jack x 1 (Mic-in, Line out)</td>
</tr>
<tr>
<td></td>
<td>RJ45 x 2</td>
</tr>
<tr>
<td>Camera</td>
<td>—</td>
</tr>
<tr>
<td>USB</td>
<td>USB 2.0 x 2 (from wafer x 1), USB2.0 Type A x 1</td>
</tr>
<tr>
<td></td>
<td>USB 3.2 Gen 2 Type A x 3</td>
</tr>
<tr>
<td></td>
<td>USB4.0 Type C x 1</td>
</tr>
<tr>
<td>Expansion</td>
<td>40 pin GPIO x 1</td>
</tr>
<tr>
<td></td>
<td>M.2 2230 E-key x 1</td>
</tr>
<tr>
<td></td>
<td>M.2 2280 (PCle Gen4.0 x 4) M-key x 2</td>
</tr>
<tr>
<td></td>
<td>SATA3 x 1</td>
</tr>
<tr>
<td></td>
<td>M.2 3052 B-key x 1</td>
</tr>
<tr>
<td></td>
<td>Nano SIM slot x 1</td>
</tr>
<tr>
<td>Display Interface</td>
<td>HDMI 2.0 x 1</td>
</tr>
<tr>
<td></td>
<td>DP 1.4a x 1</td>
</tr>
<tr>
<td></td>
<td>DP 1.4b via USB Type C x 1</td>
</tr>
<tr>
<td></td>
<td>eDP1.4b x 1</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Intel® i226IT (TSN) x 1, Intel® i219 (vPRO) x 1</td>
</tr>
<tr>
<td>Security</td>
<td>TPM 2.0</td>
</tr>
<tr>
<td>RTC</td>
<td>Yes</td>
</tr>
<tr>
<td>OS Support</td>
<td>Windows* 10 Enterprise 2021 LTSC</td>
</tr>
<tr>
<td></td>
<td>Ubuntu 22.04</td>
</tr>
<tr>
<td></td>
<td>Yocto (TBD)</td>
</tr>
</tbody>
</table>

Power Requirement

<table>
<thead>
<tr>
<th>Power</th>
<th>12-36V DC input (AT/ATX mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply Type</td>
<td>Lockable</td>
</tr>
<tr>
<td>Power Consumption (Typical)</td>
<td>Intel® Core™ (I-1270PE, LPDDR5 4800MHz 16GB, 5.86A@12V (Typical))</td>
</tr>
<tr>
<td></td>
<td>Intel® Core™ (I-1270PE, LPDDR5 4800MHz 16GB, 8.05A@12V (Max))</td>
</tr>
</tbody>
</table>

Mechanical

<table>
<thead>
<tr>
<th>Dimension</th>
<th>4.74 x 4.82” (120.35 x 122.5 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Weight</td>
<td>0.86lb (0.4kg)</td>
</tr>
<tr>
<td>Gross Weight</td>
<td>1.32lb (0.6kg)</td>
</tr>
</tbody>
</table>

Environment

<table>
<thead>
<tr>
<th>Operating Temperature</th>
<th>With Heatsink: 32°F – 140°F (0°C – 60°C) / 0.5 airflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation Humidity</td>
<td>0% – 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>MTBF</td>
<td>362,068 Hours</td>
</tr>
<tr>
<td>Certification</td>
<td>CE/FCC Class A, RoHS Compliant, REACH</td>
</tr>
</tbody>
</table>
UP Boards

UP Xtreme i12

Block Diagram

Dimention
Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9741364A00</td>
<td>Wireless LAN Kit M.2 2230 B02.11ac/a/b/g/n + BT4.0, 2T2R, with 2 sets of cable &amp; antenna (EnelQNA364A)</td>
</tr>
<tr>
<td>9651210000</td>
<td>Wireless LAN Kit M.2 2230 B02.11ac/a/b/g/n + BT5.2, 2.4G/5G/6G, with 2 sets of cable &amp; antenna (Intel AX210)</td>
</tr>
<tr>
<td>9651926001</td>
<td>M.2 2230 WiFi Kit B02.11ac: 2.4G/5G, W/BT Intel 9260. NGW. NV.958867 with 2 cable &amp; antenna (EnelQCNFA364A)</td>
</tr>
</tbody>
</table>

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9741364A00</td>
<td>Wireless LAN Kit M.2 2230 B02.11ac/a/b/g/n + BT4.0, 2T2R, with 2 sets of cable &amp; antenna (EnelQNA364A)</td>
</tr>
<tr>
<td>9651210000</td>
<td>Wireless LAN Kit M.2 2230 B02.11ac/a/b/g/n + BT5.2, 2.4G/5G/6G, with 2 sets of cable &amp; antenna (Intel AX210)</td>
</tr>
</tbody>
</table>

UP Boards

UP Xtreme i12 with active heatsink

Packing List

- UP Xtreme i12 with active heatsink
# UP Core

## UP Core Developer Board with Intel® Atom® x5-Z8350 Processor SoC

### Features
- **Intel® Atom® x5-Z8350 SoC**
- **Onboard DDR3L Memory up to 4GB**
- **Onboard eMMC Storage up to 64GB**
- **DSI/eDP x 1, HDMI x 1**
- **MIPI-CSI x 2**
- **100pin docking connector**
- **WiFi+ Bluetooth**
- **USB3.0 x 1**

### Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel® Atom® x5-Z8350 Processor SoC</td>
</tr>
<tr>
<td>Graphics</td>
<td>Intel® HD 400 Graphics</td>
</tr>
<tr>
<td>I/O</td>
<td>Full eDP x 1 HDMI x 1, Audio via HDMI and i2C (from docking)</td>
</tr>
<tr>
<td>Camera</td>
<td>MIPI-CSI (2 Lane) MIPI-CSI (4 Lane)</td>
</tr>
<tr>
<td>USB</td>
<td>USB 3.0 Host x 1, USB 2.0 pin header x 2</td>
</tr>
<tr>
<td>Expansion</td>
<td>100 pin docking connector</td>
</tr>
<tr>
<td>RTC</td>
<td>Yes</td>
</tr>
<tr>
<td>Power</td>
<td>5V DC-in @ 4A 5.5/2.1mm jack</td>
</tr>
<tr>
<td>Dimension</td>
<td>56.5 mm x 66 mm</td>
</tr>
<tr>
<td>Memory</td>
<td>2GB/ 4GB DDR3L-1600</td>
</tr>
<tr>
<td>Storage</td>
<td>eMMC 16GB / 32GB/ 64GB</td>
</tr>
<tr>
<td>Display Interface</td>
<td>DSI/eDP x 1</td>
</tr>
<tr>
<td>Ethernet</td>
<td>—</td>
</tr>
<tr>
<td>OS Support</td>
<td>Win 10, Linux (ubilinux, Ubuntu, Yocto) Android Marshmallow</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>Operation Humidity</td>
<td>10% ~ 80% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>CE/FCC Class A, RoHS Compliant, REACH</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
**Block Diagram**

**Dimension**

Unit: mm

**Ordering Information**

<table>
<thead>
<tr>
<th>Part number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPC-CHT01-A35-0118-A1</td>
<td>UP Core with i3550 CPU, 16GB RAM + 16GB eMMC, passive heatsink, WiFi 802.11 b/g/n + Bluetooth 4.2 on board powered by AMPAX AP6214A</td>
</tr>
<tr>
<td>UPC-CHT01-A35-0216-A1</td>
<td>UP Core with i3550 CPU, 2GB RAM + 16GB eMMC, passive heatsink, WiFi 802.11 b/g/n + Bluetooth 4.2 on board powered by AMPAX AP6214A</td>
</tr>
<tr>
<td>UPC-CHT01-A35-0232-A1</td>
<td>UP Core with i3550 CPU, 3GB RAM + 32GB eMMC, passive heatsink, WiFi 802.11 b/g/n + Bluetooth 4.2 on board powered by AMPAX AP6214A</td>
</tr>
<tr>
<td>UPC-CHT01-A35-0432-A1</td>
<td>UP Core with i3550 CPU, 4GB RAM + 64GB eMMC, passive heatsink, WiFi 802.11 b/g/n + Bluetooth 4.2 on board powered by AMPAX AP6214A</td>
</tr>
<tr>
<td>UPC-CHT01-A35-0464-A1</td>
<td>UP Core with i3550 CPU, 4GB RAM + 64GB eMMC, passive heatsink, WiFi 802.11 b/g/n + Bluetooth 4.2 on board powered by AMPAX AP6214A</td>
</tr>
</tbody>
</table>

**Packing List**

- UPC-CHT01 with Heatsink

Note: All specifications are subject to change without notice.
Connect Plus

Expansion board with 3 x Gigabit LAN powered by Intel® i211-AT/i210-IT for UP Core Plus, Up Xtreme

Features
- Gigabit LAN x 3
- Intel® i211-AT (optional with I210-IT for wide temperature) x 3
- USB 3.2 Gen 1 Type A x 1
- Windows® 10, Linux (ubilinux, Ubuntu, Yocto), Android-IA 9.0
- UART x 1
- SPI x 1
- M.2 3042/3052 B-key x 1

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>VPU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Ethernet | Intel I211-AT x 3 (A10-001) Intel I210-IT for wide temperature x 3 (A10-002) |
| Power Requirement | 12V5A |
| Power Supply Type | 12VDC from M/B |
| Power Consumption (Typical) | Max 13.5W w/o 5G module |
| Dimensions (L x W) | 3.54" x 2.2" (90 mm x 56 mm) |
| Operating Temperature | 32°F – 140°F (0°C – 60°C) |
| Operation Humidity | 10 ~ 80% relative humidity, non-condensing |
| Certification | CE/FCC Class A |
| OS Support | Microsoft Windows 10 Linux: ubilinux, Ubuntu, Yocto Android-IA 9.0 |

I/O

| Ethernet | 001: Intel® I211-AT x 3 002: Intel® I210-IT for wide temperature |
| USB | USB 3.0 Type A x 1 |
| SATA | c |
| Expansion Slot | M.2 3042/3052 B-key DOCKING I DOCKING II UART x 1 SPI x 1 |

Packing List

- Adapter Board i x 1
- Adapter Board ii x 1
- Standoff x 12
- UP Connector Plus x 1

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPCR-CPL3-A11-001</td>
<td>Connect Plus.i211-AT for UP core Plus/UP Xtreme</td>
</tr>
<tr>
<td>UPCR-CPL3-A11-002</td>
<td>Connect Plus.i210-IT for UP core Plus/UP Xtreme, A.1</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
### Features

- 4-Lane + Clock from Camera Module Connector x 2
- 5V/2A Power-In from Wafer

### Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
</table>
| I/O          | Power: 5V/2A In from Wafer  
MIPI-CSI In: 4-Lane + Clock from Camera Module Connector x 2  
MIPI-CSI Out: 61-pin FPC Connector x 1 |
| Dimension    | 3.3” x 2.4” (85mm x 61mm)                                              |
| Net Weight   | 0.1 lb. (0.04Kg)                                                            |
| Gross Weight | 0.13 lb. (0.06Kg)                                                            |
| Operating Temperature | 32°F – 140°F (0°C – 60°C), 0.5m/s airflow                                |
| Operation Humidity | 10% ~ 90% relative humidity, non-condensing                              |
| Certification | ---                                                                         |

### Packing List

- RVP Converter board
- FPC Cable
- Power Cable
- Screws/Stud Pack

### Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPCTR-CAMB-A10-0001</td>
<td>MIPI-CSI Camera RVP Converter Kit for UP Squared Pro 7000/UP Squared i12</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
**Block Diagram**

UPN-ADL-N

MIPI
FPC 61PIN

POWER
5V 2A

For RVP

Camera CRD-1
Connector
LSHM130-02.5-L-DV-A-S-KTR

Camera CRD-2
Connector
LSHM130-02.5-L-DV-A-S-KTR

**Dimension**

Unit: mm

Note: All specifications are subject to change without notice.

www.aaeon.com
UP-3G HAT
RS-232/422/485 x 2, Mini Card x 1, uSIM Card Reader x 1

Features
- RS-232/422/485 x 2
- MiniCard x 1, uSIM Card Reader x 1
- HAT 40-pin Header x 1
- WiFi Module Header for x 1

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>2-CH FULL-SPEED USB UART x 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC</td>
<td>USB 2.0 Hub x 1</td>
</tr>
<tr>
<td></td>
<td>RS-232/RS-485/RS-422 transceiver x 2</td>
</tr>
</tbody>
</table>

I/O Placements

| External Ports | RS-232/422/485 Connector (DB9) x 1 |
| Internal connector | RS-232 wafer (RS-232/422/485) x 1 |
|                  | USB wafer x 1                     |
|                  | MiniCard x 1                      |
|                  | uSIM Card Reader x 1              |
|                  | HAT 40 GPIO male (4x GPIO, 3.3V, 5V, GND) x 1 |
|                  | WiFi LED x 1                      |
|                  | 3G LED x 1                        |
|                  | Power LED x 1                     |

Others

| Form Factor | 2.56” x 2.2” (65 mm x 56 mm) |
| Certification | CE/FCC Class A               |
| Operating Temperature | 32°F – 140°F (0°C – 60°C) |
| Operating Humidity   | 10%–90% RH, non-condensing |

Optional

| WiFi Module | UP-WIFIMD-A20-7001 (WiFi module: 7M02) |
|            | UP-WIFIMD-A20-4001 (WiFi module: 4M02) |
| BT Module  | —                                    |
| 3G Module  | 9741UC20G0 (3G module: UC20-0)       |

Packing List

- UP-3G HAT
- 1700100061
  USB Y Cable: 10P 1.0mm HSG(F), 10P 1.0mm HSG(F), 6cm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP-3G-HAT-A20-0001</td>
<td>3G HAT</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
UP-POE HAT
PoE Ideal Diode Bridge & PD Forward/Flyback Controller

Features
- IEEE802.3 AT Standard
- Max 25W Power Supply
- 10/100/1000 Mbps LAN
- RJ45 Input x 1
- RJ45 Output x 1

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>IC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LT4321I (PoE Ideal Diode Bridge Controller) x 1</td>
</tr>
<tr>
<td></td>
<td>LT4276B (PD Forward / Flyback Controller) x 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I/O Placements</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Ports</td>
</tr>
<tr>
<td>RJ45 Input x 1</td>
</tr>
<tr>
<td>RJ45 output x 1</td>
</tr>
<tr>
<td>Internal connector</td>
</tr>
<tr>
<td>HAT 40 GPIO male (5V, GND) x 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
</tr>
<tr>
<td>3.37&quot; x 2.22&quot; x 0.98&quot; (85.6 mm x 56.5 mm x 25 mm)</td>
</tr>
<tr>
<td>Certification</td>
</tr>
<tr>
<td>CE / FCC Class A</td>
</tr>
<tr>
<td>Operating Temperature</td>
</tr>
<tr>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>OS Support</td>
</tr>
<tr>
<td>No OS limitation</td>
</tr>
</tbody>
</table>

Packing List
- LAN cable
- UP-POE HAT

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP-POE-A20-0001</td>
<td>POE board</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
UP Squared 6000 PSE Carrier Board

Features
- GbE via Marvell Alaska x 2 (limited in full function sku)
- Micro USB (PSE DEBUG PORT) x 1
- 40 pin HAT2 PSE header x 1
- SATA x 1
- Full-sized Mini-PCIe with SIM card slot x 1 (limited in full function sku)

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>UPN-EHLCB-A10-001:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GbE via Marvell Alaska x 2</td>
</tr>
<tr>
<td></td>
<td>Micro USB (PSE DEBUG PORT) x 1</td>
</tr>
<tr>
<td></td>
<td>40pin HAT2 PSE header x 1</td>
</tr>
<tr>
<td></td>
<td>(CAN x 2, QEP x 4, I2C x 1, PWM x 4, ADC x 4)</td>
</tr>
<tr>
<td></td>
<td>SATA with power connector x 1</td>
</tr>
<tr>
<td></td>
<td>100pin board-to-board high speed connector x 1</td>
</tr>
<tr>
<td></td>
<td>Full-sized Mini-PCIe (via USB2.0) x 1</td>
</tr>
<tr>
<td></td>
<td>SIM card slot x 1</td>
</tr>
<tr>
<td></td>
<td>SWD 10pin wafer (connect to MB) x 1</td>
</tr>
<tr>
<td></td>
<td>UART 10pin wafer (connect to MB) x 1</td>
</tr>
<tr>
<td></td>
<td>RS232 wafer x 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I/O</th>
<th>UPN-EHLCB-A10-002:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Micro USB (PSE DEBUG PORT) x 1</td>
</tr>
<tr>
<td></td>
<td>40pin HAT2 PSE header x 1</td>
</tr>
<tr>
<td></td>
<td>(CAN x 2, QEP x 4, I2C x 1, PWM x 4, ADC x 4)</td>
</tr>
<tr>
<td></td>
<td>SATA with power connector x 1</td>
</tr>
<tr>
<td></td>
<td>100pin board-to-board high speed connector x 1</td>
</tr>
<tr>
<td></td>
<td>SWD 10pin wafer (connect to MB) x 1</td>
</tr>
<tr>
<td></td>
<td>UART 10pin wafer (connect to MB) x 1</td>
</tr>
<tr>
<td></td>
<td>RS232 wafer x 1</td>
</tr>
</tbody>
</table>

Dimension: 4” x 4” (101.6mm x 101.6mm)
Net Weight: 0.08 kg
Gross Weight: 0.14 kg
Operating Temperature: 32°F – 140°F (0°C – 60°C)
Operation Humidity: 0% – 90% relative humidity, non-condensing
Certification: CE/FCC Class A

Packing List
- UPN-EHLCB x 1
- SWD cable x 1
- UART cable x 1
- Stud x 7
- Nut x 2

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPN-EHLCB-A10-001</td>
<td>PSE Carrier board for UP Squared 6000 w/ GbE*2, mPCIe slot &amp; SIM (Full function version)</td>
</tr>
<tr>
<td>UPN-EHLCB-A10-002</td>
<td>PSE Carrier board for UP Squared 6000 w/o GbE*2, mPCIe slot &amp; SIM (Lite version)</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Block Diagram

Dimension Unit: mm
UP 4000 M.2 Plus
UP 4000 Carrier Board for M.2 2230/3042/3052/2280

Features
- Support Wi-Fi, BT via M.2 2230
- Support 4G via M.2 3042
- Support 5G via M.2 3052
- Support PCIe storage or AI module via M.2 2280

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP-APL03CB-A10-0001</td>
<td>M.2 2230/3042/3052 B Key (USB 3.0), M.2 2230 E Key (PCIe x1 w/o Bluetooth), 41pin FPC connector x1</td>
</tr>
<tr>
<td>I/O</td>
<td>UP-APL03CB-A10-0002: M.2 2280 M Key (PCIe x1), 41pin FPC connector x1</td>
</tr>
<tr>
<td>Dimension</td>
<td>UP-APL03CB-A10-0001: 2&quot; x 2.36&quot; (51mm x 60mm), UP-APL03CB-A10-0002: 2&quot; x 3.5&quot; (51mm x 89mm), UP-APL03CB-A10-0003: 2&quot; x 2.36&quot; (51mm x 60mm)</td>
</tr>
<tr>
<td>Net Weight</td>
<td>UP-APL03CB-A10-0001: 16g, UP-APL03CB-A10-0002: 19g, UP-APL03CB-A10-0003: 15g</td>
</tr>
<tr>
<td>Gross Weight</td>
<td>UP-APL03CB-A10-0001: 55g, UP-APL03CB-A10-0002: 58g, UP-APL03CB-A10-0003: 54g</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C), 0.5m/s airflow</td>
</tr>
<tr>
<td>Operation Humidity</td>
<td>10% ~ 80% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>CE/FCC Class A, RoHS Compliant</td>
</tr>
</tbody>
</table>

Packing List
- UP 4000 carrier board
- FPC cable
- Screws pack

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP-APL03CB-A10-0001</td>
<td>UP 4000 carrier board kit for WiFi and 5G module</td>
</tr>
<tr>
<td>UP-APL03CB-A10-0002</td>
<td>UP 4000 carrier board kit for M.2 2280</td>
</tr>
<tr>
<td>UP-APL03CB-A10-0003</td>
<td>UP 4000 carrier board kit for WiFi and BT module</td>
</tr>
</tbody>
</table>

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9741364A00</td>
<td>Wireless LAN Kit M.2 2230 802.11a/b/g/n + BT4.0,2T2R,with 2 sets of cable &amp; antenna (Enli, QCNFA364A)</td>
</tr>
<tr>
<td>9651926001</td>
<td>(TF) M.2 2230 WiFi Kit 802.11ac 2.4G/5G/Wi/ BT intel.9260.NGWG. NV95887 w/2 cable &amp; antenna</td>
</tr>
</tbody>
</table>
UP POE V2 Expansion Board
UP POE V2 Expansion Board for UP 4000

Features
- POE+ (IEEE 802.3at Type 2)
- Max 30W Power Supply
- 10/100/1000 Mbps LAN
- USB 3.2 Gen 1

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O</td>
<td>RJ-45 Input x 1 (10/100/1000M Gigabit Ethernet)</td>
</tr>
<tr>
<td></td>
<td>USB 3.2 Gen 1 x 1</td>
</tr>
<tr>
<td></td>
<td>41-Pin FPC Connector x 1</td>
</tr>
<tr>
<td></td>
<td>10-Pin Wafer x 1</td>
</tr>
<tr>
<td>Dimension</td>
<td>3.37&quot; x 2.22&quot; (85mm x 56mm)</td>
</tr>
<tr>
<td>Net Weight</td>
<td>0.1 lb. (0.04Kg)</td>
</tr>
<tr>
<td>Gross Weight</td>
<td>0.13 lb. (0.06Kg)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C), 0.5m/s airflow</td>
</tr>
<tr>
<td>Operation Humidity</td>
<td>10% ~ 80% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>—</td>
</tr>
</tbody>
</table>

Packing List
- UP POE V2 Carrier Board
- FPC Cable
- Power Cable
  DC Jack 5.5x2.1mm to 3.96mm 1*2P housing.300mm
- Screws/Stud Pack

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP-POEV2-30W-A10-0001</td>
<td>POE 30W Carrier board for UP 4000</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
UP HDMI Carrier Board

Features

- FPC 61-pin MIPI CSI
- HDMI 2.0

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O</td>
<td>FPC 61-pin MIPI CSI x 1 (Lontum.LT6911UXC)</td>
</tr>
<tr>
<td></td>
<td>2-pin Power Wafer x 2</td>
</tr>
<tr>
<td></td>
<td>HDMI 2.0 x 1</td>
</tr>
<tr>
<td>Dimension</td>
<td>1.9” x 0.9” (49mm x 23mm)</td>
</tr>
<tr>
<td>Net Weight</td>
<td>TBD</td>
</tr>
<tr>
<td>Gross Weight</td>
<td>TBD</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C), 0.5m/s airflow</td>
</tr>
<tr>
<td>Operation Humidity</td>
<td>10% ~ 80% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>—</td>
</tr>
</tbody>
</table>

Packing List

- UP HDMI IN Carrier Board
- FPC cable
- Power cable
- Stud
- Bracket

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPCR-HDMI-A10-0001</td>
<td>HDMI IN carrier board for UP Squared i12, UP Squared Pro 7000, UP Xtreme i12</td>
</tr>
</tbody>
</table>
Industrial Motherboards
EMB-APL1

Mini-ITX Embedded Motherboard with Intel® N3350(DC)/N4200(QC) Processor

**Features**
- DDR3L 1866, Single Channel SODIMM x 2, Non-ECC (Max.8GB, up to 1600MHz)
- Three Independent Display: VGA x 1, HDMI x 1, LVDS/eDP x 1
- Realtek 8111H, Gigabit Ethernet x 2
- COM Port x 6 (RS-232 x 5, RS-232/422/485 x 1)
- M.2 Slot(M-key) x 1, M.2 Slot(E-key) x 1, PCIe2.0 [x1] x 1
- 12~24V DC Wide Range Voltage Power Input
- Low Profile

**Audio I/O**
- Mic-in, Line-out

**LAN I/O**
- RJ-45 x 2

**Serial Port**
- —

**PS/2 Port**
- —

**Others**
- DC power jack x 1

**Internal I/O Connectors**
- Storage: SATA 6.0Gb/s x 2 (1 colay w/ M.2 M-key), M.2 M-key (22 x 42mm)
- USB: USB 2.0 headers support additional 3 USB ports (2*5-pin, p=2.00mm) x 2
- Display I/O: 40-pin LVDS/eDP connector x 1 (default LVDS)
- Audio I/O: —
- Serial Port: RS-232/422/485 x 1, RS-232 x 5
- PS/2 Port: —
- Parallel Port: —
- DIO: 8-bit x 1 (In/Out programable)
- FAN: 4-pin Chassis Fan x 1
- Power: —
- Others: Front panel header x 1, Clear CMOS jumper x 1, AT/ATX mode select jumper (optional) x 1, SATA power connector x 1, M.2 E key (22 x 30mm) for PCIe x 1
- OS: Windows® 10 64bit, Ubuntu16.04.02/Kernel4.8.0

**Packing List**
- Heatsink
- I/O Shield
- EMB-APL1

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1709100201</td>
<td>USB 2.0 Cable (10P, 200MM, p=2.00mm, w/bracket)</td>
</tr>
<tr>
<td>1700100491</td>
<td>USB 2.0 Cable (2 x 5P, 490mm, p=2.00mm)</td>
</tr>
<tr>
<td>1709050201</td>
<td>USB 2.0 Cable (SP, 220mm, p=2.00mm)</td>
</tr>
<tr>
<td>1701100206</td>
<td>COM Cable (200MM, p=2.00mm)</td>
</tr>
<tr>
<td>1702150300</td>
<td>SATA Power Cable (AP, 300MM, p=2.54mm)</td>
</tr>
<tr>
<td>125530060Z</td>
<td>Adapter.60W.180D.W/Lock.FSP060-DHAN3</td>
</tr>
</tbody>
</table>

**Specifications**

| System | N4200, (4C @ 2.50GHz CPU [Burst Mode], 750MHz GFX [Turbo], ~6W TDP) | N3350, (2C @ 2.40GHz CPU [Burst Mode], 650MHz GFX [Turbo], ~6W TDP) |
| Chipset | Intergrated into SoC | Intergrated into SoC |
| Memory | DDR3L 1866, Single Channel SODIMM x 2, Non-ECC (Max.8GB, up to 1600MHz) | Intergrated into SoC |
| I/O | NC7Z16E | Intergrated into SoC |
| Ethernet | Realtek PCIe Gb LAN 8111H x 2 | Realtek PCIe Gb LAN 8111H x 2 |
| Audio | Realtek® ALC897 | Realtek® ALC897 |
| TPM | Nuvoton NPCT652ABCYX TPM2.0 (default: No) | Nuvoton NPCT652ABCYX TPM2.0 (default: No) |
| Expansion Slots | PCIe2.0 [x1] x 1, PCIe2.0 [x1] x 1 | PCIe2.0 [x1] x 1, PCIe2.0 [x1] x 1 |
| BIOS | 128Mbit Flash ROM x 1, AMI BIOS | 128Mbit Flash ROM x 1, AMI BIOS |
| WatchDog Timer | 1~255 steps by software program | 1~255 steps by software program |
| Smart Fan Control | Chassis Fan (Fanless) | Chassis Fan (Fanless) |
| Wake On LAN/ PXE | Yes (WOL/PXE) | Yes (WOL/PXE) |
| Power State | S3, S4, S5 | S3, S4, S5 |
| Graphics Multi Display | Three Independent Display | Three Independent Display |
| VGA | Up to 1920 x 1200 @60Hz | Up to 1920 x 1200 @60Hz |
| DVI | — | — |
| HDMI | Up to 3840 x 2160 @30Hz | Up to 3840 x 2160 @30Hz |
| Display Port | — | — |
| LVDS | Up to 1920 x 1200 @60Hz, dual-channel 18/24 bit (via PS8625) (colay with eDP) | Up to 1920 x 1200 @60Hz, dual-channel 18/24 bit (via PS8625) (colay with eDP) |
| eDP | Up to 4096 x 2160 @60Hz | Up to 4096 x 2160 @60Hz |
| Backlight Control | Voltage/PWM | Voltage/PWM |
| Environment & Power & ME | Lithium battery | Lithium battery |
| Power Requirement | 12V-24V wide-range voltage input back panel DC jack x 1; 4-pin ATX Power connector x 1 | 12V-24V wide-range voltage input back panel DC jack x 1; 4-pin ATX Power connector x 1 |
| Operation Temperature | 32°F ~ 140°F (0°C ~ 60°C) | 32°F ~ 140°F (0°C ~ 60°C) |
| Storage Temperature | -40°F ~ 185°F (-40°C ~ 85°C) | -40°F ~ 185°F (-40°C ~ 85°C) |
| Operation Humidity | 0% ~ 90% RH, non-condensing | 0% ~ 90% RH, non-condensing |
| Certificate | CE & FCC Class A | CE & FCC Class A |
| Form Factor | Mini-ITX: 6.7” x 6.7” (170mm x 170mm) | Mini-ITX: 6.7” x 6.7” (170mm x 170mm) |
| Weight | 1.1 lb (0.5 Kg) | 1.1 lb (0.5 Kg) |
| MTBF (Hours) | 263,080 | 263,080 |

**Rear Panel I/O Ports**
- USB: USB 3.2 Gen 1 (5 Gbps) x 2, USB 2.0 x 2
- Display I/O: HDMI x 1, VGA x 1

Note: All specifications are subject to change without notice.
**Block Diagram**

Intel Processor
Apollo Lake
(Integrated PCH)
(Integrated Clock Gen.)

- 2x DDR3L 5V-DIMM 1333/1600
- M.2 (M-Key) 2242
- 1 x SATA3
- 2x DDR3L SO-DIMM 1333/1600
- 1 x SATA3
- RJ-45
- PCIE 2.0 [x1]
- M.2 (E-Key) 2230
- Line out
- HDMI
- CH7511
- 1 x SATA3
- 2 x USB 3.2 Gen1
- ALC897
- LVD
- HDMI
- eDP
- IT6516B
- SMA1442K
- LVDS
- USB 2.0
- USB 2.0
- USB 2.0
- USB 3.0
- SPI
- SPI FLASH 16MB

**Dimension**

Unit: mm

**Order Information**

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</tr>
</thead>
<tbody>
<tr>
<td>EMB-APL1-A11-4200-LV</td>
<td>N4200</td>
<td>SODIMM x2</td>
<td>Passive</td>
<td>VGA, HDMI, LVDS</td>
<td>SATA3 x1, M.2M-key</td>
<td>GBE x2</td>
<td>USB2.0 x 5, USB 3.2 Gen 1 x 2</td>
<td>1</td>
<td>1</td>
<td>PCIe0 (8x1) x 1, M.2M-key x 1, M.2E-Key x 1</td>
<td>12V 24V DC</td>
<td>—</td>
</tr>
<tr>
<td>EMB-APL1-A11-3350-LV</td>
<td>N3350</td>
<td>SODIMM x2</td>
<td>Passive</td>
<td>VGA, HDMI, LVDS</td>
<td>SATA3 x1, M.2M-key</td>
<td>GBE x2</td>
<td>USB2.0 x 5, USB 3.2 Gen 1 x 2</td>
<td>1</td>
<td>1</td>
<td>PCIe0 (8x1) x 1, M.2M-key x 1, M.2E-Key x 1</td>
<td>12V 24V DC</td>
<td>—</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
**Features**

- DDR3L 1866, Single Channel SODIMM x 2, Non-ECC (Max.8GB, up to 1600MHz)
- Three Independent Display: VGA x 1, HDMI/DP x 1, LVDS/eDP x 1
- Realtek 8111H, Gigabit Ethernet x 2
- COM Port x 6 (RS-232 x 5, RS-232/422/485 x 1)
- M.2 Slot (M-key) x 1, M.2 Slot(E-key) x 1, PCIe2.0 [x1] x 1
- 12V DC Power Input
- Low Profile

**Specifications**

- **System**
  - Processor: N4200, (4C @ 2.50GHz CPU [Burst Mode] 1.90GHz Turbo, ~6W TDP) / N3350, (2C @ 2.40GHz CPU [Burst Mode], 1.60GHz Turbo, ~6W TDP)
  - Chipset: Integrated into SoC
  - Memory: DDR3L 1866, Single Channel SODIMM x 2, Non-ECC (Max.8GB, up to 1600MHz)
  - I/O Chipset: Realtek® PCIe Gb LAN 8111H x 2
  - Ethernet: Realtek® ALC897
  - TPM: Nuvoton NPC652 TPM2.0 (default: No)
  - Expansion Slots: PCIe2.0 [x1] x 1, M.2 M-key (22 x 42mm) x 1, for SATA / M.2 E-key (22 x 30mm) x 1, for PCIe
  - BIOS: 128Mbit Flash ROM x 1, AMI BIOS
  - HW Monitor: Temperature Monitor on CPU/System, Voltage Monitor on Vcore/5V/12V, Fan Monitor on CPU/Chassis
  - WatchDog Timer: 1~255 steps by software program
  - Smart Fan Control: Chassis Fan (Fanless)
  - Wake On LAN/ PXE: Yes (WOL / PXE)
  - Power State: S3, S4, S5
  - Graphics Chipset: Intel® HD Graphics
  - Graphics Multi Display: Three Independent Display
  - VGA: Up to 1920 x 1200 @ 60 Hz
  - DVI: Up to 1920 x 1200 @ 60 Hz (Colay with VGA)
  - Display Port: Up to 4096 x 2160 @ 24Hz / 4096 x 2160 @ 60Hz (Colay with eDP)
  - LVDS: Up to 4096 x 2160 @ 60Hz, dual-channel 18/24 bit (via PS8625) (colay with eDP)
  - eDP: Up to 4096 x 2160 @ 60Hz / 3840 x 2160 @30 Hz (HDMI 1.4b)
  - Backlight Control: Voltage/PWM
  - Battery: Lithium battery
  - Power Requirement: 12V DC jack (screw type) 4-pin internal power connector
  - Operation Temperature: 32°F ~140°F (0°C ~ 60°C)
  - Storage Temperature: -32°F ~140°F (-35°C ~ 60°C)
  - Operation Humidity: 0%~90%RH, non-condensing
  - Certificate: CE & FCC
  - Form Factor: Mini-ITX: 6.7” x 6.7” (170mm x 170mm)
  - Weight: 1.1 lb (0.5 Kg)
  - MTBF (Hours): 230,820

- **Environment & Power & ME**

- **Power State:** S3, S4, S5
- **Graphics Chipset:** Intel® HD Graphics
- **Graphics Multi Display:** Three Independent Display
- **VGA:** Up to 1920 x 1200 @ 60 Hz
- **DVI:** Up to 1920 x 1200 @ 60 Hz
- **Display Port:** Up to 4096 x 2160 @ 24Hz / 4096 x 2160 @ 60Hz (Colay with VGA)
- **LVDS:** Up to 4096 x 2160 @ 60Hz, dual-channel 18/24 bit (via PS8625) (colay with eDP)
- **eDP:** Up to 4096 x 2160 @ 60Hz
- **Backlight Control:** Voltage/PWM
- **Battery:** Lithium battery
- **Power Requirement:** 12V DC jack (screw type) 4-pin internal power connector
- **Operation Temperature:** 32°F ~140°F (0°C ~ 60°C)
- **Storage Temperature:** -32°F ~140°F (-35°C ~ 60°C)
- **Operation Humidity:** 0%~90%RH, non-condensing
- **Certificate:** CE & FCC
- **Form Factor:** Mini-ITX: 6.7” x 6.7” (170mm x 170mm)
- **Weight:** 1.1 lb (0.5 Kg)
- **MTBF (Hours):** 230,820

- **Rear Panel I/O Ports**

- **USB:**
  - USB 3.2 Gen 1 (5 Gbps) x 4
  - USB 2.0 headers support additional 6 USB ports (2-*5-pin, p=2.00mm) x 3

- **Display I/O**

- **Audio I/O**

- **LAN I/O**

- **Serial Port**

- **PS/2 Port**

- **Others**

- **Built-in**

- **Chassis Fan (Fanless)**

- **Front panel header**

- **Clear CMOS jumper**

- **AT/ATX mode select jumper**

- **SATA power connector**

- **M.2 E-key (22 x 30mm) for PCIe**

- **OS Support**

- **Windows® 10 64bit**

- **Ubuntu16.04.02/Kernel4.8.0**

- **Packing List**

- **Heatsink**
- **I/O Shield**
- **EMB-APL3**

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1709100291</td>
<td>USB 2.0 Cable (10P, 200MM, p=2.00mm, w/bracket)</td>
</tr>
<tr>
<td>1700100491</td>
<td>USB 2.0 Cable (2 x 5P, 490mm, p=2.00mm)</td>
</tr>
<tr>
<td>1709050291</td>
<td>USB 2.0 Cable (5P, 220mm, p=2.00mm)</td>
</tr>
<tr>
<td>1701100206</td>
<td>COM Cable (200MM, p=2.00mm)</td>
</tr>
<tr>
<td>1702150300</td>
<td>SATA Power Cable (4P, 300MM, p=2.54mm)</td>
</tr>
<tr>
<td>125530060Z</td>
<td>Adapter.60W.180D.W/Lock.FSP060-DHAN3</td>
</tr>
</tbody>
</table>

**Note:** All specifications are subject to change without notice.
**Block Diagram**

- **Intel Processor**
  - Apollo Lake
  - (Integrated PCH)
  - (Integrated Clock Gen.)

- **2x DDR3L SO-DIMM**
  - 1333/1600

- **M.2 (M-Key) 2242**

- **RI-45**
  - RTL8111H
  - PCIe
  - USB 2.0
  - SATA3

- **PCI-E 2.0 [x1]**
  - M.2 (E-Key) 2230

- **Line out**
  - AALP

- **Super IO**
  - Nuvoton NCT6116D

- **HDMI**
  - PS8625
  - eDP
  - SATA3
  - 1 x SATA III

- **GL852**
  - 2 x USB 2.0
  - 2 x USB 2.0
  - USB 2.0
  - USB 3.0

- **PCI-E 2.0 [x1]**
  - RTL8111H
  - RJ-45

- **SPI FLASH 16MB**
  - USB 3.0

- **RJ-45**
  - AATP

- **CPU/CHA**
  - FAN

- **COM1**
  - RS-232/422/485

- **COM2~6**
  - RS-232

- **DIO 8-BIT**

- **Watch Dog**

- **IT6516B**

- **ASM1442K**
  - HDMI
  - VGA
  - DP
  - eDP

- **HPD Monitor**

- **DIO**

- **GL852**
  - USB 2.0

- **IT6516B**

- **GL852**

- **NCT6116D**

**Dimension**

Unit: mm

![Dimension Diagram](image)

**Order Information**

<table>
<thead>
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<tr>
<td>EMB-APL3-A11-3350-F1-LV</td>
<td>N3350</td>
<td>SODIMM x 2</td>
<td>Fanless</td>
<td>VGA, HDMI, LVDS</td>
<td>Dual Channel 18/24 bit</td>
<td>SATA3 x 1, M.2(M-key)</td>
<td>GbE x 2</td>
<td>USB2.0 x 5, USB 3.2 Gen 1 x 2</td>
<td>5</td>
<td>1</td>
<td>PCIe x 1, M.2(M-key) x 1</td>
<td>12V DC</td>
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<td>32°F ~ 140°F (0°C ~ 60°C)</td>
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<td>EMB-APL3-A11-4200-F1-LV</td>
<td>N4200</td>
<td>SODIMM x 2</td>
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<td>VGA, HDMI, LVDS</td>
<td>Dual Channel 18/24 bit</td>
<td>SATA3 x 1, M.2(M-key)</td>
<td>GbE x 2</td>
<td>USB2.0 x 5, USB 3.2 Gen 1 x 2</td>
<td>5</td>
<td>1</td>
<td>PCIe x 1, M.2(M-key) x 1</td>
<td>12V DC</td>
<td>—</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
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Note: All specifications are subject to change without notice.
EMB-BT1
Industrial Motherboards

Mini-ITX Embedded Motherboard with Intel® Celeron® J1900/N2807/ Atom® E3845 Processor, SATA3 x 2, SATA2 x 2, USB x 8

**Features**
- Intel® Celeron® J1900/N2807/ Atom® E3845 Processor
- Dual Displays: VGA x 1, HDMI x 1, LVDS x 1
- Realtek 8111H, Gigabit Ethernet x 2
- SATA 6.0 Gb/s x 2, SATA 3.0 Gb/s x 2 (1 Colay with mSATA)
- USB 3.2 Gen 1 x 1, USB 2.0 x 7
- Full-size Mini-Card with mSATA x 1, Half-size Mini-Card x 1, PCI-E[x1] x 1
- 12V DC Power Input

**Rear Panel I/O Ports**

<table>
<thead>
<tr>
<th>Port</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB</td>
<td>USB 3.2 Gen 1 (5 Gbps)/2.0 x 1, USB 2.0 x 2</td>
</tr>
<tr>
<td>Display I/O</td>
<td>VGA x 1, HDMI x 1</td>
</tr>
<tr>
<td>Audio I/O</td>
<td>Line-out x 1</td>
</tr>
<tr>
<td>LAN I/O</td>
<td>LAN (RJ-45) port x 2</td>
</tr>
<tr>
<td>Serial Port</td>
<td>COM (RS-232) (optional) x 1</td>
</tr>
<tr>
<td>PS/2 Port</td>
<td>—</td>
</tr>
<tr>
<td>Others</td>
<td>DC port (12V) Screw type x 1</td>
</tr>
</tbody>
</table>

**Internal I/O Connectors**

<table>
<thead>
<tr>
<th>Connector Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>SATA 6.0 Gb/s x 2</td>
<td>SATA 3.0 Gb/s x 1</td>
</tr>
<tr>
<td>Full-size Mini-Card (mSATA Default)</td>
<td>Half-size Mini-Card (mSATA Default)</td>
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<tr>
<td>Mini-Card (mSATA Default)</td>
<td>Mini-Card (mSATA Default)</td>
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<tr>
<td>DDR3L SO-DIMM x 2</td>
<td>DDR3L SO-DIMM x 2</td>
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<tr>
<td>USB 2.0 x 2</td>
<td>USB 2.0 x 2</td>
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<td>RJ45 x 2</td>
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<td>USB 3.2 Gen 1 x 1</td>
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<td>HDMI</td>
<td>HDMI</td>
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<td>VGA</td>
<td>VGA</td>
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**Packaging List**

- SATA Cable
- SATA Power Cable
- I/O Shield
- Heatsink
- EMB-BT1

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1709100330</td>
<td>USB 2.0 Cable (RP, 330MM, p=2.54mm, w/ bracket)</td>
</tr>
<tr>
<td>1709050201</td>
<td>USB 2.0 Cable (SP, 220MM, p=2.00mm)</td>
</tr>
<tr>
<td>1701260305</td>
<td>LPT Cable (25P, 270MM)</td>
</tr>
<tr>
<td>1701100206</td>
<td>COM Port Cable</td>
</tr>
<tr>
<td>1700060152</td>
<td>PS/2 Cable (6P, 150mm, p=2.00mm)</td>
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<tr>
<td>1709100200</td>
<td>USB 2.0 Cable (RP, 200MM, p=2.54mm, w/o bracket)</td>
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<tr>
<td>1702150300</td>
<td>SATA Power Cable (RP, 2.54mm)</td>
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<tr>
<td>125590084A</td>
<td>Adapter 12V, 84W/N3</td>
</tr>
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</table>

**Specifications**

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel® Celeron® J1900/N2807/ Atom® E3845 Processor (4C @ 2.00 GHz CPU, 688/854 MHz GFX, 10W TDP), Intel® Atom® E3845 Processor (4C @ 1.91 GHz CPU, 542/792 MHz GFX, 10W TDP)</td>
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<tr>
<td>Chipset</td>
<td>—</td>
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<tr>
<td>Memory</td>
<td>DDR3L 1333 MHz SODIMM x 2 up to 8 GB (for J1900 / E3845), DDR3L 1333 MHz SODIMM x 1 up to 4 GB (for N2807), Non-ECC, un-buffered memory, Dual-channel memory architecture flat type</td>
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<tr>
<td>I/O Chipset</td>
<td>Fintech 81866D</td>
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<tr>
<td>Ethernet</td>
<td>Realtek® PCIe Gb LAN 8111H x 2</td>
</tr>
<tr>
<td>Audio</td>
<td>Realtek® ALC897</td>
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<tr>
<td>TPM</td>
<td>Infineon SL86565 TT 1.2 (default: No)</td>
</tr>
<tr>
<td>Expansion Slots</td>
<td>Full-size Mini-Card (mSATA default) (PCIe x USB optional) + SIM Card (default: No) x 1, Half-size Mini-Card (PCIe x USB) x 1, PCIe x 1</td>
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<tr>
<td>BIOS</td>
<td>64 M bit Flash ROM, AMI BIOS</td>
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<tr>
<td>H/W Monitor</td>
<td>Temperature Monitor on CPU/System, Voltage Monitor on Vcore/5V/3.3V/12V, Fan Monitor on CPU/Chassis</td>
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<tr>
<td>WatchDog Timer</td>
<td>1~255 steps by software program</td>
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<tr>
<td>Smart Fan Control</td>
<td>Chassis Fan (fanless)</td>
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<tr>
<td>Wake On LAN/ PXE</td>
<td>Yes (WOL/PXE)</td>
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<tr>
<td>Power State</td>
<td>S3, S4, S5</td>
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<tr>
<td>Graphics</td>
<td>Intel® HD Graphics</td>
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<tr>
<td>Graphics Multi Display</td>
<td>VGA+LVDS, VGA+HDMI, LVDS+HDMI</td>
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<tr>
<td>VGA</td>
<td>Up to 1920 x 1200 @60 Hz</td>
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<td>DVI</td>
<td>—</td>
</tr>
<tr>
<td>HDMI</td>
<td>Up to 1920 x 1200 @60 Hz</td>
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<tr>
<td>Display Port</td>
<td>—</td>
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<tr>
<td>LVDS</td>
<td>Up to 1920 x 1080 @60Hz, dual-channel 18/24-bit (via CH7511)</td>
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<tr>
<td>eDP</td>
<td>—</td>
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<tr>
<td>Backlight Control</td>
<td>Voltage/PWM</td>
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<tr>
<td>Environment &amp; Power &amp; ME</td>
<td>Battery (Lithium battery)</td>
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<tr>
<td>Power Requirement</td>
<td>12VDC</td>
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<tr>
<td>Operating Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
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<tr>
<td>Storage Temperature</td>
<td>-40°F ~ 185°F (-40°C ~ 85°C)</td>
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<tr>
<td>Operating Humidity</td>
<td>0% ~ 90% non-condensing</td>
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<tr>
<td>Certificate</td>
<td>CE &amp; FCC</td>
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<tr>
<td>Form Factor</td>
<td>Mini-ITX 6.7&quot; x 6.7&quot; (170mm x 170mm)</td>
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<tr>
<td>Weight</td>
<td>1.1 lb (0.5 Kg)</td>
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<tr>
<td>MTBF (Hours)</td>
<td>111,131</td>
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Note: All specifications are subject to change without notice.
Block Diagram

Dimension Unit: mm

Ordering Information

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<tbody>
<tr>
<td>EMB-BT1-A31-1900-MSH</td>
<td>J1900</td>
<td>DDR3L-1333</td>
<td>x 2</td>
<td>Fanless</td>
<td>SATA2 x 1, SATA3 x 2, Full size Mini Card x 1 (mSATA)</td>
<td>Dual Channel 10/24-bit</td>
<td>QDE x 2</td>
<td>USB 3.2 Gen 1 x 1, USB 2.0 x 7</td>
<td>5</td>
<td>1</td>
<td></td>
<td>PCI x 1 x 1, Half size Mini Card x 1 (PCI x 1 x 1 &amp; USB)</td>
<td>12V DC</td>
<td>—</td>
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<tr>
<td>EMB-BT1-A31-2807-MSH-1D</td>
<td>N2807</td>
<td>DDR3L-1066</td>
<td>x 1</td>
<td>Fanless</td>
<td>SATA2 x 1, SATA3 x 2, Full size Mini Card x 1 (mSATA)</td>
<td>Dual Channel 10/24-bit</td>
<td>QDE x 2</td>
<td>USB 3.2 Gen 1 x 1, USB 2.0 x 7</td>
<td>5</td>
<td>1</td>
<td></td>
<td>PCI x 1 x 1, Half size Mini Card x 1 (PCI x 1 x 1 &amp; USB)</td>
<td>12V DC</td>
<td>—</td>
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<tr>
<td>EMB-BT1-A31-3845-MSH</td>
<td>E3845</td>
<td>DDR3L-1333</td>
<td>x 2</td>
<td>Fanless</td>
<td>SATA2 x 1, SATA3 x 2, Full size Mini Card x 1 (mSATA)</td>
<td>Dual Channel 10/24-bit</td>
<td>QDE x 2</td>
<td>USB 3.2 Gen 1 x 1, USB 2.0 x 7</td>
<td>5</td>
<td>1</td>
<td></td>
<td>PCI x 1 x 1, Half size Mini Card x 1 (PCI x 1 x 1 &amp; USB)</td>
<td>12V DC</td>
<td>—</td>
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</tbody>
</table>
EMB-BT2
Mini-ITX Embedded Motherboard with Intel® Celeron® J1900 Processor, SATA2 x 2, USB 2.0 x 10, Dual LVDS

Features
- Intel® Celeron® J1900 Processor
- Realtek 8111H, Gigabit Ethernet x 2
- Dual Displays: VGA + LVDS, Dual LVDS
- SATA 3.0 Gb/s x 2
- USB 2.0 x 10
- Full-size Mini-Card with mSATA x 1, PCI-E [x1] x 1
- ATX Power

Specifications

System
- Processor: Intel® Celeron® J1900 Processor (4C @ 2.00 GHz CPU, 688/854 MHz GFX, 10W TDP)
- Chipset: —
- Memory: DDR3L 1333 MHz SODIMM x 1 up to 8 GB, Non-ECC, un-buffered memory
- I/O Chipset: Fintech 81866D
- Ethernet: Realtek PCIe Gb LAN 8111H x 2
- Audio: Realtek® ALC897
- TPM: Infineon SLB9635 TT 1.2 (default: No)
- Expansion Slots: Full-size Mini-Card (mSATA default PCIe+USB optional) x 1, PCIe [x1] x 1
- BIOS: 64 Mbit Flash ROM, AMB BIOS
- Hi/W Monitor: Temperature Monitor on CPU/System, Voltage Monitor on Vcore/5V/3.3V/12V, Fan Monitor on CPU/Chassis
- WatchDog Timer: 1~255 steps by software program
- Smart Fan Control: Chassis Fan (fanless)
- Wake On LAN/ PXE: Yes (WOL/PXE)
- Power State: S3, S4, S5

Graphics
- Graphics Chipset: Intel® HD Graphics
- Graphics Multi Display: VGA+LVDS, Dual LVDS
- VGA: Up to 1920 x 1200 @60 Hz
- DVI: —
- HDMI: —
- Display Port: —
- LVDS: Dual LVDS, Up to 1920 x 1080 @60Hz, dual-channel 18/24-bit (via CH7511)
- eDP: —
- Backlight Control: Voltage/PWM

Environment & Power & ME
- Battery: Lithium battery
- Power Requirement: ATX
- Operating Temperature: 32°F ~ 140°F (0°C ~ 60°C)
- Storage Temperature: -40°F ~185°F (-40°C ~85°C)
- Operating Humidity: 0% ~ 95% R/H, non-condensing
- Certificate: CE & FCC
- Form Factor: Mini-ITX: 6.7” x 6.7” (170mm x 170mm)
- Weight: 1.1 lb (0.5 Kg)
- MTBF (Hours): 290,990

Packing List
- SATA 3G Cable
- Heatsink
- I/O Shield
- EMB-BT2

Optional Accessories

Part Number | Description
----------- | --------------
1709100330   | USB 2.0 Cable (9P, 330MM, p=2.54mm, w/ bracket)
1701100206   | COM Port Cable
170910020K   | USB 2.0 Cable (9P, 200MM, p=2.54mm, w/bracket)

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Unit: mm

Order Information

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<tbody>
<tr>
<td>EMB-BT2-A14-1900-D1-MSH</td>
<td>J1900</td>
<td>500/256M x 1</td>
<td>Fanless</td>
<td>VGA, LVDS 2</td>
<td>SATA2 x 1, Full-Size Mini-Card x 1/mSATA</td>
<td>Dual Channel 16/32-bit x 2</td>
<td>6x8 e 2</td>
<td>USB 2.0 x 10</td>
<td>5</td>
<td>1</td>
<td>Full-size Mini Card (mSATA default, mSATA x 1)</td>
<td>ATX</td>
<td>—</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
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Note: All specifications are subject to change without notice.
# EMB-BT4

Thin Mini-ITX Embedded Motherboard with Intel® Celeron® J1900 Processor, SATA 6.0 Gb/s x 2, SATA 3.0 Gb/s x 2, USB x 8

### Features
- Intel® Celeron® J1900/N2807 Processor
- DDR3L 1333 Mhz SODIMM x 2, Up to 8 GB, (J1900)
- Dual Displays: LVDS x 1, VGA x 1, HDMI x 1,
- SATA 6.0 Gb/s x 2, SATA 3.0 Gb/s x 2
- USB 3.2 Gen 1 x 1, USB 2.0 x 7
- Full-size Mini-Card + SIM Card (mSATA Default) x 1, Half-size Mini-Card x 1
- 12V DC Power Input
- Low Profile

### Specifications

**System**
- Processor: Intel® Celeron® J1900 Processor (4C @ 2.00 GHz CPU, 688/854 MHz GFX, 10W TDP)
- Chipset: —
- Memory: DDR3L 1333 MHz SODIMM x 2 up to 8 GB, Non-ECC, un-buffered memory, Dual-channel memory architecture flat type
- I/O Chipset: Fintech 81866D
- Ethernet: Realtek PCIe Gb LAN 8111Hi x 1
- Audio: Realtek® ALC897
- TPM: Infineon SLB9635 TT 1.2 (default : No)
- Expansion Slots: Full-size Mini-Card (mSATA Default) (PCIe+USB optional) + SIM Card (default: No) x 1, Half-size Mini-Card (PCIe+USB) x 1
- BIOS: 64 M bit Flash ROM, AMI BIOS
- H/W Monitor: Temperature Monitor on CPU/System, Voltage Monitor on Vcore/5V/3.3V/12V, Fan Monitor on CPU/Chassis
- WatchDog Timer: —
- Smart Fan Control: Chassis Fan (fanless)
- Wake On LAN/ PXE: Yes (WOL/PXE)
- Power State: S3, S4, S5

**Graphics**
- Graphics Chipset: Intel® HD Graphics
- Graphics Multi Display: VGA+LVDS, VGA+HDMI, LVDS+HDMI
- VGA: Up to 1920 x 1200 @60 Hz
- DVI: —
- HDMI: Up to 1920 x 1080 @60Hz, dual-channel 18/24-bit (via CH7511)
- LVDS: Up to 1920 x 1200 @60Hz
- eDP: —
- Backlight Control: Voltage/PWM

**Environment & Power & ME**
- Battery: Lithium battery
- Power Requirement: 12VDC
- Operating Temperature: 32°F ~ 140°F (0°C ~ 60°C)
- Storage Temperature: -40°F ~ 185°F (-40°C ~85°C)
- Operating Humidity: 0% ~ 90% R/H, non-condensing
- Certificate: CE & FCC
- Form Factor: Mini-ITX: 6.7" x 6.7" (170mm x 170mm)
- Weight: 1.1 lb (0.5 Kg)
- MTBF (Hours): 295,750

**Rear Panel I/O Ports**
- USB: USB 3.2 Gen 1/2.0 x 1, USB 2.0 x 2
- Display I/O: HDMI x 1
- Audio I/O: Line in x 1, Line-out x 1
- LAN I/O: LAN (RJ-45) port x 1
- Serial Port: COM (RS-232) x 1
- PS/2 Port: —
- Others: DC port (12V) Screw type x 1

**Internal I/O Connectors**
- Storage: SATA3 (6.0Gb/s) x 2, SATA2 (3.0Gb/s) x 2 (1 colay with mSATA), SATA power connector x 1, Full Size Mini-Card slot (mSATA) x 1
- USB: USB 2.0 (2 x 5-pin, 2.54mm) x 2 ports support additional 4 USB, USB 2.0 (1x 5-pin, 2.00mm) x 1 port supports additional 1 USB
- Display I/O: VGA pin header x 1, LVDS connector x 1, LVDS 3V /5V jumper x 1, LCD DC / PWM mode jumper x 1, LCD backlight connector (inverter) x 1, LCD backlight 12V /5V jumper x 1
- Audio I/O: AAFP x 1
- Serial Port: Box header for COM (RS-232) x 4, Box header for COM (RS-232/422/485) x 1
- PS/2 Port: PS/2 Keyboard Mouse 6 PIN Connector x 1
- Parallel Port: SPP/EPP Mode
- DIO: DIG (4in/4out) x 1
- FAN: Chassis Fan connector x 1
- Power: 12V AUX Power Connector x 1, AT/ATX mode select jumper (default : No) x 1
- Others: Half-size Mini-Card (PCIe + USB) x 1, SIM Card Socket(default : No) x 1, LPT Pin header x 1, Front Panel connector x 1, CMOS jumper x 1

**OS**
- OS Support: Windows® 10 64-bit, Windows® 7 32/64-bit, Windows® 8.1 32/64-bit, Linux Fedora

### Packing List

- SATA Cable
- SATA Power Cable
- I/O Shield
- Heatsink
- EMB-BT4

### Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>1709100330</td>
<td>USB 2.0 Cable (9P, 330MM, p=2.54mm, w/ bracket)</td>
</tr>
<tr>
<td>1709050201</td>
<td>USB 2.0 Cable (5P, 220MM, p=2.00mm)</td>
</tr>
<tr>
<td>1701260305</td>
<td>LPT Cable (25F, 270MM)</td>
</tr>
<tr>
<td>125590084A</td>
<td>Adapter 12V, 84W/N3</td>
</tr>
<tr>
<td>1701190206</td>
<td>COM Port Cable</td>
</tr>
<tr>
<td>1700005152</td>
<td>PS/2 Cable (6P, 150mm, p=2.00mm)</td>
</tr>
<tr>
<td>170910020K</td>
<td>USB 2.0 Cable (9P, 200MM, p=2.54mm, w/o bracket)</td>
</tr>
<tr>
<td>1702150300</td>
<td>SATA Power Cable 4P, 2.54mm</td>
</tr>
<tr>
<td>125530060A</td>
<td>Lockable Adapter 60W, 12V, 5A, 60W</td>
</tr>
<tr>
<td>1701160201</td>
<td>VGA Cable</td>
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Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Order Information

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<tr>
<td>EMB-BT4-A03-1900-D1-MS</td>
<td>J1900</td>
<td>SODIMM x 2</td>
<td>Fanless</td>
<td>VGA, HDMI, LVDS</td>
<td>SATA2 x 1, SATA3 x 2, Full Size Mini Card (mSATA) x 1</td>
<td>Dual Channel 16/24-bit x 2</td>
<td>GBE x 1</td>
<td>USB 3.2 Gen 1</td>
<td>x 1</td>
<td>USB 3.2 Gen 1</td>
<td>x 1</td>
<td>Half Mini Card (PCIe + USB) x 1 w/ SIM slot</td>
<td>12V DC</td>
<td>—</td>
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</tbody>
</table>
MIX-EHLD1

Mini-ITX with Intel® Atom x6000E/ Pentium/ Celeron N and J series processors, Max. 12W TDPs, Flexible rear IO, 12V DC input

Features
- Intel Elkhart Lake Processor, J6412/X6413E
- DDR4 SODIMM x 2, Max. 32GB
- M.2 Slot (M key; 2280) x 1, M.2 Slot (B key; 3042/52) x 1, mini card x 1
- USB 3.2 Gen1 Ports x 2, USB 2.0 Ports x 4
- RTL8111H x 2
- HDMI2.0 x 1, VGA x 1, LVDS/edP x 1
- Flexible rear IO (Full IO or Low profile)
- 12V DC input

Specifications

System
- Processor: Intel® Elkhart Lake Processor, Max. 12W TDPs
- Chipset: NCT6126D
- Memory: SO-DIMM, max. 32GB, DDR4 3200MTS x 2
- I/O Chipset: NCT6126D
- Audio: Realtek® ALC897
- TPM: Nuvoton NPCT750, TPM2.0 onboard
- Expansion Slots: M.2 Slot (B key; 3042/3052) x1, mini-PCIe(Full/ Half) x 1
- BIOS: 256Mbit Flash ROM, AMI BIOS
- H/W Monitor: Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/5V/12V, Fan Monitor on Chassis
- WatchDog Timer: 1~255 step by software program
- Smart Fan Control: Chassis Fan
- Wake On LAN/PXE: Yes (WOL/PXE)
- Power State: S3, S4, S5

Graphics
- Graphics Chipset: Intel® UHD Graphics
- Graphics Multi Display: 3 Independent Display(1xVGA+1x HDMI + 1x LVDS/edP)
- VGA: Up to 1920 x 1200 @ 60 Hz
- DVI: —
- HDMI: Up to 4096 x 2160 @ 60Hz
- Display Port: —
- LVDS: Up to 1920 x 1080 @ 60Hz, Dual Channel 18/24 bit (via CH7513) /co-layout eDP (default LVDS)
- eDP: Up to 1920 x 1080 @ 60Hz, Dual Channel 18/24 bit (via CH7513) co-layout eDP (default LVDS)
- Backlight Control: Voltage / PWM, use HW control

Environment & Power & ME
- Battery: Lithium battery
- Power Requirement: 12V (-5%) DC
- Operating Temperature: 32°F ~ 140°F (0°C ~ 60°C)
- Storage Temperature: -40°F ~ 185°F (-40°C ~ 85°C)
- Operating Humidity: 0% ~ 90%RH, non-condensing
- Certificate: CE & FCC Class A
- Form Factor: Mini-ITX: 6.7” x 6.7” (170mm x 170mm)
- Weight: 1.1 lb (0.5 Kg)
- MTBF (Hours): —

Rear Panel I/O Ports
- USB: 3.2(S Gene) ports x 2
- Display I/O: HDMI x 1, VGA x 1
- Audio I/O: Mic-in x 1, Line-out x 1

LAN I/O
- 1GbE x 2

Serial Port
- RS232 by BOM Optional

PS/2 Port
- —

Others
- DC Jack x 1

Internal I/O Connectors
- Storage: M.2 Slot (M key; 2280; PCleX2)
- SATA 6Gb/s x 1
- SATA power connector (5V / 12V @1A) x 1
- USB: USB2.0 ports x 2
- Display I/O: 40-pin LVDS / edP connector x 1
- Audio I/O: AAFP follow ASUS pin out x 1
- Serial Port: Box header x 5 for COM
- Power: —
- Others: Front Panel connector x 1, Chassis Intrusion x 1, Buzzer onboard x 1, Clear CMOS jumper x 1, AT/ATX mode select jumper x 1

OS
- OS Support: Windows® 10 64-bit, Linux Ubuntu 64 bit (20.04.2/Kernel 5.4)

Packing List
- USB 2.0 Cable (10P, 200MM, p=2.00mm, w/bracket)
- USB 2.0 Cable (2 x 5P, 490mm, p=2.00mm)
- COM Cable (200MM, p=2.00mm)
- Adapter.60W.180D.W/Lock.FSP060-DHAN3

Optional Accessories

Part Number | Description
--- | ---
1799100201 | USB 2.0 Cable (10P, 200MM, p=2.00mm, w/bracket)
1799100491 | USB 2.0 Cable (2 x 5P, 490mm, p=2.00mm)
1701100206 | COM Cable (200MM, p=2.00mm)
125530060Z | Adapter.60W.180D.W/Lock.FSP060-DHAN3

Note: All specifications are subject to change without notice.
Block Diagram

Ordering Information

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>MIX-EHLD1-A10-J6412</td>
<td>J6412</td>
<td>SODIMM x 2</td>
<td>Fan</td>
<td>VGA, HDMI, LVDS/IO DP</td>
<td>18/24 bit Dual Channel</td>
<td>SATA x 1, M.2(M-Key)</td>
<td>GbE x 2</td>
<td>USB 2.0 x 6, USB 3.2 Gen 1 x 2</td>
<td>5</td>
<td>Mini-Card x 1, M.2B-Kaj x 1</td>
<td>12V DC</td>
<td>2.0</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
<td></td>
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<tr>
<td>MIX-EHLD1-A10-J6413</td>
<td>J6413E</td>
<td>SODIMM x 2</td>
<td>Fan</td>
<td>VGA, HDMI, LVDS/IO DP</td>
<td>18/24 bit Dual Channel</td>
<td>SATA x 1, M.2(M-Key)</td>
<td>GbE x 2</td>
<td>USB 2.0 x 6, USB 3.2 Gen 1 x 2</td>
<td>5</td>
<td>Mini-Card x 1, M.2B-Kaj x 1</td>
<td>12V DC</td>
<td>2.0</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
<td></td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.

www.aaeon.com
MIX-KLUD1

Mini-ITX, 14nm, FCBGA1356 7th Gen Intel® Core™ processor family, 15~25W TDP

Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Core™ i3-7100U, 2C/4C, 2.4GHz, 3M, 300MHz/1.00GHz (Turbo) GFX, ~15W TDP</td>
</tr>
<tr>
<td>Memory</td>
<td>SODIMM x 2, max. 32GB, DDR4-2133 non-ECC, un-buffered memory</td>
</tr>
<tr>
<td>I/O Chipset</td>
<td>NCT6793D</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Intel® PCIe Gb LAN 219LM (vPro for i7-7600U/i5-7300U) x 1</td>
</tr>
<tr>
<td>Audio</td>
<td>Realtek® ALC897 with Amp.</td>
</tr>
<tr>
<td>TPM</td>
<td>N8P-7650 TPM2.0 onboard</td>
</tr>
<tr>
<td>Expansion Slots</td>
<td>PCIe 3.0 (x4) x 1</td>
</tr>
<tr>
<td></td>
<td>M.2 M key (22 x 80 mm) x 1, SATA &amp; PCIe [x4]</td>
</tr>
<tr>
<td></td>
<td>M.2 E key (22 x 30 mm) x 1 for Wireless-wifi module (PCIe+eUSB)</td>
</tr>
<tr>
<td>BIOS</td>
<td>128Mbit Flash ROM, AMI BIOS</td>
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<tr>
<td>H/W Monitor</td>
<td>Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/5V/12V, Fan Monitor on CPU/Chassis</td>
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<tr>
<td>WatchDog Timer</td>
<td>1~255 steps by software program</td>
</tr>
<tr>
<td>Smart Fan Control</td>
<td>CPU Fan/Chassis Fan</td>
</tr>
<tr>
<td>Wake On LAN/PXE</td>
<td>Yes (WOL/PXE)</td>
</tr>
<tr>
<td>Power State</td>
<td>S3, S4, S5</td>
</tr>
</tbody>
</table>

Graphics

| Graphics                | Intel® UHD Graphics                |
| Multi Display           | HDMI x 2, eDP x 1 or LVDS x 1      |
| VGA                     |                                    |
| DVI                     |                                    |
| HDMI                    | HDMI 1.4 up to 4096 x 2340 @24Hz   |
| Display Port            |                                    |
| LVDS                    | Up to 1920 x 1200 @ 60 Hz, Dual Channel 18/24 bit |
| eDP                     | UP to 4096 x 2304 @ 60Hz           |
| Backlight Control       | Voltage/PWM; Max 1A                |

Environment & Power & ME

| Battery                 | Lithium battery                   |
| Power Requirement       | 12V DC                             |
| Operating Temperature   | 32°F – 131°F [0°C – 55°C]          |
| Storage Temperature     | -40°F – 185°F [40°C – 85°C]        |
| Operating Humidity      | 0% – 90%RH, non-condensing        |
| Certificate             | CE & FCC (Class A)                 |
| Form Factor             | Mini-ITX, 6.7” x 6.7” (170 mm x 170 mm) |
| Weight                  | 1.1 lb (0.5 Kg)                    |
| MTBF (Hours)            | 400,330                            |

Rear Panel I/O Ports

| USB                     | USB 3.2 Gen 1 (5 Gbps) x 4         |
| Display I/O             | HDMI x 2                           |

Audio I/O

| Mic-in                  | Line-out x 1                       |
| LAN I/O                 | LAN (RJ-45) part x 2               |
| Serial Port             |                                    |
| PS/2 Port               |                                    |
| Others                  | DC Power Jack x 1                   |

Internal I/O Connectors

| Storage                 | M.2 M key (22 x 80mm) for PCIe [x4]/SATA storage x 1, SATA 6.0Gb/s x 2, 4-pin SATA power x 1 |
| USB                    | USB 2.0 pin header x 2 support additional 4 USB ports |
| Display I/O            | 40-pin LVDS connector x 1, 40-pin eDP connector x 1, LCD backlight connector x 1 |
| Audio I/O              | Speaker for 2W04x[4]+1, AAFP follow ASUS pin out x 1 |
| Serial Port            | Box header x 2 for COM (COM1: RS-232/422/485 supports 5V/12V/RI) |
| PS/2 Port              |                                    |
| Parallel Port          |                                    |
| DIO                    | 8-bit programmable (4-in/4-out) x 1 |
| FAN                    | 4-pin CPU Fan connector x 1, 4-pin Chassis Fan connector x 1 |
| Power                  |                                    |
| Others                 | Front Panel connector x 1, Chassis Intrusion x 1, Buzzer onboard x 1, CMOS jumper x 1 |

OS

| Windows® 10 64-bit     |                                    |

Packing List

- Heatsink/CPU Fan
- SATA Cable
- SATA Power Cable
- I/O Shield
- MIX-KLUD1

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>170910201</td>
<td>USB 2.0 Cable (10P, 200MM, p=2.00mm, w/bracket)</td>
</tr>
<tr>
<td>170010491</td>
<td>USB 2.0 Cable (2 x 5P, 490mm, p=2.00mm)</td>
</tr>
<tr>
<td>170906201</td>
<td>USB 2.0 Cable (5P, 220mm, p=2.00mm)</td>
</tr>
<tr>
<td>170110206</td>
<td>COM Cable (200MM, p=2.00mm)</td>
</tr>
<tr>
<td>1702150300</td>
<td>SATA Power Cable (AP, 300MM p=2.54mm)</td>
</tr>
<tr>
<td>1702151201</td>
<td>SATA Power Cable (AP, 120MM, p=2.5mm)</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
### Ordering Information

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>CPU</th>
<th>RAM</th>
<th>FANLESS</th>
<th>DISPLAY</th>
<th>STORAGE</th>
<th>LVDS</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232/422/485</th>
<th>EXPANSION SLOT</th>
<th>POWER</th>
<th>TPM</th>
<th>TEMP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIX-KLUD1-A11-7100-LV-210</td>
<td>Core i3-7100U</td>
<td>2x SODIMM</td>
<td>Fanless</td>
<td>HDMI x 2, LVDS</td>
<td>SATA3 x 2, M.2 (M-Key)</td>
<td>Dual Channel 18/24 bit</td>
<td>GIGE x 2</td>
<td>USB 3.2</td>
<td>1</td>
<td>PCIe x1, M.2(M-Key) x 2</td>
<td>12V DC</td>
<td>—</td>
<td>32°F – 131°F (0°C – 55°C)</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Mini-ITX with Intel® 11thGen Core™ U-Processor, Max. 28TDPs, 4Display output, 2.5GbEx1 + 1GbEx1

**Features**
- 11th Gen. Intel® Core™ Processor
- DDR4 SODIMM x 2, Max. 64GB
- M.2 Slot (M key; 2280) x 1, mini card x 1
- USB 3.2 Ports x 4, USB 2.0 Ports x 4
- Intel® LAN 225LM x 1, 219V x 1
- HDMI2.0 x 2, DP1.4 x 2
- LVDS x 1, eDP x 1
- PCI-Express [x4] x 1
- DC 12V

**Packing List**
- SATA Cable
- I/O Shield
- MIX-TLUD1

**Optional Accessories**
- SATA Cable
- I/O Shield
- MIX-TLUD1

**Part Number**
- 1709100201: USB 2.0 Cable (10P, 200MM, p=2.00mm, w/bracket)
- 1700100491: USB 2.0 Cable (2 x 5P, 490mm, p=2.00mm)
- 1709650201: USB 2.0 Cable (5P, 220mm, p=2.00mm)
- 1701100206: COM Cable (200MM, p=2.00mm)
- 1702150300: SATA Power Cable (4P, 300MM p=2.54mm)
- 125590084A: Adapter 12V, 84W/N3
Block Diagram

Ordering Information

<table>
<thead>
<tr>
<th>Part number</th>
<th>CPU</th>
<th>RAM</th>
<th>Fan/Fan-less</th>
<th>Display</th>
<th>LVDS</th>
<th>Storage</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>RS-232/422/485</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>TPM</th>
<th>Temp</th>
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<tbody>
<tr>
<td>MIX-TLUD1-A10-6305E</td>
<td>Celeron-6305E</td>
<td>SODIMM x 2</td>
<td>Fan</td>
<td>HDMIx2,DPx2</td>
<td>Dual Channel 18/24 bit</td>
<td>SATA x 1, M.2 (M-key)</td>
<td>2.5GBE x 1, 10GBE x 1</td>
<td>USB 2.0 x 4, USB 3.2 Gen 1 x 4</td>
<td>2</td>
<td>0</td>
<td>Mini-PCIe(x1) x 1</td>
<td>12V</td>
<td>TPM2.0</td>
<td>32°F – 122°F (0°C – 50°C)</td>
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<tr>
<td>MIX-TLUD1-A10-1115G4E</td>
<td>i3-1115G4E</td>
<td>SODIMM x 2</td>
<td>Fan</td>
<td>HDMIx2,DPx2</td>
<td>Dual Channel 18/24 bit</td>
<td>SATA x 1, M.2 (M-key)</td>
<td>2.5GBE x 1, 10GBE x 1</td>
<td>USB 2.0 x 4, USB 3.2 Gen 1 x 4</td>
<td>2</td>
<td>0</td>
<td>Mini-PCIe(x1) x 1</td>
<td>12V</td>
<td>TPM2.0</td>
<td>32°F – 122°F (0°C – 50°C)</td>
</tr>
<tr>
<td>MIX-TLUD1-A10-1145G7E</td>
<td>i5-1145G7E</td>
<td>SODIMM x 2</td>
<td>Fan</td>
<td>HDMIx2,DPx2</td>
<td>Dual Channel 18/24 bit</td>
<td>SATA x 1, M.2 (M-key)</td>
<td>2.5GBE x 1, 10GBE x 1</td>
<td>USB 2.0 x 4, USB 3.2 Gen 1 x 4</td>
<td>2</td>
<td>0</td>
<td>Mini-PCIe(x1) x 1</td>
<td>12V</td>
<td>TPM2.0</td>
<td>32°F – 122°F (0°C – 50°C)</td>
</tr>
</tbody>
</table>
**MIX-H310A1**

Mini-ITX with 8th/9th Gen Intel® Core™ Processor Family, Max. 65W TDPs, Giga-LAN x 4

---

### Features
- 8th/9th Gen. Intel® Core™ LGA1151 Processor
- DDR4 SODIMM x 2, Up to 32 GB
- M.2 Slot(M Key-SATA), M.2 Slot(E key) x 1
- Two Independent Display : HDMI, VGA
- USB 3.2 Gen 1 Port x 4, USB 2.0 Port x 4
- Intel® LAN 210AT x 3, 219V x 1
- SATA 6.0 Gb/s x 2
- PCI-Express [x16] (Gen3) x 1
- ATX Power

---

### Packing List
- SATA Cable
- I/O Shield
- MIX-H310A1

---

### Rear Panel I/O Ports

<table>
<thead>
<tr>
<th>Port Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB</td>
<td>USB 3.2 Gen 1 (5 Gbps) x 4, USB 2.0 x 2</td>
</tr>
<tr>
<td>Display I/O</td>
<td>VGA x 1, HDMI x 1</td>
</tr>
<tr>
<td>Audio I/O</td>
<td>Mic-in x 1, Line-out x 1</td>
</tr>
<tr>
<td>LAN I/O</td>
<td>LAN (RJ-45) port x 4</td>
</tr>
<tr>
<td>Serial Port</td>
<td>—</td>
</tr>
<tr>
<td>PS/2 Port</td>
<td>—</td>
</tr>
</tbody>
</table>

### Internal I/O Connectors

- Storage: SATA3.0 (6.0Gb/s) x 2, M.2 M-key (22 x 80mm) at bottom side x 1 (SATA only)
- USB: USB 2.0 (2 x 5-pin, 2.00mm) x 1 ports support additional 2 USB.
- Display I/O: —
- Audio I/O: AAFP x 1, Speaker x 1
- Serial Port: Box header for COM (RS-232/422/485) x 1, Box header for COM (RS-232) x 1
- PS/2 Port: —
- Parallel Port: —
- DI0: Digital I/O box head x 1
- FAN: 4-pin CPU Fan connector x 1, 4-pin Chassis Fan connector x 1
- Power: —
- Others: Front Panel connector x 1, Chassis Intrusion x 1, Buzzer onboard x 1, CMOS jumper x 1
- OS: Windows® 10 64-bit, Linux Ubuntu 18.04 LTS

---

### Graphics

- Graphics Chipset: Intel® UHD Graphics
- Graphics Multi Display: HDMI+VGA
- VGA: Up to 1920 x 1200 @ 60 Hz
- DVI: —
- HDMI: —
- Display Port: —
- LVDS: —
- eDP: —
- Backlight Control: —

### Environment & Power & ME

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Battery</td>
<td>Lithium battery</td>
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<tr>
<td>Power Requirement</td>
<td>ATX</td>
</tr>
<tr>
<td>Operation Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F ~ 185°F (-40°C ~ 85°C)</td>
</tr>
<tr>
<td>Operation Humidity</td>
<td>0% ~ 95%RH, non-condensing</td>
</tr>
<tr>
<td>Certificate</td>
<td>CE &amp; FCC</td>
</tr>
<tr>
<td>Form Factor</td>
<td>Mini-ITX: 6.7” x 6.7” (170mm x 170mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>1.1 lb (0.5 Kg)</td>
</tr>
<tr>
<td>MTBF (Hours)</td>
<td>288,900</td>
</tr>
</tbody>
</table>

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Note: All specifications are subject to change without notice.
Note: All specifications are subject to change without notice.
## MIX-H310A2

**Mini-ITX with 8th/9th Generation Intel® Core™ LGA1151 Socket Processor, Max. 65W TDPs, Giga-LAN x 2**

### Features
- 8th /9th Gen. Intel® Core™ LGA1151 Processor
- DDR4 DRAM Support, 2666MHz, Max. 32GB
- M.2 Slot (M key) x 1, M.2 Slot (E key) x 1
- USB 3.2 Gen 1 Port x 4, USB 2.0 Port x 2
- Intel® Gigabit Ethernet x 2
- SATA 6.0 Gb/s x 2
- PCI-Express [x16] (Gen3) x 1
- ATX Power

### Specifications

#### System
- Processor: 8th/9th Gen. Intel® Core™ LGA 1151 socket Processor (formerly Coffee Lake-S), Max. 65W TDPs
- Chipset: Intel® H310 Express Chipset
- Memory: DDR4 2666/2400/2133 MHz SODIMM x 2, Up to 32GB, Non-ECC, Un-buffered Memory, Dual channel memory architecture
- I/O Chipset: NCT6793D
- Ethernet: Intel® PCIe Gb LAN 219V x 1, Intel® PCIe Gb LAN i210AT x 1
- Audio: Realtek® ALC897 with Amp.
- TPM: Firmware TPM
- Expansion Slots: PCIe3.0 [x16] x 1
- BIOS: 256Mb Flash ROM, AMI BIOS
- H/W Monitor: Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/5V/12V, Fan Monitor on CPU/Chassis
- WatchDog Timer: 1-255 steps by software program
- Smart Fan Control: CPU Fan / Chassis Fan
- Wake On LAN/PXE: Yes (WOL / PXE)
- Power State: S3, S4, S5

#### Graphics
- Graphics Chipset: Intel® UHD Graphics
- Graphics Multi Display: HDMI, VGA, DVI, LVDS, M.2 M-key, M.2 E-key

#### Display I/O
- USB 3.2 Gen 1 (5 Gbps) x 4
- Display I/O: VGA x 1, HDMI x 1, DP x 1
- Audio I/O: Mic-in x 1, Line-out x 1
- LAN I/O: LAN (RJ-45) port x 2
- Serial Port: 1x COM(RS485/422/232)
- PS/2 Port: —
- Others: —

#### Internal I/O Connectors
- Storage: SATA3.0 (6.0Gb/s) x 2, M.2 M-key (22 x 80mm) x 1
- USB: USB 2.0 (2 x 5-pin, 2.00mm) x 1 port support additional 2 USB.
- Display I/O: LVDS x 1
- Audio I/O: AAFP x 1, Speaker x 1
- Serial Port: Box header for COM (RS-232) x 1
- PS/2 Port: —
- Parallel Port: —
- DIO: Digital I/O box header x 1
- FAN: 4-pin CPU Fan connector x 1, 4-pin Chassis Fan connector x 1
- Power: —
- Others: Front Panel connector x 1, Chassis Intrusion x 1, Buzzer onboard x 1, CMOS jumper x 1

#### OS
- Windows® 10 64-bit, Linux Ubuntu 18.04 LTS

#### Rear Panel I/O Ports

<table>
<thead>
<tr>
<th>Port Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB</td>
<td>USB 3.2 Gen 1 (5 Gbps) x 4</td>
</tr>
<tr>
<td>Display I/O</td>
<td>VGA x 1, HDMI x 1, DP x 1</td>
</tr>
<tr>
<td>Audio I/O</td>
<td>Mic-in x 1, Line-out x 1</td>
</tr>
<tr>
<td>LAN I/O</td>
<td>LAN (RJ-45) port x 2</td>
</tr>
<tr>
<td>Serial Port</td>
<td>1x COM(RS485/422/232)</td>
</tr>
<tr>
<td>PS/2 Port</td>
<td>—</td>
</tr>
<tr>
<td>Others</td>
<td>—</td>
</tr>
</tbody>
</table>

#### Power State
- S3, S4, S5

#### Environment & Power & ME
- Battery: Lithium battery
- Power Requirement: ATX
- Operation Temperature: 32°F ~ 140°F (0°C ~ 60°C)
- Storage Temperature: -40°F ~ 185°F (-40°C ~ 85°C)
- Operation Humidity: 0%~90%RH, non-condensing
- Certificate: CE & FCC
- Form Factor: Mini-ITX: 6.7” x 6.7” (170mm x 170mm)
- Weight: 1.1 lb (0.5 Kg)
- MTBF (Hours): 333,520

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Note: All specifications are subject to change without notice.

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### Packing List

- SATA Cable
- I/O Shield
- MIX-H310A2
Block Diagram

Dimension

Ordering Information

Optional Accessories

Note: All specifications are subject to change without notice.
MIX-H310D1
Mini-ITX with 8th/9th Generation Intel® Core™ LGA1151 Socket Processor, Max. 65W TDPs, 12V DC Power input

Features
- 8th/9th Gen. Intel® Core™ LGA1151 Processor
- DDR4 SODIMM x 2, Up to 32 GB
- Two Independent Display: DP, HDMI, eDP, LVDS
- M.2 Slot (M-key, 2242) x 1, M.2 Slot (E-key) x 1
- PCIe [x4] x 1
- Low Profile
- 12V DC Power Input
- USB 3.2 Gen 1 x 4, USB 2.0 x 5

Specifications
- Processor: 8th/9th Gen. Intel® Core™ LGA1151 socket Processor (formerly Coffee Lake-S), Max. 65W TDPs
- Chipset: Intel® H310 Express Chipset
- Memory: DDR4 2666 MHz SODIMM x 2, Up to 32GB, Non-ECC, Un-buffered Memory, Dual channel memory architecture
- I/O Chipset: NCT6793D
- Ethernet: Realtek® PCIe Gb LAN RTL8111H
- Audio: Realtek® ALC897
- TPM: Firmware TPM
- Expansion Slots: PCIe3.0 [x4] x 1, M.2 E-key (22 x 30 mm) x 1 for Wireless-wifi module (PCIe+USB)
- BIOS: 128Mbit Flash ROM, AMI BIOS
- H/W Monitor: Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/5V/12V, Fan Monitor on CPU/Chassis
- WatchDog Timer: 1~255 steps by software program
- Smart Fan Control: CPU Fan/ Chassis Fan
- Wake On LAN/ PXE: Yes (WOL / PXE)
- Power State: S3, S4, S5
- Graphics: Intel® UHD Graphics
- Graphics Multi Display: HDMI1+HDMI2, HDMI1+DP2, DP1+HDMI2, HDMI1+LVDS, HDMI2+LVDS, HDMI1+eDP, HDMI2+eDP, DP1+DP2, DP1+LVDS, DP2+LVDS, DP1+eDP, DP2+eDP
- VGA: —
- DVI: —
- HDMI: Up to 4096 x 2304@24Hz (HDMI 1.4b)
- Display Port: Up to 4096 x 2304@60Hz
- LVDS: Up to 1920 x 1200 @ 60 Hz, dual-channel 18/24 bit (via CH 7511)
- eDP: Up to 4096 x 2304@60Hz
- Backlight Control: Voltage/PWM
- Battery: Lithium battery
- Power Requirement: 12V DC
- Operation Temperature: 32°F ~140°F (0°C ~ 60°C)
- Storage Temperature: -40°F ~ 185°F (-40°C ~ 85°C)
- Operation Humidity: 0%~90%RH, non-condensing
- Certificate: CE & FCC
- Form Factor: Mini-ITX: 6.7” x 6.7” (170 mm x 170 mm)
- Weight: 1.1 lb (0.5 kg)
- MTBF (Hours): 246,210

Rear Panel I/O Ports
- USB: USB 3.2 Gen 1 (5 Gbps) x 4
- Display I/O: HDMI x 2, DP x 1 + HDMI x 1 (Optional), DP x 2 (Optional)
- Audio I/O: Mic-in x 1, Line-out x 1
- LAN I/O: LAN (RJ-45) port x 2
- Serial Port: —
- PS/2 Port: —
- Others: DC Jack

Internal I/O Connectors
- Storage: SATA3.0 x 2, M.2 M-key (SATA) (22 x 42mm) x 1
- USB: USB 2.0 (2 x 5-pin, 2.00mm) x 3 ports support additional 5 USB.
- Display I/O: —
- Audio I/O: AAFP x 1, Speaker header x 1
- Serial Port: Box header for COM (RS-232/422/485) x 1
- PS/2 Port: —
- Parallel Port: —
- DIO: Digital I/O box header x 1
- FAN: 4-pin CPU Fan connector x 1, 4-pin Chassis Fan connector x 1
- Others: Front Panel Connector x 1, Chassis Intrusion x 1, Buzzer onboard x 1, CMOS jumper x 1

OS
- OS Support: Windows® 10 64-bit, Linux Ubuntu 18.04 LTS

Packing List
- SATA Cable
- SATA Power Cable
- I/O Shield
- MIX-H310D1

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

Optional Accessories
## MIX-H310D2

Mini-ITX with Intel® 8th / 9th Generation Core™ LGA1151 Socket Processor, Max. 65W TDPs, USB 3.2 Gen 1 Port x 4, USB 2.0 Port x 5, 12V DC input

### Features
- 8th / 9th Gen. Intel® Core™ LGA1151 Processor
- DDR4 DRAM Support, 2666MHz, Max. 64GB
- M.2 Slot (M key; PCIe) x 1, M.2 Slot (E key) x 1
- USB 3.2 Gen 1 Port x 4, USB 2.0 Port x 5
- Intel® Gigabit Ethernet x 2
- SATA 6.0 Gb/s x 2
- PCI-Express [x16] (Gen3) x 1
- 12VDC input

### Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>8th/9th Gen. Intel® Core™ LGA 1151 socket Processor (formerly Coffee Lake-S), Max. 65W TDPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chipset</td>
<td>Intel® H310 Express Chipset</td>
</tr>
<tr>
<td>Memory</td>
<td>DDR4 2666/2400/2133 MHz SO-DIMM x 2, Up to 64GB, Non-ECC, Un-buffered Memory, Dual channel memory architecture</td>
</tr>
<tr>
<td>I/O Chipset</td>
<td>NCT6793D</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Intel® GbE LAN (i219v x 1, Intel® GbE LAN (i210AT x 1)</td>
</tr>
<tr>
<td>Audio</td>
<td>Realtek® ALC897</td>
</tr>
<tr>
<td>TPM</td>
<td>NPTC750 TPM2.0 (default: No)</td>
</tr>
<tr>
<td>Expansion Slots</td>
<td>PCIe3.0 [x16] x 1, M.2 E-key(22 x 30 mm) x1 for Wireless-wifi module ( PCIe+USB; CNVi)</td>
</tr>
<tr>
<td>BIOS</td>
<td>256Mbit Flash ROM, AMI BIOS</td>
</tr>
<tr>
<td>H/W Monitor</td>
<td>Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/SV12/V12, Fan Monitor on CPU/Chassis</td>
</tr>
<tr>
<td>WatchDog Timer</td>
<td>WatchDog Timer on software program 1–255 steps by software program</td>
</tr>
<tr>
<td>Smart Fan Control</td>
<td>CPU Fan/Chassis Fan</td>
</tr>
<tr>
<td>Wake On LAN/ PXE</td>
<td>Yes (WOL / PXE)</td>
</tr>
<tr>
<td>Power State</td>
<td>S3, S4, SS</td>
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</table>

### Graphics

<table>
<thead>
<tr>
<th>Graphics</th>
<th>Intel® UHD Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi Display</td>
<td>HDR + HDMI, HDMI+eDP, HDMI+VGA, VGA+eDP, VGA+eDP</td>
</tr>
<tr>
<td>VGA</td>
<td>Up to 1920 x 1080 @ 60 Hz (Optional)</td>
</tr>
<tr>
<td>DVI</td>
<td>Up to 3840 x 2160 @60 Hz (HDMI 1.4)</td>
</tr>
<tr>
<td>HDMI</td>
<td>Up to 4096 x 2304 @ 60Hz</td>
</tr>
<tr>
<td>Display Port</td>
<td>Support eDP</td>
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</tbody>
</table>

### Environment & ME

<table>
<thead>
<tr>
<th>Battery</th>
<th>Lithium battery</th>
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</thead>
<tbody>
<tr>
<td>Power Requirement</td>
<td>12V DC</td>
</tr>
<tr>
<td>Temperature</td>
<td>32°F ~140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F ~185°F (-40°C ~ 85°C)</td>
</tr>
<tr>
<td>Operation Humidity</td>
<td>0%–95%RH, non-condensing</td>
</tr>
<tr>
<td>Certificate</td>
<td>CE &amp; FCC</td>
</tr>
<tr>
<td>Form Factor</td>
<td>Mini-ITX 6.7&quot; x 6.7&quot; (170 mm x 170 mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>1.1 lb (0.5 kg)</td>
</tr>
<tr>
<td>MTBF (Hours)</td>
<td>373,720</td>
</tr>
</tbody>
</table>

### Packing List

- SATA Cable
- SATA Power Cable
- I/O Shield
- MIX-H310D2

### Rear Panel I/O Ports

- USB 3.2 Gen 1 x 4, USB 2.0 x 4
- Display I/O HDMI x 2, VGA x 1 (Optional)
- Audio I/O Mic in x 1, Line-out x 1
- LAN I/O LAN (RJ-45) port x 2
- Serial Port —
- PS/2 Port —
- Others 12V DC Jack (max:192W)

### Internal I/O Connectors

<table>
<thead>
<tr>
<th>Storage</th>
<th>SATA3.0 (6.0Gb/s) x 2, M.2 M-key (22 x 42/80mm; PCIe) x 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB</td>
<td>USB 2.0 (2 x 5-pin, 2.00mm) x 1 port support additional 1 USB</td>
</tr>
<tr>
<td>Display I/O</td>
<td>eDP x 1</td>
</tr>
<tr>
<td>Audio I/O</td>
<td>AAFP x 1</td>
</tr>
<tr>
<td>Serial Port</td>
<td>Box header for COM (RS-232) x 1; RS-232/422/485 x 1</td>
</tr>
<tr>
<td>PS/2 Port</td>
<td>—</td>
</tr>
<tr>
<td>Parallel Port</td>
<td>—</td>
</tr>
<tr>
<td>DIO</td>
<td>Digital I/O box header x 1</td>
</tr>
<tr>
<td>FAN</td>
<td>4-pin CPU Fan connector x 1, 4-pin Chassis Fan connector x 1</td>
</tr>
<tr>
<td>Power</td>
<td>—</td>
</tr>
<tr>
<td>Others</td>
<td>Front Panel Connector x 1, Chassis Intrusion x 1, Buzzer onboard x 1, CMOS jumper x 1, AXI/AT mode select x 1, ME disable x 1, eDP1 Tcon IC voltage select x 1, eDP panel backlight voltage select x 1, COM/RI select jumper x 1, SATA PWR x 1</td>
</tr>
</tbody>
</table>

# OS

- Windows® 10 64-bit, Linux Ubuntu 18.04.2

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Note: All specifications are subject to change without notice.
**Block Diagram**

**Dimension**

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>MIX-H310D2-A11-210</td>
<td>Socket</td>
<td>SODIMM x 2</td>
<td>Fan</td>
<td>HDMI x 2</td>
<td>SATA3 x 2</td>
<td>M.2(M-Key) x 1</td>
<td>—</td>
<td>QDE x 2</td>
<td>USB2.0 x 5, USB3.2 Gen 1 x 4</td>
<td>1</td>
<td>1</td>
<td>PClx3.0(0x16) x 1, M.2(E-Key) x 1</td>
<td>12V DC</td>
<td>—</td>
</tr>
</tbody>
</table>

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1759200172</td>
<td>CPU Cooler (2-Ball, Screw with Retention Plate)</td>
</tr>
<tr>
<td>1759211568</td>
<td>CPU Cooler (2-Ball, Push-pin Type)</td>
</tr>
<tr>
<td>COOLER-65W-01</td>
<td>CPU Cooler, LGA 1156, 12V, 65W, 4P, Kingcooler, 0571-1463R</td>
</tr>
<tr>
<td>1709100201</td>
<td>USB 2.0 Cable (10P, 200MM, p=.2.00mm, w/bracket)</td>
</tr>
<tr>
<td>1701100206</td>
<td>COM Cable (200MM, p=.2.00mm)</td>
</tr>
<tr>
<td>1709050201</td>
<td>USB 2.0 Cable (5P, 220mm, p=.2.00mm)</td>
</tr>
<tr>
<td>1253800011</td>
<td>(TF)AC/DC Adapter,12V:192W,16A:FSP192-AHAN3.9MA1920100</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
### Features

- 8th/9th Gen. Intel® Core™ LGA1151 Processor
- DDR4 DRAM Support, 2666MHz, Max. 32GB
- M.2 Slot (M key- SATA only) x 1, M.2 Slot (E key) x 1
- USB 3.2 Gen 2 Port x 4, USB 2.0 Port x 4
- Intel® LAN 210AT x 3, 219LM for iAMT 12.0 x 1
- SATA 6.0 Gb/s x 2
- PCI-Express [x16] (Gen3) x 1
- ATX Power

### Specifications

#### Processor
- 8th/9th Gen. Intel® Core™ LGA1151 socket Processor (formerly Coffee Lake-S), Max. 65W TDPs

#### Chipset
- Intel® Q370 Express Chipset

#### Memory
- DDR4 2666/2400/2133 MHz SO-DIMM x 2, Up to 32GB, Non-ECC, Un-buffered Memory, dual-channel memory architecture

#### Expansion Slots
- PCIe3.0 [x16] x 1
- M.2 E-key (22 x 30mm; Support CNVi)

#### I/O Chipset
- NCT6793D

#### Ethernet
- Intel® PCIe Gb LAN 219LM x 1, Intel® PCIe Gb LAN I210AT x 3

#### Audio
- Realtek® ALC897 with Amp.

#### TPM
- Firmware TPM

#### Expansion Slots
- M.2 M-key (22 x 80mm) at bottom side x 1 (SATA only)

#### BIOS
- 256Mbit Flash ROM, AMI BIOS

#### H/W Monitor
- Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/5V/12V, Fan Monitor on CPU/Chassis
- WakeOnLAN/Chassis Fan
- WatchDog Timer 1~255 steps by software program
- Smart Fan Control CPU Fan/Chassis Fan
- Wake On LAN/ PXE Yes (WOL / PXE)

#### Power State
- S3, S4, S5

#### Graphics Chipset
- Intel® UHD Graphics

#### Graphics Multi Display
- HDMI + VGA

#### Display Port
- Up to 1920 x 1200 @ 60 Hz

#### DVI
- Up to 2048 x 1536 @ 60 Hz

#### HDMI
- Up to 4096 x 2160 @ 30Hz (HDMI 1.4)

#### Display Port
- Up to 4096 x 2160 @ 30Hz (HDMI 1.4)

#### LVDS
- EDP
- Backlight Control

#### Environment & Power & ME

- Battery
- Lithium battery
- Power Requirement
- ATX
- Operation Temperature
- 32°F ~ 140°F (0°C ~ 60°C)
- Storage Temperature
- -40°F ~ 185°F (-40°C ~ 85°C)
- Operation Humidity
- 0% ~ 90%RH, non-condensing
- Certificate
- CE & FCC
- Form Factor
- Mini-ITX: 6.7” x 6.7” (170mm x 170mm)
- Weight
- 1.1 lb (0.5 kg)
- MTBF (Hours)
- 

### Packing List

- SATA Cable
- I/O Shield
- MIX-Q370A1

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

Optional Accessories
**MIX-Q370D1**

Mini-ITX with 8th/9th Gen Intel® Core™ Processor Family, DDR4 DRAM, USB x 10, Max. 65W TDPs

---

### Features
- DDR4 SODIMM x 2, Up to 32 GB
- Three Independent Display: DP x 2, eDP x 1, LVDS x 1
- Intel® LAN 210AT x 1, 219LM for iAMT 12.0 x 1
- M.2 Slot (M-key) x 1
- M.2 Slot (E-key) x 1
- USB 3.2 Gen 2 x 4, USB 2.0 x 6
- PCIe [x4] x 1
- Low Profile
- 12V DC Power Input
- Support Intel® NVMe M.2 SSD

---

### Rear Panel I/O Ports

<table>
<thead>
<tr>
<th>Port</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB</td>
<td>USB 3.2 Gen 2 (10 Gbps) x 4</td>
</tr>
<tr>
<td>Display I/O</td>
<td>DP x 2</td>
</tr>
<tr>
<td>Audio I/O</td>
<td>Mic-in x 1, Line out x 1</td>
</tr>
<tr>
<td>LAN I/O</td>
<td>LAN (RJ45) port x 2</td>
</tr>
<tr>
<td>Serial Port</td>
<td>—</td>
</tr>
<tr>
<td>PS/2 Port</td>
<td>—</td>
</tr>
<tr>
<td>Others</td>
<td>DC Jack</td>
</tr>
</tbody>
</table>

---

### Internal I/O Connectors

#### Storage
- SATA 6.0 Gb/s x 4
- M.2 M key (22 x 80 mm) x 1 (Support Intel® NVMe M.2 SSD)
- M.2 E key x 1
- M.2 M key x 1 (bottom)

#### USB
- USB 2.0 x 6
- AAFP x 1
- Speaker x 1

#### Display I/O
- 40-pin LVDS connector x 1
- 40-pin eDP connector x 1
- LVDS (top) and eDP (bottom)
- 40-pin eDP connector x 1
- 40-pin LVDS connector x 1

#### Audio I/O
- 2-Watt 4Ω speaker
- AAFP x 1
- Speaker for 2W/4Ω x 1

#### Power
- 12V DC Power jack x 1
- DC Jack x 1
- Clear CMOS jumper x 1
- AT/ATX select jumper x 1
- Chassis intrusion x 1
- 4-pin SATA power x 1

#### OS
- Windows® 10 64 bit, Ubuntu 16.04 LTS

---

### Packing List
- SATA Cable
- SATA Power Cable
- I/O Shield
- MIX-Q370D1

---

### Specifications

#### System
- Processor: 8th/9th Generation Intel® Core™ i7/i5/i3, Pentium® LGA 1151 socket
- Chipset: Intel® Q370 Express Chipset
- Memory: SODIMM x 2, Max. 32GB, DDR4 2666/2400 MHz, Non-ECC, Un-buffered
- I/O Chipset: NCT6793D
- Ethernet: Intel® PHY 219LM Giga LAN (support Intel® AMT 12.0) x 1
- Audio: Realtek® ALC897
- TPM: Nuvoton TPM version 2.0
- Expansion Slots: PCIe 3.0 [x4] x 1
- BIOS: 256M bit Flash ROM, AMI BIOS
- H/W Monitor: Temperature Monitor on CPU/System, Voltage Monitor on Vcore/5V/3.3V/12V, Fan Monitor on Chassis
- WatchDog Timer: 1~255 steps by software program
- Smart Fan Control: CPU Fan/Chassis Fan
- Wake On LAN/PXE: Yes (WOL/PXE)
- Power State: S3, S4, SS

#### Graphics
- Graphics Chipset: Intel® UHD Graphics
- Graphics Multi Display: Three Independent Display
- VGA:
- DVI:
- HDMI:
- Display Port:
- HDMI:
- LVDS:
- eDP:
- Backlight Control:

#### Environment & Power & ME
- Battery: Lithium battery
- Power Requirement: 12V DC
- Operating Temperature: 32°F ~ 140°F (0°C ~ 60°C)
- Storage Temperature: -40°F ~ 185°F (-40°C ~ 85°C)
- Operating Humidity: 0% ~ 90% R/H, non-condensing
- Certificate: CE & FCC (Class A)
- Form Factor: Mini-ITX: 6.7" x 6.7" (170 mm x 170 mm)
- Weight: 1.1 lb (0.5 Kg)
- MTBF (Hours): 256,310

---

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Ordering Information

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>MIX-Q370D1-A12</td>
<td>Socket</td>
<td>500MM x 2</td>
<td>Fan</td>
<td>DP + 2, LVDS, eDP</td>
<td>SATA x 4, M.2(M-key)</td>
<td>Dual Channel 16/24 bit</td>
<td>GBE x 2</td>
<td>USB2.0 x 6, USB 3.2 Gen 2 x 4</td>
<td>—</td>
<td>1</td>
<td>PCIe/LVDS x 1, M.2E (Key) x 1, M.2E (Key) x 1</td>
<td>12V DC</td>
<td>2.0</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
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</table>

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1758200172</td>
<td>(T)CPU Cooler Fan, LGA 1156 socket, 4P, 12V, 2-Ball Bearing, Dynatron, K785, (2U cooler)</td>
</tr>
<tr>
<td>175821156B</td>
<td>(T)CPU Cooler Fan, LGA 1156 socket, 12V, 4P, 2Ball (Trey), Dreamer, DSA-00273</td>
</tr>
<tr>
<td>COOLER-65W-01</td>
<td>CPU Cooler, LGA 1156, 12V, 65W, 4P, Kingcool, 0571-1453R</td>
</tr>
<tr>
<td>1709100201</td>
<td>USB 2.0 Cable (10P, 200MM, p=2.00mm, w/bracket)</td>
</tr>
<tr>
<td>1700100491</td>
<td>USB 2.0 Cable (2 x 5P, 490mm, p=2.00mm)</td>
</tr>
<tr>
<td>1709050201</td>
<td>USB 2.0 Cable (5P, 220mm, p=2.00mm)</td>
</tr>
<tr>
<td>1701100206</td>
<td>COM Cable (200MM, p=2.00mm)</td>
</tr>
<tr>
<td>1702150300</td>
<td>SATA Power Cable (4P, 300MM p=2.54mm)</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
MIX-Q370D2

Mini-ITX with Intel® 8th / 9th Generation Core™ LGA1151 Socket Processor, Max. 65W TDPs, USB 3.2 Gen 2 Port x 6, USB 2.0 Port x 6, 12V DC input

Features
- 8th/9th Gen. Intel® Core™ LGA1151 Processor
- DDR4 DRAM Support, 2666MHz, Max. 64GB
- M.2 Slot (M key; NVME/SATA) x 1, M.2 Slot (E key) x 1
- USB 3.2 Gen 2 Port x 6, USB 2.0 Port x 6
- Intel® Gigabit Ethernet x 2
- SATA 6.0 Gb/s x 2
- PCI-Express [x16] (Gen3) x 1
- 12VDC input

Specifications

System
- Processor: 8th/9th Gen. Intel® Core™ LGA 1151 socket Processor (formerly Coffee Lake-S), Max. 65W TDPs
- Chipset: Intel® Q370 Express Chipset
- Memory: DDR4 2666/2400/2133 MHz SO-DIMM x 2, Up to 64GB, Non-ECC, Un-buffered Memory, Dual channel memory architecture
- I/O Chipset: NCT7673D
- Ethernet: Intel® GbE LAN i219V x 1, Intel® GbE LAN i210AT x 1
- Audio: Realtek® ALC897
- TPM: NPCT750 TPM2.0
- Expansion Slots: PCE+USB (22 x 30 mm) x 1 for Wireless-wifi module ( PCIe+USB; CNVi)
- BIOS: 256Mbit Flash ROM, AMI BIOS
- Hi/W Monitor: Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/SU12V, Fan Monitor on CPU/Chassis
- WatchDog Timer: 1~255 steps by software program
- Smart Fan Control: CPU Fan/Chassis Fan
- Wake On LAN/ PXE: Yes (WOL/PXE)
- Power State: S3, S4, S5

Graphics
- Graphics Chipset: Intel® UHD Graphics
- Graphics Multi Display: HDMI+VGA+eDP, HDMI+HDMI+VGA, HDMI+HDMI+eDP
- VGA: Up to 1920 x 1200 @ 60 Hz
- DVI: Up to 2048 x 1536 @ 60 Hz
- HDMI: Up to 3840 x 2160 @ 30 Hz/HDMI 1.4b
- Display Port: —
- LVDS: —
- eDP: eDP Up to 4096 x 2304 @ 60Hz

Environment & Power & ME
- Battery: Lithium battery
- Power Requirement: 12V DC
- Operating Temperature: 32°F – 140°F (0°C – 60°C)
- Storage Temperature: -40°F – 185°F (-40°C – 85°C)
- Operating Humidity: 0% – 90% R/H, non-condensing
- Certificate: CE & FCC
- Form Factor: MINI-ITX: 6.7" x 6.7" (170 mm x 170 mm)
- Weight: 1.1 lb (0.5 Kg)
- MTBF (Hours): 319,160

Packing List
- SATA Cable
- SATA Power Cable
- I/O Shield
- MIX-Q370D2

Note: All specifications are subject to change without notice.
Block Diagram

Dimension Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>RAM</th>
<th>Fan/Fanless</th>
<th>Display</th>
<th>Storage</th>
<th>LVDS</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>TPM</th>
<th>Temp.</th>
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<tbody>
<tr>
<td>MIX-Q370D2-A11-210</td>
<td>Socket SODIMM x 2</td>
<td>Fan</td>
<td>VGA, HDMI x 2, eDP</td>
<td>SATA3 x2</td>
<td>M.2 (M-key) x 1</td>
<td>—</td>
<td>GbE x 2</td>
<td>USB2.0 x 6</td>
<td>USB2.0 Gen2 x 6</td>
<td>PCIe3.0[1x8]</td>
<td>12V DC</td>
<td>2.0</td>
<td>32°F ~ 140°F (8°C ~ 60°C)</td>
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</tbody>
</table>

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1759200172</td>
<td>CPU Cooler (2-Ball, Screw with Retention Plate)</td>
</tr>
<tr>
<td>175921156B</td>
<td>CPU Cooler (2-Ball, Push-pin Type)</td>
</tr>
<tr>
<td>COOLER-65W-01</td>
<td>CPU Cooler, LGA 1156, 12V, 65W, 4P. Kingcooler, 0571-1463R</td>
</tr>
<tr>
<td>1709100201</td>
<td>USB 2.0 Cable (1P, 200MM, p=2.00mm, w/bracket)</td>
</tr>
<tr>
<td>1701900206</td>
<td>COM Cable (200MM, p=2.00mm)</td>
</tr>
<tr>
<td>1700100491</td>
<td>USB 2.0 Cable (1P, 490mm, p=2.00mm)</td>
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<tr>
<td>1255X00011</td>
<td>(TF)AC/DC Adapter. 12V.192W.16A. FSP192-AHAN3.9NA1920100</td>
</tr>
</tbody>
</table>
MIX-Q670A1

MIX with 13th & 12th Gen Intel® Core™ Processors (formerly Raptor Lake-S/Alder Lake-S)

Note: All specifications are subject to change without notice.

www.aaeon.com

Industrial Motherboards

13th & 12th Gen Intel® Core™ Processors (Raptor Lake-S/Alder Lake-S)

DDR5 SO-DIMM Support, 4800MHz, Max. 64GB

HDMI 2.0 x 2 + DP 1.2 x 2

M.2 2280 M-Key x 1, M.2 3042/3052 B-Key x 1

USB 3.2 Port x 8, USB 2.0 Port x 4

Intel GbE LAN x 2

SATA 6.0 Gb/s x 2

PCIe Gen 5 [x16] x 1

Specifications

**Features**

- 13th & 12th Gen Intel® Core™ Processors (Raptor Lake-S/Alder Lake-S)
- DDR5 SO-DIMM Support, 4800MHz, Max. 64GB
- HDMI 2.0 x 2 + DP 1.2 x 2
- M.2 2280 M-Key x 1, M.2 3042/3052 B-Key x 1
- USB 3.2 Port x 8, USB 2.0 Port x 4
- Intel GbE LAN x 2
- SATA 6.0 Gb/s x 2
- PCIe Gen 5 [x16] x 1

**System**

- Processor: 13th & 12th Gen Intel® Core™ Processors (Raptor Lake-S/Alder Lake-S)
- Chipset: Q670E
- Memory: Dual-Channel DDR5 4800MHz SO-DIMM x 2, Max. 64GB
- I/O Chipset: Intel® UHD Graphics
- Network: Intel® GbE LAN 219LM x 1
- Audio: Realtek® ALC897 with Amp
- TPM: Onboard TPM 2.0/C
- Expansion Slots: PCIe Gen 5 (x16) x 1, A10: M.2 3042/3052 B-Key x 1, A11-EK: M.2 2230 E-Key x 1
- BIOS: 256Mbit Flash ROM, AMI BIOS
- H/W Monitor: Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/SV12V, Fan Monitor on CPU/Chassis
- WatchDog Timer: 1~255 step by software program
- Smart Fan Control: CPU Fan/Chassis Fan
- Wake On LAN/ PXE: Yes (WOL/PXE)
- Power State: S3, S4, S5

**Graphics**

- Graphics Chipset: Intel® UHD Graphics
- Graphics Multi Display: HDMI x 2 + DP x 2, HDMI x 2 + DP x 1 + LVDS x 1, HDMI x 2 + eDP x 1, HDMI x 1 + DP x 2 + LVDS x 1, HDMI x 1 + DP x 2 + eDP x 1
- VGA: —
- DVI: —
- HDMI: Up to 4096 x 2160 @60Hz (HDMI 2.0)
- DisplayPort: Up to 4096 x 2160 @60Hz
- LVDS: Up to 1920 x 1080 @60Hz, Dual-Channel 18/24 bit
- eDP: Up to 1920 x 1080 @60Hz (via CH7513), co-layout LVDS
- Backlight Control: PWM

**Environment & Power & ME**

- Battery: Lithium Battery
- Power Requirement: ATX
- Operating Temperature: 32°F ~ 140°F (0°C ~ 60°C)
- Storage Temperature: -40°F ~ 185°F (-40°C ~ 85°C)
- Operating Humidity: 0%~90%RH, non-condensing
- Certificate: CE & FCC
- Form Factor: Mini-ITX: 6.7” x 6.7” (170mm x 170mm)

**Features**

- Rear Panel I/O Ports
- USB: A10: USB 3.2 Gen 2 x 8 + USB 2.0 x 4
- Audio: Mic-in x 1, Line-out x 1
- LAN I/O: LAN Port x 2 (RJ-45)
- Internal I/O Connectors
- Storage: SATA III 2 x (6.0Gb/s), M.2 2280 M-Key
- Display I/O: USB 3.0 Pin Header x 1 (Supports additional USB 3.2 Gen 1 x 2)
- Audio I/O: AAFP x 1, Speaker x 1
- OS Support: Windows® 10 64-bit, Windows® 11 64-bit

**Packing List**

- I/O Shield
- SATA Cable
- MIX-Q670A1
Block Diagram

Dimension

Ordering Information

<table>
<thead>
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<td>MIX-Q670A1-A10</td>
<td>Socket</td>
<td>SODIMM x 2</td>
<td>Fan</td>
<td>HDMI x 2, DP x 2, LVDS/eDP x 1</td>
<td>SATA 3 x 2, M.2 2280 M-Key</td>
<td>GBE x 2</td>
<td>USB 3.0 x 4</td>
<td>USB 3.2 x 8</td>
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<td>1</td>
<td>PCIe x1, x1, x1, x1, M.2 3042/3052 B-Key x1</td>
<td>ATX</td>
<td>2.0</td>
<td>0~60°C</td>
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Optional Accessories

<table>
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<tr>
<th>Part Number</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1701100206</td>
<td>COM Cable (200MM, p=2.00mm)</td>
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</tbody>
</table>
**Mini-ITX with Intel® 12th Generation Core™ LGA1700 Socket Processor, Max. 65W TDPs, HDMI x 2 + DP x 2, Giga-LAN x 2, DDR5x2 Max. 64GB, DC 12V input, Low Profile**

### Specifications

#### System
- **Processor**: Intel® Alder lake-S Core™ Processors, 8 + 8; 65W
- **Chipset**: Q670E
- **Memory**: SODIMM x 2, max. 64GB, Dual Channel DDR5 4800 MHz (Non-ECC)
- **Audio**: Realtek® ALC897 with Amp.
- **BIOS**: 256Mbit Flash ROM, AMI BIOS
- **Expansion Slots**: M.2 B-key (3042/3052; PCIex1; USB3.2 Gen1/USB2.0) x 1, M.2 E-key (2232; PCIex1/optional: multiple PCIex1); USB2.0 x 1
- **GPU**: Intel® UHD Graphics

#### Hardware
- **Display Chipsets**: HDMIx2+DP1.2 x 2
- **Audio**: Realtek® ALC897 with Amp.
- **Flash**: 512Mbit flash ROM, AMI BIOS
- **Fan**: 4-pin CPU fan or Systems fan
- **Connectors**: SATA 6.0 Gb/s x 2 with SATA power conn x 2(1A) M.2 M key(2280) x1, [PCIex4/NVMe]
- **Audio I/O**: HD Audio using AAFP header x 1, Internal Speaker (2W/4Ohm)x 1
- **Display I/O**: HDMIx2+DP1.2 x 2 + LVDSx1, HDMIx2+DP1.2 x 2 + eDP1.2
- **Internal I/O**: SATA 6.0 Gb/s x 2 with SATA power conn x 2(1A)
- **USB Ports**: USB2.0 x 4 ports using 2 x 5-pin headers x 2
- **Display**: HDMIx2+DP1.2 x 2 + LVDSx1, HDMIx2+DP1.2 x 2 + eDP1.2
- **Internal I/O Connectors**: SATA 6.0 Gb/s x 2 with SATA power conn x 2(1A)
- **USB**: USB2.0 x 4 ports using 2 x 5-pin headers x 2
- **Display I/O**: 40-pin LVDS/eDP connector x 1 with Inverter
- **Audio I/O**: HD Audio using AAFP header x 1, Internal Speaker (2W/4Ohm)x 1
- **Serial Port**: Box header for COM (RS-232/422/485) x 1, Box header for COM (RS-232) x 1
- **PS/2 Port**: Box header for COM (RS-232/422/485) x 1, Box header for COM (RS-232) x 1
- **DIO**: Digital I/O box header x 1
- **FAN**: Digital I/O box header x 1, Chassis Intrusion x 1, Buzzer onboard x 1, CMOS jumper x 1
- **OS Support**: Windows® 10 64-bit, Windows® 11 64bit

### Features
- **12th Gen. Intel® Core™ LGA1700 Processor**
- **DDR5 DRAM Support**, 4800MHz, Max. 64GB
- **HDMI 2.0 x 2 + DP1.2 x 2**
- **M.2 Slot** (M-key; PCIe4; NVMe;2280) x 1, **M.2 Slot** (E-key;2232) x 1, **M.2 Slot** (B-key; 3042; 3052) x 1 with SIM slot
- **USB 3.2 Port x 4, USB 2.0 Port x 4**
- **Intel GbE LAN x 2**
- **SATA 6.0 Gb/s x 2**
- **DC 12V input**

### Packing List
- **I/O Shield**
- **SATA Cable**
- **SATA Power Cable**
- **MIX-Q670D1**

### Weight
- 1.1 lb (0.5 Kg)

### Dimensions
- **Mini-ITX**: 6.7” x 6.7” (170mm x 170mm)

---

**Note:** All specifications are subject to change without notice.
**Block Diagram**

![Block Diagram of MIX-Q670D1](image)

**Dimension**

<table>
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<tr>
<th>Unit: mm</th>
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</thead>
<tbody>
<tr>
<td>8.3 (W) x 16.8 (H) x 1.4 (D)</td>
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**Ordering Information**

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</tr>
</thead>
<tbody>
<tr>
<td>MIX-Q670D1-A10</td>
<td>Socket</td>
<td>SODIMM x 2</td>
<td>Fan</td>
<td>HDMI x 2, DP x 2, LVDS/eDP x 1</td>
<td>1</td>
<td>SATA3 x 2, M.2M-Key x 1</td>
<td>GBE x 2</td>
<td>1</td>
<td>1</td>
<td>M.2B-Key x 1, M.2E-Key x 1</td>
<td>DC 12V</td>
<td>2.0</td>
<td>0~60°C</td>
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</tr>
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</table>

**Optional Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1701100206</td>
<td>COM Cable (200MM, p=2.00mm)</td>
</tr>
<tr>
<td>1255300011</td>
<td>(TF) AC/DC Adapter.12V:192W,16.8A, FSP192-AHAN3.9NA1920100</td>
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</tbody>
</table>
**EMB-Q170A**

6th/7th Generation Intel® Core™ i Series, LGA1151 Socket Processor, Max. 65W TDPs, M.2 x 1, SATA 6.0 Gb/s x 2, USB x 10

---

### Features
- **LGA1151 Socket For 6th/7th Generation Intel® Core™ i Series Processor**
- **DDR4 SODIMM x 2, Up to 32 GB**
- **Three Independent Display: DP x 3, VGA x 1**
- **4K for Display Port**
- **Intel® LAN 210AT x 1, LAN 219LM for vPro x 1 (LAN1 Supports iAMT11.0)**
- **SATA 6.0 Gb/s x 2, M.2 slot (M-key) x 1**
- **PCI-Express [x16] (Gen3) x 1**
- **ATX Power**

---

### Specifications

**System**
- **Processor**: 6th/7th Generation Intel® Core™ i Series, LGA1151 Socket Processor, Max. 65W TDPs
- **Chipset**: Intel® Q170
- **Memory**: DDR4 2133/1867 MHz SODIMM x 2, Up to 32GB, Non-ECC, Un-buffered Memory, Dual channel memory architecture
- **I/O Chipset**: Intel® Q170
- **Expansion Slots**: PCIe3.0 [x16] x 1, M.2 M-key(22 x 80 mm) at bottom side x 1
- **BIOS**: 128M bit Flash ROM, AMI BIOS
- **H/W Monitor**: Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/5V/12V, Fan Monitor on CPU/Chassis
- **WatchDog Timer**: 1~255 steps by software program
- **Smart Fan Control**: CPU Fan/ Chassis Fan
- **Wake On LAN/ PKE**: Yes (WOL/PXE)
- **Power State**: S3, S4, S5

**Graphics**
- **Graphics Chipset**: Intel® HD Graphics
- **Graphics Multi Display**: DP+DP+VGA, DP+DP+VGA, DP+DP+DP
- **VGA**: Up to 1920 x 1200 @60 Hz
- **DVI**: —
- **HDMI**: —
- **Display Port**: Up to 4096 x 2160 @24 Hz / 3840 x 2160 @60 Hz, with Digital Audio
- **LVDS**: —
- **eDP**: —
- **Backlight Control**: —

**Environment & Power & ME**
- **Battery**: Lithium battery
- **Power Requirement**: ATX
- **Operating Temperature**: 32°F ~ 140°F (-0°C ~ 60°C)
- **Storage Temperature**: -40°F ~ 185°F (-40°C ~ 85°C)
- **Operating Humidity**: 0% ~ 90% R/H, non-condensing
- **Certificate**: CE & FCC
- **Form Factor**: Mini-ITX: 6.7” x 6.7” (170 mm x 170 mm)
- **Weight**: 1.1 lb (0.5 Kg)
- **MTBF (Hours)**: 221,850

---

### Packaging List

- **14001-00630100**
  - SATA 6G Cable (7P; 180; 90, 500mm 2 in1)
- **I/O Shield**
- **EMB-Q170A**

---

### Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1759200172</td>
<td>CPU Cooler (2-Bail, Screw with Retention Plate)</td>
</tr>
<tr>
<td>175921156B</td>
<td>CPU Cooler (2-Bail, Push-pin Type)</td>
</tr>
<tr>
<td>C007ER-65W-01</td>
<td>CPU Cooler</td>
</tr>
<tr>
<td>1709010221</td>
<td>USB 2.0 Cable (10P, 200MM, p=2.00mm, w/ bracket)</td>
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<tr>
<td>1701101214</td>
<td>COM Cable (200MM, p=2.00mm)</td>
</tr>
<tr>
<td>1701001491</td>
<td>USB 2.0 Cable (10P, 490mm, p=2.00mm)</td>
</tr>
<tr>
<td>1709050201</td>
<td>USB 2.0 Cable (5P, 220mm, p=2.00mm)</td>
</tr>
</tbody>
</table>

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Note: All specifications are subject to change without notice.
Block Diagram

Block Diagram

Dimension
Unit: mm

Ordering Information

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<tbody>
<tr>
<td>EMB-Q170A-A11-210</td>
<td>Socket</td>
<td>SODIMM x 2</td>
<td>Fan</td>
<td>VOA, DP</td>
<td>SATA3 x 2, M.2(M-Key)</td>
<td>—</td>
<td>GBE x 1</td>
<td>USB 3.2 Gen 1 x 4, USB 2.0 x 6</td>
<td>1</td>
<td>1</td>
<td>PORTx1.5 (x1) x 1, M.2M-Key x 1</td>
<td>ATX</td>
<td>—</td>
<td>122°F ~ 148°F (50°C ~ 60°C)</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.

www.aaeon.com
EMB-Q170B

6th/7th Generation Intel® Core™ i Series, LGA1151 Socket Processor, Max. 65W TDPs, M.2 x 2, SATA 6.0 Gb/s x 2, USB x 10

Features
- 6th/7th Generation Intel® Core™ i Series, LGA1151 Socket Processor
- DDR4 SODIMM x 2, Up to 32GB
- Three Independent Display: DP x 2, eDP x 1, LVDS x 1
- M.2 Slot (E-key) x 1 @Top Side, (M-key) x 1 @Bottom Side
- PCI-Express [x4] x 1
- Low Profile
- 4K for DP/eDP
- LAN1 Supports iAMT11.0

Specifications
- Processor: 6th/7th Generation Intel® Core™ i Series, LGA1151 Socket Processor, Max. 65W TDPs
- Chipset: Intel® Q170
- Memory: DDR4 SODIMM x 2, Up to 32GB, Non-ECC, Un-buffered Memory, Dual channel memory architecture
- I/O Chipset: NCT6791D
- Ethernet: Intel® PCIe Gb LAN 219LM for vPro x 1, Intel® PCIe Gb LAN 210AT x 1
- Audio: Realtek® ALC897
- TPM: Infineon SLB96XX TT 1.2/2.0 (default: No)
- Expansion Slots: PCIe 3.0 x 4, M.2 M key (22 x 80 mm) at Bottom side x 1, M.2 E key (22 x 30 mm) at Top side x 1
- BIOS: 128M bit Flash ROM, AMI BIOS
- H/W Monitor: Temperature Monitor on CPU/Chassis, Voltage Monitor on VCore™ 5V/12V, Fan Monitor on CPU/Chassis
- Smart Fan Control: CPU Fan/ Chassis Fan
- Wake On LAN/ PXE: Yes (WOL/PXE)
- Power State: S3, S4, S5
- Graphics Chipset: Intel® HD Graphics
- Graphics Multi Display: 2DP + LVDS, 3P + eDP + LVDS, 2DP + eDP
- Display Port: Up to 4096 x 2160 @24 Hz / 3840 x 2160 @60 Hz, with Digital Audio
- Audio I/O: Mic-in x 1, Line-out x 1
- LAN I/O: LAN (RJ-45) port x 2
- Display I/O: LVDS (top) and eDP (bottom)
- COM: Box header for COM (RS-232/422/485) x 1
- PS/2 Port: —
- Parallel Port: —
- Fan: Digital I/O box header x 1
- Power: 12V AUX Power Connector x 1, AT/ATX mode select jumper (optional) x 1
- OS: Windows® 7 32/64-bit, Windows® 8.1 32/64-bit, Windows® 10 64-bit, Ubuntu16.04.02/Kernel4.8.0

Packing List
- SATA Cable
- SATA Power Cable
- I/O Shield
- EMB-Q170B

Optional Accessories
- Part Number: Description
  1759200172: (TF)CPU Cooler Fan, LGA 1156 socket, 40, 12V, 2-Ball Bearing, Dynatron, K785 (2U cooler)
  175921156B: (TF)CPU Cooler Fan, LGA 1156 socket, 12V, 40, 2-Ball (Tray), Dreamer, DSA-00273
  1709100201: USB 2.0 Cable (10P, 200MM, p=2.00mm, w/bracket)
  1701100206: COM Cable (200MM, p=2.00mm)
  1702150300: SATA Power Cable (4P, 300MM, p=2.5mm)
  125590084A: Adapter 12V (4P/3A)
  1709050201: USB 2.0 Cable (5P, 220MM, p=2.00mm)
Block Diagram

Dimension

Order Information

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<tbody>
<tr>
<td>EMB-Q170B-A11-210</td>
<td>Socket</td>
<td>SODIMM x 2</td>
<td>Fan</td>
<td>LVDS, eDP, DP</td>
<td>SATA3 x 4, M.2 (M-key)</td>
<td>Daul Channel 18/24 bit</td>
<td>GBE x 2</td>
<td>USB 3.2 Gen1 x 4, USB2.0 x 6</td>
<td>—</td>
<td>PCIe [4] x 1, M.2(M-key) x 1</td>
<td>32°F – 140°F (0°C – 60°C)</td>
<td>12VDC</td>
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EMB-H110B
6th/7th Generation Intel® Core™ i Series, LGA1151 Socket Processor, Max. 65W TDPs, SATA 6.0 Gb/s x 2, USB x 8

**Features**
- LGA1151 Socket For 6th/7th Generation Intel® Core™ i Series Processor
- DDR4 SODIMM x 2, Up to 32GB
- Two Independent Display: DP/HDMI (BOM Change), LVDS, eDP
- SATA 6.0 Gb/s x 2, Half-size Mini-Card x 1, Full/ Half-size Mini-Card x 1
- PCI-Express [x1] x 1
- 12V DC
- Low Profile
- 4K for HDMI/eDP

**Specifications**

### System
- **Processor**: 6th/7th Generation Intel® Core™ i Series, LGA1151 Socket Processor, Max. 65W TDPs
- **Chipset**: Intel® H110
- **Memory**: DDR4 2133/1867 MHz SODIMM x 2, Up to 32GB
- **Expansion Slots**: PCIe [x1] x 1, Full-size Mini-Card (mSATA Default) x 1, Half-size Mini-Card (PCIe+USB) x 1
- **BIOS**: 64 Mbit Flash ROM, AMI BIOS
- **H/W Monitor**: Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/SV/12V, Fan Monitor on CPU/Chassis
- **WatchDog Timer**: 1~255 steps by software program
- **Smart Fan Control**: CPU Fan/Chassis Fan
- **Wake On LAN/ PXE**: Yes (WOL/PXE)
- **Power State**: S3, S4, S5

### Graphics
- **Graphics Chipset**: —
- **Graphics Multi Display**: HDMI1+HDMI2, HDMI1+DP2, DP1+HDMI2, HDMI1+LVDS, HDMI2+LVDS, HDMI1+eDP, HDMI2+eDP, DP1+DP2, DP1+LVDS, LVDS+LVDS, DP1+eDP, DP2+DP2
- **VGA**: —
- **DVI**: —
- **HDMI**: Up to 4096 x 2160 @24 Hz / 2560 x 1600 @60 Hz, with Digital Audio (HDMI/DP Combo)
- **Display Port**: Up to 1920 x 1200 @60 Hz, with Digital Audio (HDMI/DP Combo)
- **LVDS**: Up to 1920 x 1200 @60 Hz, dual-channel 18/24-bit colay
- **eDP**: Up to 4096 x 2340 @60Hz
- **Power**: Voltage/PWM

### Environmental & Power & ME
- **Battery**: Lithium battery
- **Power Requirement**: 12VDC
- **Operating Temperature**: 32°F ~ 140°F (0°C ~ 60°C)
- **Storage Temperature**: -40°F ~ 185°F (-40°C ~ 85°C)
- **Operating Humidity**: 0% ~ 90% R/H, non-condensing
- **Certificate**: CE & FCC
- **Form Factor**: Mini-ITX: 6.7” x 6.7” (170mm x 170mm)
- **Weight**: 1.1 lb (0.5 Kg)
- **MTBF (Hours)**: 315,210

### Packaging List
- **Part Number**: Description
  - 1759200172: CPU Cooler (2-Ball, Screw with Retention Plate)
  - 175921156B: CPU Cooler (2-Ball, Push-pin Type)
  - COOLER-65W-01: CPU Cooler, 1U, 12V, 65W, 4P
  - 1709100201: USB 2.0 Cable (10P, 200MM, p=2.00mm, w/ bracket)
  - 1701100206: COM Cable (200MM, p=2.00mm)
  - 1702150300: SATA Power Cable, 4P, 2.54mm
  - 125590084A: Adapter 12V, 64W/N3
  - 1700180491: USB 2.0 Cable (2 x 5P, 490mm, p=2.00mm)
  - 1709050201: USB 2.0 Cable (5P, 220mm, p=2.00mm)

### Optional Accessories
- **Part Number**: Description
  - 14001-00630100: SATA 6G Cable (7P; 180; 90, 500mm 2 int)
  - 14001-00230100: SATA data cable (4P; 120MM)

Note: All specifications are subject to change without notice.
Block Diagram

Industrial Motherboards

EMB-H110B

Dimension

Unit: mm

Ordering Information

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>EMB-H110B-A14-HH-A</td>
<td>Socket</td>
<td>SODIMM x 2</td>
<td>Fan</td>
<td>LVDS, eDP, HDMI x 2</td>
<td>SATA 3 x 2, Full size mini card x 1, mSATA</td>
<td>Dual Channel 16/24bit</td>
<td>GbE x 2</td>
<td>USB 3.2 Gen 1 x 4, USB 2.0 x 4</td>
<td>1</td>
<td>PCIe 2.0 (x1) x 1, Half-size Mini Card (PCIe + USB default) x 1</td>
<td>12VDC</td>
<td>—</td>
<td>32°F – 140°F (0°C – 60°C)</td>
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</table>

Note: All specifications are subject to change without notice.
**MAX-Q670A**

MAX with 12th/13th Generation Intel® Core™ LGA1700 Socket Processors, TDP Max. 125W

### Features
- **12th/13th Gen Intel® Core™ LGA1700 Socket Processors**
- **DDR5 4000MHz U-DIMM x 4, up to 128GB**
- **Four Independent Displays:** HDMI 2.0 x 1, DP x 1, VGA x 1, LVDS/eDP x 1
- **GbE LAN x 2** (Optional: Additional 2.5GbE LAN x 2, Intel® I225-LM)
- **M.2 2242/2280 M-Key x 2, M.2 3042/3052/2242 B-Key + Micro SIM Slot, M.2 2230 E-Key x 1**
- **USB 3.2 Gen 2 x 4, USB 3.2 Gen 1 x 3, USB 2.0 x 2** (Optional: **Type-C 1**)
- **SATA x 8**
- **Switchable USB Power feature for remote USB device reset**
- **Bootable feature in rear USB Port for enhanced security**
- **Onboard TPM 2.0**

### Specifications

#### System
- **Processor:** 12th/13th Generation Intel® Core™ LGA1700 Socket Processors (formerly Alder Lake/Raptor Lake), TDP Max 125W
- **Chipset:** Intel® Q670 Express Chipset
- **Memory:** DDR5 DRAM, up to 128GB
- **Expansion Slots:**
  - PCIe Gen 5 [x16] (8 Lanes/8 Lanes when dual-use PCIe [x16] slot)
  - PCIe Gen 3 [x4] (2 Lanes, Open Slot)
  - PCIe Gen 4 [x4] (4 Lanes)
  - M.2 3042/3052/2242 B-Key [x1] (PCIe 3.0 [x4]/USB 3.2 Gen 1 + Micro SIM Slot)
  - M.2 2230 E-Key [x1] (PCIe 3.0 [x1]/USB 2.0)
- **BIOS:** 256 Mbit Flash ROM, AMI BIOS
- **Hi/W Monitor:** Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/5V/3.3V/12V, Fan Monitor on CPU/Chassis
- **WatchDog Timer:** 1~255 step by software program
- **Smart Fan Control:** CPU Fan x 1/Chassis Fan x 2 (3rd Chassis Fan is DC Fan)
- **Wake On LAN/PXE:** Yes (WOL/ PXE)
- **Power State:** S3, S4, S5

#### Graphics
- **Graphics Chipset:** Intel® Graphics Media Accelerator
- **Graphics Multi Display:** HDMI + VGA + DP + LVDs/eDP
- **VGA:** Up to 1920 x 1200 @60Hz (via IT6516B)
- **DVI:** —
- **HDMI:** 2.0 x 1, up to 4096 x 2160 @60Hz/30Hz
- **Display Port:** DP 1.4 x 1, up to 4096 x 2160 @24 Hz or 3840 x 2160 @60Hz, with Digital Audio
- **LVDS:** 18/24-bit Dual-Channel LVDS x 1, up to 1920 x 1080 @60 Hz
- **eDP:** eDP x 1, up to 3840 x 2160 @30 Hz
- **Backlight Control:** Yes

#### Environment & Power & ME
- **Battery:** Lithium battery
- **Power Requirement:** 24-pin ATX connector x 1, 8-pin 12V ATX Power Connector x 1
- **Operating Temperature:** 32°F ~ 140°F (0°C ~ 60°C)
- **Storage Temperature:** -40°F ~ 185°F (-40°C ~ 85°C)
- **Operating Humidity:** 0% ~ 90% relative humidity, non-condensing

#### Rear Panel I/O Ports
- **USB:**
  - USB 3.2 Gen 2 x 4 (10Gbps)
  - USB Type-C x 1 (Optional, 20Gbps, 5V, 3A)
  - USB 2.0 x 2 (Optional, 5V, 1A)
  - USB 3.2 Gen 1 x 3, USB 2.0 x 2
  - Micro-SIM Slot
- **Audio I/O:**
  - Jack x 3: Line-in, Mic-in, Line-out
  - Audio Jack x 3: Line-in, Mic-in, Line-out
- **LAN I/O:** RJ-45 LAN x 2 (Optional: RJ-45 x 4)
- **Serial Port:** RS-232 x 5 (Supports RS-232/422/485, 5V/12V/RI)
- **PS/2 Port:** —
- **Others:**
  - PS/2 Port
  - 3-pin Chassis Fan connector x 1 (DC Mode)
  - 4-pin Chassis Fan connector x 2 (PWM Mode)
  - 4-pin CPU Fan Connector x 1 (PWM Mode)
  - 4-pin Chassis Fan connector x 2 (PWM Mode)
  - 3-pin Chassis Fan connector x 1 (DC Mode)
- **Power:**
  - Chassis Intrusion x 1
  - AT/ATX Mode Select Jumper x 1
  - Front Panel Header x 1
  - Back Panel Header x 1
- **OS:**
  - Windows® 10 64-bit, Windows® 11 64-bit

Note: All specifications are subject to change without notice.
Block Diagram

Dimension
Unit: mm

Ordering Information

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<thead>
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<tbody>
<tr>
<td>MAX-Q670A-A10-2L</td>
<td>LGA1700 Socket</td>
<td>DDR5 4000MHz</td>
<td>Fan</td>
<td>HDMI x 1</td>
<td>M.2 2242/80 M-Key x 2</td>
<td>SATA III x 8 Sata III 6Gbps</td>
<td>Intel® QCH Q670E x 2</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>USB 3.0 Header x 1</td>
<td>USB 2.0 Header x 1</td>
<td>USB 3.2 Gen 1 x 1 (Type-A Vertical)</td>
<td>5</td>
<td>1</td>
<td>PCIe x 16</td>
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<tr>
<td>MAX-Q670A-A10-4LC</td>
<td>LGA1700 Socket</td>
<td>DDR5 4000MHz</td>
<td>Fan</td>
<td>HDMI x 1</td>
<td>M.2 2242/80 M-Key x 2</td>
<td>SATA III x 8 Sata III 6Gbps</td>
<td>Intel® QCH Q670E x 4</td>
<td>USB 3.2 Gen 2 x 4</td>
<td>Type-C x 1</td>
<td>USB 3.0 Header x 1</td>
<td>USB 2.0 Header x 1</td>
<td>USB 3.2 Gen 1 x 1 (Type-A Vertical)</td>
<td>5</td>
<td>1</td>
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Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1709100330</td>
<td>USB 2.0 Cable (9P, 330mm, p=2.54mm, w/ Bracket)</td>
</tr>
<tr>
<td>170910020K</td>
<td>USB 3.0 Cable (9F, 200mm, p=2.54mm, w/o Bracket)</td>
</tr>
<tr>
<td>1700180450</td>
<td>USB 3.2 Gen 1 Cable (19P, 450mm, w/ Bracket)</td>
</tr>
<tr>
<td>AP-FNTN117000020</td>
<td>1U CPU cooler for LGA1700, TDP Max. 125W, 5400RPM</td>
</tr>
<tr>
<td>AP-FNTN117000030</td>
<td>2U CPU cooler for LGA1700, TDP Max 125W, 8400RPM</td>
</tr>
</tbody>
</table>

Packing List

- MAX-Q670A
- SATA Cable
- COM Cable
- I/O Shield

Note: All specifications are subject to change without notice.
# MAX-Q470A

Micro-ATX Industrial Motherboard with 10th Generation Intel® Core™ Processor, DDR4 DRAM, Multiple Display Ports, Supports iAMT 12.0

---

## Features
- **10th Generation Intel® Core™ LGA1200 Processor**
- **Supports Power 10 Core 80W max.**
- **DDR4 2933/2666/2400 MHz, max. 128GB**
- **Three Independent Displays: HDMI x 3 (2.0 x 1, 1.4 x 2), VGA x 1, LVDS x 1**
- **Dual Intel® Gigabit Ethernet, LAN1 supports iAMT 12.0**
- **USB 3.2 Gen2 x 2, USB 3.2 Gen1 x 7, USB 2.0 x 2**
- **BIOS recovery function, convenient way to flash BIOS if needed**
- **TPM onboard**

---

## Specifications

### System

<table>
<thead>
<tr>
<th>Processor</th>
<th>Intel® 10th Generation (Comet Lake-S) Core™ i9 /i7/ i5 /i3, Pentium 14nm LGA 1200 socket Processor, Max. 10 Core 80W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chipset</td>
<td>Intel® Q470E Express Chipset</td>
</tr>
<tr>
<td>Memory</td>
<td>DIMM x 4, DDR4 (2933/2666/2400 MHz, max. 128GB) non-ECC, un-buffered memory Dual channel memory architecture</td>
</tr>
<tr>
<td>I/O Chipset</td>
<td>IT5121E + F81216HD</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Intel® PHY IZ19LM Giga LAN (supports Intel® AMT 12.0) x 1, Intel® 210AT Siga LAN x 1, RJ45 x 2</td>
</tr>
<tr>
<td>Audio</td>
<td>Realtek® ALC897 6-Channel High Definition Audio CODEC</td>
</tr>
<tr>
<td>TPM</td>
<td>Nuvoton NPCT750AADYX TPM2.0 onboard (optional: default: onboard)</td>
</tr>
<tr>
<td>Expansion Slots</td>
<td>PCIe 3.0(x16) Slot (16 lanes) when dual use PCIe(x16) x 1, PCIe 3.0(x8) (8 lanes) x 1, PCIe 3.0(x4) Slot x 1, PCIe 3.0(x4) Slot (2 lanes) x 1, M.2 2230 E-key (PCIe/CNVI) x 1, M.2 3042/3052/2242 E-key (PCIe/USB/SATA) x 1, Micro SIM Card Slot x 1</td>
</tr>
<tr>
<td>BIOS</td>
<td>256Mbit Flash ROM, AML BIOS</td>
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<tr>
<td>H/W Monitor</td>
<td>Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/5V/3.3V/12V, Fan Monitor on CPU/Chassis</td>
</tr>
<tr>
<td>WatchDog Timer</td>
<td>1~255 steps by software program</td>
</tr>
<tr>
<td>SmartFan Control</td>
<td>CPU Fan/Chassis Fan x 2</td>
</tr>
<tr>
<td>Wake On LAN/ PXE</td>
<td>Yes (WOL / PXE)</td>
</tr>
<tr>
<td>Power State</td>
<td>S3, S4, S5</td>
</tr>
</tbody>
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### Graphics

<table>
<thead>
<tr>
<th>Graphics Chipset</th>
<th>Intel® Graphics Media Accelerator</th>
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<tbody>
<tr>
<td>Graphics Multi Display</td>
<td>HDMI+HDMI+VGA, HDMI+HDMI+LVDS, HDMI+VGA+LVDS, HDMI+HDMI+HDMI</td>
</tr>
<tr>
<td>VGA</td>
<td>Up to 1920 x 1200 @60Hz (via IT6516B)</td>
</tr>
<tr>
<td>DVI</td>
<td>—</td>
</tr>
<tr>
<td>HDMI</td>
<td>Up to 4096 x 2160 @ 60 / 30 Hz, with Digital Audio</td>
</tr>
<tr>
<td>Display Port</td>
<td>—</td>
</tr>
<tr>
<td>LVDS</td>
<td>Up to 1920 x 1200 @ 60 Hz, Dual Channel 18/34 bit</td>
</tr>
<tr>
<td>eDP</td>
<td>—</td>
</tr>
<tr>
<td>Backlight Control</td>
<td>Yes</td>
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### Environment & Power & ME

<table>
<thead>
<tr>
<th>Battery</th>
<th>Lithium battery</th>
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<tr>
<td>Power Requirement</td>
<td>24-pin ATX connector x 1, 8-pin (2x4) ATX 12V Power connector x 1</td>
</tr>
<tr>
<td>Temperature</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°F ~ 185°F (-40°C ~ 85°C)</td>
</tr>
<tr>
<td>Operation Humidity</td>
<td>0% ~ 90%RH, non-condensing</td>
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<tr>
<td>Certificate</td>
<td>CE &amp; FCC Class A</td>
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</table>

### Power State

- **MICRO-ATX Form Factor, 9.6”x9.6” (244 mm x 244 mm)**
- **USB 3.2 Gen2 x 2, USB 3.2 Gen1 x 7, USB 2.0 x 2**
- **1920 x 1200 @60Hz (via IT6516B)**
- **Intel® Graphics Media Accelerator**
- **Chassis Intrusion x 1, AT/ATX mode select jumper x 1, Front panel header x 1, RS-232 headers x 3**
- **8-bit Digital I/O interface (In/Out programmable) x 1**
- **Intel® Q470E Express Chipset**
- **Yes (WOL / PXE)**
- **DDR4 2933/2666/2400 MHz, max. 128GB**
- **Supports Power 10 Core 80W max.**
- **Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/5V/3.3V/12V, CPU Fan/ Chassis Fan x 2**
- **Up to 1920 x 1200 @60 Hz, Dual Channel 18/34 bit**
- **BIOS recovery function, convenient way to flash BIOS if needed**
- **TPM onboard**

### Rear Panel I/O Ports

- **USB 3.2 Gen2 ports x 2**
- **USB 3.2 Gen1 ports x 2, USB 2.0 ports (5 Gbps) x 4**
- **Display I/O**
  - VGA x 1, HDMI x 3 (2.0 x 1, 1.4 x 2)
- **Audio I/O**
  - Audio Jack x 3: Line-in, Mic-in, Line-out
- **LAN I/O**
  - LAN (RJ45) ports x 2
- **Serial Port**
  - DB-9 COM (supports RS-232/422/485, 5V/12V/RI) x 1
- **PS/2 Port**
  - —
- **Others**
  - BIOS recovery button

### Internal I/O Connectors

- **Storage**
  - SATA III (6.0Gb/s) ports x 4, support RAID 0/1/5/10
  - USB3.2 Gen1 box header support additional 2 USB ports (2x5PIN, p=2.54mm) x 1, USB3.2 Gen1 Type A (vertical) connector x 1, USB 2.0 header support additional 2 USB ports (2x5PIN, p=2.54mm) x 1
- **Display I/O**
  - 40-pin LVDS connector x 1
- **Audio I/O**
  - speaker header (Line-out) x 1, AAFP x 1
- **Serial Port**
  - RS-232 headers x 3
- **PS/2 Port**
  - —
- **Parallel Port**
  - —
- **DIO**
  - 8-bit digital I/O interface (In/Out programmable) x 1
- **FAN**
  - CPU Fan connector(s) (4-pin) x 1, Chassis Fan connector(s) (4-pin) x 2
- **Power**
  - 24-pin EATX Power connector x 1, 8-pin EATX 12V Power connector x 1
- **Others**
  - Chassis Intrusion x 1, AT/ATX mode select jumper x 1, Front panel header x 1, Clear CMOS jumper x 1, 3-pin ME lock header x 1, Buzzer on board x 1

### OS

- **Windows® 10 64bit, Windows® 11 64bit, Linux Ubuntu 64bit (20.04.0 / Kernel 5.4)**

---

### Note:

All specifications are subject to change without notice.

---

### Packing List

- 14001-00630100 SATA 6Gb Cable (7P: 180; 90, 500mm 2 in 1)
- 14001-00400100 COM Port Cable (9P, 260mm, p=2.54mm w/bracket)
- I/O Shield
- MAX-Q470A
**Block Diagram**

**COMETLAKE-S LGA1200 CPU**

- PCIe [x16] x 2
- Intel® PCH Q470
- DDR4 2933/2666MHz
- USB 3.2 Gen2 x 2
- USB 3.2 Gen1 x 4
- USB 3.2 Gen1 box header x 1
- USB 2.0 header x 1
- USB 2.0 cable (9P, 330MM, p=2.54mm, w/bracket)
- USB 2.0 cable (9P, 200MM, p=2.54mm, w/o bracket)
- USB3.2 Gen1 x 5
- USB3.2 Gen2 x 2
- SATI A header x 1 (2 ports)
- SATA III x 4
- M.2 (M key) PCIe III
- M.2 (E key) PCIe III
- M.2 (B key) PCIe III
- 6 Gbps
- 24 MHz
- 25.52 mm

**Dimension**

Unit: mm

**Ordering Information**

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<tbody>
<tr>
<td>MAX-Q470A-A11-210</td>
<td>LGA 1200 socket</td>
<td>DDR4 2933/2666/2400</td>
<td>Fan</td>
<td>HDMI x 3, VGA x 1, LVDS x 1</td>
<td>SATA x 4, M.2 2280/2242 K-key (PCle3) x 1</td>
<td>Intel®Q470</td>
<td>USB 3.2 Gen2 x 2, USB 3.2 Gen x 4, USB 3.2 Gen (back) header x 1, USB 3.2 Gen (vertical) type A x 1, USB 2.0 header x 1</td>
<td>3</td>
<td>PCIe [x16] x 1, PCIe [x16] (Rave) x 1, PCIe [x16] (Maxm) x 1, M.2 2230 E-key (PCle3) x 1, M.2 2280/2242 M-key (PCle3) x 1, M.2 1042/3052/2242 B-key (PCIe3/USB/ SATA) x 1, Micro SIM card Slot x 1</td>
<td>ATX Onboard</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
<td></td>
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</table>

**Optional Accessories**

<table>
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<tr>
<th>Part Number</th>
<th>Description</th>
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<tr>
<td>1709100330</td>
<td>USB 2.0 cable (9P, 330MM, p=2.54mm, w/bracket)</td>
</tr>
<tr>
<td>170910020K</td>
<td>USB 2.0 cable (9P, 200MM, p=2.54mm, w/o bracket)</td>
</tr>
<tr>
<td>1700190450</td>
<td>USB3.2 Gen1 Cable (19P, 450MM, w/bracket)</td>
</tr>
<tr>
<td>AP-FNTH0G070100</td>
<td>CPU Cooler (2-Ball Bearing, 2U, TDP Max. 100W)</td>
</tr>
</tbody>
</table>
**MAX-Q370A**

Micro-ATX Industrial Motherboard with 8th/9th Generation Intel® Core™ Processor, DDR4 DRAM, Multiple Display Ports, Supports iAMT 12.0

---

### Features
- 8th/9th Generation Intel® Core™ LGA1151 Processor
- Supports Max. TDP 8 Core 95W.
- DDR4 2666/2400/2133 MHz, max. 128GB
- Three Independent Displays: HDMI x 2, VGA x 1, DP x 1
- Dual Intel® Gigabit Ethernet, i210AT x 1, i219LM x 1, i219LM Supports iAMT 12.0
- USB 3.2 Gen 2 ports x 6, USB 3.2 Gen 1 ports x 4, USB 2.0 ports x 3
- M.2 E-key (PCIe/USB) x 1, M.2 M-key (PClex4/SATA3) x 1
- TPM Onboard

---

### Specifications

#### System
- Processor: 8th/9th Generation Intel® (Coffee Lake-S/Coffee Lake-S Refresh) Core™ i9/ i7/ i5 /i3, Pentium™ 14nm LGA 1151 socket processor, max. TDP 8 Core 95W
- Chipset: Intel® Q370 Express Chipset
- Memory: DIMM x 4, DDR4 (2666/2400/2133 MHz, max. 128GB)
- I/O Chipset: NCT6793D+ F81216HD
- Ethernet: Intel® PHY 219LM x 1, i210AT x 1, i219LM
- Audio: Realtek® ALC897 6-Channel High Definition Audio CODEC
- TPM: Nuvoton NPCT750 onboard
- Expansion Slots: PCIe 3.0 x16 Slot x 1, PCIe 3.0 x4 Slot x 2, PCIe 3.0 x1 Slot x 1, M.2 2280 M-key (PCIex4/SATA3) x 1, M.2 2280 E-key (PCIe/USB) x 1
- BIOS: 256Mbit Flash ROM, AMI BIOS
- H/W Monitor: Temperature Monitor on CPU/System, Voltage Monitor on Vcore/5V/3.3V/12V, Fan Monitor on CPU/Chassis, WatchDog Timer 1~255 steps by software program, Smart Fan Control CPU Fan/ Chassis Fan x 2
- Wake On LAN/ PXE: Yes (WOL / PXE)
- Power State: S3, S4, S5

#### Graphics
- Graphics Chipset: Intel® UHD Graphics
- Graphics Multi Display: HDMI+VGA+DP, HDMI+VGA, HDMI+VGA, HDMI+VGA, HDMI+VGA, HDMI+VGA
- VGA: Up to 1920 x 1200 @60Hz (via IT6516B)
- DVI: —
- HDMI: Up to 4096 x 2160 @ 24 Hz / 2560 x 1600 @ 60 Hz, with Digital Audio
- Display Port: Up to 4096 x 2160 @ 24 Hz / 3840 x 2160 @ 60 Hz, with Digital Audio
- LVDS: —
- eDP: —
- Backlight Control: —

#### Environment & Power & ME
- Battery: Lithium battery
- Power Requirement: 24-pin ATX connector x 1, 8-pin (2x4) ATX 12V Power connector x 1
- Operation Temperature: 32°F ~140°F (0°C ~ 60°C)
- Storage Temperature: 40°F ~185°F (-40°C ~ 85°C)
- Operation Humidity: 0%~95%RH, non-condensing
- Certificate: CE & FCC Class A
- Form Factor: Micro-ATX Form Factor. 9.6"x9.6" (244 mm x 244 mm)
- Weight: 1.76 lb (0.8 Kg)
- MTBF (Hours): 264,820

---

### Packing List
- 14001-00630100 SATA 6G Cable (7P: 180; 90, 500mm 2 in 1)
- 14001-00400100 COM Port Cable (9P, 260mm, p=2.54mm w bracket)
- I/O Shield
- MAX-Q370A

---

Note: All specifications are subject to change without notice.
Note: All specifications are subject to change without notice.

**Block Diagram**

**Dimension**

**Ordering Information**

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<tr>
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<td>LGA 1151 socket</td>
<td>DDR4 2666/2400/2133</td>
<td>Fan</td>
<td>HDMI x 2, VGA x 1, DP x 1</td>
<td>SATA x 4, M.2 2280 M-key x 1</td>
<td>Intel i3/i5/i7</td>
<td>USB 3.2 Gen 2 x 4, USB 3.2 Gen 1 x 4</td>
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**Optional Accessories**

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<th>Part Number</th>
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<tr>
<td>AP-FNTHIQ370010</td>
<td>CPU Cooler (2-Ball Bearing, 2U, TOP Max. 100W)</td>
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<tr>
<td>1709100330</td>
<td>USB 2.0 cable (9P, 330MM, p=2.54mm, w/bracket)</td>
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<tr>
<td>170910020K</td>
<td>USB 2.0 cable (9P, 200MM, p=2.54mm, w/o bracket)</td>
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<tr>
<td>17592156B</td>
<td>CPU Cooler (2-Ball, Push-pin Type)</td>
</tr>
<tr>
<td>1759200172</td>
<td>CPU Cooler (2-Ball, Screw with Retention Plate)</td>
</tr>
</tbody>
</table>
**MAX-Q370C**

Micro-ATX Industrial Motherboard with 8th/9th Generation Intel® Core™ Processor, DDR4 DRAM, Multiple Display Ports, Supports iAMT 12.0

---

**Features**
- 8th/9th Generation Intel® Core™ LGA1151 Processor
- Supports Max. TDP 6 Core 95W, Do Not Support 8 Core 65W/95W
- DDR4 2666/2400/2133 MHz, max. 128GB
- Three Independent Displays: HDMI x 2, VGA x 1, DP x 1
- Dual Intel® Gigabit Ethernet, LAN1 Supports iAMT 12.0
- USB 3.2 Gen 1 x 9, USB 2.0 x 4
- Internal USB 3.2 Gen 1 box header x 1, USB 3.2 Gen 1 Type A (vertical) x 1, M.2 2280/2242 M-key (PCIe x 2) x 1
- TPM Onboard

---

**Specifications**

**System**
- Processor: Intel® 8th/9th Generation (Coffee Lake-S/Coffee Lake-S Refresh) Core™ i9 / i7 / i5 / i3, Pentium 14nm LGA 1151 socket Processor, Max. 6 Core 95W
- Chipset: Intel® Q370 Express Chipset
- Memory: DIMM x 4, DDR4 (2666/2400/2133 MHz, max. 128GB)
  - non-ECC, un-buffered memory
  - Dual channel memory architecture
- I/O Chipset: NCT6793D+ F81216HD

**Chipset**
- Ethernet: Intel® PHY i219LM Giga LAN (supports Intel® AMT 12.0) x 1
- Intel® i210AT Giga LAN x 1
- RJ45 x 2

**Audio**
- Realtek® ALC897 6-Channel High Definition Audio CODEC

**TPM**
- Nuvoton NPCT750 TPM2.0 onboard

**Expansion Slots**
- PCIe x 3 (x16) Slot x 1
- PCIe x 3 (x4) Slot (open edge) x 3
- M.2 2280/2242 M-key (PCIe SSD (Ideal speed: 800MB/S)) x 1

**BIOS**
- 256 Mbit Flash ROM x 1, AMI BIOS

**H/W Monitor**
- Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/5V/3.3V/12V,
- Fan Monitor on CPU/Chassis
- WatchDog Timer: 1~255 steps by software program
- Smart Fan Control: CPU Fan/ Chassis Fan x 2

**Backup on/off Port**
- Wake On LAN/ PXE: Yes (WOL / PXE)

**Power State**
- S3, S4, S5

**Graphics**
- Graphics Chipset: Intel® Graphics Media Accelerator
- Graphics Multi-Display: HDMI+VGA+DP, HDMI+HDMI+VGA, HDMI+HDMI+DP
- VGA: Up to 1920 x 1200 @60Hz (via IT6516B)
- DVI —
- HDMI: Up to 4096 x 2160 @ 24 Hz / 2560 x 1600 @ 60 Hz, with Digital Audio
- Display Port: Up to 4096 x 2160 @ 24 Hz / 3840 x 2160 @ 60 Hz, with Digital Audio
- LVDS —
- eDP —
- Backlight Control —

**Environment & Power & ME**
- Battery: Lithium battery
- Power Requirement: 24-pin ATX connector x 1, 8-pin (2x4) ATX 12V Power connector x 1
- Operation Temperature: 32°F ~140°F (0°C ~ 60°C)
- Storage Temperature: -40°F ~185°F (-40°C ~85°C)
- Operation Humidity: 0%~95%RH, non-condensing
- Certificate: CE & FCC Class A
- Form Factor: Micro-ATX Form Factor, 9.6"x9.6" (244 mm x 244 mm)
- Weight: 1.76 lb (0.8 Kg)
- MTBF (Hours): 264,820

---

**Packing List**
- 14001-00630100 SATA 6G Cable (7P; 180; 90, 500mm 2 in 1)
- 14001-00400100 COM Port Cable (9P, 260mm, p=2.54mm w/bracket)
- I/O Shield
- MAX-Q370C
**Block Diagram**

**Dimension**  
Unit: mm

**Ordering Information**

<table>
<thead>
<tr>
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<tr>
<td>MAX-Q370C-A11-210</td>
<td>LGA 1151 socket</td>
<td>DDR4 2666/2400/2133MHz</td>
<td>Fan</td>
<td>HDMI x 2, DVI x 1, DP x 1</td>
<td>SATA3 x 4, M.2 x 2, 2280/2242 M.2 x 1</td>
<td>Intel(R) Q370 Express Chipset</td>
<td>USB 3.2 Gen 1 x 6, USB 2.0 x 4, USB 3.2 Gen 1 Type-C x 1, USB 3.2 Gen 1 Type-A (vertical) x 1</td>
<td>1</td>
<td>PCIe x16 x 1, PCIe x4 x 3</td>
<td>AEX</td>
<td>Onboard</td>
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**Optional Accessories**

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<tr>
<td>1700190450</td>
<td>USB 3.2 Gen 1 Cable (19P, 450mm, w/bracket)</td>
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<td>AP-FNTHQ370010</td>
<td>CPU Cooler (2-Ball Bearing, 2U, TDP Max. 100W)</td>
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<tr>
<td>1709100030</td>
<td>USB 2.0 cable (9P, 330mm, p=2.54mm, w/bracket)</td>
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<tr>
<td>1709100020</td>
<td>USB 2.0 cable (9P, 200mm, p=2.54mm, w/o bracket)</td>
</tr>
<tr>
<td>175921156B</td>
<td>CPU Cooler (2-Ball, Push-pin Type)</td>
</tr>
<tr>
<td>1759200172</td>
<td>CPU Cooler (2-Ball, Screw with Retention Plate)</td>
</tr>
</tbody>
</table>
MAX-C246A

Micro-ATX Industrial Motherboard with 8th/9th Generation Intel® Core™ Processor, DDR4 DRAM, Multiple Display Ports, Supports iAMT 12.0

Features

- 8th/9th Generation Intel® Core™ LGA1151 Processor
- Supports Power 95W max.
- DDR4 2666/2400/2133 MHz, max. 128GB
- Three Independent Displays: HDMI x 2, VGA x 1, DP x 1
- Dual Intel® Gigabit Ethernet, i210AT x 1, i219LM x 1, i219LM Supports iAMT 12.0
- USB 3.2 Gen 2 ports x 6, USB 3.2 Gen 1 ports x 4, USB 2.0 ports x 3
- M.2 E-key (PCIE/USB) x 1, M.2 M-key (PCie4/SATA3) x 1
- TPM Onboard

Specifications

- 8th/9th Generation Intel® Core™ LGA1151 Processor
- DDR4 2666/2400/2133 MHz, max. 128GB
- Three Independent Displays: HDMI x 2, VGA x 1, DP x 1
- Dual Intel® Gigabit Ethernet, i210AT x 1, i219LM x 1, i219LM Supports iAMT 12.0
- USB 3.2 Gen 2 ports x 6, USB 3.2 Gen 1 ports x 4, USB 2.0 ports x 3
- M.2 E-key (PCIE/USB) x 1, M.2 M-key (PCie4/SATA3) x 1
- TPM Onboard

Packing List

- 14001-00630100 SATA 6G Cable (7P: 180; 90, 500mm 2 in 1)
- 14001-00400100 COM Port Cable (9P, 260mm, p=2.54mm w/bracket)
- I/O Shield
- MAX-C246A
Block Diagram

Dimension

Ordering Information

Optional Accessories

Note: All specifications are subject to change without notice.
MAX-H310A

Micro-ATX Industrial Motherboard with 8th/9th Generation Intel® Core™ Processor, DDR4 DRAM

Features
- 8th/9th Generation Intel® Core™ LGA1151 Processor
- DDR4 2666/2400/2133 MHz, max. 64GB
- Two Independent Displays: HDMI x 1, VGA x 1, DP x 1
- Dual Intel® Gigabit Ethernet, i210AT x 1, i219V x 1
- USB 3.2 Gen 1 ports x 4, USB 2.0 ports x 6
- M.2 M-Key (PCle or SATA) x 1, up to 5 SATA III (Optional)
- TPM Onboard

Specifications

- **System**
  - Processor: 8th/9th Generation Intel® (Coffee Lake-S/Coffee Lake-S Refresh) Core™ i9/ i7/ i5 /i3, Pentium 14nm LGA 1151 socket Processor
  - Chipset: Intel® H310 Express Chipset
  - Memory: DIMM x 2, DDR4 (2666/2400/2133 MHz, max. 64GB) non-ECC, un-buffered memory
  - I/O Chipset: NCT6793D+ F81216HD
  - Ethernet: Intel® PHY i219V Gb LAN x 1
  - Audio: Realtek® ALC897 6-Channel High Definition Audio CODEC
  - BIOS: 128Mbit Flash ROM, AMI BIOS
  - H/W Monitor: Temperature Monitor on CPU/System, Voltage Monitor on Vcore/5V/3.3V/12V, Fan Monitor on CPU/Chassis
  - WatchDog Timer: 1~255 steps by software program
  - Smart Fan Control: CPU Fan x 1, Chassis Fan x 2
  - Wake On LAN/PXE: Yes (WOL / PXE)
  - Power State: S3, S4, S5

- **Graphics**
  - Graphics Chipset: Intel® UHD Graphics
  - Graphics Multi Display: VGA+DP, VGA+HDMI, DP+HDMI
  - VGA: Up to 1920 x 1200 @60Hz (via IT06156B)
  - DVI: —
  - HDMI: Up to 4096 x 2160 @ 24 Hz / 2560 x 1600 @ 60 Hz, with Digital Audio
  - Display Port: Up to 4096 x 2160 @ 24 Hz / 3840 x 2160 @ 60 Hz, with Digital Audio
  - LVDS: —
  - eDP: —
  - Backlight Control: —

- **Environment & Power & ME**
  - Battery: Lithium battery
  - Power Requirement: 24-pin ATX connector x 1, 8-pin (2x4) ATX 12V Power connector x 1
  - Operation Temperature: 32°F ~ 140°F (0°C ~ 60°C)
  - Storage Temperature: -40°F ~ 185°F (-40°C ~ 85°C)
  - Operation Humidity: 0%~90%RH, non-condensing
  - Certificate: CE & FCC Class A
  - Form Factor: Micro-ATX Form Factor, 9.6”x9.6” (244 mm x 244 mm)

- **Packing List**
  - 14001-00630100 SATA 6G Cable (7P; 180; 90, 500mm 2 in 1)
  - 14001-00400100 COM Port Cable (9P, 260mm, p=2.54mm w/bracket)
  - I/O Shield
  - MAX-H310A

Note: All specifications are subject to change without notice.
Block Diagram

Dimension

Unit: mm

Ordering Information

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<tbody>
<tr>
<td>MAX-H310A-A11-210</td>
<td>LGA 1151 socket</td>
<td>DDR4 2666/2400/2133</td>
<td>Fan</td>
<td>HDMI x 1 VGA x 1 DP x 1</td>
<td>SATA x 3</td>
<td>M.2 2280 M-key (SATA) x 1</td>
<td>Intel® I219V</td>
<td>USB 3.2 Gen 1 x 4 USB 2.0 x 6</td>
<td>5</td>
<td>1</td>
<td>PCIe x16</td>
<td>ATX</td>
<td>on-board</td>
<td>32°F ~ 140°F (0°C ~ 60°C)</td>
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Optional Accessories

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<th>Part number</th>
<th>Description</th>
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<tr>
<td>1709100330</td>
<td>USB 2.0 cable (9P, 330MM, p=2.54mm, w/bracket)</td>
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<td>170910020K</td>
<td>USB 2.0 cable (9P, 200MM, p=2.54mm, w/o bracket)</td>
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<td>CPU Cooler (2-Ball, Push-pin Type)</td>
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<td>CPU Cooler (2-Ball, Screw with Retention Plate)</td>
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Note: All specifications are subject to change without notice.
IMBM-Q170A

Micro-ATX with 7th/6th Generation Intel® Core™ Processor, DDR4 DRAM, USB x 14, Supports iAMT 11.0

Specifications

Features

- 6th/7th Generation Intel® Core™ LGA1151 Processor
- DDR4 DRAM Support, 2133 MHz, Max. 64GB
- Three Independent Display: HDMI x 2, DVI-I Port x 1
- Dual Intel® Gigabit Ethernet, LAN1 Supports iAMT 11.0
- USB 3.2 Gen 1 Port x 10, USB 2.0 Port x 4
- TPM Optional

Rear Panel I/O Ports

| USB | USB 3.2 Gen 1 port x 10 |
| Display I/O | DVI-I x 1, HDMI x 2 |
| Audio I/O | Audio Jacks: Line-in, Mic-in, Line-out |
| LAN I/O | LAN (RJ-45) port x 2 |
| Serial Port | RS-232/422/485 DB-9 connector x 1 (COM1, supports 5/12V on RI pin) |
| PS/2 Port | PS/2 Combo Port (Keyboard & Mouse) x 1 |
| Others | — |

Internal I/O Connectors

| Storage | SATA3 (6.0 Gb/s) port x 6, supports RAID 0/1/5/10 |
| USB 2.0 header supports additional 2 USB ports x 2 |
| Display I/O | — |
| Audio I/O | Speaker header x 1 (Line-out) |
| Serial Port | RS-232 header x 5 |
| PS/2 Port | — |
| Parallel Port | — |
| BIOS | 8-bit Digital I/O interface x 1 (In/Out programmable) |
| FAN | CPU Fan Connector(s) (4-pin) x 1, Chassis Fan Connector(s) (4-pin) x 2 |
| Power | — |
| Others | Front panel header x 1, Clear CMOS jumper x 1, BIOS flash header (2[4]P p=1.27mm) x 1, Chassis Intrusion x 1 |
| OS | Windows® 7.32/64-bit, Windows® 8.1 64-bit, Windows® 10 64-bit, Linux Fedora 64bit |

Packaging List

- 14001-00630100 SATA 6G Cable (7P: 180; 90, 500mm 2 in 1) |
- 14001-00400100 COM Port Cable (9P, 260mm, p=2.54mm w/bracket) |
- I/O Shield |
- IMBM-Q170A |

Optional Accessories

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Note: All specifications are subject to change without notice.
Block Diagram

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<td>IMBM-Q170A-A12-210</td>
<td>LGA1151 socket DDR4 2133</td>
<td>Fan</td>
<td>DVI x 1, HDMI x 2, SATA3 x 6</td>
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<td>Intel®RS-220E x 2</td>
<td>USB 3.2 Gen 1 x 4, USB 2.0 x 4</td>
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IMBM-H110A
Micro-ATX with 7th/6th Generation Intel® Core™ Processor, DDR4 DRAM, M.2 x 1, USB x 10

Features
- 7th/6th Generation Intel® Core™ LGA1151 Processor
- DDR4 DRAM Support, 2400MHz, Max. 32GB
- Two Independent Display: HDMI x 2, VGA x 1, DVI-D x 1
- Dual Intel® Gigabit Ethernet
- M.2 Slot (M key) x 1
- USB 3.2 Gen 1 Port x 4, USB 2.0 Port x 6

Rear Panel I/O Ports
- USB 3.2 Gen 1 x 4
- Display I/O HDMI x 2, VGA x 1, DVI-D x 1
- Audio I/O Line-in, Mic-in, Line-out
- LAN I/O RJ-45 x 2
- Serial Port DB-9 COM x 1 (supports RS-232/422/485)
- PS/2 Port Stack Port (Keyboard & Mouse) x 1
- Others ---

Internal I/O Connectors
- Storage SATA 6.0Gb/s x 5, M.2 M key (22 x 42mm) x 1
- USB USB 2.0 x 6
- Display I/O ---
- Audio I/O ---
- Serial Port RS-232 header x 5
- PS/2 Port ---
- Parallel Port ---
- DIO 8-bit x 1 (In/Out programmable)
- FAN 4-pin CPU Fan x 1, 4-pin Chassis Fan x 2
- Power ---
- Others Front panel header x 1, Clear CMOS jumper x 1, BIOS flash header (2[x4]P p=1.27mm) x 1, Chassis Intrusion x 1, AT/ATX mode select jumper x 1

OS
- Windows® 7 32/64-bit (not supported when a Kaby Lake processor is used), Windows® 8.1 64-bit (not supported when a Kaby Lake processor is used), Windows® 10 64-bit, Linux Fedora 64bit

Packing List
- 14001-00630100 SATA 6G Cable (7P, 180; 90, 500mm 2 Int)
- 14001-00400100 COM Port Cable (9P, 260mm, p=2.54mm w bracket)
- I/O Shield
- IMBM-H110A

Specifications
- Processor 7th/6th Generation Intel® Core™ i7/i5/i3/Pentium®/Celeron® 14nm LGA1151 Socket Processor
- Memory 288-pin DIMM x 2, up to 32GB
- Expansion Slots PCIe [x16] x 1, PCIe [x1] (open edge) x 2, PCI x 1
- BIOS 128M bit Flash ROM x 1, AMI BIOS
- WatchDog Timer 1~255 steps by software program
- Smart Fan Control CPU Fan x 1, Chassis Fan x 2
- Wake On LAN/FXE Yes (WOL/FXE)
- Power State S3, S4, S5
- Graphics Chipset Intel® HD Graphics
- Graphics Multi Output HDMI, DVI-D, VGA, DisplayPort
- Display Port ---
- LVDS ---
- eDP ---
- Backlight Control ---
- Battery Lithium battery
- Power Requirement 24-pin ATX connector x 1, 8-pin ATX 12V Power connector x 1
- Operation Temperature 32°F – 140°F (0°C – 60°C)
- Storage Temperature -40°F – 185°F (-40°C – 85°C)
- Operation Humidity 0% – 90% RH, non-condensing
- Certificate CE & FCC Class A
- Form Factor Micro-ATX, 9.6” x 9.6” (244mm x 244mm)
- Weight 1.78 lb (0.8 Kg)
- MTBF (Hours) 245,250

Note: All specifications are subject to change without notice.
### Block Diagram

**KABYLKE-S/ SKYLAKE-S**

**LGA1151 CPU**

- **DDR4 2400/2133/1867MHz**
- **PCIe [x16]**

**Channel A**

- **Port B**
- **Port C**
- **Port D**
- **Port E**

**Channel B**

- **PCIe [x1] x 2**
- **Intel I210AT**
- **RJ-45**

**PCI**

- **RJ-45**
- **ASM1083**

- **Line in**
- **Line out**
- **Mic In**

**Audio**

- **ALC897**

**LPC**

- **NPCT650 TPM2.0**

**Moveable Module**

- **F81216HD**
- **COM3~6**

**SIO**

- **NCT6791D**

**SPI**

- **Flash**

**SATA**

- **M.2 M key 2280 x 1**

**USB 3.2 Gen 1/2**

- **1 x 4**
- **6 Gbps**

**USB 2.0**

- **6 x USB 2.0**

**RS-232/422/485**

- **1 x 2**

**Power**

- **ATX**

**Expansion Slot**

- **PCIe [x1] x 2**
- **PCI [x1] x 2**
- **PCI [x1] x 2**

**LAN**

- **USB 2.0 Gen 2 x 4, USB2.0 x 6**

**Audio**

- **RTD2168**

**DVI-D 2**

- **HDMI x 2**
- **VGA x 1**

**Display**

- **HDMI**
- **DVI-D**
- **LVDS**

**Storage**

- **SATA3 x 5**

**Fan/Fanless**

- **Fan**

**Ordering Information**

<table>
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<tr>
<th>Part Number</th>
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<tr>
<td>1709100330</td>
<td>USB 2.0 cable (9P, 330MM, p=2.54mm, w/bracket)</td>
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<td>170910020K</td>
<td>USB 2.0 cable (9P, 330MM, p=2.54mm, w/o bracket)</td>
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<td>175921156B</td>
<td>CPU Cooler (2-Ball, Push-pin Type)</td>
</tr>
<tr>
<td>1759280172</td>
<td>CPU Cooler (2-Ball, Screw with Retention Plate)</td>
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**Optional Accessories**

**Part Number**

- IMBM-H110A-A01-210
- LGA1151 socket
- DDR4 2400
- Fan

**CPU**

- LGA1151

**RAM**

- DDR4 2400

**Fan/Fanless**

- Fan

**Display**

- HDMI x 2, VGA x 1, DVI-D x 1

**Storage**

- M.2 M key 2242 x 1

**LVDS**

- SATA3 x 5

**LAN**

- GBE x 2

**USB**

- USB 2.0 Gen 1 x 4, USB2.0 x 6

**RS-232**

- 1 x 2

**Expansion Slot**

- PCIe [x16] x 1, PCIe [x1] x 2, PCIe [x1] x 1

**Power**

- ATX

**Temp.**

- 32°F~140°F (0°C~60°C)
**ATX-Q670A**

ATX with 12th/13th Generation Intel® Core™ LGA1700 Socket Processors, TDP Max. 125W, DDR5 DRAM, Multiple Display Ports

### Features

- **12th/13th Generation Intel® Core™ LGA1700 Socket Processors**
- **DDR5 DRAM Support, 4000MHz, Max. 128GB**
- **Four Independent Display: HDMI 2.0 x 2, DP x 2, VGA x 1**
- **Dual Intel® Gbe (Optional: additional LAN 3 I225-LM x 1)**
- **M.2 2280/2242 M-Key x 2, M.2 3042/3052 B-Key x 1 + Micro SIM Slot x 1, Mini PCIe x 1 + Micro SIM Slot x 1**
- **USB 3.2 Gen 2 x 2, USB 3.2 Gen 1 x 4, USB 2.0 x 3 (Optional: USB Type-C x 1, USB 3.2 Gen 2 x 3)**
- **SATA x 8**
- **USB Power Switchable Feature, for convenient USB device remote reset**
- **Bootable feature in rear USB Port for enhanced security**
- **Onboard TPM 2.0**

### Specifications

#### System

- **Processor**: 12th/13th Generation Intel® Core™ LGA1700 Socket Processors (formerly Alder Lake/ATX Connector/Lake), TDP Max. 125W
- **Chipset**: Intel® Q670E Chipset
- **Memory**: DDR5 DRAM, 4000MHz, Max. 128GB
- **Graphics**: Intel® Graphics Media Accelerator
- **USB Ports**: USB 3.2 Gen 2 x 2, USB 3.2 Gen 1 x 4, USB 2.0 x 3 (Optional: USB 4-pin CPU Fan Connector x 1 (PWM Mode)
- **M.2 Slots**: M.2 2280 M-Key (PCIex4) + M.2 3042/3052 B-key (PCIex1)
- **TPM**: 2.0 onboard
- **Realtek ALC897**: 6-Channel High Definition Audio CODEC
- **SATA**: 8
- **Audio Jacks**: Line-in, Mic-in, Line-out
- **RJ-45 LAN**: x 2 (Optional: RJ-45 x 3)
- **DB-9 COM**: x 1 (supports RS-232/422/485, 5V/12V/RI)
- **8-bit Digital I/O Interface**: x 1 (In/Out Programmable)
- **0~95°F (-40°C ~ 35°C), -40°F ~ 185°F (-40°C ~ 85°C)**

#### Environment & Power & ME

- **Battery**: Lithium battery
- **Power Requirement**: 24-pin ATX Connector x 1, 8-pin ATX 12V Power Connector x 1
- **Temperature Monitor**: on CPU/Chassis, Voltage Monitor on Vcore/5V/3.3V/12V
- **BIOS**: 256Mb flash ROM, AMI BIOS
- **Watchdog Timer**: 1~255 step by software program
- **Fan Monitor**: on CPU/Chassis
- **Power State**: S3, S4, S5
- **OS**: Windows® 10 64-bit, Windows® 11 64-bit

### Packing List

- **14001-0063010** SATA 6G Cable (7P, 180; 90, 500mm 2 mnt)
- **14019-00006700** VGA Cable (300mm, 2X15P, w/bracket)
- **I/O Shield**
- **ATX-Q670A**

Note: All specifications are subject to change without notice.
Note: All specifications are subject to change without notice.

**ATX-Q670A**

**Industrial Motherboards**

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>CPU</th>
<th>RAM</th>
<th>Fan/Fanless</th>
<th>Display</th>
<th>Storage</th>
<th>LVDS</th>
<th>LAN</th>
<th>USB</th>
<th>RS-232</th>
<th>Expansion Slot</th>
<th>Power</th>
<th>TPM</th>
<th>Temp.</th>
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<td>LGA1700 Socket</td>
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<td>SATA III x 8, M.2 2280, M.2 2242, M.2 2280, M.2 2242</td>
<td>Intel® PCH Q670E</td>
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**Optional Accessories**

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<th>Part Number</th>
<th>Description</th>
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<tr>
<td>1709100020</td>
<td>USB 2.0 cable (9P, 200MM, p=2.54mm, w/o bracket)</td>
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<td>USB 3.2 Gen 1 Cable (19P, 450mm, w/ bracket)</td>
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<td>2U CPU cooler for LGA1700, TDP Max. 95W, 2500RPM</td>
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<td>AP-FNTH11700020</td>
<td>1U CPU cooler for LGA1700, TDP Max. 125W, 5400RPM</td>
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<td>AP-FNTH11700030</td>
<td>2U CPU cooler for LGA1700, TDP Max. 125W, 8400RPM</td>
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ATX-Q370A

ATX Industrial Motherboard with 8th/9th Generation Intel® Core™ Processor, DDR4 DRAM, Supports iAMT 12.0, and Intel® CNVi WLAN Card, Option: LAN x 3, Type-C Alternate (Display + Data USB 3.2 Gen 1) Function

Features
- 8th/9th Generation Intel® Core™ LGA1151 Processor
- Supports Power 95W max.
- DDR4 2666/2400/2133 MHz, max. 128GB
- Three Independent Displays: HDMI x 1, VGA x 1, DP x 1, USB Type-C x 1 (optional)
- Dual Intel® Gigabit Ethernet, i210AT x 1 (option: i210AT x 2), i219LM x 1
- USB 3.2 Gen 2 ports x 4, USB 3.2 Gen 1 ports x 2, USB 2.0 ports x 6
- M.2 E-key (PCIe1/USB2.0/CNVi) x 1, M.2 M-key (PCIe4/SATA3) x 1
- TPM Onboard

Specifications

System
- Processor: Intel® 8th/9th Generation (Coffee Lake-S/Coffee Lake-S Refresh) Core™ i9/i7/i5/i3, Pentium 14nm LGA 1151 socket Processor, max. TDP 8 Core 95W
- Chipset: Intel® Q370 Express Chipset
- Memory: DIMM x 4, DDR4 (2666/2400/2133 MHz, max. 128GB)
- I/O Chipset: NCT6793D + F81216HD
- Ethernet: Intel® PHY 2.5GBM 8G Sata III x 1 (supports Intel® AMT 12.0)
- Audio: Realtek® ALC897 6-Channel High Definition Audio CODEC
- TPM: Nuvoton NPT7305 TP2M.0 onboard
- Expansion Slots: PCI 3.0(1x) Slot x 1, PCIe 3.0(4x) Slot (open edge) x 2
- POST/Clear CMOS Jumpers: 1 x 3-pin ME lock header x 1
- Power: Li-ion battery
- Power Requirement: 24-pin ATX connector x 1, 8-pin (2x4) ATX 12V Power connector x 1
- Operation Temperature: 32°F ~ 122°F (-0°C ~ 50°C)
- Storage Temperature: -4°F ~ 158°F (-20°C ~ 70°C)
- Fan Control: CPU Fan/ Chassis Fan x 2
- Wake On LAN/ PXE: Yes (WOL / PXE)
- Power State: S1, S3, S4, S5

Graphics
- Graphics Chipset: Intel® Graphics Media Accelerator
- Graphics Multi Display: HDMI x 1, VGA x 1, DP x 1, USB Type-C x 1 (optional)

Environment & Power & ME
- Battery: Lithium battery
- Power Requirement: 24-pin ATX connector x 1, 8-pin (2x4) ATX 12V Power connector x 1
- Operation Temperature: 32°F ~ 122°F (-0°C ~ 50°C)
- Storage Temperature: -4°F ~ 158°F (-20°C ~ 70°C)
- Fan Control: CPU Fan/ Chassis Fan x 2
- Wake On LAN/ PXE: Yes (WOL / PXE)

Packing List
- 14001-00630100 SATA 6G Cable (7P: 180; 90, 500mm 2 in 1)
- 14001-00400100 COM Port Cable (9P: 600mm, p=2.54mm w/bracket)
- I/O Shield
- ATX-Q370A

Note: All specifications are subject to change without notice.
Note: All specifications are subject to change without notice.

Block Diagram

Ordering Information

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<td>DDR4 2666/2400/1866</td>
<td>Fan</td>
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<td>SATA 3 x 4, M.2 2280 M-key x 1</td>
<td>Intel/I3/5/7 Gen x 2</td>
<td>USB 3.2 Gen 2 x 4, USB 3.2 Gen 1 x 2, USB 2.0 x 6</td>
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<td>PCIe[4]x1, PCIe[4] (open edge) x 2, PCI x 2, M.2 2280 E-key x 1, M.2 2230 M-key x 1</td>
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<td>Onboard</td>
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<td>USB 2.0 cable (9P, 330MM, p~2.54mm, w/bracket)</td>
<td>170910020K</td>
<td>USB 2.0 cable (9P, 200MM, p~2.54mm, w/o bracket)</td>
<td>175921156B</td>
<td>CPU Cooler (2-Ball, Push-pin Type)</td>
<td>1759201312</td>
<td>CPU Cooler (2-Ball, Screw with Retention Plate)</td>
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Optional Accessories

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<th>Description</th>
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<td>AP-FNTH100370019</td>
<td>CPU Cooler (2-Ball Bearing, 2U, TOP Max. 100W)</td>
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<td>1709100330</td>
<td>USB 2.0 cable (9P, 330MM, p~2.54mm, w/bracket)</td>
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<tr>
<td>170910020K</td>
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<td>CPU Cooler (2-Ball, Push-pin Type)</td>
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<tr>
<td>1759201312</td>
<td>CPU Cooler (2-Ball, Screw with Retention Plate)</td>
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ATX-C246A

ATX Industrial Motherboard with 8th/9th Generation Intel® Core™ Processor, DDR4 DRAM, Supports iAMT 12.0, and Intel® CNVi WLAN Card, Option: LAN x 3, Type-C Alternate (Display + Data USB 3.2 Gen 2) Function

Features
- 8th/9th Generation Intel® Core™ LGA1151 Processor
- Supports Power 95W max.
- DDR4 2666/2400/2133 MHz, max. 128GB
- Three Independent Displays: HDMI x 1, VGA x 1, DP x 1, USB Type-C x 1 (optional)
- Dual Intel® Gigabit Ethernet, i210AT x 1 (option: i210AT x 2), i219LM x 1
- USB 3.2 Gen 2 ports x 4, USB 3.2 Gen 1 ports x 2, USB 2.0 ports x 6
- M.2 E-Key (PClex1/USB2.0/CNVi) x 1, M.2 M-key (PClex4/SATA3) x 1
- TPM Onboard

Specifications

System
- Processor: Intel® 8th/9th Generation (Coffee Lake-S/Coffee Lake-S Refresh) Core™ i9/ i7 / i5 / i3, Pentium 14nm, Celeron™, Xeon E-2200/2100, LGA 1151 socket Processor, max. TDP 8 Core 95W
- Chipset: Intel® C246 Express Chipset
- Memory: DIMM x 4, DDR4 (2666/2400/2133 MHz, max. 128GB)
- I/O Chipset: NCT6793D + F81216HD
- Ethernet: Intel® PHY i219LM Giga LAN x 1 (supports Intel® AMT 12.0)
- Realtek® ALC269 6-Channel High Definition Audio CODEC
- TPM: Nuvoton NPCT750 TPM2.0 onboard
- BIOS: 256Mbit Flash ROM x 1, AMI BIOS
- H/W Monitor: Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/V5V/3.3V/12V, Fan Monitor on CPU/Chassis
- WatchDog Timer: 1~255 steps by software program
- Smart Fan Control: CPU Fan, Chassis Fan x 2
- Wake On LAN/PXE: Yes (WOL/PXE)
- Power State: S3, S4, S5

Graphics
- Graphics Chipset: Intel® Graphics Media Accelerator
- Graphics Multi Display: HDMI+VGA+DP (BOM option: USB 3.2 Gen 2-10Gbps Type-C connector (Alternate Mode: USB+DP) x 1)
- VGA: Up to 1920 x 1200 @60Hz (via IT6516B)
- HDMI: Up to 4096 x 2160 @ 24 Hz / 2560 x 1600 @ 60 Hz, with Digital Audio
- Display Port: Up to 4096 x 2160 @ 24 Hz / 3840 x 2160 @ 60 Hz, with Digital Audio
- LVDS: —
- eDP: —
- Backlight Control: —

Environment & Power & ME
- Battery: Lithium battery
- Power Requirement: 24-pin ATX connector x 1, 8-pin (2x4) ATX 12V Power connector x 1
- Operation Temperature: 32°F~140°F (0°C ~ 60°C)
- Storage Temperature: -40°F ~185°F (-40°C ~85°C)
- Operation Humidity: 0%~90%RH, non-condensing
- Certificate: CE & FCC Class A
- Form Factor: ATX Form Factor, 12”x9.6” (305mm x 244mm)

Packing List
- 14001-00630100 SATA6 Cable (7P: 180; 90, 500mm 2 in 1)
- 14001-00400100 COM Port Cable (9P, 260mm, p=2.54mm w bracket)
- I/O Shield
- ATX-C246A
Ordering Information

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<tr>
<td>ATX-C246A-A20-2L-210</td>
<td>LGA 1151 socket</td>
<td>DDR4 2666/2400MHz</td>
<td>Fan</td>
<td>HDMI x 1, VGA x 1, DP x 1</td>
<td>SATA x 2, M.2 2280 M-key x 1</td>
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<td>PCIe III, USB 3.0, USB 2.0, USB 2.0</td>
<td>ATX</td>
<td>32°F - 140°F (0°C - 60°C)</td>
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Optional Accessories

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<th>Part Number</th>
<th>Description</th>
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<tr>
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<td>CPU Cooler (2-Ball Bearing, 2U, TDP Max. 100W)</td>
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<td>1709100330</td>
<td>USB 2.0 cable (9P, 330MM, p=2.54mm, w/bracket)</td>
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<td>170910020K</td>
<td>USB 2.0 cable (9P, 200MM, p=2.54mm, w/o bracket)</td>
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<tr>
<td>175921156B</td>
<td>CPU Cooler (2-Ball, Push-pin Type)</td>
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<tr>
<td>1759200172</td>
<td>CPU Cooler (2-Ball, Screw with Retention Plate)</td>
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## ATX-H310A

ATX Industrial Motherboard with 8th/9th Generation Intel® Core™ Processor, DDR4 DRAM, Option: 4G+LTE Function

### Features
- 8th/9th Generation Intel® Core™ LGA1151 Processor
- Supports Max. TDP 6 Core 95W
- DDR4 2666/2400/2133 MHz, max. 64GB
- Two Independent Displays: HDMI x 1, VGA x 1, DP x 1
- Dual Intel® Gigabit Ethernet, i210AT x 1, i219V x 1
- USB 3.2 Gen1 ports x 4, USB 2.0 ports x 5
- M.2 2280/2242 M-key (PCIE1/SAT3A) x 1
- TPM Onboard

### Specifications

#### System
- Processor: Intel® 8th/9th Generation (Coffee Lake-S/Coffee Lake-S Refresh) Core™ i9/ i7/i5/i3, Pentium 14nm LGA 1151 socket Processor, Max. 6 Core 95W
- Chipset: Intel® H310 Express Chipset
- Memory: DIMM x 2, DDR4 (2666/2400/2133 MHz, max. 64GB)
- I/O Chipset: NCT6793D+ F81216HD
- Ethernet: Intel® PHY i219V Giga LAN x 1, Intel® i210AT Giga LAN x 1
- Audio: Realtek® ALC897 6-Channel High Definition Audio CODEC
- Expansion Slots: PCIe 3.0 (x16) Slot x 1, PCIe 2.0 (x4) Slot (open edge) x 2 (#1: 1Lane #2: 2Lanes, only support 1Lane when Mini PCIe slot is installed.), PCI x 3, M.2 2280/2242 M-key (PCIE1/SAT3A) x 1, Mini PCIe + Micro SIM card Slot (optional, default: N/A)
- BIOS: 128Mbit Flash ROM x 1, AMI BIOS
- H/W Monitor: Temperature Monitor on CPU/Chassis, Voltage Monitor on Vcore/5V/3.3V/12V, Fan Monitor on CPU/Chassis
- WatchDog Timer: 1~255 steps by software program
- Smart Fan Control: CPU Fan/ Chassis Fan x 2
- Wake On LAN/ PXE: Yes (WOL / PXE)
- Power State: S3, S4, S5

#### Graphics
- Graphics Chipset: Intel® Graphics Media Accelerator
- Graphics Multi Display: HDMI+VGA, HDMI+DP, VGA+DP
- VGA: Up to 1920 x 1200 @60Hz (via IT6516B)
- DVI: —
- HDMI: Up to 4096 x 2160 @ 30 Hz
- Display Port: Up to 4096 x 2160 @ 24 Hz / 3840 x 2160 @ 60 Hz, with Digital Audio
- LVDS: —
- eDP: —
- Backlight Control: —

#### Environment & Power & ME
- Battery: Lithium battery
- Power Requirement: 24-pin ATX connector x 1, 8-pin (2x4) ATX 12V Power connector x 1
- Operation Temperature: 32°F – 140°F (0°C – 60°C)
- Storage Temperature: -40°F – 185°F (-40°C ~85°C)
- Operation Humidity: 0% ~ 90%RH, non-condensing
- Certificate: CE & FCC Class A
- Form Factor: ATX Form Factor, 12” x 9.6” (305mm x 244mm)

### Packing List
- 14001-00630100 SATA 6G Cable (7P 180; 90, 500mm 2 in 1)
- 14001-00400100 COM Port Cable (9P, 260mm, p=2.54mm w/bracket)
- I/O Shield
- ATX-H310A

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Note: All specifications are subject to change without notice.
**Block Diagram**

**Dimension**

**Ordering Information**

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<td>LGA 1151</td>
<td>DDR4 2666/2400MHz</td>
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<td>DDR4 x 2</td>
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<td>Intel®</td>
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<td>PCIe x2</td>
<td>ATX on-board</td>
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**Optional Accessories**

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<td>USB 3.2 Gen 1 Cable (19P, 450mm, w/bracket)</td>
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<td>USB 2.0 cable (RJ45, 300MM, p=2.54mm, w/bracket)</td>
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<td>USB 3.2 Gen 1 Cable (19P, 450mm, w/bracket)</td>
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<td>17S921156B</td>
<td>CPU Cooler (2-Ball, Push-pin Type)</td>
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<tr>
<td>AP-FNTHQ370010</td>
<td>CPU Cooler (2-Ball Bearing, 2U, TDP Max. 100W)</td>
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*Note: All specifications are subject to change without notice.*
IMBA-Q170A

ATX with 7th/6th Generation Intel® Core™ Processor, DDR4 DRAM, USB x 14, Supports iAMT 11.0

Features
- 7th/6th Generation Intel® Core™ LGA1151 Processor
- DDR4 DRAM Support, 2400 MHz, Max. 64GB
- Three Independent Display: HDMI x 2, VGA x 1
- Dual Intel® Gigabit Ethernet, LAN1 Supports iAMT 11.0
- PCIe [x16] x 1, PCIe [x4] x 2, PCI x 3
- M.2 Slot (M key) x 1, M.2 Slot (E key) x 1
- USB 3.2 Gen 1 Port x 10, USB 2.0 Port x 3

Rear Panel I/O Ports
- USB 3.2 Gen 1 x 10
- Display I/O HDMI x 2, VGA x 1
- Audio I/O Line-in, Mic-in, Line-out
- LAN I/O RJ-45 x 2
- Serial Port DB-9 COM Port x 1 (supports RS-232/422/485, 5V/12V/RSi)
- PS/2 Port Stack Port (Keyboard & Mouse) x 1
- Others —

Internal I/O Connectors
- Storage Supports RAID 0/1/5/10
- USB 2.0 x 3
- Display I/O —
- Audio I/O Speaker header x 1 (Line-out)
- Serial Port RS-232 header x 5
- PS/2 Port —
- Parallel Port —
- BIO 8-bit DIO x 1 (In/Out programmable)
- FAN 4-pin CPU Fan x 1, 4-pin Chassis Fan x 2
- Power —
- Others Front panel header x 1, Clear CMOS jumper x 1, BIOS Flash header (2x4)P
- OS Windows® 7 32/64-bit (not supported when a Kaby Lake processor is used), Windows® 8.1 64-bit (not supported when a Kaby Lake processor is used), Windows® 10 64-bit, Linux Fedora 64bit

Packing List
- 14001-00630100 SATA 6G Cable (7P; 180; 90, 500mm 2 in1)
- 14001-00400100 COM Port Cable (99; 260mm, p=2.54mm w/bracket)
- I/O Shield
- IMBA-Q170A
Block Diagram

Dimension

Ordering Information

Optional Accessories

Note: All specifications are subject to change without notice.
IMBA-H110A

ATX with 7th/6th Generation Intel® Core™ Processor, DDR4 Max. 32GB, M.2 x 1, USB x 10

Specifications

Features

- 7th/6th Generation Intel® Core™ LGA1151 Processor
- DDR4 DRAM Support, 2400 MHz, Max. 32GB
- Two Independent Display: HDMI x 1, DP x 1, VGA x 1
- Dual Intel® Gigabit Ethernet
- M.2 Slot (M key) x 1
- USB 3.2 Gen 1 Port x 4, USB 2.0 Port x 6
- TPM onboard

Rear Panel I/O Ports

<table>
<thead>
<tr>
<th>Port Type</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB</td>
<td>3.2 Gen 1 x 4, 2.0 x 2</td>
</tr>
<tr>
<td>Display I/O</td>
<td>HDMI x 1, DP x 1, VGA x 1</td>
</tr>
<tr>
<td>Audio I/O</td>
<td>Line-in, Mic-in, Line-out</td>
</tr>
<tr>
<td>LAN I/O</td>
<td>RJ-45 x 2</td>
</tr>
<tr>
<td>Serial Port</td>
<td>DB-9 COM x 1 supports RS-232/422/485</td>
</tr>
<tr>
<td>PS/2 Port</td>
<td>Stack Port (Keyboard &amp; Mouse) x 1</td>
</tr>
<tr>
<td>Others</td>
<td>---</td>
</tr>
</tbody>
</table>

Internal I/O Connectors

- Storage: SATA 6.0Gb/s x 3, M.2 M key (22 x 80mm) x 1
- USB: USB 2.0 x 4
- Audio I/O: Speaker header x 1 (Line-out)
- Serial Port: RS-232 header x 5
- PS/2 Port: ---
- Parallel Port: ---
- DIO: 8-bit x 1 (In/Out programmable)
- FAN: 4-pin CPU Fan x 1, 4-pin Chassis Fan x 2
- Power: Front panel header x 1, Clear CMOS jumper x 1, BIOS flash header (2x4P p=1.27mm) x 1, Chassis Intrusion x 1, AT/ATX mode select jumper x 1
- OS: Windows® 7 32/64-bit (not supported when a Kaby Lake processor is used), Windows® 8.1 64-bit (not supported when a Kaby Lake processor is used), Windows® 10 64-bit, Linux Fedora 64bit

Packing List

- 14001-0063010 SATA 6G Cable (7P, 180; 90, 500mm 2 in1)
- 14001-00400100 COM Port Cable (9P, 260mm, p=2.54mm w/bracket)
- I/O Shield
- IMBA-H110A
Block Diagram

**DIMENSION**

Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>IMBA-H110A-A11-210</td>
<td>LGA1151 socket</td>
<td>DDR4</td>
<td>Fan</td>
<td>HDMI x 1, DP x 1, VGA x 1</td>
<td>M.2 M key 2280 x 1, SATA3 x 3</td>
<td>—</td>
<td>PCIe x 2</td>
<td>USB 3.2 Gen 1 x 4, USB3.0 x 8</td>
<td>5</td>
<td>1</td>
<td>PCIe(x16) x 1, PCIe(x4) x 1, PCIe x 4</td>
<td>ATX</td>
<td>onboard</td>
<td>32°F – 140°F (0°C – 60°C)</td>
</tr>
</tbody>
</table>

Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1709100330</td>
<td>USB 2.0 cable (9P, 330MM, p=2.54mm, w/bracket)</td>
</tr>
<tr>
<td>170910020K</td>
<td>USB 2.0 cable (9P, 330MM, p=2.54mm, w/o bracket)</td>
</tr>
<tr>
<td>175921156B</td>
<td>CPU Cooler (2-Ball, Push-pin Type)</td>
</tr>
<tr>
<td>1759200172</td>
<td>CPU Cooler (2-Ball, Screw with Retention Plate)</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
10

Industrial Server
# ARES-WHI0

## Features
- ATX Server Board
- Single Intel 3rd Gen. Xeon® Scalable Ice Lake-SP processor
- Intel® Communications Chipset C621A
- DDR4 2666 MHz R-DIMM Slot x 6
- SATA III x 8, supporting RAID 0, 1, 5, 10
- M.2 2280 M-Key with PCIe [x4] signal
- Dual LAN with Intel® i210 Gigabit Ethernet Controller
- Audio In/Out and VGA
- TPM, DIO pin header reserved, and Case Open Support
- USB 3.0 x 6
- PCIe Gen 4 [x16] x 3, PCIe Gen 4 [x8] x 1, PCIe Gen 4 [x4] x 1, PCIe Gen 3 [x4] x 2
- 4-pin fan headers (up to 5 fans) x 5
- Operating Temperature Range 32°F – 140°F (0°C – 60°C)

## Specifications

### System

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>ATX Server Board Whitely Platform</td>
</tr>
<tr>
<td>Processor</td>
<td>Single Intel® Xeon® Processor Ice Lake-SP processor, supports up to 270W</td>
</tr>
<tr>
<td>System Memory</td>
<td>DDR4 2666MHz R-DIMM Slot x 6, supports up to 192GB (32GB per DIMM)</td>
</tr>
<tr>
<td>Chipset</td>
<td>Intel®C621A</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Intel® i210 Gigabit Ethernet x 2</td>
</tr>
<tr>
<td>COM</td>
<td>RS-232 x 1</td>
</tr>
<tr>
<td>BIOS</td>
<td>AMI BIOS</td>
</tr>
<tr>
<td>Serial ATA</td>
<td>SATA III port x 8</td>
</tr>
<tr>
<td>Audio and VGA</td>
<td>1</td>
</tr>
</tbody>
</table>

### Expansion Interface

PCIE 1: 1 x PCIe x16 (Gen4 x16) slot  
PCIE 2: 1 x PCIe x8 (Gen3 x8) slot  
PCIE 3: 1 x PCIe x16 (Gen4 x16) slot  
PCIE 4: 1 x PCIe x8 (Gen4 x8) slot  
PCIE 5: 1 x PCIe x16 (Gen4 x16) slot  
PCIE 6: 1 x PCIe x8 (Gen3 x4) slot  
PCIE 7: 1 x PCIe x8 (Gen4 x4) slot  

### Watchdog Timer

1~255 steps by software programming

### RTC

Internal RTC

### System Fan

4-pin fan headers x 5 (up to 5 fans)

### Front I/O Panel

N/A

### Rear I/O Panel

USB 3.0 x 6, 10b RJ45 LAN x 2, AUDIO in and out x 1, VGA x 1

### Color

N/A

### Power Supply

ATX

### Dimension

12.0” x 9.8” (305mm x 244 mm)

---

Note: All specifications are subject to change without notice.
Dimension

Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Chipset</th>
<th>RAM</th>
<th>Storage</th>
<th>RAID Support</th>
<th>Display</th>
<th>LAN</th>
<th>USB</th>
<th>Serial port</th>
<th>Expansion interface</th>
<th>Power requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARES-WHI0-A10-00</td>
<td>Lewisburg C621A</td>
<td>288pin R-DIMM slot x 6</td>
<td>Supporting SATA slot x 8, M.2 M-Key 2280 x 1</td>
<td>RAID 0,1,5,10</td>
<td>VGA x 1</td>
<td>GbE x 2</td>
<td>USB 3.0 x 6</td>
<td>COM x1</td>
<td>[PCI-E 3.0 x 16] x 3, [PCI-E 3.0 x 4] x 3, [PCIE-3.0 x 16] x 3</td>
<td>ATX</td>
</tr>
</tbody>
</table>

Packing List

- ARES-WHI0 server board x1
- CPU carrier x1
- I/O Cable x2
- I/O Shield x1

Optional Accessories

- 1709070800
  SATA CABLE.7P Pitch 1.27mm.80cm.W/Lock

Note: All specifications are subject to change without notice.
Industrial Server System

### Features
- 4U Rackmount Server System
- Dual Intel® Xeon® Processor Skylake-SP and Cascade Lake –SP processor
- Intel® Communications Chipset C621
- DDR4 2133/2400/2666 MHz DIMM (8 DIMM Per CPU) RDIMM x 16, Up to 512 GB
- IPMI Support
- Up to 32 Gigabit Ethernet Ports Via NIM (Project Base Up to 32 Gigabit Ethernet Ports Via NIM)
- 6 x 3.5” SATA HDD or 2.5” SATA HDD x 6, M.2 2260 Socket x 1
- Option Rear Side PCIe [x4] x 4 (or PCIe [x8] x 2) + PCIe [x8] x 2 (Or PCIe [x16] x 1)
- Option Front PCIe [x16] x 2
- Optional Parallel LCM with Keypad x 1
- RJ-4S Console x 1, USB 3.0 x 2, 1 GbE LAN x 2
- 800~1600W CRPS Redundant Power

### Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>4U Rackmount Server System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel® Xeon® Skylake-SP and Cascade Lake-SP Processors</td>
</tr>
<tr>
<td>System Memory</td>
<td>DDR4 2133/2400/2666 R-DIMM, Up to 512 GB</td>
</tr>
<tr>
<td>Chipset</td>
<td>Intel® C621</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Intel® i211 Gigabit Ethernet x 2</td>
</tr>
<tr>
<td>BIOS</td>
<td>AMI BIOS</td>
</tr>
<tr>
<td>Serial ATA</td>
<td>SATA II port x 6</td>
</tr>
<tr>
<td>Storage</td>
<td>2.5” HDD x 6 or 3.5” HDD x 6, M.2 x 1</td>
</tr>
<tr>
<td>Expansion Interface</td>
<td>NIM slot x 4 (Project Base NIM Slot x 0) Option front PCIe [x16] slots x 2 Option rear side PCIe [x4] x 4 (or PCIe [x8] x 2) + PCIe [x8] x 2 (Or PCIe [x16] x 1) M.2 Slot x 1 Mini PCIe x 1</td>
</tr>
<tr>
<td>Watchdog Timer</td>
<td>1~255 steps by software programmable</td>
</tr>
<tr>
<td>RTC</td>
<td>Internal RTC</td>
</tr>
<tr>
<td>System Fan</td>
<td>5</td>
</tr>
<tr>
<td>Front I/O Panel</td>
<td>Power LED x 1, Status LED x 1, HDD Active LED x 1</td>
</tr>
<tr>
<td>Rear I/O Panel</td>
<td>AC Power Input x 1, Power Switch x 1, VGA port (Optional), Rear Expansion Slot (Option)</td>
</tr>
<tr>
<td>Color</td>
<td>Black</td>
</tr>
<tr>
<td>Power Supply</td>
<td>800 ~1600W Redundant PSU</td>
</tr>
<tr>
<td>Dimension</td>
<td>(480mm x 600mm x 176mm)</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>TBD</td>
</tr>
<tr>
<td>MTBF (Hours)</td>
<td>TBD</td>
</tr>
<tr>
<td>Display</td>
<td>Chipset AST2500 Graphic Engine From IPMI or Mini PCIe Option Resolution — Connector VGA Option</td>
</tr>
<tr>
<td>I/O</td>
<td>Serial Port RJ-4S Console x 1 K/B and Mouse N/A USB USB 3.0 x 2</td>
</tr>
<tr>
<td>Environmental</td>
<td>Operating Temperature 32°F ~ 104°F (0°C ~ 40°C) Storage Temperature -4°F ~ 140°F (-20°C ~ 60°C) Operating Humidity 10% ~ 80% relative humidity, non-condensing Storage Humidity 10% ~ 80% @40°C, non-condensing Vibration 0.5 g rms/ 5 ~ 500Hz / operation (2.5” Hard Disk Drive) 1.5 g rms/ 5 ~ 500Hz / non operation Shock 10 G peak acceleration (11 m sec. duration), operation 20 G peak acceleration (11 m sec. duration), non operation</td>
</tr>
</tbody>
</table>

Note: All specifications are subject to change without notice.
Ordering Information

• TBD

Packing List

• ZEUS-PUR0

Optional Accessories

• TBD

Note: All specifications are subject to change without notice.
**Features**

- 4U Rackmount Server System
- Single 3rd Generation Intel® Xeon® Scalable Ice Lake-SP CPU
- Intel® Communications Chipset C621A
- DDR4 2666MHz R-DIMM Slot x 6
- IPMI Support, optional
- 3.5” SATA HDD or 2.5” SATA HDD x 8, M.2 2280 M key socket x 1
- Rear side PCIe 3.0 [x16] x 3, PCIe 3.0 [x4] use PCIe [x8] slot x 3, PCIe 3.0 [x8] x 1
- 800W Mini Redundant PSU or 1600W CRPS PSU

**Specifications**

<table>
<thead>
<tr>
<th>System Fan</th>
<th>Middle Fan x 3 (Default), Rear Fan x 2 (Optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front I/O Panel</td>
<td>AC Power Input x 1, Power Switch button x 1, USB 3.1 Gen 1 x 6 (Type-A), 1Gb RJ45 LAN x 2, AUDIO in and out x 1, VGA x 1, Rear Expansion Slots x 7</td>
</tr>
<tr>
<td>Rear I/O Panel</td>
<td>1~255 steps by software programmable</td>
</tr>
<tr>
<td>Color</td>
<td>Black</td>
</tr>
<tr>
<td>Power Supply</td>
<td>800W mini redundant PSU; 1600W CRPS PSU, optional</td>
</tr>
<tr>
<td>Dimension</td>
<td>23.5” x 17” x 6.8” (597.2mm x 430mm x 174.8mm)</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>—</td>
</tr>
<tr>
<td>Display</td>
<td>Internal RTC</td>
</tr>
<tr>
<td>RTC</td>
<td>—</td>
</tr>
<tr>
<td>System</td>
<td>Middle Fan x 3 (Default), Rear Fan x 2 (Optional)</td>
</tr>
<tr>
<td>Fan</td>
<td>AC Power Input x 1, Power Switch button x 1, USB 3.1 Gen 1 x 6 (Type-A), 1Gb RJ45 LAN x 2, AUDIO in and out x 1, VGA x 1, Rear Expansion Slots x 7</td>
</tr>
<tr>
<td>Color</td>
<td>Black</td>
</tr>
<tr>
<td>Power Supply</td>
<td>800W mini redundant PSU; 1600W CRPS PSU, optional</td>
</tr>
<tr>
<td>Dimension</td>
<td>23.5” x 17” x 6.8” (597.2mm x 430mm x 174.8mm)</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>—</td>
</tr>
</tbody>
</table>

**Display**

- Chipset: SM750
- Graphic Engine: —
- Resolution: 1920x1080 (WIN Server 2019); 800x600 (CentOS 7.3)
- Connector: VGA

**I/O**

- Serial Port: COM x 1
- K/B and Mouse: —
- USB: USB 3.1 Gen 1 x 6 (Type-A)

**Environmental**

- Operating Temperature: 32°F ~ 104°F (0°C ~ 40°C)
- Storage Temperature: -40°F ~ 185°F (-40°C ~ 85°C)
- Operating Humidity: 10% ~ 90% relative humidity, non-condensing
- Storage Humidity: 10% ~ 80% @40°C; non-condensing
- Vibration: 0.5 g rms/5 ~ 500Hz / operation (3.5” Hard Disk Drive)
- Shock: 10 G peak acceleration (11 m sec. duration), operation

Note: All specifications are subject to change without notice.
### Ordering Information

| Part Number  | Chipset         | RAM              | Storage          | RAID Support | Display  | LAN      | USB                  | Serial port         | Expansion Interface | Power                  |
|--------------|-----------------|------------------|-------------------|--------------|----------|---------|---------|----------------------|----------------------|-----------------------|-----------------------|
| ZEUS-WHIO-A10-00 | Lewisburg C621A | 288pin R-DIMM slot x 6 | Internal 3.5" HDD bays x 6 M.2 M-Key 2280 x 1 | RAID 0,1,5,10 | VGA x 1  | GbE x 2 | USB 3.0 x 2 (USB 2.0 Signal) | COM x1 | [PCI-E 3.0 x 16] x 3, [PCI-E 3.0 x 4] x 4, [PCI-E 3.0 x 8] x 3, [PCI-E 3.0 x 8] x 1 | 800W Mini Redundant PSU |

### Packing List

- ZEUS-WHIO x 1

### Optional Accessories

- 1709070800
  SATA CABLE: 7P Pitch 1.27mm, 80cm, W/Lock
# ARES-EAGO

Intel® Eagle Stream Platform Server Board, Supporting 4th Generation Intel® Xeon® Scalable Processors (formerly Sapphire Rapids-SP)

## Launching in Q1

## Features
- EATX Server Board
- Dual 4th Generation Intel® Xeon® Scalable Processors (formerly Sapphire Rapids-SP)
- Intel® Emmitsburg Chipset
- DDR5 4800 MHz R-DIMM Slot x 12
- SATA3 port x 2, miniSAS x 1 (up to SATA x 4), SlimSAS 4i x 1, SlimSAS 8i x 4
- M.2 2280 M-Key (PCIe [x4])
- GbE LAN x 1, 10GbE LAN x 2
- VGA x 1, Audio In Out (Optional)
- TPM, Digital IO pin header reserved, and Case open Support
- PCIe Gen.5 [x16] x 6
- 4-Pin Fan Header x 5 (up to 5 fans), CPU/System Overheat LED, Suspend Static Indicator LED
- Operating Temperature Range 32°F ~ 140°F (0°C ~ 60°C)

## Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>EATX Server Board Eagle Stream Platform</td>
</tr>
<tr>
<td>Processor</td>
<td>Dual 4th Generation Intel® Xeon® Scalable Processors (formerly Sapphire</td>
</tr>
<tr>
<td></td>
<td>Rapids-SP)</td>
</tr>
<tr>
<td>System Memory</td>
<td>DDR5 4800 MHz R-DIMM Slot x 12</td>
</tr>
<tr>
<td>Chipset</td>
<td>Intel® Emmitsburg PCH</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Intel® I226LM LAN controller x 1, Intel® X550-AT2 x 1</td>
</tr>
<tr>
<td>COM</td>
<td>Pin header x 1</td>
</tr>
<tr>
<td>BIOS</td>
<td>AMI BIOS</td>
</tr>
<tr>
<td>Serial ATA</td>
<td>SATA III port x 2, miniSAS x 1 (up to 4x SATA)</td>
</tr>
<tr>
<td>Audio and VGA</td>
<td>VGA x 1, Audio In Out (Optional)</td>
</tr>
<tr>
<td>Expansion Interface</td>
<td>PCIe 1: PCIe Gen 5 [x16] x 1</td>
</tr>
<tr>
<td></td>
<td>PCIe 2: PCIe Gen 5 [x16] x 1</td>
</tr>
<tr>
<td></td>
<td>PCIe 3: PCIe Gen 5 [x16] x 1</td>
</tr>
<tr>
<td></td>
<td>PCIe 4: PCIe Gen 5 [x16] x 1</td>
</tr>
<tr>
<td></td>
<td>PCIe 5: PCIe Gen 5 [x16] x 1</td>
</tr>
<tr>
<td></td>
<td>PCIe 6: PCIe Gen 5 [x16] x 1</td>
</tr>
<tr>
<td>Watchdog Timer</td>
<td>1~255 steps by software programming</td>
</tr>
<tr>
<td>RTC</td>
<td>Internal RTC</td>
</tr>
<tr>
<td>System Fan</td>
<td>4-pin fan headers x 5 (up to 5 fans)</td>
</tr>
<tr>
<td>Front I/O Panel</td>
<td>—</td>
</tr>
<tr>
<td>Rear I/O Panel</td>
<td>USB 3.2 Gen 1 x 4, 2.5GbE LAN x 1, 10GbE LAN x 2, VGA x 1, COM x 1</td>
</tr>
</tbody>
</table>

## Display
- Chipset: AST2510
- Graphic Engine: —
- Resolution: TBD
- Connector: VGA

## I/O
- Serial Port: COM x 1 Pin
- K/B and Mouse: —
- USB: USB 3.2 Gen 1 x 4

## Environment
- Operating Temperature: 32°F ~ 140°F (0°C ~ 60°C)
- Storage Temperature: -4°F ~ 140°F (-20°C ~ 60°C)
- Operating Humidity: 10%~80% relative humidity, non-condensing
- Storage Humidity: 10%~80% @40°C; non-condensing
- Vibration: 0.5 g rms/5 ~ 500Hz / operation (2.5” Hard Disk Drive)
  1.5 g rms/5 ~ 500Hz / non operation
- Shock: 10 G peak acceleration (11 m sec. duration), operation
  20 G peak acceleration (11 m sec. duration), non operation

## Packing List
- TBD

## Ordering Information
- TBD

## Optional Accessories
- TBD

Note: All specifications are subject to change without notice.