



Unveiling AAEON Solutions Empowered by the Intel® Atom™ E3900 Series, Intel® Celeron® N3350, and Intel® Pentium® N4200 SoCs (Formerly Apollo Lake)

White Paper



AAEON®
an ASUS® assoc. co.

Table of Contents

Table of Contents	2
Overview	3
PICO-APL3	4
GENE-APL5	4
NanoCOM-APL	5
COM-APLC6	5
EMB-APL1	6
BOXER-6616	6
ACP-1106 & ACP-1076	7
UPS-GWS01	7
FWS-2271 & FWS-2272	8
ICS-6270	8
Conclusion	9
About AAEON	9



Shortly after the launch of the 7th Generation of Intel® Core™ branded processors (formerly Kaby Lake), Intel® also launched the entry-level counterpart SoCs consisting of Intel® Atom® processor E3900 series, Intel® Celeron® processor N3350, and Intel® Pentium® processor N4200 (formerly Apollo Lake). The latest generation of Atom™, Celeron® and Pentium® SoCs succeed their predecessors (formerly Braswell) by offering major technological enhancements and it is obvious that these architectural upgrades are designed not only for entry-level devices but also today's embedded applications.



Major Performance Boost, TDP Remains Low



According to Intel® tick-tock roadmap, the latest Intel® Atom™, Celeron® and Pentium® SoCs are built in 14nm microarchitecture. But aside from the small die package, the new generation SoCs promise major architectural enhancements leveraged from the 6th Generation of Intel® Core™-I (formerly Skylake), providing a performance boost by approximately 30%, while power consumptions still remain low, around 6 to 12 TDP. The 30% performance upgrade is considered a major step, when making a comparison with the slight improvements found in their predecessors.

Improved Graphic Processing



Leverage from the graphic core in previous generations, the new generation of Intel® entry-level SoCs families support Intel® HD Graphics 500/505 graphic engine (Intel® Gen9), offering around 40 to 45% boost in processing performance and enabling 4K related applications. The graphic processing upgrade also enables the output of eDP, DP, HDMI, and MIPI-DSI.

Memory and Storage Advancement



Memory bandwidth and storage advancements are also found in the latest Intel® Atom™, Celeron® and Pentium® SoCs, such as the support of LPDDR4 memory at 2,133 MT/s and eMMC 5.0 for NAND Flash storages.

The major architectural enhancements in performance, graphic and memory in the latest generation of Intel® Atom™, Celeron® and Pentium® SoCs can be considered as the revolutionary design to compete with ARM SoCs.

AAEON has adopted Intel® Atom® processor E3900 series, Intel® Celeron® processor N3350, and Intel® Pentium® processor N4200 in various product lineup to meet different application needs, including Pico-ITX, Mini-ITX, SubCompact SBCs, COM Express Type 10, Type 6 CPU modules, Box PC, Panel PC, IOT Gateway, and network appliances.

PICO-APL3

Aside from the benefits in ultra-compact Pico-ITX form factor, the new PICO-APL3 board is empowered by the Intel® Pentium® N4200/ Celeron® N3350 Processor and DDR3L memory, boosting the processing performance up to 30%. Built with the latest Intel® architecture, PICO-APL3 supports eMMC 5.0 for NAND Flash storage at 16 GB, optionally upgradable to 32 or 64 GB.

Being a feature-rich Pico-ITX board, PICO-APL3 ITX board supports various functional I/O including HDMI, eDP, USB 3.0, M.2 2230 (PCIe + USB signals), M.2 2280 (SATA + USB signals), MIPI-CSI camera serial interface (optional) and RJ-45 interface. In terms of security, PICO-APL3 supports TPM 2.0 to enable cryptographic encryption.

Empowered by the Intel® Pentium® N4200/ Celeron® N3350 Processor, PiCO-APL3 delivers improved processing and graphic performance beneficial for embedded applications such as digital signage, HMI, and thin client.

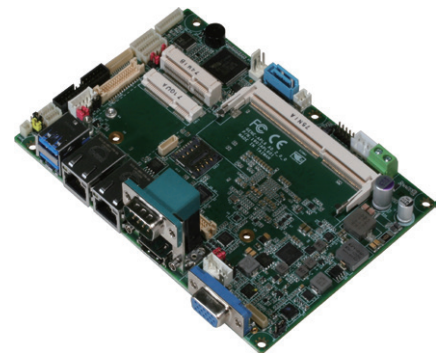


GENE-APL6

The all new GENE-APL6 features subcompact form factor and the latest generation of Intel® 14nm quad-core, low-power SoCs with solder up design which is suitable for any rugged and space-limited applications.

GENE-APL6 has richest I/O, wide DC input 9~36V, and powerful video engine including triple independent display with 2x LVDS and VGA. It also provides an option for HDMI output port compatible with 4K media playback.

GENE-APL6 can be easily deployed for any embedded applications including transportation, automation and digital signage in elevators.



NanoCOM-APL

NanoCOM-APL is AAEON's new COM Express Type 10 module featuring the latest generation Intel® Atom™ E3900 series SoC. The new NanoCOM module offers higher performance than its previous generation, while power consumptions remain low. Regarding memory bandwidth, NanoCOM supports LPDDR4 to deliver superior performance and power usage to the DDR3 counterpart.

Designed for embedded applications, NanoCOM-APL supports multiple I/O interfaces for peripheral devices including eDP/LVDS/DDI display, the latest eMMC 5.0, USB 2.0/3.0, SATA, UART, and PCI-Express. In addition, NanoCOM-APL is built in with Intel® I210/I211 Ethernet controller when deployed for networking purpose. With the scalability by rich I/O and high performance, the new NanoCOM-APL can shorten the deployment time for applications in ticketing, POS, gaming, transportation and automation.



COM-APLC6

COM-APLC6 is AAEON's new COM Express Type 6 module featuring the latest Intel® Atom™ E3900 series SoC and two DDR3L up to 8GB each with ECC enabled for data integrity. Due to major architectural upgrade of the new Intel® Atom™ SoC, the new COM-APLC6 offers enhanced performance than previous COM Express modules while power consumption remains low.

In addition, COM-APLC6 supports Intel® I210 Ethernet controller for networking usages. Being a feature-rich embedded board, COM-APLC6 is designed with various I/O interfaces including VGA display (via DDI), LVDS display (via eDP), HD audio, SATA 6.0 Gbps ports, microSD card slot, multiple USB 3.0/2.0 ports, PCI-Express socket, PWM fan connectors and 12V DC input. The comprehensive features enable COM-APLC6 to be easily deployed in mission-critical applications.

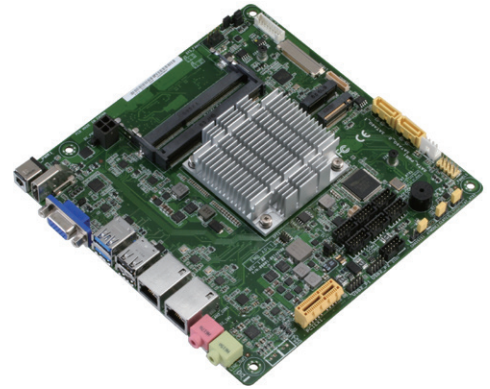


EMB-APL1

EMB-APL1 is the new member of AAEON's Mini-ITX motherboard lineup. The new Mini-ITX board is empowered by Intel® Pentium® N4200/ Intel® Celeron® N3350 SoC, low power processor. With major architectural upgrade by the new Intel® SoC, EMB-APL1 offers enhanced performance and supports DDR3L SODIMM memory.

With advanced graphic engine, EMB-APL1 supports three independent display interfaces: VGA, HDMI and LVDS/eDP. Regarding connections with LAN I/O, EMB-APL1 comes with two Realtek 8111G Ethernet controller. For industrial applications, the new Mini-ITX board provides six COM ports (5 x RS-232 and 1 x RS-232/422/485), allowing connections with peripheral instruments.

EMB-APL1 offers multiple expansion slots including two M.2 interfaces and one PCI Express socket. When deploying EMB-APL1 in certain applications where security is needed, the Mini-ITX board is optionally available with a TPM module to enable cryptographic computing.



BOXER-6616

BOXER-6616 is AAEON's new entry-level Box PC member driven by Intel® Pentium N4200 or Celeron® N3350 SoC and DDR3L SODIMM memory up to 8GB. With the generation of Intel® platform, BOXER-6616 offers high performance and low power consumption.

As a highly-integrated embedded controller, BOXER-6616 provides six COM I/Os (4 x RS-232 and 2 x RS-232/422/485), four USB 3.0 ports, dual display with VGA + HDMI, SATA and mSATA storage sockets, and a protected DC 9-24V power input. In addition, BOXER-6616 comes with value-added features including AAEON's Hi-Safe Support and "Microsoft Azure Certified".



ACP-1106 & ACP-1076

ACP-1106 and ACP-1076 are both newly added into AAEON's ACP-1000 product family. Both new members of the ACP-1000 product family show the similar features of ACP-1000 product family, like the elegant outlook, customizable panel, and IP 65 front bezel. Internally, the new ACP—1106 and ACP-1076 are driven by Intel® Pentium® N4200/ Celeron® N3350 Processor and built-in DDR3L 4GB memory. The new Intel® platform offer ACP-1106 and ACP-1076 enhanced performance and power efficiency, which are optimal for smart city applications or data-driven services.



Except the difference in dimensions (10.1" for ACP-1106 and 7" for ACP-1076), both new panel PCs share many similar features like two 10/100/1000 BASE-TX RJ-45 ports, 1 x mSATA socket, 1 x mini-card socket, projected capacitive multi-touch, IP65 aluminum front bezel, fanless design, VESA mount option and DC 9-30V power.

UPS-GWS01

UPS-GWS01 is a highly integrated UP Square system empowered by Intel® Pentium® N4200/ Celeron® N3350 Processor SoC to deliver exceptional performance while power consumption is kept at minimal. The palm-sized UPS-GWS01 also offers CPLD/FPGA malfunctioning switching capability.

Designed for IoT or IIoT deployments, UPS-GWS01 consolidates all the I/O features including LPDDR4 memory, eMMC storage, Gigabit LAN, powerful Intel® Gen9 graphic engine, HDMI and USB 3.0/2.0 ports. In addition, UPS-GWS01 is expandable when accompanied with I/O connectors.



FWS-2271 & FWS-2272

ACP-1106 and ACP-1076 are both newly added into AAEON's ACP-1000 product family. Both new members of the ACP-1000 product family show the similar features of ACP-1000 product family, like the elegant outlook, customizable panel, and IP 65 front bezel. Internally, the new ACP—1106 and ACP-1076 are driven by Intel® Pentium® N4200/ Celeron® N3350 Processor and built-in DDR3L 4GB memory. The new Intel® platform offer ACP-1106 and ACP-1076 enhanced performance and power efficiency, which are optimal for smart city applications or data-driven services.

Except the difference in dimensions (10.1" for ACP-1106 and 7" for ACP-1076), both new panel PCs share many similar features like two 10/100/1000 BASE-TX RJ-45 ports, 1 x mSATA socket, 1 x mini-card socket, projected capacitive multi-touch, IP65 aluminum front bezel, fanless design, VESA mount option and DC 9-30V power.



ICS-6270

ICS-6270 is a DIN Rail, industrial-grade fanless network appliance for ICS cyber security. This new AAEON's rugged platform is powered by Intel® Celeron® N3350 SoC. With the performance upgrade and power efficiency enabled by the new Intel® platform, ICS-6270 can execute security instructions as the firewall to protect the industrial control systems and SCADA.

Functionality wise, ICS-6270 provides six Ethernet ports (with up to 2 pairs of LAN bypass) and two COM ports with RS-232/422/485 and ESD protection. As an industrial firewall, ICS-6270 is built to be rugged in order to function in harsh environment. The firewall can operate from -40°C to 75°C ambient temperature.



Conclusion

In order to retain market leadership, it is crucial to leverage all of the technological benefits from advanced hardware architecture. By implementing the latest processing units into our products, AAEON will continue to deliver high-quality and technologically advanced solutions to meet all kinds of application demands.

About AAEON

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.

