

PICO-BT01

Pico-ITX Board

User's Manual 9th Ed

Copyright Notice

This document is copyrighted, 2019. All rights are reserved. The original manufacturer reserves the right to make improvements to the products described in this manual at any time without notice.

No part of this manual may be reproduced, copied, translated, or transmitted in any form or by any means without the prior written permission of the original manufacturer. Information provided in this manual is intended to be accurate and reliable. However, the original manufacturer assumes no responsibility for its use, or for any infringements upon the rights of third parties that may result from its use.

The material in this document is for product information only and is subject to change without notice. While reasonable efforts have been made in the preparation of this document to assure its accuracy, AAEMON assumes no liabilities resulting from errors or omissions in this document, or from the use of the information contained herein.

AAEMON reserves the right to make changes in the product design without notice to its users.

Acknowledgement

All other products' name or trademarks are properties of their respective owners.

- Microsoft Windows® is a registered trademark of Microsoft Corp.
- ITE is a trademark of Integrated Technology Express, Inc.
- IBM, PC/AT, PS/2, and VGA are trademarks of International Business Machines Corporation.

All other product names or trademarks are properties of their respective owners.

Packing List

Before setting up your product, please make sure the following items have been shipped:

| Item | Quantity |
|--------------------------|----------|
| ● PICO-BT01 | 1 |
| ● Heat Spreader | 1 |
| ● COM x2, Line-out Cable | 1 |

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

About this Document

This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the AAEON.com for the latest version of this document.

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any AC supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:
 - i. Damaged power cord or plug
 - ii. Liquid intrusion to the device
 - iii. Exposure to moisture
 - iv. Device is not working as expected or in a manner as described in this manual
 - v. The device is dropped or damaged
 - vi. Any obvious signs of damage displayed on the device

18. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4°F) OR ABOVE 60°C (140°F) TO PREVENT DAMAGE.**

Warning!



This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Attention:

Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte. Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

| 部件名称 | 有毒有害物质或元素 | | | | | |
|-----------------|-----------|-----------|-----------|-----------------|---------------|-----------------|
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (Cr(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| 印刷电路板 及其电子组件 | × | ○ | ○ | ○ | ○ | ○ |
| 外部信号 连接器及线材 | × | ○ | ○ | ○ | ○ | ○ |

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。

备注: 此产品所标示之环保使用期限, 系指在一般正常使用状况下。

China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products

AAEON Main Board/ Daughter Board/ Backplane

| Component | Poisonous or Hazardous Substances or Elements | | | | | |
|---|---|--------------|--------------|------------------------------|--------------------------------|---------------------------------------|
| | Lead (Pb) | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (Cr(VI)) | Polybrominated Biphenyls (PBB) | Polybrominated Diphenyl Ethers (PBDE) |
| PCB & Other Components | X | ○ | ○ | ○ | ○ | ○ |
| Wires & Connectors for External Connections | X | ○ | ○ | ○ | ○ | ○ |
| <p>O: The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.</p> <p>X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.</p> <p>Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only</p> | | | | | | |

Table of Contents

| | |
|--|----------|
| Chapter 1 - Product Specifications | 1 |
| 1.1 Specifications..... | 2 |
| Chapter 2 – Hardware Information | 5 |
| 2.1 Dimensions | 6 |
| 2.2 Jumpers and Connectors | 11 |
| 2.3 List of Jumpers | 13 |
| 2.3.1 Clear CMOS Jumper (JP1 1,3,5)..... | 14 |
| 2.3.2 Auto Power Button Enable/Disable Selection (JP1 2,4,6) | 14 |
| 2.3.3 LVDS Port Operating Voltage Selection (JP3) | 14 |
| 2.3.4 LVDS Port Backlight Inverter Voltage Selection (JP4 1,3,5) | 14 |
| 2.3.5 LVDS Port Backlight Lightness Control Mode Selection (JP4,2,4,6) | 15 |
| 2.4 List of Connectors..... | 16 |
| 2.4.1 Battery (CN1)..... | 17 |
| 2.4.2 DDR3L SO-DIMM Slot (CN2) | 17 |
| 2.4.3 VGA Port (CN3) | 17 |
| 2.4.4 DP Port (CN4)..... | 18 |
| 2.4.5 LVDS Port Inverter / Backlight Connector (CN5)..... | 19 |
| 2.4.6 LAN (RJ-45) Port (CN7)..... | 20 |
| 2.4.7 Digital IO Port (CN8)..... | 21 |
| 2.4.8 MiniCard Slot (Full Size)/ Default mSATA (feature select by BOM) | 21 |
| (CN9) | |
| 2.4.9 USB Ports 0 and 1 (CN10) | 24 |
| 2.4.10 USB 2.0 Port 2 (CN11) | 25 |
| 2.4.11 +5V Output for SATA HDD (CN14)..... | 26 |
| 2.4.12 SATA Port (CN15)..... | 26 |
| 2.4.13 LPC Port (CN18)..... | 27 |

| | | |
|--|--|-----------|
| 2.4.14 | Front Panel (CN19)..... | 28 |
| 2.4.15 | External +12V Input (CN20)..... | 28 |
| 2.4.16 | Buzzer Connector (CN21)..... | 29 |
| 2.4.17 | BIO Connector (CN22)..... | 29 |
| 2.4.18 | COM Port 1/2 & Line Out Connector (CN23)..... | 31 |
| 2.4.19 | MiniCard Slot (Half-Mini Card) (CN24)..... | 33 |
| 2.4.20 | LVDS Port (CN25)..... | 36 |
| Chapter 3 - AMI BIOS Setup..... | | 38 |
| 3.1 | System Test and Initialization..... | 39 |
| 3.2 | AMI BIOS Setup..... | 40 |
| 3.3 | Setup Submenu: Main..... | 41 |
| 3.4 | Setup Submenu: Advanced..... | 42 |
| 3.4.1 | Advanced: ACPI Settings..... | 43 |
| 3.4.2 | Advanced: F81801 Super IO Configuration..... | 45 |
| 3.4.2.1 | Super IO Configuration: Serial Port 1 Configuration..... | 46 |
| 3.4.2.2 | Super IO Configuration: Serial Port 2 Configuration..... | 47 |
| 3.4.3 | Advanced: Hardware Monitor..... | 49 |
| 3.4.4 | Advanced: CPU Configuration..... | 50 |
| 3.4.4.1 | CPU Configuration: Socket 0 CPU Information..... | 51 |
| 3.4.5 | Advanced: SATA Configuration..... | 52 |
| 3.4.6 | Advanced: Dynamic Digital IO Configuration..... | 54 |
| 3.4.7 | Advanced: USB Configuration..... | 55 |
| 3.5 | Setup submenu: Chipset..... | 57 |
| 3.5.1 | Chipset: North Bridge..... | 58 |
| 3.5.2 | Chipset: South Bridge..... | 60 |
| 3.5.2.1 | South Bridge: Azalia HD Audio..... | 61 |
| 3.5.2.2 | South Bridge: USB Configuration..... | 62 |
| 3.5.2.3 | South Bridge: PCI Express Configuration..... | 63 |

| | | |
|--|--|-----------|
| 3.6 | Setup submenu: Security..... | 64 |
| 3.7 | Setup submenu: Boot..... | 66 |
| 3.8 | Setup submenu: Save & Exit | 67 |
| Chapter 4 – Drivers Installation..... | | 68 |
| 4.1 | Driver Download/Installation..... | 69 |
| Appendix A - Watchdog Timer Programming..... | | 71 |
| A.1 | Watchdog Timer Registers..... | 72 |
| A.2 | Watchdog Sample Program..... | 73 |
| Appendix B - I/O Information | | 76 |
| B.1 | I/O Address Map..... | 77 |
| B.2 | Memory Address Map | 78 |
| B.3 | IRQ Mapping Chart..... | 79 |
| Appendix C – Electrical Specifications for I/O Ports..... | | 91 |
| C.1 | Electrical Specifications for I/O Ports..... | 92 |
| Appendix D – Mating Connectors..... | | 93 |
| D.1 | List of Mating Connectors and Cables..... | 94 |

Chapter 1

Product Specifications

1.1 Specifications

System

| | |
|-----------------------------|---|
| Form Factor | Pico-ITX |
| CPU | Onboard Intel® Atom™ E3845/ Celeron® J1900/N2807 Processor SoC |
| CPU Frequency | Up to 2.0 GHz |
| Chipset | Intel® E3845/J1900/N2807 |
| Memory Type | 204-pin DDR3L SODIMM x 1, DDR3L 1066/1333, Max. 8GB |
| Max. Memory Capacity | Up to 8GB |
| BIOS | AMI/SPI |
| Wake On LAN | Yes |
| Watchdog Timer | 255 levels |
| Power Requirement | +12VDC |
| Power Supply Type | AT/ATX (default) optional lockable connector |
| Power Consumption (Typical) | Intel® Celeron® J1900 2.0GHz ,DDR3L 1333 MHz 8 GB 1.14A@+12V |
| System Cooling | Heat-spreader, heatsink or cooler optional |
| Dimension | 3.94" x 2.84" (100mm x 72mm) |
| Gross Weight | 0.88lb (0.4 kg) |
| Operating Temperature | 32°F ~ 140°F (0°C ~ 60°C) or WiTAS 1 (-20°C ~ 70°C) |

System

| | |
|---------------------|--|
| Storage Temperature | -40°F ~ 176°F (-40°C ~ 80°C) |
| Operating Humidity | 0% ~ 90% relative humidity, non-condensing |
| MTBF (Hours) | 80,000 |
| Certification | CE,FCC |

I/O

| | |
|----------------|---|
| Storage/SSD | SATA 3.0Gb/s x 1, Mini-Card(Full size)/mSATA(default) x 1 |
| Ethernet | Intel® Gigabit Ethernet, 10/100/1000Base-TX x 1 (Atom E series with I210IT, Celeron J/N series with I211AT) |
| USB Port | USB 3.0 x 1 Rear IO, USB 2.0 x 1 Rear IO and x 1 Pin header |
| Serial Port | RS-232 x 1, RS-232/422/485 x 1 (Ring /+5V/+12V) |
| Audio | Line-out x 1 |
| DIO | 4-bit (2-in, 2-out) |
| Expansion Slot | Mini-Card (Half-size) x 1, BIO x 1 |
| SIM | Option by BIO Board |
| TPM | — |
| Touch | — |

Display

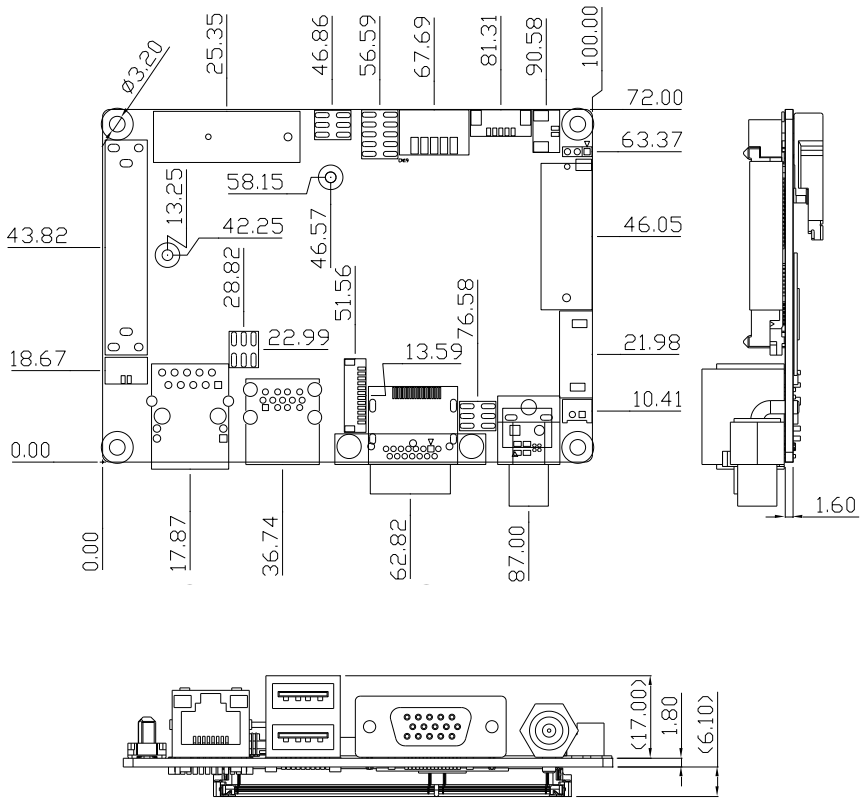
| | |
|----------------------|---|
| Chipset | Intel® E3845/J1900/N2807 |
| Resolution | VGA up to 2048 x 1152 @60Hz or DP up to 2560 x 1400 @60Hz LVDS (18/24-bit) up to 1400 x 900 @60Hz |
| LCD Interface | 18/24-bit Single LVDS |

Chapter 2

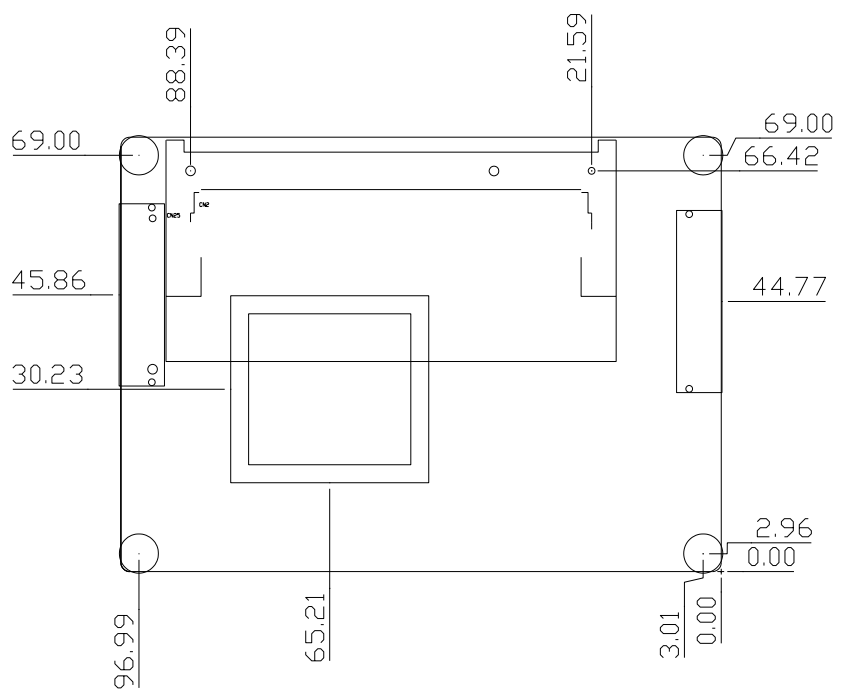
Hardware Information

2.1 Dimensions

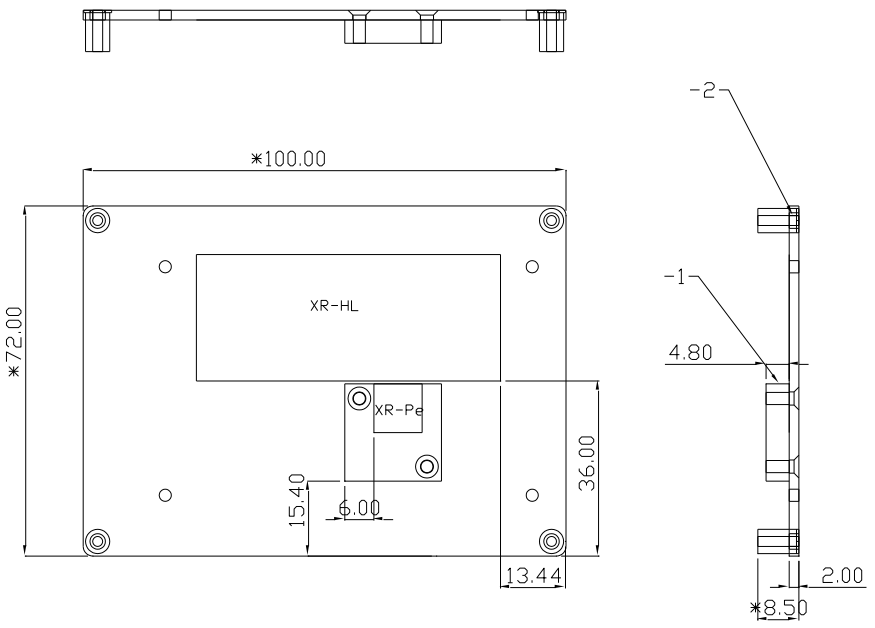
Component Side

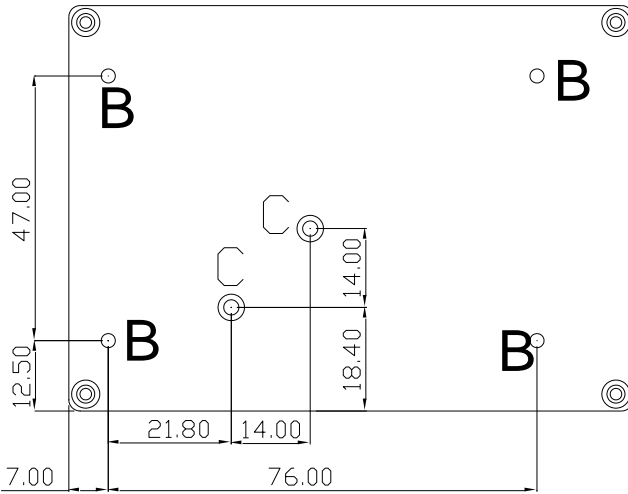
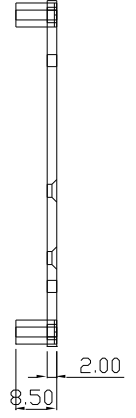
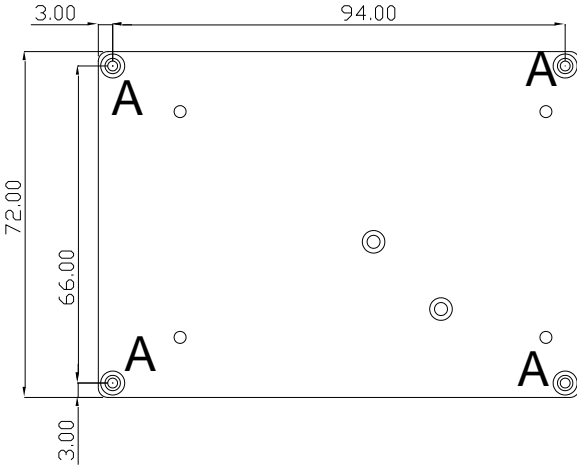


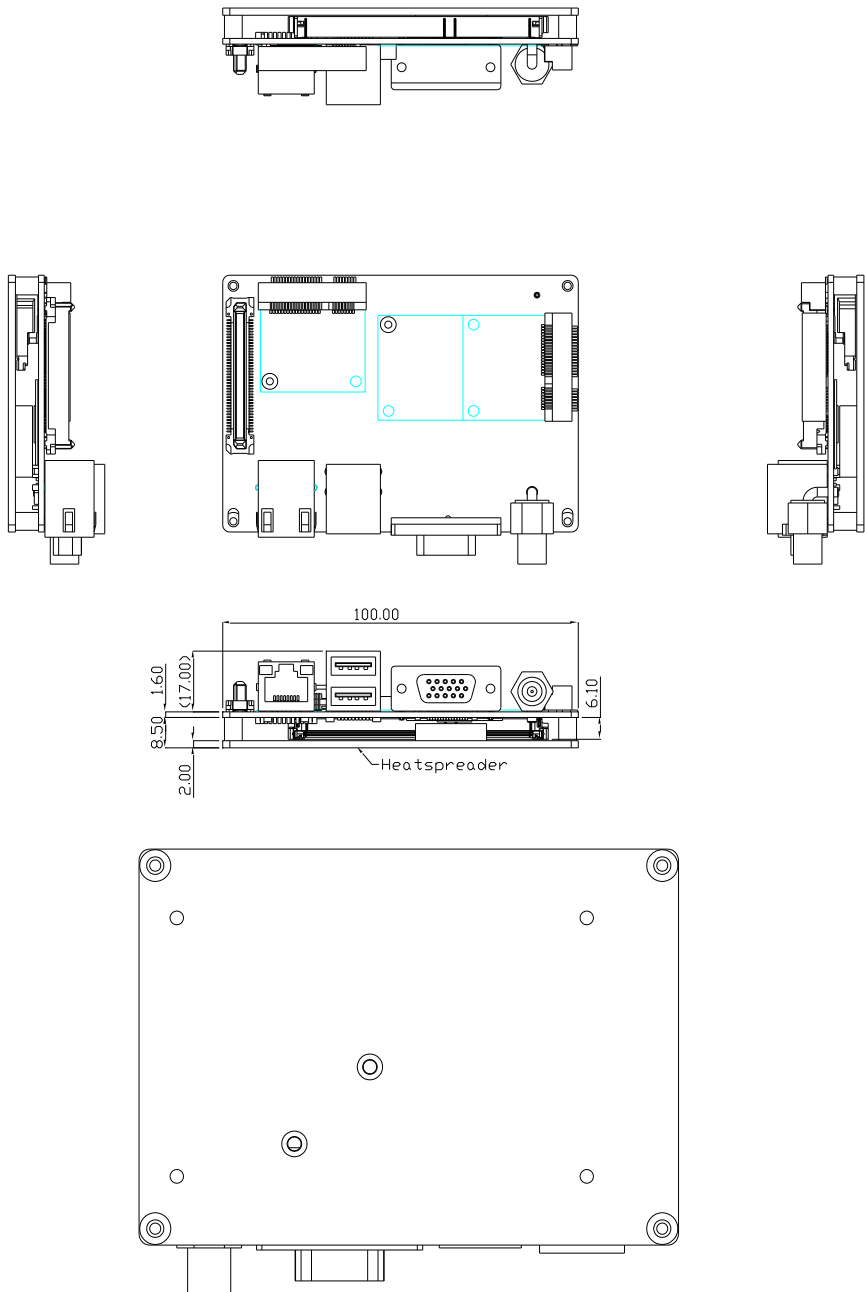
Solder Side



Heat Spreader

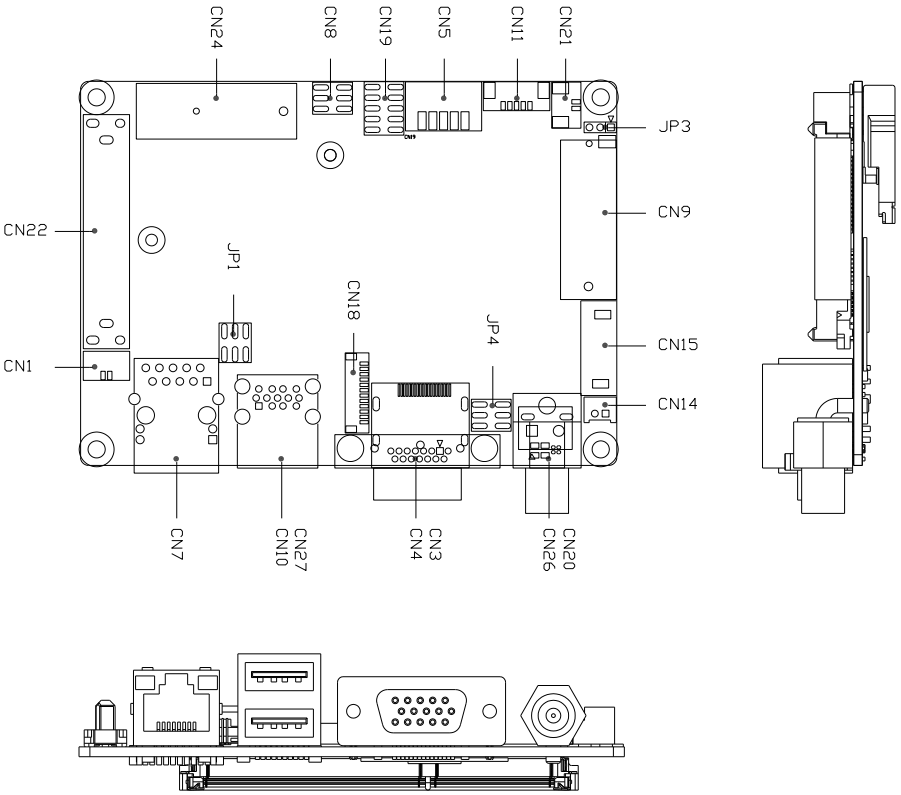




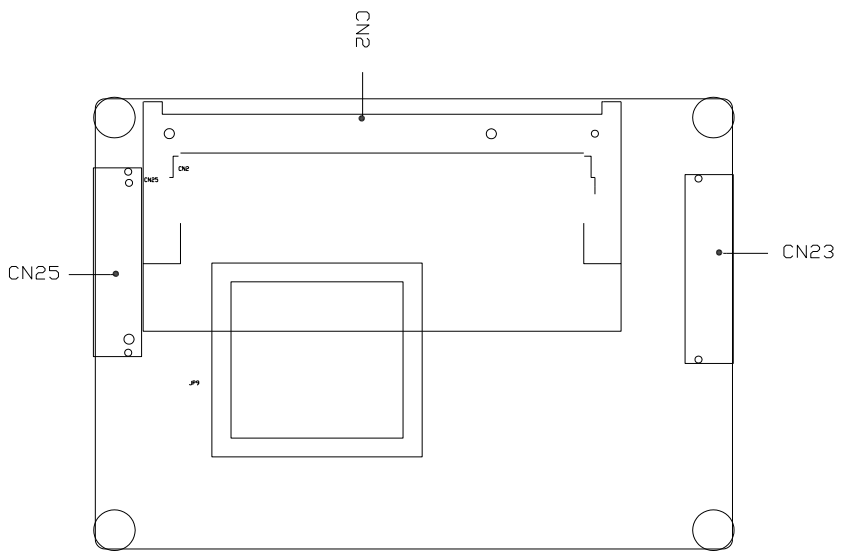


2.2 Jumpers and Connectors

Component Side



Solder Side

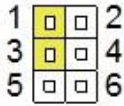


2.3 List of Jumpers

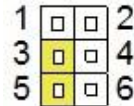
Please refer to the table below for all of the board's jumpers that you can configure for your application

| Label | Function |
|-------------|--|
| JP1 (1,3,5) | Clear CMOS Jumper |
| JP1 (2,4,6) | Auto Power Button Enable/Disable Selection |
| JP3 | LVDS Port Operating Voltage Selection |
| JP4 (1,3,5) | LVDS Port Backlight Inverter Voltage Selection |
| JP4 (2,4,6) | LVDS Port Backlight Lightness Control Mode Selection |

2.3.1 Clear CMOS Jumper (JP1 1,3,5)

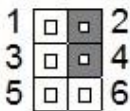


Normal (Default)

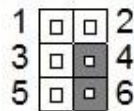


Clear CMOS

2.3.2 Auto Power Button Enable/Disable Selection (JP1 2,4,6)

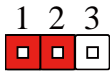


Enable (Default)

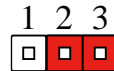


Disable

2.3.3 LVDS Port Operating Voltage Selection (JP3)

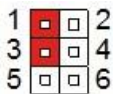


+5V

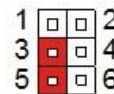


+3.3V (Default)

2.3.4 LVDS Port Backlight Inverter Voltage Selection (JP4 1,3,5)

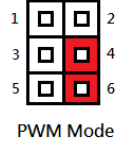
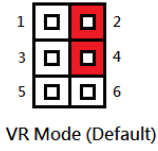


+12V



+5V (Default)

2.3.5 LVDS Port Backlight Lightness Control Mode Selection (JP4,2,4,6)



2.4 List of Connectors

Please refer to the table below for all of the board's connectors that you can configure for your application

| Label | Function |
|-------|--|
| CN1 | Battery |
| CN2 | DDR3L SO-DIMM Slot |
| CN3 | VGA Port |
| CN4 | DP port |
| CN5 | LVDS Port Inverter / Backlight Connector |
| CN7 | LAN (RJ-45) Port |
| CN8 | Digital IO Port |
| CN9 | MiniCard Slot (Full Size)/ Default mSATA (feature select by BOM) |
| CN10 | USB Ports 0 and 1 |
| CN11 | USB 2.0 Port 2 |
| CN14 | +5V Output for SATA HDD |
| CN15 | SATA Port |
| CN18 | LPC Port |
| CN19 | Front Panel |
| CN20 | External +12V Input w/ lockable power-in connector (optional) |
| CN21 | Buzzer connector |
| CN22 | BIO connector |
| CN23 | COM Port 1/2 & line out connector |
| CN24 | Mini-Card Slot (Half-Mini Card) |
| CN25 | LVDS Connector |

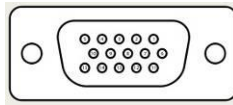
2.4.1 Battery (CN1)

| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | +3.3V | PWR | 3.3V |
| 2 | GND | GND | |

2.4.2 DDR3L SO-DIMM Slot (CN2)

Standard specification

2.4.3 VGA Port (CN3)

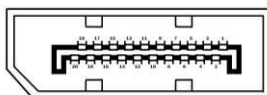


| VGA | | | |
|-----|---------------|-------------|--------------|
| Pin | Pin Name | Signal Type | Signal level |
| 1 | RED | OUT | |
| 2 | GREEN | OUT | |
| 3 | BLUE | OUT | |
| 4 | NC | | |
| 5 | GND | GND | |
| 6 | RED_GND_RTN | GND | |
| 7 | GREEN_GND_RTN | GND | |
| 8 | BLUE_GND_RTN | GND | |
| 9 | +5V | PWR | +5V |

VGA

| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 10 | GND | GND | |
| 11 | NC | | |
| 12 | DDC_DATA | I/O | +5V |
| 13 | HSYNC | OUT | |
| 14 | VSYNC | OUT | |
| 15 | DDC_CLK | I/O | +5V |

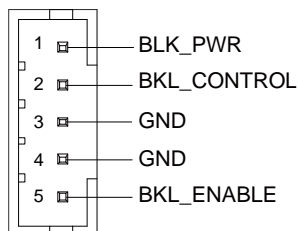
2.4.4 DP Port (CN4)



| Pin | Pin Name | Signal Type | Signal level |
|-----|--------------|-------------|--------------|
| 1 | DDIO_DP_D0_P | DIFF | |
| 2 | GND | GND | |
| 3 | DDIO_DP_D0_N | DIFF | |
| 4 | DDIO_DP_D1_P | DIFF | |
| 5 | GND | GND | |
| 6 | DDIO_DP_D1_N | DIFF | |
| 7 | DDIO_DP_D2_P | DIFF | |
| 8 | GND | GND | |
| 9 | DDIO_DP_D2_N | DIFF | |

| | | | |
|----|---------------|------|-------|
| 10 | DDIO_DP_D3_P | DIFF | |
| 11 | GND | GND | |
| 12 | DDIO_DP_D3_N | DIFF | |
| 13 | GND | | |
| 14 | GND | | |
| 15 | DDIO_DP_AUX_P | I/O | +3.3V |
| 16 | GND | | |
| 17 | DDIO_DP_AUX_N | I/O | +3.3V |
| 18 | HPLG_DETECT | IN | +1.8V |
| 19 | RTN_PWR | | |
| 20 | PWR | IN | +3.3V |

2.4.5 LVDS Port Inverter / Backlight Connector (CN5)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|-------------|-------------|--------------|
| 1 | BKL_PWR | PWR | +5V / +12V |
| 2 | BKL_CONTROL | OUT | |
| 3 | GND | GND | |

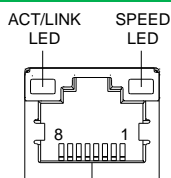
| | | | |
|---|------------|-----|-------|
| 4 | GND | GND | |
| 5 | BKL_ENABLE | OUT | +3.3V |

* LVDS2/BKL_PWR can be set to +5V or +12V by JP4.

* LVDS2/BKL_CONTROL can be set by JP4.

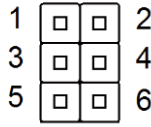
* The driving current supports up to 2A

2.4.6 LAN (RJ-45) Port (CN7)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | MDI0+ | DIFF | |
| 2 | MDI0- | DIFF | |
| 3 | MDI1+ | DIFF | |
| 4 | MDI2+ | DIFF | |
| 5 | MDI2- | DIFF | |
| 6 | MDI1- | DIFF | |
| 7 | MDI3+ | DIFF | |
| 8 | MDI3- | DIFF | |

2.4.7 Digital IO Port (CN8)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | +5V | PWR | +5V |
| 2 | DIO0 | I/O | +5V |
| 3 | DIO1 | I/O | +5V |
| 4 | DIO2 | I/O | +5V |
| 5 | DIO3 | I/O | +5V |
| 6 | GND | GND | |

2.4.8 MiniCard Slot (Full Size)/ Default mSATA (feature select by BOM) (CN9)

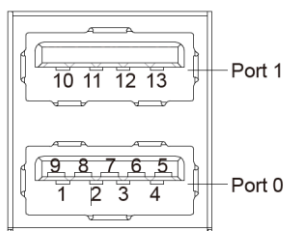
| Pin | Pin Name | Signal Type | Signal level |
|-----|---------------|-------------|--------------|
| 1 | PCIE_WAKE# | IN | |
| 2 | +3.3VSB/+3.3V | PWR | +3.3V |
| 3 | NC | | |
| 4 | GND | GND | |
| 5 | NC | | |
| 6 | +1.5V | PWR | +1.5V |
| 7 | PCIE_CLK_REQ# | IN | |

| Pin | Pin Name | Signal Type | Signal level |
|-----|-------------------|-------------|--------------|
| 8 | UIM_PWR | PWR | |
| 9 | GND | GND | |
| 10 | UIM_DATA | I/O | |
| 11 | PCIE_REF_CLK- | DIFF | |
| 12 | UIM_CLK | IN | |
| 13 | PCIE_REF_CLK+ | DIFF | |
| 14 | UIM_RST | IN | |
| 15 | GND | GND | |
| 16 | UIM_VPP | PWR | |
| 17 | NC | | |
| 18 | GND | GND | |
| 19 | NC | | |
| 20 | W_DISABLE# | OUT | +3.3V |
| 21 | GND | GND | |
| 22 | PCIE_RST# | OUT | +3.3V |
| 23 | PCIE_RX-/mSATARX+ | DIFF | |
| 24 | +3.3VSB/+3.3V | PWR | +3.3V |
| 25 | PCIE_RX+/mSATARX- | DIFF | |
| 26 | GND | GND | |
| 27 | GND | GND | |
| 28 | +1.5V | PWR | +1.5V |

| Pin | Pin Name | Signal Type | Signal level |
|-----|-------------------|-------------|--------------|
| 29 | GND | GND | |
| 30 | SMB_CLK | I/O | +3.3V |
| 31 | PCIE_TX-/mSATATX- | DIFF | |
| 32 | SMB_DATA | I/O | +3.3V |
| 33 | PCIE_TX+/mSATATX+ | DIFF | |
| 34 | GND | GND | |
| 35 | GND | GND | |
| 36 | USB_D- | DIFF | |
| 37 | GND | GND | |
| 38 | USB_D+ | DIFF | |
| 39 | +3.3VSB/+3.3V | PWR | +3.3V |
| 40 | GND | GND | |
| 41 | +3.3VSB/+3.3V | PWR | +3.3V |
| 42 | NC | | |
| 43 | GND | GND | |
| 44 | NC | | |
| 45 | NC | | |
| 46 | NC | | |
| 47 | NC | | |
| 48 | +1.5V | PWR | +1.5V |
| 49 | NC | | |

| Pin | Pin Name | Signal Type | Signal level |
|-----|---------------|-------------|--------------|
| 50 | GND | GND | |
| 51 | NC | | |
| 52 | +3.3VSB/+3.3V | PWR | +3.3V |

2.4.9 USB Ports 0 and 1 (CN10)

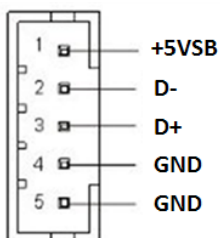


| Pin | Pin Name | Signal Type | Signal level |
|-----|------------|-------------|--------------|
| 1 | +5VSB | PWR | +5V |
| 2 | USB0_D- | DIFF | |
| 3 | USB0_D+ | DIFF | |
| 4 | GND | GND | |
| 5 | USB0_SSRX- | DIFF | |
| 6 | USB0_SSRX+ | DIFF | |
| 7 | GND | GND | |
| 8 | USB0_SSTX- | DIFF | |
| 9 | USB0_SSTX+ | DIFF | |
| 10 | +5VSB | PWR | +5V |

| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 11 | USB1_D- | DIFF | |
| 12 | USB1_D+ | DIFF | |
| 13 | GND | GND | |

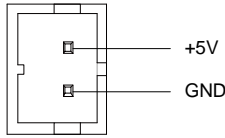
* Only Port 0 supports USB 3.0.

2.4.10 USB 2.0 Port 2 (CN11)



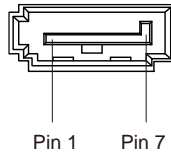
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | +5VSB | PWR | +5V |
| 2 | USB2_D- | DIFF | |
| 3 | USB2_D+ | DIFF | |
| 4 | GND | GND | |
| 5 | GND | GND | |

2.4.11 +5V Output for SATA HDD (CN14)



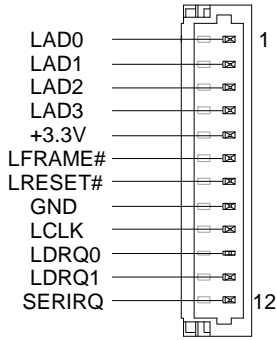
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | +5V | PWR | +5V |
| | GND | GND | |

2.4.12 SATA Port (CN15)



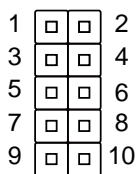
| Pin | Pin Name | Signal Type | Signal Level |
|-----|-----------|-------------|--------------|
| 1 | GND | GND | |
| 2 | SATA_TX1+ | DIFF | |
| 3 | SATA_TX1- | DIFF | |
| 4 | GND | GND | |
| 5 | SATA_RX1- | DIFF | |
| 6 | SATA_RX1+ | DIFF | |
| 7 | GND | GND | |

2.4.13LPC Port (CN18)



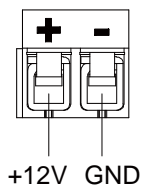
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------------------------------|-------------|--------------|
| 1 | LAD0 | I/O | +3.3V |
| 2 | LAD1 | I/O | +3.3V |
| 3 | LAD2 | I/O | +3.3V |
| 4 | LAD3 | I/O | +3.3V |
| 5 | +3.3V | PWR | +3.3V |
| 6 | LFRAME# | IN | |
| 7 | LRESET# | OUT | +3.3V |
| 8 | GND | GND | |
| 9 | LCLK | OUT | |
| 10 | SMB_DATA [Default] / I2C_DATA | I/O | |
| 11 | SMB_CLK [Default] / I2C_CLK | IN | |
| 12 | SMB_ALERT [Default] / INT_SERIRQ | I/O | +3.3V |

2.4.14 Front Panel (CN19)



| Pin | Pin Name | Pin | Pin Name |
|-----|------------|-----|------------|
| 1 | PWR_BTN- | 2 | PWR_BTN+ |
| 3 | HDD_LED- | 4 | HDD_LED+ |
| 5 | SPEAKER- | 6 | SPEAKER+ |
| 7 | PWR_LED- | 8 | PWR_LED+ |
| 9 | H/W RESET- | 10 | H/W RESET+ |

2.4.15 External +12V Input (CN20)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | +12V | PWR | +12V |
| 2 | GND | GND | |

2.4.16 Buzzer Connector (CN21)

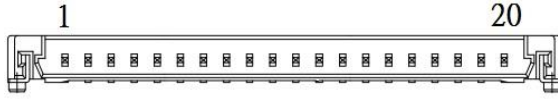
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | +3.3V | PWR | 3.3V |
| 2 | SPEAKER- | | |

2.4.17 BIO Connector (CN22)

| Pin | Pin Name | Pin | Pin Name |
|-----|----------------|-----|-----------|
| 1 | +12VSB | 2 | GND |
| 3 | GND | 4 | PCIE_TXN0 |
| 5 | PCIE_RXN0 | 6 | PCIE_TXP0 |
| 7 | PCIE_RXP0 | 8 | GND |
| 9 | GND | 10 | NC |
| 11 | NC | 12 | NC |
| 13 | NC | 14 | GND |
| 15 | GND | 16 | PS_ON# |
| 17 | NC | 18 | NC |
| 19 | +5VSB | 20 | +5VSB |
| 21 | +5VSB | 22 | +5VSB |
| 23 | PCIE_REF_CLK0 | 24 | RESET# |
| 25 | PCIE_REF_CLK0# | 26 | GND |
| 27 | GND | 28 | NC |
| 29 | NC | 30 | NC |
| 31 | NC | 32 | GND |
| 33 | GND | 34 | NC |

| Pin | Pin Name | Pin | Pin Name |
|-----|--------------------------------|-----|---------------|
| 35 | NC | 36 | NC |
| 37 | NC | 38 | GND |
| 39 | GND | 40 | NC |
| 41 | NC | 42 | GND |
| 43 | NC | 44 | NC |
| 45 | GND | 46 | NC |
| 47 | USBN0 | 48 | GND |
| 49 | USBP0 | 50 | USBN1 |
| 51 | GND | 52 | USBP2 |
| 53 | I2C_CLK or SMB_CLK [Default] | 54 | GND |
| 55 | I2C_DATA or SMB_DATA [Default] | 56 | WAKE# |
| 57 | GND | 58 | USB_OC0# |
| 59 | +5V | 60 | USB_OC1# |
| 61 | +5V | 62 | +5V |
| 63 | +5V | 64 | +5V |
| 65 | LPC_AD0 | 66 | LPC_FRAME# |
| 67 | LPC_AD1 | 68 | SERIRQ |
| 69 | LPC_AD2 | 70 | LPC_DRQ |
| 71 | LPC_AD3 | 72 | PWR_OK/GPIO |
| 73 | GND | 74 | AGND |
| 75 | LPC_CLK | 76 | AUD_LINEOUT_L |
| 77 | PME# | 78 | AUD_LINEOUT_R |
| 79 | GND | 80 | GND |

2.4.18COM Port 1/2 & Line Out Connector (CN23)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|--------------|-------------|--------------|
| 1 | DCDB | IN | |
| 2 | DSRB | IN | |
| 3 | RXB | IN | |
| 4 | RTSB | OUT | ±9V |
| 5 | TXB | OUT | ±9V |
| 6 | CTSB | IN | |
| 7 | DTRB | OUT | ±9V |
| 8 | RIB/+5V/+12V | IN/ PWR | +5V/+12V |
| 9 | DCDA | IN | |
| 10 | DSRA | IN | |
| 11 | RXA | IN | |
| 12 | RTSA | OUT | ±9V |
| 13 | TXA | OUT | ±9V |
| 14 | CTSA | IN | |
| 15 | DTRA | OUT | ±9V |
| 16 | RIA | IN | |

| | | |
|----|--------|-----|
| 17 | GND | GND |
| 18 | AGND | GND |
| 19 | LOUT_R | I/O |
| 20 | LOUT_L | I/O |

COM Port 2 RS-485

| Pin | Pin Name | Signal Type | Signal level |
|-----|-------------|-------------|--------------|
| 1 | RS485_D- | I/O | ±5V |
| 2 | NC | | |
| 3 | RS485_D+ | I/O | ±5V |
| 4 | NC | | |
| 5 | NC | | |
| 6 | NC | | |
| 7 | NC | | |
| 8 | NC/+5V/+12V | PWR | +5V/+12V |
| 17 | GND | IN | |

COM Port 2 RS-422

| Pin | Pin Name | Signal Type | Signal level |
|-----|-----------|-------------|--------------|
| 1 | RS422_TX- | OUT | ±5V |
| 2 | NC | | |
| 3 | RS422_TX+ | OUT | ±5V |
| 4 | NC | | |

| Pin | Pin Name | Signal Type | Signal level |
|-----|-------------|-------------|--------------|
| 5 | RS422_RX+ | IN | |
| 6 | NC | | |
| 7 | RS422_RX- | IN | |
| 8 | NC/+5V/+12V | PWR | +5V/+12V |
| 17 | GND | GND | |

* COM2 RS-232/422/485 can be set by BIOS setting. Default is RS-232.

* COM2 RI/+5V/+12V function can be set by BOM(R524-RI/R521--+12V/R526--+5V)

2.4.19 MiniCard Slot (Half-Mini Card) (CN24)

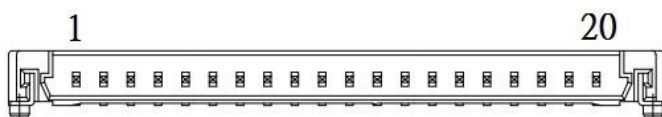
| Pin | Pin Name | Signal Type | Signal Level |
|-----|---------------|-------------|--------------|
| 1 | PCIE_WAKE# | IN | |
| 2 | +3.3VSB | PWR | +3.3V |
| 3 | NC | | |
| 4 | GND | GND | |
| 5 | NC | | |
| 6 | +1.5V | PWR | +1.5V |
| 7 | PCIE_CLK_REQ# | IN | |
| 8 | NC | PWR | |
| 9 | GND | GND | |

| Pin | Pin Name | Signal Type | Signal Level |
|-----|---------------|-------------|--------------|
| 10 | NC | I/O | |
| 11 | PCIE_REF_CLK- | DIFF | |
| 12 | NC | IN | |
| 13 | PCIE_REF_CLK+ | DIFF | |
| 14 | NC | | |
| 15 | GND | GND | |
| 16 | NC | PWR | |
| 17 | NC | | |
| 18 | GND | GND | |
| 19 | NC | | |
| 20 | W_DISABLE# | OUT | +3.3V |
| 21 | GND | GND | |
| 22 | PCIE_RST# | OUT | +3.3V |
| 23 | PCIE_RX- | DIFF | |
| 24 | +3.3VSB | PWR | +3.3V |
| 25 | PCIE_RX+ | DIFF | |
| 26 | GND | GND | |
| 27 | GND | GND | |
| 28 | +1.5V | PWR | +1.5V |
| 29 | GND | GND | |

| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 30 | SMB_CLK | I/O | +3.3V |
| 31 | PCIE_TX- | DIFF | |
| 32 | SMB_DATA | I/O | +3.3V |
| 33 | PCIE_TX+ | DIFF | |
| 34 | GND | GND | |
| 35 | GND | GND | |
| 36 | USB_D- | DIFF | |
| 37 | GND | GND | |
| 38 | USB_D+ | DIFF | |
| 39 | +3.3VSB | PWR | +3.3V |
| 40 | GND | GND | |
| 41 | +3.3VSB | PWR | +3.3V |
| 42 | NC | | |
| 43 | GND | GND | |
| 44 | NC | | |
| 45 | NC | | |
| 46 | NC | | |
| 47 | NC | | |
| 48 | +1.5V | PWR | +1.5V |
| 49 | NC | | |

| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 50 | GND | GND | |
| 51 | NC | | |
| 52 | +3.3VSB | PWR | +3.3V |

2.4.20 LVDS Port (CN25)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|-------------|-------------|--------------|
| 1 | BKL_ENABLE | OUT | |
| 2 | BKL_CONTROL | OUT | |
| 3 | LCD_PWR | PWR | +3.3V/+5V |
| 4 | LVDS_A_CLK- | DIFF | |
| 5 | LVDS_A_CLK+ | DIFF | |
| 6 | LCD_PWR | PWR | +3.3V/+5V |
| 7 | LVDS_DA0+ | DIFF | |
| 8 | LVDS_DA0- | DIFF | |
| 9 | LCD_PWR | PWR | +3.3V/+5V |
| 10 | LVDS_DA1+ | DIFF | |

| | | |
|----|-----------|------|
| 11 | LVDS_DA1- | DIFF |
| 12 | GND | GND |
| 13 | LVDS_DA2+ | DIFF |
| 14 | LVDS_DA2- | DIFF |
| 15 | GND | GND |
| 16 | LVDS_DA3+ | DIFF |
| 17 | LVDS_DA3- | DIFF |
| 18 | GND | GND |
| 19 | DDC_DATA | I/O |
| 20 | DDC_CLK | I/O |

Chapter 3

AMI BIOS Setup

3.1 System Test and Initialization

The board uses certain routines to perform testing and initialization. If an error, fatal or non-fatal, is encountered, a few short beeps or an error message will be outputted. The board can usually continue the boot up sequence with non-fatal errors.

The system configuration verification routines check the current system configuration against the values stored in the CMOS memory. If they do not match, an error message will be outputted, in which case you will need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

- You are starting your system for the first time
- You have changed your system's hardware
- The CMOS memory has lost power and the configuration information is erased

The system's CMOS memory uses a backup battery for data retention, which is to be replaced once emptied.

3.2 AMI BIOS Setup

The AMI BIOS ROM has a pre-installed Setup program that allows users to modify basic system configurations, which is stored in the battery-backed CMOS RAM and BIOS NVRAM so that the information is retained when the power is turned off.

To enter BIOS Setup, press or <F2> immediately while your computer is powering up.

The function for each interface can be found below.

Main – Date and time can be set here. Press <Tab> to switch between date elements

Advanced – Enable/ Disable boot option for legacy network devices

Chipset – For hosting bridge parameters

Boot – Enable/ Disable quiet Boot Option

Security – The setup administrator password can be set here

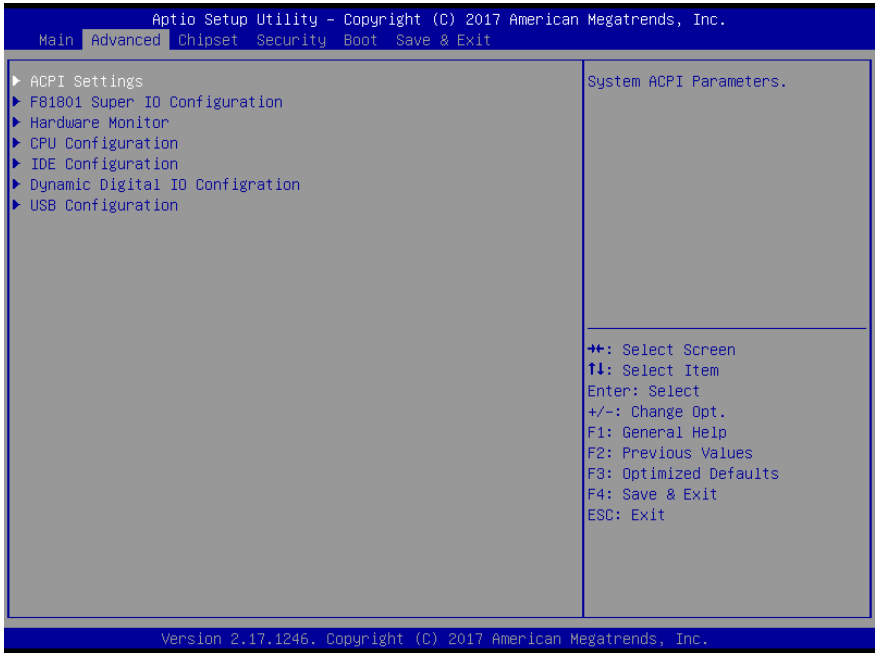
Save & Exit – Save your changes and exit the program

3.3 Setup Submenu: Main

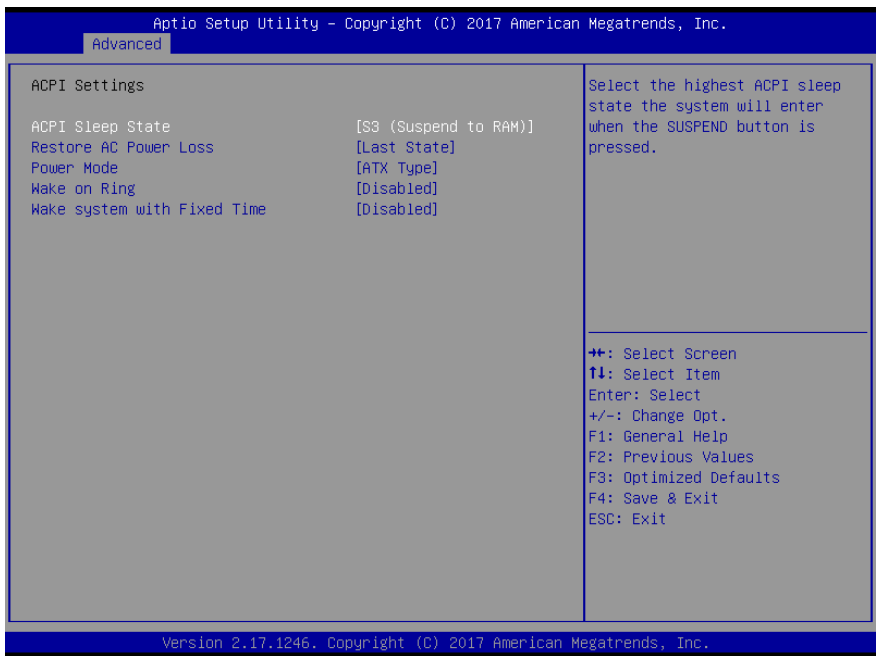
Press "Delete" to enter Setup



3.4 Setup Submenu: Advanced



3.4.1 Advanced: ACPI Settings

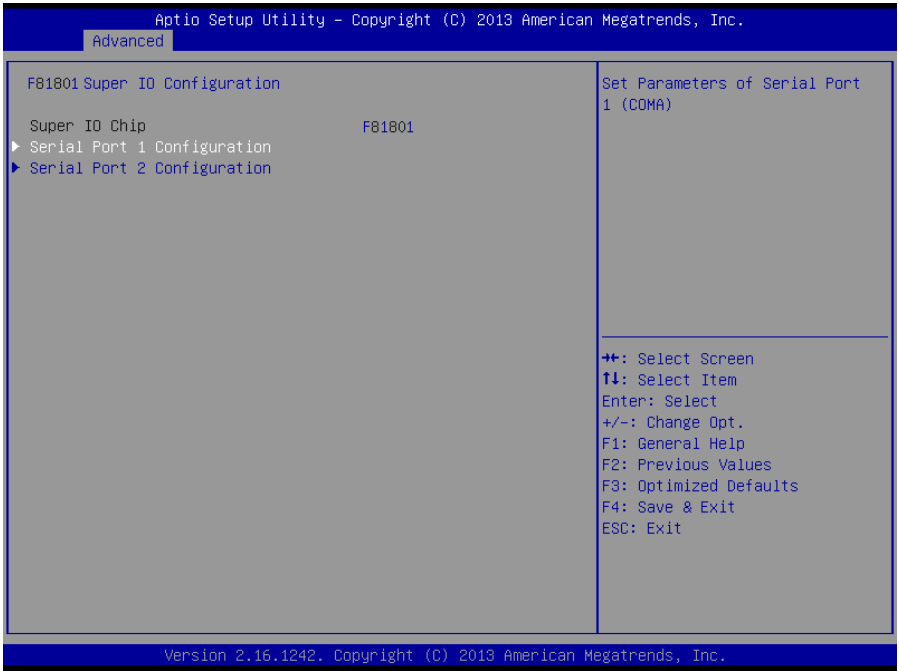


Options summary:

| | | |
|---|---------------------|-----------------------------------|
| ACPI Sleep State | Suspend Disabled | Optimal Default, Failsafe Default |
| | S3 (suspend to RAM) | |
| Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed. | | |
| Restore on Power Loss | Power Off | Optimal Default, Failsafe Default |
| | Power On | |
| | Last State | |
| Select power state when power is re-applied after a power failure. | | |
| Power Mode | ATX Type | Optimal Default, Failsafe Default |
| | AT Type | |
| Select power supply mode. | | |

| | | |
|--|------------|-----------------------------------|
| Wake on Ring | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enable or disable System Wake on Ring | | |
| RTC wake system from S5 | Disabled | Optimal Default, Failsafe Default |
| | Fixed Time | |
| Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified | | |

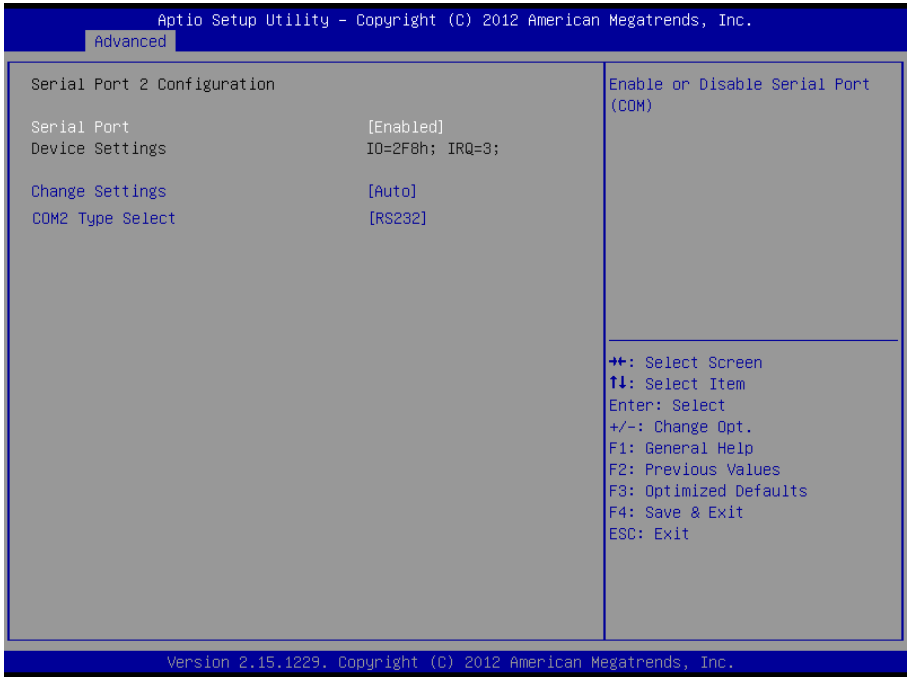
3.4.2 Advanced: F81801 Super IO Configuration



3.4.2.1 Super IO Configuration: Serial Port 1 Configuration



3.4.2.2 Super IO Configuration: Serial Port 2 Configuration

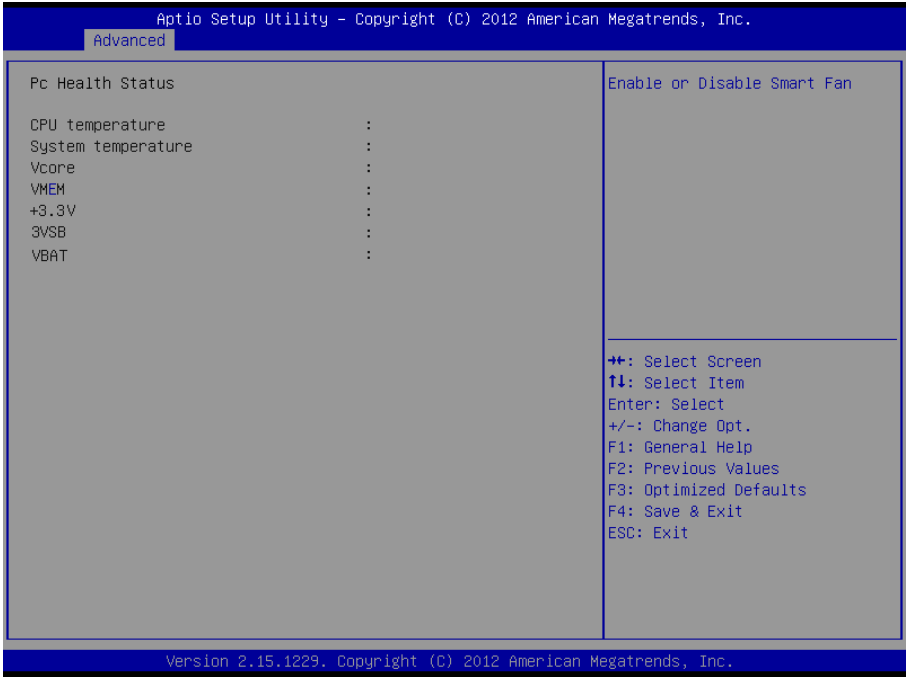


Options summary:

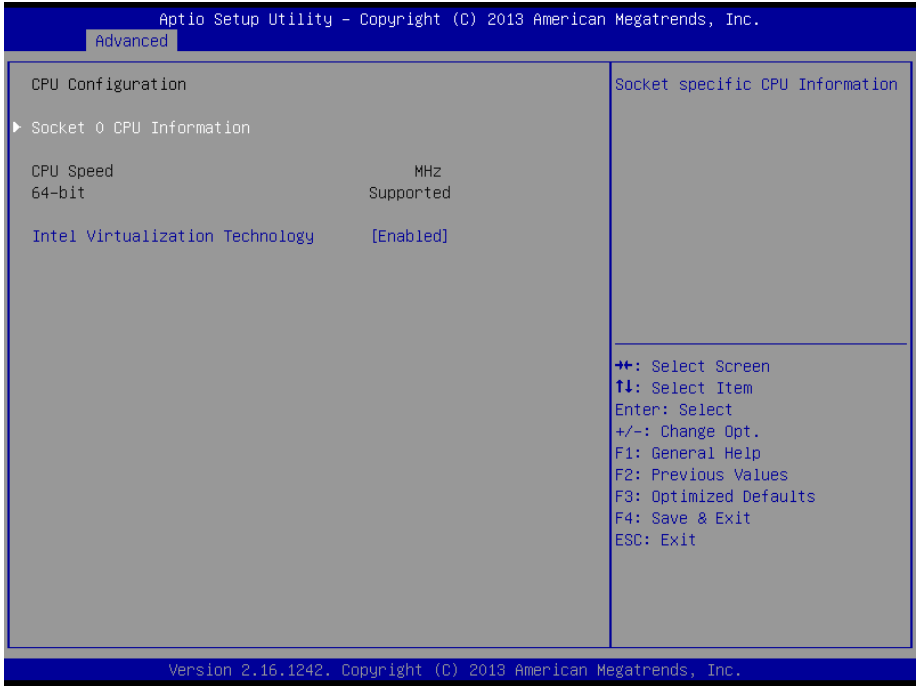
| | | |
|---|---------------------------------------|---------|
| Serial Port | Disabled | |
| | Enabled | Default |
| Allows BIOS to En/Disable correspond serial port. | | |
| Change Settings (Serial Port 1) | Auto | Default |
| | IO=3F8h; IRQ=4; | |
| | IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; | |
| | IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; | |
| | IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; | |

| | | | |
|---|--|---------|---------|
| | IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; | | |
| | IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12; | | |
| Allows BIOS to Select Serial Port resource. | | | |
| Change Settings (Serial Port 2) | Auto IO=2F8h; IRQ=3; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; | Default | |
| | IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; | | |
| | IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; | | |
| | IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12; | | |
| COM2 Type Select | RS232 | | Default |
| | RS422 | | |
| | RS485 | | |
| Select Working model | | | |

3.4.3 Advanced: Hardware Monitor



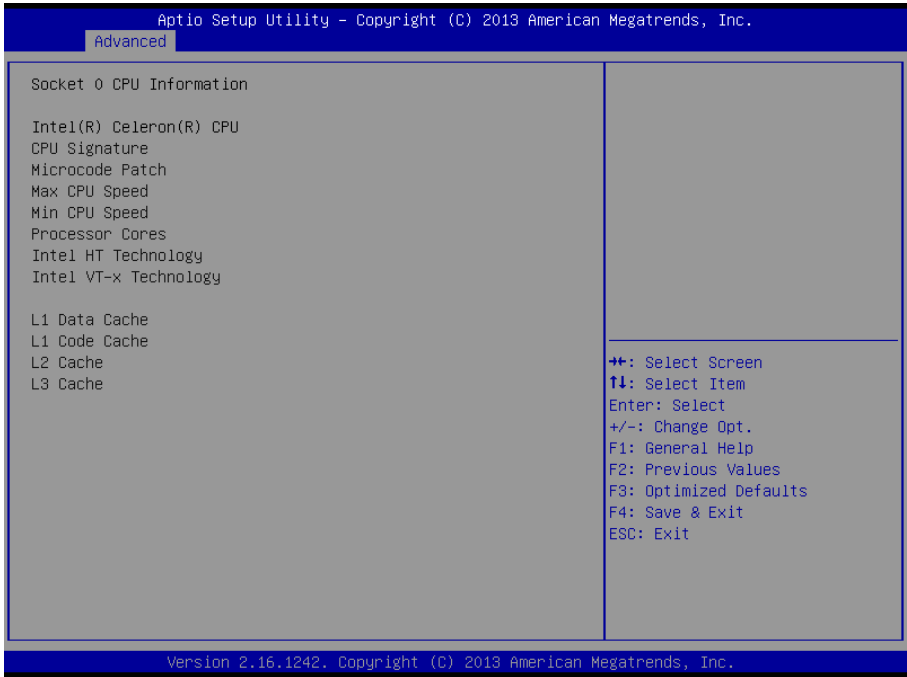
3.4.4 Advanced: CPU Configuration



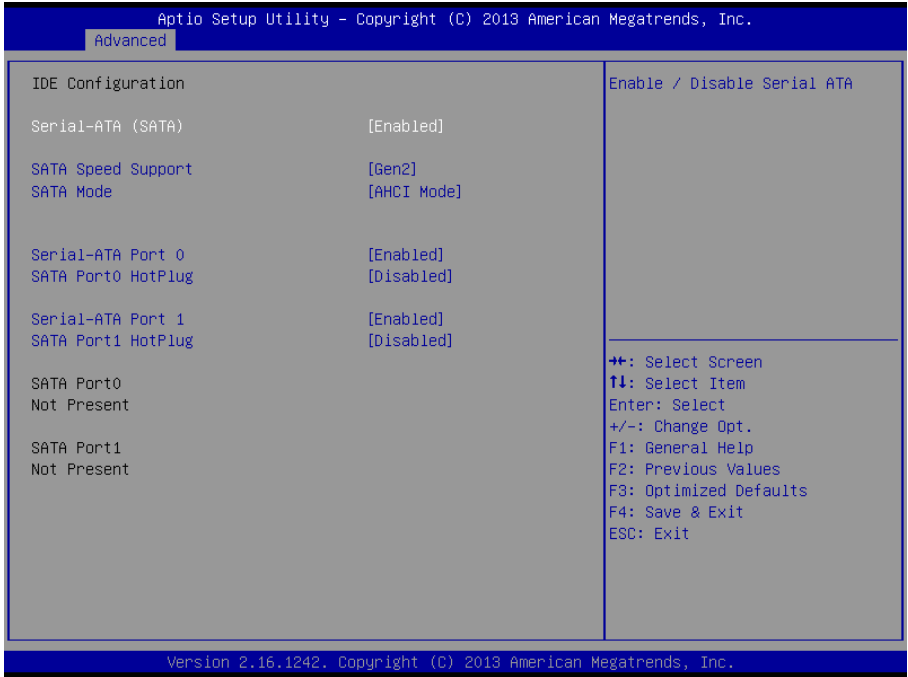
Options summary:

| | | |
|---|----------|-----------------------------------|
| Intel Virtualization | Disabled | Optimal Default, Failsafe Default |
| Technology | Enabled | |
| When enabled, a VMM can utilize the additional hardware capabilities provided by Vander pool Technology | | |

3.4.4.1 CPU Configuration: Socket 0 CPU Information



3.4.5 Advanced: SATA Configuration

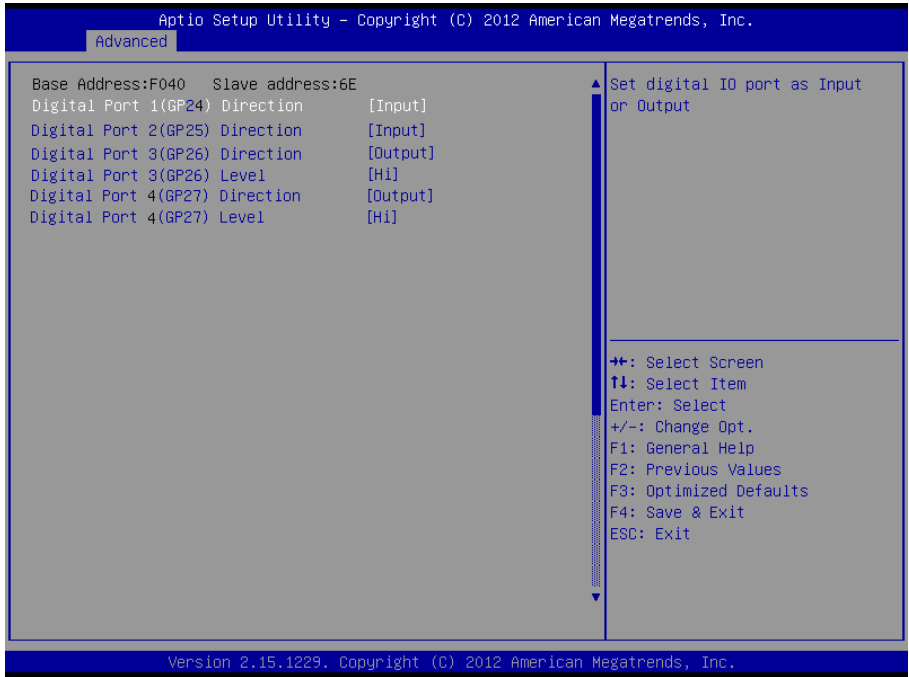


Options summary:

| | | |
|--|----------|---------|
| Serial-ATA (SATA) | Enabled | Default |
| | Disabled | |
| En/Disable SATA | | |
| SATA Speed Support | Gen1 | Default |
| | Gen2 | |
| SATA Speed Support Gen1 or Gen2 | | |
| SATA Mode | IDE | Default |
| | AHCI | |
| IDE: Configure SATA controllers as legacy IDE | | |
| AHCI: Configure SATA controllers to operate in AHCI mode | | |

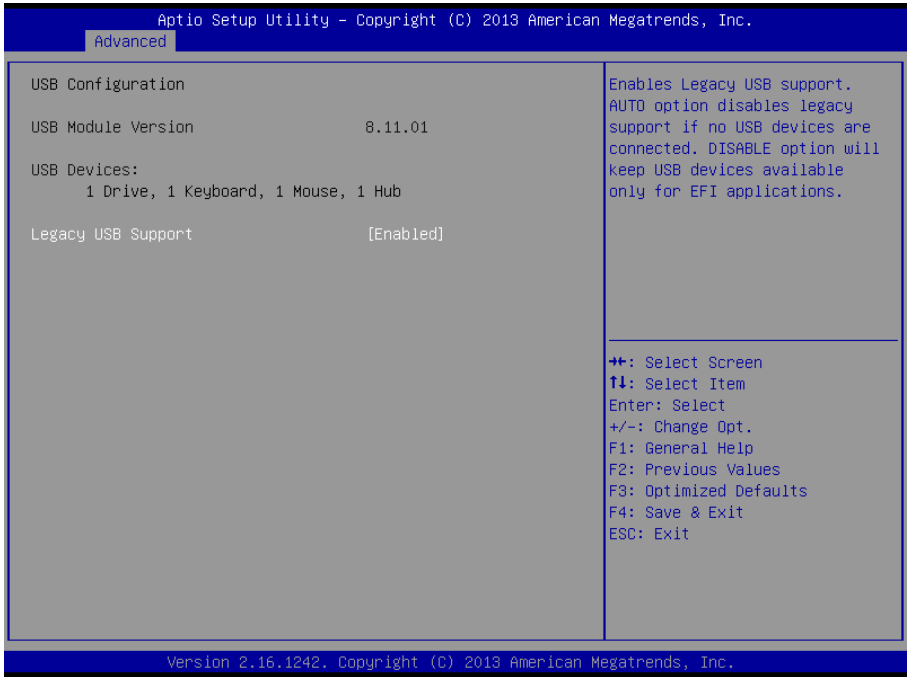
| | | |
|------------------------------|----------|---------|
| Serial-ATA Port x | Enabled | Default |
| | Disabled | |
| En/Disable SATA Port | | |
| SATA Port1 HotPlug | Enabled | |
| | Disabled | Default |
| En/Disable SATA Port Hotplug | | |

3.4.6 Advanced: Dynamic Digital IO Configuration



| | | |
|-------------------------------|--------|---------|
| Digital Port X Direction | Input | |
| | Output | |
| Set DIO as input or Output | | |
| Digital Port X Level | Hi | Default |
| | Low | |
| Set DIO Output port Hi or Low | | |

3.4.7 Advanced: USB Configuration

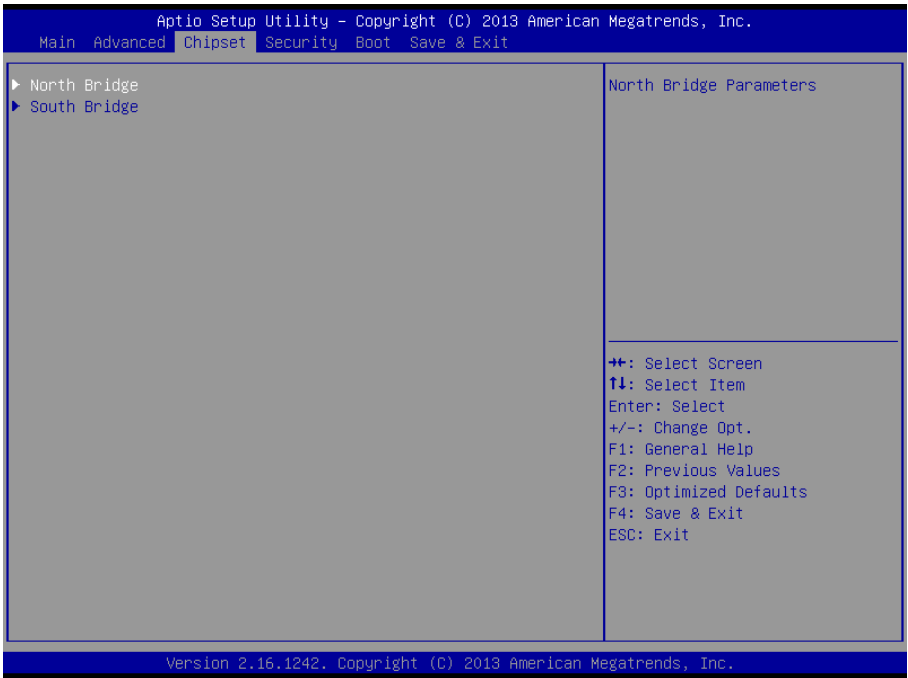


Options summary:

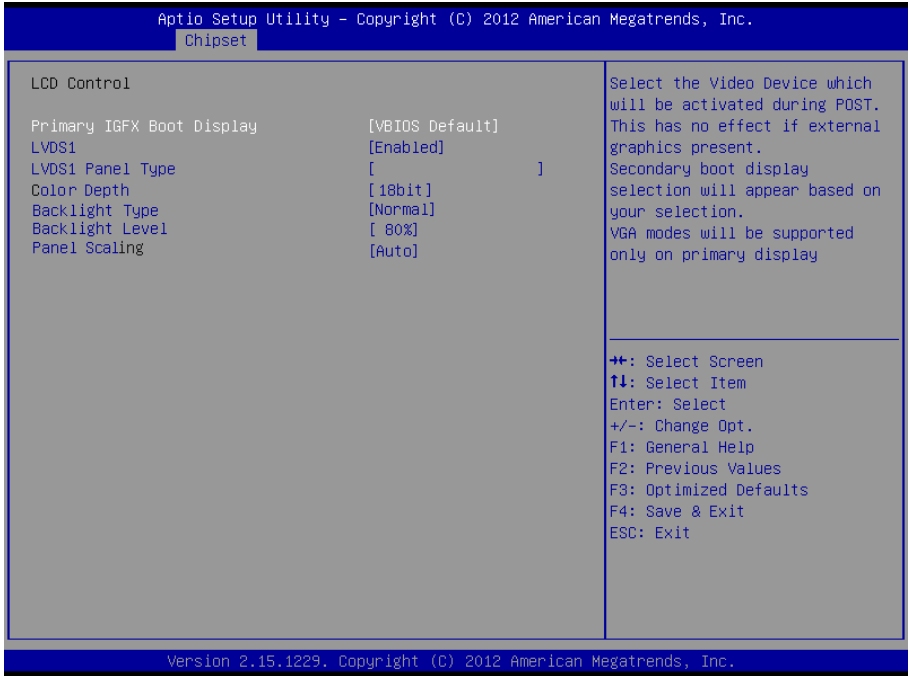
| | | |
|--|------------|-----------------------------------|
| Legacy USB Support | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| | Auto | |
| Enables BIOS Support for Legacy USB Support. When enabled, USB can be functional in legacy environment like DOS. | | |
| AUTO option disables legacy support if no USB devices are connected | | |
| Device Name (Emulation Type) | Auto | Optimal Default, Failsafe Default |
| | Floppy | |
| | Forced FDD | |
| | Hard Disk | |

| | |
|---|-------|
| | CDROM |
| If Auto. USB devices less than 530MB will be emulated as Floppy and remaining as Floppy and remaining as hard drive. Forced FDD option can be used to force a HDD formatted drive to boot as FDD(Ex. ZIP drive) | |

3.5 Setup submenu: Chipset



3.5.1 Chipset: North Bridge

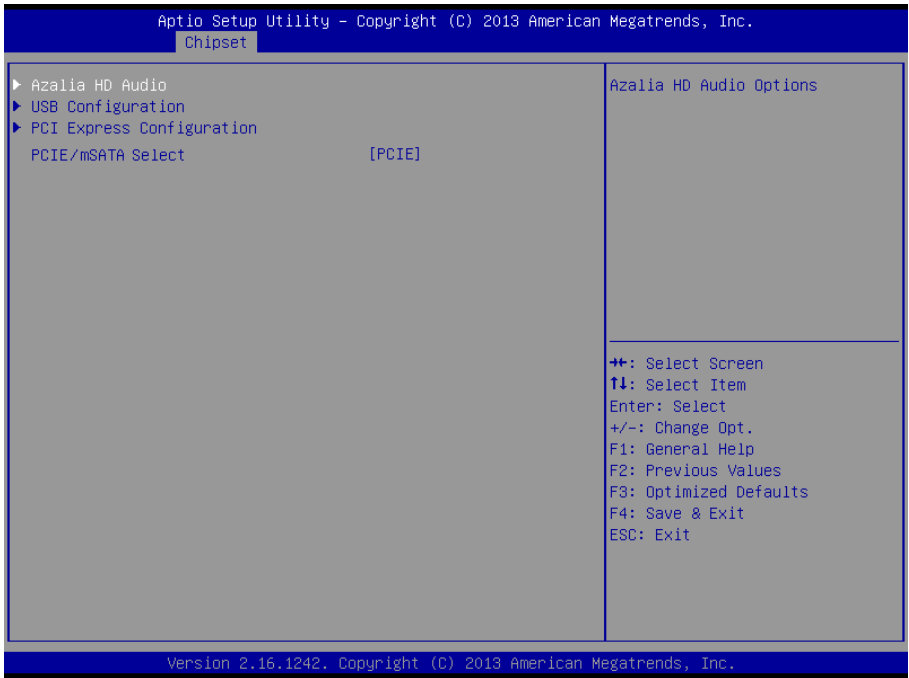


Options summary:

| | | |
|---------------------------|---------------|-----------------------------------|
| Primary IGFX Boot Display | VBIOS Default | Optimal Default, Failsafe Default |
| | CRT | |
| | DP | |
| | LVDS | |
| Select the Video device | | |
| LVDS1 | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| En/Dis LVDS | | |
| Panel Type | 640x480 | |
| | 800x480 | |

| | | |
|---|---------------|-----------------------------------|
| | 800x600 | |
| | 1024x600 | |
| | 1024x768 | Optimal Default, Failsafe Default |
| | 1280x768 | |
| | 1366x768 | |
| | 1440x900 | |
| Select panel type | | |
| Color Depth | 18Bit | Optimal Default, Failsafe Default |
| | 24Bit | |
| Set color depth | | |
| Backlight Type | Normal | Optimal Default, Failsafe Default |
| | Inverted | |
| Select backlight control signal type | | |
| Backlight Level | 0-100% | |
| Select backlight control level | | |
| Panel Scaling | Auto | Optimal Default, Failsafe Default |
| | Off | |
| | Force Scaling | |
| Select the LCD scaling option used by the internal graphics device. | | |

3.5.2 Chipset: South Bridge

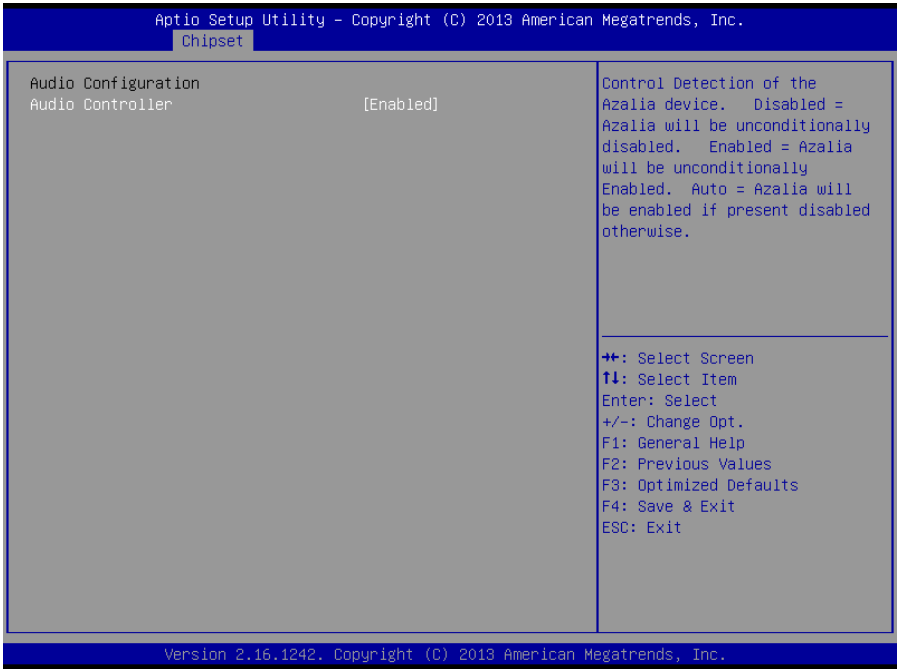


Options summary*:

| | | |
|-------------------|-------|-----------------------------------|
| PCIE/mSATA Select | PCIE | Optimal Default, Failsafe Default |
| | mSATA | |
| PCIE/mSATA Select | | |

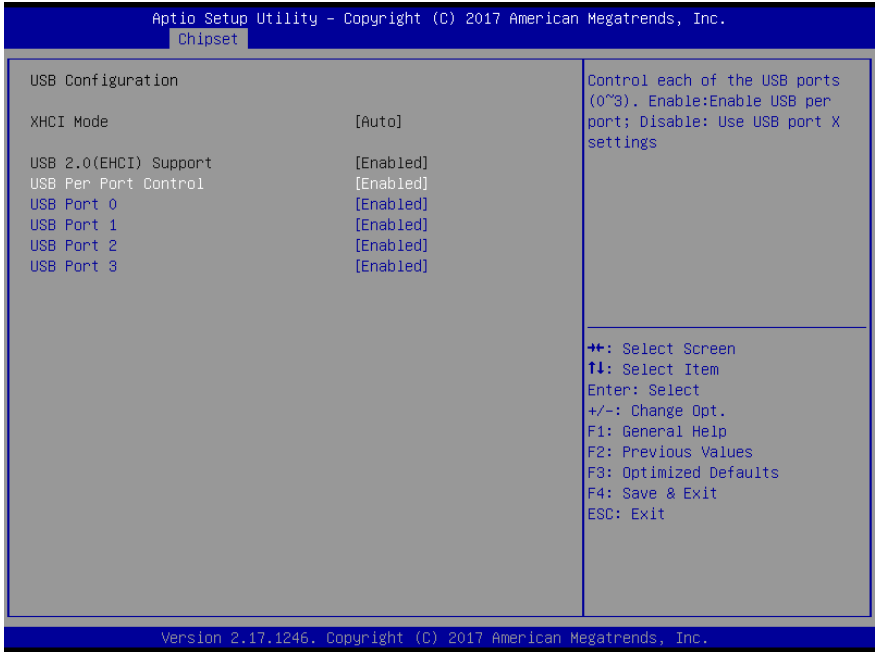
* PCIE/mSATA Select is available only for A1.0 version and not available for A1.1 and / or later version.

3.5.2.1 South Bridge: Azalia HD Audio

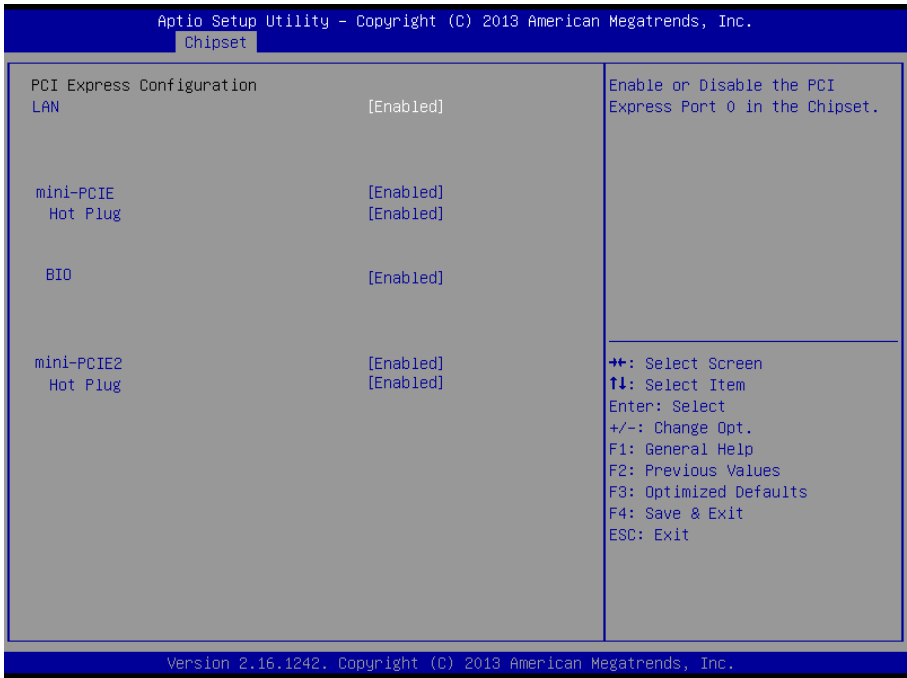


| | | |
|---|----------|-----------------------------------|
| Azalia HD Audio | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enabling/Disabling HD Audio controller. | | |

3.5.2.2 South Bridge: USB Configuration



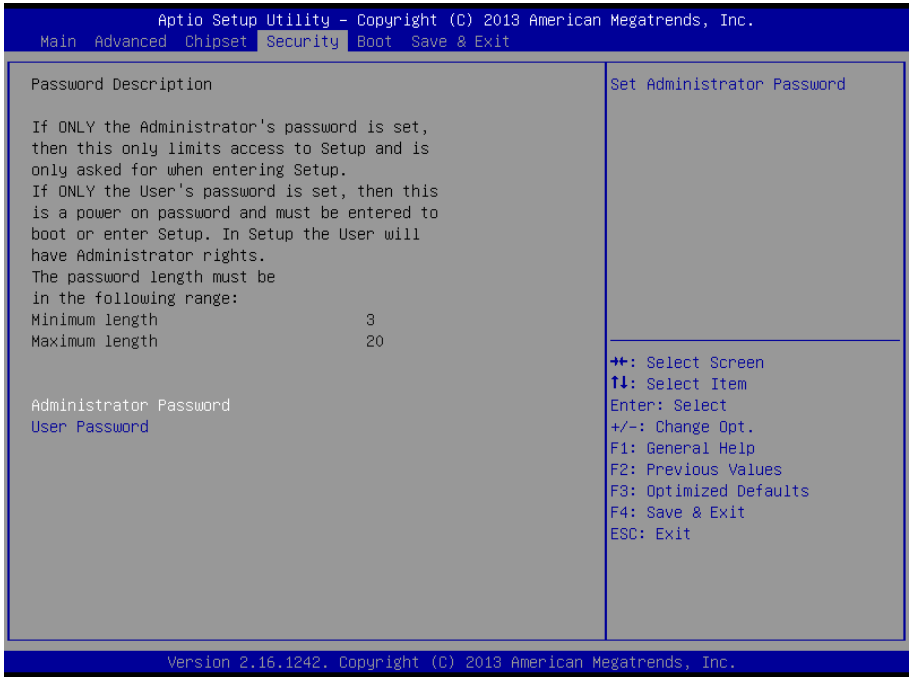
3.5.2.3 South Bridge: PCI Express Configuration



Options summary:

| | | |
|---|----------|-----------------------------------|
| PCI Express Root Port x | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enabling/Disabling PCI Express root ports | | |

3.6 Setup submenu: Security



Change User/Administrator Password

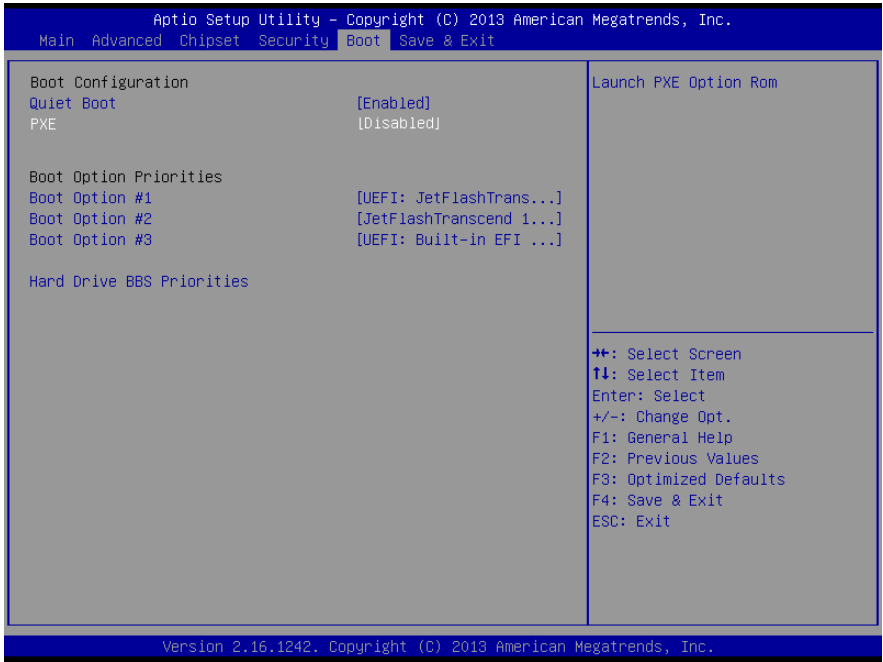
You can set a User Password once an Administrator Password is set. The password will be required during boot up, or when the user enters the Setup utility. Please Note that a User Password does not provide access to many of the features in the Setup utility.

Select the password you wish to set, press Enter to open a dialog box to enter your password (you can enter no more than six letters or numbers). Press Enter to confirm your entry, after which you will be prompted to retype your password for a final confirmation. Press Enter again after you have retyped it correctly.

Removing the Password

Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

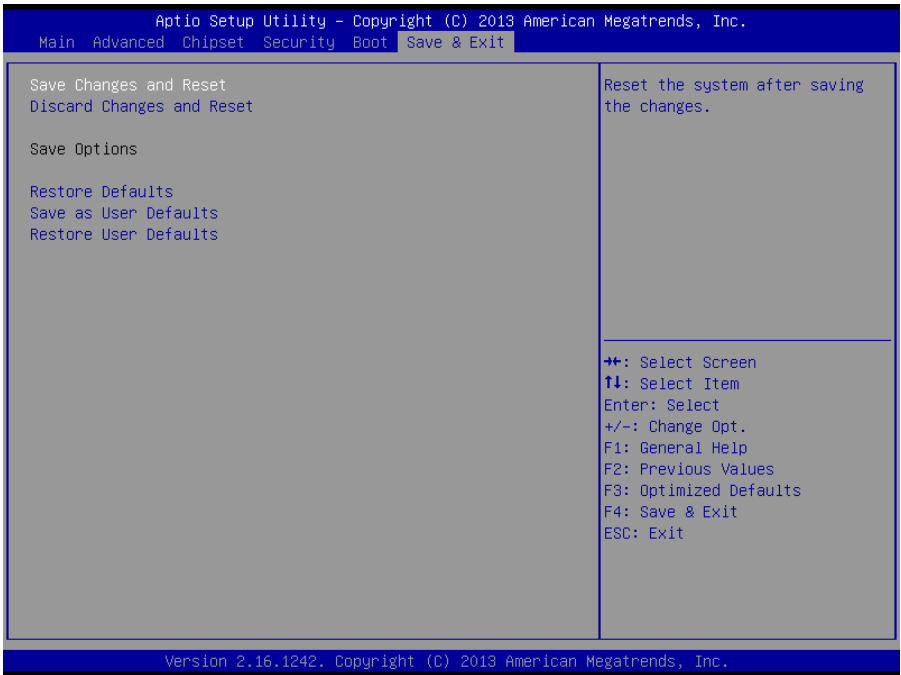
3.7 Setup submenu: Boot



Options summary:

| | | |
|----------------------------------|----------|---------|
| PXE | Disabled | Default |
| | Enabled | |
| En/Disable PXE boot for I211 LAN | | |
| Quiet Boot | Disabled | Default |
| | Enabled | |
| En/Disable showing boot logo. | | |

3.8 Setup submenu: Save & Exit



Chapter 4

Drivers Installation

4.1 Driver Download/Installation

Drivers for the PICO-BT01 can be downloaded from the product page on the AAEON website by following this link:

<https://www.aaeon.com/en/p/pico-itx-boards-pico-bt01>

Download the driver(s) you need and follow the steps below to install them.

Step 1 – Install Chipset Driver

1. Open the **Step1 - Chipset** folder and open the **SetupChipset.exe** file
2. Follow the instructions
3. Drivers will be installed automatically

Step 2 – Install Graphics Driver

1. Open the **Step2 - Graphics** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Driver will be installed automatically

Step 3 – Install LAN Driver

1. Open the **Step3 - LAN** folder followed by the **I211** folder
2. Select your OS
3. Open the **.exe** file in the folder
4. Follow the instructions
5. Driver will be installed automatically

Step 4 – Install Audio Driver

1. Open the **Step4 - Audio** folder and open the **Win7_8-32_64_R273.exe** file
2. Follow the instructions
3. Driver will be installed automatically

Step 5 – Install USB3.0 Driver

1. Open the **Step5 - USB3.0** folder and open the **Setup.exe** file
2. Follow the instructions
3. Driver will be installed automatically

Step 6 – Install MBI Driver

1. Open the **Step7 - MBI** folder and open the **Setup.exe** file
2. Follow the instructions
3. Driver will be installed automatically

Appendix A

Watchdog Timer Programming

A.1 Watchdog Timer Registers

| Table 1 : Watch dog relative IO address | | |
|---|---------------|---|
| | Default Value | Note |
| I/O Base Address | 0xA00 | I/O Base address for Watchdog operation. This address is assigned by SIO LDN7, register 0x60-0x61. |

| Table 2 : Watchdog relative register table | | | | |
|--|--------|--------|-------|---|
| Register | Offset | BitNum | Value | Note |
| Watchdog WDTRST# Enable | 0x00 | 7 | 1 | Enable/Disable time out output via WDTRST# 0: Disable 1: Enable |
| Pulse Width | 0x05 | 0:1 | 01 | Width of Pulse signal 00: 1ms (do not use) 01: 25ms 10: 125ms 11: 5s <i>Pulse width is must longer then 16ms.</i> |
| Signal Polarity | 0x05 | 2 | 0 | 0: low active 1: high active <i>Must set this bit to 0</i> |
| Counting Unit | 0x05 | 3 | 0 | Select time unit. 0: second 1: minute |
| Output Signal Type | 0x05 | 4 | 1 | 0: Level 1: Pulse <i>Must set this bit to 1</i> |
| Watchdog Timer Enable | 0x05 | 5 | 1 | 0: Disable 1: Enable |
| Timeout Status | 0x05 | 6 | 1 | 1: timeout occurred. Write a 1 to clear timeout status |
| Timer Counter | 0x06 | | | Time of watchdog timer (0~255) |

A.2 Watchdog Sample Program

```
*****
// WDT I/O operation relative definition (Please reference to Table 1)
#define WDTAddr    0xA00 // WDT I/O base address
Void  WDTWriteByte(byte Register, byte Value);
byte  WDTReadByte(byte Register);
Void  WDTSetReg(byte Register, byte Bit, byte Val);
// Watch Dog relative definition (Please reference to Table 2)
#define DevReg     0x00 // Device configuration register
    #define WDRstBit 0x80 // Watchdog WDTRST# (Bit7)
    #define WDRstVal 0x80 // Enabled WDTRST#
#define TimerReg   0x05 // Timer register
    #define PSWidthBit 0x00 // WDTRST# Pulse width (Bit0:1)
    #define PSWidthVal 0x01 // 25ms for WDTRST# pulse
    #define PolarityBit 0x02 // WDTRST# Signal polarity (Bit2)
    #define PolarityVal 0x00 // Low active for WDTRST#
    #define UnitBit    0x03 // Unit for timer (Bit3)
    #define ModeBit    0x04 // WDTRST# mode (Bit4)
    #define ModeVal    0x01 // 0:level 1: pulse
    #define EnableBit  0x05 // WDT timer enable (Bit5)
    #define EnableVal  0x01 // 1: enable
    #define StatusBit  0x06 // WDT timer status (Bit6)
#define CounterReg 0x06 // Timer counter register
*****

*****
VOID Main(){
    // Procedure : AaeonWDTConfig
    // (byte)Timer : Counter of WDT timer.(0x00~0xFF)
    // (boolean)Unit : Select time unit(0: second, 1: minute).
    AaeonWDTConfig(Counter, Unit);

    // Procedure : AaeonWDTEnable
    // This procedure will enable the WDT counting.
    AaeonWDTEnable();
}
*****

*****
// Procedure : AaeonWDTEnable
```

```

VOID AaeonWDTEnable (){
    WDTEnableDisable(1);
}

// Procedure : AaeonWDTConfig
VOID AaeonWDTConfig (byte Counter, BOOLEAN Unit){
    // Disable WDT counting
    WDTEnableDisable(0);
    // Clear Watchdog Timeout Status
    WDTClearTimeoutStatus();
    // WDT relative parameter setting
    WDTParameterSetting(Timer, Unit);
}

VOID WDTEnableDisable(byte Value){
    If (Value == 1)
        WDTSetBit(TimerReg, EnableBit, 1);
    else
        WDTSetBit(TimerReg, EnableBit, 0);
}

VOID WDTParameterSetting(byte Counter, BOOLEAN Unit){
    // Watchdog Timer counter setting
    WDTWriteByte(CounterReg, Counter);
    // WDT counting unit setting
    WDTSetBit(TimerReg, UnitBit, Unit);
    // WDT output mode set to pulse
    WDTSetBit(TimerReg, ModeBit, ModeVal);
    // WDT output mode set to active low
    WDTSetBit(TimerReg, PolarityBit, PolarityVal);
    // WDT output pulse width is 25ms
    WDTSetBit(TimerReg, PSWidthBit, PSWidthVal);
    // Watchdog WDTRST# Enable
    WDTSetBit(DevReg, WDTRstBit, WDTRstVal);
}

VOID WDTClearTimeoutStatus(){
    WDTSetBit(TimerReg, StatusBit, 1);
}

*****
*****

```

```
VOID WDTWriteByte(byte Register, byte Value){  
    IOWriteByte(WDTAddr+Register, Value);  
}
```

```
byte WDTReadByte(byte Register){  
    return IOReadByte(WDTAddr+Register);  
}
```

```
VOID WDTSetBit(byte Register, byte Bit, byte Val){  
    byte TmpValue;  
  
    TmpValue = WDTReadByte(Register);  
    TmpValue &= ~(1 << Bit);  
    TmpValue |= Val << Bit;  
    WDTWriteByte(Register, TmpValue);  
}
```

```
*****
```


Appendix B

I/O Information

B.1 I/O Address Map

| | |
|---|---|
| 4 | Input/output (I/O) |
| | [00000000 - 0000006F] PCI Express Root Complex |
| | [00000020 - 00000021] Programmable interrupt controller |
| | [00000024 - 00000025] Programmable interrupt controller |
| | [00000028 - 00000029] Programmable interrupt controller |
| | [0000002C - 0000002D] Programmable interrupt controller |
| | [0000002E - 0000002F] Motherboard resources |
| | [00000030 - 00000031] Programmable interrupt controller |
| | [00000034 - 00000035] Programmable interrupt controller |
| | [00000038 - 00000039] Programmable interrupt controller |
| | [0000003C - 0000003D] Programmable interrupt controller |
| | [00000040 - 00000043] System timer |
| | [0000004E - 0000004F] Motherboard resources |
| | [00000050 - 00000053] System timer |
| | [00000060 - 00000060] Standard PS/2 Keyboard |
| | [00000061 - 00000061] Motherboard resources |
| | [00000063 - 00000063] Motherboard resources |
| | [00000064 - 00000064] Standard PS/2 Keyboard |
| | [00000065 - 00000065] Motherboard resources |
| | [00000067 - 00000067] Motherboard resources |
| | [00000070 - 00000070] Motherboard resources |
| | [00000070 - 00000077] System CMOS/real time clock |
| | [00000078 - 000000CF7] PCI Express Root Complex |
| | [00000080 - 0000008F] Motherboard resources |
| | [00000092 - 00000092] Motherboard resources |
| | [000000A0 - 000000A1] Programmable interrupt controller |
| | [000000A4 - 000000A5] Programmable interrupt controller |
| | [000000A8 - 000000A9] Programmable interrupt controller |
| | [000000AC - 000000AD] Programmable interrupt controller |
| | [000000B0 - 000000B1] Programmable interrupt controller |
| | [000000B2 - 000000B3] Motherboard resources |
| | [000000B4 - 000000B5] Programmable interrupt controller |
| | [000000B8 - 000000B9] Programmable interrupt controller |
| | [000000BC - 000000BD] Programmable interrupt controller |
| | [000002F8 - 000002FF] Communications Port (COM2) |
| | [000003B0 - 000003BB] Microsoft Basic Display Adapter |
| | [000003C0 - 000003DF] Microsoft Basic Display Adapter |
| | [000003F8 - 000003FF] Communications Port (COM1) |
| | [00000400 - 0000047F] Motherboard resources |
| | [000004D0 - 000004D1] Programmable interrupt controller |
| | [00000500 - 000005FE] Motherboard resources |
| | [00000600 - 0000061F] Motherboard resources |
| | [00000680 - 0000069F] Motherboard resources |
| | [00000A00 - 00000A0F] Motherboard resources |
| | [00000A10 - 00000A1F] Motherboard resources |
| | [00000D00 - 0000FFFF] PCI Express Root Complex |
| | [0000E000 - 0000EFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48 |
| | [0000F000 - 0000F01F] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12 |




































B.2 Memory Address Map




































Pico-ITX Board




































PICO-BT01




































| | |
|-------------------------|---|
| Memory | |
| [000A0000 - 000BFFFF] | Microsoft Basic Display Adapter |
| [000A0000 - 000BFFFF] | PCI Express Root Complex |
| [000C0000 - 000DFFFF] | PCI Express Root Complex |
| [000E0000 - 000FFFFF] | PCI Express Root Complex |
| [C0000000 - CFFFFFFF] | Microsoft Basic Display Adapter |
| [C0000000 - D0716FFF] | PCI Express Root Complex |
| [D0000000 - D03FFFFF] | Microsoft Basic Display Adapter |
| [D0400000 - D04FFFFF] | Intel(R) Trusted Execution Engine Interface |
| [D0500000 - D05FFFFF] | Intel(R) Trusted Execution Engine Interface |
| [D0600000 - D061FFFF] | Intel(R) I211 Gigabit Network Connection |
| [D0600000 - D066FFFF] | Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48 |
| [D0620000 - D0623FFF] | Intel(R) I211 Gigabit Network Connection |
| [D0700000 - D070FFFF] | Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft) |
| [D0710000 - D0713FFF] | High Definition Audio Controller |
| [D0714000 - D071401F] | Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12 |
| [D0716000 - D07167FF] | Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23 |
| [E0000000 - EFFFFFFF] | Motherboard resources |
| [E00000D0 - E00000DB] | Intel(R) Sideband Fabric Device |
| [FED00000 - FED003FF] | High precision event timer |
| [FED01000 - FED01FFF] | Motherboard resources |
| [FED03000 - FED03FFF] | Motherboard resources |
| [FED04000 - FED04FFF] | Motherboard resources |
| [FED08000 - FED08FFF] | Motherboard resources |
| [FED0C000 - FED0FFFF] | Motherboard resources |
| [FED1C000 - FED1CFFF] | Motherboard resources |
| [FEE00000 - FEEFFFFFFF] | Motherboard resources |
| [FEF00000 - FEFFFFFFFF] | Motherboard resources |
| [FF000000 - FFFFFFFF] | Intel(R) 82802 Firmware Hub Device |




































B.3 IRQ Mapping Chart




































| | |
|--|---------------------------------|
|  Interrupt request (IRQ) | |
|  (ISA) 0x00000000 (00) | System timer |
|  (ISA) 0x00000001 (01) | Standard PS/2 Keyboard |
|  (ISA) 0x00000003 (03) | Communications Port (COM2) |
|  (ISA) 0x00000004 (04) | Communications Port (COM1) |
|  (ISA) 0x00000008 (08) | High precision event timer |
|  (ISA) 0x0000000C (12) | PS/2 Compatible Mouse |
|  (ISA) 0x00000051 (81) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000052 (82) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000053 (83) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000054 (84) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000055 (85) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000056 (86) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000057 (87) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000058 (88) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000059 (89) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000005A (90) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000005B (91) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000005C (92) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000005D (93) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000005E (94) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000005F (95) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000060 (96) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000061 (97) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000062 (98) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000063 (99) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000064 (100) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000065 (101) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000066 (102) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000067 (103) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000068 (104) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000069 (105) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000006A (106) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000006B (107) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000006C (108) | Microsoft ACPI-Compliant System |




































| | |
|--|---------------------------------|
|  (ISA) 0x0000006C (108) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000006D (109) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000006E (110) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000006F (111) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000070 (112) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000071 (113) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000072 (114) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000073 (115) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000074 (116) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000075 (117) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000076 (118) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000077 (119) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000078 (120) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000079 (121) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000007A (122) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000007B (123) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000007C (124) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000007D (125) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000007E (126) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000007F (127) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000080 (128) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000081 (129) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000082 (130) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000083 (131) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000084 (132) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000085 (133) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000086 (134) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000087 (135) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000088 (136) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000089 (137) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000008A (138) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000008B (139) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000008C (140) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000008D (141) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000008E (142) | Microsoft ACPI-Compliant System |




































| | |
|--|---------------------------------|
|  (ISA) 0x0000008E (142) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000008F (143) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000090 (144) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000091 (145) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000092 (146) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000093 (147) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000094 (148) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000095 (149) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000096 (150) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000097 (151) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000098 (152) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000099 (153) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000009A (154) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000009B (155) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000009C (156) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000009D (157) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000009E (158) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000009F (159) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A0 (160) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A1 (161) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A2 (162) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A3 (163) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A4 (164) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A5 (165) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A6 (166) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A7 (167) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A8 (168) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A9 (169) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000AA (170) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000AB (171) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000AC (172) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000AD (173) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000AE (174) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000AF (175) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B0 (176) | Microsoft ACPI-Compliant System |




































| | |
|--|---------------------------------|
|  (ISA) 0x000000B0 (176) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B1 (177) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B2 (178) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B3 (179) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B4 (180) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B5 (181) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B6 (182) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B7 (183) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B8 (184) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B9 (185) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000BA (186) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000BB (187) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000BC (188) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000BD (189) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000BE (190) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000BF (191) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000100 (256) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000101 (257) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000102 (258) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000103 (259) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000104 (260) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000105 (261) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000106 (262) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000107 (263) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000108 (264) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000109 (265) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000010A (266) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000010B (267) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000010C (268) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000010D (269) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000010E (270) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000010F (271) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000110 (272) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000111 (273) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000112 (274) | Microsoft ACPI-Compliant System |




































| | |
|--|---------------------------------|
|  (ISA) 0x00000111 (273) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000112 (274) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000113 (275) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000114 (276) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000115 (277) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000116 (278) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000117 (279) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000118 (280) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000119 (281) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000011A (282) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000011B (283) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000011C (284) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000011D (285) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000011E (286) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000011F (287) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000120 (288) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000121 (289) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000122 (290) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000123 (291) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000124 (292) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000125 (293) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000126 (294) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000127 (295) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000128 (296) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000129 (297) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000012A (298) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000012B (299) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000012C (300) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000012D (301) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000012E (302) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000012F (303) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000130 (304) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000131 (305) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000132 (306) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000133 (307) | Microsoft ACPI-Compliant System |




































| | |
|--|---------------------------------|
|  (ISA) 0x00000132 (306) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000133 (307) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000134 (308) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000135 (309) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000136 (310) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000137 (311) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000138 (312) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000139 (313) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000013A (314) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000013B (315) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000013C (316) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000013D (317) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000013E (318) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000013F (319) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000140 (320) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000141 (321) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000142 (322) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000143 (323) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000144 (324) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000145 (325) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000146 (326) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000147 (327) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000148 (328) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000149 (329) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000014A (330) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000014B (331) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000014C (332) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000014D (333) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000014E (334) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000014F (335) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000150 (336) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000151 (337) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000152 (338) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000153 (339) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000154 (340) | Microsoft ACPI-Compliant System |




































| | |
|--|---------------------------------|
|  (ISA) 0x00000153 (339) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000154 (340) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000155 (341) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000156 (342) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000157 (343) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000158 (344) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000159 (345) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000015A (346) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000015B (347) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000015C (348) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000015D (349) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000015E (350) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000015F (351) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000160 (352) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000161 (353) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000162 (354) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000163 (355) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000164 (356) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000165 (357) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000166 (358) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000167 (359) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000168 (360) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000169 (361) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000016A (362) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000016B (363) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000016C (364) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000016D (365) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000016E (366) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000016F (367) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000170 (368) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000171 (369) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000172 (370) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000173 (371) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000174 (372) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000175 (373) | Microsoft ACPI-Compliant System |

| | |
|--|---------------------------------|
|  (ISA) 0x00000174 (372) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000175 (373) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000176 (374) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000177 (375) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000178 (376) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000179 (377) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000017A (378) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000017B (379) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000017C (380) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000017D (381) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000017E (382) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000017F (383) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000180 (384) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000181 (385) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000182 (386) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000183 (387) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000184 (388) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000185 (389) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000186 (390) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000187 (391) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000188 (392) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000189 (393) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000018A (394) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000018B (395) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000018C (396) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000018D (397) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000018E (398) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000018F (399) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000190 (400) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000191 (401) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000192 (402) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000193 (403) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000194 (404) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000195 (405) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000196 (406) | Microsoft ACPI-Compliant System |

| | |
|--|---------------------------------|
|  (ISA) 0x00000195 (405) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000196 (406) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000197 (407) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000198 (408) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000199 (409) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000019A (410) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000019B (411) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000019C (412) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000019D (413) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000019E (414) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000019F (415) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001A0 (416) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001A1 (417) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001A2 (418) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001A3 (419) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001A4 (420) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001A5 (421) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001A6 (422) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001A7 (423) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001A8 (424) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001A9 (425) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001AA (426) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001AB (427) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001AC (428) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001AD (429) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001AE (430) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001AF (431) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B0 (432) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B1 (433) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B2 (434) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B3 (435) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B4 (436) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B5 (437) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B6 (438) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B7 (439) | Microsoft ACPI-Compliant System |

| | |
|--|---------------------------------|
|  (ISA) 0x000001B6 (438) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B7 (439) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B8 (440) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B9 (441) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001BA (442) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001BB (443) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001BC (444) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001BD (445) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001BE (446) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001BF (447) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C0 (448) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C1 (449) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C2 (450) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C3 (451) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C4 (452) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C5 (453) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C6 (454) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C7 (455) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C8 (456) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C9 (457) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001CA (458) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001CB (459) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001CC (460) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001CD (461) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001CE (462) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001CF (463) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D0 (464) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D1 (465) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D2 (466) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D3 (467) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D4 (468) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D5 (469) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D6 (470) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D7 (471) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D8 (472) | Microsoft ACPI-Compliant System |

| | |
|--|---------------------------------|
|  (ISA) 0x000001D7 (471) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D8 (472) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D9 (473) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001DA (474) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001DB (475) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001DC (476) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001DD (477) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001DE (478) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001DF (479) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E0 (480) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E1 (481) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E2 (482) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E3 (483) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E4 (484) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E5 (485) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E6 (486) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E7 (487) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E8 (488) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E9 (489) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001EA (490) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001EB (491) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001EC (492) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001ED (493) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001EE (494) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001EF (495) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F0 (496) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F1 (497) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F2 (498) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F3 (499) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F4 (500) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F5 (501) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F6 (502) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F7 (503) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F8 (504) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F9 (505) | Microsoft ACPI-Compliant System |

| | |
|---|---|
|  (ISA) 0x000001EF (495) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F0 (496) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F1 (497) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F2 (498) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F3 (499) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F4 (500) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F5 (501) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F6 (502) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F7 (503) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F8 (504) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F9 (505) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FA (506) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FB (507) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FC (508) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FD (509) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FE (510) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FF (511) | Microsoft ACPI-Compliant System |
|  (PCI) 0x00000005 (05) | Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12 |
|  (PCI) 0x00000010 (16) | Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48 |
|  (PCI) 0x00000011 (17) | Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 2 - 0F4A |
|  (PCI) 0x00000012 (18) | Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 3 - 0F4C |
|  (PCI) 0x00000013 (19) | Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23 |
|  (PCI) 0x00000013 (19) | Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 4 - 0F4E |
|  (PCI) 0x00000016 (22) | High Definition Audio Controller |
|  (PCI) 0xFFFFFFFF7 (-9) | Intel(R) Trusted Execution Engine Interface |
|  (PCI) 0xFFFFFFFF8 (-8) | Intel(R) I211 Gigabit Network Connection |
|  (PCI) 0xFFFFFFFF9 (-7) | Intel(R) I211 Gigabit Network Connection |
|  (PCI) 0xFFFFFFFFFA (-6) | Intel(R) I211 Gigabit Network Connection |
|  (PCI) 0xFFFFFFFFFB (-5) | Intel(R) I211 Gigabit Network Connection |
|  (PCI) 0xFFFFFFFFFC (-4) | Intel(R) I211 Gigabit Network Connection |
|  (PCI) 0xFFFFFFFFFD (-3) | Intel(R) I211 Gigabit Network Connection |
|  (PCI) 0xFFFFFFFFFE (-2) | Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft) |
|  Memory | |
|  [000A0000 - 000BFFFF] Microsoft Basic Display Adapter | |
|  [000A0000 - 000BFFFF] PCI Express Root Complex | |

Appendix C

Electrical Specifications for I/O Ports

C.1 Electrical Specifications for I/O Ports

| I/O | Reference | Signal Name | Rate Output |
|--|-----------|------------------|----------------------------|
| VGA | CN3 | VGA: +5V | +5V/0.5A |
| LVDS Port Inverter / Backlight Connector | CN5 | VDD | +5V/2A or +12V/2A |
| Digital IO Port | CN8 | D0~D3 | +5V/(Open drain) |
| Mini-Card Slot | CN9 | +3.3VSB +1.5V | +3.3V/1.1A +1.5V/0.375A |
| USB 3.0 Port 1 & 2 | CN10 | +5VSB | +5VSB/1A (per channel) |
| USB 2.0 Port 3 | CN11 | +5VSB | +5VSB/0.5A |
| +5V Output for SATA HDD | CN14 | +5V | +5V/1A |
| LPC Port | CN18 | +3.3V | +3.3V/0.5A |
| COM Port 2 | CN23 | +5V/+12V | +5V/1A or +12V/1A |
| Mini-Card Slot | CN24 | +3.3VSB +1.5V | +3.3V/1.1A +1.5V/0.375A |
| LVDS Port | CN25 | VCC | +3.3V/2A or +5V/2A |

Appendix D

Mating Connectors

D.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

| Connector Label | Function | Mating Connector | | Available Cable | Cable P/N |
|-----------------|--|------------------|---------------------|------------------|------------|
| | | Vendor | Model no | | |
| CN1 | Battery | Molex | 51021-0200 | Battery Cable | 175011901M |
| CN2 | DDR3 204PIN SKT | FOXCONN | AS0A626-JER6-7H | | NA |
| CN3 | VGA Connector | Astron | HDLH-B15-CFHN1T-1-R | | NA |
| CN4 | DPCconnector | FOXCONN | 13VD51203-D7JJ-7H | | NA |
| CN5 | LVDS Port Inverter / Backlight Connector | JST | PHR-5 | | NA |
| CN7 | LAN Connector | UDE | RT7-17FAAM1A | | NA |
| CN8 | Digital IO Port | JST | SM6B-GHS-TB | | NA |
| CN9 | Mini-Card Slot (Full-Mini Card) | FOXCONN | AS0B226-S68Q-7H | | NA |
| CN10 | USB 3.0 Connector | Contek | UDNFA199N-AY-21-A | | NA |
| CN11 | USB Connector | Molex | 51021-0500 | USB Cable | 1700050207 |
| CN14 | +5V Output for SATA HDD | JST | PHR-2 | SATA power cable | 1702150155 |
| CN15 | SATA Port | Molex | 887505318 | SATA | NA |

| | | | | | |
|------|---|---------|-----------------|--|------------|
| | | | | Cable | |
| CN18 | LPC Port | JST | SHR-12V-S-B | AAEON LPC Cable | 1703120130 |
| CN19 | Front Panel Connector | PINREX | 222-97-05GBE1 | Front Panel Cable | 1701100156 |
| CN20 | External +12V Input | Molex | 19211-0003 | Power cable | 170204010R |
| CN21 | Buzzer connector | PINREX | 712-73-02TWE0 | Buzzer Cable | 170302010C |
| CN22 | BIO connector | Hirose | FX18-80P-0.8SV | | N/A |
| CN23 | COM Port 1/2 & line out connector | Hirose | DF14-20S-1.25C | COM Port 1/2 & line out cable | 1703200153 |
| CN24 | Mini-Card Slot (Half-Mini Card) | FOXCONN | AS0B226-S68Q-7H | | NA |
| CN25 | LVDS Port | Hirose | DF14-20S-1.25C | LVDS cable | 170430015A |