

# BOXER-6839

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Fanless Embedded Box PC

User's Manual 3<sup>rd</sup> Ed

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## Packing List

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

| Item                                                | Quantity |
|-----------------------------------------------------|----------|
| BOXER-6839                                          | 1        |
| Wallmount Bracket                                   | 2        |
| Screw Package                                       | 1        |
| Thermal Pad                                         | 3        |
| Phoenix Power Connector                             | 1        |
| Product DVD with User's Manual (in pdf) and Drivers | 1        |

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

## About this Document

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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 product page at [AAEON.com](http://AAEON.com) for the latest version of this document.

## Safety Precautions

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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. All cables and adapters supplied by AAEON are certified and in accordance with the material safety laws and regulations of the country of sale. Do not use any cables or adapters not supplied by AAEON to prevent system malfunction or fires.
3. Make sure the power source matches the power rating of the device.
4. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
5. Always completely disconnect the power before working on the system's hardware.
6. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
7. 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.
8. Always disconnect this device from any power supply before cleaning.
9. While cleaning, use a damp cloth instead of liquid or spray detergents.
10. Make sure the device is installed near a power outlet and is easily accessible.
11. Keep this device away from humidity.
12. Place the device on a solid surface during installation to prevent falls
13. Do not cover the openings on the device to ensure optimal heat dissipation.
14. Watch out for high temperatures when the system is running.
15. Do not touch the heat sink or heat spreader when the system is running
16. Never pour any liquid into the openings. This could cause fire or electric shock.

17. 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.
18. 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
19. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.**

## FCC Statement

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### **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 System

QO4-381 Rev.A2

| 部件名称            | 有毒有害物质或元素 |           |           |                 |               |                 |
|-----------------|-----------|-----------|-----------|-----------------|---------------|-----------------|
|                 | 铅<br>(Pb) | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(Cr(VI)) | 多溴联苯<br>(PBB) | 多溴二苯醚<br>(PBDE) |
| 印刷电路板<br>及其电子组件 | ×         | ○         | ○         | ○               | ○             | ○               |
| 外部信号<br>连接器及线材  | ×         | ○         | ○         | ○               | ○             | ○               |
| 外壳              | ○         | ○         | ○         | ○               | ○             | ○               |
| 中央处理器<br>与内存    | ×         | ○         | ○         | ○               | ○             | ○               |
| 硬盘              | ×         | ○         | ○         | ○               | ○             | ○               |
| 液晶模块            | ×         | ○         | ○         | ○               | ○             | ○               |
| 光驱              | ×         | ○         | ○         | ○               | ○             | ○               |
| 触控模块            | ×         | ○         | ○         | ○               | ○             | ○               |
| 电源              | ×         | ○         | ○         | ○               | ○             | ○               |
| 电池              | ×         | ○         | ○         | ○               | ○             | ○               |

本表格依据 SJ/T 11364 的规定编制。  
○：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 GB/T 26572 标准规定的限量要求以下。  
×：表示该有害物质的某一均质材料超出了 GB/T 26572 的限量要求，然而该部件仍符合欧盟指令 2011/65/EU 的规范。  
环保使用期限(EFUP (Environmental Friendly Use Period))：10 年  
备注：  
一、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。  
二、上述部件物质中央处理器、内存、硬盘、光驱、电源为选购品。  
三、上述部件物质液晶模块、触控模块仅一体机产品适用。

China RoHS Requirement (EN)

Name and content of hazardous substances in product

AAEON System

QO4-381 Rev.A2

| Part Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Hazardous Substances |           |           |                 |               |                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------|-----------|-----------------|---------------|-----------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 铅<br>(Pb)            | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(Cr(VI)) | 多溴联苯<br>(PBB) | 多溴二苯醚<br>(PBDE) |
| PCB Assemblies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ×                    | ○         | ○         | ○               | ○             | ○               |
| Connector and Cable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ×                    | ○         | ○         | ○               | ○             | ○               |
| Chassis                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ○                    | ○         | ○         | ○               | ○             | ○               |
| CPU and Memory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ×                    | ○         | ○         | ○               | ○             | ○               |
| Hard Disk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ×                    | ○         | ○         | ○               | ○             | ○               |
| LCD Modules                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ×                    | ○         | ○         | ○               | ○             | ○               |
| CD-ROM/DVD-ROM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ×                    | ○         | ○         | ○               | ○             | ○               |
| Touch Modules                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ×                    | ○         | ○         | ○               | ○             | ○               |
| Power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ×                    | ○         | ○         | ○               | ○             | ○               |
| Battery                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ×                    | ○         | ○         | ○               | ○             | ○               |
| <p>The table is prepared in accordance with the provisions of SJ/T 11364.</p> <p>○ : Indicates that said hazardous substance contained in all of the homogenous materials for this product is below the limit requirement of GB/T 26572.</p> <p>× : Indicates that said hazardous substance contained in at least one of the homogenous materials used for this part is above the limit requirement of GB/T 26572. But this product still be compliance with 2011/65/EU Directive (allowed with 2011/65/EU Annex III of RoHS exemption with number 6(c),7(a),7(c)-1).</p> <p>EFUP (Environment Friendly Use Period) value: 10 years.</p> <p>Notes:</p> <p>1. This product defined period of use is under normal condition.</p> <p>2. In above part, CPU/Memory/ Hard Disk/CD-ROM/DVD-ROM/ Power are optional.</p> <p>3. In above part, LCD Modules/ Touch Modules are for all-in-one product model.</p> |                      |           |           |                 |               |                 |

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# Chapter 1

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Product Specifications

## 1.1 Specifications

### System

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU               | <b>7th Gen Intel® Core™/Pentium® &amp; Celeron®</b><br><b>Processor G Series Processors:</b><br>Intel® Core™ i7-7700T, 2.9 GHz<br>Intel® Core™ i5-7500T, 2.7 GHz<br>Intel® Core™ i3-7101TE, 3.4 GHz<br>Intel® Pentium® Processor G4600T, 3.0 GHz<br>Intel® Pentium® Processor G4560T, 2.9 GHz<br>Intel® Celeron® Processor G3930T, 2.7 GHz<br><b>6th Gen Intel® Core™/Pentium® &amp; Celeron®</b><br><b>Processor G Series Processors:</b><br>Intel® Core™ i7-6700TE, 2.4 GHz<br>Intel® Core™ i5-6500TE, 2.3 GHz<br>Intel® Core™ i3-6100TE, 2.7 GHz<br>Intel® Pentium® Processor G4500T, 3.0 GHz<br>Intel® Pentium® Processor G4400T, 2.9 GHz<br>Intel® Celeron® Processor G3900T, 2.6 GHz |
| Chipset           | Intel® Q170 Chipset                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| System Memory     | DDR4 1866/2133 SODIMM x 2, up to 32GB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Display Interface | HDMI<br>VGA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Storage Device    | CFast™ HDD/SSD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Ethernet          | Intel® Ethernet Controller I210, 10/100/1000 Base-TX x<br>3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| System     |                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I/O        | RS-232/422/485 x 6<br>USB 3.2 Gen 1 (Type-A) x 6<br>USB 2.0 (Type-A) x 2<br>RJ-45 x 3 for GbE LAN<br>DB-44 for 34-bit Digital I/O (5V)<br>Power On/Off Button x 1<br>2-pin Remote power on/off<br>Reset switch<br>Mic-in x 1, Line-out x 1<br>Antenna Opening x 2<br>System LED Indicator x 1<br>HDD LED Indicator x 1<br>DB-15 x 1 for VGA<br>HDMI v1.3 x 2<br>DC-in 3-pin Terminal Block (9V ~ 36V) |
| Expansion  | Full-size Mini Card x 2<br>PCIe [x4] x 1 & PCIe [x1] x 1 (A1 SKU)<br>PCIe [x4] x 1 & PCI x 1 (A2 SKU)<br>PCI x 2 (A3 SKU)<br>CFast™ Slot x 1<br>SIM Card slot x 1<br>Max expansion card size: 150mm x 105mm x 40mm                                                                                                                                                                                    |
| Indicator  | Power LED, HDD active LED                                                                                                                                                                                                                                                                                                                                                                             |
| OS Support | 7th Gen Intel® Core™/Pentium® & Celeron®<br><br>Processor G Series Processors:<br><br>Windows® 10 IoT (64-bit)<br><br>Ubuntu 16.04 and above                                                                                                                                                                                                                                                          |



System

|                    |                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OS Support (cont.) | Fedora Linux 25 and above<br>CentOS 7.3 and above<br><b>6th Gen Intel® Core™/Pentium® &amp; Celeron®</b><br><b>Processor G Series Processors:</b><br>Windows® 10 IoT (64-bit)<br>Windows® 8.1 (64-bit)<br>Windows® Embedded 8 Standard (64-bit)<br>Windows® 7 (64-bit/32-bit)<br>Windows® Embedded Standard 7 (32/64bit)<br>Ubuntu 16.04 and above<br>Fedora Linux 25 and above<br>CentOS 7.3 and above |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Power Supply

|                   |                                   |
|-------------------|-----------------------------------|
| Power Requirement | 9V ~ 36V via 3-pin terminal block |
|-------------------|-----------------------------------|

Mechanical

|                        |                                                      |
|------------------------|------------------------------------------------------|
| Mounting               | Wallmount                                            |
| Dimensions (W x H x D) | 10.40" x 4.90" x 6.15" (264.2mm x 124.5mm x 156.2mm) |
| Gross Weight           | 13.2 lb. (6.0Kg)                                     |
| Net Weight             | 9.9 lb. (4.5Kg)                                      |

Environmental

|                       |                                                                                                        |
|-----------------------|--------------------------------------------------------------------------------------------------------|
| Operating Temperature | -4°F ~ 131°F (-20°C ~ 55°C) (according to IEC68-2-14<br>with 0.5 m/s AirFlow; with industrial devices) |
| Storage Temperature   | -49°F ~ 176°F (-45°C ~ 80°C)                                                                           |
| Storage Humidity      | 5~95% @ 40°C, non-condensing                                                                           |

Environmental

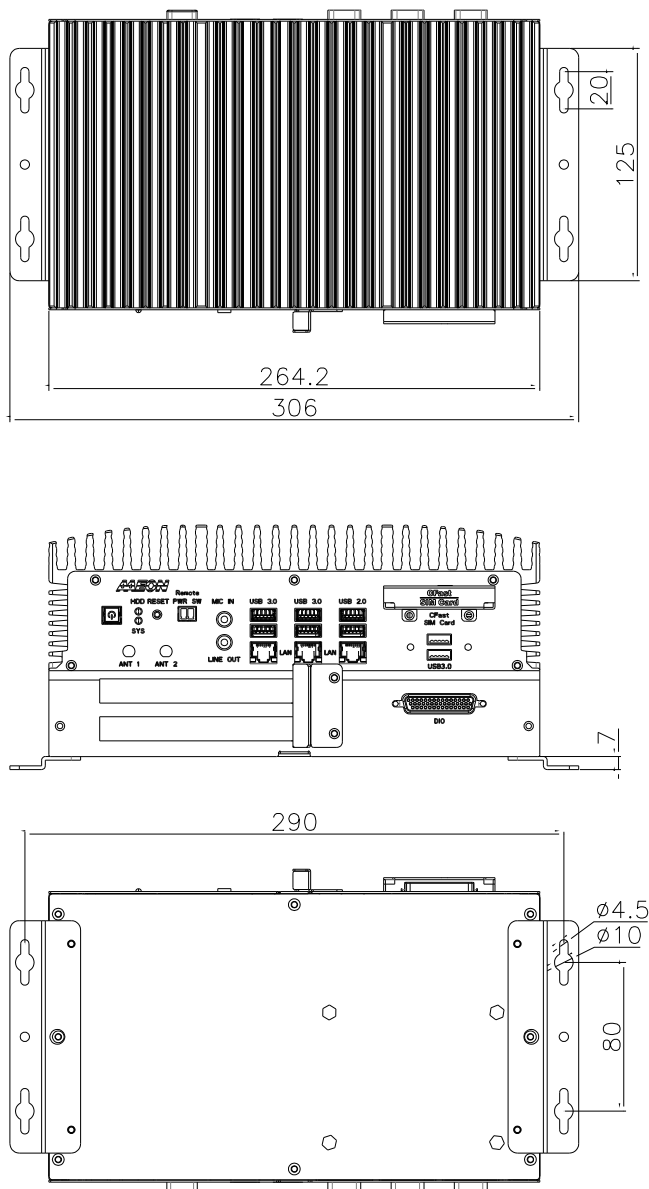
|                |                                                                                     |
|----------------|-------------------------------------------------------------------------------------|
| Anti-Vibration | 5 Grms/ 5 ~ 500Hz/ operation – SSD/CFast™ card<br>1 Grms/ 5~ 500Hz/ operation – HDD |
| Anti-Shock     | —                                                                                   |
| Certification  | CE/FCC class A                                                                      |

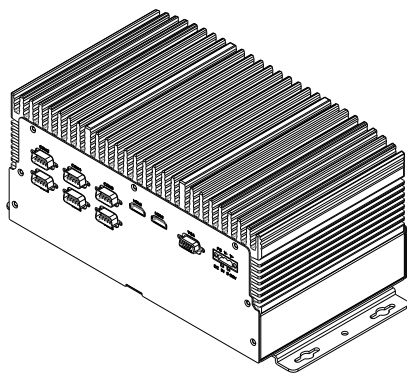
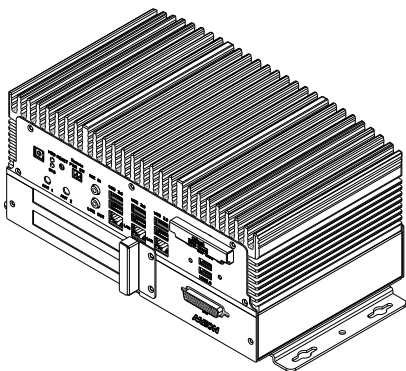
# Chapter 2

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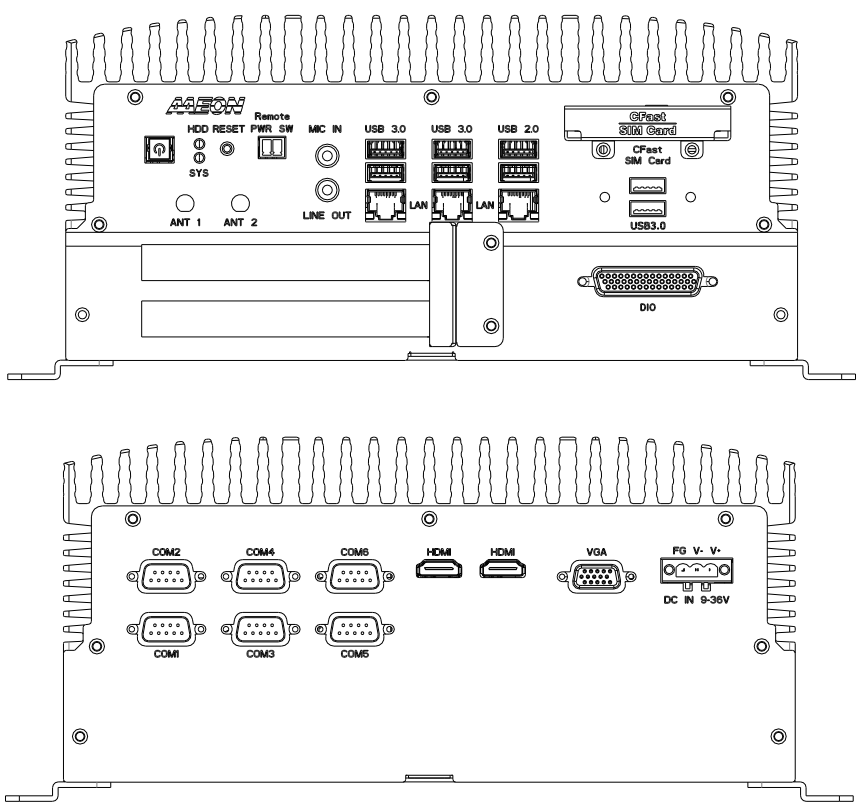
Hardware Information

## 2.1 Dimensions



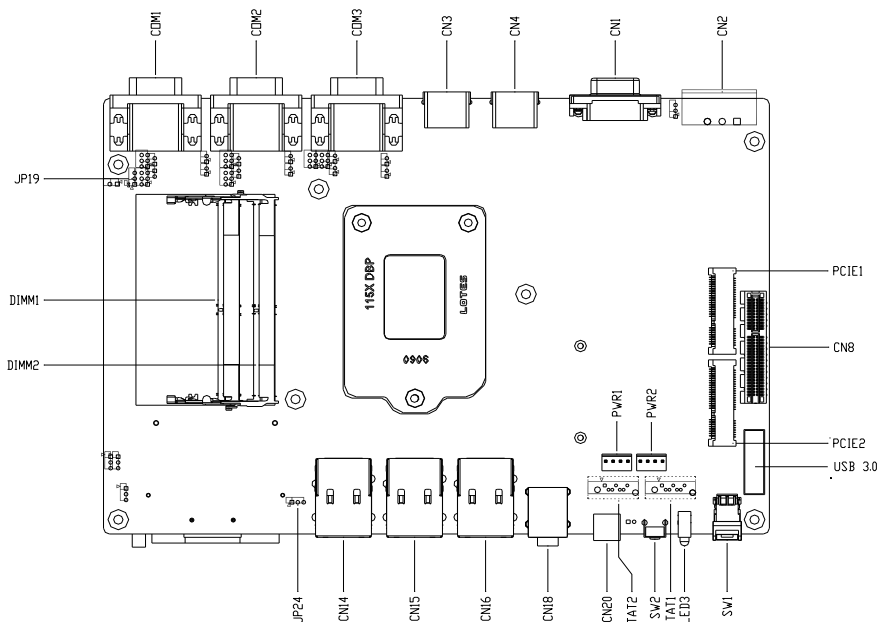


## 2.1.1 I/O Location

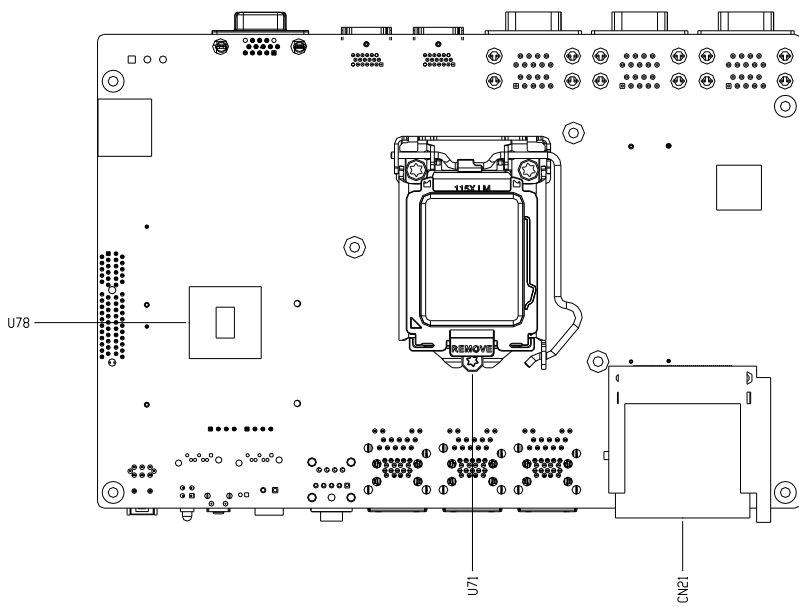


## 2.2 Jumpers and Connectors

### Component Side



Solder Side



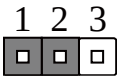


### 2.3 List of Jumpers

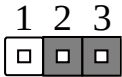
Please refer to the table below for all of the system's jumpers that you can configure for your application.

| Label | Function                                |
|-------|-----------------------------------------|
| JP4   | RS-232/422/485 Selection for COM 1 Port |
| JP5   | RS-232/422/485 Selection for COM 6 Port |
| JP6   | RS-232/422/485 Selection for COM 4 Port |
| JP7   | RS-232/422/485 Selection for COM 3 Port |
| JP17  | RS-232/422/485 Selection for COM 2 Port |
| JP18  | RS-232/422/485 Selection for COM 5 Port |
| JP19  | AT/ATX Mode Select                      |
| JP24  | Clear CMOS                              |

#### 2.3.1 Auto Power Button (JP19)

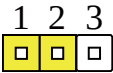


Disable

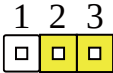


Enable (Default)

#### 2.3.2 Clear CMOS Jumper (JP24)



Normal (Default)



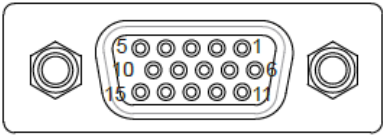
Clear CMOS

## 2.4 List of Connectors

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

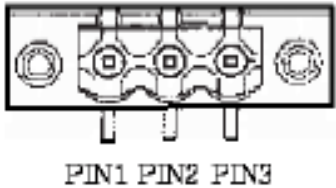
| Label                     | Function                                |
|---------------------------|-----------------------------------------|
| VGA                       | DB-15 CRT Port                          |
| DC-In                     | 9V ~ 36V DC-In Connector                |
| HDMI 1                    | HDMI Connector                          |
| HDMI 2                    | HDMI Connector                          |
| DIO                       | 34-bit Digital Input & Output Connector |
| USB 3.0 Port 1~4          | USB 3.0 Port                            |
| USB 3.0 Port 5~6          | USB 3.0 Port                            |
| USB 2.0 Port 1~2          | USB 2.0 Port                            |
| LAN Port 1~3              | RJ-45 Connector                         |
| Audio Jack                | 3.5mm Audio Line-out Connector          |
| Remote Power Button       | 2-pin Remote Power on/off Button        |
| CFast                     | CFast Slot Connector                    |
| Power Switch              | Power on/off Switch                     |
| Reset Switch              | H/W Reset Switch                        |
| SATA Power Connector 1~2  | SATA Storage Power Connector            |
| SATA Signal Connector 1~2 | SATA Storage Signal Connector           |
| COM 1/2/3/4/5/6           | DB9 RS232/422/485 Connector             |
| MiniCard 1~2              | PCI Express Mini Card Slot              |
| SIM Slot                  | SIM Card Connector                      |
| DDR4 SODIMM Slot 1~2      | 260-pin DDR4 Memory Bank                |

2.4.1 VGA Port



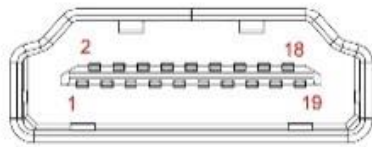
| Pin | Signal    | Pin | Signal    |
|-----|-----------|-----|-----------|
| 1   | Red       | 2   | Green     |
| 3   | Blue      | 4   | NC        |
| 5   | GND       | 6   | GND       |
| 7   | GND       | 8   | GND       |
| 9   | VGA_VCC   | 10  | GND       |
| 11  | NC        | 12  | DDC_DATA  |
| 13  | VGA_HSYNC | 14  | VGA_VSYNC |
| 15  | DDC_CLK   |     |           |

2.4.2 DC-In



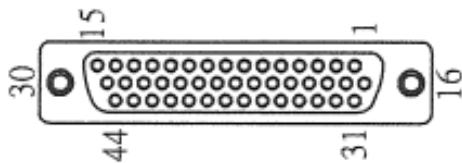
| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1   | PWR_IN | 2   | GND    |
| 3   | NC     |     |        |

### 2.4.3 HDMI Port (HDMI 1/HDMI 2)



| Pin | Signal       | Pin | Signal       |
|-----|--------------|-----|--------------|
| 1   | HDMI_DATA2_P | 2   | GND          |
| 3   | HDMI_DATA2_N | 4   | HDMI_DATA1_P |
| 5   | GND          | 6   | HDMI_DATA1_N |
| 7   | HDMI_DATA0_P | 8   | GND          |
| 9   | HDMI_DATA0_N | 10  | HDMI_CLK_P   |
| 11  | GND          | 12  | HDMI_CLK_N   |
| 13  | NC           | 14  | NC           |
| 15  | HDMI_SCL     | 16  | HDMI_SDA     |
| 17  | GND          | 18  | HDMI_PWR     |
| 19  | HDMI_HDP     |     |              |

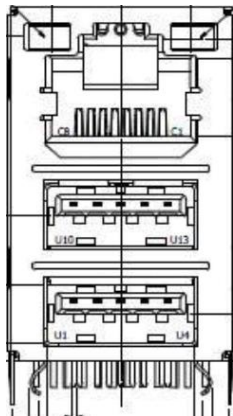
### 2.4.4 DIO Port



| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1   | DIO1   | 2   | DIO2   |
| 3   | DIO3   | 4   | DIO4   |
| 5   | DIO5   | 6   | DIO6   |
| 7   | DIO7   | 8   | DIO8   |
| 9   | DIO9   | 10  | DIO10  |
| 11  | DIO11  | 12  | DIO12  |

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 13  | DIO13  | 14  | DIO14  |
| 15  | DIO15  | 16  | DIO16  |
| 17  | DIO17  | 18  | DIO18  |
| 19  | DIO19  | 20  | DIO20  |
| 21  | DIO21  | 22  | DIO22  |
| 23  | DIO23  | 24  | DIO24  |
| 25  | DIO25  | 26  | DIO26  |
| 27  | DIO27  | 28  | DIO28  |
| 29  | DIO29  | 30  | DIO30  |
| 31  | DIO31  | 32  | DIO32  |
| 33  | DIO33  | 34  | DIO34  |
| 35  | +5V    | 36  | GND    |
| 37  | +5V    | 38  | GND    |
| 39  | +5V    | 40  | GND    |
| 41  | NC     | 42  | NC     |
| 43  | NC     | 44  | NC     |

### 2.4.5 LAN + USB 3.0



| Pin | Signal   | Pin | Signal   |
|-----|----------|-----|----------|
| C1  | MDI0+    | U2  | MDI0-    |
| C3  | MDI1+    | U4  | MDI2+    |
| C5  | MDI2-    | U6  | MDI1-    |
| C7  | MDI3+    | U8  | MDI3-    |
| U1  | VBUS_1   | U10 | VBUS_2   |
| U2  | (A)D-    | U11 | (B)D-    |
| U3  | (A)D+    | U12 | (B)D+    |
| U4  | GND      | U13 | GND      |
| U5  | (A)SSRX- | U14 | (B)SSRX- |
| U6  | (A)SSRX+ | U15 | (B)SSRX+ |
| U7  | GND      | U16 | GND      |
| U8  | (A)SSTX- | U17 | (B)SSTX- |
| U9  | (A)SSTX+ | U18 | (B)SSTX+ |

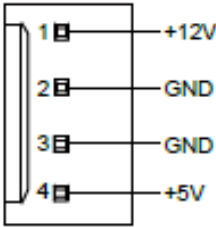
### 2.4.6 Remote Power Button

| Pin | Signal  | Pin | Signal |
|-----|---------|-----|--------|
| 1   | PANSWH# | 2   | GND    |

2.4.7 CFast

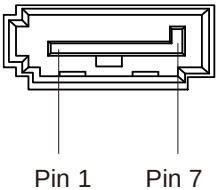
| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| S1  | GND    | S2  | TX+    |
| S3  | TX-    | S4  | GND    |
| S5  | RX-    | S6  | RX+    |
| S7  | GND    |     |        |
| P1  | CD     | P2  | GND    |
| P3  | NC     | P4  | NC     |
| P5  | NC     | P6  | NC     |
| P7  | GND    | P8  | NC     |
| P9  | NC     | P10 | NC     |
| P11 | NC     | P12 | NC     |
| P13 | +3.3V  | P14 | +3.3V  |
| P15 | GND    | P16 | GND    |
| P17 | NC     |     |        |

2.4.8 SATA Power Connector 1~2



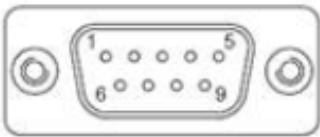
| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1   | +12V   | 12V | TX+    |
| 2   | GND    | GND |        |
| 3   | GND    | GND |        |
| 4   | +5V    | 5V  |        |

2.4.9 SATA Signal Connector 1~2



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

2.4.10 COM 1/2/3/4/5/6



| Pin | RS-232 | RS-422 | RS-485 |
|-----|--------|--------|--------|
| 1   | DCD    | TX-    | DATA-  |
| 2   | RXD    | TX+    | DATA+  |
| 3   | TXD    | RX+    | NC     |
| 4   | DTR    | RX-    | NC     |
| 5   | GND    | NC     | NC     |
| 6   | DSR    | NC     | NC     |
| 7   | RTS    | NC     | NC     |
| 8   | CTS    | NC     | NC     |
| 9   | RI     | NC     | NC     |



## 2.4.11 Mini Card Connector with Onboard SIM

| Pin | Signal        | Pin | Signal              |
|-----|---------------|-----|---------------------|
| 1   | PCIE_WAKE#    | 2   | +V3.3A              |
| 3   | NC            | 4   | GND                 |
| 5   | NC            | 6   | +1.5V               |
| 7   | PCIE_CLK_REQ# | 8   | UIM_PWR             |
| 9   | GND           | 10  | UIM_DATA            |
| 11  | PCIE_REF_CLK- | 12  | UIM_CLK             |
| 13  | PCIE_REF_CLK+ | 14  | UIM_RST             |
| 15  | GND           | 16  | UIM_VPP             |
| 17  | NC            | 18  | GND                 |
| 19  | NC            | 20  | W_DISABLE#          |
| 21  | GND           | 22  | PCIE_RST#           |
| 23  | PCIE_RX-      | 24  | +V3.3A              |
| 25  | PCIE_RX+      | 26  | GND                 |
| 27  | GND           | 28  | +1.5V               |
| 29  | GND           | 30  | SMB_CLK<br>PCIE_TX- |
| 31  | PCIE_TX-      | 32  | SMB_DATA            |
| 33  | PCIE_TX+      | 34  | GND                 |
| 35  | GND           | 36  | USB_D-              |
| 37  | GND           | 38  | USB_D+              |
| 39  | +V3.3A        | 40  | GND                 |
| 41  | +V3.3A        | 42  | NC                  |
| 43  | GND           | 44  | NC                  |
| 45  | NC            | 46  | NC                  |
| 47  | NC            | 48  | +1.5V               |
| 49  | NC            | 50  | GND                 |
| 51  | NC            | 52  | +V3.3A              |

## 2.4.12 PCIe Slot

| Pin | Signal           | Pin | Signal      |
|-----|------------------|-----|-------------|
| A1  | GND              | B01 | +V12S       |
| A2  | +V12S            | B02 | +V12S       |
| A3  | +V12S            | B03 | +V12S       |
| A4  | GND              | B04 | GND         |
| A5  | PCIE_TXN14       | B05 | SMB_CLK     |
| A6  | PCIE_TXP14       | B06 | SMB_DATA    |
| A7  | PCIE_RXN14       | B07 | GND         |
| A8  | PCIE_RXP14       | B08 | +V3.3S      |
| A9  | +V3.3S           | B09 | NC          |
| A10 | +V3.3S           | B10 | +V3.3A      |
| A11 | CB_RESET#        | B11 | PCIE_WAKE1# |
| A12 | GND              | B12 | NC          |
| A13 | PCIE_x4SLOT_CLK  | B13 | GND         |
| A14 | PCIE_x4SLOT_CLK# | B14 | PCIE_TXP5   |
| A15 | GND              | B15 | PCIE_TXN5   |
| A16 | PCIE_RXP5        | B16 | GND         |
| A17 | PCIE_RXN5        | B17 | +V3.3S      |
| A18 | GND              | B18 | GND         |
| A19 | NC               | B19 | PCIE_TXP6   |
| A20 | GND              | B20 | PCIE_TXN6   |
| A21 | PCIE_RXP6        | B21 | GND         |
| A22 | PCIE_RXN6        | B22 | GND         |
| A23 | GND              | B23 | PCIE_TXP7   |
| A24 | GND              | B24 | PCIE_TXN7   |
| A25 | PCIE_RXP7        | B25 | GND         |
| A26 | PCIE_RXN7        | B26 | GND         |
| A27 | GND              | B27 | PCIE_TXP8   |
| A28 | GND              | B28 | PCIE_TXN8   |
| A29 | PCIE_RXP8        | B29 | GND         |
| A30 | PCIE_RXN8        | B30 | NC          |

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| A31 | GND    | B31 | +V3.3S |
| A32 | NC     | B32 | GND    |

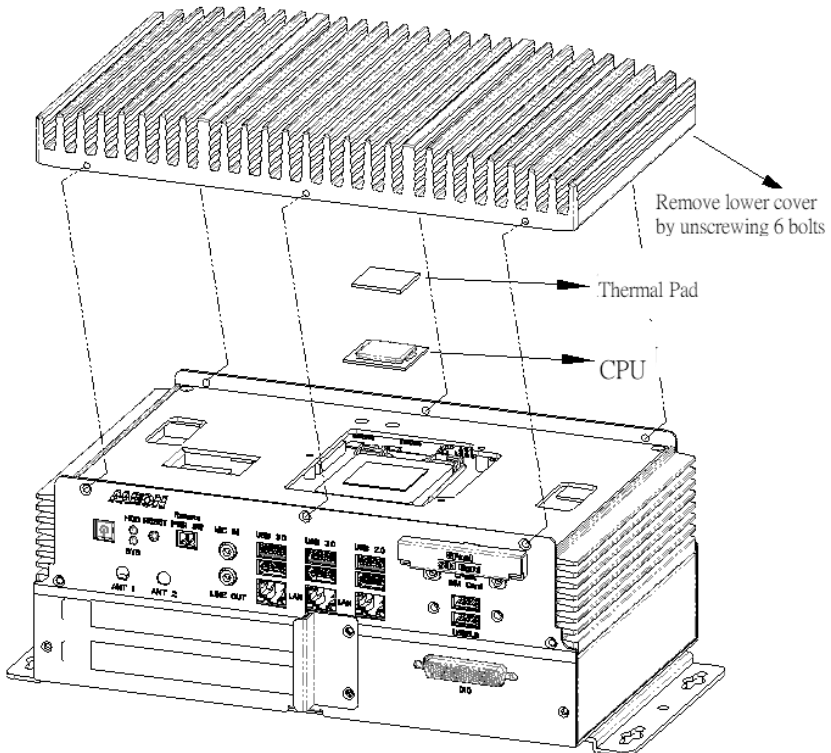
## 2.5 CPU Installation

**Step 1:** Turn off the system, unplug the power cord and make sure the system is off.

**Step 2:** Have Intel KabyLake FCLGA1151 Processor (Max. TDP 35W) ready.



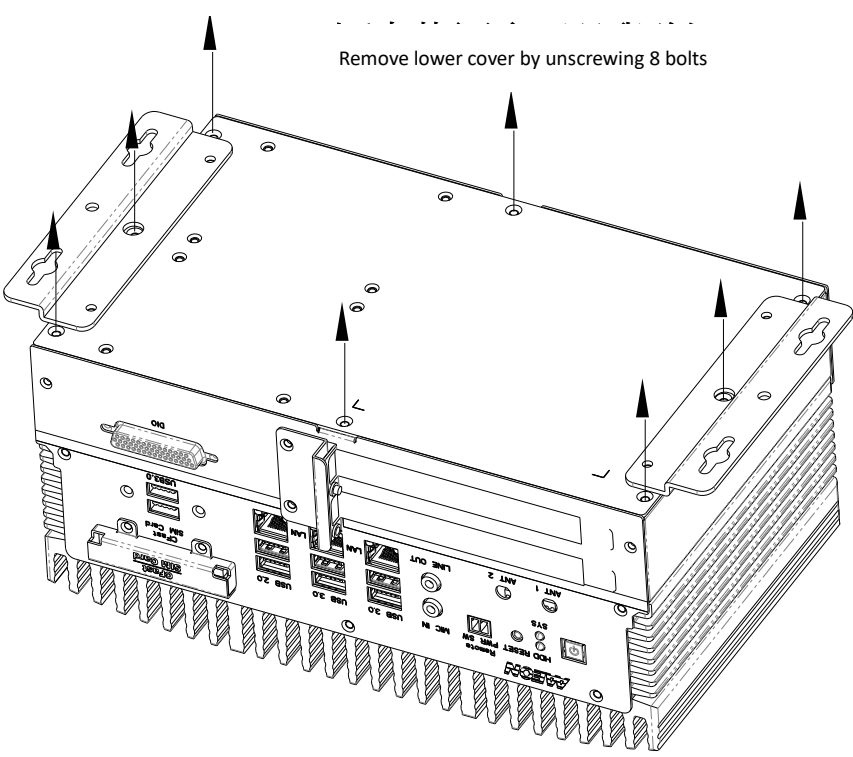
**Step 3:** Install the CPU into the socket and place the thermal pad onto it.



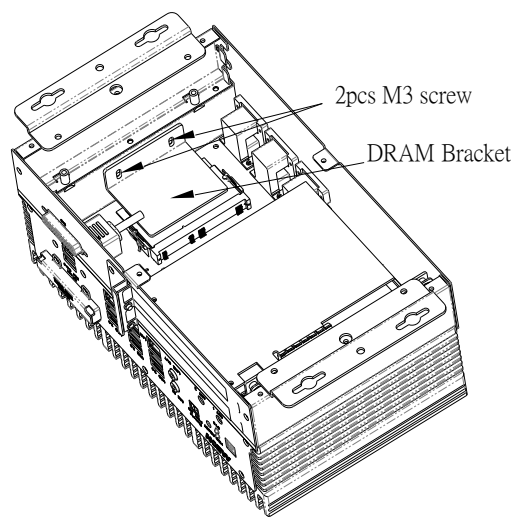
## 2.6 DDR4 Memory Module Installation

Turn off the system, unplug the power cord to make sure the system is power off.

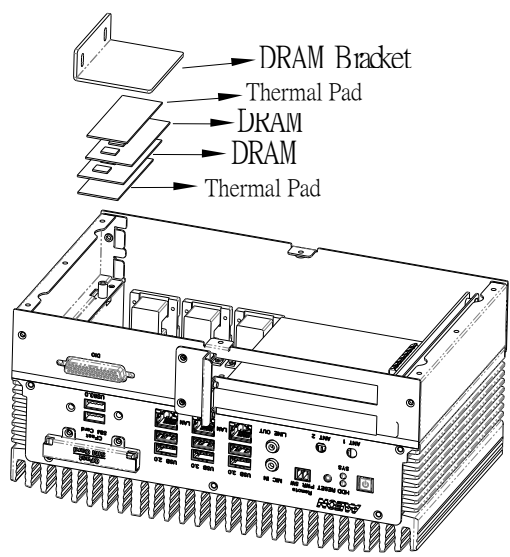
**Step 1:** Remove the screws as instructed below and remove the heatsink.



**Step 2:** Place the thermal pads onto the RAM modules as instructed below.

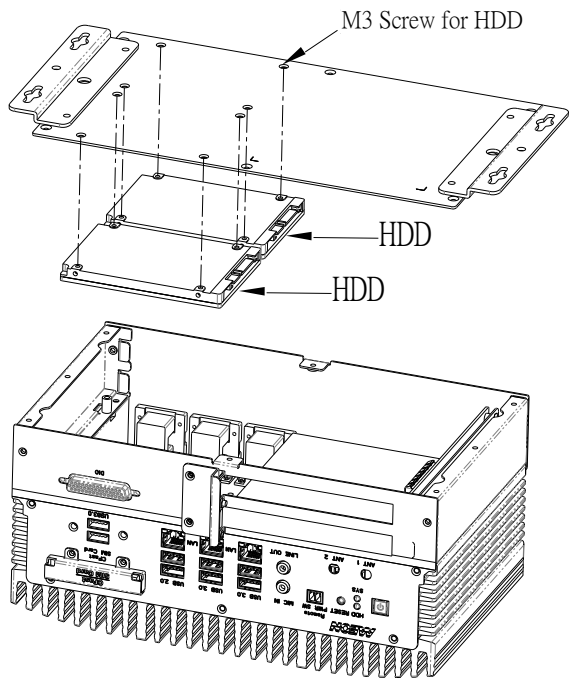


**Step 3:** After the RAM modules are installed, place the bracket onto the RAM and secure the screws as instructed below.



## 2.7 2.5" SATA Drive Installation

Turn off the system, unplug the power cord to make sure the system is power off.  
Use the HDD screws provided to assemble 2.5" SATA drive with the HDD Bracket.



# Chapter 3

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AMI BIOS Setup



## 3.1 System Test and Initialization

---

The system 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 <Del> 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

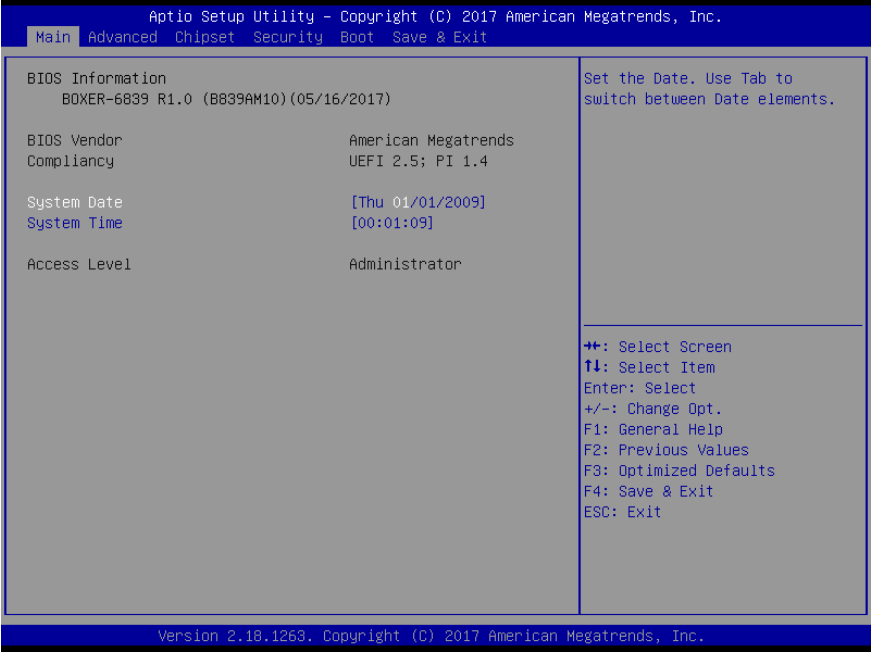
**Chipset** – For hosting bridge parameters

**Security** – The setup administrator password can be set here

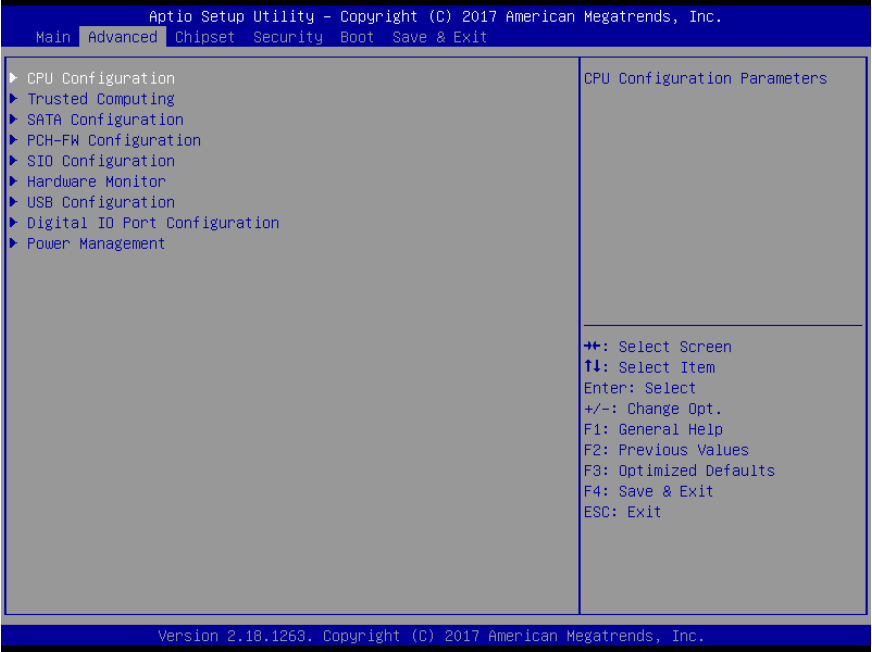
**Boot** – Enable/ Disable quiet Boot Option

**Save & Exit** – Save your changes and exit the program

### 3.3 Setup Submenu: Main



### 3.4 Setup Submenu: Advanced

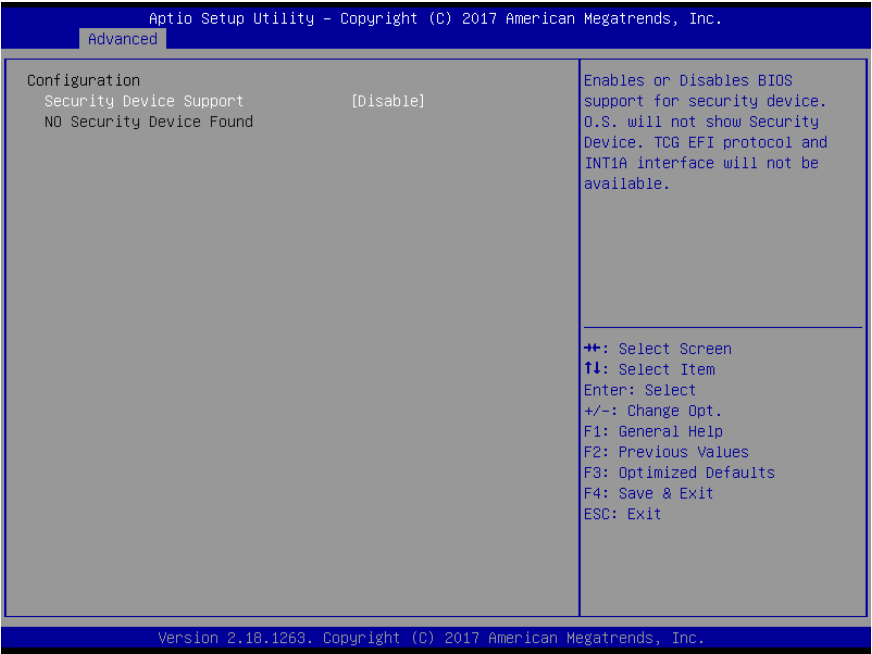


### 3.4.1 CPU Configuration



| Options Summary                                                                                                                                                                                                        |          |                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------|
| Hyper-threading                                                                                                                                                                                                        | Disabled |                                   |
|                                                                                                                                                                                                                        | Enabled  | Optimal Default, Failsafe Default |
| Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled. |          |                                   |
| Intel Virtualization Technology                                                                                                                                                                                        | Disabled |                                   |
|                                                                                                                                                                                                                        | Enabled  | Optimal Default, Failsafe Default |
| When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology                                                                                                                 |          |                                   |
| Active Processor Cores                                                                                                                                                                                                 | 1        |                                   |
|                                                                                                                                                                                                                        | 2        |                                   |
|                                                                                                                                                                                                                        | 3        |                                   |
|                                                                                                                                                                                                                        | All      | Optimal Default, Failsafe Default |
| Number of cores to enable in each processor package.                                                                                                                                                                   |          |                                   |

### 3.4.2 Trusted Computing



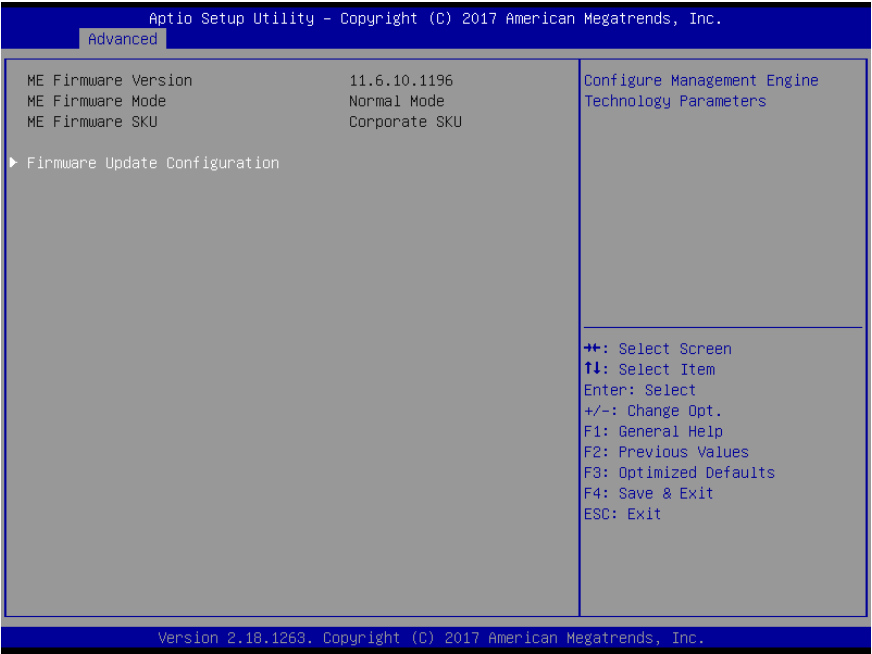
| Options Summary                                                                                                                                          |          |                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------|
| Security Device Support                                                                                                                                  | Enabled  | Optimal Default, Failsafe Default |
|                                                                                                                                                          | Disabled |                                   |
| Enable or Disable SATA BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available. |          |                                   |

### 3.4.3 SATA Configuration

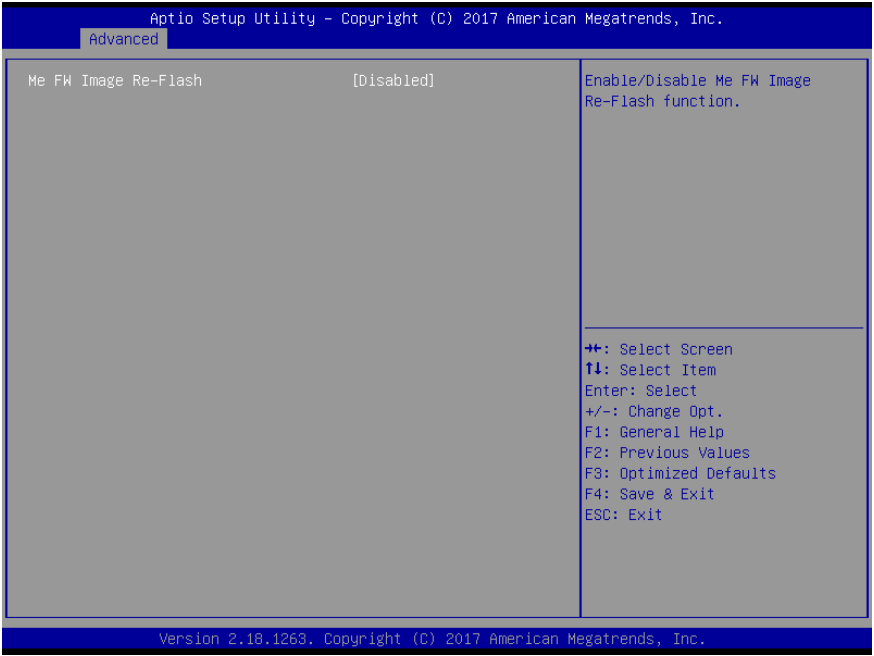


| Options Summary                            |           |                                   |
|--------------------------------------------|-----------|-----------------------------------|
| SATA Controller(s)                         | Enabled   | Optimal Default, Failsafe Default |
|                                            | Disabled  |                                   |
| Enable or Disable SATA Device.             |           |                                   |
| SATA Mode Selection                        | AHCI Mode | Optimal Default, Failsafe Default |
|                                            | RAID      |                                   |
| Determines how SATA controller(s) operate. |           |                                   |
| Port 0/1/2/3                               | Enabled   | Optimal Default, Failsafe Default |
|                                            | Disabled  |                                   |
| Enable or Disable SATA Port.               |           |                                   |
| Hot Plug                                   | Enabled   |                                   |
|                                            | Disabled  | Optimal Default, Failsafe Default |
| Designates this port as Hot Pluggable.     |           |                                   |

### 3.4.3 PCH-FW Configuration

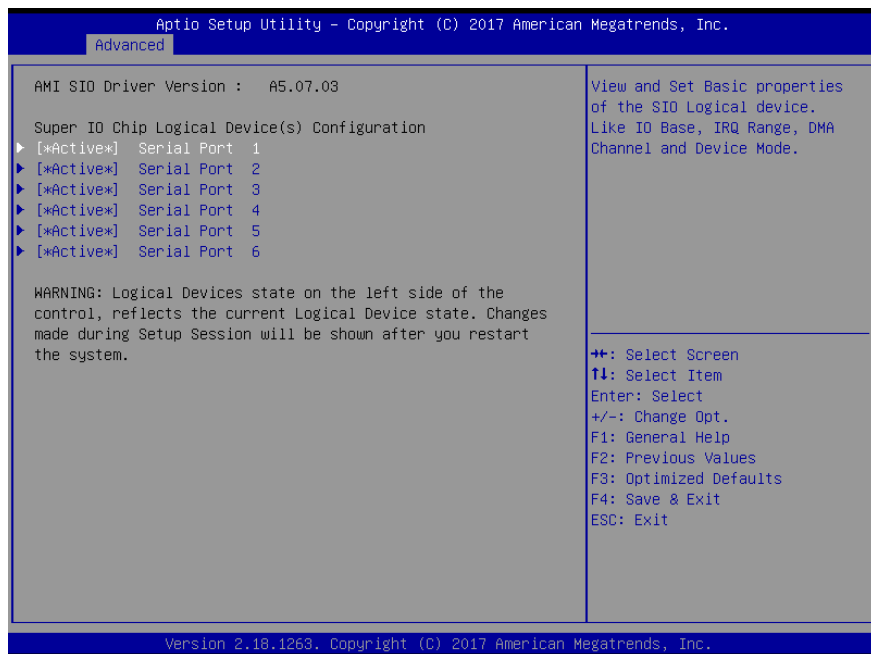




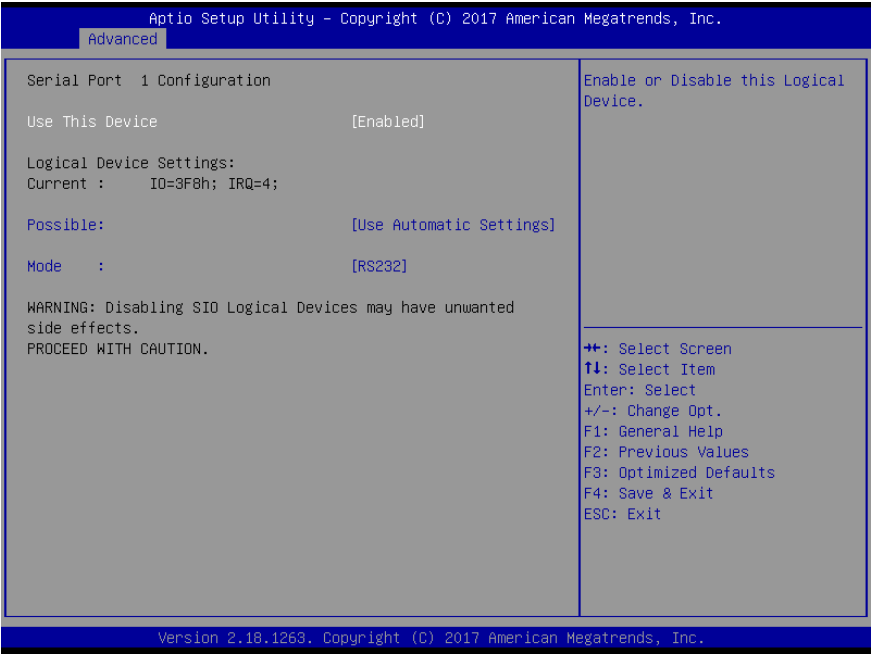


| Options Summary                                  |          |                                   |
|--------------------------------------------------|----------|-----------------------------------|
| ME FW Image Re-Flash                             | Enabled  |                                   |
|                                                  | Disabled | Optimal Default, Failsafe Default |
| Enable or Disable ME FW Image Re-Flash function. |          |                                   |

### 3.4.4 SIO Configuration

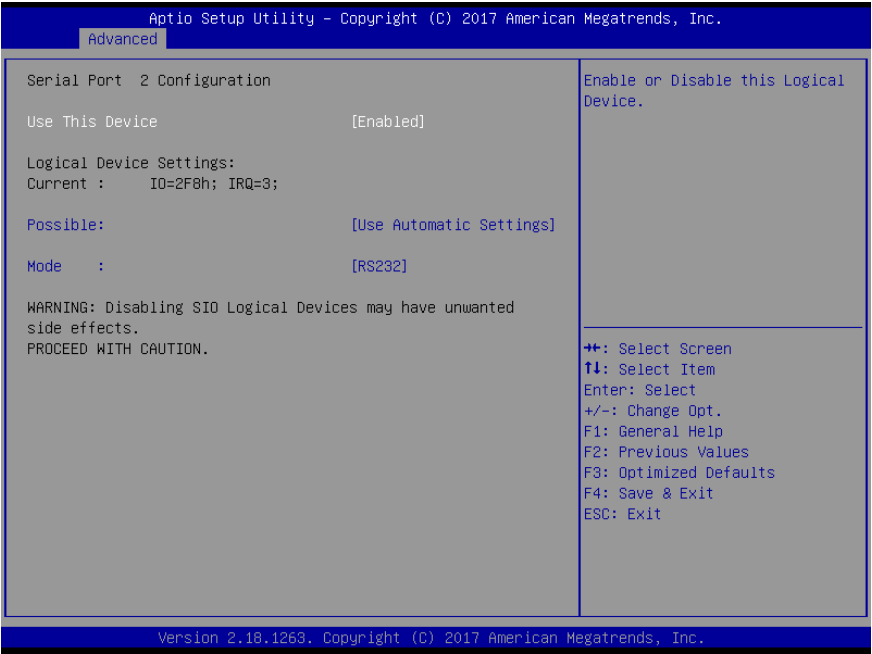


### 3.4.4.1 Serial Port 1 Configuration



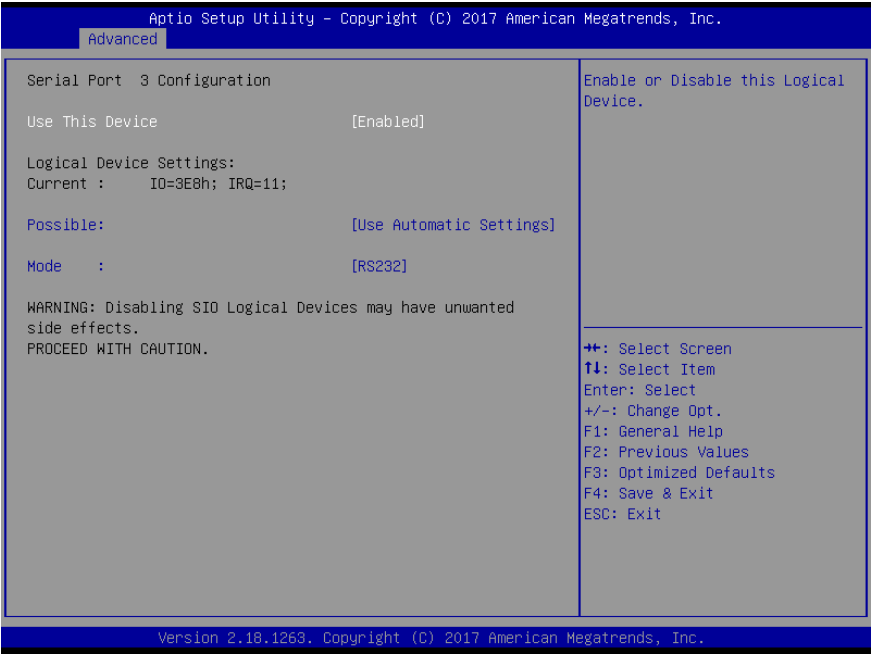
| Options Summary                                                                                                            |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                            | Disabled               |                                   |
|                                                                                                                            | Enabled                | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device.                                                                                     |                        |                                   |
| Possible:                                                                                                                  | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                            | IO=2F8; IRQ=3;         |                                   |
|                                                                                                                            | IO=3F8; IRQ=4;         |                                   |
| Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts. |                        |                                   |
| Mode:                                                                                                                      | RS232                  | Optimal Default, Failsafe Default |
|                                                                                                                            | RS422                  |                                   |
|                                                                                                                            | RS485                  |                                   |
| UART RS232, 422, 485 selection.                                                                                            |                        |                                   |

### 3.4.4.2 Serial Port 2 Configuration



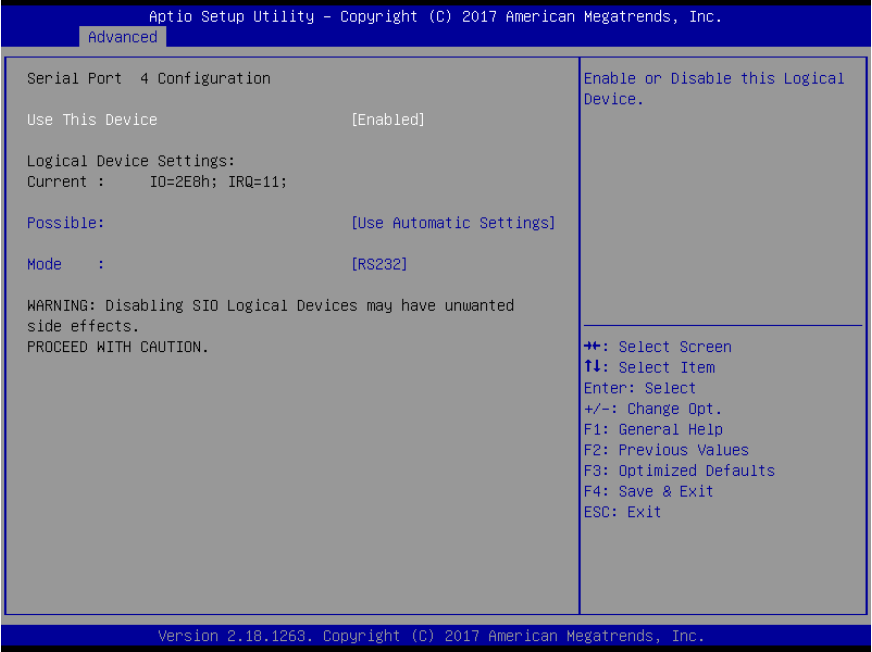
| Options Summary                                                                                                            |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                            | Disabled               |                                   |
|                                                                                                                            | Enabled                | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device.                                                                                     |                        |                                   |
| Possible:                                                                                                                  | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                            | IO=2F8; IRQ=3;         |                                   |
|                                                                                                                            | IO=3F8; IRQ=4;         |                                   |
| Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts. |                        |                                   |
| Mode:                                                                                                                      | RS232                  | Optimal Default, Failsafe Default |
|                                                                                                                            | RS422                  |                                   |
|                                                                                                                            | RS485                  |                                   |
| UART RS232, 422, 485 selection.                                                                                            |                        |                                   |

### 3.4.4.3 Serial Port 3 Configuration



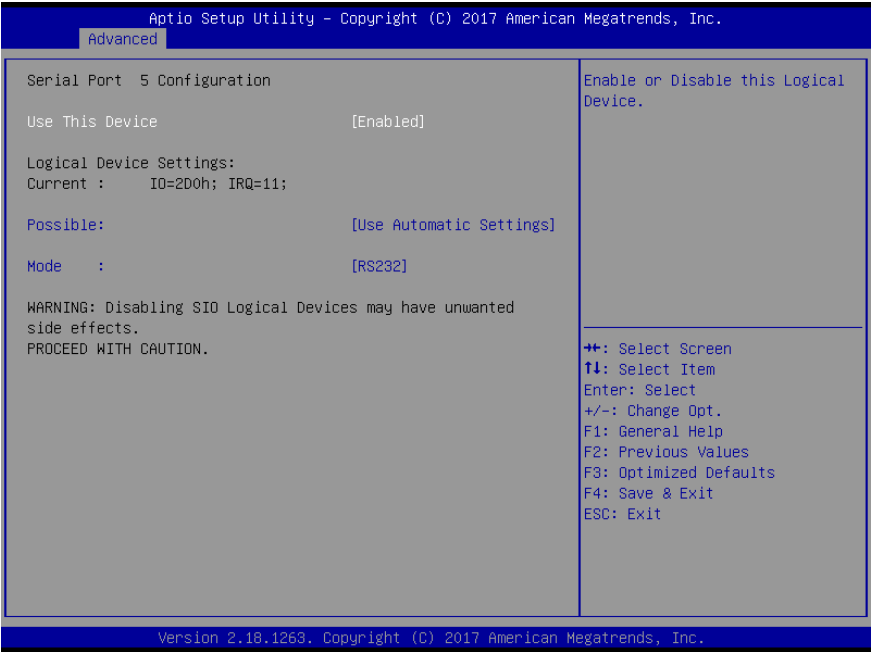
| Options Summary                                                                                                            |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                            | Disabled               |                                   |
|                                                                                                                            | Enabled                | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device.                                                                                     |                        |                                   |
| Possible:                                                                                                                  | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                            | IO=2F8; IRQ=11;        |                                   |
|                                                                                                                            | IO=3F8; IRQ=11;        |                                   |
| Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts. |                        |                                   |
| Mode:                                                                                                                      | RS232                  | Optimal Default, Failsafe Default |
|                                                                                                                            | RS422                  |                                   |
|                                                                                                                            | RS485                  |                                   |
| UART RS232, 422, 485 selection.                                                                                            |                        |                                   |

### 3.4.4.4 Serial Port 4 Configuration



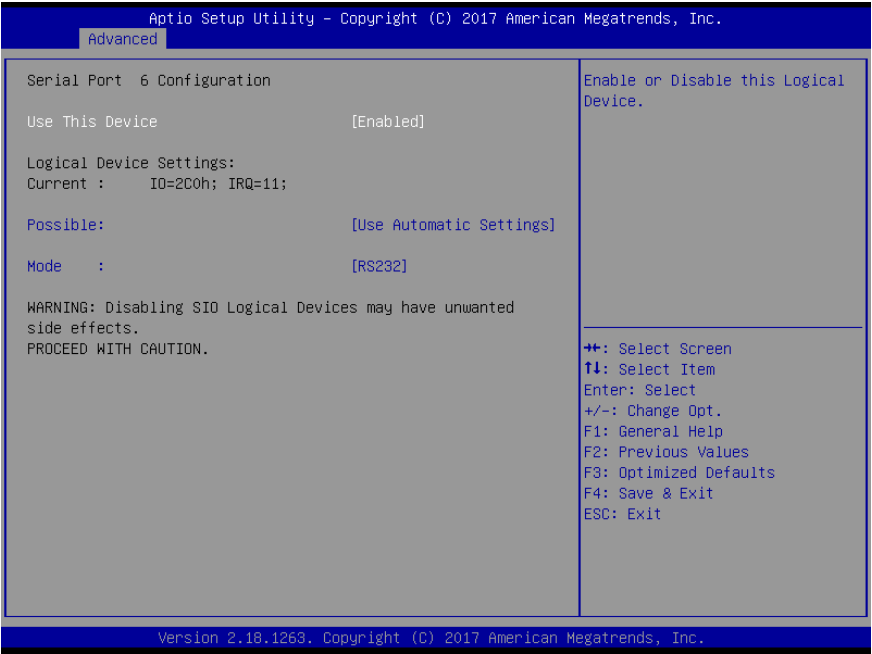
| Options Summary                                                                                                            |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                            | Disabled               |                                   |
|                                                                                                                            | Enabled                | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device.                                                                                     |                        |                                   |
| Possible:                                                                                                                  | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                            | IO=2F8; IRQ=11;        |                                   |
|                                                                                                                            | IO=3F8; IRQ=11;        |                                   |
| Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts. |                        |                                   |
| Mode:                                                                                                                      | RS232                  | Optimal Default, Failsafe Default |
|                                                                                                                            | RS422                  |                                   |
|                                                                                                                            | RS485                  |                                   |
| UART RS232, 422, 485 selection.                                                                                            |                        |                                   |

### 3.4.4.5 Serial Port 5 Configuration



| Options Summary                                                                                                            |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                            | Disabled               |                                   |
|                                                                                                                            | Enabled                | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device.                                                                                     |                        |                                   |
| Possible:                                                                                                                  | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                            | IO=2D0; IRQ=11;        |                                   |
|                                                                                                                            | IO=2C0; IRQ=11;        |                                   |
| Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts. |                        |                                   |
| Mode:                                                                                                                      | RS232                  | Optimal Default, Failsafe Default |
|                                                                                                                            | RS422                  |                                   |
|                                                                                                                            | RS485                  |                                   |
| UART RS232, 422, 485 selection                                                                                             |                        |                                   |

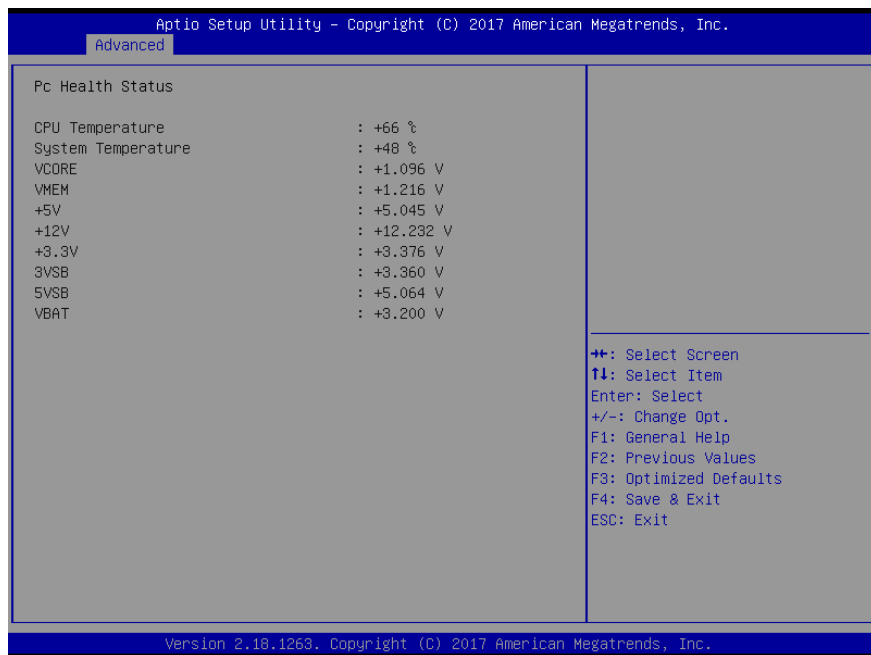
### 3.4.4.6 Serial Port 6 Configuration



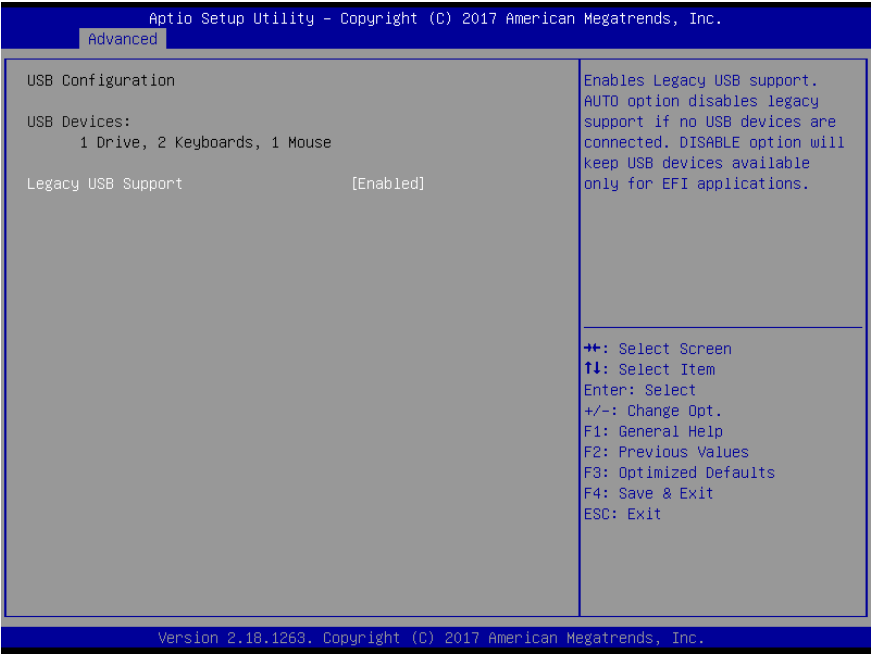
| Options Summary                                                                                                            |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                            | Disabled               |                                   |
|                                                                                                                            | Enabled                | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device.                                                                                     |                        |                                   |
| Possible:                                                                                                                  | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                            | IO=2D0; IRQ=11;        |                                   |
|                                                                                                                            | IO=2C0; IRQ=11;        |                                   |
| Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts. |                        |                                   |
| Mode:                                                                                                                      | RS232                  | Optimal Default, Failsafe Default |
|                                                                                                                            | RS422                  |                                   |
|                                                                                                                            | RS485                  |                                   |
| UART RS232, 422, 485 selection.                                                                                            |                        |                                   |



### 3.4.5 Hardware Monitor

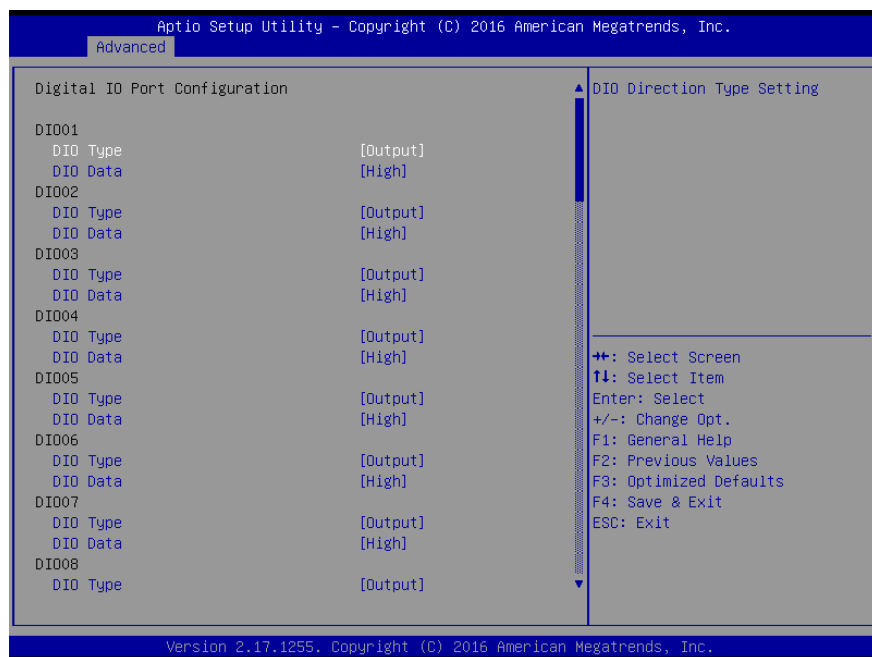


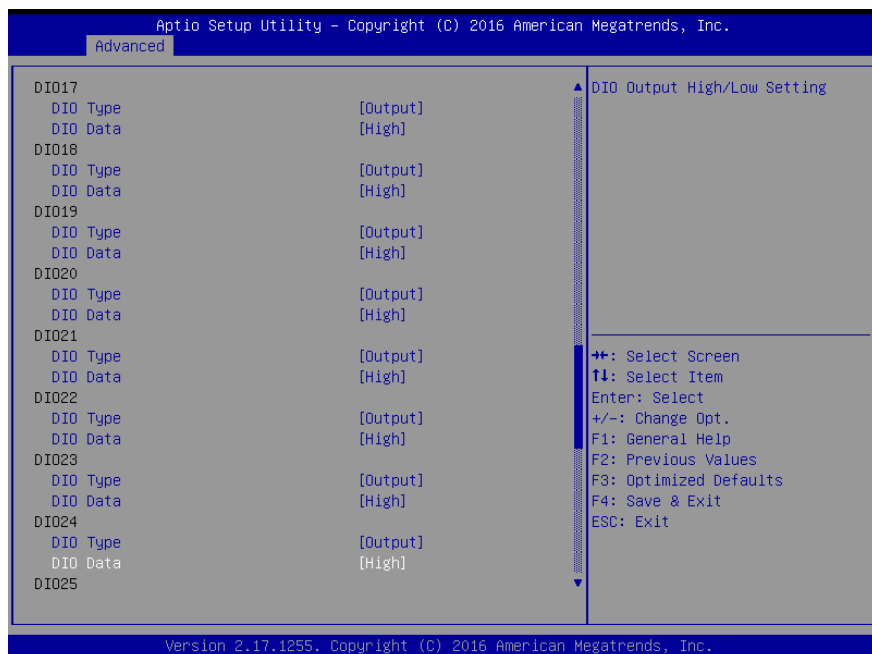
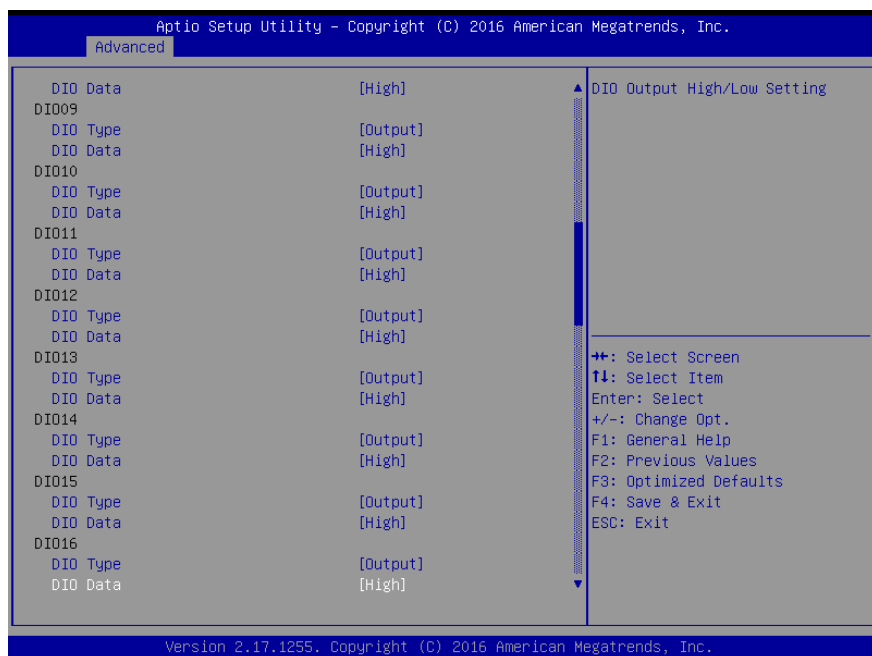
### 3.4.6 USB Configuration

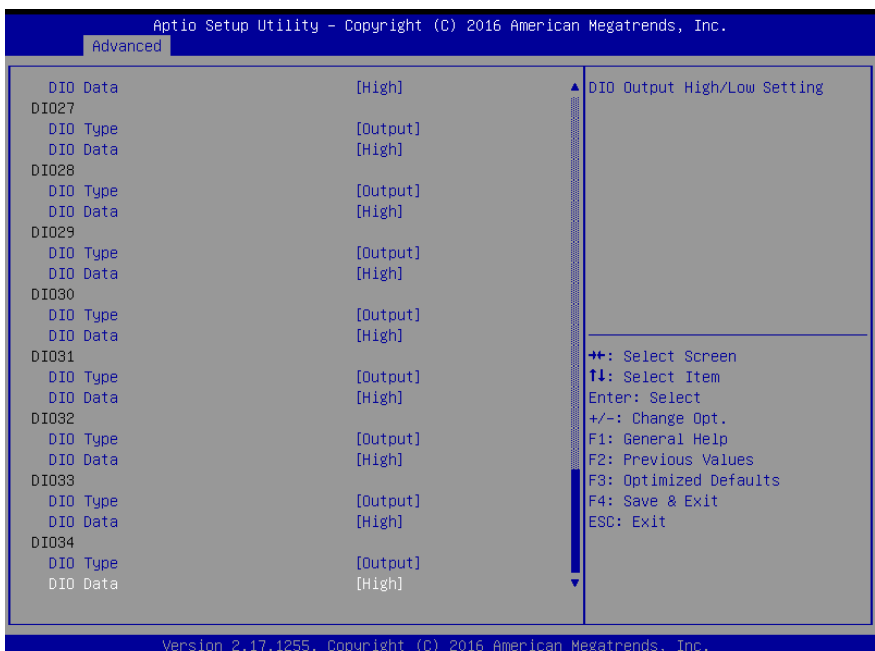
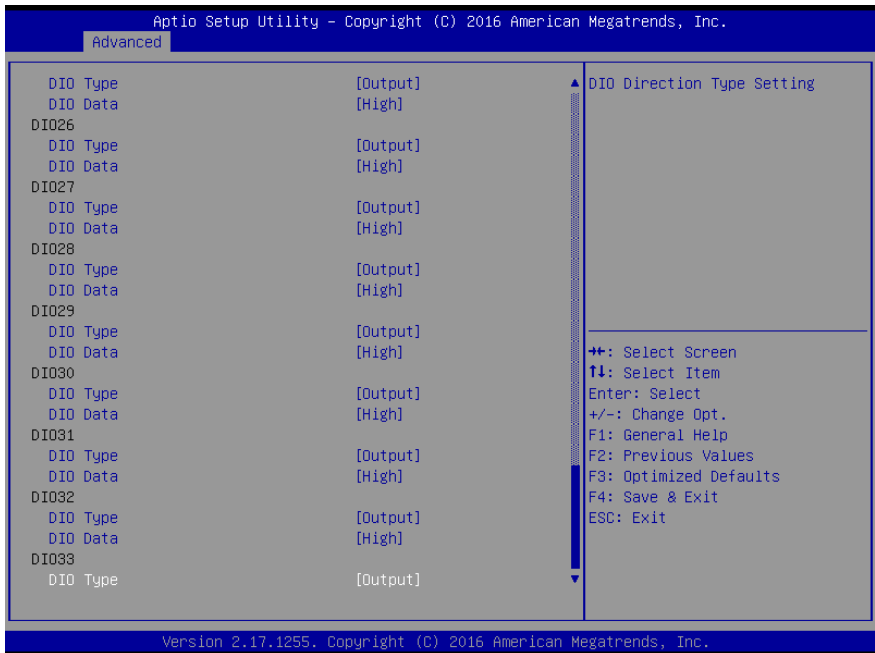


| Options Summary                                                                                                                                                            |          |                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------|
| Legacy USB Support                                                                                                                                                         | Enabled  | Optimal Default, Failsafe Default |
|                                                                                                                                                                            | Disabled |                                   |
|                                                                                                                                                                            | Auto     |                                   |
| Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications. |          |                                   |

### 3.4.7 Digital IO Port Configuration

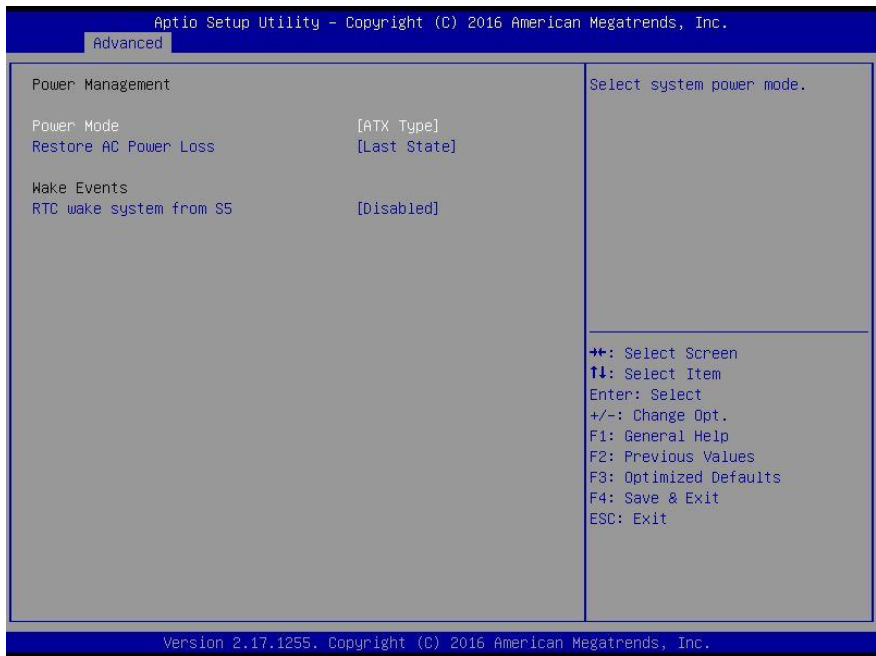






| Options Summary              |        |                                   |
|------------------------------|--------|-----------------------------------|
| DIO Type                     | Output | Optimal Default, Failsafe Default |
|                              | Input  |                                   |
| DIO Direction Type Setting.  |        |                                   |
| DIO Data                     | Low    |                                   |
|                              | High   | Optimal Default, Failsafe Default |
| DIO Output High/Low Setting. |        |                                   |

### 3.4.8 Power Management



| Options Summary           |            |                                   |
|---------------------------|------------|-----------------------------------|
| Power Mode                | ATX Type   | Optimal Default, Failsafe Default |
|                           | AT Type    |                                   |
| Select power supply mode. |            |                                   |
| AC Power Loss             | Last State | Optimal Default, Failsafe Default |
|                           | Power On   |                                   |
|                           | Power Off  |                                   |

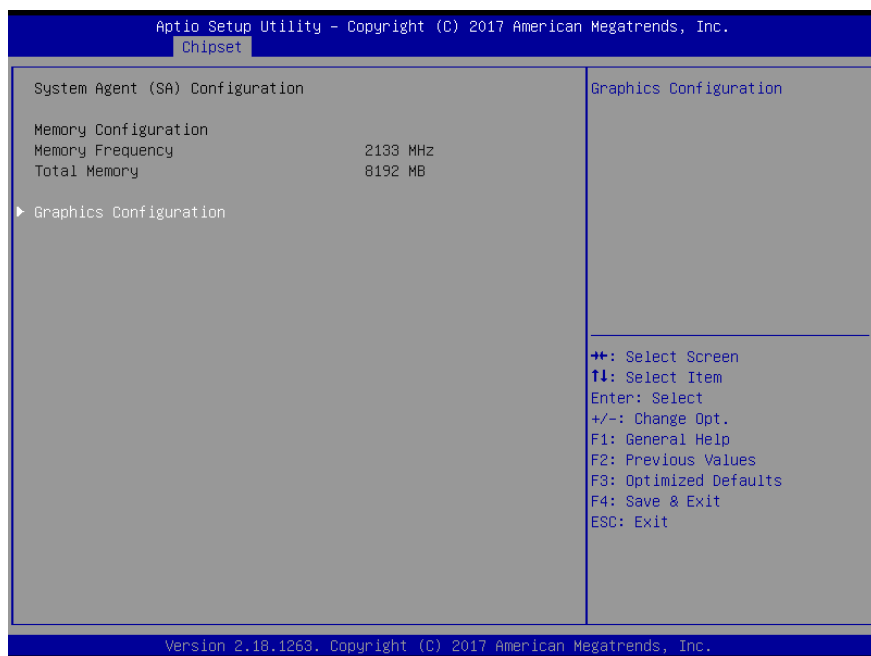
| Options Summary                                                                                                                        |              |                                   |
|----------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------------------|
| Select power state when power is re-applied after a power failure.                                                                     |              |                                   |
| RTC wake system from S5                                                                                                                | Disabled     | Optimal Default, Failsafe Default |
|                                                                                                                                        | Fixed Time   |                                   |
|                                                                                                                                        | Dynamic Time |                                   |
| Fixed Time: System will wake on the hr::min::sec specified./n Dynamic Time: System will wake on the current time + Increase minute(s). |              |                                   |

## 3.5 Setup Submenu: Chipset

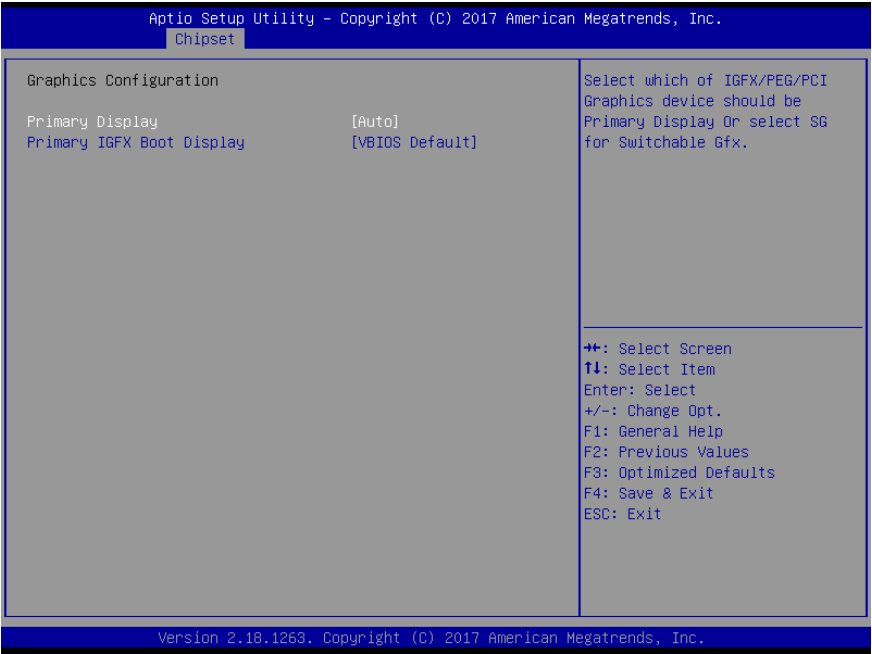




### 3.5.1 System Agent (SA) Configuration

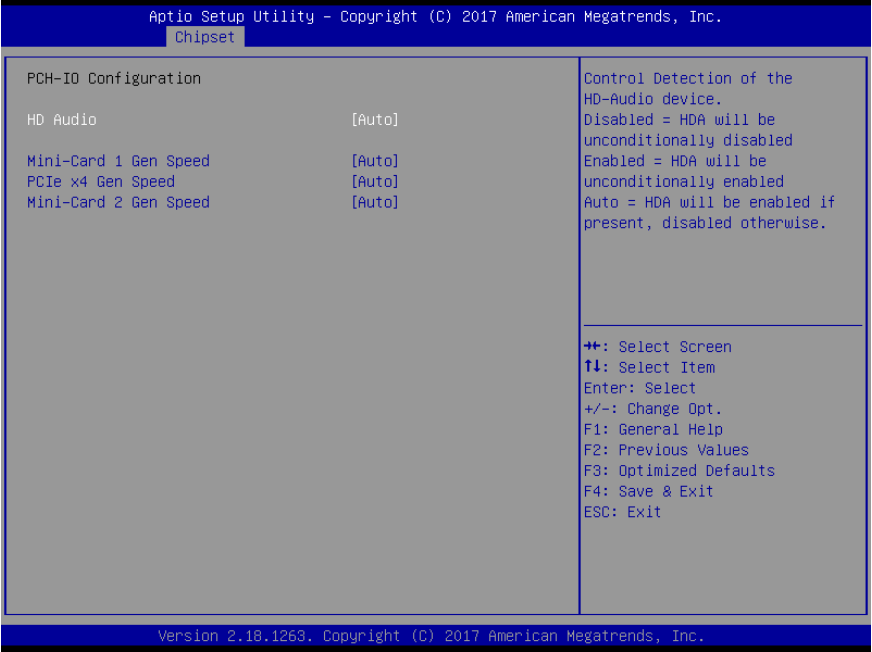


### 3.5.1.1 Graphics Configuration



| Options Summary             |               |                                   |
|-----------------------------|---------------|-----------------------------------|
| Primary Display             | Auto          | Optimal Default, Failsafe Default |
|                             | IGFX          |                                   |
|                             | PCIE          |                                   |
| Primary IGFX Boot Display   | VBIOS default | Optimal Default, Failsafe Default |
|                             | HDMI 1        |                                   |
|                             | CRT           |                                   |
|                             | HDMI 2        |                                   |
| Secondary IGFX Boot Display | Disable       | Optimal Default, Failsafe Default |
|                             | HDMI 1        |                                   |
|                             | CRT           |                                   |
|                             | HDMI 2        |                                   |

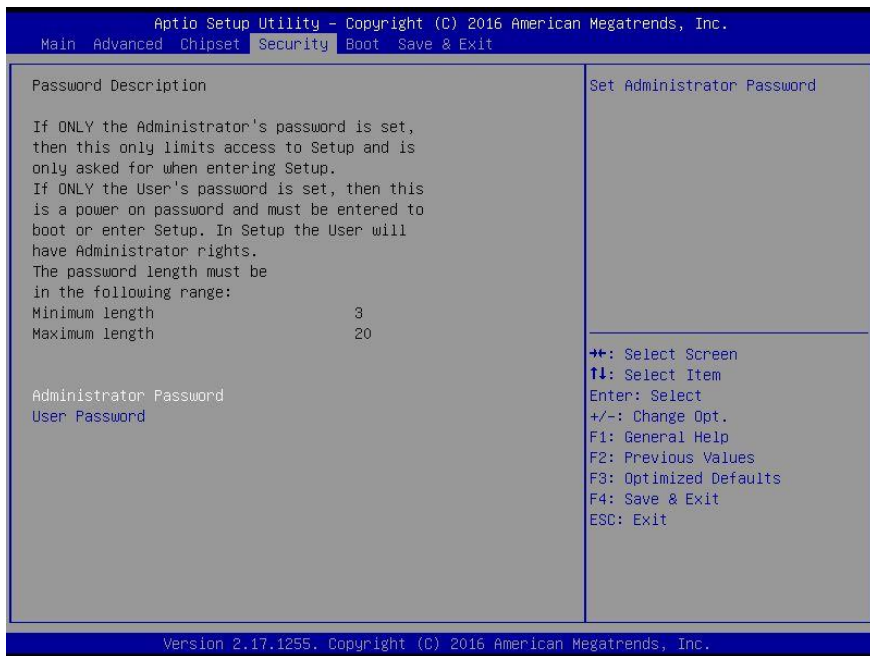
### 3.5.2 PCH-IO Configuration



| Options Summary                                                                                                                                                                                      |          |                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------|
| HD Audio                                                                                                                                                                                             | Disabled |                                   |
|                                                                                                                                                                                                      | Enabled  |                                   |
|                                                                                                                                                                                                      | Auto     | Optimal Default, Failsafe Default |
| Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled. Enabled = HDA will be unconditionally enabled. Auto = HDA will be enabled if present, disabled otherwise. |          |                                   |
| Mini-Card 1 Gen Speed                                                                                                                                                                                | Auto     | Optimal Default, Failsafe Default |
|                                                                                                                                                                                                      | Gen1     |                                   |
|                                                                                                                                                                                                      | Gen2     |                                   |
|                                                                                                                                                                                                      | Gen3     |                                   |
| Select PCI Express port speed.                                                                                                                                                                       |          |                                   |
| Mini-Card 2 Gen Speed                                                                                                                                                                                | Auto     | Optimal Default, Failsafe Default |
|                                                                                                                                                                                                      | Gen1     |                                   |
|                                                                                                                                                                                                      | Gen2     |                                   |
|                                                                                                                                                                                                      | Gen3     |                                   |

| Options Summary                |      |                                   |
|--------------------------------|------|-----------------------------------|
| Select PCI Express port speed. |      |                                   |
| PCIe x4 Gen Speed              | Auto | Optimal Default, Failsafe Default |
|                                | Gen1 |                                   |
|                                | Gen2 |                                   |
|                                | Gen3 |                                   |
| Select PCI Express port speed. |      |                                   |

### 3.6 Setup Submenu: Security



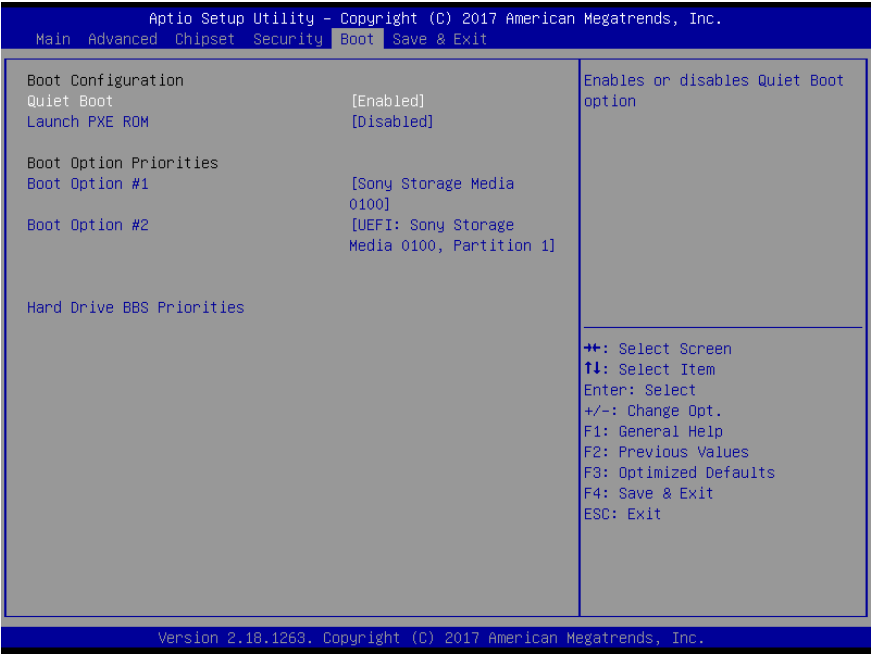
#### Change User/Administrator Password

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

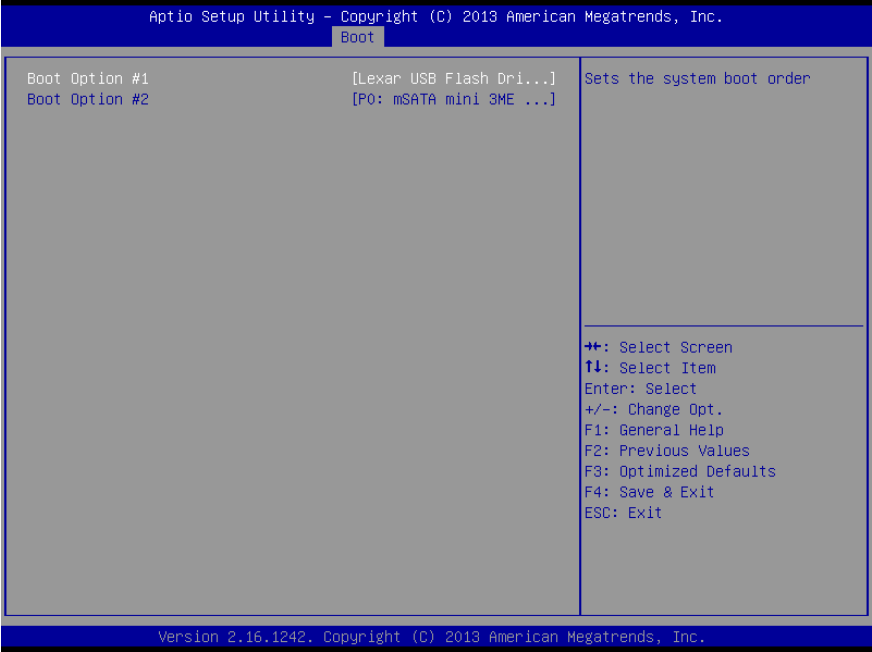
Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

### 3.7 Setup Submenu: Boot

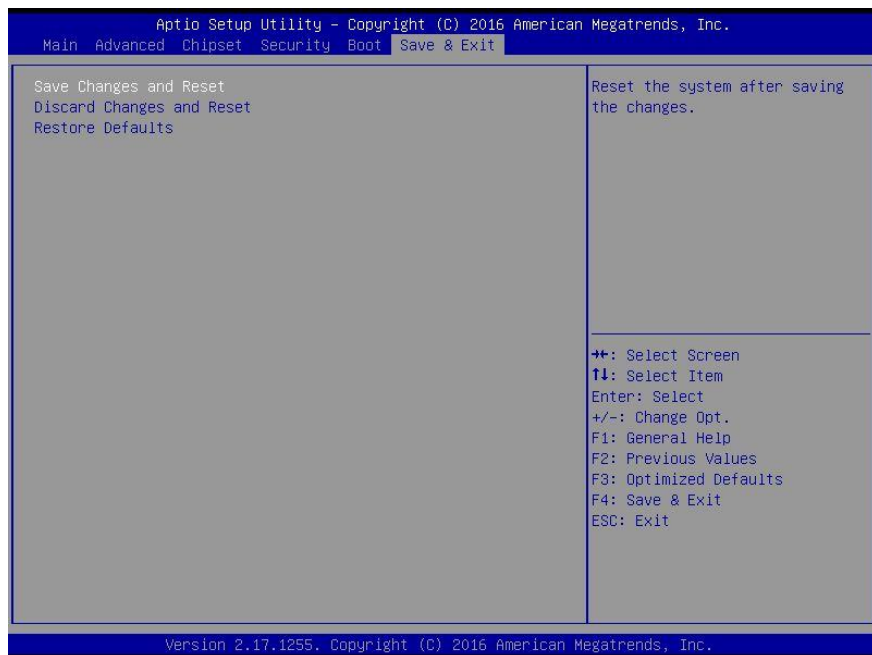


| Options Summary                                      |          |                                   |
|------------------------------------------------------|----------|-----------------------------------|
| Quiet Boot                                           | Disabled |                                   |
|                                                      | Enabled  | Optimal Default, Failsafe Default |
| Enables or disables Quiet Boot option.               |          |                                   |
| Launch PXE OpROM                                     | Disabled | Optimal Default, Failsafe Default |
|                                                      | Enabled  |                                   |
| Controls the execution of UEFI and Legacy PXE OpROM. |          |                                   |

### 3.8 BBS Priorities



### 3.9 Setup Submenu: Save & Exit





# Chapter 4

---

Drivers Installation

## 4.1 Product CD/DVD

---

The BOXER-6839 comes with a product DVD that contains all the drivers and utilities you need to setup your product. Insert the DVD and follow the steps in the autorun program to install the drivers.

In case the program does not start, follow the sequence below to install the drivers.

### Step 1 – Install Chipset Driver

1. Open the **Step1 - Chipset** folder and select your OS
2. Open the **SetupChipset.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

### Step 2 – Install Graphics Driver

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

### Step 3 – Install LAN Driver

1. Open the **Step3 - LAN** folder and select your OS
2. Open the **.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

#### Step 4 – Install Audio Driver

1. Open the **Step4 - Audio** folder and select your OS
2. followed by the **.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

#### Step 5 – Install USB3.0 Driver

1. Open the **Step5 – USB3.0** folder and select your OS
2. Open the **.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

#### Step 6 – Install ME Driver

1. Open the **Step6 - ME** folder and select your OS
2. Open the **SetupME.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

# Appendix A

---

## Watchdog Timer Programming

## A.1 Watchdog Timer Initial Program

**Table 1: SuperIO Relative Register Table**

|       | Default Value | Note                                           |
|-------|---------------|------------------------------------------------|
| Index | 0x2E(Note1)   | SIO MB PnP Mode Index Register<br>0x2E or 0x4E |
| Data  | 0x2F(Note2)   | SIO MB PnP Mode Data Register<br>0x2F or 0x4F  |

**Table 2: Watchdog Relative Register Table**

|                 | LDN          | Register     | BitNum    | Value     | Note                                                                  |
|-----------------|--------------|--------------|-----------|-----------|-----------------------------------------------------------------------|
| Timer Counter   | 0x07(Note3)  | 0xF6(Note4)  |           | (Note24)  | Time of watchdog timer (0~255)<br>This register is byte access        |
| Counting Unit   | 0x07(Note5)  | 0xF5(Note6)  | 3(Note7)  | 0(Note8)  | Select time unit.<br>0: second<br>1: minute                           |
| Watchdog Enable | 0x07(Note9)  | 0xF5(Note10) | 5(Note11) | 1(Note12) | 0: Disable<br>1: Enable                                               |
| Timeout Status  | 0x07(Note13) | 0xF5(Note14) | 6(Note15) | 1         | 1: Clear timeout status                                               |
| Output Mode     | 0x07(Note16) | 0xF5(Note17) | 4(Note18) | 1(Note19) | Select WDTRST# output mode<br>0: level<br>1: pulse                    |
| WDTRST output   | 0x07(Note20) | 0xFA(Note21) | 0(Note22) | 1(Note23) | Enable/Disable time out output via WDTRST#<br>0: Disable<br>1: Enable |

```

*****
// SuperIO relative definition (Please reference to Table 1)
#define byte  SIOIndex  //This parameter is represented from Note1
#define byte  SIODData  //This parameter is represented from Note2
#define void   IOWriteByte(byte IOPort, byte Value);
#define byte  IOReadByte(byte IOPort);
// Watch Dog relative definition (Please reference to Table 2)
#define byte  TimerLDN  //This parameter is represented from Note3
#define byte  TimerReg  //This parameter is represented from Note4
#define byte  TimerVal  // This parameter is represented from Note24
#define byte  UnitLDN   //This parameter is represented from Note5
#define byte  UnitReg   //This parameter is represented from Note6
#define byte  UnitBit   //This parameter is represented from Note7
#define byte  UnitVal   //This parameter is represented from Note8
#define byte  EnableLDN //This parameter is represented from Note9
#define byte  EnableReg //This parameter is represented from Note10
#define byte  EnableBit //This parameter is represented from Note11
#define byte  EnableVal //This parameter is represented from Note12
#define byte  StatusLDN // This parameter is represented from Note13
#define byte  StatusReg // This parameter is represented from Note14
#define byte  StatusBit // This parameter is represented from Note15
#define byte  ModeLDN   // This parameter is represented from Note16
#define byte  ModeReg   // This parameter is represented from Note17
#define byte  ModeBit   // This parameter is represented from Note18
#define byte  ModeVal   // This parameter is represented from Note19
#define byte  WDRstLDN  // This parameter is represented from Note20
#define byte  WDRstReg  // This parameter is represented from Note21
#define byte  WDRstBit  // This parameter is represented from Note22
#define byte  WDRstVal  // This parameter is represented from Note23
*****

```

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

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

```

*****
***

// Procedure : AaeonWDTEnable
VOID AaeonWDTEnable (){
    WDTEnableDisable(EnableLDN, EnableReg, EnableBit, 1);
}

// Procedure : AaeonWDTConfig
VOID AaeonWDTConfig (){
    // Disable WDT counting
    WDTEnableDisable(EnableLDN, EnableReg, EnableBit, 0);
    // Clear Watchdog Timeout Status
    WDTClearTimeoutStatus();
    // WDT relative parameter setting
    WDTParameterSetting();
}

VOID WDTEnableDisable(byte LDN, byte Register, byte BitNum, byte Value){
    SIOBitSet(LDN, Register, BitNum, Value);
}

VOID WDTParameterSetting(){
    // Watchdog Timer counter setting
    SIOByteSet(TimerLDN, TimerReg, TimerVal);
    // WDT counting unit setting
    SIOBitSet(UnitLDN, UnitReg, UnitBit, UnitVal);
    // WDT output mode setting, level / pulse
    SIOBitSet(ModeLDN, ModeReg, ModeBit, ModeVal);
    // Watchdog timeout output via WDTRST#
    SIOBitSet(WDTRstLDN, WDTRstReg, WDTRstBit, WDTRstVal);
}

VOID WDTClearTimeoutStatus(){
    SIOBitSet(StatusLDN, StatusReg, StatusBit, 1);
}

*****
***

```



```

*****
***

VOID SIOEnterMBPnPMode(){
    IOWriteByte(SIOIndex, 0x87);
    IOWriteByte(SIOIndex, 0x87);
}

VOID SIOExitMBPnPMode(){
    IOWriteByte(SIOIndex, 0xAA);
}

VOID SIOSelectLDN(byte LDN){
    IOWriteByte(SIOIndex, 0x07); // SIO LDN Register Offset = 0x07
    IOWriteByte(SIOData, LDN);
}

VOID SIOBitSet(byte LDN, byte Register, byte BitNum, byte Value){
    Byte TmpValue;

    SIOEnterMBPnPMode();
    SIOSelectLDN(byte LDN);
    IOWriteByte(SIOIndex, Register);
    TmpValue = IOReadByte(SIOData);
    TmpValue &= ~(1 << BitNum);
    TmpValue |= (Value << BitNum);
    IOWriteByte(SIOData, TmpValue);
    SIOExitMBPnPMode();
}

VOID SIOByteSet(byte LDN, byte Register, byte Value){
    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, Register);
    IOWriteByte(SIOData, Value);
    SIOExitMBPnPMode();
}

*****
***

```

# Appendix B

---

I/O Information

## B.1 I/O Address Map

|                                       |                                   |
|---------------------------------------|-----------------------------------|
| Input/output (I/O)                    |                                   |
| [0000000000000000 - 000000000000CF7]  | PCI Express Root Complex          |
| [0000000000000020 - 0000000000000021] | Programmable interrupt controller |
| [0000000000000024 - 0000000000000025] | Programmable interrupt controller |
| [0000000000000028 - 0000000000000029] | Programmable interrupt controller |
| [000000000000002C - 000000000000002D] | Programmable interrupt controller |
| [000000000000002E - 000000000000002F] | Motherboard resources             |
| [0000000000000030 - 0000000000000031] | Programmable interrupt controller |
| [0000000000000034 - 0000000000000035] | Programmable interrupt controller |
| [0000000000000038 - 0000000000000039] | Programmable interrupt controller |
| [000000000000003C - 000000000000003D] | Programmable interrupt controller |
| [0000000000000040 - 0000000000000043] | System timer                      |
| [000000000000004E - 000000000000004F] | Motherboard resources             |
| [0000000000000050 - 0000000000000053] | System timer                      |
| [0000000000000061 - 0000000000000061] | Motherboard resources             |
| [0000000000000063 - 0000000000000063] | Motherboard resources             |
| [0000000000000065 - 0000000000000065] | Motherboard resources             |
| [0000000000000067 - 0000000000000067] | Motherboard resources             |
| [0000000000000070 - 0000000000000070] | Motherboard resources             |
| [0000000000000070 - 0000000000000077] | System CMOS/real time clock       |
| [0000000000000080 - 0000000000000080] | Motherboard resources             |
| [0000000000000092 - 0000000000000092] | Motherboard resources             |
| [00000000000000A0 - 00000000000000A1] | Programmable interrupt controller |
| [00000000000000A4 - 00000000000000A5] | Programmable interrupt controller |
| [00000000000000A8 - 00000000000000A9] | Programmable interrupt controller |
| [00000000000000AC - 00000000000000AD] | Programmable interrupt controller |
| [00000000000000B0 - 00000000000000B1] | Programmable interrupt controller |
| [00000000000000B2 - 00000000000000B3] | Motherboard resources             |
| [00000000000000B4 - 00000000000000B5] | Programmable interrupt controller |
| [00000000000000B8 - 00000000000000B9] | Programmable interrupt controller |
| [00000000000000BC - 00000000000000BD] | Programmable interrupt controller |
| [00000000000000F0 - 00000000000000F0] | Numeric data processor            |
| [00000000000002C0 - 00000000000002C7] | Communications Port (COM6)        |
| [00000000000002D0 - 00000000000002D7] | Communications Port (COM5)        |
| [00000000000002E8 - 00000000000002EF] | Communications Port (COM4)        |
| [00000000000002F8 - 00000000000002FF] | Communications Port (COM2)        |
| [00000000000003B0 - 00000000000003BB] | Intel(R) HD Graphics 530          |
| [00000000000003C0 - 00000000000003DF] | Intel(R) HD Graphics 530          |
| [00000000000003E8 - 00000000000003EF] | Communications Port (COM3)        |
| [00000000000003F8 - 00000000000003FF] | Communications Port (COM1)        |
| [00000000000004D0 - 00000000000004D1] | Programmable interrupt controller |
| [0000000000000680 - 000000000000069F] | Motherboard resources             |
| [0000000000000800 - 000000000000087F] | Motherboard resources             |
| [0000000000000A00 - 0000000000000A0F] | Motherboard resources             |
| [0000000000000A10 - 0000000000000A1F] | Motherboard resources             |
| [0000000000000A20 - 0000000000000A2F] | Motherboard resources             |
| [0000000000000D00 - 0000000000000FFF] | PCI Express Root Complex          |
| [000000000000164E - 000000000000164F] | Motherboard resources             |
| [0000000000001800 - 00000000000018FE] | Motherboard resources             |
| [0000000000001854 - 0000000000001857] | Motherboard resources             |

|                                                                                   |                                       |                                                             |
|-----------------------------------------------------------------------------------|---------------------------------------|-------------------------------------------------------------|
|  | [000000000000F000 - 000000000000F03F] | Intel(R) HD Graphics 530                                    |
|  | [000000000000F040 - 000000000000F05F] | Intel(R) 100 Series/C230 Series Chipset Family SMBus - A123 |
|  | [000000000000F060 - 000000000000F07F] | Standard SATA AHCI Controller                               |
|  | [000000000000F080 - 000000000000F083] | Standard SATA AHCI Controller                               |
|  | [000000000000F090 - 000000000000F097] | Standard SATA AHCI Controller                               |
|  | [000000000000FF00 - 000000000000FFFE] | Motherboard resources                                       |
|  | [000000000000FFFF - 000000000000FFFF] | Motherboard resources                                       |
|  | [000000000000FFFF - 000000000000FFFF] | Motherboard resources                                       |
|  | [000000000000FFFF - 000000000000FFFF] | Motherboard resources                                       |

## B.2 Memory Address Map

|                                         |                                                                                 |
|-----------------------------------------|---------------------------------------------------------------------------------|
| ▼ Memory                                |                                                                                 |
| [0000000000A0000 - 0000000000BFFFF]     | Intel(R) HD Graphics 530                                                        |
| [0000000000A0000 - 0000000000BFFFF]     | PCI Express Root Complex                                                        |
| [0000000090000000 - 00000000DFFFFFFF]   | PCI Express Root Complex                                                        |
| [00000000C0000000 - 00000000CFFFFFFF]   | Intel(R) HD Graphics 530                                                        |
| [00000000DE000000 - 00000000DEFFFFFF]   | Intel(R) HD Graphics 530                                                        |
| [00000000DF000000 - 00000000DF01FFFF]   | Intel(R) I211 Gigabit Network Connection #3                                     |
| [00000000DF000000 - 00000000DF01FFFF]   | Intel(R) I211 Gigabit Network Connection #6                                     |
| [00000000DF000000 - 00000000DF0FFFFF]   | Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #13 - A11C |
| [00000000DF020000 - 00000000DF023FFF]   | Intel(R) I211 Gigabit Network Connection #3                                     |
| [00000000DF020000 - 00000000DF023FFF]   | Intel(R) I211 Gigabit Network Connection #6                                     |
| [00000000DF100000 - 00000000DF11FFFF]   | Intel(R) I211 Gigabit Network Connection #2                                     |
| [00000000DF100000 - 00000000DF11FFFF]   | Intel(R) I211 Gigabit Network Connection #5                                     |
| [00000000DF100000 - 00000000DF11FFFF]   | Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #12 - A11B |
| [00000000DF120000 - 00000000DF123FFF]   | Intel(R) I211 Gigabit Network Connection #2                                     |
| [00000000DF120000 - 00000000DF123FFF]   | Intel(R) I211 Gigabit Network Connection #5                                     |
| [00000000DF200000 - 00000000DF21FFFF]   | Intel(R) I211 Gigabit Network Connection                                        |
| [00000000DF200000 - 00000000DF21FFFF]   | Intel(R) I211 Gigabit Network Connection #4                                     |
| [00000000DF200000 - 00000000DF2FFFFF]   | Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #4 - A113  |
| [00000000DF220000 - 00000000DF23FFF]    | Intel(R) I211 Gigabit Network Connection                                        |
| [00000000DF220000 - 00000000DF23FFF]    | Intel(R) I211 Gigabit Network Connection #4                                     |
| [00000000DF300000 - 00000000DF30FFFF]   | High Definition Audio Controller                                                |
| [00000000DF310000 - 00000000DF31FFFF]   | Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)                   |
| [00000000DF320000 - 00000000DF323FFF]   | High Definition Audio Controller                                                |
| [00000000DF324000 - 00000000DF327FFF]   | Intel(R) 100 Series/C230 Series Chipset Family PMC - A121                       |
| [00000000DF328000 - 00000000DF329FFF]   | Standard SATA AHCI Controller                                                   |
| [00000000DF32A000 - 00000000DF32AFFF]   | Intel(R) 100 Series/C230 Series Chipset Family SMBus - A123                     |
| [00000000DF32B000 - 00000000DF32B7FF]   | Standard SATA AHCI Controller                                                   |
| [00000000DF32C000 - 00000000DF32C0FF]   | Standard SATA AHCI Controller                                                   |
| [00000000DF32E000 - 00000000DF32EFFF]   | Intel(R) 100 Series/C230 Series Chipset Family Thermal subsystem - A131         |
| [00000000DFFE0000 - 00000000DFFFFFFF]   | Motherboard resources                                                           |
| [00000000E0000000 - 00000000EFFFFFFF]   | Motherboard resources                                                           |
| [00000000FD000000 - 00000000FDABFFFF]   | Motherboard resources                                                           |
| [00000000FD000000 - 00000000FE7FFFFF]   | PCI Express Root Complex                                                        |
| [00000000FDAC0000 - 00000000FDACFFFF]   | Motherboard resources                                                           |
| [00000000FDAD0000 - 00000000FDADFFFF]   | Motherboard resources                                                           |
| [00000000FDAE0000 - 00000000FDAEFFFF]   | Motherboard resources                                                           |
| [00000000FDAF0000 - 00000000FDAFFFFF]   | Motherboard resources                                                           |
| [00000000FDB00000 - 00000000FDFFFFFFFF] | Motherboard resources                                                           |
| [00000000FE000000 - 00000000FE01FFFF]   | Motherboard resources                                                           |
| [00000000FE036000 - 00000000FE03BFFF]   | Motherboard resources                                                           |
| [00000000FE03D000 - 00000000FE3FFFFF]   | Motherboard resources                                                           |
| [00000000FE40F000 - 00000000FE40FFFF]   | Intel(R) Management Engine Interface                                            |
| [00000000FE410000 - 00000000FE7FFFFF]   | Motherboard resources                                                           |
| [00000000FED00000 - 00000000FED003FF]   | High precision event timer                                                      |
| [00000000FED10000 - 00000000FED17FFF]   | Motherboard resources                                                           |
| [00000000FED18000 - 00000000FED18FFF]   | Motherboard resources                                                           |
| [00000000FED19000 - 00000000FED19FFF]   | Motherboard resources                                                           |
| [00000000FED20000 - 00000000FED3FFFF]   | Motherboard resources                                                           |
| [00000000FED45000 - 00000000FED8FFFF]   | Motherboard resources                                                           |
| [00000000FED90000 - 00000000FED93FFF]   | Motherboard resources                                                           |
| [00000000FEE00000 - 00000000FEEFFFFF]   | Motherboard resources                                                           |
| [00000000FF000000 - 00000000FFFFFFFF]   | Legacy device                                                                   |
| [00000000FF000000 - 00000000FFFFFFFF]   | Motherboard resources                                                           |

## B.3 IRQ Mapping Chart

|                                                                                     |                                                                   |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| ▼                                                                                   | Interrupt request (IRQ)                                           |
|    | (ISA) 0x00000000 (00) System timer                                |
|    | (ISA) 0x00000003 (03) Communications Port (COM2)                  |
|    | (ISA) 0x00000004 (04) Communications Port (COM1)                  |
|    | (ISA) 0x00000005 (05) Intel(R) I211 Gigabit Network Connection #6 |
|    | (ISA) 0x00000008 (08) System CMOS/real time clock                 |
|    | (ISA) 0x0000000B (11) Communications Port (COM3)                  |
|    | (ISA) 0x0000000B (11) Communications Port (COM4)                  |
|    | (ISA) 0x0000000B (11) Communications Port (COM5)                  |
|    | (ISA) 0x0000000B (11) Communications Port (COM6)                  |
|    | (ISA) 0x0000000D (13) Numeric data processor                      |
|    | (ISA) 0x0000000E (14) Intel(R) I211 Gigabit Network Connection #4 |
|    | (ISA) 0x0000000E (14) Intel(R) I211 Gigabit Network Connection #5 |
|    | (ISA) 0x0000000E (14) Motherboard resources                       |
|    | (ISA) 0x00000036 (54) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x00000037 (55) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x00000038 (56) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x00000039 (57) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x0000003A (58) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x0000003B (59) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x0000003C (60) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x0000003D (61) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x0000003E (62) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x0000003F (63) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x00000040 (64) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x00000041 (65) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x00000042 (66) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x00000043 (67) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x00000044 (68) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x00000045 (69) Microsoft ACPI-Compliant System             |
|    | (ISA) 0x00000046 (70) Microsoft ACPI-Compliant System             |
|   | (ISA) 0x00000047 (71) Microsoft ACPI-Compliant System             |
|  | (ISA) 0x00000048 (72) Microsoft ACPI-Compliant System             |
|  | (ISA) 0x00000049 (73) Microsoft ACPI-Compliant System             |
|  | (ISA) 0x0000004A (74) Microsoft ACPI-Compliant System             |
|  | (ISA) 0x0000004B (75) Microsoft ACPI-Compliant System             |
|  | (ISA) 0x0000004C (76) Microsoft ACPI-Compliant System             |
|  | (ISA) 0x0000004D (77) Microsoft ACPI-Compliant System             |
|  | (ISA) 0x0000004E (78) Microsoft ACPI-Compliant System             |
|  | (ISA) 0x0000004F (79) Microsoft ACPI-Compliant System             |
|  | (ISA) 0x00000050 (80) Microsoft ACPI-Compliant System             |
|  | (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) 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) 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) 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) 0x000000C0 (192) | Microsoft ACPI-Compliant System |



|                                                                                                            |                                 |
|------------------------------------------------------------------------------------------------------------|---------------------------------|
|  (ISA) 0x000000C1 (193)   | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000C2 (194)   | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000C3 (195)   | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000C4 (196)   | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000C5 (197)   | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000C6 (198)   | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000C7 (199)   | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000C8 (200)   | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000C9 (201)   | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000CA (202)   | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000CB (203)   | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000CC (204)   | 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) 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) 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) 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) 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) 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) 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) 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) 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) 100 Series/C230 Series Chipset Family SMBus - A123                     |
|    | (PCI) 0x0000000A (10)  | Intel(R) 100 Series/C230 Series Chipset Family Thermal subsystem - A131         |
|    | (PCI) 0x00000010 (16)  | High Definition Audio Controller                                                |
|    | (PCI) 0xFFFFFE4 (-28)  | Intel(R) Management Engine Interface                                            |
|    | (PCI) 0xFFFFFE5 (-27)  | Intel(R) I211 Gigabit Network Connection #3                                     |
|    | (PCI) 0xFFFFFE6 (-26)  | Intel(R) I211 Gigabit Network Connection #3                                     |
|    | (PCI) 0xFFFFFE7 (-25)  | Intel(R) I211 Gigabit Network Connection #3                                     |
|    | (PCI) 0xFFFFFE8 (-24)  | Intel(R) I211 Gigabit Network Connection #3                                     |
|    | (PCI) 0xFFFFFE9 (-23)  | Intel(R) I211 Gigabit Network Connection #3                                     |
|    | (PCI) 0xFFFFFEA (-22)  | Intel(R) I211 Gigabit Network Connection #3                                     |
|    | (PCI) 0xFFFFFEB (-21)  | Intel(R) I211 Gigabit Network Connection #2                                     |
|    | (PCI) 0xFFFFFEC (-20)  | Intel(R) I211 Gigabit Network Connection #2                                     |
|    | (PCI) 0xFFFFFED (-19)  | Intel(R) I211 Gigabit Network Connection #2                                     |
|    | (PCI) 0xFFFFFEE (-18)  | Intel(R) I211 Gigabit Network Connection #2                                     |
|    | (PCI) 0xFFFFFEF (-17)  | Intel(R) I211 Gigabit Network Connection #2                                     |
|    | (PCI) 0xFFFFFFF0 (-16) | Intel(R) I211 Gigabit Network Connection #2                                     |
|    | (PCI) 0xFFFFFFF1 (-15) | Intel(R) I211 Gigabit Network Connection                                        |
|    | (PCI) 0xFFFFFFF2 (-14) | Intel(R) I211 Gigabit Network Connection                                        |
|    | (PCI) 0xFFFFFFF3 (-13) | Intel(R) I211 Gigabit Network Connection                                        |
|    | (PCI) 0xFFFFFFF4 (-12) | Intel(R) I211 Gigabit Network Connection                                        |
|    | (PCI) 0xFFFFFFF5 (-11) | Intel(R) I211 Gigabit Network Connection                                        |
|    | (PCI) 0xFFFFFFF6 (-10) | Intel(R) I211 Gigabit Network Connection                                        |
|    | (PCI) 0xFFFFFFF7 (-9)  | Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)                   |
|    | (PCI) 0xFFFFFFF8 (-8)  | Intel(R) HD Graphics 530                                                        |
|   | (PCI) 0xFFFFFFF9 (-7)  | Standard SATA AHCI Controller                                                   |
|  | (PCI) 0xFFFFFFFA (-6)  | Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #13 - A11C |
|  | (PCI) 0xFFFFFFFB (-5)  | Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #12 - A11B |
|  | (PCI) 0xFFFFFFFC (-4)  | Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #9 - A118  |
|  | (PCI) 0xFFFFFFFD (-3)  | Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #4 - A113  |
|  | (PCI) 0xFFFFFFF0 (-2)  | Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #1 - A110  |

# Appendix C

---

Digital I/O Information

## C.1 DIO Programming

The BOXER-6639 utilizes the Fintek F75113 chipset as its Digital I/O controller. Below are the procedures to complete its configuration which you can develop customized program to fit your application.

## C.2 DIO Register

Table 1: SuperIO Relative Register Table

|       | Default Value | Note                                           |
|-------|---------------|------------------------------------------------|
| Index | 0x2E(Note1)   | SIO MB PnP Mode Index Register<br>0x2E or 0x4E |
| Data  | 0x2F(Note2)   | SIO MB PnP Mode Data Register<br>0x2F or 0x4F  |
| LDN   | 0x07(Note3)   |                                                |

Table 2: Digital I/O Relative Register Table

|            | Register                  |        |                            |        |        |
|------------|---------------------------|--------|----------------------------|--------|--------|
|            | Input Register<br>(Note4) | BitNum | Output Register<br>(Note5) | BitNum | Note   |
| DIO-1 Pin  | 0x12                      | 0      | 0x13                       | 0      | GPIO00 |
| DIO-2 Pin  | 0x12                      | 1      | 0x13                       | 1      | GPIO01 |
| DIO-3 Pin  | 0x12                      | 2      | 0x13                       | 2      | GPIO02 |
| DIO-4 Pin  | 0x12                      | 3      | 0x13                       | 3      | GPIO03 |
| DIO-5 Pin  | 0x12                      | 4      | 0x13                       | 4      | GPIO04 |
| DIO-6 Pin  | 0x12                      | 5      | 0x13                       | 5      | GPIO05 |
| DIO-7 Pin  | 0x12                      | 6      | 0x13                       | 6      | GPIO06 |
| DIO-8 Pin  | 0x12                      | 7      | 0x13                       | 7      | GPIO07 |
| DIO-9 Pin  | 0x22                      | 0      | 0x23                       | 0      | GPIO10 |
| DIO-10 Pin | 0x22                      | 1      | 0x23                       | 1      | GPIO11 |
| DIO-11 Pin | 0x22                      | 2      | 0x23                       | 2      | GPIO12 |
| DIO-12 Pin | 0x22                      | 3      | 0x23                       | 3      | GPIO13 |
| DIO-13 Pin | 0x22                      | 4      | 0x23                       | 4      | GPIO14 |
| DIO-14 Pin | 0x22                      | 5      | 0x23                       | 5      | GPIO15 |
| DIO-15 Pin | 0x22                      | 6      | 0x23                       | 6      | GPIO16 |



|            |      |   |      |   |        |
|------------|------|---|------|---|--------|
| DIO-16 Pin | 0x22 | 7 | 0x23 | 7 | GPIO17 |
| DIO-17 Pin | 0x32 | 0 | 0x33 | 0 | GPIO20 |
| DIO-18 Pin | 0x32 | 1 | 0x33 | 1 | GPIO21 |
| DIO-19 Pin | 0x32 | 2 | 0x33 | 2 | GPIO22 |
| DIO-20 Pin | 0x32 | 3 | 0x33 | 3 | GPIO23 |
| DIO-21 Pin | 0x32 | 4 | 0x33 | 4 | GPIO24 |
| DIO-22 Pin | 0x32 | 5 | 0x33 | 5 | GPIO25 |
| DIO-23 Pin | 0x32 | 6 | 0x33 | 6 | GPIO26 |
| DIO-24 Pin | 0x32 | 7 | 0x33 | 7 | GPIO27 |
| DIO-25 Pin | 0x42 | 0 | 0x43 | 0 | GPIO30 |
| DIO-26 Pin | 0x42 | 1 | 0x43 | 1 | GPIO31 |
| DIO-27 Pin | 0x42 | 2 | 0x43 | 2 | GPIO32 |
| DIO-28 Pin | 0x42 | 3 | 0x43 | 3 | GPIO33 |
| DIO-29 Pin | 0x42 | 4 | 0x43 | 4 | GPIO34 |
| DIO-30 Pin | 0x42 | 5 | 0x43 | 5 | GPIO35 |
| DIO-31 Pin | 0x42 | 6 | 0x43 | 6 | GPIO36 |
| DIO-32 Pin | 0x42 | 7 | 0x43 | 7 | GPIO37 |
| DIO-33 Pin | 0x72 | 0 | 0x73 | 0 | GPIO40 |
| DIO-34 Pin | 0x72 | 1 | 0x73 | 1 | GPIO41 |

## C.3 DIO Sample Program

```

*****
// SuperIO relative definition (Please reference to Table 1)
#define byte   SIOIndex   //This parameter is represented from Note1
#define byte   SIODData   //This parameter is represented from Note2
#define void   IOWriteByte(byte IOPort, byte Value);
#define byte   IOReadByte(byte IOPort);
// Digital Input Status relative definition (Please reference to Table 2)
#define byte   DIInputLDN  // This parameter is represented from Note3
#define byte   DIInputReg  // This parameter is represented from Note4
#define byte   DIInputBit  // This parameter is represented from Note5
*****

*****
VOID Main() {
    Boolean PinStatus ;

    // Procedure : AaeonReadPinStatus
    // Input :
    //     Example, Read Digital I/O Pin 3 status
    // Output :
    //     InputStatus :
    //         0: Digital I/O Pin level is low
    //         1: Digital I/O Pin level is High
    PinStatus = AaeonReadPinStatus(DIInputLDN, DIInputReg, DIInputBit);

    // Procedure : AaeonSetOutputLevel
    // Input :
    //     Example, Set Digital I/O Pin 6 level
    AaeonSetOutputLevel(DOutputLDN, DOutputReg, DOutputBit, DOutputVal);
}

```

```
*****
Boolean  AaeonReadPinStatus(byte LDN, byte Register, byte BitNum){
    Boolean PinStatus ;

    PinStatus = SIOBitRead(LDN, Register, BitNum);
    Return PinStatus ;
}
VOID  AaeonSetOutputLevel(byte LDN, byte Register, byte BitNum, byte Value){
    ConfigToOutputMode(LDN, Register, BitNum);
    SIOBitSet(LDN, Register, BitNum, Value);
}
*****
```

```
*****
```

```
VOID SIOEnterMBPnPMode(){
    IOWriteByte(SIOIndex, 0x87);
    IOWriteByte(SIOIndex, 0x87);
}
```

```
VOID SIOExitMBPnPMode(){
    IOWriteByte(SIOIndex, 0xAA);
}
```

```
VOID SIOSelectLDN(byte LDN){
    IOWriteByte(SIOIndex, 0x07); // SIO LDN Register Offset = 0x07
    IOWriteByte(SIOData, LDN);
}
```

```
VOID SIOBitSet(byte LDN, byte Register, byte BitNum, byte Value){
    Byte TmpValue;

    SIOEnterMBPnPMode();
    SIOSelectLDN(byte LDN);
    IOWriteByte(SIOIndex, Register);
    TmpValue = IOReadByte(SIOData);
    TmpValue &= ~(1 << BitNum);
    TmpValue |= (Value << BitNum);
    IOWriteByte(SIOData, TmpValue);
    SIOExitMBPnPMode();
}
```

```
VOID SIOByteSet(byte LDN, byte Register, byte Value){
    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, Register);
    IOWriteByte(SIOData, Value);
    SIOExitMBPnPMode();
}
```

```
*****
```

```
*****
```

```
Boolean SIOBitRead(byte LDN, byte Register, byte BitNum){
```

```
    Byte TmpValue;
```

```
    SIOEnterMBPnPMode();
```

```
    SIOSelectLDN(LDN);
```

```
    IOWriteByte(SIOIndex, Register);
```

```
    TmpValue = IOReadByte(SIOData);
```

```
    TmpValue &= (1 << BitNum);
```

```
    SIOExitMBPnPMode();
```

```
    If(TmpValue == 0)
```

```
        Return 0;
```

```
    Return 1;
```

```
}
```

```
VOID ConfigToOutputMode(byte LDN, byte Register, byte BitNum){
```

```
    Byte TmpValue, OutputEnableReg;
```

```
    OutputEnableReg = Register-1;
```

```
    SIOEnterMBPnPMode();
```

```
    SIOSelectLDN(LDN);
```

```
    IOWriteByte(SIOIndex, OutputEnableReg);
```

```
    TmpValue = IOReadByte(SIOData);
```

```
    TmpValue |= (1 << BitNum);
```

```
    IOWriteByte(SIOData, OutputEnableReg);
```

```
    SIOExitMBPnPMode();
```

```
}
```

```
*****
```