

# BOXER-6616

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Fanless Embedded Box PC

User's Manual 1<sup>st</sup> Ed

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## Packing List

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

| Item                                                  | Quantity |
|-------------------------------------------------------|----------|
| ● BOXER-6616                                          | 1        |
| ● Wallmount bracket                                   | 2        |
| ● Screw Package                                       | 1        |
| ● 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 [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. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any power supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls.
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:
  - i. Damaged power cord or plug
  - ii. Liquid intrusion to the device
  - iii. Exposure to moisture
  - iv. Device is not working as expected or in a manner as described in this manual
  - v. The device is dropped or damaged
  - vi. Any obvious signs of damage displayed on the device
18. Do not leave this device in an uncontrolled environment with temperatures beyond the device's permitted storage temperatures (see chapter 1) to prevent damage.
19. Do NOT disassemble the motherboard so as not to damage the system or void your warranty.
20. If the thermal pad had been damaged, please contact AAEON's salesperson to purchase a new one. Do NOT use those of other brands.
21. The Hex Cylinder Coppers on the front panel are not removable.
22. Repeatedly assemble and disassemble the system may cause damages to the exterior paint and surface and screw holes.
23. Use the right size screwdriver.
24. Use the screwdriver correctly to remove screws from the system.

## 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 Embedded Box PC/ Industrial System

| 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                                                                                                                                                                                                                    | ○         | ○         | ○         | ○               | ○             | ○               |
| 电源                                                                                                                                                                                                                    | ○         | ○         | ○         | ○               | ○             | ○               |
| <p>○：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<br/>SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出<br/>SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注：<br/>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。<br/>二、上述部件物质中央处理器、内存、硬盘、电源为选购品。</p> |           |           |           |                 |               |                 |

China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products

AAEON Embedded Box PC/ Industrial System

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

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# Chapter 1

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Product Specifications

## 1.1 Specifications

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### System

|                     |                                                                                                                                                                                                                                                           |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ● Processor         | Intel (R) Pentium(R) N4200 2.5GHz or Celeron(R) N3350 2.4GHz                                                                                                                                                                                              |
| ● Chipset           | Intel® System on Chip                                                                                                                                                                                                                                     |
| ● System Memory     | 204-pin 1866 DDR3L SODIMM x 1, up to 8GB                                                                                                                                                                                                                  |
| ● Display Interface | VGA x 1<br>HDMI x 1                                                                                                                                                                                                                                       |
| ● Storage Device    | mSATA, 2.5" HDD/SSD                                                                                                                                                                                                                                       |
| ● Ethernet          | Intel (R), 10/100/1000Base x2                                                                                                                                                                                                                             |
| ● I/O               | RS-232/422/485 x 2<br>RS-232 x 4<br>USB3.0 x 4<br>VGA x 1<br>HDMI x 1<br>DIO x 1 (Optional)<br>Mic-in x 1<br>Line-Out x 1<br>Antenna holes x 2<br>Power Button x 1<br>AT/ATX Switch x 1<br>Remote Power On/Off Connector x 1<br>9~24C Wire Range DC-Input |
| ● Expansion Slot    | Full-size Mini-Card x 1<br>Half-size Mini-Card x 1 (optional for mSATA)                                                                                                                                                                                   |

- Indicator
  - Power LED x 1
  - HDD Active LED x 1
- OS Support
  - Windows® 10
  - Win10 IOT
  - Linux

## Mechanical

- Mounting
  - Wallmount
  - DIN Rail (optional)
- Dimension (W x H x D)
  - 197mm x 111mm x 61.2mm
- Gross Weight
  - 2.8 kg (6.6 lb)
- Net Weight
  - 2 kg (4.4 lb)

## Environmental

- Operating Temperature
  - 15°C ~ 60°C with W.T. SSD/HDD/mSATA  
(according to IEC68-2-14 with 0.5 m/s AirFlow ;  
with industrial devices)
- Storage Temperature
  - 20°C ~ 70°C (-4°F ~ 158°F)
- Storage Humidity
  - 95% @ 40°C, non-condensing
- Anti-Vibration
  - 5 Grms/ 5~500Hz/ operation – mSATA/SSD
  - 1 Grms/ 5~500Hz/ operation – HDD
- EMC
  - CE/FCC Class A

## Power Supply

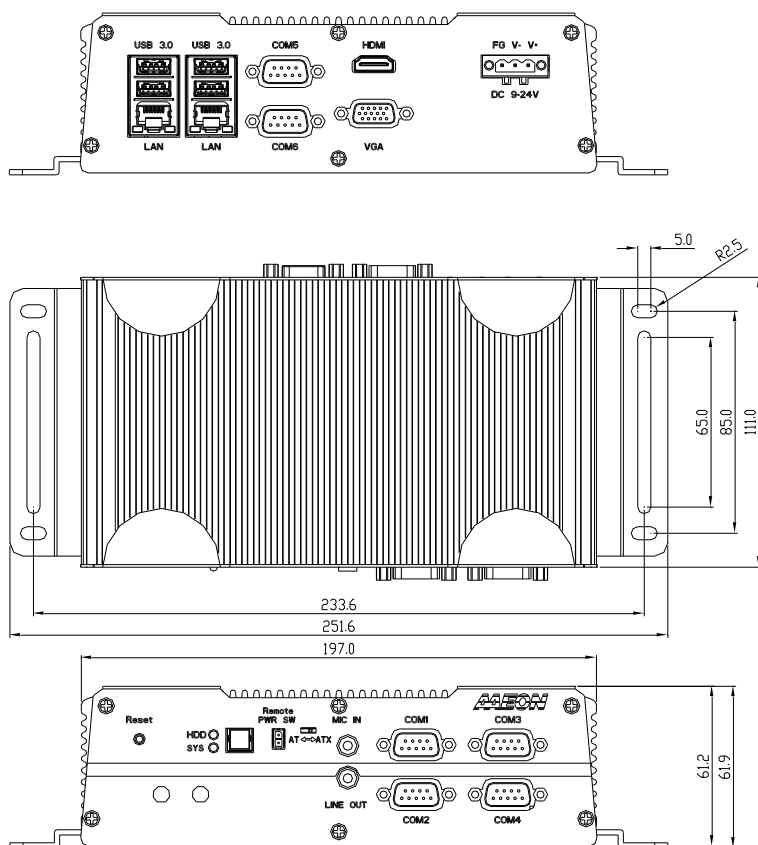
- DC Input
  - 9 - 24V with 3-pin terminal block

# Chapter 2

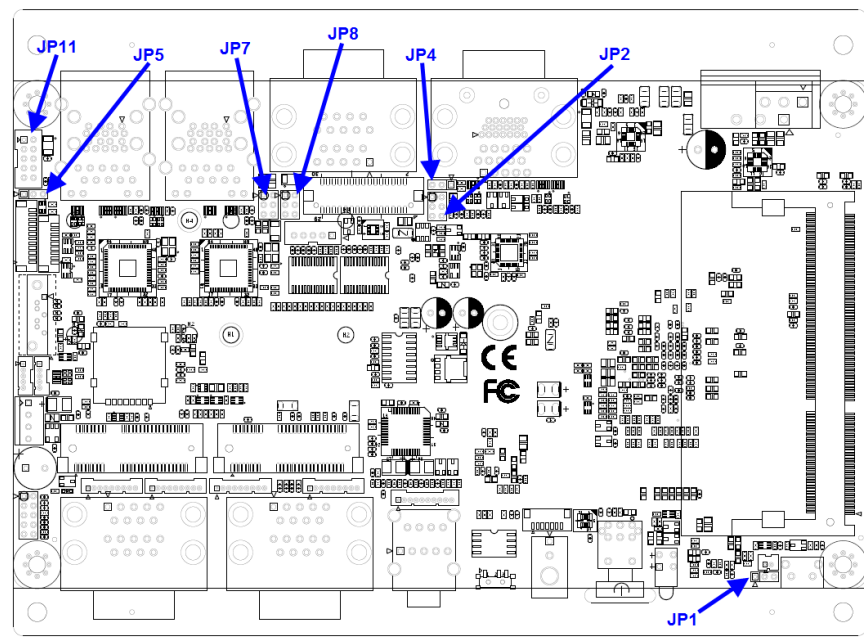
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Hardware Information

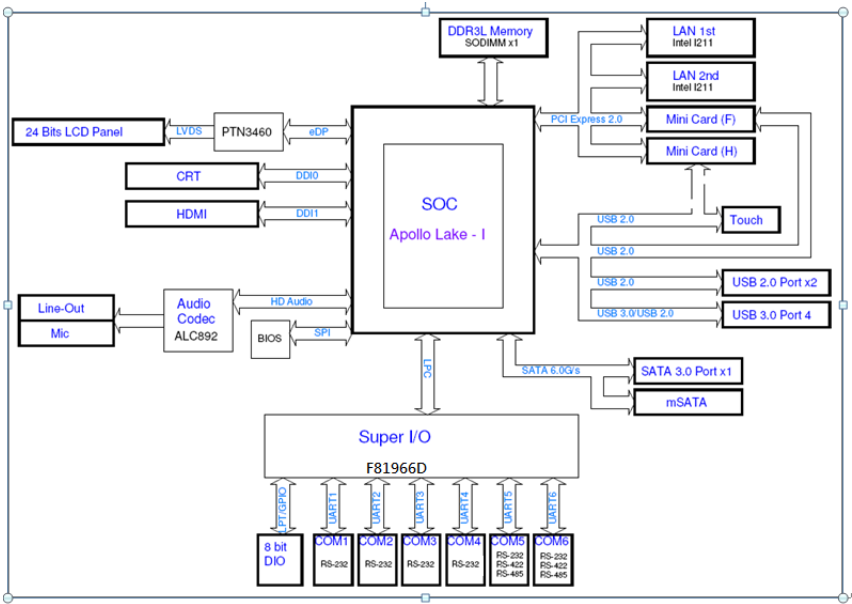
## 2.1 Dimensions



## 2.2 Jumpers and Connectors



### 2.3 Block Diagram



## 2.4 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                                |
|-------|-----------------------------------------|
| JP1   | Clear CMOS Jumper                       |
| JP2   | LVDS Power & Backlight Power Selection  |
| JP4   | LVDS Backlight Control Selection        |
| JP5   | Touch Screen Lines 4,5,8 Wire Selection |
| JP7   | COM2 Pin18 Function Selection           |
| JP8   | COM2 Pin9 Function Selection            |
| JP11  | Front Panel                             |

### 2.4.1 Clear CMOS Jumper (JP1)



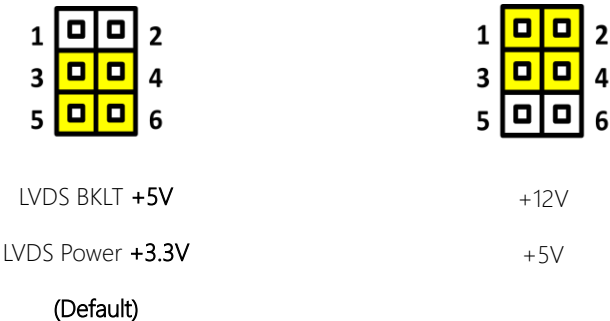
1

2

3

Clear CMOS

### 2.4.2 LVDS Power & Backlight Power Selection (JP2)



1

2

3

4

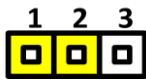
5

6

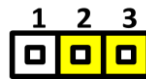
+12V

+5V

### 2.4.3 LVDS BKLT Control Selection (JP4)

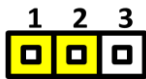


VR Mode(Default)

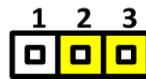


PWM Mode

### 2.4.4 Touch Screen Lines 4, 5, 8 Wire Selection (JP5)

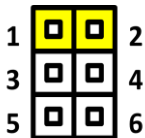


4, 8 wire (Default)

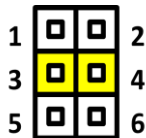


5 wire

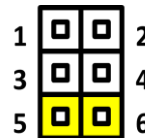
### 2.4.5 COM2A Pin18 Function Selection (JP7)



+12V

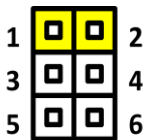


Ring (Default)

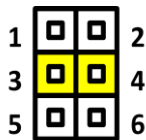


+5V

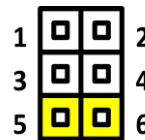
### 2.4.6 COM2B Pin9 Function Selection (JP8)



+12V

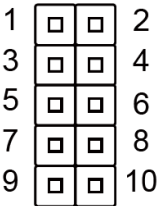


Ring (Default)



+5V

### 2.4.7 Front Panel (JP11)



| Pin | Function    |
|-----|-------------|
| 1   | GND         |
| 2   | EXT_PWRBTN# |
| 3   | FP_HDLED-   |
| 4   | FP_HDLED+   |
| 5   | FP_SPKR-    |
| 6   | +V5S        |
| 7   | GND         |
| 8   | PWRLED+     |
| 9   | GND         |
| 10  | HWRST#      |

## 2.5 List of Connectors

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

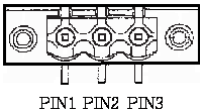
| Label | Function                        |
|-------|---------------------------------|
| CN1   | RTC Battery                     |
| CN2   | External Power Input            |
| CN5   | LVDS Backlight                  |
| CN6   | LVDS                            |
| CN13  | UIM Card push-push (Optional)   |
| CN14  | SATA HDD                        |
| CN15  | +5V/+12V Output for SATA HDD    |
| CN16  | Mini-Card Slot (Full-Mini Card) |
| CN18  | Audio Line-out/MIC              |
| CN20  | USB 2.0 x 1                     |
| CN21  | USB 2.0 x 1                     |
| CN22  | Touch Panel                     |
| CN23  | BIOS Debug Port                 |
| CN24  | LPC Port                        |
| CN37  | Mini-Card Slot (Half-Mini Card) |
| CN40  | LAN1/USB3 x 2                   |
| CN41  | LAN2/USB3 x 2                   |
| CN43  | Digital IO Port                 |
| CN44  | Remote Power on/off Switch      |
| CN53  | HDMI/VGA Port                   |
| DIMM1 | DDR3L SO-DIMM Slot              |
| COM1  | COM Port 1/2                    |
| COM2  | COM Port 3/4                    |

| Label | Function     |
|-------|--------------|
| COM3  | COM Port 5/6 |

### 2.5.1 RTC Battery (CN1)

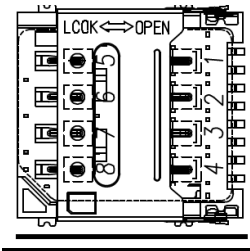
| Pin | Pin Name   | Signal Type | Signal Level |
|-----|------------|-------------|--------------|
| 1   | +V3.3A_RTC | PWR         | +3.3V        |
| 2   | GND        | GND         |              |

### 2.5.2 External Power Input (CN2)



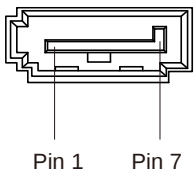
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1   | PWR_IN   | PWR         | +9V~+24V     |
| 2   | GND      | GND         |              |
| 3   | NC       | NC          |              |

### 2.5.3 UIM Card Socket (Push-Push type) (CN13)



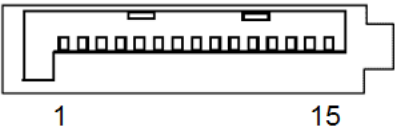
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1   | UIM_PWR  | PWR         |              |
| 2   | UIM_RST  | IN          |              |
| 3   | UIM_CLK  | IN          |              |
| 4   | NC       |             |              |
| 5   | GND      | GND         |              |
| 6   | UIM_VPP  | PWR         |              |
| 7   | UIM_DATA | I/O         |              |
| 8   | NC       |             |              |

2.5.4 SATA Port (CN14)



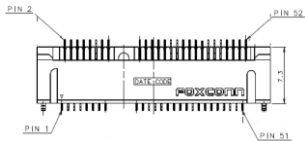
| Pin | Pin Name  | Signal Type | Signal Level |
|-----|-----------|-------------|--------------|
| 1   | GND       | GND         |              |
| 2   | SATA_TXP0 | DIFF        |              |
| 3   | SATA_TXN0 | DIFF        |              |
| 4   | GND       | GND         |              |
| 5   | SATA_RXN0 | DIFF        |              |
| 6   | SATA_RXP0 | DIFF        |              |
| 7   | GND       | GND         |              |

### 2.5.5 SATA Power Connector



| Pin | Signal  | Pin | Signal  |
|-----|---------|-----|---------|
| 1   | +3.3VDC | 2   | +3.3VDC |
| 3   | +3.3VDC | 4   | COM     |
| 5   | COM     | 6   | COM     |
| 7   | +5VDC   | 8   | +5VDC   |
| 9   | +5VDC   | 10  | COM     |
| 11  | COM     | 12  | COM     |
| 13  | +12VDC  | 14  | +12VDC  |
| 15  | +12VDC  |     |         |

2.5.6 Mini-Card Slot (Full-Mini Card) (CN16)

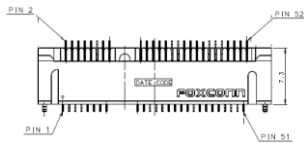


| Pin | Pin Name             | Signal Type | Signal Level |
|-----|----------------------|-------------|--------------|
| 1   | PCIE_WAKE3_MP2_N_3P3 | IN          |              |
| 2   | +V3.3_MINICARD_MSATA | PWR         | +3.3V        |
| 3   | NC                   |             |              |
| 4   | GND                  | GND         |              |
| 5   | NC                   |             |              |
| 6   | +V1.5S               | PWR         | +1.5V        |
| 7   | MPCIE2_CLKREQ#       |             |              |
| 8   | NC                   |             |              |
| 9   | GND                  | GND         |              |
| 10  | NC                   | I/O         |              |
| 11  | CLK_PCIE_MPCIE2_N    | DIFF        |              |
| 12  | NC                   | IN          |              |
| 13  | CLK_PCIE_MPCIE2_P    | DIFF        |              |
| 14  | NC                   |             |              |
| 15  | GND                  | GND         |              |
| 16  | NC                   | PWR         |              |

| Pin | Pin Name             | Signal Type | Signal Level |
|-----|----------------------|-------------|--------------|
| 17  | NC                   |             |              |
| 18  | GND                  | GND         |              |
| 19  | NC                   |             |              |
| 20  | W_DISABLE1#          | OUT         | +3.3V        |
| 21  | GND                  | GND         |              |
| 22  | BUF_PLT_RST#         | OUT         | +3.3V        |
| 23  | PCIE_RXN3_R          | DIFF        |              |
| 24  | +V3.3_MINICARD_MSATA | PWR         | +3.3V        |
| 25  | PCIE_RXP3_R          | DIFF        |              |
| 26  | GND                  | GND         |              |
| 27  | GND                  | GND         |              |
| 28  | +V1.5S               | PWR         | +1.5V        |
| 29  | GND                  | GND         |              |
| 30  | SMB_CLK_A            | I/O         | +3.3V        |
| 31  | PCIE_TXN3_R          | DIFF        |              |
| 32  | SMB_DATA_A           | I/O         | +3.3V        |
| 33  | PCIE_TXP3_R          | DIFF        |              |
| 34  | GND                  | GND         |              |
| 35  | GND                  | GND         |              |
| 36  | USB_DN7_MPCIE        | DIFF        |              |
| 37  | GND                  | GND         |              |

| Pin | Pin Name             | Signal Type | Signal Level |
|-----|----------------------|-------------|--------------|
| 38  | USB_DP7_MPCIE        | DIFF        |              |
| 39  | +V3.3_MINICARD_MSATA | PWR         | +3.3V        |
| 40  | GND                  | GND         |              |
| 41  | +V3.3_MINICARD_MSATA | PWR         | +3.3V        |
| 42  | NC                   |             |              |
| 43  | GND                  | GND         |              |
| 44  | NC                   |             |              |
| 45  | NC                   |             |              |
| 46  | NC                   |             |              |
| 47  | NC                   |             |              |
| 48  | +V1.5S               | PWR         | +1.5V        |
| 49  | NC                   |             |              |
| 50  | GND                  | GND         |              |
| 51  | NC                   |             |              |
| 52  | +V3.3_MINICARD_MSATA | PWR         | +3.3V        |

### 2.5.7 Mini-Card Slot (Half-Mini Card) (CN37)

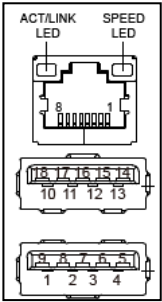


| Pin | Pin name             | Signal Type | Signal Level |
|-----|----------------------|-------------|--------------|
| 1   | PCIE_WAKE2_MP1_N_3P3 | IN          |              |
| 2   | +V3.3A               | PWR         | +3.3V        |
| 3   | NC                   |             |              |
| 4   | GND                  | GND         |              |
| 5   | NC                   |             |              |
| 6   | +V1.5S               | PWR         | +1.5V        |
| 7   | MPCIE1_CLKREQ#       |             |              |
| 8   | UIM_PWR              |             |              |
| 9   | GND                  | GND         |              |
| 10  | UIM_DAT              | I/O         |              |
| 11  | CLK_PCIE_MPCIE1_N    | DIFF        |              |
| 12  | UIM_CLK              | IN          |              |
| 13  | CLK_PCIE_MPCIE1_P    | DIFF        |              |
| 14  | UIM_RST              |             |              |
| 15  | GND                  | GND         |              |
| 16  | UIM_VPP              | PWR         |              |
| 17  | NC                   |             |              |
| 18  | GND                  | GND         |              |
| 19  | NC                   |             |              |
| 20  | W_DISABLE0#          | OUT         | +3.3V        |
| 21  | GND                  | GND         |              |

| Pin | Pin name     | Signal Type | Signal Level |
|-----|--------------|-------------|--------------|
| 22  | BUF_PLT_RST# | OUT         | +3.3V        |
| 23  | PCIE_RXN2    | DIFF        |              |
| 24  | +V3.3A       | PWR         | +3.3V        |
| 25  | PCIE_RXP2    | DIFF        |              |
| 26  | GND          | GND         |              |
| 27  | GND          | GND         |              |
| 28  | +V1.5S       | PWR         | +1.5V        |
| 29  | GND          | GND         |              |
| 30  | SMB_CLK_A    | I/O         | +3.3V        |
| 31  | PCIE_TXN2    | DIFF        |              |
| 32  | SMB_DATA_A   | I/O         | +3.3V        |
| 33  | PCIE_TXP2    | DIFF        |              |
| 34  | GND          | GND         |              |
| 35  | GND          | GND         |              |
| 36  | USB_DN6      | DIFF        |              |
| 37  | GND          | GND         |              |
| 38  | USB_DP6      | DIFF        |              |
| 39  | +V3.3A       | PWR         | +3.3V        |
| 40  | GND          | GND         |              |
| 41  | +V3.3A       | PWR         | +3.3V        |
| 42  | NC           |             |              |
| 43  | GND          | GND         |              |
| 44  | NC           |             |              |
| 45  | NC           |             |              |
| 46  | NC           |             |              |
| 47  | NC           |             |              |
| 48  | +V1.5S       | PWR         | +1.5V        |

| Pin | Pin name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 49  | NC       |             |              |
| 50  | GND      | GND         |              |
| 51  | NC       |             |              |
| 52  | +V3.3A   | PWR         | +3.3V        |

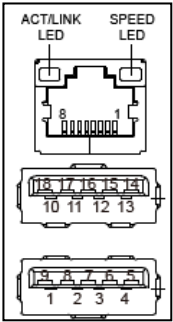
### 2.5.8 LAN1/USB3x2 (CN40)



| Pin | Pin name   | Signal Type | Signal Level |
|-----|------------|-------------|--------------|
| 1   | LAN1_MDI0P | DIFF        |              |
| 2   | LAN1_MDI0N | DIFF        |              |
| 3   | LAN1_MDI1P | DIFF        |              |
| 4   | LAN1_MDI1N | DIFF        |              |
| 5   | LAN1_MDI2P | DIFF        |              |
| 6   | LAN1_MDI2N | DIFF        |              |
| 7   | LAN1_MDI3P | DIFF        |              |
| 8   | LAN1_MDI3N | DIFF        |              |
| U1  | +V5A_USB_0 | PWR         | +5V          |
| U2  | USB0-      | DIFF        |              |
| U3  | USB0+      | DIFF        |              |
| U4  | GND        | GND         |              |

|     |                |      |     |
|-----|----------------|------|-----|
| U5  | USB3_RX0_CON_N | DIFF |     |
| U6  | USB3_RX0_CON_P | DIFF |     |
| U7  | GND            | GND  |     |
| U8  | USB3_TX0_CON_N | DIFF |     |
| U9  | USB3_TX0_CON_P | DIFF |     |
| U10 | +V5A_USB_1     | PWR  | +5V |
| U11 | USBD1-         | DIFF |     |
| U12 | USBD1+         | DIFF |     |
| U13 | GND            | GND  |     |
| U14 | USB3_RX1_CON_N | DIFF |     |
| U15 | USB3_RX1_CON_P | DIFF |     |
| U16 | GND            | GND  |     |
| U17 | USB3_TX1_CON_N | DIFF |     |
| U18 | USB3_TX1_CON_P | DIFF |     |

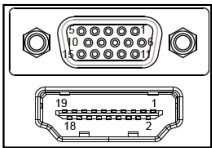
### 2.5.9 LAN2/USB3x2 (CN41)



| Pin | Pin name   | Signal Type | Signal Level |
|-----|------------|-------------|--------------|
| 1   | LAN2_MDI0P | DIFF        |              |
| 2   | LAN2_MDI0N | DIFF        |              |

|     |                |      |     |
|-----|----------------|------|-----|
| 3   | LAN2_MDI1P     | DIFF |     |
| 4   | LAN2_MDI1N     | DIFF |     |
| 5   | LAN2_MDI2P     | DIFF |     |
| 6   | LAN2_MDI2N     | DIFF |     |
| 7   | LAN2_MDI3P     | DIFF |     |
| 8   | LAN2_MDI3N     | DIFF |     |
| U1  | +V5A_USB_2     | PWR  | +5V |
| U2  | USBD2-         | DIFF |     |
| U3  | USBD2+         | DIFF |     |
| U4  | GND            | GND  |     |
| U5  | USB3_RX2_CON_N | DIFF |     |
| U6  | USB3_RX2_CON_P | DIFF |     |
| U7  | GND            | GND  |     |
| U8  | USB3_TX2_CON_N | DIFF |     |
| U9  | USB3_TX2_CON_P | DIFF |     |
| U10 | +V5A_USB_3     | PWR  | +5V |
| U11 | USBD3-         | DIFF |     |
| U12 | USBD3+         | DIFF |     |
| U13 | GND            | GND  |     |
| U14 | USB3_RX3_CON_N | DIFF |     |
| U15 | USB3_RX3_CON_P | DIFF |     |
| U16 | GND            | GND  |     |
| U17 | USB3_TX3_CON_N | DIFF |     |
| U18 | USB3_TX3_CON_P | DIFF |     |

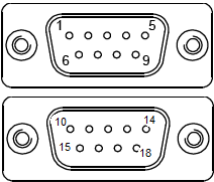
2.5.10VGA\HDMI Port (CN53)



| Pin | Pin name     | Signal Type | Signal Level |
|-----|--------------|-------------|--------------|
| A1  | RED          | OUT         |              |
| A2  | GREEN        | OUT         |              |
| A3  | BLUE         | OUT         |              |
| A4  | NC           |             |              |
| A5  | GND          | GND         |              |
| A6  | GND          | GND         |              |
| A7  | NC           |             |              |
| A8  | GND          | GND         |              |
| A9  | +V5S_DISP    | PWR         | +5V          |
| A10 | CRT_PLUG     |             |              |
| A11 | NC           |             |              |
| A12 | VGA_DDCDATA  | I/O         | +5V          |
| A13 | HSYNC        | OUT         |              |
| A14 | VSYNC        | OUT         |              |
| A15 | VGA_DDCCLK   | I/O         | +5V          |
| 1   | HDMI_DATA2_P | DIFF        |              |
| 2   | GND          | GND         |              |
| 3   | HDMI_DATA2_N | DIFF        |              |
| 4   | HDMI_DATA1_P | DIFF        |              |
| 5   | GND          | GND         |              |

|    |               |      |     |
|----|---------------|------|-----|
| 6  | HDMI_DATA1_N  | DIFF |     |
| 7  | HDMI_DATA0_P  | DIFF |     |
| 8  | GND           | GND  |     |
| 9  | HDMI_DATA0_N  | DIFF |     |
| 10 | HDMI_CLK_C_P  | DIFF |     |
| 11 | GND           | GND  |     |
| 12 | HDMI_CLK_C_N  | DIFF |     |
| 13 | NC            |      |     |
| 14 | NC            |      |     |
| 15 | HDMI_SCL      | I/O  | +5V |
| 16 | HDMI_SDA      | I/O  | +5V |
| 17 | GND           | GND  |     |
| 18 | +VSS_HDMI_CON | I/O  | +5V |
| 19 | HDMI_HPD      | IN   |     |

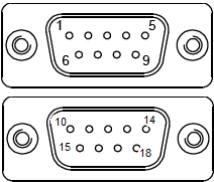
2.5.11 COM Port1/2 (COM1)



| Pin | Pin name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1   | DCD1     | IN          |              |
| 2   | RX1      | IN          |              |
| 3   | TX1      | OUT         | ±9V          |
| 4   | DTR1     | OUT         | ±9V          |

|    |      |     |     |
|----|------|-----|-----|
| 5  | GND  | GND |     |
| 6  | DSR1 | IN  |     |
| 7  | RTS1 | OUT | ±9V |
| 8  | CTS1 | IN  |     |
| 9  | RI1  | IN  |     |
| 10 | DCD2 | IN  |     |
| 11 | RX2  | IN  |     |
| 12 | TX2  | OUT | ±9V |
| 13 | DTR2 | OUT | ±9V |
| 14 | GND  | GND |     |
| 15 | DSR2 | IN  |     |
| 16 | RTS2 | OUT | ±9V |
| 17 | CTS2 | IN  |     |
| 18 | RI2  | IN  |     |

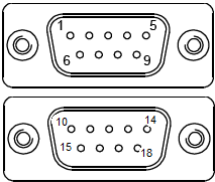
2.5.12COM Port3/4



| Pin | Pin name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1   | DCD3     | IN          |              |
| 2   | RX3      | IN          |              |
| 3   | TX3      | OUT         | ±9V          |
| 4   | DTR3     | OUT         | ±9V          |

|    |      |     |     |
|----|------|-----|-----|
| 5  | GND  | GND |     |
| 6  | DSR3 | IN  |     |
| 7  | RTS3 | OUT | ±9V |
| 8  | CTS3 | IN  |     |
| 9  | RI3  | IN  |     |
| 10 | DCD4 | IN  |     |
| 11 | RX4  | IN  |     |
| 12 | TX4  | OUT | ±9V |
| 13 | DTR4 | OUT | ±9V |
| 14 | GND  | GND |     |
| 15 | DSR4 | IN  |     |
| 16 | RTS4 | OUT | ±9V |
| 17 | CTS4 | IN  |     |
| 18 | RI4  | IN  |     |

2.5.13COM Port5/6

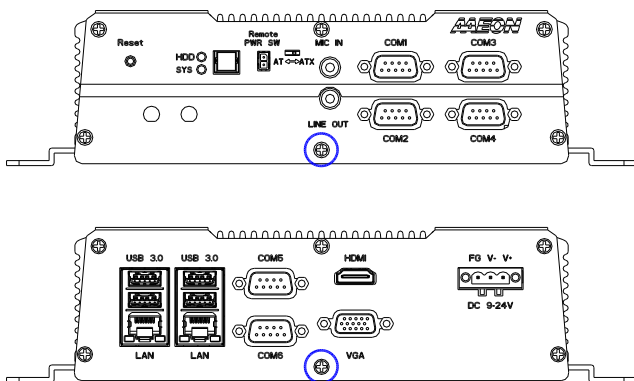


| Pin | Pin name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1   | DCD5     | IN          |              |
| 2   | RX5      | IN          |              |
| 3   | TX5      | OUT         | ±9V          |
| 4   | DTR5     | OUT         | ±9V          |

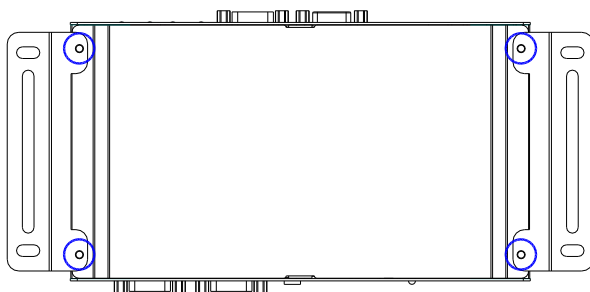
|    |      |     |     |
|----|------|-----|-----|
| 5  | GND  | GND |     |
| 6  | DSR5 | IN  |     |
| 7  | RTS5 | OUT | ±9V |
| 8  | CTS5 | IN  |     |
| 9  | RI5  | IN  |     |
| 10 | DCD6 | IN  |     |
| 11 | RX6  | IN  |     |
| 12 | TX6  | OUT | ±9V |
| 13 | DTR6 | OUT | ±9V |
| 14 | GND  | GND |     |
| 15 | DSR6 | IN  |     |
| 16 | RTS6 | OUT | ±9V |
| 17 | CTS6 | IN  |     |
| 18 | RI6  | IN  |     |

## 2.6 Hard Disk Drive Installation

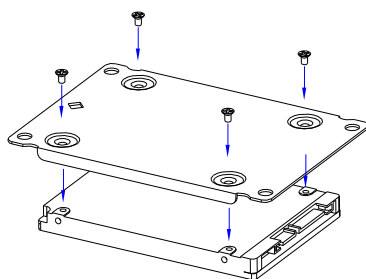
Step 1: Remove the baseplate as instructed below



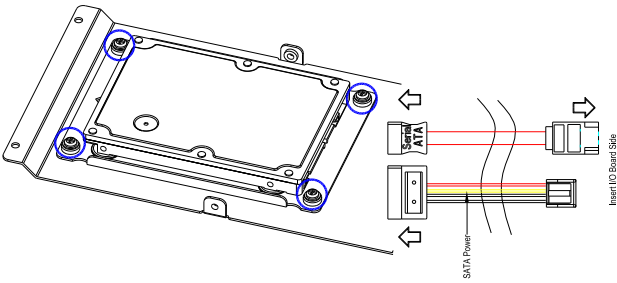
Step 2: Place the HDD on the bracket plate



Step 3: Tighten the screws at the back to secure the HDD

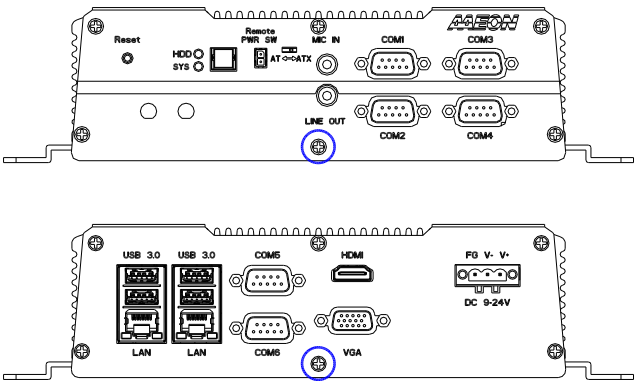


Step 4: Connect the SATA and power cables to the HDD, attach the HDD assembly to the baseplate.

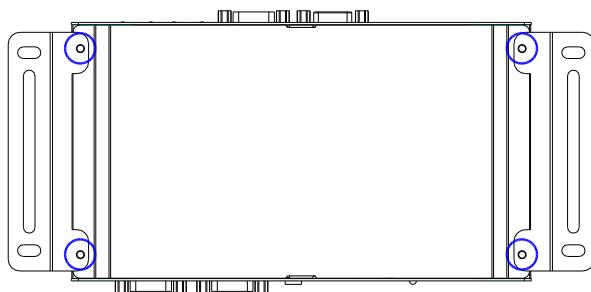


## 2.7 RAM Installation

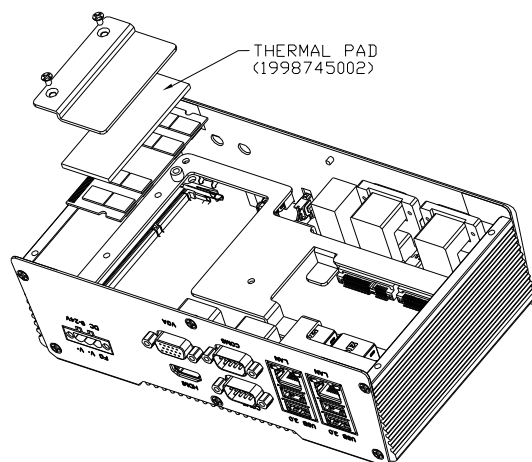
Step 1: Remove the baseplate as instructed below



Step 2: Insert the RAM into the RAM slot

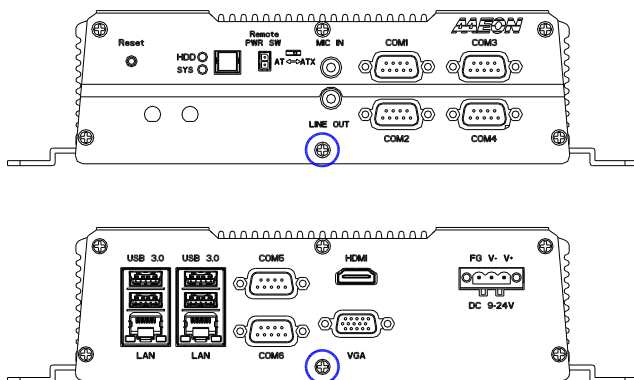


Step 3: Push down to secure the RAM

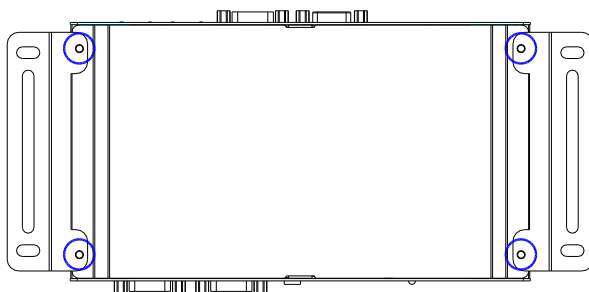


## 2.8 Mini\_Card Installation

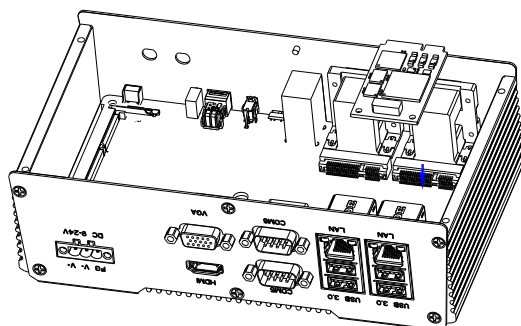
Step 1: Remove the baseplate as instructed below



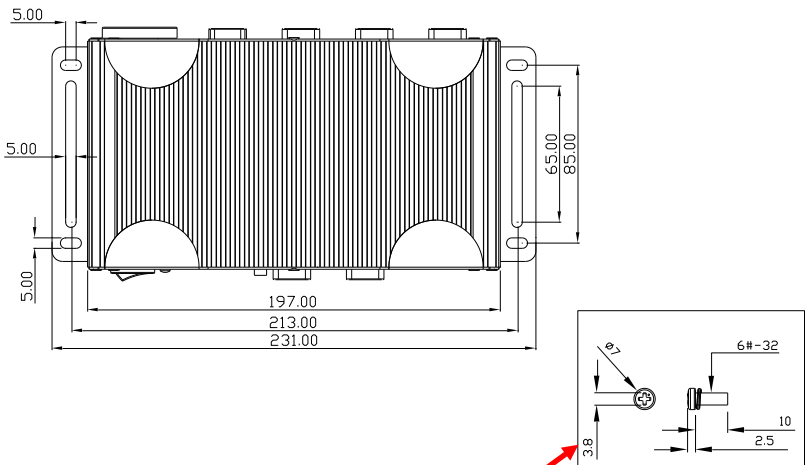
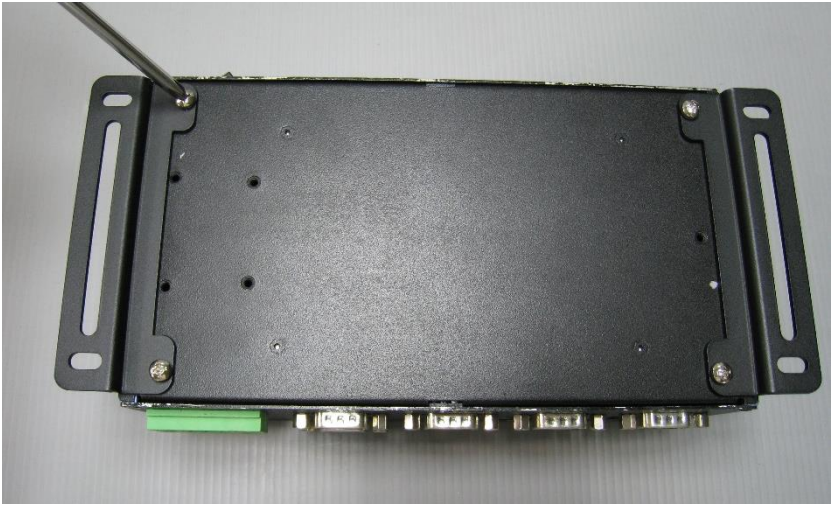
Step 2: Insert the Mini-Card into the Mini-Card slot



Step 3: Push down to secure the Mini-Card



## 2.9 Wallmount Installation



We suggest using this screw.

# 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

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

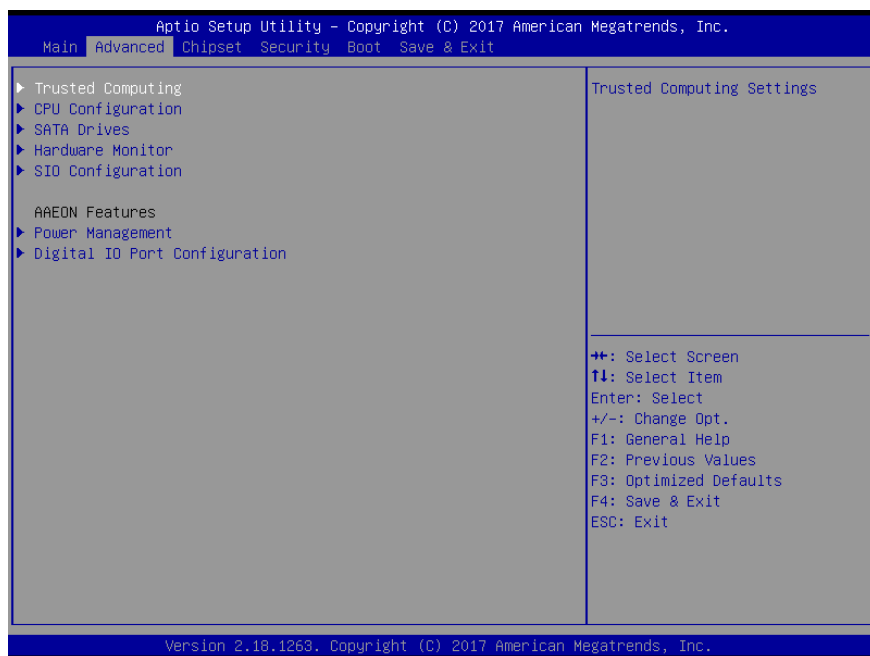
**Security** – The setup administrator password can be set here

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

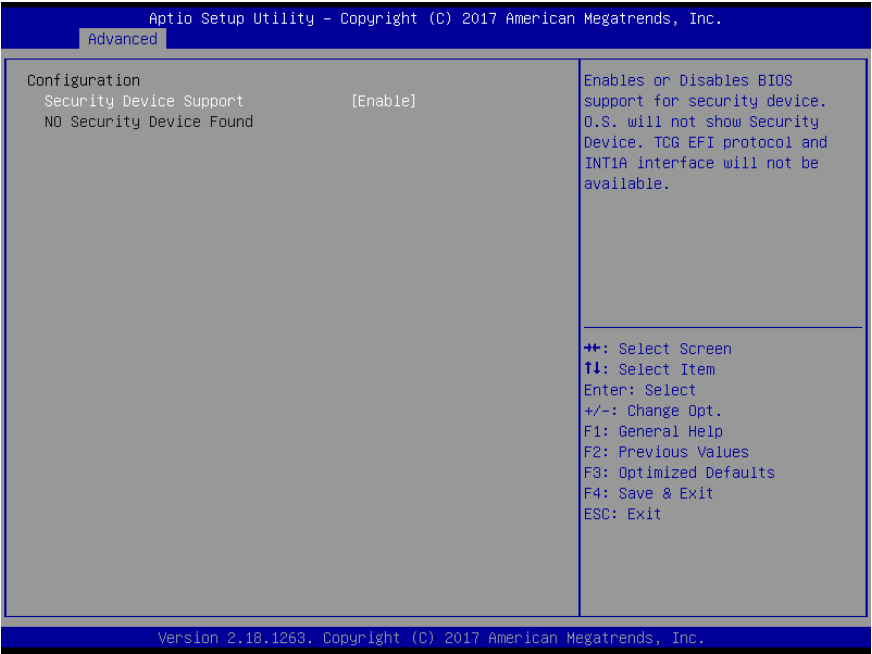
### 3.3 Setup Submenu: Main



### 3.4 Setup Submenu: Advanced



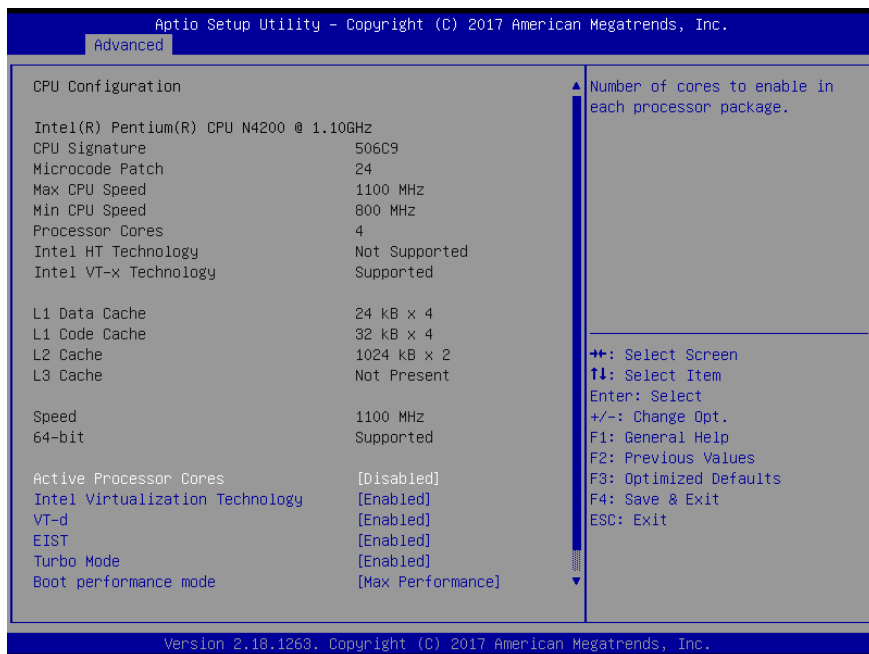
### 3.4.1 Advanced: Trusted Computing



Options summary:

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

### 3.4.2 Advanced: CPU Configuration

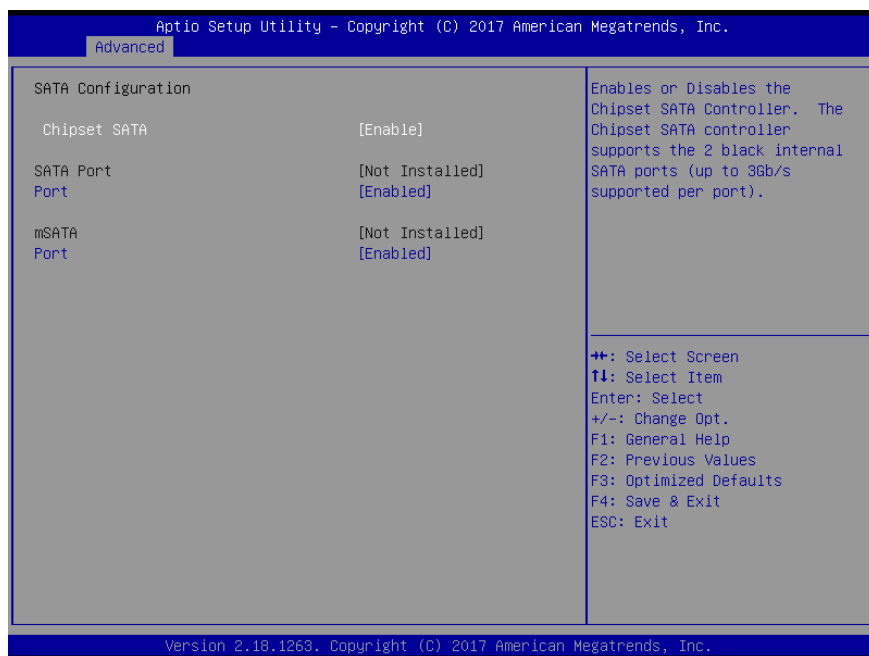


Options summary:

|                                                                                                         |          |                                   |
|---------------------------------------------------------------------------------------------------------|----------|-----------------------------------|
| Active Processor Cores                                                                                  | Disabled | Optimal Default, Failsafe Default |
| Number of cores to enable in each processor package                                                     | Enabled  |                                   |
| Intel Virtualization Technology                                                                         | Disabled |                                   |
|                                                                                                         | Enabled  | Optimal Default, Failsafe Default |
| When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. |          |                                   |
| VT-d                                                                                                    | Disabled |                                   |
|                                                                                                         | Enabled  | Optimal Default, Failsafe Default |
| Enable/Disable CPU VT-d                                                                                 |          |                                   |
| EIST                                                                                                    | Disabled |                                   |
|                                                                                                         | Enabled  | Optimal Default, Failsafe Default |
| Enable/Disable Intel SpeedStep                                                                          |          |                                   |
| Turbo Mode                                                                                              | Disabled |                                   |
|                                                                                                         | Enabled  | Optimal Default, Failsafe Default |
| Turbo Mode                                                                                              |          |                                   |

|                                                                       |                 |                                   |
|-----------------------------------------------------------------------|-----------------|-----------------------------------|
| Boot performance mode                                                 | Max performance | Optimal Default, Failsafe Default |
|                                                                       | Max battery     |                                   |
| Select the performance state that the BIOS will set before OS handoff |                 |                                   |
| Power Limit 1 Enable                                                  | Disabled        | Optimal Default, Failsafe Default |
|                                                                       | Enabled         |                                   |
| Enable/Disable Power Limit 1                                          |                 |                                   |
| C-states                                                              | Disabled        | Optimal Default, Failsafe Default |
|                                                                       | Enabled         |                                   |
| Enable/Disable C states                                               |                 |                                   |

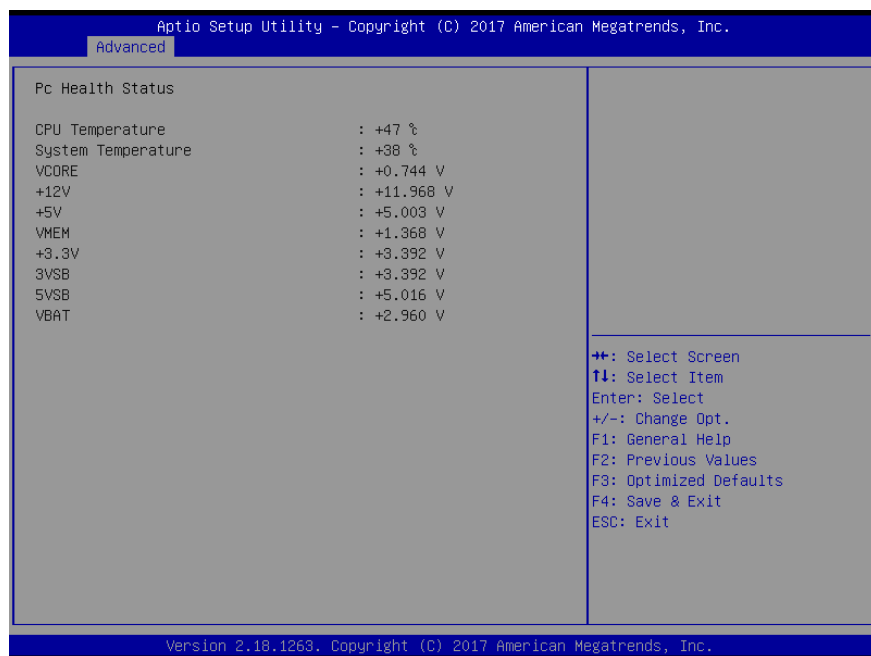
### 3.4.3 Advanced: SATA Drives



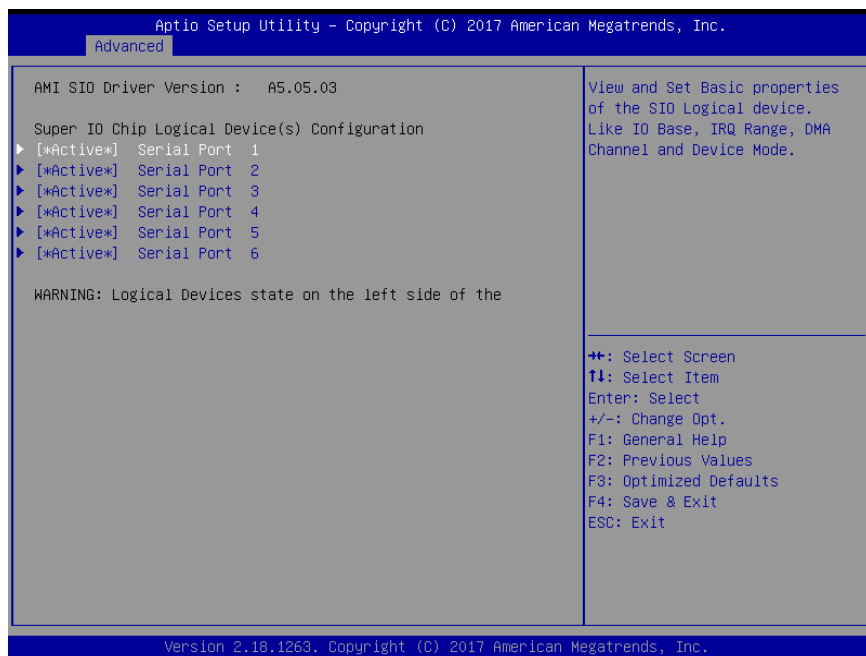
Options summary:

|                                                                                                                                                      |         |                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------------|
| Chipset SATA                                                                                                                                         | Enable  | Optimal Default, Failsafe Default |
|                                                                                                                                                      | Disable |                                   |
| Enable or Disable the Chipset SATA Controller. The Chipset SATA controller supports the 2 black internal SATA ports (up to 3Gb/s supported per port) |         |                                   |
| Port                                                                                                                                                 | Enable  | Optimal Default, Failsafe Default |
|                                                                                                                                                      | Disable |                                   |
| Enable or Disable SATA Port                                                                                                                          |         |                                   |
| Port                                                                                                                                                 | Enable  | Optimal Default, Failsafe Default |
|                                                                                                                                                      | Disable |                                   |
| Enable or Disable SATA Port                                                                                                                          |         |                                   |

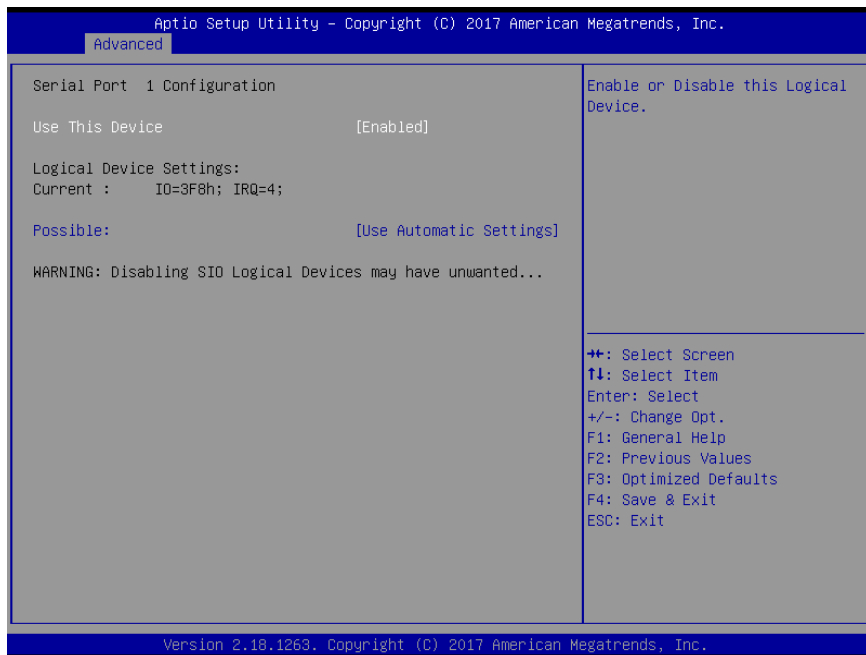
### 3.4.4 Advanced: Hardware Monitor



### 3.4.5 Advanced: SIO Configuration



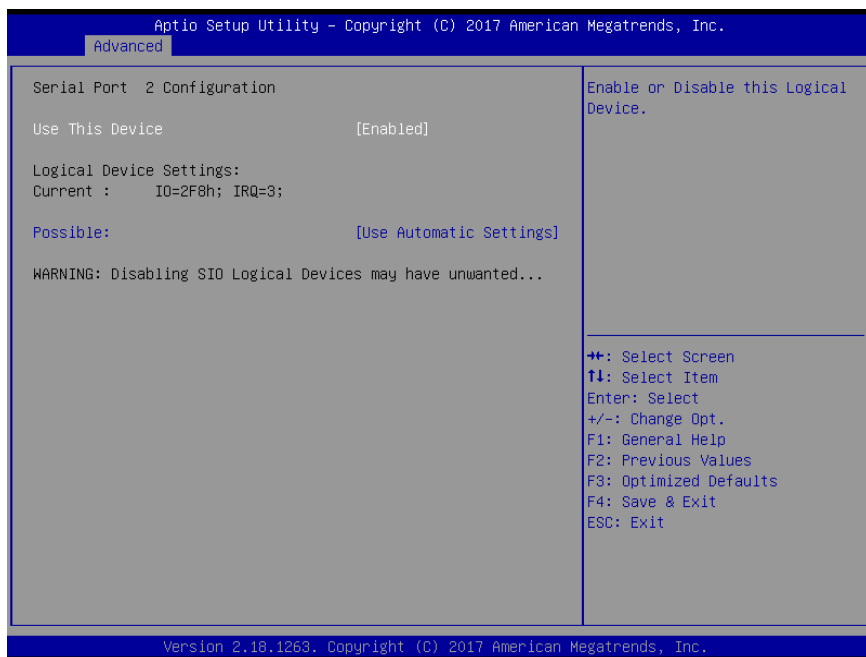
### 3.4.5.1 SIO Configuration: Serial Port 1 Configuration



Options summary:

|                                                                                                                                  |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                                  | Disabled               | Optimal Default, Failsafe Default |
|                                                                                                                                  | Enabled                |                                   |
| Enable or Disable this Logical Device.                                                                                           |                        |                                   |
| Possible:                                                                                                                        | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                                  | IO=3F8; IRQ=4;         |                                   |
|                                                                                                                                  | IO=2F8; IRQ=3;         |                                   |
| Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts. |                        |                                   |

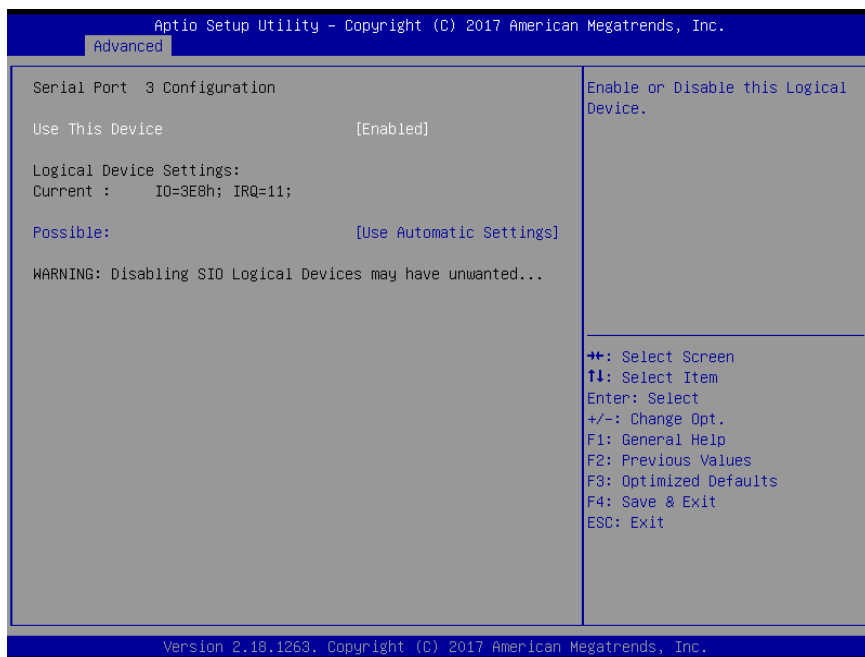
### 3.4.5.2 SIO Configuration: Serial Port 2 Configuration



Options summary:

|                                                                                                                                  |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                                  | Disabled               | Optimal Default, Failsafe Default |
|                                                                                                                                  | Enabled                |                                   |
| Enable or Disable this Logical Device.                                                                                           |                        |                                   |
| Possible:                                                                                                                        | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                                  | IO=2F8; IRQ=3;         |                                   |
|                                                                                                                                  | IO=3F8; IRQ=4;         |                                   |
| Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts. |                        |                                   |

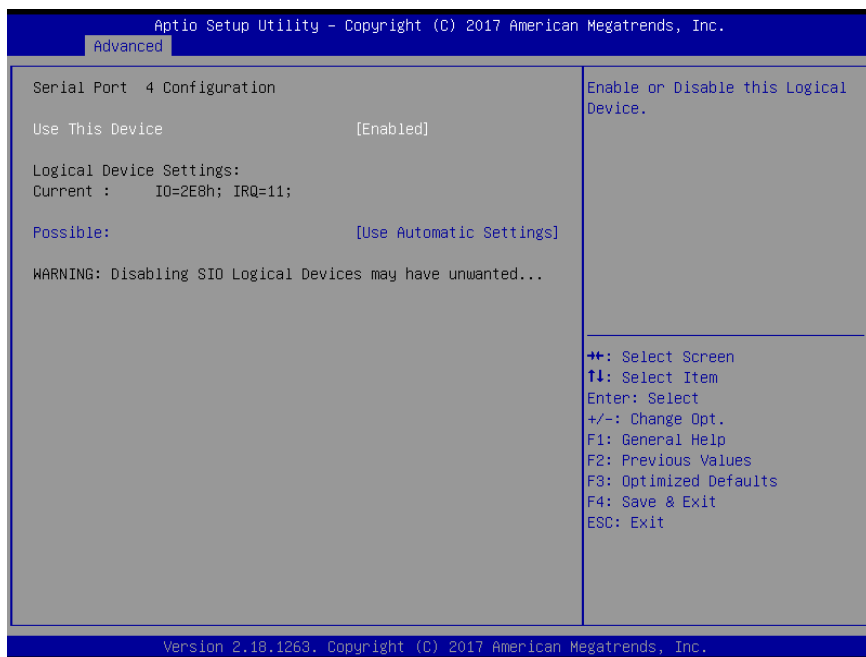
### 3.4.5.3 SIO Configuration: Serial Port 3 Configuration



Options summary:

|                                                                                                                                  |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                                  | Disabled               | Optimal Default, Failsafe Default |
|                                                                                                                                  | Enabled                |                                   |
| Enable or Disable this Logical Device.                                                                                           |                        |                                   |
| Possible:                                                                                                                        | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                                  | IO=3E8; IRQ=11;        |                                   |
|                                                                                                                                  | IO=2E8; IRQ=11;        |                                   |
| Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts. |                        |                                   |

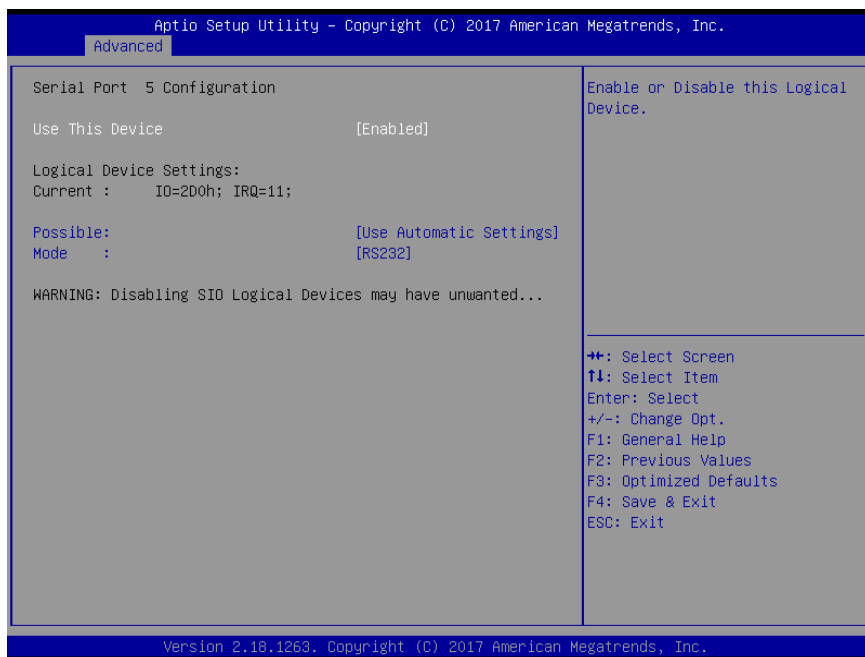
### 3.4.5.4 SIO Configuration: Serial Port 4 Configuration



Options summary:

|                                                                                                                                  |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                                  | Disabled               | Optimal Default, Failsafe Default |
|                                                                                                                                  | Enabled                |                                   |
| Enable or Disable this Logical Device.                                                                                           |                        |                                   |
| Possible:                                                                                                                        | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                                  | IO=2E8; IRQ=11;        |                                   |
|                                                                                                                                  | IO=3E8; IRQ=11;        |                                   |
| Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts. |                        |                                   |

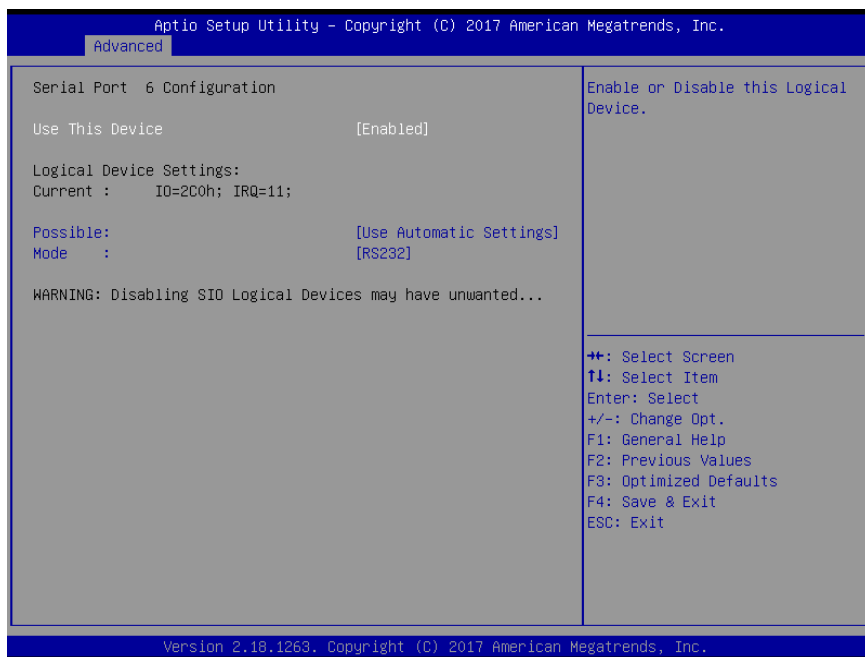
### 3.4.5.5 SIO Configuration: Serial Port 5 Configuration



Options summary:

|                                                                                                                                  |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                                  | Disabled               | Optimal Default, Failsafe Default |
|                                                                                                                                  | Enabled                |                                   |
| Enable or Disable this Logical Device.                                                                                           |                        |                                   |
| Possible:                                                                                                                        | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                                  | IO=2D0; IRQ=11;        |                                   |
|                                                                                                                                  | IO=2C0; IRQ=11;        |                                   |
| Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts. |                        |                                   |
| Mode:                                                                                                                            | RS232                  | Optimal Default, Failsafe Default |
|                                                                                                                                  | RS422                  |                                   |
|                                                                                                                                  | RS458                  |                                   |
| UART RS232 RS422 RS485 selection                                                                                                 |                        |                                   |

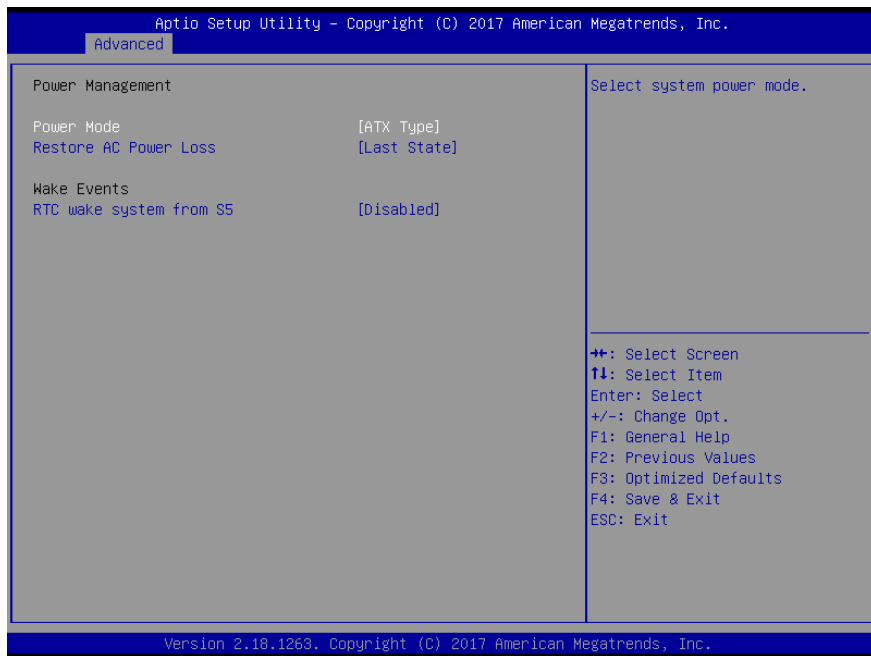
### 3.4.5.6 SIO Configuration: Serial Port 6 Configuration



Options summary:

|                                                                                                                                  |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                                  | Disabled               | Optimal Default, Failsafe Default |
|                                                                                                                                  | Enabled                |                                   |
| Enable or Disable this Logical Device.                                                                                           |                        |                                   |
| Possible:                                                                                                                        | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                                  | IO=2C0; IRQ=11;        |                                   |
|                                                                                                                                  | IO=2D0; IRQ=11;        |                                   |
| Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts. |                        |                                   |
| Mode:                                                                                                                            | RS232                  | Optimal Default, Failsafe Default |
|                                                                                                                                  | RS422                  |                                   |
|                                                                                                                                  | RS458                  |                                   |
| UART RS232 RS422 RS485 selection                                                                                                 |                        |                                   |

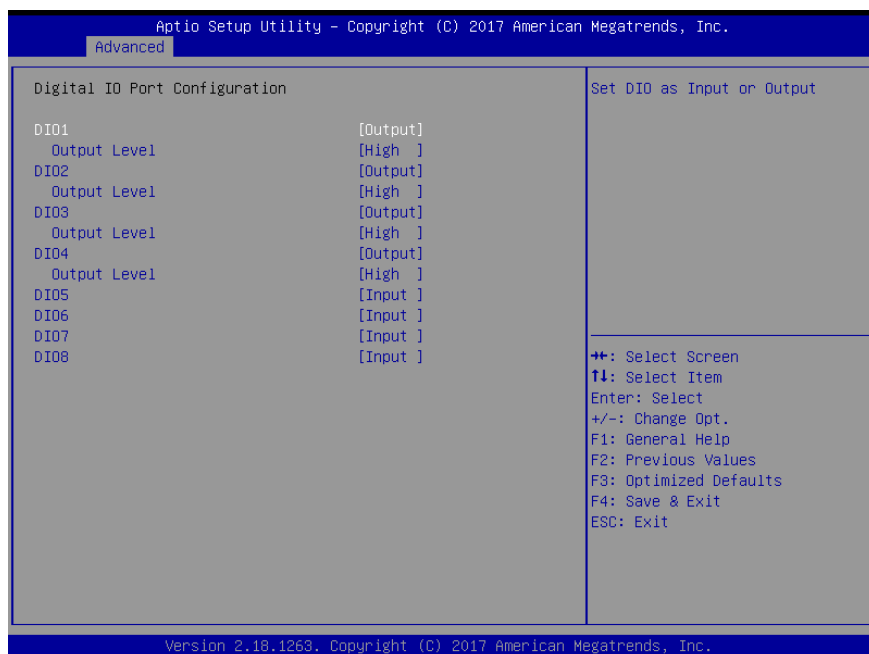
### 3.4.6 Power Management



Options summary:

|                                                                                                            |              |                                   |
|------------------------------------------------------------------------------------------------------------|--------------|-----------------------------------|
| Power Mode                                                                                                 | ATX Type     | Optimal Default, Failsafe Default |
|                                                                                                            | AT Type      |                                   |
| Select system power mode.                                                                                  |              |                                   |
| Restore AC Power Loss                                                                                      | Last State   | Optimal Default, Failsafe Default |
|                                                                                                            | Power On     |                                   |
|                                                                                                            | Power Loss   |                                   |
| RTC wake system from S5                                                                                    | Disabled     | Optimal Default, Failsafe Default |
|                                                                                                            | Fixed Time   |                                   |
|                                                                                                            | Dynamic Time |                                   |
| Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified |              |                                   |

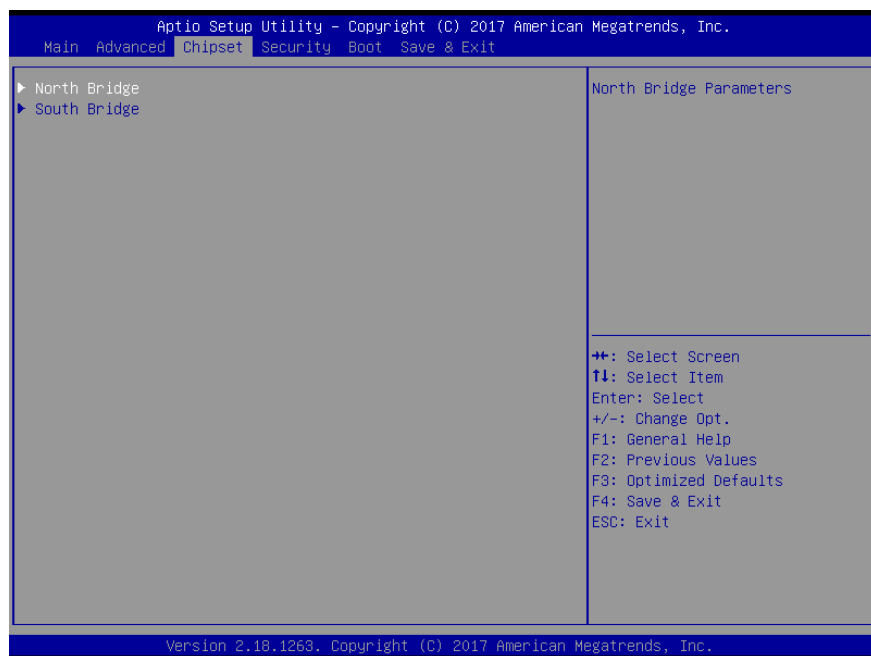
### 3.4.7 Advanced: Dynamic Digital IO Configuration



Options summary:

|                                         |        |                                   |
|-----------------------------------------|--------|-----------------------------------|
| DIO[1:4]                                | Input  | Optimal Default, Failsafe Default |
|                                         | Output |                                   |
| Set DIO as Input or Output              |        |                                   |
| DIO[1:4] Output Level                   | High   | Optimal Default, Failsafe Default |
|                                         | Low    |                                   |
| Set output level when DIO pin is output |        |                                   |
| DIO[5:8]                                | Input  | Optimal Default, Failsafe Default |
|                                         | Output |                                   |
| Set DIO as Input or Output              |        |                                   |
| DIO[5:8] Output Level                   | High   | Optimal Default, Failsafe Default |
|                                         | Low    |                                   |
| Set output level when DIO pin is output |        |                                   |

### 3.5 Setup submenu: Chipset



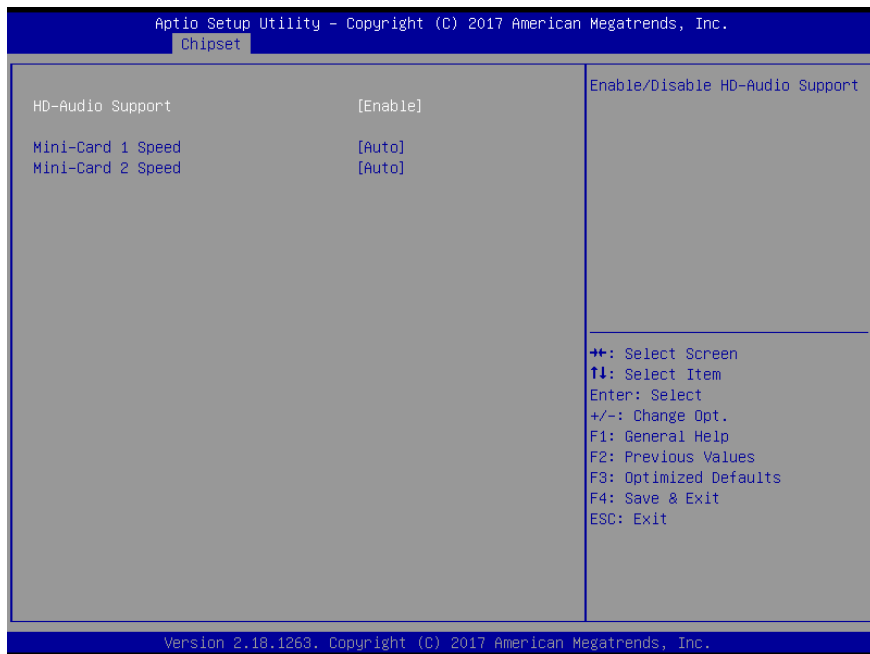
### 3.5.1 Chipset: North Bridge



Options summary:

|                                                                                |      |                                   |
|--------------------------------------------------------------------------------|------|-----------------------------------|
| DCMT Total Gfx<br>Mem                                                          | 128M | Optimal Default, Failsafe Default |
|                                                                                | 256M |                                   |
|                                                                                | MAX  |                                   |
| Select DVMT5.0 Total Graphics Memory size used by the Internal Graphics Device |      |                                   |

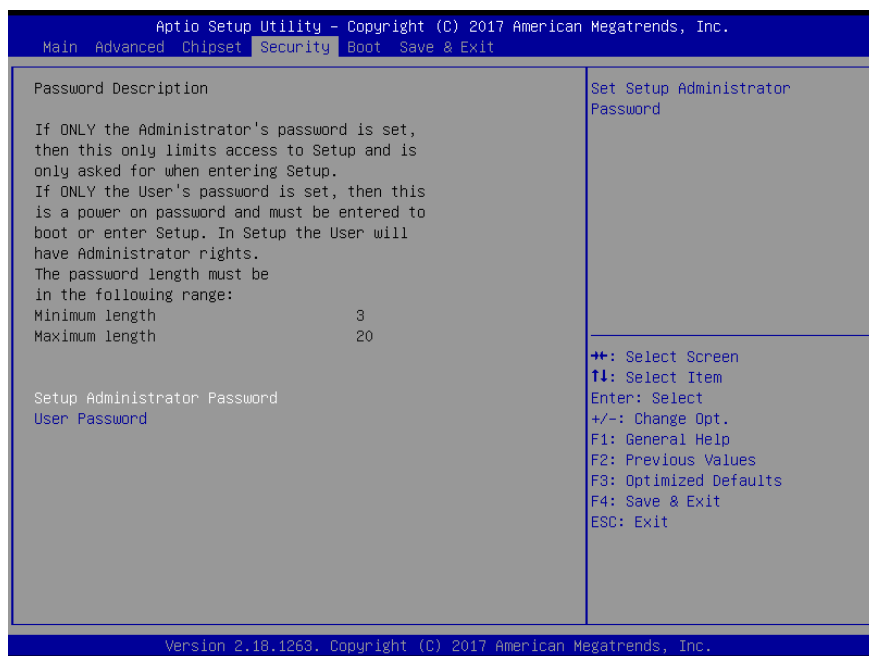
### 3.5.2 Chipset: South Bridge



Options summary:

|                                 |         |                                   |
|---------------------------------|---------|-----------------------------------|
| HD-Audio Support                | Disable | Optimal Default, Failsafe Default |
|                                 | Enable  |                                   |
| Enable/Disable HD-Audio Support |         |                                   |
| Mini-Card 1 Speed               | Auto    | Optimal Default, Failsafe Default |
|                                 | Gen 1   |                                   |
|                                 | Gen 2   |                                   |
| Configure PCIe Speed            |         |                                   |
| Mini-Card 2 Speed               | Auto    | Optimal Default, Failsafe Default |
|                                 | Gen 1   |                                   |
|                                 | Gen 2   |                                   |
| Configure PCIe Speed            |         |                                   |

## 3.6 Setup submenu: Security



### Change User/Administrator Password

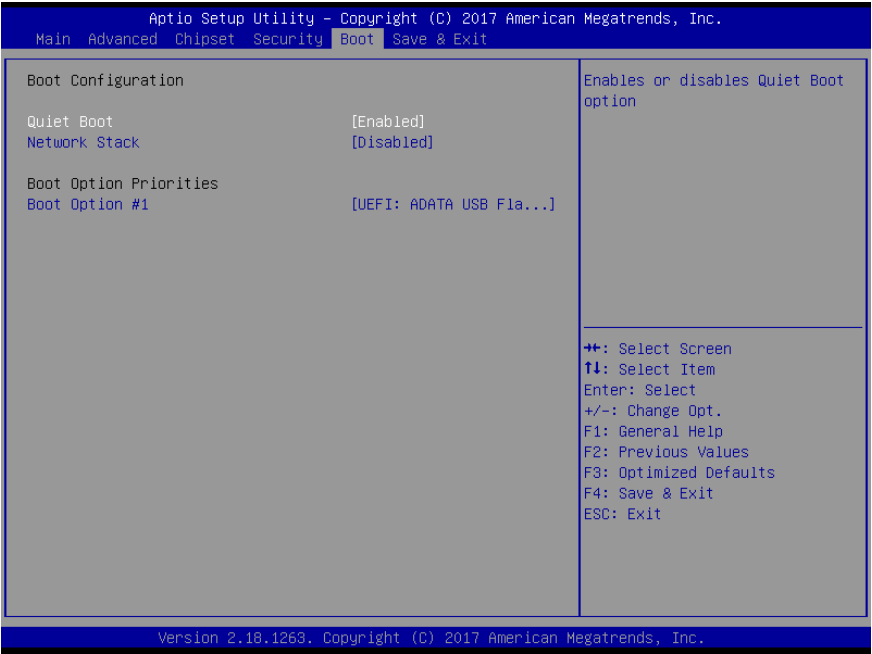
You can set a User Password once an Administrator Password. The password will be required during boot up, or when the user enters the Setup utility. Please Note that a User Password does not provide access to many of the features in the Setup utility.

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 | Optimal Default, Failsafe Default |
|                                     | Enabled  |                                   |
| Enable or Disable Quiet Boot option |          |                                   |
| Network Stack                       | Disabled | Optimal Default, Failsafe Default |
|                                     | Enabled  |                                   |
| Enable/Disable UEFI Network Stack   |          |                                   |

### 3.8 Setup submenu: Save & Exit



# Chapter 4

---

Drivers Installation

## 4.1 Product CD/DVD

---

The BOXER-6616 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 followed by **SetupChipset.exe** file
2. Follow the instructions
3. Drivers will be installed automatically

### Step 2 – Install VGA 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 TXE Driver

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

### Step 4 – Install LAN Driver

1. Open the **Step4 - 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 5 – Install Audio Driver

1. Open the **Step5 - Audio** folder and followed by **.exe** file
2. Follow the instructions
3. Drivers will be installed automatically

### Step 6 – Install Serial IO Driver

1. Open the **Step6 – Serial IO** folder and select your OS
2. Open the **SetupSerialIO.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

### Step 7 – Install Serial Port Driver (Optional)

- 1.
2. Open the **Step7 - Serial Port Driver (Optional)** folder and select your OS
3. Open the **.exe** file in the folder
4. Follow the instructions
5. 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   SIOData    //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   WDTRstLDN  // This parameter is represented from Note20
#define byte   WDTRstReg  // This parameter is represented from Note21
#define byte   WDTRstBit  // This parameter is represented from Note22
#define byte   WDTRstVal  // 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(ModelLDN, 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

|                                        |                                   |
|----------------------------------------|-----------------------------------|
| DESKTOP-LK7HR01                        |                                   |
| Input/output (IO)                      |                                   |
| [0000000000000000 - 000000000000006F]  | PCI Express Root Complex          |
| [0000000000000020 - 0000000000000021]  | Programmable interrupt controller |
| [0000000000000020 - 0000000000000021]  | Programmable interrupt controller |
| [0000000000000020 - 0000000000000021]  | Programmable interrupt controller |
| [0000000000000024 - 0000000000000025]  | Programmable interrupt controller |
| [0000000000000024 - 0000000000000025]  | Programmable interrupt controller |
| [0000000000000024 - 0000000000000025]  | Programmable interrupt controller |
| [0000000000000028 - 0000000000000029]  | Programmable interrupt controller |
| [0000000000000028 - 0000000000000029]  | Programmable interrupt controller |
| [0000000000000028 - 0000000000000029]  | Programmable interrupt controller |
| [000000000000002C - 000000000000002D]  | Programmable interrupt controller |
| [000000000000002C - 000000000000002D]  | Programmable interrupt controller |
| [000000000000002C - 000000000000002D]  | Programmable interrupt controller |
| [000000000000002E - 000000000000002F]  | Motherboard resources             |
| [0000000000000030 - 0000000000000031]  | Programmable interrupt controller |
| [0000000000000030 - 0000000000000031]  | Programmable interrupt controller |
| [0000000000000030 - 0000000000000031]  | Programmable interrupt controller |
| [0000000000000034 - 0000000000000035]  | Programmable interrupt controller |
| [0000000000000034 - 0000000000000035]  | Programmable interrupt controller |
| [0000000000000034 - 0000000000000035]  | Programmable interrupt controller |
| [0000000000000038 - 0000000000000039]  | Programmable interrupt controller |
| [0000000000000038 - 0000000000000039]  | Programmable interrupt controller |
| [0000000000000038 - 0000000000000039]  | Programmable interrupt controller |
| [000000000000003C - 000000000000003D]  | Programmable interrupt controller |
| [000000000000003C - 000000000000003D]  | Programmable interrupt controller |
| [000000000000003C - 000000000000003D]  | Programmable interrupt controller |
| [0000000000000040 - 0000000000000043]  | System timer                      |
| [0000000000000040 - 0000000000000043]  | System timer                      |
| [0000000000000040 - 0000000000000043]  | System timer                      |
| [000000000000004E - 000000000000004F]  | Motherboard resources             |
| [0000000000000050 - 0000000000000053]  | System timer                      |
| [0000000000000050 - 0000000000000053]  | System timer                      |
| [0000000000000050 - 0000000000000053]  | System timer                      |
| [0000000000000061 - 0000000000000061]  | Motherboard resources             |
| [0000000000000063 - 0000000000000063]  | Motherboard resources             |
| [0000000000000065 - 0000000000000065]  | Motherboard resources             |
| [0000000000000067 - 0000000000000067]  | Motherboard resources             |
| [0000000000000070 - 0000000000000070]  | Motherboard resources             |
| [0000000000000078 - 0000000000000077]  | System CMOS/real time clock       |
| [0000000000000078 - 00000000000000CF7] | PCI Express Root Complex          |
| [0000000000000080 - 000000000000008F]  | Motherboard resources             |
| [0000000000000092 - 0000000000000092]  | Motherboard resources             |
| [00000000000000A0 - 00000000000000A1]  | Programmable interrupt controller |
| [00000000000000A0 - 00000000000000A1]  | Programmable interrupt controller |
| [00000000000000A0 - 00000000000000A1]  | Programmable interrupt controller |
| [00000000000000A4 - 00000000000000A5]  | Programmable interrupt controller |
| [00000000000000A4 - 00000000000000A5]  | Programmable interrupt controller |
| [00000000000000A4 - 00000000000000A5]  | Programmable interrupt controller |
| [00000000000000A8 - 00000000000000A9]  | Programmable interrupt controller |
| [00000000000000A8 - 00000000000000A9]  | Programmable interrupt controller |

|                                                                                     |                                       |                                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------------------------------------------|
|    | [00000000000000A8 - 00000000000000A9] | Programmable interrupt controller                                     |
|    | [00000000000000AC - 00000000000000AD] | Programmable interrupt controller                                     |
|    | [00000000000000AC - 00000000000000AD] | Programmable interrupt controller                                     |
|    | [00000000000000AC - 00000000000000AD] | Programmable interrupt controller                                     |
|    | [00000000000000B0 - 00000000000000B1] | Programmable interrupt controller                                     |
|    | [00000000000000B0 - 00000000000000B1] | Programmable interrupt controller                                     |
|    | [00000000000000B0 - 00000000000000B1] | Programmable interrupt controller                                     |
|    | [00000000000000B2 - 00000000000000B3] | Motherboard resources                                                 |
|    | [00000000000000B4 - 00000000000000B5] | Programmable interrupt controller                                     |
|    | [00000000000000B4 - 00000000000000B5] | Programmable interrupt controller                                     |
|    | [00000000000000B4 - 00000000000000B5] | Programmable interrupt controller                                     |
|    | [00000000000000B8 - 00000000000000B9] | Programmable interrupt controller                                     |
|    | [00000000000000B8 - 00000000000000B9] | Programmable interrupt controller                                     |
|    | [00000000000000B8 - 00000000000000B9] | Programmable interrupt controller                                     |
|    | [00000000000000BC - 00000000000000BD] | Programmable interrupt controller                                     |
|    | [00000000000000BC - 00000000000000BD] | Programmable interrupt controller                                     |
|    | [00000000000000BC - 00000000000000BD] | Programmable interrupt controller                                     |
|    | [00000000000002C0 - 00000000000002C7] | Communications Port (COM6)                                            |
|    | [00000000000002D0 - 00000000000002D7] | Communications Port (COM5)                                            |
|    | [00000000000002E8 - 00000000000002EF] | Communications Port (COM4)                                            |
|    | [00000000000002F8 - 00000000000002FF] | Communications Port (COM2)                                            |
|    | [00000000000003E8 - 00000000000003EF] | Communications Port (COM3)                                            |
|    | [00000000000003F8 - 00000000000003FF] | Communications Port (COM1)                                            |
|    | [0000000000000400 - 000000000000047F] | Motherboard resources                                                 |
|    | [00000000000004D0 - 00000000000004D1] | Programmable interrupt controller                                     |
|    | [00000000000004D0 - 00000000000004D1] | Programmable interrupt controller                                     |
|    | [00000000000004D0 - 00000000000004D1] | Programmable interrupt controller                                     |
|    | [0000000000000500 - 00000000000005FE] | Motherboard resources                                                 |
|    | [0000000000000680 - 000000000000069F] | Motherboard resources                                                 |
|    | [0000000000000A00 - 0000000000000A0F] | Motherboard resources                                                 |
|    | [0000000000000A00 - 0000000000000A0F] | Motherboard resources                                                 |
|    | [0000000000000A10 - 0000000000000A1F] | Motherboard resources                                                 |
|  | [0000000000000A10 - 0000000000000A1F] | Motherboard resources                                                 |
|  | [0000000000000A20 - 0000000000000A2F] | Motherboard resources                                                 |
|  | [0000000000000A20 - 0000000000000A2F] | Motherboard resources                                                 |
|  | [0000000000000D00 - 0000000000000FFF] | PCI Express Root Complex                                              |
|  | [000000000000B000 - 000000000000BFFF] | PCI-to-PCI Bridge                                                     |
|  | [000000000000C000 - 000000000000CFFF] | PCI-to-PCI Bridge                                                     |
|  | [000000000000D000 - 000000000000DFFF] | Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9 |
|  | [000000000000D000 - 000000000000DFFF] | Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9 |
|  | [000000000000D000 - 000000000000DFFF] | PCI-to-PCI Bridge                                                     |
|  | [000000000000E000 - 000000000000E01F] | SM Bus Controller                                                     |
|  | [000000000000E000 - 000000000000EFFF] | Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8 |
|  | [000000000000E000 - 000000000000EFFF] | Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8 |
|  | [000000000000E020 - 000000000000E03F] | Standard SATA AHCI Controller                                         |
|  | [000000000000E040 - 000000000000E043] | Standard SATA AHCI Controller                                         |
|  | [000000000000E050 - 000000000000E057] | Standard SATA AHCI Controller                                         |
|  | [000000000000E060 - 000000000000E063] | Standard SATA AHCI Controller                                         |

|                                                                                   |                                       |                                                       |
|-----------------------------------------------------------------------------------|---------------------------------------|-------------------------------------------------------|
|  | [000000000000E070 - 000000000000E077] | Standard SATA AHCI Controller                         |
|  | [000000000000E080 - 000000000000E087] | Microsoft Basic Display Adapter                       |
|  | [000000000000F000 - 000000000000F03F] | Intel(R) HD Graphics                                  |
|  | [000000000000F000 - 000000000000F03F] | Intel(R) HD Graphics                                  |
|  | [000000000000F040 - 000000000000F05F] | Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4 |
|  | [000000000000F040 - 000000000000F05F] | Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4 |
|  | [000000000000F060 - 000000000000F07F] | Standard SATA AHCI Controller                         |
|  | [000000000000F060 - 000000000000F07F] | Standard SATA AHCI Controller                         |
|  | [000000000000F080 - 000000000000F083] | Standard SATA AHCI Controller                         |
|  | [000000000000F080 - 000000000000F083] | Standard SATA AHCI Controller                         |
|  | [000000000000F090 - 000000000000F097] | Standard SATA AHCI Controller                         |
|  | [000000000000F090 - 000000000000F097] | Standard SATA AHCI Controller                         |

## B.2 Memory Address Map

|                                          |                                                                       |
|------------------------------------------|-----------------------------------------------------------------------|
| Memory                                   |                                                                       |
| [000000007B000001 - 000000007BFFFFFF]    | PCI Express Root Complex                                              |
| [000000007C000001 - 000000007CFFFFFF]    | PCI Express Root Complex                                              |
| [0000000080000000 - 0000000080FFFFFF]    | Intel(R) HD Graphics                                                  |
| [0000000080000000 - 0000000080FFFFFF]    | Intel(R) HD Graphics                                                  |
| [0000000080000000 - 00000000CFFFFFFF]    | PCI Express Root Complex                                              |
| [0000000081000000 - 00000000810FFFFFFF]  | High Definition Audio Controller                                      |
| [0000000081100000 - 00000000811FFFFFFF]  | Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9 |
| [00000000811DC000 - 00000000811DFFFFF]   | Intel(R) I211 Gigabit Network Connection                              |
| [00000000811E0000 - 00000000811EFFFFF]   | Intel(R) I211 Gigabit Network Connection                              |
| [0000000081200000 - 00000000812FFFFFFF]  | Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8 |
| [00000000812DC000 - 00000000812DFFFFF]   | Intel(R) I211 Gigabit Network Connection #2                           |
| [00000000812E0000 - 00000000812EFFFFF]   | Intel(R) I211 Gigabit Network Connection #2                           |
| [0000000081300000 - 000000008130FFFFFF]  | Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)         |
| [0000000081310000 - 0000000081313FFFFF]  | High Definition Audio Controller                                      |
| [0000000081314000 - 0000000081315FFFFF]  | Standard SATA AHCI Controller                                         |
| [0000000081318000 - 0000000081318OFFF]   | Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4                 |
| [0000000081319000 - 00000000813197FFF]   | Standard SATA AHCI Controller                                         |
| [000000008131A000 - 000000008131A0FFF]   | Standard SATA AHCI Controller                                         |
| [000000008131E000 - 000000008131EFFFF]   | Intel(R) Trusted Execution Engine Interface                           |
| [0000000090000000 - 0000000090FFFFFFF]   | Intel(R) HD Graphics                                                  |
| [0000000090000000 - 0000000090FFFFFFF]   | Intel(R) HD Graphics                                                  |
| [0000000091000000 - 000000009100FFFFFFF] | High Definition Audio Controller                                      |
| [0000000091100000 - 000000009110FFFFFFF] | Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9 |
| [0000000091200000 - 000000009120FFFFFFF] | Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8 |
| [0000000091300000 - 000000009130FFFFFFF] | Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)         |
| [0000000091310000 - 0000000091313FFFFF]  | High Definition Audio Controller                                      |
| [0000000091314000 - 0000000091315FFFFF]  | Standard SATA AHCI Controller                                         |
| [0000000091318000 - 0000000091318OFFF]   | Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4                 |
| [0000000091319000 - 00000000913197FFF]   | Standard SATA AHCI Controller                                         |
| [000000009131A000 - 000000009131A0FFF]   | Standard SATA AHCI Controller                                         |
| [000000009131E000 - 000000009131EFFFF]   | Intel(R) Trusted Execution Engine Interface                           |
| [00000000C0000000 - 00000000C0FFFFFFF]   | Microsoft Basic Display Adapter                                       |
| [00000000D0000000 - 00000000D03FFFFFFF]  | Microsoft Basic Display Adapter                                       |
| [00000000D0400000 - 00000000D04FFFFFFF]  | PCI-to-PCI Bridge                                                     |
| [00000000D0500000 - 00000000D05FFFFFFF]  | PCI-to-PCI Bridge                                                     |
| [00000000D0600000 - 00000000D06FFFFFFF]  | PCI-to-PCI Bridge                                                     |
| [00000000D0700000 - 00000000D0703FFFFF]  | High Definition Audio Controller                                      |
| [00000000D0704000 - 00000000D070401FFF]  | SM Bus Controller                                                     |
| [00000000D0705000 - 00000000D07053FFFFF] | Standard Enhanced PCI to USB Host Controller                          |
| [00000000D0706000 - 00000000D07067FFFFF] | Standard SATA AHCI Controller                                         |
| [00000000D0C00000 - 00000000D0C00653FFF] | Intel(R) Serial IO GPIO Host Controller - INT3452                     |
| [00000000D0C40000 - 00000000D0C40763FFF] | Intel(R) Serial IO GPIO Host Controller - INT3452                     |
| [00000000D0C50000 - 00000000D0C5076BFFF] | Intel(R) Serial IO GPIO Host Controller - INT3452                     |
| [00000000D0C70000 - 00000000D0C70763FFF] | Intel(R) Serial IO GPIO Host Controller - INT3452                     |
| [00000000E0000000 - 00000000E0FFFFFFF]   | Motherboard resources                                                 |
| [00000000E0000000 - 00000000E0FFFFFFF]   | PCI Express Root Complex                                              |
| [00000000E00000D0 - 00000000E00000DBFFF] | Unknown device                                                        |
| [00000000FEA00000 - 00000000FEAFFFFFFF]  | Motherboard resources                                                 |
| [00000000FED00000 - 00000000FED003FFFFF] | High precision event timer                                            |
| [00000000FED01000 - 00000000FED01FFFFF]  | Motherboard resources                                                 |
| [00000000FED03000 - 00000000FED03FFFFF]  | Motherboard resources                                                 |

|                                                                                   |                                         |                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------|---------------------------------------------------|
|  | [00000000D0400000 - 00000000D04FFFFF]   | PCI-to-PCI Bridge                                 |
|  | [00000000D0500000 - 00000000D05FFFFF]   | PCI-to-PCI Bridge                                 |
|  | [00000000D0600000 - 00000000D06FFFFF]   | PCI-to-PCI Bridge                                 |
|  | [00000000D0700000 - 00000000D0703FFF]   | High Definition Audio Controller                  |
|  | [00000000D0704000 - 00000000D070401F]   | SM Bus Controller                                 |
|  | [00000000D0705000 - 00000000D07053FF]   | Standard Enhanced PCI to USB Host Controller      |
|  | [00000000D0706000 - 00000000D07067FF]   | Standard SATA AHCI Controller                     |
|  | [00000000D0C00000 - 00000000D0C00653]   | Intel(R) Serial IO GPIO Host Controller - INT3452 |
|  | [00000000D0C40000 - 00000000D0C40763]   | Intel(R) Serial IO GPIO Host Controller - INT3452 |
|  | [00000000D0C50000 - 00000000D0C5076B]   | Intel(R) Serial IO GPIO Host Controller - INT3452 |
|  | [00000000D0C70000 - 00000000D0C70673]   | Intel(R) Serial IO GPIO Host Controller - INT3452 |
|  | [00000000E0000000 - 00000000EFFFFFFF]   | Motherboard resources                             |
|  | [00000000E0000000 - 00000000EFFFFFFF]   | PCI Express Root Complex                          |
|  | [00000000E00000D0 - 00000000E00000DB]   | Unknown device                                    |
|  | [00000000FEA00000 - 00000000FEAFFFFF]   | Motherboard resources                             |
|  | [00000000FED00000 - 00000000FED003FF]   | High precision event timer                        |
|  | [00000000FED01000 - 00000000FED01FFF]   | Motherboard resources                             |
|  | [00000000FED03000 - 00000000FED03FFF]   | Motherboard resources                             |
|  | [00000000FED06000 - 00000000FED06FFF]   | Motherboard resources                             |
|  | [00000000FED08000 - 00000000FED09FFF]   | Motherboard resources                             |
|  | [00000000FED1C000 - 00000000FED1CFFF]   | Motherboard resources                             |
|  | [00000000FED80000 - 00000000FEDBFFFF]   | Motherboard resources                             |
|  | [00000000FEE00000 - 00000000FEEFFFFFFF] | Motherboard resources                             |
|  | [00000000FF000000 - 00000000FFFFFFFF]   | Legacy device                                     |

## B.3 IRQ Mapping Chart

|                         |                                                               |
|-------------------------|---------------------------------------------------------------|
| Interrupt request (IRQ) |                                                               |
| (ISA) 0x00000000 (00)   | System timer                                                  |
| (ISA) 0x00000000 (00)   | System timer                                                  |
| (ISA) 0x00000000 (00)   | System timer                                                  |
| (ISA) 0x00000003 (03)   | Communications Port (COM2)                                    |
| (ISA) 0x00000004 (04)   | Communications Port (COM1)                                    |
| (ISA) 0x00000005 (05)   | PCI-to-PCI Bridge                                             |
| (ISA) 0x00000005 (05)   | PCI-to-PCI Bridge                                             |
| (ISA) 0x00000005 (05)   | PCI-to-PCI Bridge                                             |
| (ISA) 0x00000005 (05)   | Standard Enhanced PCI to USB Host Controller                  |
| (ISA) 0x00000005 (05)   | Standard SATA AHCI Controller                                 |
| (ISA) 0x00000008 (08)   | High precision event timer                                    |
| (ISA) 0x0000000A (10)   | High Definition Audio Controller                              |
| (ISA) 0x0000000A (10)   | Microsoft Basic Display Adapter                               |
| (ISA) 0x0000000A (10)   | PCI-to-PCI Bridge                                             |
| (ISA) 0x0000000A (10)   | PCI-to-PCI Bridge                                             |
| (ISA) 0x0000000A (10)   | PCI-to-PCI Bridge                                             |
| (ISA) 0x0000000A (10)   | PCI-to-PCI Bridge                                             |
| (ISA) 0x0000000A (10)   | PCI-to-PCI Bridge                                             |
| (ISA) 0x0000000A (10)   | SM Bus Controller                                             |
| (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) 0x0000000E (14)   | Intel(R) Serial IO GPIO Host Controller - INT3452             |
| (ISA) 0x0000000E (14)   | Intel(R) Serial IO GPIO Host Controller - INT3452             |
| (ISA) 0x0000000E (14)   | Intel(R) Serial IO GPIO Host Controller - INT3452             |
| (ISA) 0x0000000E (14)   | Intel(R) Serial IO GPIO Host Controller - INT3452             |
| (ISA) 0x00000011 (17)   | Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft) |
| (ISA) 0x00000019 (25)   | High Definition Audio Controller                              |
| (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) 0x00000B3 (179)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000B4 (180)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000B5 (181)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000B6 (182)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000B7 (183)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000B8 (184)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000B9 (185)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000BA (186)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000BB (187)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000BC (188)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000BD (189)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000BE (190)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000BF (191)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000C0 (192)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000C1 (193)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000C2 (194)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000C3 (195)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000C4 (196)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000C5 (197)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000C6 (198)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000C7 (199)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000C8 (200)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000C9 (201)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000CA (202)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000CB (203)  | Microsoft ACPI-Compliant System |
|    | (ISA) 0x00000CC (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 |

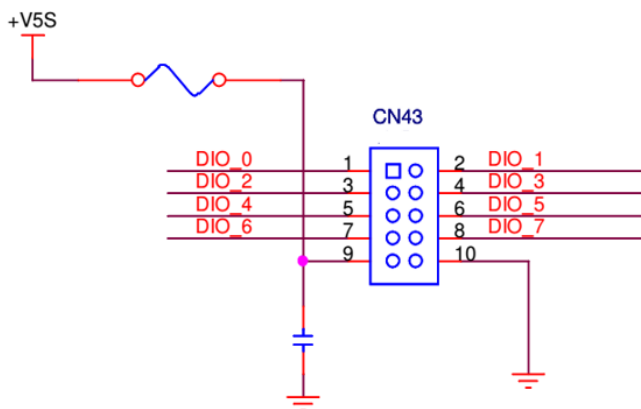
|                                                                                     |                        |                                                                       |
|-------------------------------------------------------------------------------------|------------------------|-----------------------------------------------------------------------|
|    | (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) 0x00000019 (25)  | High Definition Audio Controller                                      |
|    | (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 #2                           |
|    | (PCI) 0xFFFFFFF2 (-14) | Intel(R) I211 Gigabit Network Connection #2                           |
|    | (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) I211 Gigabit Network Connection                              |
|    | (PCI) 0xFFFFFFF8 (-8)  | Intel(R) I211 Gigabit Network Connection                              |
|    | (PCI) 0xFFFFFFF9 (-7)  | Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)         |
|    | (PCI) 0xFFFFFFFA (-6)  | Intel(R) Trusted Execution Engine Interface                           |
|   | (PCI) 0xFFFFFFFB (-5)  | Intel(R) HD Graphics                                                  |
|  | (PCI) 0xFFFFFFFC (-4)  | Standard SATA AHCI Controller                                         |
|  | (PCI) 0xFFFFFFFD (-3)  | Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9 |
|  | (PCI) 0xFFFFF000 (-2)  | Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8 |

# Appendix C

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Digital I/O Ports

## C.1 Electrical Specifications for Digital I/O Ports



|        |       |
|--------|-------|
| GPIO80 | DIO_0 |
| GPIO81 | DIO_1 |
| GPIO82 | DIO_2 |
| GPIO83 | DIO_3 |
| GPIO84 | DIO_4 |
| GPIO85 | DIO_5 |
| GPIO86 | DIO_6 |
| GPIO87 | DIO_7 |

## C.2 DIO Programming

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The BOXER-6616 utilizes FINTEK F81966 chipset as its Digital I/O controller. Below are the procedures to complete its configuration. AAEON initial DI/O program is also attached for developing customized program for your application.

There are three steps to complete the configuration setup:

- (1) Enter the MB PnP Mode
- (2) Modify the data of configuration registers
- (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

### C.3 Digital I/O 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  |

**Table 2 : Digital Input relative register table**

|                  | LDN          | Register     | BitNum    | Value | Note   |
|------------------|--------------|--------------|-----------|-------|--------|
| DIO-1 Pin Status | 0x06(Note3)  | 0x8A(Note4)  | 0(Note5)  |       | GPIO80 |
| DIO-2 Pin Status | 0x06(Note6)  | 0x8A (Note7) | 1(Note8)  |       | GPIO81 |
| DIO-3 Pin Status | 0x06(Note9)  | 0x8A(Note10) | 2(Note11) |       | GPIO82 |
| DIO-4 Pin Status | 0x06(Note12) | 0x8A(Note13) | 3(Note14) |       | GPIO83 |
| DIO-5 Pin Status | 0x06(Note15) | 0x8A(Note16) | 4(Note17) |       | GPIO84 |
| DIO-6 Pin Status | 0x06(Note18) | 0x8A(Note19) | 5(Note20) |       | GPIO85 |
| DIO-7 Pin Status | 0x06(Note21) | 0x8A(Note22) | 6(Note23) |       | GPIO86 |
| DIO-8 Pin Status | 0x06(Note24) | 0x8A(Note25) | 7(Note26) |       | GPIO87 |

**Table 3 : Digital Output relative register table**

|                   | LDN          | Register     | BitNum    | Value    | Note   |
|-------------------|--------------|--------------|-----------|----------|--------|
| DIO-1 Output Data | 0x06(Note27) | 0x89(Note28) | 0(Note29) | (Note30) | GPIO80 |
| DIO-2 Output Data | 0x06(Note31) | 0x89(Note32) | 1(Note33) | (Note34) | GPIO81 |
| DIO-3 Output Data | 0x06(Note35) | 0x89(Note36) | 2(Note37) | (Note38) | GPIO82 |
| DIO-4 Output Data | 0x06(Note39) | 0x89(Note40) | 3(Note41) | (Note42) | GPIO83 |
| DIO-5 Output Data | 0x06(Note43) | 0x89(Note44) | 4(Note45) | (Note46) | GPIO84 |
| DIO-6 Output Data | 0x06(Note47) | 0x89(Note48) | 5(Note49) | (Note50) | GPIO85 |
| DIO-7 Output Data | 0x06(Note51) | 0x89(Note52) | 6(Note53) | (Note54) | GPIO86 |
| DIO-8 Output Data | 0x06(Note55) | 0x89(Note56) | 7(Note57) | (Note58) | GPIO87 |

## C.4 Digital I/O Sample Program

```
*****
// SuperIO relative definition (Please reference to Table 1)
#define byte   SIOIndex   //This parameter is represented from Note1
#define byte   SIOData    //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   DInput1LDN // This parameter is represented from Note3
#define byte   DInput1Reg // This parameter is represented from Note4
#define byte   DInput1Bit // This parameter is represented from Note5
#define byte   DInput2LDN // This parameter is represented from Note6
#define byte   DInput2Reg // This parameter is represented from Note7
#define byte   DInput2Bit // This parameter is represented from Note8
#define byte   DInput3LDN // This parameter is represented from Note9
#define byte   DInput3Reg // This parameter is represented from Note10
#define byte   DInput3Bit // This parameter is represented from Note11
#define byte   DInput4LDN // This parameter is represented from Note12
#define byte   DInput4Reg // This parameter is represented from Note13
#define byte   DInput4Bit // This parameter is represented from Note14
#define byte   DInput5LDN // This parameter is represented from Note15
#define byte   DInput5Reg // This parameter is represented from Note16
#define byte   DInput5Bit // This parameter is represented from Note17
#define byte   DInput6LDN // This parameter is represented from Note18
#define byte   DInput6Reg // This parameter is represented from Note19
#define byte   DInput6Bit // This parameter is represented from Note20
#define byte   DInput7LDN // This parameter is represented from Note21
#define byte   DInput7Reg // This parameter is represented from Note22
#define byte   DInput7Bit // This parameter is represented from Note23
#define byte   DInput8LDN // This parameter is represented from Note24
#define byte   DInput8Reg // This parameter is represented from Note25
#define byte   DInput8Bit // This parameter is represented from Note26
*****
```

```
*****
// Digital Output control relative definition (Please reference to Table 3)
#define byte DOutput1LDN // This parameter is represented from Note27
#define byte DOutput1Reg // This parameter is represented from Note28
#define byte DOutput1Bit // This parameter is represented from Note29
#define byte DOutput1Val // This parameter is represented from Note30
#define byte DOutput2LDN // This parameter is represented from Note31
#define byte DOutput2Reg // This parameter is represented from Note32
#define byte DOutput2Bit // This parameter is represented from Note33
#define byte DOutput2Val // This parameter is represented from Note34
#define byte DOutput3LDN // This parameter is represented from Note35
#define byte DOutput3Reg // This parameter is represented from Note36
#define byte DOutput3Bit // This parameter is represented from Note37
#define byte DOutput3Val // This parameter is represented from Note38
#define byte DOutput4LDN // This parameter is represented from Note39
#define byte DOutput4Reg // This parameter is represented from Note40
#define byte DOutput4Bit // This parameter is represented from Note41
#define byte DOutput4Val // This parameter is represented from Note42
#define byte DOutput5LDN // This parameter is represented from Note43
#define byte DOutput5Reg // This parameter is represented from Note44
#define byte DOutput5Bit // This parameter is represented from Note45
#define byte DOutput5Val // This parameter is represented from Note46
#define byte DOutput6LDN // This parameter is represented from Note47
#define byte DOutput6Reg // This parameter is represented from Note48
#define byte DOutput6Bit // This parameter is represented from Note49
#define byte DOutput6Val // This parameter is represented from Note50
#define byte DOutput7LDN // This parameter is represented from Note51
#define byte DOutput7Reg // This parameter is represented from Note52
#define byte DOutput7Bit // This parameter is represented from Note53
#define byte DOutput7Val // This parameter is represented from Note54
#define byte DOutput8LDN // This parameter is represented from Note55
#define byte DOutput8Reg // This parameter is represented from Note56
#define byte DOutput8Bit // This parameter is represented from Note57
#define byte DOutput8Val // This parameter is represented from Note58
*****
```

```

*****
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(DInput3LDN, DInput3Reg, DInput3Bit);

    // Procedure : AaeonSetOutputLevel
    // Input :
    //     Example, Set Digital I/O Pin 6 level
    AaeonSetOutputLevel(DOutput6LDN, DOutput6Reg, DOutput6Bit,
DOutput6Val);
}
*****

```

```
*****
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();
```

```
}
```

```
*****
```