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Authorized Distributor, Integrator, and Value-Added Reseller

# EPIC-BT07

EPIC Board

User's Manual 3rd Ed

*Last Updated: October 27, 2015*

## Copyright Notice

## Acknowledgement

## Packing List

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

| Item | Quantity |
|---|---|
| ● EPIC-BT07 | 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

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.

## Safety Precautions

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

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

17. If any of the following situations arises, please the contact our service personnel:
    i. Damaged power cord or plug
    ii. Liquid intrusion to the device
    iii. Exposure to moisture
    iv. Device is not working as expected or in a manner as described in this manual
    v. The device is dropped or damaged
    vi. Any obvious signs of damage displayed on the device
18. DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4°F) OR ABOVE 60°C (140°F) TO PREVENT DAMAGE.

## FCC Statement


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

*Caution:*

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

*Attention:*

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

## China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

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

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

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

备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。

## China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products

AAEON Main Board/ Daughter Board/ Backplane

| Component | Poisonous or Hazardous Substances or Elements | | | | | |
|---|---|---|---|---|---|---|
| | Lead (Pb) | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (Cr(VI)) | Polybrominated Biphenyls (PBB) | Polybrominated Diphenyl Ethers (PBDE) |
| PCB & Other Components | X | O | O | O | O | O |
| Wires & Connectors for External Connections | X | O | O | O | O | O |

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.

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.

Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only

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# Chapter 1

Product Specifications

## 1.1 Specifications

### System

| | |
|---|---|
| Form Factor | EPIC Board |
| Processor | Onboard Intel® Atom™ E3845/ Celeron® J1900/ N2807 Processor SoC |
| System Memory | 204-pin DDR3L 1333 MHz SODIMM, up to 8 GB |
| Chipset | Intel® Atom/Celeron® Processor SoC |
| Ethernet | Gigabit Ethernet, RJ-45 x2 |
| BIOS | AMI/SPI |
| Wake On LAN | Yes |
| Watchdog Timer | 1~255 steps by Software |
| H/W Status Monitoring | CPU temperature, Voltage Status |
| Expansion Interface | MiniCard x 1 (SIM x 1)<br>PCI-104 x 1 (Optional)<br>LPT co-lay 16-bit DI/O<br>SMBus, I2C (Optional), TPM (Optional), Touch Controller (Optional) |
| Battery | Lithium RTC battery |
| Power Requirement | DC 12 V or 9 ~ 24 V AT/ATX (Default) |
| Power Consumption (Typical) | - |
| Board Size | 165 x 115 mm (6.5 x 4.5") |

| | |
|---|---|
| Gross Weight | 0.5 kg (1.2 lbs) |
| Operating Temperature | 0°C ~ 60°C (32°F ~ 140°F) |
| Storage Temperature | -40°C ~ 80°C (-40°F ~ 176°F) |
| Operation Humidity | 0 ~ 90% Relative Humidity, Non-Condensing |

## Display

| | |
|---|---|
| Chipset | Intel® Atom/Celeron® Processor SoC |
| Resolution | VGA up to 2048 x 1152 @ 60Hz<br>DisplayPort up to 1920 x 1200 @ 60Hz<br>HDMI up to 1920 x 1080 @ 60Hz<br>LVDS (18/24-bit Dual-Channel) up to 1920 x 1200 @ 60 Hz<br>eDP up to 2560 x 1600 @ 60 Hz |
| LCD Interface | VGA, HDMI, LVDS |

## I/O

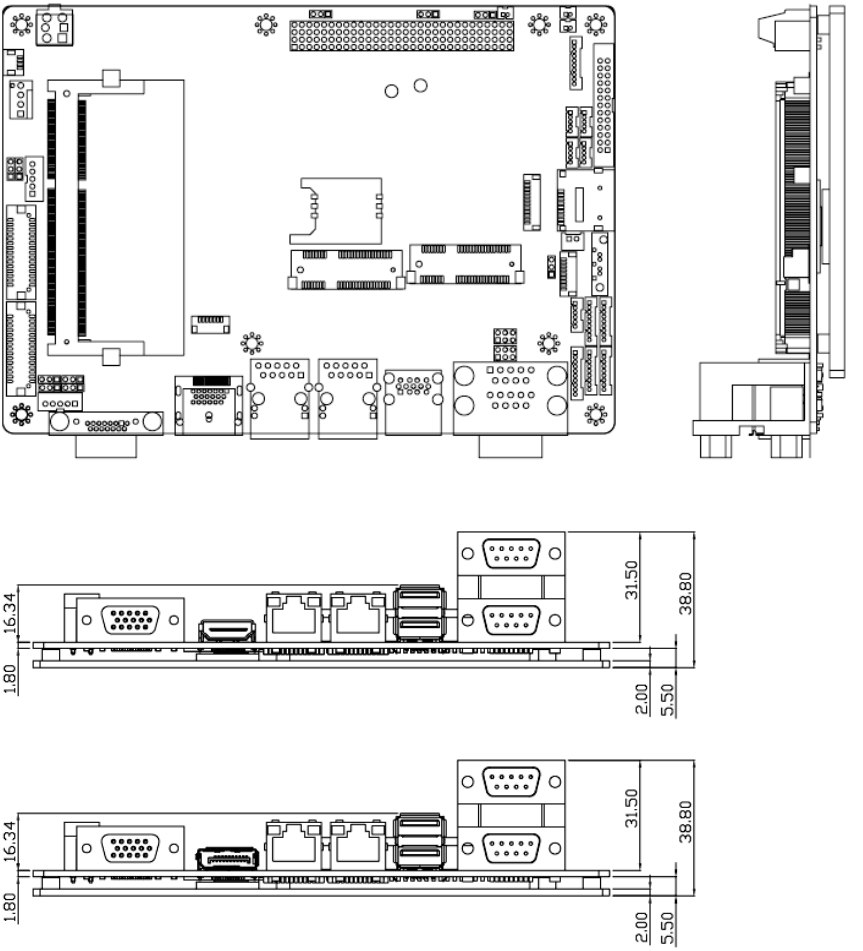
| | |
|---|---|
| Storage | SATA 3.0 Gb/s x 1, mSATA/ MiniCard x 1, SD x 1 (Optional for i-SKUs only) |
| USB | USB 3.0 x 1<br>USB 2.0 x 5 |
| Serial Port | RS-232 x 4<br>RS-232/422/485 x 2 (Ring/ +5V/ +12V) |
| DI/O | 16-bit digital I/O interface co-lay with LPT Port |
| Audio | Line-in, Line-out, Mic-in, 2W Audio Amp (optional) |

# Chapter 2

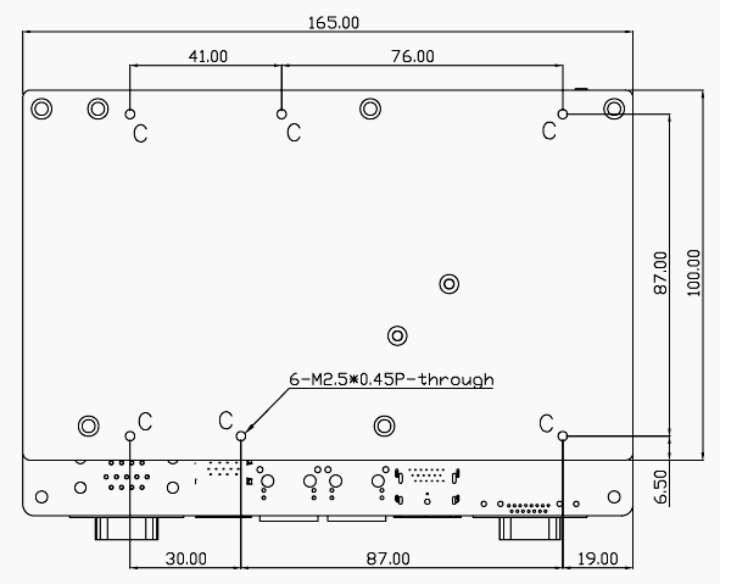
Hardware Information

## 2.1 Dimensions

### Component Side

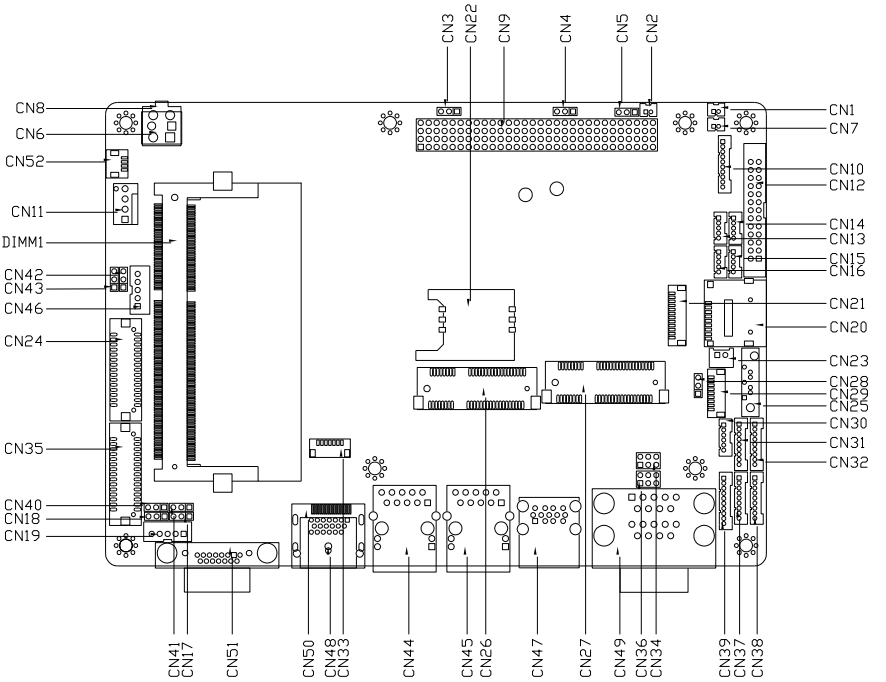


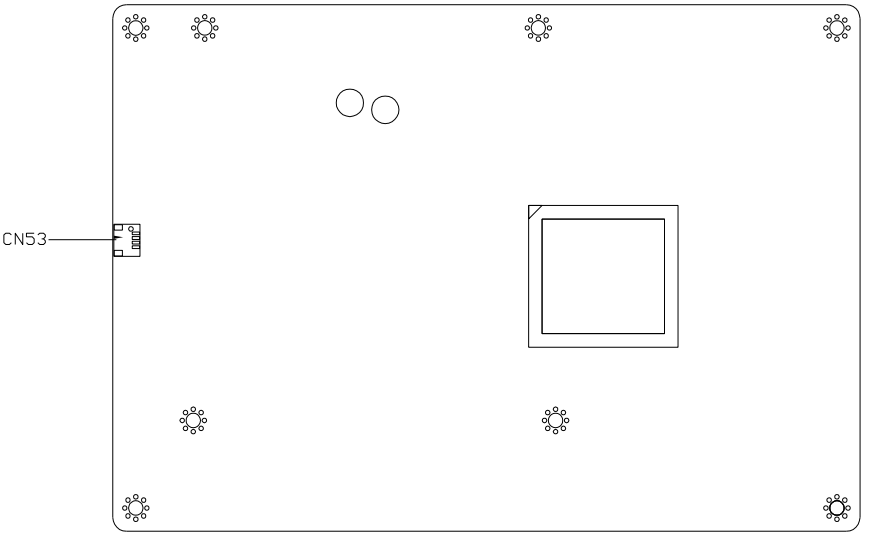
Solder Side


165.00
41.00
76.00
87.00
100.00
6-M2.5*0.45P-through
6.50
30.00
87.00
19.00

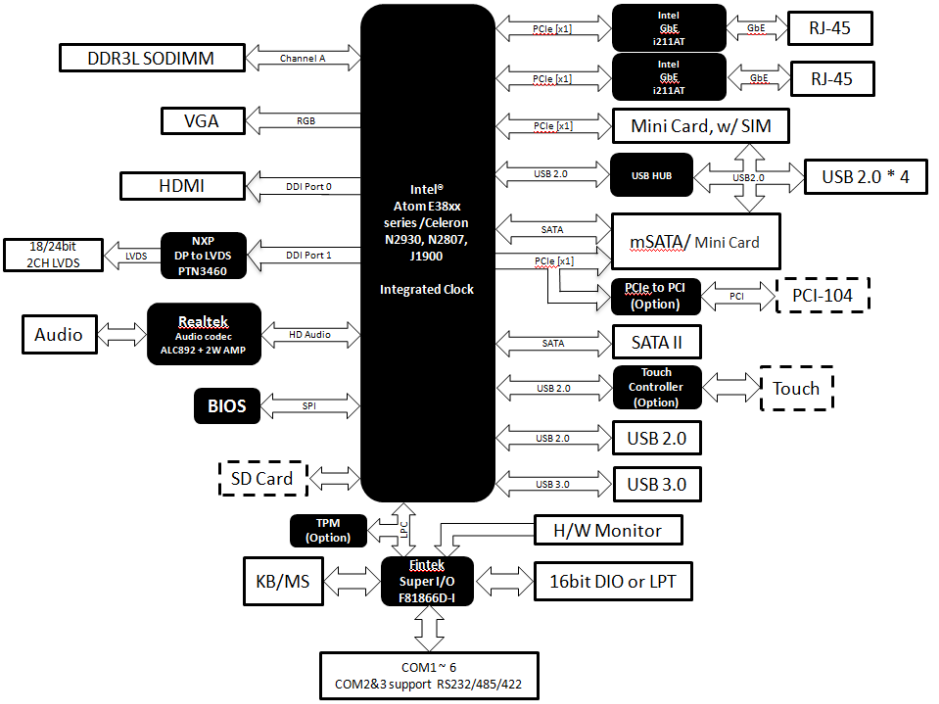
## 2.2 Jumpers and Connectors

### Component Side




CN53

## 2.3 Block Diagram

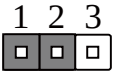


## 2.4 List of Jumpers

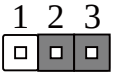
Please refer to the table below for all of the board's jumpers that you can configure for your application

| Label | Function |
|---|---|
| CN3 | Auto Power Button Selection |
| CN4 | PCI-104 VIO Voltage Selection |
| CN5 | CMOS RTC Setting |
| CN17 | LVDS/eDP Backlight Voltage Selection |
| CN18 | LVDS/eDP Backlight Control Selection |
| CN28 | Touchscreen 4/5/8-wire Mode Selection |
| CN34 | COM2 RI/+5/+12V Selection |
| CN36 | COM3 RI/+5/+12V Selection |
| CN41 | LVDS/eDP Operating Voltage Selection |

### 2.4.1 Auto Power Button Selection (CN3)



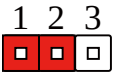

Disable



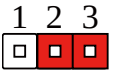

Enable (Default)

* When disabled, use CN39 (1-2) to power on the system.

### 2.4.2 PCI-104 VI/O Voltage Selection (CN4)

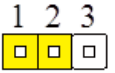



+5V

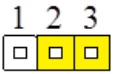



+3.3V (Default)

### 2.4.3 CMOS RTC Setting (CN5)

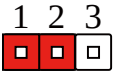



Normal (Default)

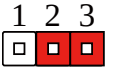



Clear CMOS

### 2.4.4 LVDS/eDP Backlight Voltage Selection (CN17)

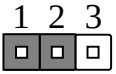



+12V

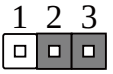



+5V (Default)

## 2.4.5 LVDS/eDP Backlight Control Selection (CN18)

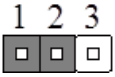



VR Mode (Default)

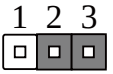



PWM Mode

## 2.4.6 Touchscreen 4/5/8-wire Mode Selection (CN28)

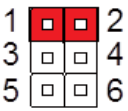



4/8 Wires Mode (Default)

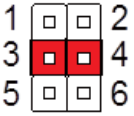



5 Wires Mode

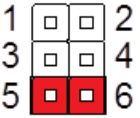
## 2.4.7 COM2 RI/+5/+12V Selection (CN34)




+12V

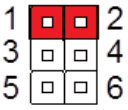



Ring (Default)

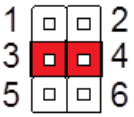



+5V

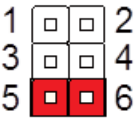
## 2.4.8 COM3 RI/+5/+12V Selection (CN36)




+12V

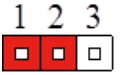



Ring (Default)

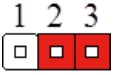



+5V

## 2.4.9 LVDS/eDP Operating Voltage Selection (CN41)




+5V




+3.3V (Default)

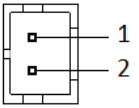
## 2.5 List of Connectors

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

| Label | Function |
|---|---|
| CN1 | Stereo Audio Right Channel |
| CN2 | RTC Battery Connector |
| CN6 | 4-Pin Power-In Connector |
| CN7 | Stereo Audio Left Channel |
| CN8 | 2-Pin Power-In Connector |
| CN9 | PCI-104 Connector |
| CN10 | Audio Connector |
| CN12 | LPT/Digital IO Connector |
| CN13 | USB 2.0 Port 2 |
| CN14 | USB 2.0 Port 3 |
| CN15 | USB 2.0 Port 5 |
| CN16 | USB 2.0 Port 4 |
| CN19 | LVDS/eDP Inverter / Backlight Connector |
| CN20 | Micro SD Card Connector |
| CN21 | LPC Expansion Connector |
| CN22 | UIM Card Socket |
| CN23 | +5V Output for SATA HDD |
| CN25 | SATA Port1 |
| CN26 | Mini-Card Slot |
| CN27 | Mini-Card / mSATA Slot |
| CN29 | Touch Screen Connector |
| CN30 | PS/2 Keyboard Mouse Connector |
| CN31 | COM Port 6 |

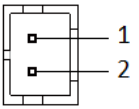
| | |
|---|---|
| CN32 | COM Port 5 |
| CN33 | SPI Programming Port |
| CN35 | LVDS Port /eDP |
| CN37 | COM Port 4 |
| CN38 | COM Port 3 |
| CN39 | Front Panel Connector |
| CN44 | 10M/100M/1G Ethernet Port 1 |
| CN45 | 10M/100M/1G Ethernet Port 2 |
| CN47 | USB Ports 0 & 1 |
| CN48 | DP Port |
| CN49 | COM Port 1 & 2 |
| CN50 | HDMI Port |
| CN51 | VGA Port |
| CN52 | SMBUS Connector |
| DIMM1 | DDR3L SODIMM |

### 2.5.1 Stereo Audio Right Channel (CN1)



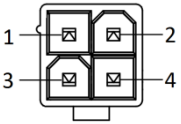

| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | R+ | OUT | |
| 2 | R- | OUT | |

### 2.5.2 RTC Battery Connector (CN2)



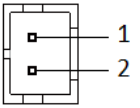

| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | +3.3 V | PWR | 3.3 V |
| 2 | GND | GND | |

### 2.5.3 4-Pin Power-In Connector (CN6)



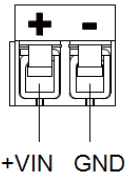

| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | GND | GND | |
| 2 | GND | GND | |
| 3 | +VIN | PWR | +12V |
| 4 | +VIN | PWR | +12V |

### 2.5.4 Stereo Audio Left Channel (CN7)




| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | L+ | OUT | |
| 2 | L- | OUT | |

### 2.5.5 2-Pin Power in Connector (CN8)



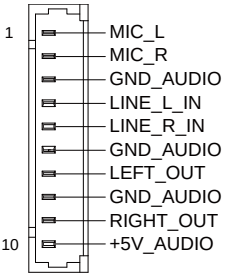

| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | +VIN | PWR | +9V to +24 V |
| 2 | GND | GND | |

### 2.5.6 PCI-104 Connector (CN9)

| | A | B | C | D |
|---|---|---|---|---|
| 1 | GND | +5V_SB | +5V | AD00 |
| 2 | VI/O | AD02 | AD01 | +5V |
| 3 | AD05 | GND | AD04 | AD03 |
| 4 | C/BE0# | AD07 | GND | AD06 |
| 5 | GND | AD09 | AD08 | GND |
| 6 | AD11 | VI/O | AD10 | M66EN |
| 7 | AD14 | AD13 | GND | AD12 |

| | | | | |
|---|---|---|---|---|
| 8 | +3.3V | C/BE1# | AD15 | +3.3V |
| 9 | SERR# | GND | PSON# | PAR |
| 10 | GND | PERR# | +3.3V | PME# |
| 11 | STOP# | +3.3V | LOCK# | GND |
| 12 | +3.3V | TRDY# | GND | DEVSEL# |
| 13 | FRAME# | GND | IRDY# | +3.3V |
| 14 | GND | AD16 | +3.3V | C/BE2# |
| 15 | AD18 | +3.3V | AD17 | GND |
| 16 | AD21 | AD20 | GND | AD19 |
| 17 | +3.3V | AD23 | AD22 | +3.3V |
| 18 | IDSEL0 | GND | IDSEL1 | IDSEL2 |
| 19 | AD24 | C/BE3# | VI/O | IDSEL3 |
| 20 | GND | AD26 | AD25 | GND |
| 21 | AD29 | +5V | AD28 | AD27 |
| 22 | +5V | AD30 | GND | AD31 |
| 23 | REQ0# | GND | REQ1# | VI/O |
| 24 | GND | REQ2# | +5V | GNT0# |
| 25 | GNT1# | VI/O | GNT2# | GND |
| 26 | +5V | CLK0 | GND | CLK1 |
| 27 | CLK2 | +5V | CLK3 | GND |
| 28 | GND | INTD# | +5V | RST# |
| 29 | +12V | INTA# | INTB# | INTC# |
| 30 | -12V | REQ3# | GNT3# | GND |

## 2.5.7 Audio Connector (CN10)




| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | MIC_L | IN | |
| 2 | MIC_R | IN | |
| 3 | GND_AUDIO | GND | |
| 4 | LINE_L_IN | IN | |
| 5 | LINE_R_IN | IN | |
| 6 | GND_AUDIO | GND | |
| 7 | LEFT_OUT | OUT | |
| 8 | GND_AUDIO | GND | |
| 9 | RIGHT_OUT | OUT | |
| 10 | +5V_AUDIO | PWR | +5V |

## 2.5.8 LPT/ Digital I/O Connector (CN12)

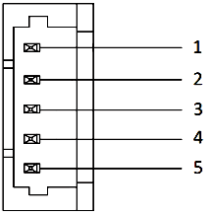
| LPT Mode | | | |
|---|---|---|---|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | STOBE# | I/O | |
| 2 | #AFD | I/O | |

| | | | |
|---|---|---|---|
| 3 | PPD0 | I/O | |
| 4 | ERR# | I/O | |
| 5 | PPD1 | I/O | |
| 6 | PINIT# | I/O | |
| 7 | PPD2 | I/O | |
| 8 | SLIN# | I/O | |
| 9 | PPD3 | I/O | |
| 10 | GND | GND | |
| 11 | PPD4 | I/O | |
| 12 | GND | GND | |
| 13 | PPD5 | I/O | |
| 14 | GND | GND | |
| 15 | PPD6 | I/O | |
| 16 | GND | GND | |
| 17 | PPD7 | I/O | |
| 18 | GND | GND | |
| 19 | ACK# | I/O | |
| 20 | GND | GND | |
| 21 | BUSY | I/O | |
| 22 | GND | GND | |
| 23 | PE | I/O | |
| 24 | GND | GND | |
| 25 | SLCT | I/O | |
| 26 | PWR | PWR | +5V |

| Digital I/O Mode | | | |
|---|---|---|---|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | GPIO15 | I/O | +5 V |
| 2 | GPIO14 | I/O | +5 V |
| 3 | GPIO0 | I/O | +5 V |
| 4 | GPIO13 | I/O | +5 V |
| 5 | GPIO1 | I/O | +5 V |
| 6 | GPIO12 | I/O | +5 V |
| 7 | GPIO2 | I/O | +5 V |
| 8 | GPIO11 | I/O | +5 V |
| 9 | GPIO3 | I/O | +5 V |
| 10 | GND | GND | |
| 11 | GPIO4 | I/O | +5 V |
| 12 | GND | GND | |
| 13 | GPIO5 | I/O | +5 V |
| 14 | GND | GND | |
| 15 | GPIO6 | I/O | +5 V |
| 16 | GND | GND | |
| 17 | GPIO7 | I/O | +5 V |
| 18 | GND | GND | |
| 19 | GPIO10 | I/O | +5 V |
| 20 | GND | GND | |
| 21 | GPIO9 | I/O | +5 V |
| 22 | GND | GND | |
| 23 | GPIO8 | I/O | +5 V |
| 24 | GND | GND | |
| 25 | N.C | | |

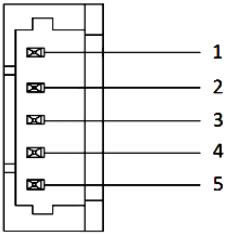
| | | | |
|---|---|---|---|
| 26 | PWR | PWR | +5V |

### 2.5.9 USB 2.0 Port 2 (CN13)




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

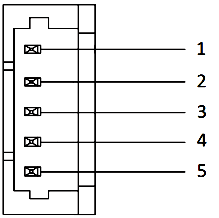
### 2.5.10 USB 2.0 Port 3 (CN14)




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

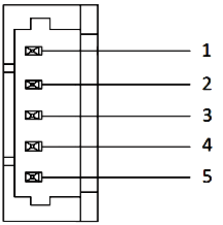
| | | |
|---|---|---|
| 2 | USB3_D- | DIFF |
| 3 | USB3_D+ | DIFF |
| 4 | GND | GND |
| 5 | GND | GND |

### 2.5.11 USB 2.0 Port 5 (CN15)



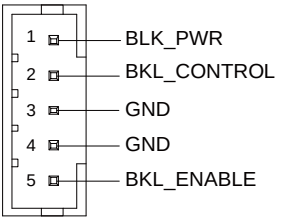

| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | +5VSB | PWR | +5V |
| 2 | USB5_D- | DIFF | |
| 3 | USB5_D+ | DIFF | |
| 4 | GND | GND | |
| 5 | GND | GND | |

### 2.5.12 USB 2.0 Port 4 (CN16)



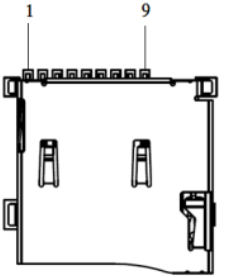
| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | +5VSB | PWR | +5V |
| 2 | USB4_D- | DIFF | |
| 3 | USB4_D+ | DIFF | |
| 4 | GND | GND | |
| 5 | GND | GND | |

### 2.5.13 LVDS/eDP Inverter / Backlight Connector (CN19)



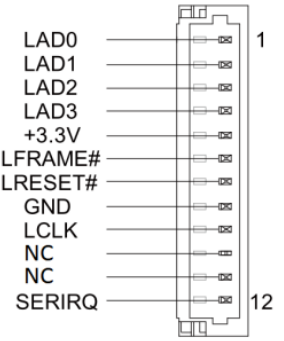

| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | BKL_PWR | PWR | +5V / +12V |
| 2 | BKL_CONTROL | OUT | |
| 3 | GND | GND | |
| 4 | GND | GND | |
| 5 | BKL_ENABLE | OUT | +3.3V |

### 2.5.14 MicroSD Card Connector (CN20)




| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | SDIO_D2 | I/O | |
| 2 | SDIO_D3 | I/O | |
| 3 | SDIO_CMD | I/O | |
| 4 | +3.3V | PWR | +3.3V |
| 5 | SDIO_CLK | I/O | |
| 6 | GND | GND | |
| 7 | SDIO_D0 | I/O | |
| 8 | SDIO_D1 | I/O | |
| 9 | SDIO_CD# | I/O | |

### 2.5.15 LPC Expansion Connector (CN21)

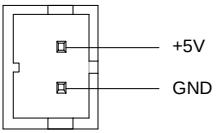



| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | LAD0 | I/O | +3.3V |
| 2 | LAD1 | I/O | +3.3V |
| 3 | LAD2 | I/O | +3.3V |
| 4 | LAD3 | I/O | +3.3V |
| 5 | +3.3V | PWR | +3.3V |
| 6 | LFRAME# | IN | |
| 7 | LRESET# | OUT | +3.3V |
| 8 | GND | GND | |
| 9 | LCLK | OUT | |
| 10 | NC | | |
| 11 | NC | | |
| 12 | SERIRQ | I/O | +3.3V |

### 2.5.16 UIM Socket (CN22)

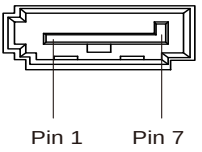
| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | UIM_PWR | PWR | |
| 2 | UIM_RST | IN | |
| 3 | UIM_CLK | IN | |
| 4 | GND | GND | |
| 5 | UIM_VPP | PWR | |
| 6 | UIM_DATA | I/O | |

### 2.5.17 +5V Output for SATA HDD (CN23)




| Pin | Pin Name | Signal type | Signal Level |
|---|---|---|---|
| 1 | +5V | PWR | +5 V |
| 2 | GND | GND | |

### 2.5.18 SATA Port1 (CN25)




| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | GND | GND | |

| | | | |
|---|---|---|---|
| 2 | SATA_TX+ | DIFF | |
| 3 | SATA_TX- | DIFF | |
| 4 | GND | GND | |
| 5 | SATA_RX- | DIFF | |
| 6 | SATA_RX+ | DIFF | |
| 7 | GND | GND | |

### 2.5.19 MiniCard Slot (CN26)

| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | PCIE_WAKE# | IN | |
| 2 | +3.3VSB | PWR | +3.3V |
| 3 | NC | | |
| 4 | GND | GND | |
| 5 | NC | | |
| 6 | +1.5V | PWR | +1.5V |
| 7 | PCIE_CLK_REQ# | IN | |
| 8 | UIM_PWR | | |
| 9 | GND | GND | |
| 10 | UIM_DAT | | |
| 11 | PCIE_REF_CLK- | DIFF | |
| 12 | UIM_CLK | | |
| 13 | PCIE_REF_CLK+ | DIFF | |

| | | | |
|---|---|---|---|
| 14 | UIM_RST | | |
| 15 | GND | GND | |
| 16 | UIM_VPP | | |
| 17 | NC | | |
| 18 | GND | GND | |
| 19 | NC | | |
| 20 | W_DISABLE# | OUT | +3.3V |
| 21 | GND | GND | |
| 22 | PCIE_RST# | OUT | +3.3V |
| 23 | PCIE_RX- | DIFF | |
| 24 | +3.3VSB | PWR | +3.3V |
| 25 | PCIE_RX+ | DIFF | |
| 26 | GND | GND | |
| 27 | GND | GND | |
| 28 | +1.5V | PWR | +1.5V |
| 29 | GND | GND | |
| 30 | SMB_CLK | I/O | +3.3V |
| 31 | PCIE_TX- | DIFF | |
| 32 | SMB_DATA | I/O | +3.3V |
| 33 | PCIE_TX+ | DIFF | |
| 34 | GND | GND | |

| | | | |
|---|---|---|---|
| 35 | GND | GND | |
| 36 | USB_D- | DIFF | |
| 37 | GND | GND | |
| 38 | USB_D+ | DIFF | |
| 39 | +3.3VSB | PWR | +3.3V |
| 40 | GND | GND | |
| 41 | +3.3VSB | PWR | +3.3V |
| 42 | NC | | |
| 43 | GND | GND | |
| 44 | NC | | |
| 45 | NC | | |
| 46 | NC | | |
| 47 | NC | | |
| 48 | +1.5V | PWR | +1.5V |
| 49 | NC | | |
| 50 | GND | GND | |
| 51 | NC | | |
| 52 | +3.3VSB | PWR | +3.3V |

### 2.5.20 MiniCard/ mSATA Slot (CN27)

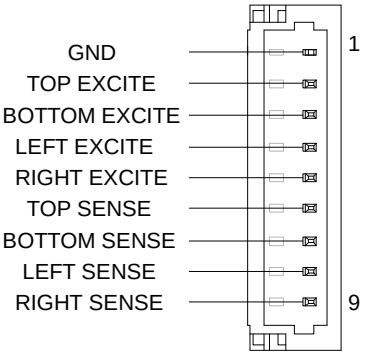
| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | PCIE_WAKE# | IN | |
| 2 | +3.3VSB | PWR | +3.3V |
| 3 | NC | | |
| 4 | GND | GND | |
| 5 | NC | | |
| 6 | +1.5V | PWR | +1.5V |
| 7 | PCIE_CLK_REQ# | IN | |
| 8 | NC | | |
| 9 | GND | GND | |
| 10 | NC | | |
| 11 | PCIE_REF_CLK- | DIFF | |
| 12 | NC | | |
| 13 | PCIE_REF_CLK+ | DIFF | |
| 14 | NC | | |
| 15 | GND | GND | |
| 16 | NC | | |
| 17 | NC | | |
| 18 | GND | GND | |
| 19 | NC | | |

| | | | |
|---|---|---|---|
| 20 | W_DISABLE# | OUT | +3.3V |
| 21 | GND | GND | |
| 22 | PCIE_RST# | OUT | +3.3V |
| 23 | SATA_RX+ | DIFF | |
| 24 | +3.3V | PWR | +3.3V |
| 25 | SATA_RX- | DIFF | |
| 26 | GND | GND | |
| 27 | GND | GND | |
| 28 | +1.5V | PWR | +1.5V |
| 29 | GND | GND | |
| 30 | SMB_CLK | I/O | +3.3V |
| 31 | SATA_TX- | DIFF | |
| 32 | SMB_DATA | I/O | +3.3V |
| 33 | SATA_TX+ | DIFF | |
| 34 | GND | GND | |
| 35 | GND | GND | |
| 36 | USB_D- | DIFF | |
| 37 | GND | GND | |
| 38 | USB_D+ | DIFF | |
| 39 | +3.3V | PWR | +3.3V |
| 40 | GND | GND | |

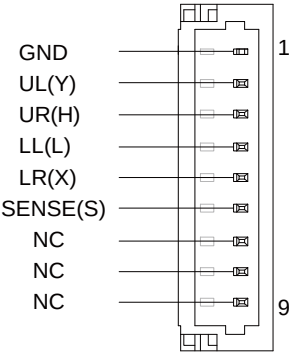
| | | | |
|---|---|---|---|
| 41 | +3.3V | PWR | +3.3V |
| 42 | NC | | |
| 43 | GND | GND | |
| 44 | NC | | |
| 45 | NC | | |
| 46 | NC | | |
| 47 | NC | | |
| 48 | +1.5V | PWR | +1.5V |
| 49 | NC | | |
| 50 | GND | GND | |
| 51 | NC | | |
| 52 | +3.3V | PWR | +3.3V |

Note: CN27 can be selected for MiniCard or mSATA by changing BOM

### 2.5.21 Touchscreen Connector (CN29)

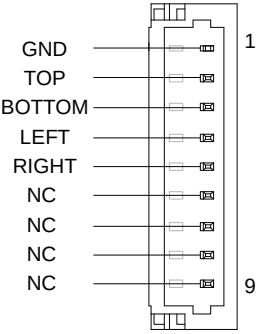


| 8 Wires | | | |
|---|---|---|---|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | GND | GND | |
| 2 | TOP EXCITE | IN | |
| 3 | BOTTOM EXCITE | IN | |
| 4 | LEFT EXCITE | IN | |
| 5 | RIGHT EXCITE | IN | |
| 6 | TOP SENSE | IN | |
| 7 | BOTTOM SENSE | IN | |
| 8 | LEFT SENSE | IN | |
| 9 | RIGHT SENSE | IN | |




| 5 Wires | | | |
|---|---|---|---|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | GND | GND | |
| 2 | UL(Y) | IN | |

| | | |
|---|---|---|
| 3 | UR(H) | IN |
| 4 | LL(L) | IN |
| 5 | LR(X) | IN |
| 6 | SENSE(S) | IN |
| 7 | NC | |
| 8 | NC | |
| 9 | NC | |

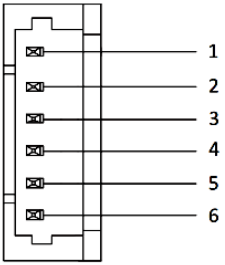



| 4 Wires | | | |
|---|---|---|---|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | GND | GND | |
| 2 | TOP | IN | |
| 3 | BOTTOM | IN | |
| 4 | LEFT | IN | |
| 5 | RIGHT | IN | |
| 6 | NC | | |

| | |
|---|---|
| 7 | NC |
| 8 | NC |
| 9 | NC |

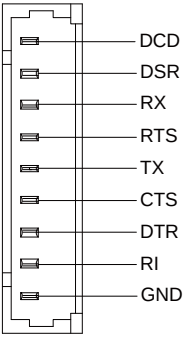
* Touchscreen mode can be set by CN28

### 2.5.22 PS/2 Keyboard Mouse Connector (CN30)



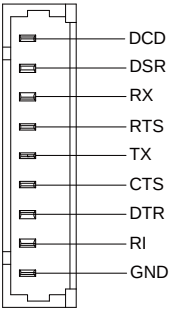

| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | KB_ DATA | I/O | +5V |
| 2 | KB_CLK | I/O | +5V |
| 3 | GND | GND | |
| 4 | +5VSB | PWR | +5V |
| 5 | MS_DATA | I/O | +5V |
| 6 | MS_CLK | I/O | +5V |

### 2.5.23 COM Port 6 (CN31)



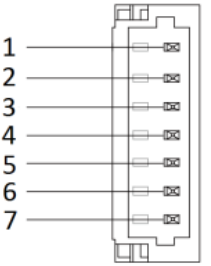

| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | DCD | IN | |
| 2 | DSR | IN | |
| 3 | RX | IN | |
| 4 | RTS | OUT | ±9V |
| 5 | TX | OUT | ±9V |
| 6 | CTS | IN | |
| 7 | DTR | OUT | ±9V |
| 8 | RI | IN | |
| 9 | GND | GND | |

## 2.5.24 COM Port 5 (CN32)



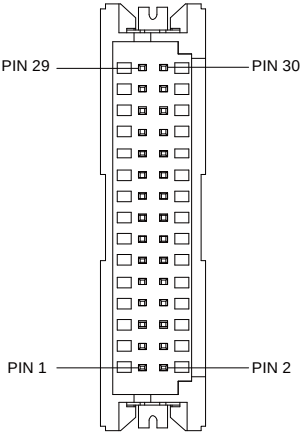

| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | DCD | IN | |
| 2 | DSR | IN | |
| 3 | RX | IN | |
| 4 | RTS | OUT | ±9V |
| 5 | TX | OUT | ±9V |
| 6 | CTS | IN | |
| 7 | DTR | OUT | ±9V |
| 8 | RI | IN | |
| 9 | GND | GND | |

## 2.5.25 SPI Programming Port (CN33)



| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | SPI_MISO | OUT | |
| 2 | GND | GND | |
| 3 | SPI_CLK | IN | |
| 4 | +3.3VSB | PWR | +3.3V |
| 5 | SPI_MOSI | IN | |
| 6 | SPI_CS | IN | |
| 7 | NC | | |

### 2.5.26 LVDS Port 1/ eDP (CN35)




* LVDS LCD_PWR can be set to +3.3 V or +5 V by CN41

* The max driving current is 2 A

| LVDS | | | |
|---|---|---|---|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | BKL_ENABLE | OUT | |
| 2 | BKL_CONTROL | OUT | |

| | | | |
|---|---|---|---|
| 3 | LCD_PWR | PWR | +3.3V/+5V |
| 4 | GND | GND | |
| 5 | LVDS_A_CLK- | DIFF | |
| 6 | LVDS_A_CLK+ | DIFF | |
| 7 | LCD_PWR | PWR | +3.3V/+5V |
| 8 | GND | GND | |
| 9 | LVDS_DA0- | DIFF | |
| 10 | LVDS_DA0+ | DIFF | |
| 11 | LVDS_DA1- | DIFF | |
| 12 | LVDS_DA1+ | DIFF | |
| 13 | LVDS_DA2- | DIFF | |
| 14 | LVDS_DA2+ | DIFF | |
| 15 | LVDS_DA3- | DIFF | |
| 16 | LVDS_DA3+ | DIFF | |
| 17 | DDC_DATA | I/O | +3.3V |
| 18 | DDC_CLK | I/O | +3.3V |
| 19 | LVDS_DB0- | DIFF | |
| 20 | LVDS_DB0+ | DIFF | |
| 21 | LVDS_DB1- | DIFF | |
| 22 | LVDS_DB1+ | DIFF | |
| 23 | LVDS_DB2- | DIFF | |

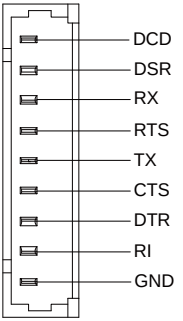
| | | | |
|---|---|---|---|
| 24 | LVDS_DB2+ | DIFF | |
| 25 | LVDS_DB3- | DIFF | |
| 26 | LVDS_DB3+ | DIFF | |
| 27 | LCD_PWR | PWR | +3.3V/+5V |
| 28 | GND | GND | |
| 29 | LVDS_B_CLK- | DIFF | |
| 30 | LVDS_B_CLK+ | DIFF | |

| eDP | | | |
|---|---|---|---|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | BKL_ENABLE | OUT | |
| 2 | BKL_CONTROL | OUT | |
| 3 | LCD_PWR | PWR | +3.3V/+5V |
| 4 | GND | GND | |
| 5 | eDP_DA3- | DIFF | |
| 6 | eDP_DA3+ | DIFF | |
| 7 | LCD_PWR | PWR | +3.3V/+5V |
| 8 | GND | GND | |
| 9 | eDP_DA2- | DIFF | |
| 10 | eDP_DA2+ | DIFF | |
| 11 | eDP_DA1- | DIFF | |
| 12 | eDP_DA1+ | DIFF | |

| | | | |
|---|---|---|---|
| 13 | eDP_DA0- | DIFF | |
| 14 | eDP_DA0+ | DIFF | |
| 15 | NC | | |
| 16 | Hot Plug Detect # | | |
| 17 | eDP_AUX- | DIFF | |
| 18 | eDP_AUX+ | DIFF | |
| 19 | NC | | |
| 20 | NC | | |
| 21 | NC | | |
| 22 | NC | | |
| 23 | NC | | |
| 24 | NC | | |
| 25 | NC | | |
| 26 | NC | | |
| 27 | LCD_PWR | PWR | +3.3V/+5V |
| 28 | GND | GND | |
| 29 | NC | | |
| 30 | NC | | |

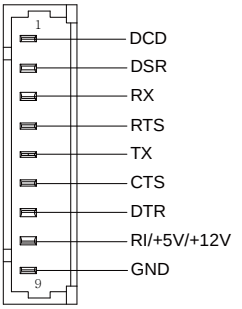
Remark: eDP may not work on DDI0. Pre-testing eDP first is recommended

## 2.5.27 COM Port 4 (CN37)

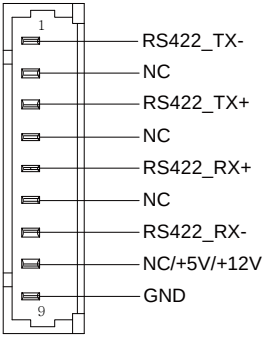



| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | DCD | IN | |
| 2 | DSR | IN | |
| 3 | RX | IN | |
| 4 | RTS | OUT | ±9V |
| 5 | TX | OUT | ±9V |
| 6 | CTS | IN | |
| 7 | DTR | OUT | ±9V |
| 8 | RI | IN | |
| 9 | GND | GND | |

## 2.5.28 COM Port 3 (CN38)

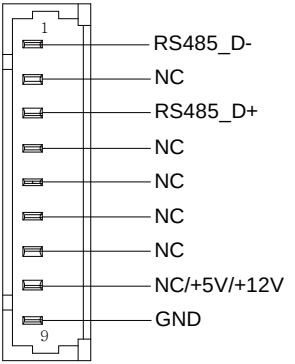


| RS-232 | | | |
|---|---|---|---|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | DCD | IN | |
| 2 | DSR | IN | |
| 3 | RX | IN | |
| 4 | RTS | OUT | ±6V |
| 5 | TX | OUT | ±6V |
| 6 | CTS | IN | |
| 7 | DTR | OUT | ±6V |
| 8 | RI/+5V/+12V | IN/ PWR | +5V/+12V |
| 9 | GND | GND | |




| RS-422 | | | |
|---|---|---|---|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | RS422_TX- | OUT | ±5V |
| 2 | NC | | |
| 3 | RS422_TX+ | OUT | ±5V |

| | | | |
|---|---|---|---|
| 4 | NC | | |
| 5 | RS422_RX+ | IN | |
| 6 | NC | | |
| 7 | RS422_RX- | IN | |
| 8 | NC/+5V/+12V | PWR | +5V/+12V |
| 9 | GND | GND | |



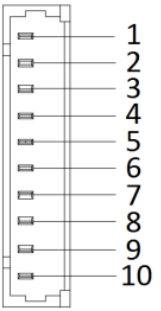

| RS-485 | | | |
|---|---|---|---|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | RS485_D- | I/O | ±5V |
| 2 | NC | | |
| 3 | RS485_D+ | I/O | ±5V |
| 4 | NC | | |
| 5 | NC | | |
| 6 | NC | | |
| 7 | NC | | |

| | | | |
|---|---|---|---|
| 8 | NC/+5V/+12V | PWR | +5V/+12V |
| 9 | GND | GND | |

* COM3 RS-232/422/485 can be set by BIOS settings. Default is RS-232

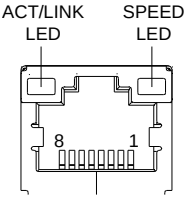
* Function for Pin 8 can be set by CN36

### 2.5.29 Front Panel Connector (CN39)



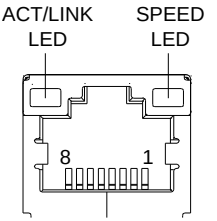

| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | PWR_BTN# | IN | |
| 2 | GND | GND | |
| 3 | +5V | PWR | +5V |
| 4 | FP_SPKR | IN | |
| 5 | +3.3V | PWR | +3.3V |
| 6 | HDD_LED# | IN | |
| 7 | +3.3V | PWR | +3.3V |
| 8 | GND | GND | |
| 9 | HWRST# | IN | |
| 10 | GND | GND | |

## 2.5.30 10M/100M/1G Ethernet Port 1 (CN44)



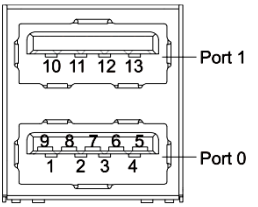

| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | MDI0+ | DIFF | |
| 2 | MDI0- | DIFF | |
| 3 | MDI1+ | DIFF | |
| 4 | MDI2+ | DIFF | |
| 5 | MDI2- | DIFF | |
| 6 | MDI1- | DIFF | |
| 7 | MDI3+ | DIFF | |
| 8 | MDI3- | DIFF | |

## 2.5.31 10M/100M/1G Ethernet Port 2 (CN45)



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

### 2.5.32 USB Port 0 & 1 (CN47)

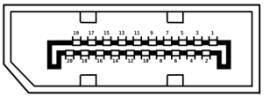



| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | +5VSB | PWR | +5 V |
| 2 | USB0_D- | DIFF | |
| 3 | USB0_D+ | DIFF | |
| 4 | GND | GND | |
| 5 | USB0_SSRX– | DIFF | |

| | | | |
|---|---|---|---|
| 6 | USB0_SSRX+ | DIFF | |
| 7 | GND | GND | |
| 8 | USB0_SSTX− | DIFF | |
| 9 | USB0_SSTX+ | DIFF | |
| 10 | +5VSB | PWR | +5 V |
| 11 | USB1_D- | DIFF | |
| 12 | USB1_D+ | DIFF | |
| 13 | GND | GND | |

* Only Port0 supports USB 3.0

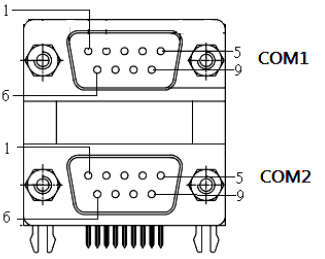
### 2.5.33 DP Port (CN48)



| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | DP_D0+ | DIFF | |
| 2 | GND | GND | |
| 3 | DP_D0- | DIFF | |
| 4 | DP_D1+ | DIFF | |
| 5 | GND | GND | |
| 6 | DP_D1- | DIFF | |
| 7 | DP_D2+ | DIFF | |

| | | | |
|---|---|---|---|
| 8 | GND | GND | |
| 9 | DP_D2- | DIFF | |
| 10 | DP_D3+ | DIFF | |
| 11 | GND | GND | |
| 12 | DP_D3- | DIFF | |
| 13 | GND | GND | |
| 14 | GND | GND | |
| 15 | DP_AUX+ | DIFF | |
| 16 | GND | GND | |
| 17 | DP_AUX- | DIFF | |
| 18 | HPLG_DETECT | IN | |
| 19 | GND | GND | |
| 20 | +3.3V | I/O | +3.3 V |

### 2.5.34 COM Port 1 & 2 (CN49)




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

* Function for Pin 9 can be set by CN34

| COM1 (RS-232) | | | |
|---|---|---|---|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | DCD | IN | |
| 2 | RX | IN | |
| 3 | TX | OUT | ±9 V |
| 4 | DTR | OUT | ±9 V |
| 5 | GND | GND | |
| 6 | DSR | IN | |
| 7 | RTS | OUT | ±9 V |
| 8 | CTS | IN | |
| 9 | RI | IN | |

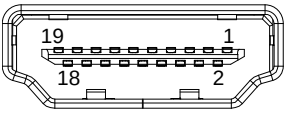
| COM2 (RS-232) | | | |
|---|---|---|---|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | DCD | IN | |
| 2 | RX | N | |
| 3 | TX | OUT | ±9 V |
| 4 | DTR | OUT | ±9 V |
| 5 | GND | GND | |
| 6 | DSR | IN | |
| 7 | RTS | OUT | ±9 V |
| 8 | CTS | IN | |
| 9 | RI/+5V/+12V | IN/PWR | +5 V/ +12 V |

| COM2 (RS-422) | | | |
|---|---|---|---|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | RS422_TX- | OUT | ±5 V |

| | | | |
|---|---|---|---|
| 2 | RS422_TX+ | OUT | ±5 V |
| 3 | RS422_RX+ | IN | |
| 4 | RS422_RX- | IN | |
| 5 | GND | GND | |
| 6 | NC | | |
| 7 | NC | | |
| 8 | NC | | |
| 9 | NC/+5V/+12V | PWR | +5 V/ +12 V |

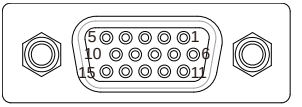
| COM2 (RS-485) | | | |
|---|---|---|---|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | RS485_D- | I/O | ±5 V |
| 2 | RS485_D+ | I/O | ±5 V |
| 3 | NC | | |
| 4 | NC | | |
| 5 | GND | GND | |
| 6 | NC | | |
| 7 | NC | | |
| 8 | NC | | |
| 9 | NC/+5V/+12V | PWR | +5V/ +12V |

### 2.5.35 HDMI Port (CN50)



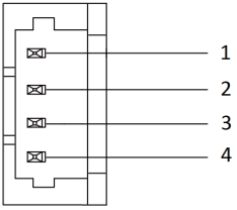
| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | TMDS_DAT2+ | DIFF | |
| 2 | GND | GND | |
| 3 | TMDS_DAT2- | DIFF | |
| 4 | TMDS_DAT1+ | DIFF | |
| 5 | GND | GND | |
| 6 | TMDS_DAT1- | DIFF | |
| 7 | TMDS_DAT0+ | DIFF | |
| 8 | GND | GND | |
| 9 | TMDS_DAT0- | DIFF | |
| 10 | TMDS_CLK+ | DIFF | |
| 11 | GND | GND | |
| 12 | TMDS_CLK- | DIFF | |
| 13 | NC | | |
| 14 | NC | | |
| 15 | DDC_CLK | I/O | +5V |
| 16 | DDC_DATA | I/O | +5V |
| 17 | GND | GND | |
| 18 | +5V | I/O | +5V |
| 19 | HPLG_DETECT | IN | |

### 2.5.36 VGA Port (CN51)




| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | RED | OUT | |
| 2 | GREEN | OUT | |
| 3 | BLUE | OUT | |
| 4 | NC | | |
| 5 | GND | GND | |
| 6 | RED_GND_RTN | GND | |
| 7 | GREEN_GND_RTN | GND | |
| 8 | BLUE_GND_RTN | GND | |
| 9 | +5V | PWR | +5V |
| 10 | CRT_PLUG# | | |
| 11 | NC | | |
| 12 | DDC_DATA | I/O | +5V |
| 13 | HSYNC | OUT | |
| 14 | VSYNC | OUT | |
| 15 | DDC_CLK | I/O | +5V |

## 2.5.37 SMBus Connector (CN52)




| Pin | Pin Name | Signal Type | Signal Level |
|---|---|---|---|
| 1 | GND | GND | +5V |
| 2 | SMB_DATA | I/O | |
| 3 | SMB_CLK | I/O | |
| 4 | +5V | PWR | |

## 2.5.38 DDR3L SODIMM (DIMM1)

Standard Specification

# Chapter 3

AMI BIOS Setup

## 3.1 System Test and Initialization

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

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

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

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

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

## 3.2 AMI BIOS Setup

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

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

The function for each interface can be found below.

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

**Advanced** – Enable/ Disable boot option for legacy network devices

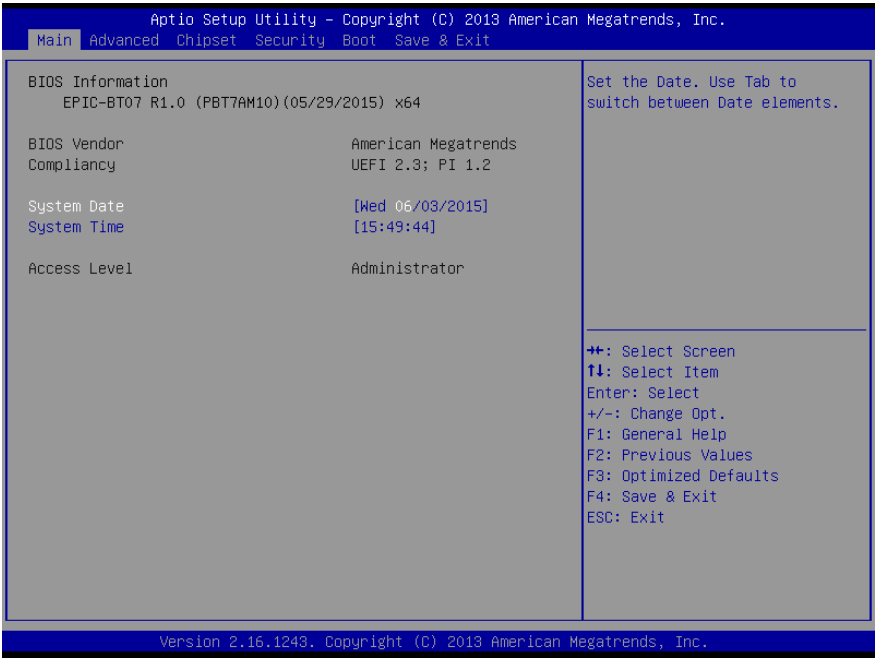
**Chipset** – For hosting bridge parameters

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

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

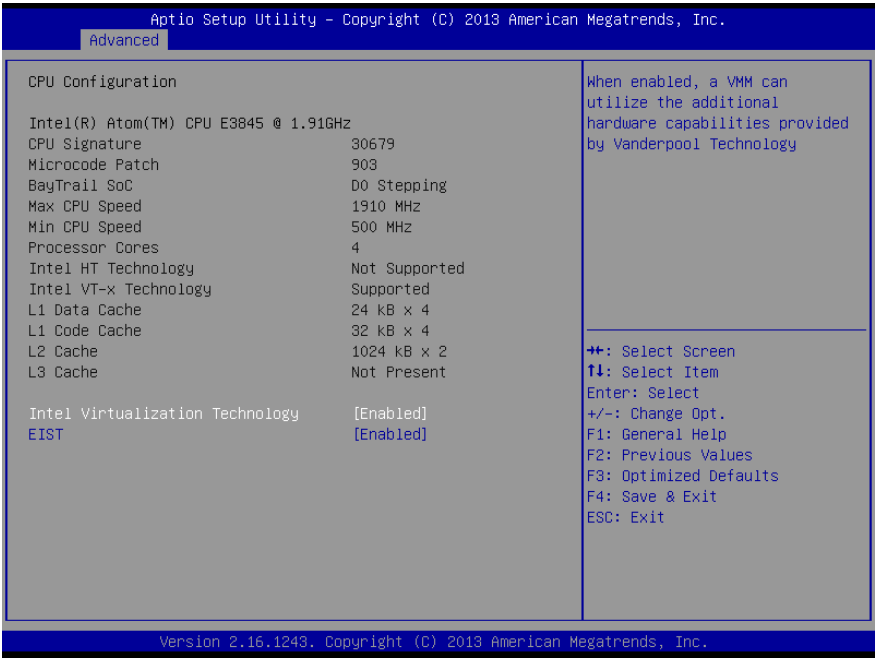
**Save & Exit –**Save your changes and exit the program

## 3.3 Setup submenu: Main



## 3.4 Setup submenu: Advanced

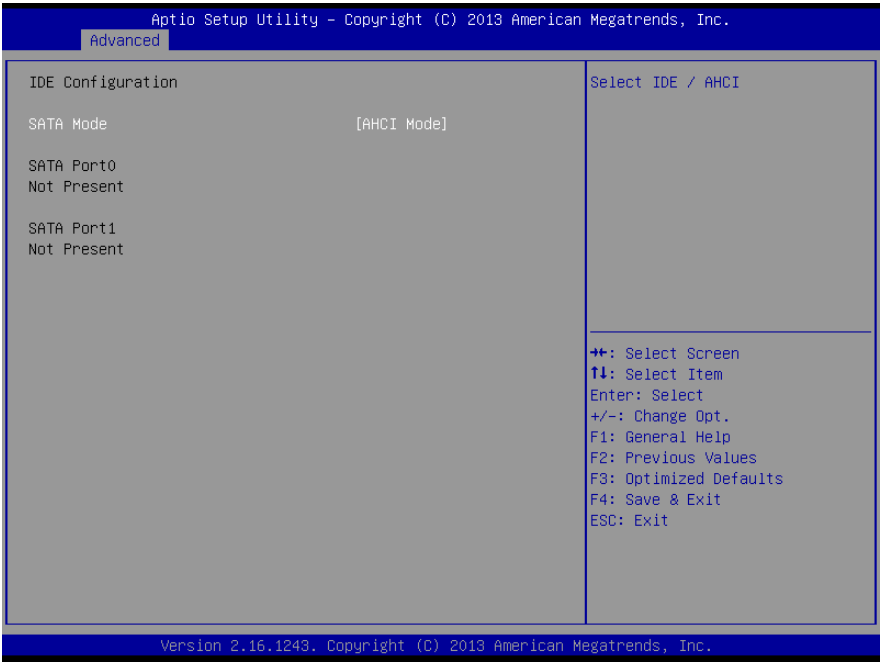
## 3.4.1 Advanced: CPU Configuration




Options summary:

| | | |
|---|---|---|
| Intel Virtualization Technology | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable Intel Virtualization Technology | | |
| EIST | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable EIST | | |

## 3.4.2 Advanced: IDE Configuration




Options summary:

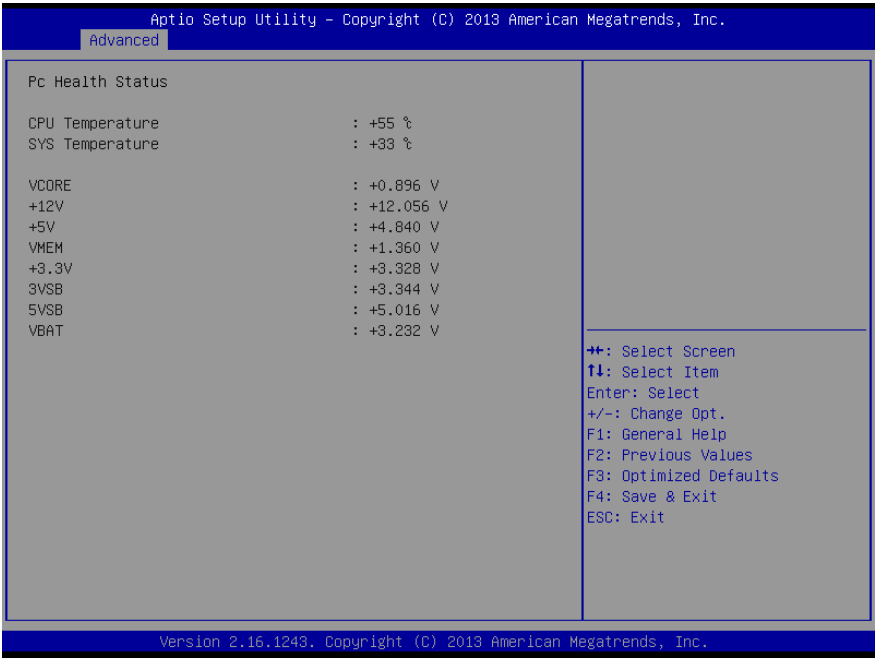
| | | |
|---|---|---|
| SATA Mode | IDE Mode | Optimal Default, Failsafe Default |
| | AHCI Mode | |

### 3.4.3 Advanced: USB Configuration

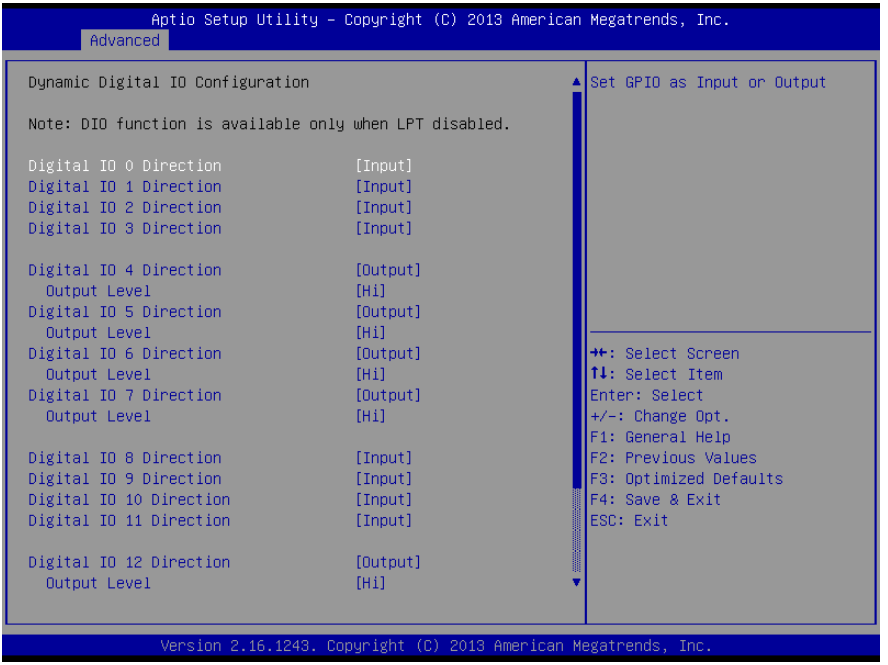

Options summary:

| | | |
|---|---|---|
| Legacy USB Support | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| | Auto | |
| Enables BIOS Support for Legacy USB Support. When enabled, USB can be functional in legacy environment like DOS.<br>AUTO option disables legacy support if no USB devices are connected | | |

## 3.4.4 Advanced: Hardware Monitor



## 3.4.5 Advanced: Dynamic Digital I/O





Options summary:

| | | |
|---|---|---|
| Digital GPIO [3:0] Direction | Input | Optimal Default, Failsafe Default |
| | Output | |
| Set GPIO as Input or Output | | |
| Digital GPIO [7:4] Direction | Input | |
| | Output | Optimal Default, Failsafe Default |
| Set GPIO as Input or Output | | |
| Output Level | Low | |
| | Hi | Optimal Default, Failsafe Default |

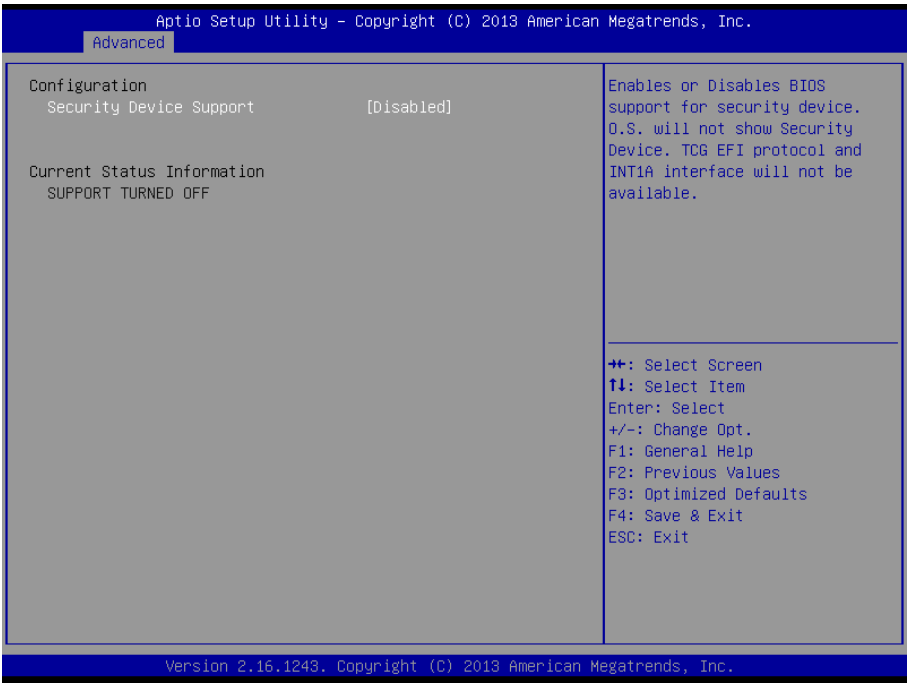
| | | |
|---|---|---|
| Digital GPIO [11:8] Direction | Input | Optimal Default, Failsafe Default |
| | Output | |
| Set GPIO as Input or Output | | |
| Digital GPIO [15:12] Direction | Input | Optimal Default, Failsafe Default |
| | Output | |
| Set GPIO as Input or Output | | |
| Output Level | Low | Optimal Default, Failsafe Default |
| | Hi | |

## 3.4.6 Advanced: Power Management


Options summary:

| | | |
|---|---|---|
| Power Mode | ATX Type | Optimal Default, Failsafe Default |
| | AT Type | |
| Select power supply mode. | | |
| AC Power Loss | Last State | Optimal Default, Failsafe Default |
| | Power On | |
| | Power Off | |
| Select power state when power is re-applied after a power failure. | | |
| Wake on Ring | Enable | Optimal Default, Failsafe Default |
| | Disable | |
| Enable or disable System wake on Ring. | | |
| 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 | | |

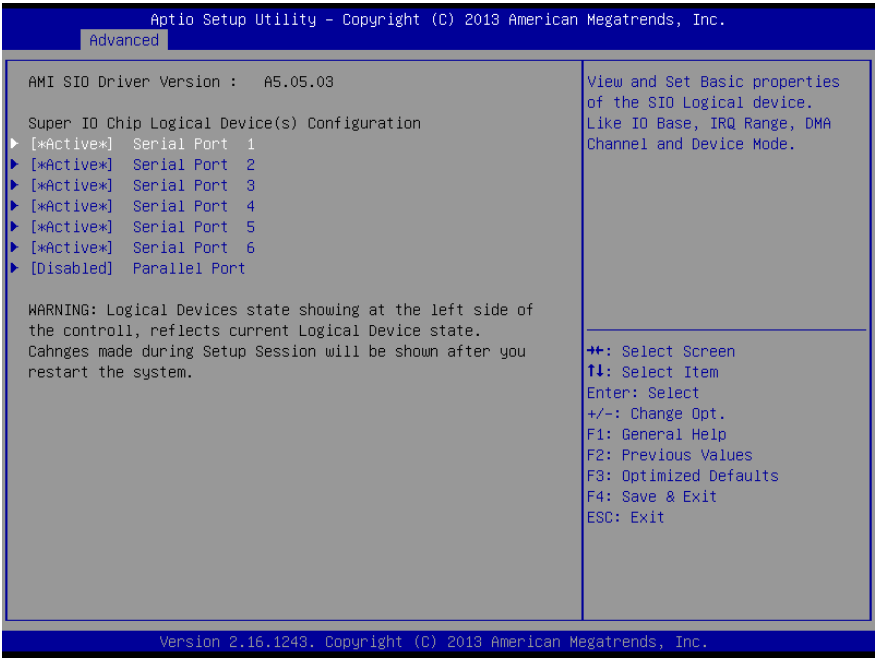
## 3.4.7 Advanced: Trusted Computing



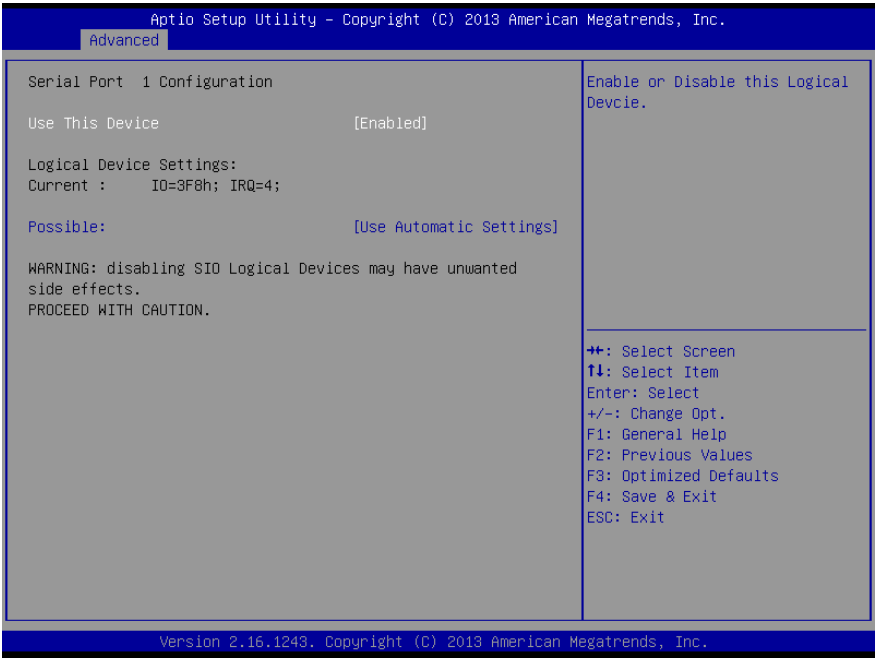

Options summary:

| | | |
|---|---|---|
| Security Device Support | Disable | Optimal Default, Failsafe Default |
| | Enable | |
| Enable or Disable BIOS support for security device. | | |

## 3.4.8 Advanced: SIO Configuration



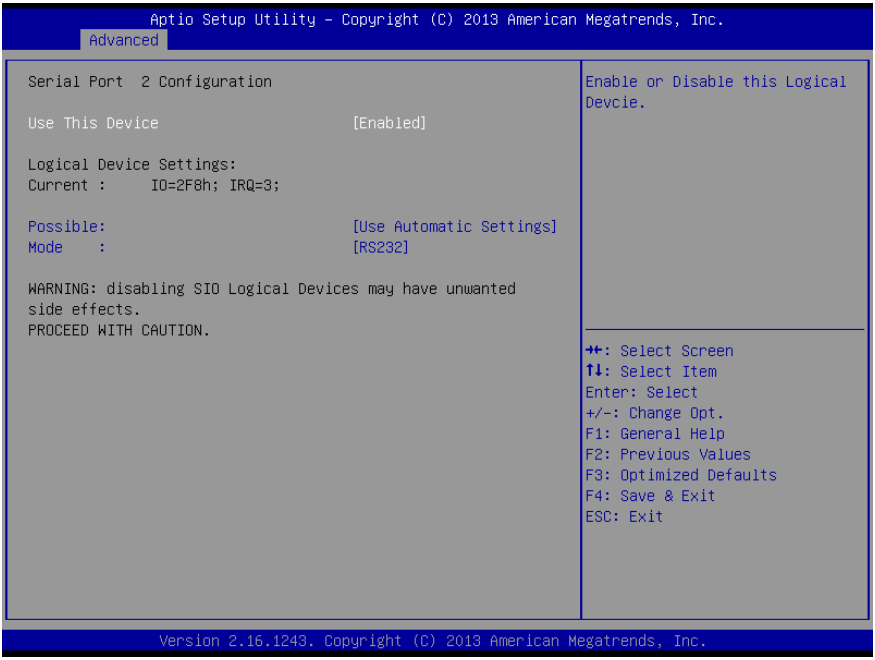
### 3.4.8.1 SIO Configuration: Serial Port 1 Configuration




Options summary:

| | | |
|---|---|---|
| Use This Device | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enable or Disable Serial Port (COM) | | |
| Possible: | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=3F8; IRQ=4; | |
| | IO=2F8; IRQ=3; | |
| Select an optimal setting for IO device | | |

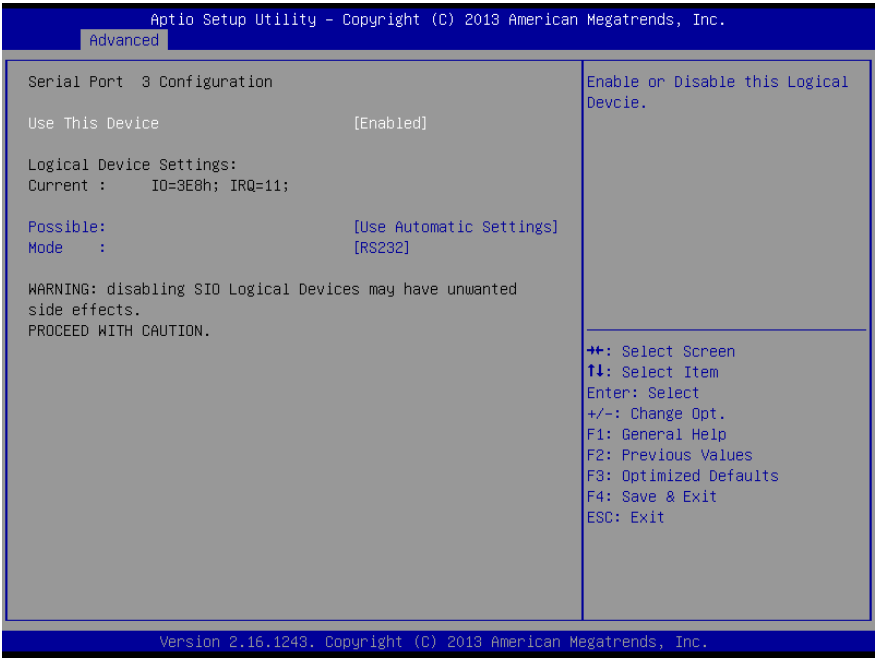
### 3.4.8.2 SIO Configuration: Serial Port 2 Configuration




Options summary:

| | | |
|---|---|---|
| Use This Device | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable Serial Port (COM) | | |
| Possible: | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=2F8; IRQ=3; | |
| | IO=3F8; IRQ=4; | |
| Select an optimal setting for IO device | | |
| Mode: | RS232 | Optimal Default, Failsafe Default |
| | RS422 | |
| | RS485 | |

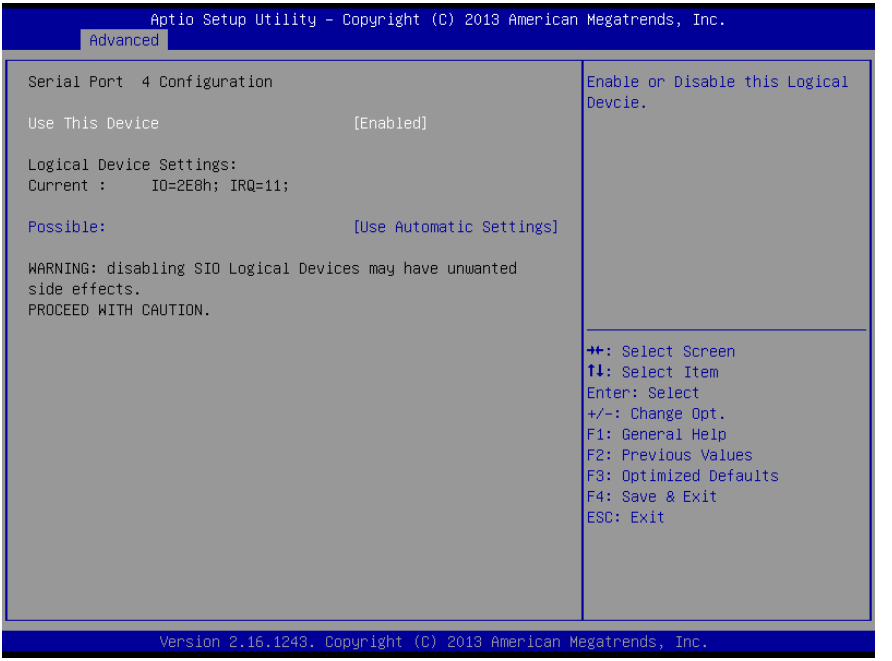
### 3.4.8.3 SIO Configuration: Serial Port 3 Configuration




Options summary:

| | | |
|---|---|---|
| Use This Device | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable Serial Port (COM) | | |
| Possible: | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=3E8; IRQ=11; | |
| | IO=2E8; IRQ=11; | |
| Select an optimal setting for IO device | | |
| Mode: | RS232 | Optimal Default, Failsafe Default |
| | RS422 | |
| | RS485 | |

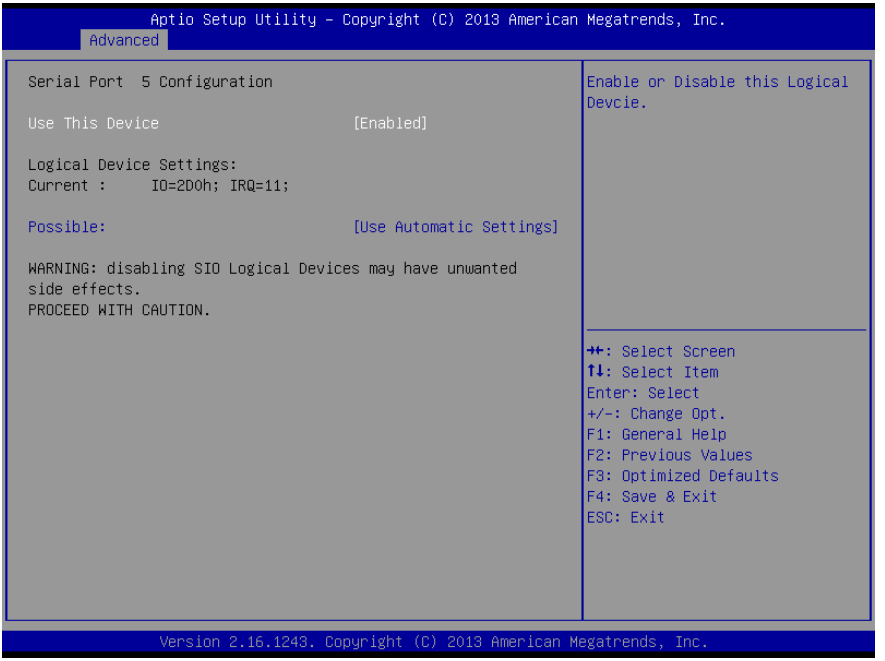
### 3.4.8.4 SIO Configuration: Serial Port 4 Configuration




Options summary:

| | | |
|---|---|---|
| Use This Device | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enable or Disable Serial Port (COM) | | |
| Possible: | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=2E8; IRQ=11; | |
| | IO=3E8; IRQ=11; | |
| Select an optimal setting for IO device | | |

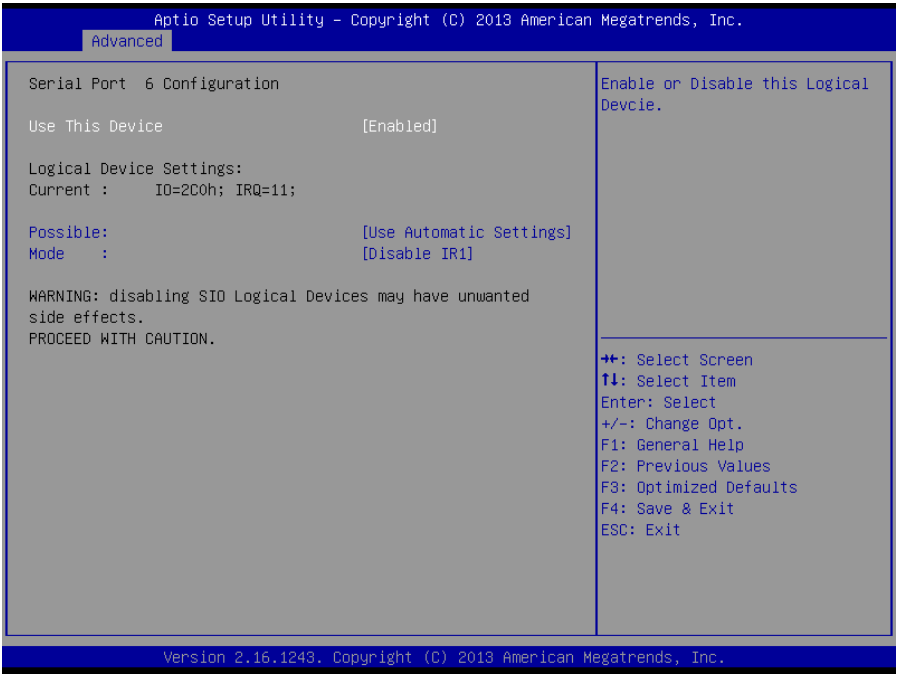
### 3.4.8.5 SIO Configuration: Serial Port 5 Configuration




Options summary:

| | | |
|---|---|---|
| Use This Device | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enable or Disable Serial Port (COM) | | |
| Possible: | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=2D0; IRQ=11; | |
| | IO=2C0; IRQ=11; | |
| Select an optimal setting for IO device | | |

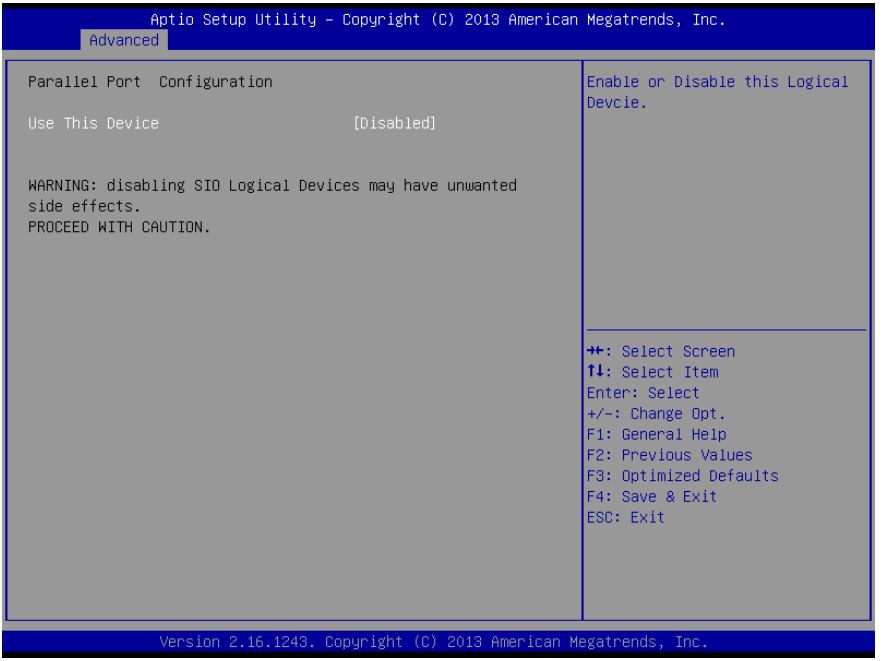
### 3.4.8.6 SIO Configuration: Serial Port 6 Configuration




Options summary:

| | | |
|---|---|---|
| Use This Device | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| En/Disable Serial Port (COM) | | |
| Possible: | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=2C0; IRQ=11; | |
| | IO=2E8; IRQ=11; | |
| Select an optimal setting for IO device | | |
| Mode: | Disable IR1 | Optimal Default, Failsafe Default |
| | Enable IR1 (pulse 1.6uS) | |
| | Enable IR1 (pulse 3/16 bit time) | |
| Set the Serial Mode | | |

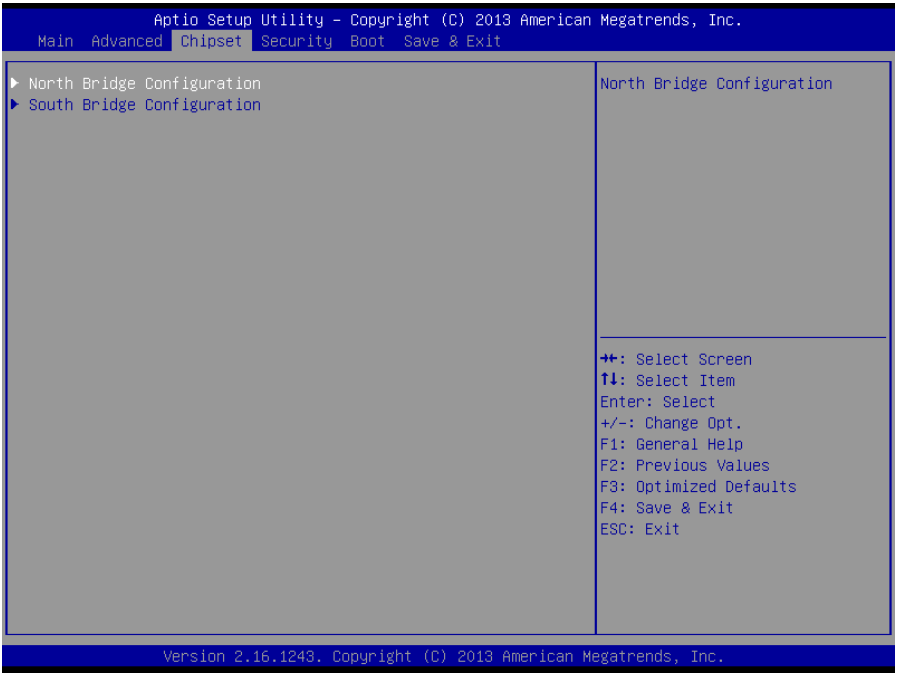
## 3.4.9 Advanced: Parallel Port Configuration



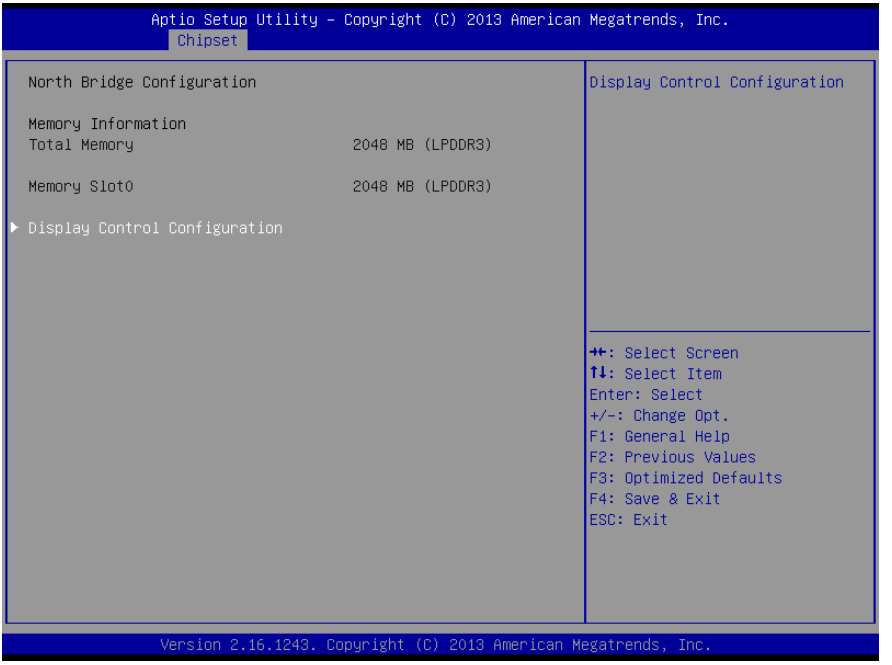

Options summary:

| | | |
|---|---|---|
| Use This Device | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| En/Disable Parallel Port | | |

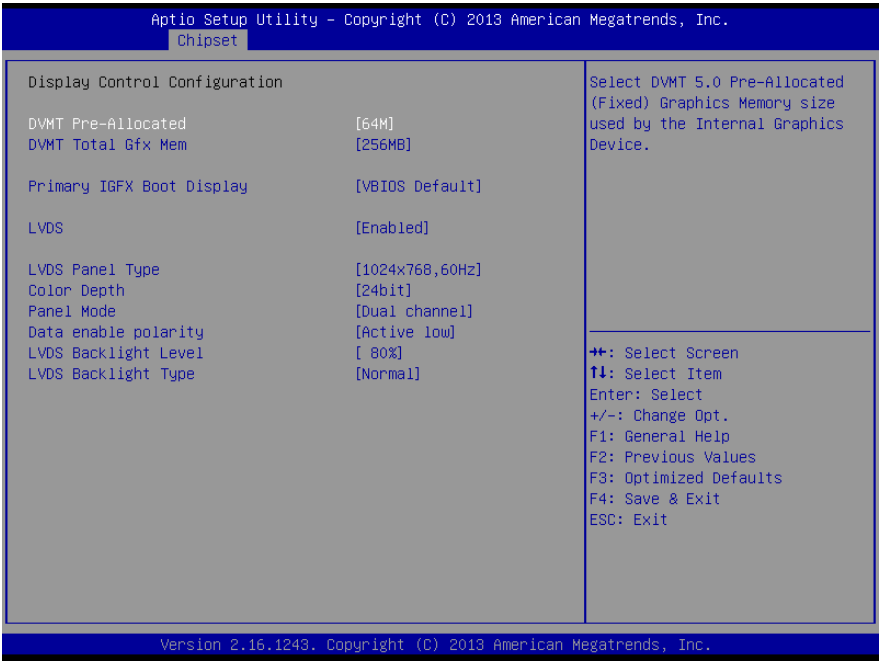
## 3.5 Setup submenu: Chipset



### 3.5.1 Chipset: North Bridge



## 3.5.2 Chipset: Display Control Configuration

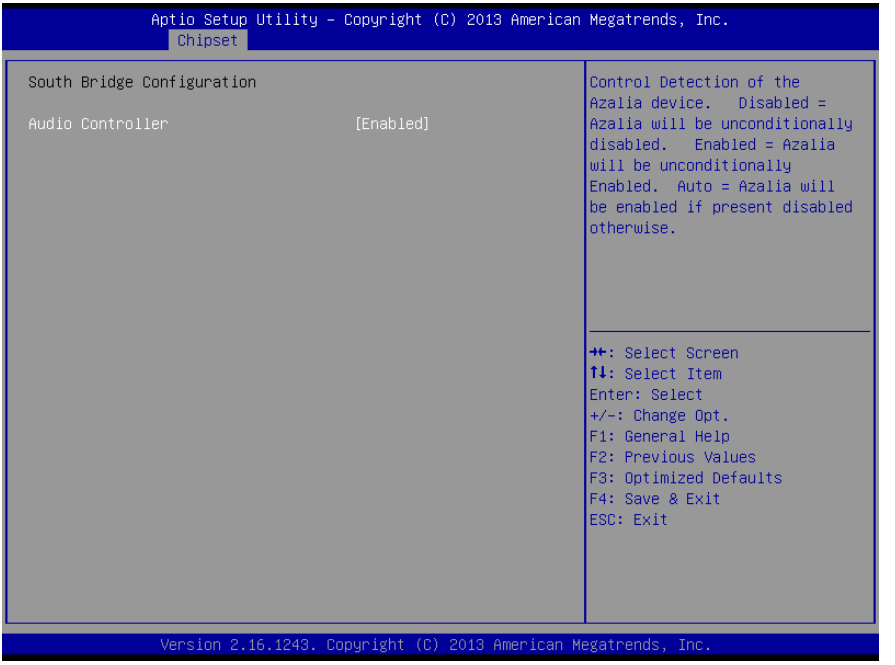



Options summary:

| | | |
|---|---|---|
| DVMT Pre-Allocated | 64M | Optimal Default, Failsafe Default |
| | 96M | |
| | 128M | |
| | 160M | |
| | 192M | |
| | 224M | |
| | 256M | |
| | 288M | |
| | 320M | |
| | 352M | |
| | 384M | |
| | 416M | |
| | 448M | |
| | 480M | |
| | 512M | |
| DVMT Total Gfx Mem | 128MB | |

| | | |
|---|---|---|
| | 256MB | Optimal Default, Failsafe Default |
| | Max | |
| DVMT Total Gfx Mem | 128MB | Optimal Default, Failsafe Default |
| | 256MB | |
| | Max | |
| LVDS | Enable | Optimal Default, Failsafe Default |
| | Disable | |
| LVDS Panel Type | 640x480, 60Hz | Optimal Default, Failsafe Default |
| | 800x480, 60Hz | |
| | 800x600,60Hz | |
| | 1024x600,60Hz | |
| | 1024x768,60Hz | |
| | 1280x768,60Hz | |
| | 1280x1024,60Hz | |
| | 1366x768,60Hz | |
| | 1440x900,60Hz | |
| | 1600x1200,60Hz | |
| | 1920x1080,60Hz | |
| | 1920x1200,60Hz | |
| | 1280x800,60Hz | |
| Color Depth | 24bit | Optimal Default, Failsafe Default |
| | 18bit | |
| Panel Mode | Single Channel | Optimal Default, Failsafe Default |
| | Dual Channel | |
| Data enable polarity | Active Low | Optimal Default, Failsafe Default |
| | Active High | |
| LVDS Backlight Level | 100% | Default |
| | 90% | |
| | 80% | |
| | 70% | |
| | 60% | |
| | 50% | |
| | 40% | |
| | 30% | |
| | 20% | |
| | 10% | |
| | 0% | |
| LVDS Backlight Control | Normal | Default |
| | Inverted | |

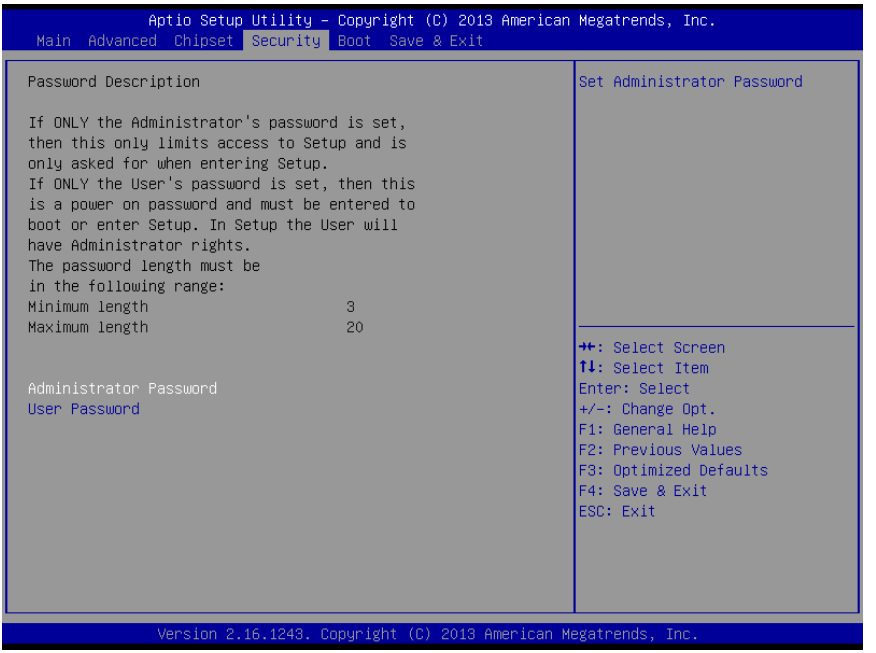
### 3.5.3 Chipset: South Bridge




Options summary:

| | | |
|---|---|---|
| Audio Controller | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |

## 3.6 Setup submenu: Security




### Change User/Administrator Password

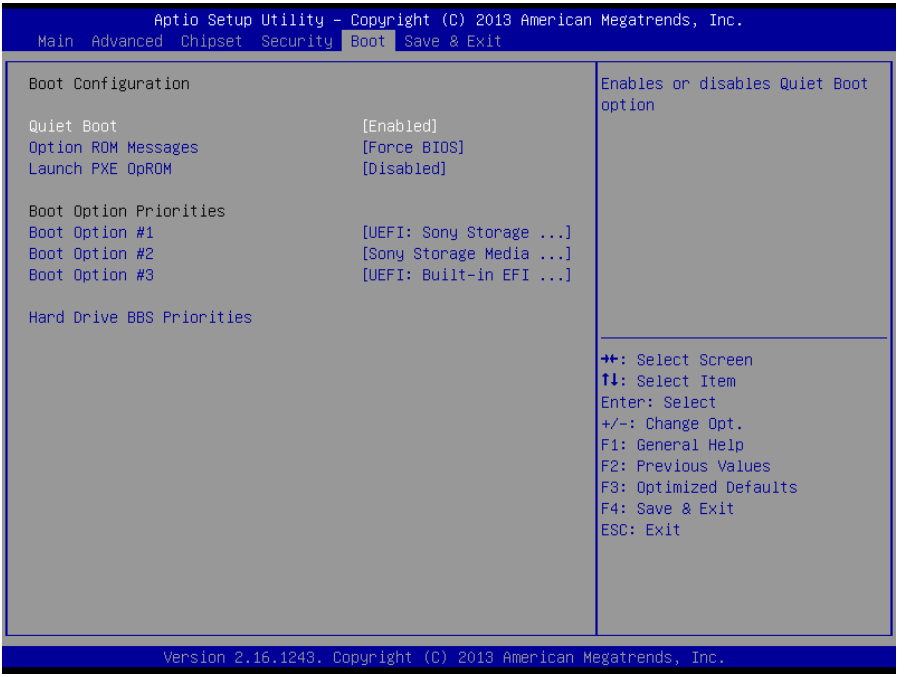
You can set a User Password once an Administrator Password is set. The password will be required during boot up, or when the user enters the Setup utility. Please Note that a User Password does not provide access to many of the features in the Setup utility.

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

### Removing the Password

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

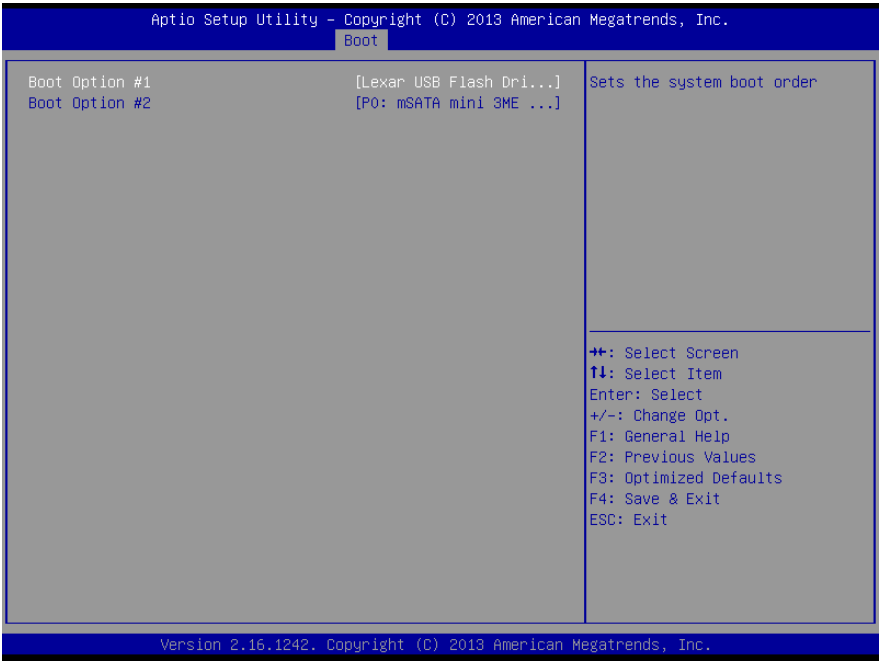
## 3.7 Setup submenu: Boot



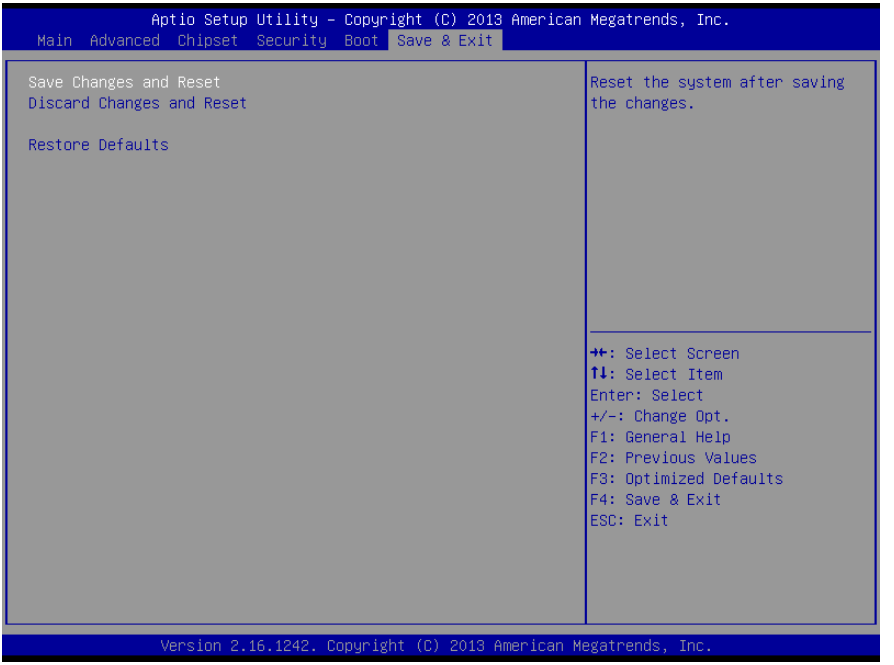

Options summary:

| | | |
|---|---|---|
| Quiet Boot | Disabled | |
| | Enabled | Default |
| En/Disable showing boot logo. | | |
| Option ROM Messages | Force BIOS | Default |
| | Keep Current | |
| Set display mode for Option ROM | | |
| Launch PXE OpROM | Disabled | Default |
| | Enabled | |
| En/Disable Legacy Boot Option | | |

### 3.7.1 Boot: BBS Priorities



## 3.8 Setup submenu: Save & Exit



# Chapter 4

Drivers Installation

## 4.1 Product CD/DVD

The EPIC-BT07 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 Drivers

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

### Step 2 – Install Graphics Driver

1. Open the **STEP2 - Graphics** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

### Step 3 – Install LAN Driver

1. Open the **STEP3 – Network** folder and select your OS
2. Open the **.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

### Step 4 – Install xHCI Driver (Windows 7 only)

1. Open the **STEP4 – TXE** folder followed by **Setup.exe**

2. Follow the instructions
3. Drivers will be installed automatically

Step 5 – Install Intel Sideband Fabric Device Drivers (Windows 8.1/ 10 only)

1. Open the **STEP5 - Intel Sideband Fabric Device** folder followed by **Setup.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Step 6 – Install TPM Drivers

1. Open the **STEP6 – TPM** folder followed by **Setup.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Step 7 – Install Audio Driver

1. Open the **STEP7 – Audio** folder and select your OS
2. Open the **.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

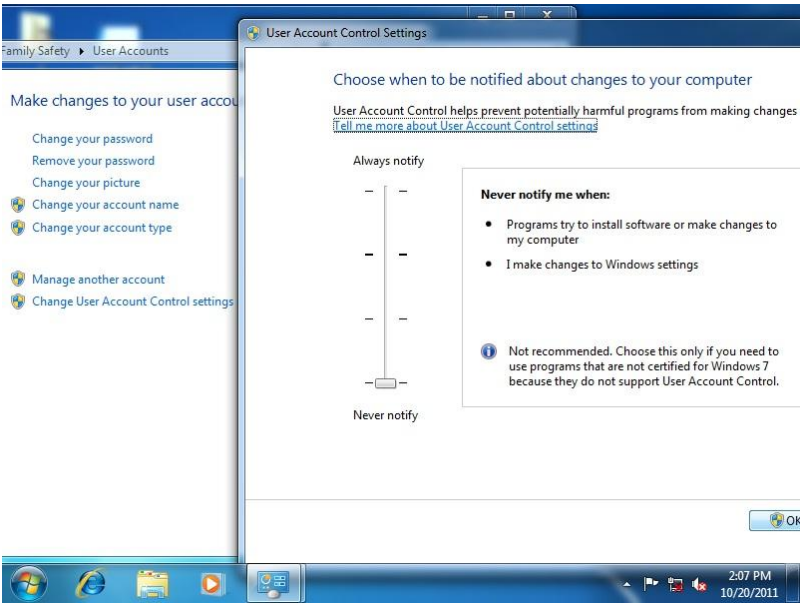
Step 8 – Install Touch Driver

1. Open the **STEP8 – Touch** folder and select your OS
2. Open the **Setup.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

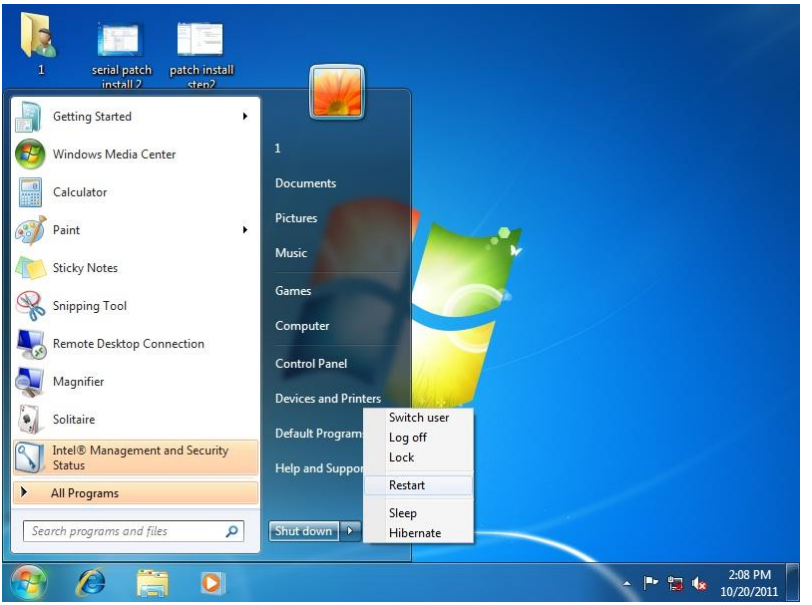
Step 9 – Serial Port Drivers (Optional)

For Windows 7:

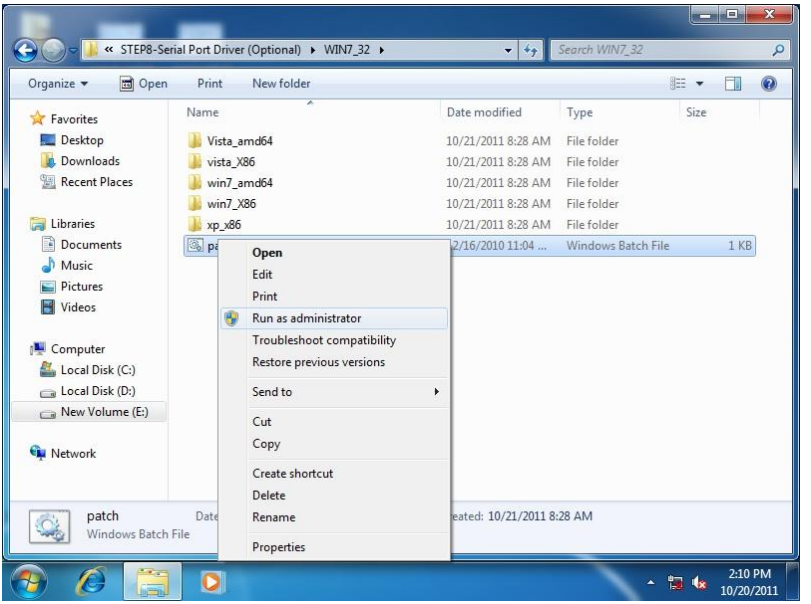
1. Change User Account Control settings to **Never notify**


Family Safety ▸ User Accounts
Make changes to your user accou
Change your password
Remove your password
Change your picture
Change your account name
Change your account type
Manage another account
Change User Account Control settings
User Account Control Settings
Choose when to be notified about changes to your computer
User Account Control helps prevent potentially harmful programs from making changes
Tell me more about User Account Control settings
Always notify
Never notify
Never notify me when:
Programs try to install software or make changes to my computer
I make changes to Windows settings
Not recommended. Choose this only if you need to use programs that are not certified for Windows 7 because they do not support User Account Control.
OK
2:07 PM
10/20/2011

2. Reboot and log in as administrator

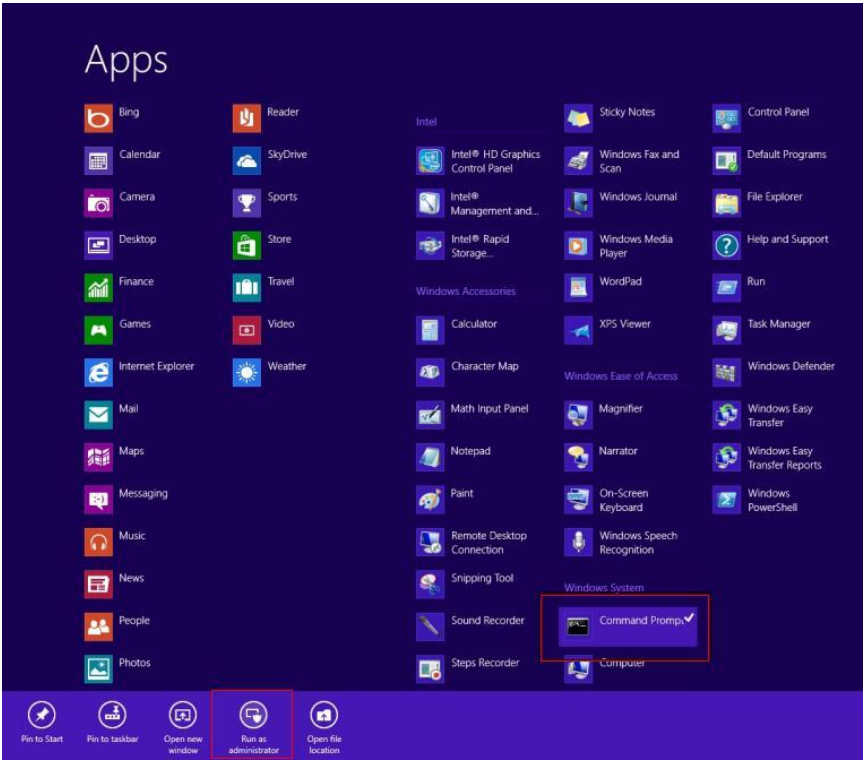


3. Run patch.bat as administrator



For Windows 8:

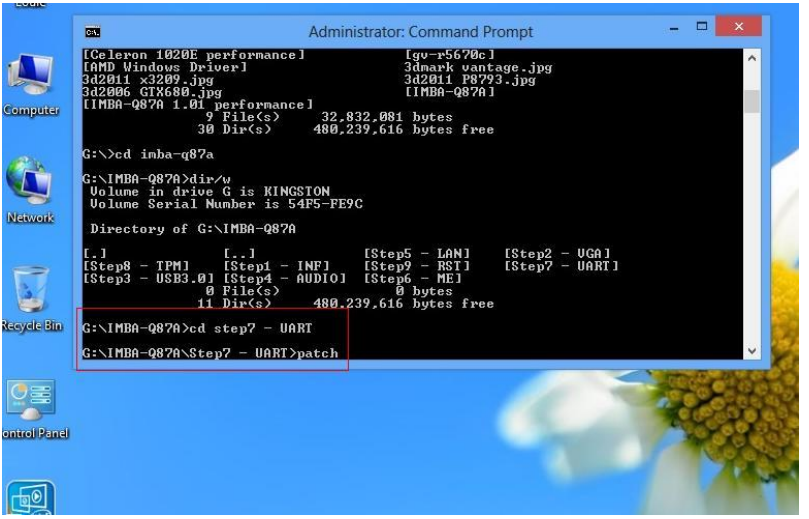
1. Open the Apps Screen, right click on the **Command Prompt** tile and select **Run as Administrator**



2. To install the driver (patch.bat), you will first have to locate the file in command prompt. To do that, first go to the directory which contains the file by entering **<drive letter>:** eg. if the driver is in D drive, enter **D:**

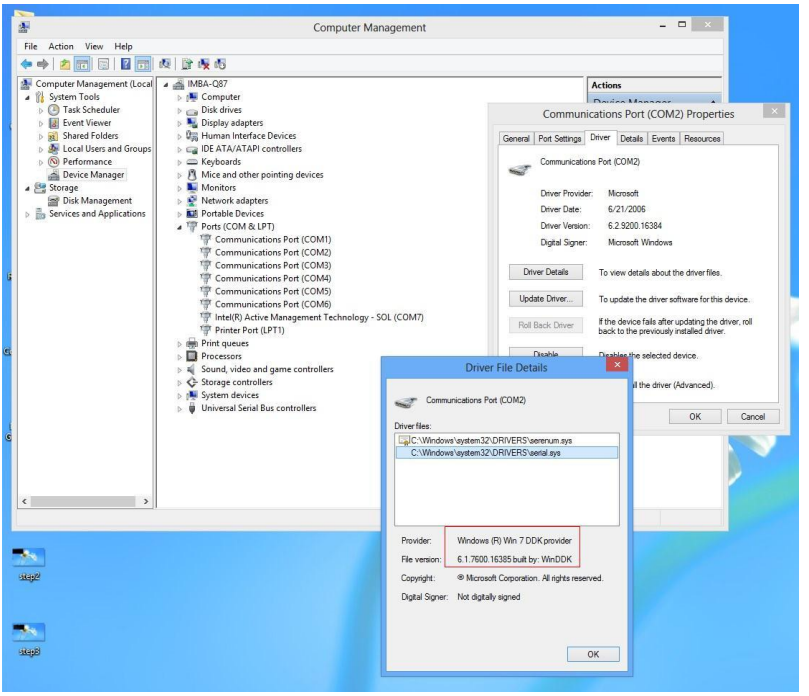
3. You are now at the directory containing the installation file. Next, go to the folder in which the file resides by entering **cd <folder>** eg: if the file is in a folder named abc, enter cd <abc>.

4. You are now at the folder where the file is located. Enter the **patch.bat** to open and install the drivers. If your file is in a subfolder, enter the cd <folder> command again to access the subfolder (screenshot below is for reference only).



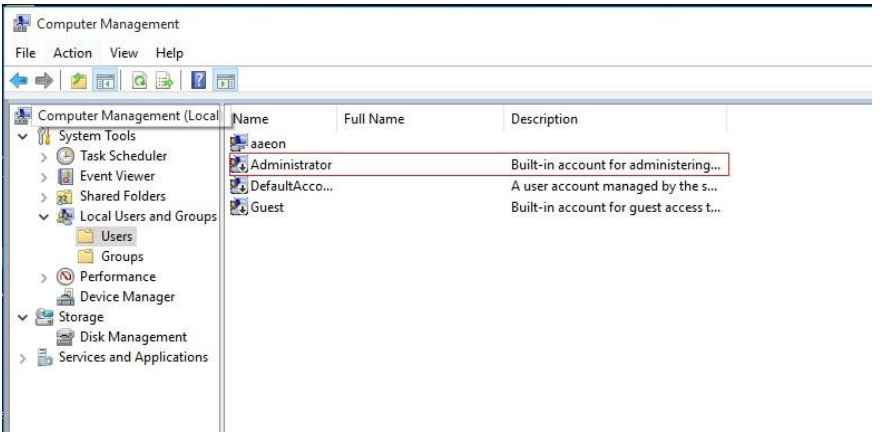

5. Reboot after installation completes.

6. To confirm the installation, go to Device Manager, expand the Ports (COM & LPT) tree and double click on any of the COM ports to open its properties. Go to the Driver tab, select Driver Details and click on **serial.sys**, you should see its provider as **Windows (R) Win 7 DDK Provider**.

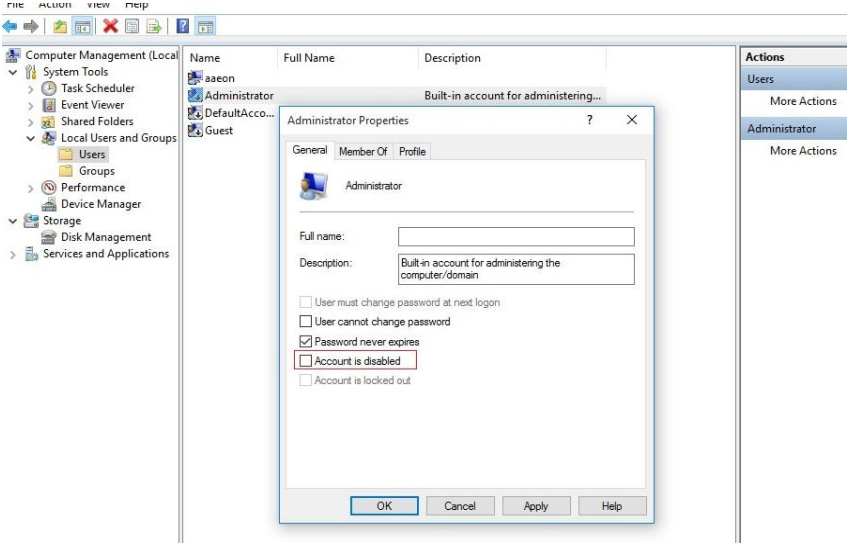

Computer Management
File Action View Help
Computer Management (Local
System Tools
Task Scheduler
Event Viewer
Shared Folders
Local Users and Groups
Performance
Device Manager
Storage
Disk Management
Services and Applications
IMBA-Q87
Computer
Disk drives
Display adapters
Human Interface Devices
IDE ATA/ATAPI controllers
Keyboards
Mice and other pointing devices
Monitors
Network adapters
Portable Devices
Ports (COM & LPT)
Communications Port (COM1)
Communications Port (COM2)
Communications Port (COM3)
Communications Port (COM4)
Communications Port (COM5)
Communications Port (COM6)
Intel(R) Active Management Technology - SOL (COM7)
Printer Port (LPT1)
Print queues
Processors
Sound, video and game controllers
Storage controllers
System devices
Universal Serial Bus controllers
Actions
Communications Port (COM2) Properties
General Port Settings Driver Details Events Resources
Communications Port (COM2)
Driver Provider: Microsoft
Driver Date: 6/21/2006
Driver Version: 6.2.9200.16384
Digital Signer: Microsoft Windows
Driver Details
To view details about the driver files.
Update Driver...
To update the driver software for this device.
Roll Back Driver
If the device fails after updating the driver, roll back to the previously installed driver.
Disable
Disables the selected device.
OK
Cancel
Driver File Details
Communications Port (COM2)
Driver files:
C:\Windows\system32\DRIVERS\serenum.sys
C:\Windows\system32\DRIVERS\serial.sys
Provider: Windows (R) Win 7 DDK provider
File version: 6.1.7600.16385 built by: WinDDK
Copyright: © Microsoft Corporation. All rights reserved.
Digital Signer: Not digitally signed
OK

For Windows 10:

1. You will need administrator rights to install the drivers. To get it, first go to **Computer Management** in **Control Panel** and double-click on **Administrator**

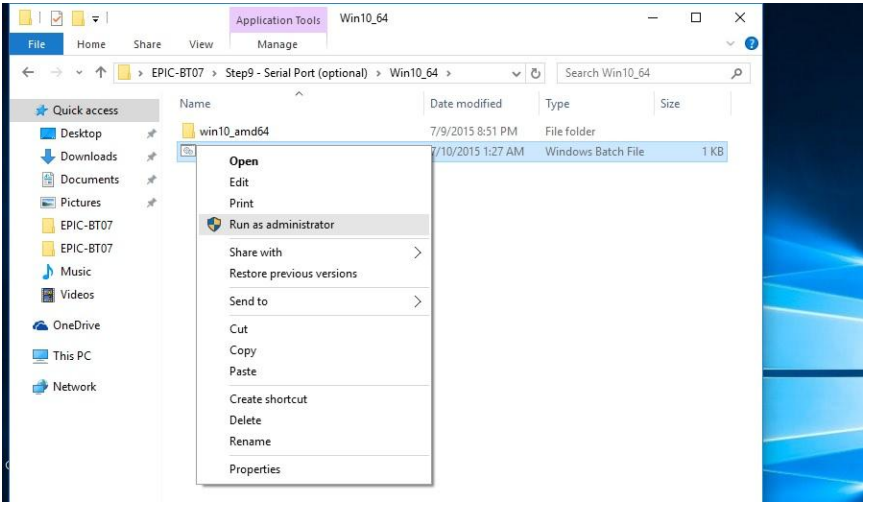



2. In the dialog box, **uncheck** the **Account is disabled** option to enable administrator account.



3. Restart and sign in as the administrator (not password protect by default)


4. Go back to the Windows 10 Serial Port drivers directory and **run patch.bat as administrator.**



Step 8 – Install Atom E3800 I/O Driver

1. Open the STEP8 –Atom E3800 I/O folder and select your OS
2. Open the.exe file
3. Follow the instructions
4. Drivers will be installed automatically

# Appendix A

Watchdog Timer Programming

## A.1 Watchdog Timer Initial Program

| Table 1 : SuperIO relative register table | | |
|---|---|---|
| | Default Value | Note |
| Index | 0x2E(Note1) | SIO MB PnP Mode Index Register<br>0x2E or 0x4E |
| Data | 0x2F(Note2) | SIO MB PnP Mode Data Register<br>0x2F or 0x4F |

| Table 2 : Watchdog relative register table | | | | | |
|---|---|---|---|---|---|
| | LDN | Register | BitNum | Value | Note |
| Timer Counter | 0x07(Note3) | 0xF6(Note4) | | (Note24) | Time of watchdog timer<br>(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 procudure will enable the WDT counting.
        AaeonWDTEnable();
}
*********************************************************************************
```

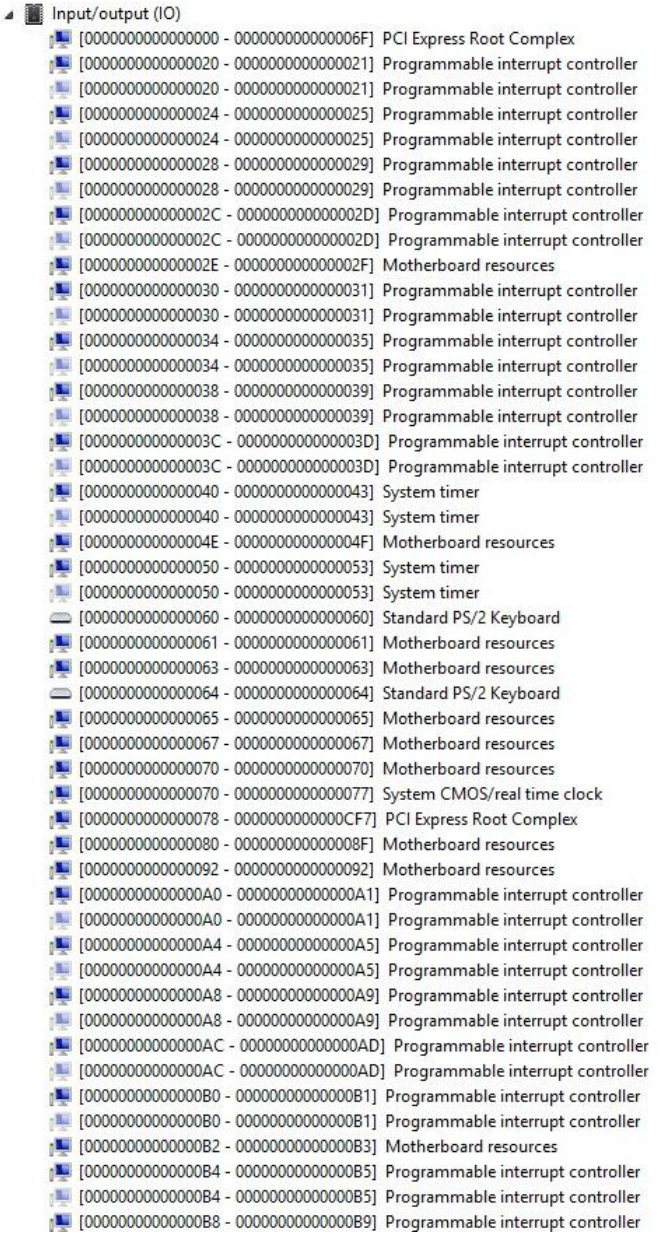
```
*****************************************************************************************
// Procedure : AaeonWDTEnable
VOID    AaeonWDTEnable ( ){
        WDTEnableDisable(EnableLDN, EnableReg, EnableBit, 1);
}

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

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

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

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

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

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

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

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

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

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

# Appendix B

I/O Information

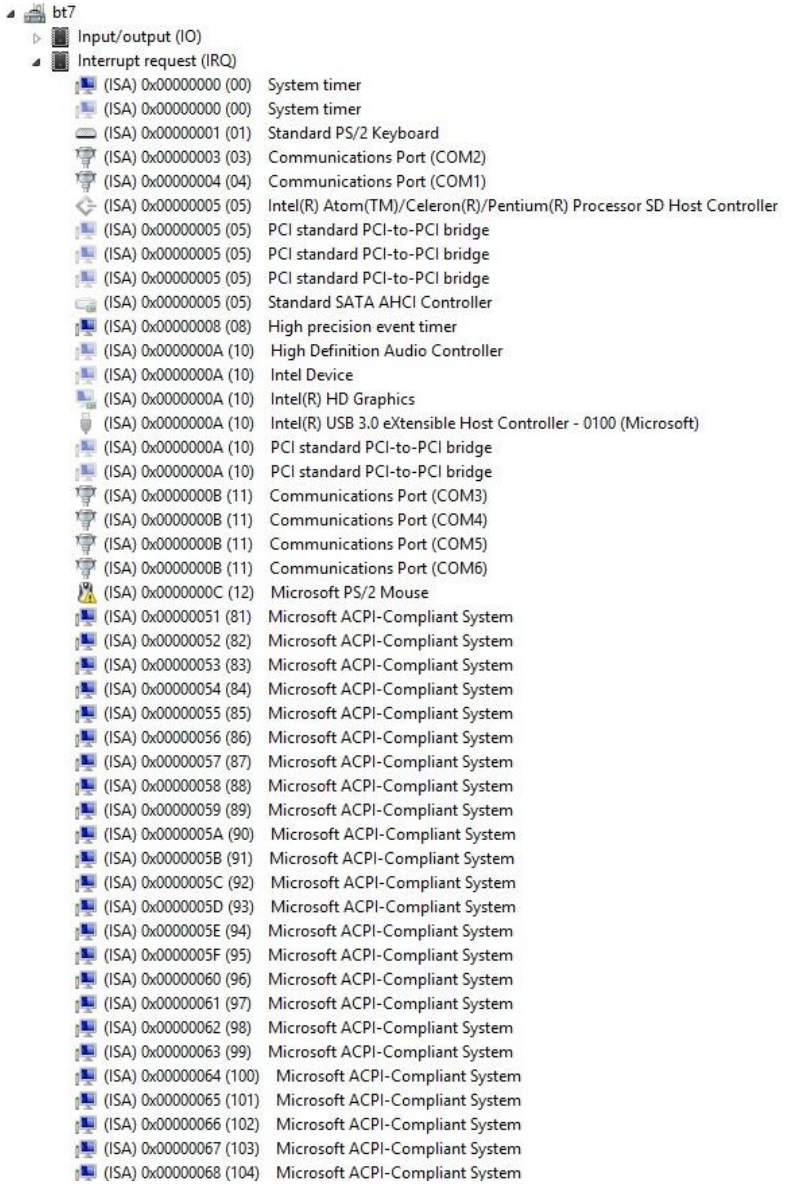
## B.1 I/O Address Map



[00000000000000B8 - 00000000000000B9] 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)
[00000000000003B0 - 00000000000003BB] Intel(R) HD Graphics
[00000000000003C0 - 00000000000003DF] Intel(R) HD Graphics
[00000000000003E8 - 00000000000003EF] Communications Port (COM3)
[00000000000003F8 - 00000000000003FF] Communications Port (COM1)
[0000000000000400 - 000000000000047F] Motherboard resources
[00000000000004D0 - 00000000000004D1] Programmable interrupt controller
[00000000000004D0 - 00000000000004D1] Programmable interrupt controller
[0000000000000500 - 00000000000005FE] Motherboard resources
[0000000000000600 - 000000000000061F] Motherboard resources
[0000000000000680 - 000000000000069F] Motherboard resources
[0000000000000A00 - 0000000000000A0F] Motherboard resources
[0000000000000A10 - 0000000000000A1F] Motherboard resources
[0000000000000A20 - 0000000000000A2F] Motherboard resources
[0000000000000D00 - 000000000000FFFF] PCI Express Root Complex
[000000000000C000 - 000000000000CFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 2 - 0F4A
[000000000000C000 - 000000000000CFFF] PCI standard PCI-to-PCI bridge
[000000000000D000 - 000000000000DFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
[000000000000D000 - 000000000000DFFF] PCI standard PCI-to-PCI bridge
[000000000000E000 - 000000000000E01F] Intel Device
[000000000000E000 - 000000000000E01F] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
[000000000000E020 - 000000000000E03F] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000E020 - 000000000000E03F] Standard SATA AHCI Controller
[000000000000E040 - 000000000000E043] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000E040 - 000000000000E043] Standard SATA AHCI Controller
[000000000000E050 - 000000000000E057] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000E050 - 000000000000E057] Standard SATA AHCI Controller
[000000000000E060 - 000000000000E063] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000E060 - 000000000000E063] Standard SATA AHCI Controller
[000000000000E070 - 000000000000E077] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
[000000000000E070 - 000000000000E077] Standard SATA AHCI Controller
[000000000000E080 - 000000000000E087] Intel(R) HD Graphics
[000000000000E080 - 000000000000E087] Intel(R) HD Graphics

## B.2 Memory Address Map

## B.3 IRQ Mapping Chart



(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
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(ISA) 0x0000006F (111) Microsoft ACPI-Compliant System
(ISA) 0x00000070 (112) Microsoft ACPI-Compliant System
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(ISA) 0x000001B4 (436) Microsoft ACPI-Compliant System
(ISA) 0x000001B5 (437) Microsoft ACPI-Compliant System
(ISA) 0x000001B6 (438) Microsoft ACPI-Compliant System
(ISA) 0x000001B7 (439) Microsoft ACPI-Compliant System
(ISA) 0x000001B8 (440) Microsoft ACPI-Compliant System
(ISA) 0x000001B9 (441) Microsoft ACPI-Compliant System
(ISA) 0x000001BA (442) Microsoft ACPI-Compliant System
(ISA) 0x000001BB (443) Microsoft ACPI-Compliant System
(ISA) 0x000001BC (444) Microsoft ACPI-Compliant System
(ISA) 0x000001BD (445) Microsoft ACPI-Compliant System
(ISA) 0x000001BE (446) Microsoft ACPI-Compliant System
(ISA) 0x000001BF (447) Microsoft ACPI-Compliant System
(ISA) 0x000001C0 (448) Microsoft ACPI-Compliant System
(ISA) 0x000001C1 (449) Microsoft ACPI-Compliant System
(ISA) 0x000001C2 (450) Microsoft ACPI-Compliant System
(ISA) 0x000001C3 (451) Microsoft ACPI-Compliant System
(ISA) 0x000001C4 (452) Microsoft ACPI-Compliant System
(ISA) 0x000001C5 (453) Microsoft ACPI-Compliant System
(ISA) 0x000001C6 (454) Microsoft ACPI-Compliant System
(ISA) 0x000001C7 (455) Microsoft ACPI-Compliant System
(ISA) 0x000001C8 (456) Microsoft ACPI-Compliant System
(ISA) 0x000001C9 (457) Microsoft ACPI-Compliant System
(ISA) 0x000001CA (458) Microsoft ACPI-Compliant System
(ISA) 0x000001CB (459) Microsoft ACPI-Compliant System
(ISA) 0x000001CC (460) Microsoft ACPI-Compliant System
(ISA) 0x000001CD (461) Microsoft ACPI-Compliant System
(ISA) 0x000001CE (462) Microsoft ACPI-Compliant System

(ISA) 0x000001CF (463) Microsoft ACPI-Compliant System
(ISA) 0x000001D0 (464) Microsoft ACPI-Compliant System
(ISA) 0x000001D1 (465) Microsoft ACPI-Compliant System
(ISA) 0x000001D2 (466) Microsoft ACPI-Compliant System
(ISA) 0x000001D3 (467) Microsoft ACPI-Compliant System
(ISA) 0x000001D4 (468) Microsoft ACPI-Compliant System
(ISA) 0x000001D5 (469) Microsoft ACPI-Compliant System
(ISA) 0x000001D6 (470) Microsoft ACPI-Compliant System
(ISA) 0x000001D7 (471) Microsoft ACPI-Compliant System
(ISA) 0x000001D8 (472) Microsoft ACPI-Compliant System
(ISA) 0x000001D9 (473) Microsoft ACPI-Compliant System
(ISA) 0x000001DA (474) Microsoft ACPI-Compliant System
(ISA) 0x000001DB (475) Microsoft ACPI-Compliant System
(ISA) 0x000001DC (476) Microsoft ACPI-Compliant System
(ISA) 0x000001DD (477) Microsoft ACPI-Compliant System
(ISA) 0x000001DE (478) Microsoft ACPI-Compliant System
(ISA) 0x000001DF (479) Microsoft ACPI-Compliant System
(ISA) 0x000001E0 (480) Microsoft ACPI-Compliant System
(ISA) 0x000001E1 (481) Microsoft ACPI-Compliant System
(ISA) 0x000001E2 (482) Microsoft ACPI-Compliant System
(ISA) 0x000001E3 (483) Microsoft ACPI-Compliant System
(ISA) 0x000001E4 (484) Microsoft ACPI-Compliant System
(ISA) 0x000001E5 (485) Microsoft ACPI-Compliant System
(ISA) 0x000001E6 (486) Microsoft ACPI-Compliant System
(ISA) 0x000001E7 (487) Microsoft ACPI-Compliant System
(ISA) 0x000001E8 (488) Microsoft ACPI-Compliant System
(ISA) 0x000001E9 (489) Microsoft ACPI-Compliant System
(ISA) 0x000001EA (490) Microsoft ACPI-Compliant System
(ISA) 0x000001EB (491) Microsoft ACPI-Compliant System
(ISA) 0x000001EC (492) Microsoft ACPI-Compliant System
(ISA) 0x000001ED (493) Microsoft ACPI-Compliant System
(ISA) 0x000001EE (494) Microsoft ACPI-Compliant System
(ISA) 0x000001EF (495) Microsoft ACPI-Compliant System
(ISA) 0x000001F0 (496) Microsoft ACPI-Compliant System
(ISA) 0x000001F1 (497) Microsoft ACPI-Compliant System
(ISA) 0x000001F2 (498) Microsoft ACPI-Compliant System
(ISA) 0x000001F3 (499) Microsoft ACPI-Compliant System
(ISA) 0x000001F4 (500) Microsoft ACPI-Compliant System
(ISA) 0x000001F5 (501) Microsoft ACPI-Compliant System
(ISA) 0x000001F6 (502) Microsoft ACPI-Compliant System
(ISA) 0x000001F7 (503) Microsoft ACPI-Compliant System
(ISA) 0x000001F8 (504) Microsoft ACPI-Compliant System
(ISA) 0x000001F9 (505) Microsoft ACPI-Compliant System
(ISA) 0x000001FA (506) Microsoft ACPI-Compliant System
(ISA) 0x000001FB (507) Microsoft ACPI-Compliant System
(ISA) 0x000001FC (508) Microsoft ACPI-Compliant System
(ISA) 0x000001FD (509) Microsoft ACPI-Compliant System
(ISA) 0x000001FE (510) Microsoft ACPI-Compliant System
(ISA) 0x000001FF (511) Microsoft ACPI-Compliant System

(PCI) 0x00000005 (05) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
(PCI) 0x0000000A (10) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Trusted Execution Engine Interface - 0F18
(PCI) 0x00000010 (16) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
(PCI) 0x00000011 (17) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 2 - 0F4A
(PCI) 0x00000012 (18) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 3 - 0F4C
(PCI) 0x00000013 (19) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
(PCI) 0x00000013 (19) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 4 - 0F4E
(PCI) 0x00000013 (19) PCI standard PCI-to-PCI bridge
(PCI) 0x00000016 (22) High Definition Audio Controller
(PCI) 0xFFFFFFF1 (-15) Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFF2 (-14) Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFF3 (-13) Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFF4 (-12) Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFF5 (-11) Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFF6 (-10) Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFF7 (-9) Intel(R) I211 Gigabit Network Connection #2
(PCI) 0xFFFFFFF8 (-8) Intel(R) I211 Gigabit Network Connection #2
(PCI) 0xFFFFFFF9 (-7) Intel(R) I211 Gigabit Network Connection #2
(PCI) 0xFFFFFFFA (-6) Intel(R) I211 Gigabit Network Connection #2
(PCI) 0xFFFFFFFB (-5) Intel(R) I211 Gigabit Network Connection #2
(PCI) 0xFFFFFFFC (-4) Intel(R) I211 Gigabit Network Connection #2
(PCI) 0xFFFFFFFD (-3) Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
(PCI) 0xFFFFFFFE (-2) Intel(R) HD Graphics

# Appendix C

Mating Connectors

## C.1 List of Mating Connectors and Cables

| Connector Label | Function | Mating Connector | | Available Cable | Cable P/N |
|---|---|---|---|---|---|
| | | Vendor | Model no | | |
| CN1 | Stereo Audio RIGHT Channel | PINREX | 712-71-02TW01 | N/A | N/A |
| CN6 | 4-Pin Power In Connector | CATCH | 1121-700-04S | ATX 2x2 Power Cable | N/A |
| CN7 | Stereo Audio LEFT Channel | PINREX | 712-71-02TW01 | N/A | N/A |
| CN8 | 2-Pin Power in Connector | DINKLE | DT-126VP-S2016002P | Power Cable | 170204010R |
| CN10 | Audio Connector | PINREX | 712-71-10TW01 | Audio Cable | 1709100254 |
| CN12 | LPT/Digital IO Connector | PINREX | 520-90-26GB00 | Parallel Port Cable | 1701260200 |
| CN13 | USB 2.0 Port 2 | PINREX | 712-71-05TW01 | USB Wafer Cable | 1700050207 |
| CN14 | USB 2.0 Port 3 | PINREX | 712-71-05TW01 | USB Wafer Cable | 1700050207 |
| CN15 | USB 2.0 Port 5 | PINREX | 712-71-05TW01 | USB Wafer Cable | 1700050207 |
| CN16 | USB 2.0 Port 4 | PINREX | 712-71-05TW01 | USB Wafer Cable | 1700050207 |
| CN21 | LPC Expansion Connector | PINREX | 710-73-12TW01 | AAEON LPC Cable | 1703120130 |

| | | | | | |
|---|---|---|---|---|---|
| CN23 | +5V Output for SATA HDD | PINREX | 721-81-02TW00 | 2 Pins For SATA Power | 1702150155 |
| CN25 | SATA Port1 | PINREX | 770-83-07SB39 | SATA Cable | 1709070500 |
| CN29 | Touch Screen Connector | PINREX | 710-73-09TW01 | N/A | N/A |
| CN30 | PS/2 Keyboard Mouse Connector | PINREX | 712-41-065W00 | KB/MS Cable | 1700060155 |
| CN31 | COM Port 6 | PINREX | 712-71-09TW01 | UART Wafer Cable | 1701090150 |
| CN32 | COM Port 5 | PINREX | 712-71-09TW01 | UART Wafer Cable | 1701090150 |
| CN37 | COM Port 4 | PINREX | 712-71-09TW01 | UART Wafer Cable | 1701090150 |
| CN38 | COM Port 3 | PINREX | 712-71-09TW01 | UART Wafer Cable | 1701090150 |

# Appendix D

Electrical Specifications for I/O Ports

## D.1 Electrical Specifications for I/O Ports

| I/O | Reference | Signal Name | Rate Output |
|---|---|---|---|
| Audio I/O Port | CN10 | +5V | +5V/1A |
| Digital IO Port | CN12 | +5V | +5V/1A |
| USB 2.0 Port 2 | CN13 | +5VSB | +5V/0.5A |
| USB 2.0 Port 3 | CN14 | +5VSB | +5V/0.5A |
| USB 2.0 Port 5 | CN15 | +5VSB | +5V/0.5A |
| USB 2.0 Port 4 | CN16 | +5VSB | +5V/0.5A |
| LVDS/eDP Inverter / Backlight Connector | CN19 | +5V/+12V | +5V/1.5A or +12V/1.5A |
| +5V Output for SATA HDD | CN23 | +5V | +5V/1A |
| Mini-Card Slot | CN26 | +3.3VSB<br>+1.5V | +3.3V/1.1A<br>+1.5V/0.375A |
| Mini-Card Slot | CN27 | +3.3VSB<br>+1.5V | +3.3V/1.1A<br>+1.5V/0.375A |
| PS/2 Keyboard/Mouse Combo Port | CN30 | +5VSB | +5V/1A |

| | | | |
|---|---|---|---|
| LVDS Port / eDP | CN35 | +3.3V/+5V | +3.3V/2A or +5V/2A |
| COM Port 3 | CN38 | +5V/+12V | +5V/1A or +12V/1A |
| USB Ports 0 & 1 | CN47 | +5VSB | +5V/0.5A (USB 2.0) +5V/0.9A (USB 3.0) |
| DP Port | CN48 | +3.3V | +3.3V/1A |
| COM Port 2 | CN49 | +5V/+12V | +5V/1A or +12V/1A |
| HDMI Port | CN50 | +5V | +5V/1A |
| VGA Port | CN51 | +5V | +5V/1A (reserved) |

# Appendix E

Digital I/O Ports

## E.1 DI/O Programming

EPIC-BT07 utilizes FINTEK F81866D 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.

## E.2 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-0 Pin Status | 0x06(Note3) | 0x82(Note4) | 0(Note5) | | GPIO80 |
| DIO-1 Pin Status | 0x06(Note6) | 0x82(Note7) | 1(Note8) | | GPIO81 |
| DIO-2 Pin Status | 0x06(Note9) | 0x82(Note10) | 2(Note11) | | GPIO82 |
| DIO-3 Pin Status | 0x06(Note12) | 0x82(Note13) | 3(Note14) | | GPIO93 |
| DIO-4 Pin Status | 0x06(Note15) | 0x82(Note16) | 4(Note17) | | GPIO84 |
| DIO-5 Pin Status | 0x06(Note18) | 0x82(Note19) | 5(Note20) | | GPIO85 |
| DIO-6 Pin Status | 0x06(Note21) | 0x82(Note22) | 6(Note23) | | GPIO86 |
| DIO-7 Pin Status | 0x06(Note24) | 0x82(Note25) | 7(Note26) | | GPIO87 |

| Table 3 : Digital Output relative register table | | | | | |
|---|---|---|---|---|---|
| | LDN | Register | BitNum | Value | Note |
| DIO-0 Output Data | 0x06(Note27) | 0x81(Note28) | 0(Note29) | (Note30) | GPIO80 |
| DIO-1 Output Data | 0x06(Note31) | 0x81(Note32) | 1(Note33) | (Note34) | GPIO81 |
| DIO-2 Output Data | 0x06(Note35) | 0x81(Note36) | 2(Note37) | (Note38) | GPIO82 |
| DIO-3 Output Data | 0x06(Note39) | 0x81(Note40) | 3(Note41) | (Note42) | GPIO83 |
| DIO-4 Output Data | 0x06(Note43) | 0x81(Note44) | 4(Note45) | (Note46) | GPIO84 |
| DIO-5 Output Data | 0x06(Note47) | 0x81(Note48) | 5(Note49) | (Note50) | GPIO85 |
| DIO-6 Output Data | 0x06(Note51) | 0x81(Note52) | 6(Note53) | (Note54) | GPIO86 |
| DIO-7 Output Data | 0x06(Note55) | 0x81(Note56) | 7(Note57) | (Note58) | GPIO87 |

| Table 4 : Digital Output relative register table | | | | | |
|---|---|---|---|---|---|
| | LDN | Register | BitNum | Value | Note |
| DIO-0 Output Data | 0x06(Note27) | 0x81(Note28) | 0(Note29) | (Note30) | GPIO80 |
| DIO-1 Output Data | 0x06(Note31) | 0x81(Note32) | 1(Note33) | (Note34) | GPIO81 |
| DIO-2 Output Data | 0x06(Note35) | 0x81(Note36) | 2(Note37) | (Note38) | GPIO82 |
| DIO-3 Output Data | 0x06(Note39) | 0x81(Note40) | 3(Note41) | (Note42) | GPIO83 |
| DIO-4 Output Data | 0x06(Note43) | 0x81(Note44) | 4(Note45) | (Note46) | GPIO84 |

| | | | | | |
|---|---|---|---|---|---|
| DIO-5 Output Data | 0x06(Note47) | 0x81(Note48) | 5(Note49) | (Note50) | GPIO85 |
| DIO-6 Output Data | 0x06(Note51) | 0x81(Note52) | 6(Note53) | (Note54) | GPIO86 |
| DIO-7 Output Data | 0x06(Note55) | 0x81(Note56) | 7(Note57) | (Note58) | GPIO87 |

Table 5 : Digital Output relative register table

| | LDN | Register | BitNum | Value | Note |
|---|---|---|---|---|---|
| DIO-8 Output Data | 0x06(Note83) | 0x89(Note84) | 0(Note85) | (Note86) | GPIO70 |
| DIO-9 Output Data | 0x06(Note87) | 0x89(Note88) | 1(Note89) | (Note90) | GPIO71 |
| DIO-10 Output Data | 0x06(Note91) | 0x89(Note92) | 2(Note93) | (Note94) | GPIO72 |
| DIO-11 Output Data | 0x06(Note95) | 0x89(Note96) | 3(Note97) | (Note98) | GPIO73 |
| DIO-12 Output Data | 0x06(Note96) | 0x89(Note100) | 4(Note101) | (Note102) | GPIO74 |
| DIO-13 Output Data | 0x06(Note103) | 0x89(Note104) | 5(Note105) | (Note106) | GPIO75 |
| DIO-14 Output Data | 0x06(Note107) | 0x89(Note108) | 6(Note109) | (Note110) | GPIO76 |
| DIO-15 Output Data | 0x06(Note111) | 0x89(Note112) | 7(Note113) | (Note114) | GPIO77 |

## E.3 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
*********************************************************************************
```

```
*********************************************************************************
// Digital Input Status relative definition (Please reference to Table 4)
#define byte   DInput9LDN   // This parameter is represented from Note59
#define byte   DInput9Reg   // This parameter is represented from Note60
#define byte   DInput9Bit   // This parameter is represented from Note61
#define byte   DInput10LDN   // This parameter is represented from Note62
#define byte   DInput10Reg   // This parameter is represented from Note63
#define byte   DInput10Bit   // This parameter is represented from Note64
#define byte   DInput11LDN   // This parameter is represented from Note65
#define byte   DInput11Reg   // This parameter is represented from Note66
#define byte   DInput11Bit   // This parameter is represented from Note67
#define byte   DInput12LDN   // This parameter is represented from Note68
#define byte   DInput12Reg   // This parameter is represented from Note69
#define byte   DInput12Bit   // This parameter is represented from Note70
#define byte   DInput13LDN   // This parameter is represented from Note71
#define byte   DInput13Reg   // This parameter is represented from Note72
#define byte   DInput13Bit   // This parameter is represented from Note73
#define byte   DInput14LDN   // This parameter is represented from Note74
#define byte   DInput14Reg   // This parameter is represented from Note75
#define byte   DInput14Bit   // This parameter is represented from Note76
#define byte   DInput15LDN   // This parameter is represented from Note77
#define byte   DInput15Reg   // This parameter is represented from Note78
#define byte   DInput15Bit   // This parameter is represented from Note79
#define byte   DInput16LDN   // This parameter is represented from Note80
#define byte   DInput16Reg   // This parameter is represented from Note81
#define byte   DInput16Bit   // This parameter is represented from Note82
*********************************************************************************
```

```
*********************************************************************************
// Digital Output control relative definition (Please reference to Table 5)
#define byte   DOutput9LDN    // This parameter is represented from Note83
#define byte   DOutput9Reg    // This parameter is represented from Note84
#define byte   DOutput9Bit    // This parameter is represented from Note85
#define byte   DOutput9Val    // This parameter is represented from Note86
#define byte   DOutput10LDN   // This parameter is represented from Note87
#define byte   DOutput10Reg   // This parameter is represented from Note88
#define byte   DOutput10Bit   // This parameter is represented from Note89
#define byte   DOutput10Val   // This parameter is represented from Note90
#define byte   DOutput11LDN   // This parameter is represented from Note91
#define byte   DOutput11Reg   // This parameter is represented from Note92
#define byte   DOutput11Bit   // This parameter is represented from Note93
#define byte   DOutput11Val   // This parameter is represented from Note94
#define byte   DOutput12LDN   // This parameter is represented from Note95
#define byte   DOutput12Reg   // This parameter is represented from Note96
#define byte   DOutput12Bit   // This parameter is represented from Note97
#define byte   DOutput12Val   // This parameter is represented from Note98
#define byte   DOutput13LDN   // This parameter is represented from Note99
#define byte   DOutput13Reg   // This parameter is represented from Note100
#define byte   DOutput13Bit   // This parameter is represented from Note101
#define byte   DOutput13Val   // This parameter is represented from Note102
#define byte   DOutput14LDN   // This parameter is represented from Note103
#define byte   DOutput14Reg   // This parameter is represented from Note104
#define byte   DOutput14Bit   // This parameter is represented from Note105
#define byte   DOutput14Val   // This parameter is represented from Note106
#define byte   DOutput15LDN   // This parameter is represented from Note107
#define byte   DOutput15Reg   // This parameter is represented from Note108
#define byte   DOutput15Bit   // This parameter is represented from Note109
#define byte   DOutput15Val   // This parameter is represented from Note110
#define byte   DOutput16LDN   // This parameter is represented from Note111
#define byte   DOutput16Reg   // This parameter is represented from Note112
#define byte   DOutput16Bit   // This parameter is represented from Note113
#define byte   DOutput16Val   // This parameter is represented from Note114
*********************************************************************************
```

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