

# EMX-Q170P

Intel® Core™ Processors with Intel® Q170 Mini ITX  
Motherboard

## User's Manual



5<sup>th</sup> Ed – 17 August 2017

## 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.
- (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

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## Notice

This guide is designed for experienced users to setup the system within the shortest time. For detailed information, please always refer to the electronic user's manual.

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3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your good return more quickly.
4. Carefully pack the defective product, a complete Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

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# 1. Getting Started

## 1.1 Safety Precautions

### Warning!



Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

### Caution!



Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

## 1.2 Packing List

Before you begin installing your single board, please make sure that the following materials have been shipped:

- 1 x EMX-Q170P motherboard
- 2 x SATA cable
- 1 x I/O Shield



If any of the above items is damaged or missing, contact your retailer.

### 1.3 Document Amendment History

| Revision        | Date          | By     | Comment                      |
|-----------------|---------------|--------|------------------------------|
| 1 <sup>st</sup> | December 2015 | Avalue | Initial Release              |
| 2 <sup>nd</sup> | May 2016      | Avalue | Update BIOS Setup            |
| 3 <sup>rd</sup> | October 2016  | Avalue | Update BIOS Setup            |
| 4 <sup>th</sup> | January 2017  | Avalue | Update BIOS Setup            |
| 5 <sup>th</sup> | August 2017   | Avalue | Update System Specifications |

### 1.4 Manual Objectives

This manual describes in details Avalue Technology EMX-Q170P Single Board.

We have tried to include as much information as possible but we have not duplicated information that is provided in the standard IBM Technical References, unless it proved to be necessary to aid in the understanding of this board.

We strongly recommend that you study this manual carefully before attempting to set up EMX-Q170P or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors regarding this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

## 1.5 System Specifications

| System                        |                                                                                                                                                                                                                                                                                                             |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CPU</b>                    | Intel® LGA1151 Socket Supports 6th Generation Core™ i7/ i5/ i3 Processors (Max. TDP at 95W)                                                                                                                                                                                                                 |
| <b>BIOS</b>                   | AMI uEFI BIOS, 128Mbit SPI Flash ROM                                                                                                                                                                                                                                                                        |
| <b>System Chipset</b>         | Intel® Q170 Express Chipset                                                                                                                                                                                                                                                                                 |
| <b>I/O Chip</b>               | Nuvoton® NCT6106D                                                                                                                                                                                                                                                                                           |
| <b>System Memory</b>          | Two 260-pin DDR4 2133MHz SO-DIMM socket, supports up to 32GB Max                                                                                                                                                                                                                                            |
| <b>Watchdog Timer</b>         | H/W Reset, 5~255 seconds/5~255 minutes                                                                                                                                                                                                                                                                      |
| <b>H/W Status Monitor</b>     | CPU temperature monitoring<br>Voltages monitoring<br>CPU fan speed control                                                                                                                                                                                                                                  |
| <b>Expansion</b>              | 1 x PCI-e x 16<br>1 x Full Size Mini-PCI-e with mSATA Support (SATA III)<br>1 x Half Size Mini PCI-e                                                                                                                                                                                                        |
| <b>S3/S4</b>                  | Yes (S0/S3/S4/S5)                                                                                                                                                                                                                                                                                           |
| Display                       |                                                                                                                                                                                                                                                                                                             |
| <b>Chipset</b>                | Intel® Q170 Express chipset                                                                                                                                                                                                                                                                                 |
| <b>Resolution</b>             | VGA: 2048 x 1536@50 Hz<br>HDMI: 4096 x 2160@24 Hz, 2560 x 1600@60 Hz<br>DP: 4096 x 2304@60Hz                                                                                                                                                                                                                |
| <b>Multiple Display</b>       | Triple Display                                                                                                                                                                                                                                                                                              |
| Audio                         |                                                                                                                                                                                                                                                                                                             |
| <b>Audio Codec</b>            | Realtek ALC892 HD Audio Decoding Controller with 6W Amplifier                                                                                                                                                                                                                                               |
| Ethernet                      |                                                                                                                                                                                                                                                                                                             |
| <b>LAN Chip</b>               | 1 x Intel® I219LM PCI-e Gigabit Ethernet PHY<br>1 x Intel® I211AT PCI-e Gigabit Ethernet                                                                                                                                                                                                                    |
| Internal I/O Connectors       |                                                                                                                                                                                                                                                                                                             |
| <b>Internal I/O Connector</b> | Storage:<br>- 1 x SATA III or 1 x full size Mini PCI-e support mSATA by auto switch IC<br>- 5 x SATA III<br>UEFI Win 8.1 FTPM<br>Onboard Infineon SLB9665 support TPM 2.0<br>COM 1 Pin9 power selection:<br>- 1 x 2 x 3 pin, pitch 2.00mm connector for COM1 support RS232 with Pin 9,+5V/+12V/RI<br>COM 2: |

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|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | <ul style="list-style-type: none"> <li>- 1 x 2 x 3 pin, pitch 2.00mm connector for COM2 support RS232 with Pin 9, +5V/+12V/RI</li> <li>- 1 x 2 x 3 pin, pitch 2.00mm connector for COM2: support RS422/485 connector, Pin 5 with +5V</li> <li>COM3~6: <ul style="list-style-type: none"> <li>- 4 x 2 x 5 pin, pitch 2.00mm connector for COM3~6: support RS-232 connector</li> </ul> </li> <li>3 x 2 x 5 pin, pitch 2.54mm connector for 6 USB 2.0</li> <li>1 x 2 x 20 pin, pitch 1.25mm connector for LVDS</li> <li>1 x 1 x 5 pin, pitch 2.00mm Wafer connector for LCD inverter backlight connector (5V/12V)</li> <li>1 x 1 x 4 pin, pitch 2.54mm CPU fan connector with smart fan function supported</li> <li>1 x 1 x 4 pin, pitch 2.54mm System fan connector with smart fan function supported</li> <li>1 x 2 x 5 pin, pitch 2.54mm connector for front panel</li> <li>2 x 1 x 2 pin, pitch 2.00mm connector for LAN1 &amp; LAN2 Activity Indicator LED</li> <li>1 x 2 x 5 pin, pitch 2.54mm connector for front Audio</li> <li>1 x 4 pin, pitch wafer 2.00mm connector for 6W x 2 Speaker</li> <li>1 x 1 x 3 pin, pitch 2.54mm connector for COMS Clear</li> <li>1 x 2 Pin Pitch 1.25mm Vertical type battery connector</li> <li>1 x 2 x 6 pin, pitch 2.00mm connector for 8 bits GPIO</li> <li>1 x 2 x 3 pin, pitch 2.00mm connector for SGPIO</li> <li>1 x 2 x 4 pin, pitch 2.00mm connector for BIOS SPI</li> <li>1 x 2 x 5 pin, pitch 2.0mm connector for LPC</li> <li>Onboard buzzer</li> <li>1 x 1 x 3 pin pitch 2.00mm connector for AT/ATX jumper</li> <li>1 x 2 x 10 pin ATX power connector</li> <li>1 x 2 x 2 pin ATX 12V power connector</li> </ul> |
| <b>Rear I/O Connectors</b>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Rear Side External I/O Connector</b> | <ul style="list-style-type: none"> <li>2 x RJ-45 with Dual deck USB 3.0 connector</li> <li>1 x VGA</li> <li>1 x DP</li> <li>1 x HDMI</li> <li>COM1 support RS-232 DB9 connector, Pin 9 with /+5V/+12V/RI Supported</li> <li>1 x Line-out, 1 x Mic-In, 1 x Line-in</li> <li>1 x PS2 Keyboard or PS2 Mouse with Dual deck USB 2.0</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Mechanical &amp; Environmental</b>   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Power Requirement</b>                | +12V/+5V/5VSB/+3.3V/-12V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>ACPI</b>                             | Single power ATX Support S0, S3, S4, S5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

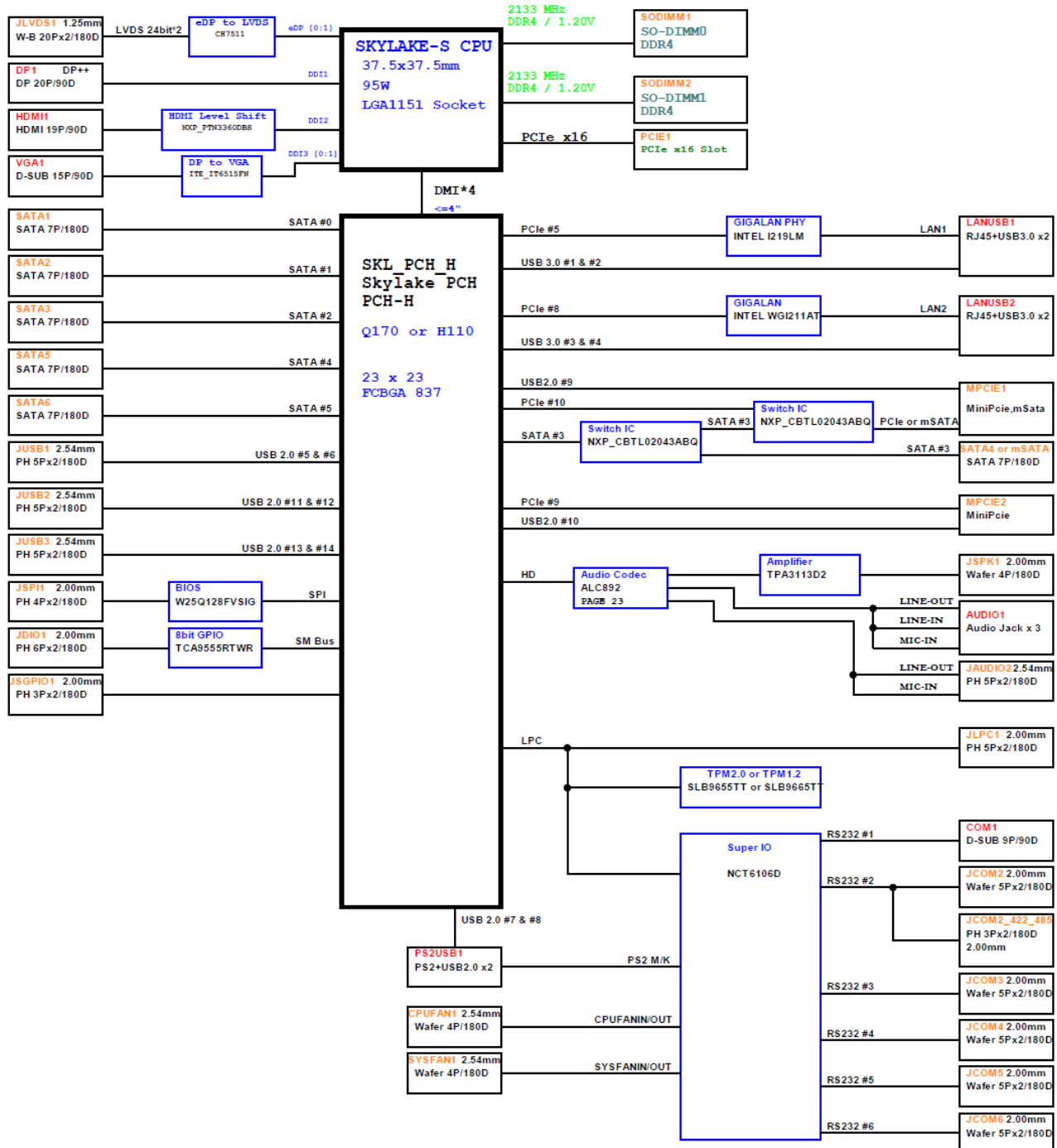
|                           |                                            |
|---------------------------|--------------------------------------------|
| <b>Power on Type</b>      | AT / ATX mode Switchable Through Jumper    |
| <b>Operating Temp.</b>    | 0 ~ 60°C (32~140°F)                        |
| <b>Storage Temp.</b>      | -40 ~ 75°C                                 |
| <b>Operating Humidity</b> | 0% ~ 90% relative humidity, non-condensing |
| <b>Size (L x W)</b>       | 6.7" x 6.7" (170mm x 170mm)                |
| <b>Weight</b>             | 0.40 kg                                    |

**Note:**

1. The Windows 7 & Windows 8 must be Setup USB 3.0 driver.
2. Specifications are subject to change without notice.

## 1.6 Architecture Overview—Block Diagram

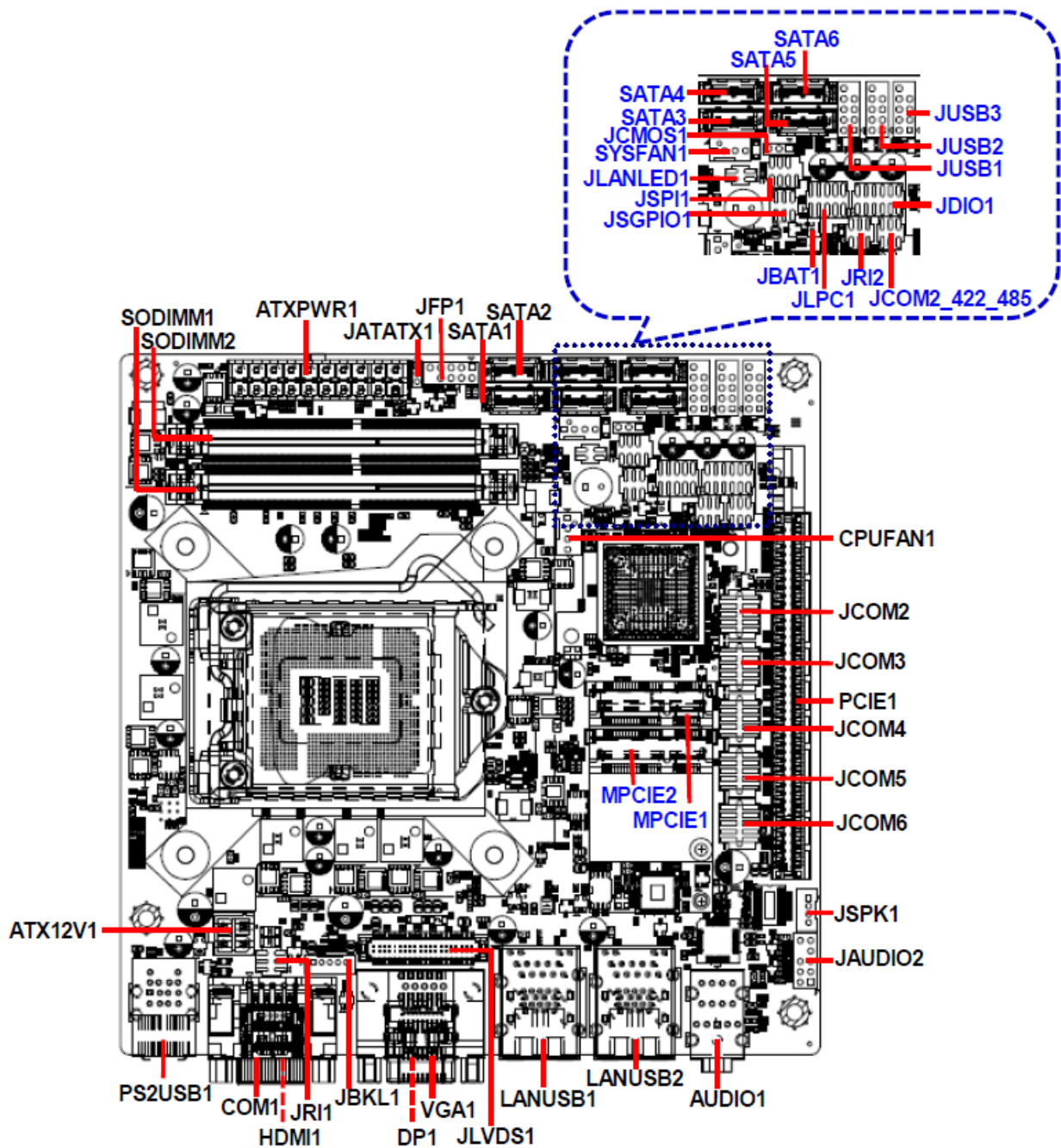
The following block diagram shows the architecture and main components of EMX-Q170P.



## 2. Hardware Configuration

---

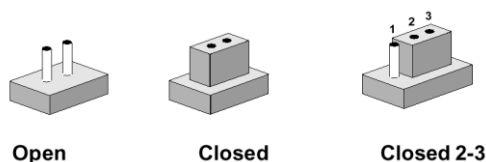
## 2.1 Product Overview



## 2.2 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip. To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



The jumper settings are schematically depicted in this manual as follows:



A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

The following tables list the function of each of the board's jumpers and connectors.

### Jumpers

| Label   | Function                           | Note                       |
|---------|------------------------------------|----------------------------|
| JRI1/2  | Serial port 1/2 pin9 signal select | 3 x 2 header, pitch 2.00mm |
| JATATX1 | AT/ATX Power Mode Select           | 3 x 1 header, pitch 2.00mm |
| JCMOS1  | Clear CMOS                         | 3 x 1 header, pitch 2.54mm |

### Connectors

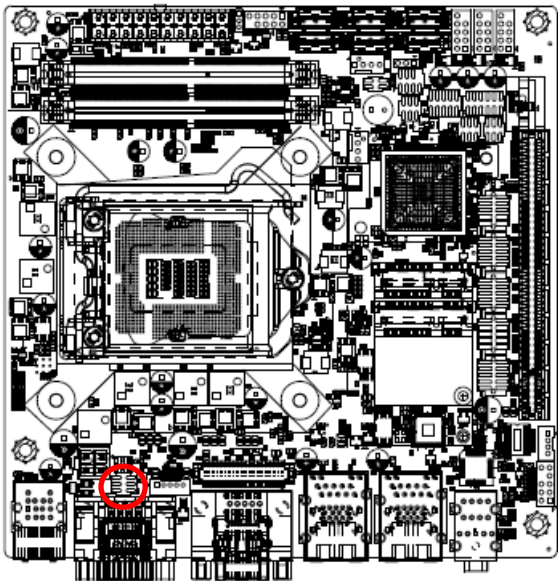
| Label     | Function                      | Note                        |
|-----------|-------------------------------|-----------------------------|
| CPUFAN1   | CPU fan connector             | 4 x 1 wafer, pitch 2.54mm   |
| SYSFAN1   | System fan connector          | 4 x 1 wafer, pitch 2.54mm   |
| JFP1      | Front panel setting connector | 5 x 2 header, pitch 2.54 mm |
| SODIMM1/2 | 260-pin DDR4 DIMM socket      |                             |
| AUDIO1    | Line out, Mic in, Line out    |                             |
| JAUDIO2   | Front Audio connector         | 5 x 2 header, pitch 2.54 mm |

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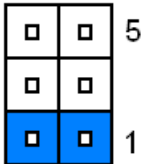
|                      |                                                                      |                                |
|----------------------|----------------------------------------------------------------------|--------------------------------|
| <b>JBKL1</b>         | LCD Inverter connector                                               | 5 x 1 wafer, pitch 2.00mm      |
| <b>JSPI1</b>         | SPI connector                                                        | 4 x 2 header, pitch 2.00mm     |
| <b>COM1</b>          | Serial Port 1 connector                                              | D-sub 9 pin, male              |
| <b>JCOM2/3/4/5/6</b> | Serial Port 2/3/4/5/6 connector                                      | 5 x 2 wafer, pitch 2.00mm      |
| <b>JCOM2_422_485</b> | COM2 RS485/422 connector                                             | 3 x 2 header, pitch 2.00 mm    |
| <b>JDIO1</b>         | General purpose I/O connector                                        | 6 x 2 header, pitch 2.00mm     |
| <b>JSGPIO1</b>       | SGPIO connector                                                      | 3 x 2 header, pitch 2.00 mm    |
| <b>JSPK1</b>         | Amplifier connector                                                  | 1 x 4 wafer, pitch 2.00 mm     |
| <b>JLVDS1</b>        | LVDS Connector                                                       | DIN 40-pin wafer, pitch 1.25mm |
| <b>PS2USB1</b>       | PS/2 keyboard or mouse connector<br>2 x USB 2.0 connector            |                                |
| <b>LANUSB1/2</b>     | 2 x RJ-45 with Dual deck USB 3.0 connector                           |                                |
| <b>JUSB1</b>         | USB 2.0 connector 1                                                  | 5 x 2 header, pitch 2.54mm     |
| <b>JUSB2</b>         | USB 2.0 connector 2                                                  | 5 x 2 header, pitch 2.54mm     |
| <b>JUSB3</b>         | USB 2.0 connector 3                                                  | 5 x 2 header, pitch 2.54mm     |
| <b>JLPC1</b>         | LPC connector                                                        | 5 x 2 header, pitch 2.00mm     |
| <b>PCIE1</b>         | PCI-e x 16 connector                                                 |                                |
| <b>JLANLED1</b>      | LAN1& LAN 2 active LED connector                                     | 2 x 2 header, pitch 2.00 mm    |
| <b>JBAT1</b>         | Battery connector                                                    | 2 x 1 wafer, pitch 1.25mm      |
| <b>MPCIE1/2</b>      | Full size Mini-PCI-e connector 1<br>Half size Mini-PCI-e connector 2 |                                |
| <b>ATXPWR1</b>       | ATX Power connector                                                  | 10 x 2 wafer, pitch 4.20mm     |
| <b>ATX12V1</b>       | ATX 12V power connector                                              | 2 x 2 wafer, pitch 4.20mm      |
| <b>SATA1~6</b>       | Serial ATA III connector 1~6                                         |                                |
| <b>HDMI1</b>         | HDMI connector                                                       |                                |
| <b>DP1</b>           | DP connector                                                         |                                |
| <b>VGA1</b>          | VGA connector                                                        |                                |

2.3 Setting Jumpers & Connectors

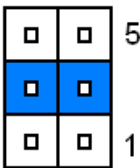
2.3.1 Serial port 1 pin9 signal select (JRI1)



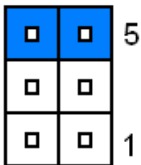
Ring\*



+5V

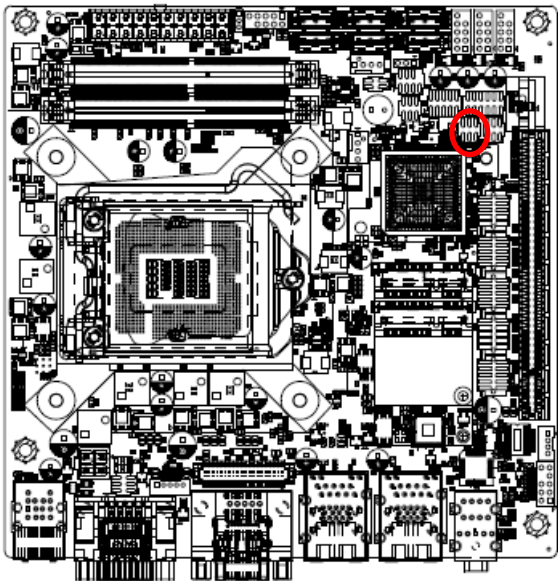


+12V

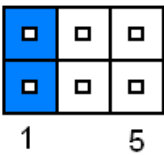


\* Default  
**Note:**  
Max Current 1A.

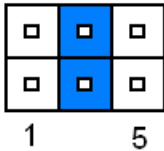
2.3.2 Serial port 2 pin9 signal select (JRI2)



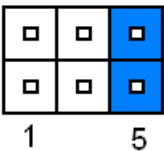
Ring\*



+5V

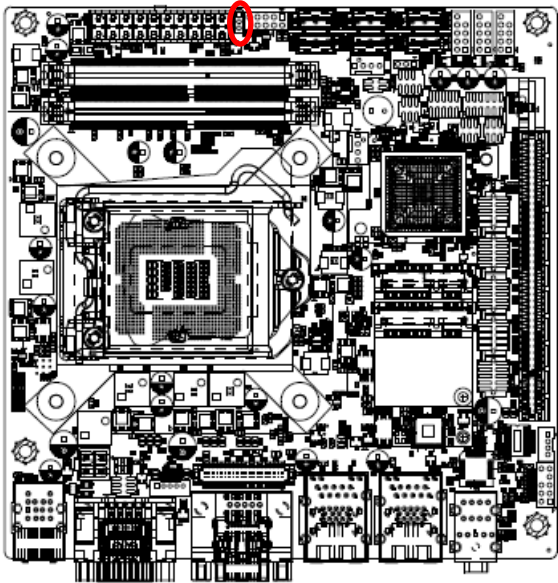


+12V

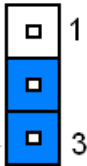


\* Default  
**Note:**  
Max Current 1A.

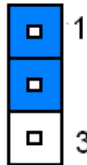
2.3.3 AT/ATX Power Mode Select (JATATX1)



ATX\*

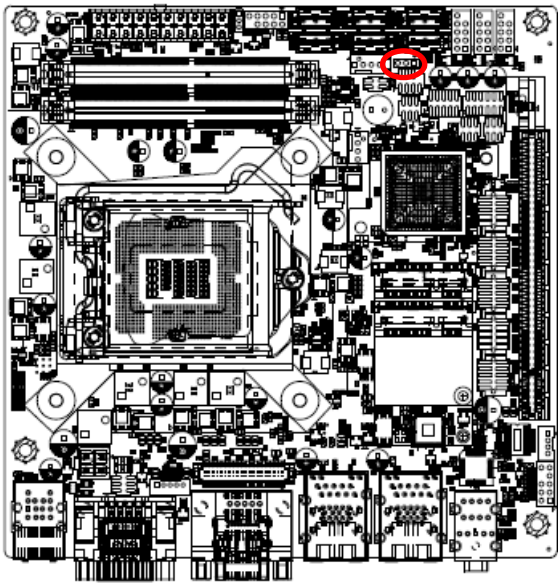


AT



\* Default

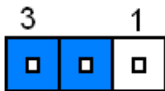
2.3.4 Clear CMOS (JCMOS1)



Protect\*

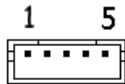
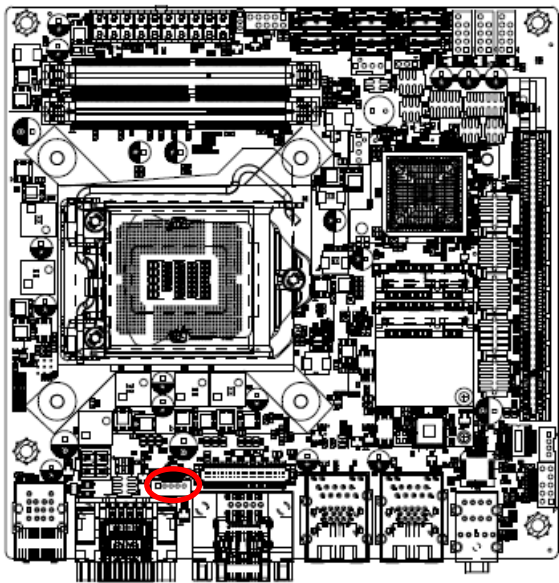


Clear CMOS



\* Default

2.3.5 LCD Inverter connector (JBKL1)

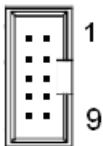
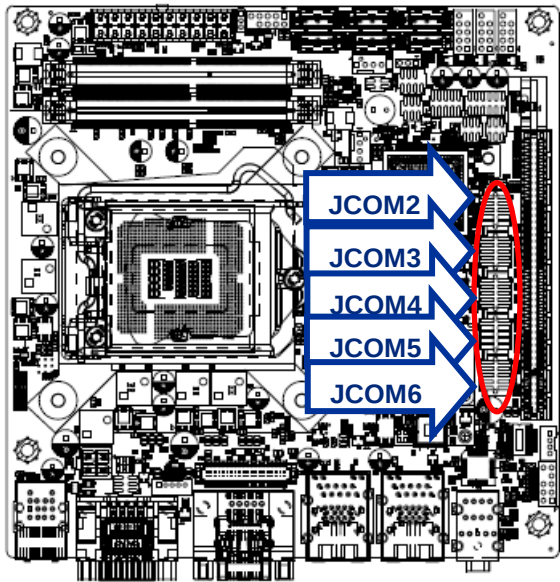


| PIN | Signal  | Max current |
|-----|---------|-------------|
| 1   | +12V    | 2A          |
| 2   | GND     |             |
| 3   | BKLEN   |             |
| 4   | VBRIGHT |             |
| 5   | +5V     | 2A          |

Note:

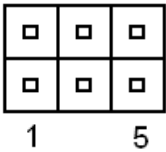
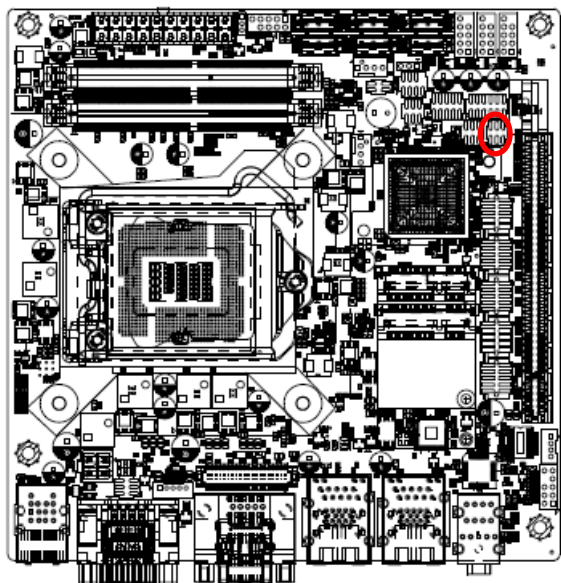
Mapping connector PHR5.

2.3.6 Serial port 2/3/4/5/6 connector (JCOM2/3/4/5/6)



| Signal | PIN | PIN | Signal |
|--------|-----|-----|--------|
| RXD    | 2   | 1   | DCD    |
| DTR    | 4   | 3   | TXD    |
| DSR    | 6   | 5   | GND    |
| CTS    | 8   | 7   | RTS    |
| NC     | 10  | 9   | RI     |

2.3.7 COM2 RS485/422 connector (JCOM2\_422\_485)



RS-422

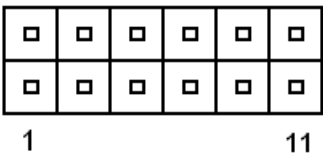
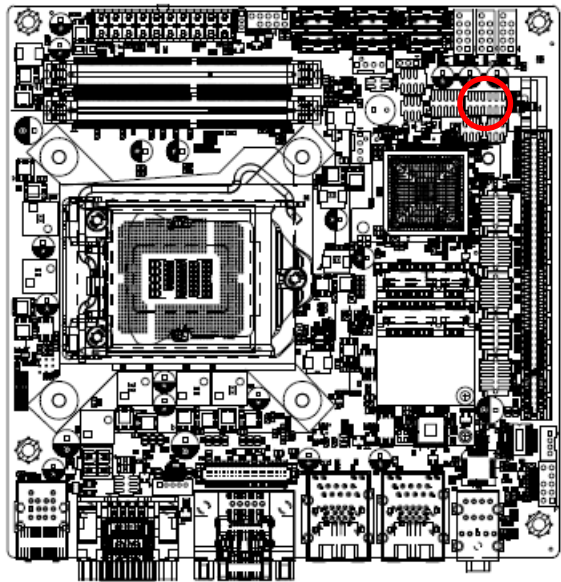
| Signal | PIN | PIN | Signal |
|--------|-----|-----|--------|
| 422TX- | 1   | 2   | 422RX- |
| 422TX+ | 3   | 4   | 422RX+ |
| +5V    | 5   | 6   | GND    |

RS-485

| Signal | PIN | PIN | Signal |
|--------|-----|-----|--------|
| DATA-  | 1   | 2   | NC     |
| DATA+  | 3   | 4   | NC     |
| +5V    | 5   | 6   | GND    |

**Note:**  
Max Current 1A.

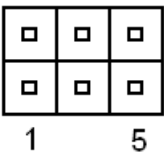
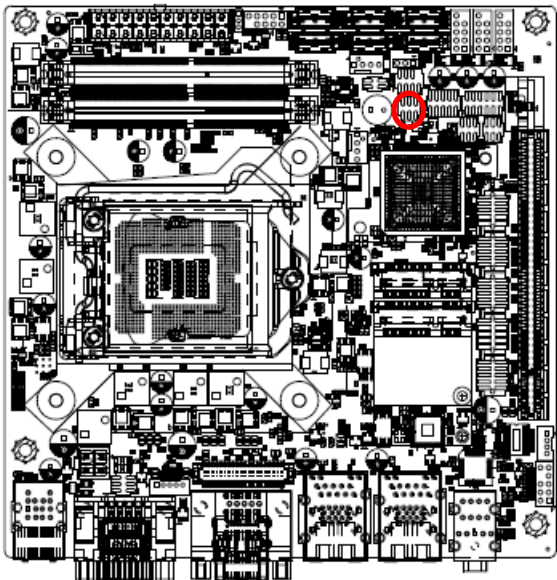
2.3.8 General purpose I/O connector (JDIO1)



| Signal       | PIN | PIN | Signal        |
|--------------|-----|-----|---------------|
| DI0          | 1   | 2   | DO0           |
| DI1          | 3   | 4   | DO1           |
| DI2          | 5   | 6   | DO2           |
| DI3          | 7   | 8   | DO3           |
| SMB_CLK_9555 | 9   | 10  | SMB_DATA_9555 |
| GND          | 11  | 12  | +5V           |

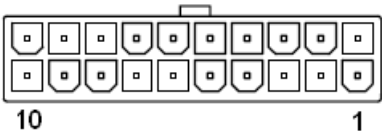
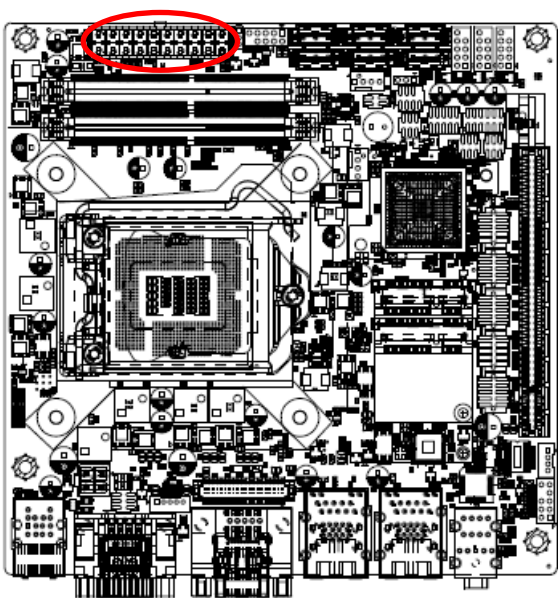
**Note:**  
Max Current 1A.

2.3.9 SGPIO connector (JSGPIO1)



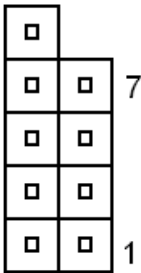
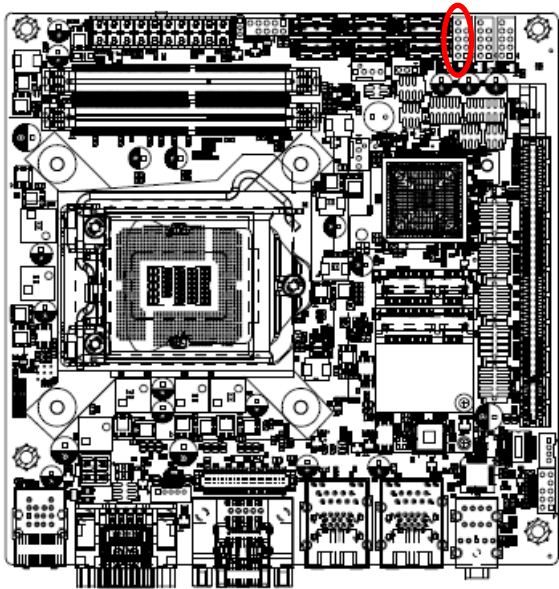
| Signal    | PIN | PIN | Signal       |
|-----------|-----|-----|--------------|
| GND       | 1   | 2   | GND          |
| SGIO_LOAD | 3   | 4   | SGIO_DATOUT0 |
| SGIO_CLK  | 5   | 6   | SGIO_DATOUT1 |

2.3.10 ATX Power connector (ATXPWR1)



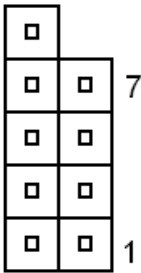
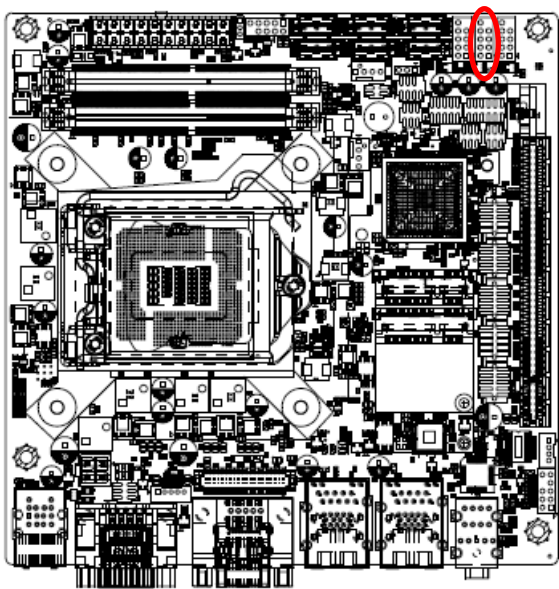
| Signal   | PIN | PIN | Signal |
|----------|-----|-----|--------|
| +3.3V    | 1   | 11  | +3.3V  |
| +3.3V    | 2   | 12  | -12V   |
| GND      | 3   | 13  | GND    |
| +5V      | 4   | 14  | PSON#  |
| GND      | 5   | 15  | GND    |
| +5V      | 6   | 16  | GND    |
| GND      | 7   | 17  | GND    |
| PG_ATX   | 8   | 18  | -5V    |
| +V5SB_DP | 9   | 19  | +5V    |
| +12V     | 10  | 20  | +5V    |

2.3.11 USB 2.0 connector 1 (JUSB1)



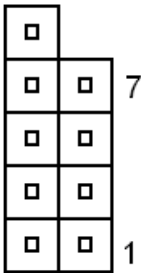
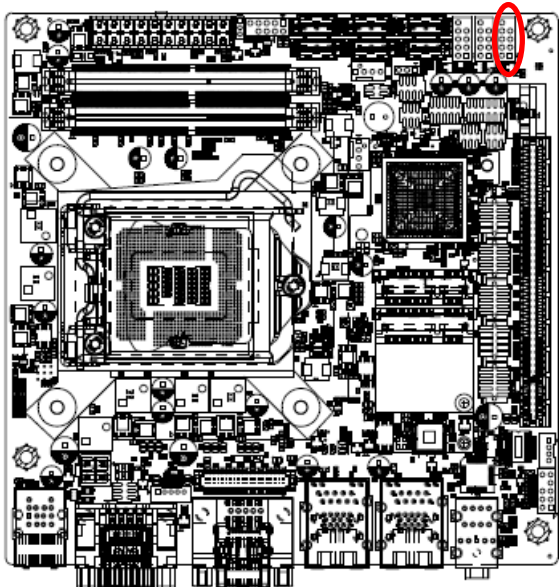
| Signal    | PIN | PIN | Signal    |
|-----------|-----|-----|-----------|
| NC        | 10  |     |           |
| GND       | 8   | 7   | GND       |
| USB_R_DP6 | 6   | 5   | USB_R_DP5 |
| USB_R_DN6 | 4   | 3   | USB_R_DN5 |
| +5V       | 2   | 1   | +5V       |

2.3.12 USB 2.0 connector 2 (JUSB2)



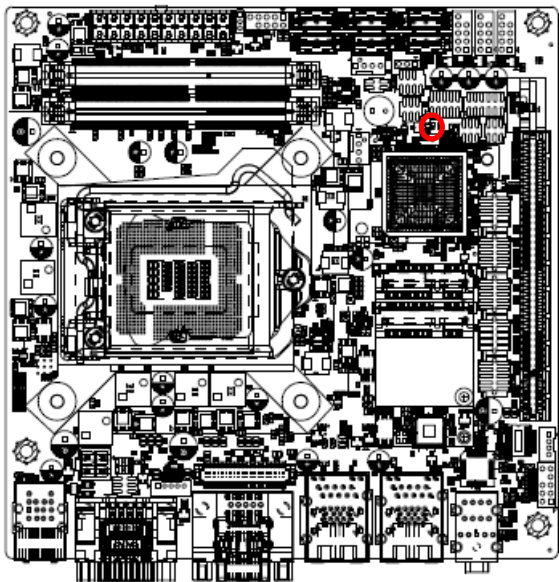
| Signal     | PIN | PIN | Signal     |
|------------|-----|-----|------------|
| NC         | 10  |     |            |
| GND        | 8   | 7   | GND        |
| USB_R_DP12 | 6   | 5   | USB_R_DP11 |
| USB_R_DN12 | 4   | 3   | USB_R_DN11 |
| +5V        | 2   | 1   | +5V        |

2.3.13 USB 2.0 connector 3 (JUSB3)



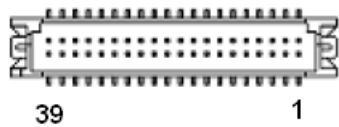
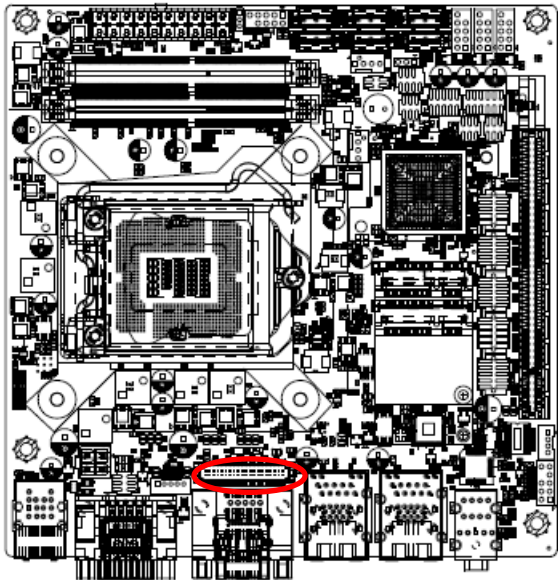
| Signal     | PIN | PIN | Signal     |
|------------|-----|-----|------------|
| NC         | 10  |     |            |
| GND        | 8   | 7   | GND        |
| USB_R_DP14 | 6   | 5   | USB_R_DP13 |
| USB_R_DN14 | 4   | 3   | USB_R_DN13 |
| +5V        | 2   | 1   | +5V        |

2.3.14 Battery connector (JBAT1)



| Signal     | PIN |
|------------|-----|
| RTC_VBAT_1 | 1   |
| GND        | 2   |

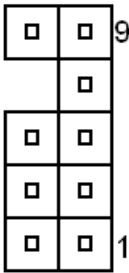
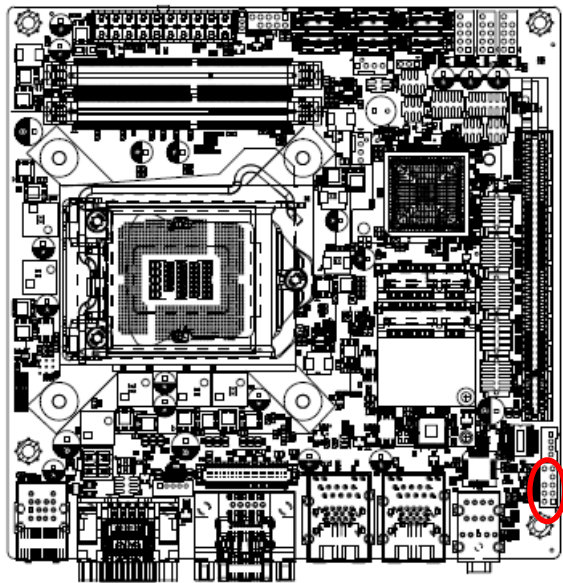
2.3.15 LVDS connector (JLVDS1)



**Note:**  
Mapping connector DF13-40DS-1.25C (1.0mm).

| Signal       | PIN | PIN | Signal       |
|--------------|-----|-----|--------------|
| +5V          | 2   | 1   | +3.3V        |
| +5V          | 4   | 3   | +3.3V        |
| NC           | 6   | 5   | NC           |
| GND          | 8   | 7   | GND          |
| LVDS_DATA0_P | 10  | 9   | LVDS_DATA1_P |
| LVDS_DATA0_N | 12  | 11  | LVDS_DATA1_N |
| GND          | 14  | 13  | GND          |
| LVDS_DATA2_P | 16  | 15  | LVDS_DATA3_P |
| LVDS_DATA2_N | 18  | 17  | LVDS_DATA3_N |
| GND          | 20  | 19  | GND          |
| LVDS_DATA4_P | 22  | 21  | LVDS_DATA5_P |
| LVDS_DATA4_N | 24  | 23  | LVDS_DATA5_N |
| GND          | 26  | 25  | GND          |
| LVDS_DATA6_P | 28  | 27  | LVDS_DATA7_P |
| LVDS_DATA6_N | 30  | 29  | LVDS_DATA7_N |
| GND          | 32  | 31  | GND          |
| LVDS_CLK1_P  | 34  | 33  | LVDS_CLK2_P  |
| LVDS_CLK1_N  | 36  | 35  | LVDS_CLK2_N  |
| GND          | 38  | 37  | GND          |
| +12V         | 40  | 39  | +12V         |

2.3.16 Front Audio connector (JAUDIO2)

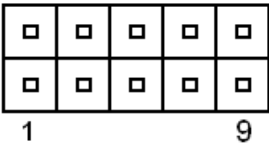
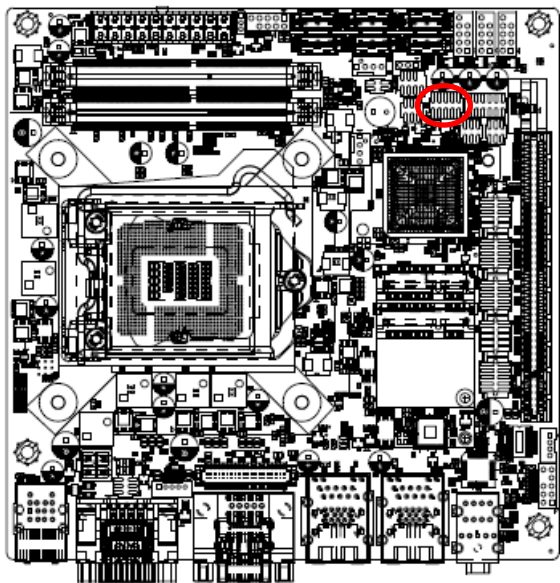


| Signal     | PIN | PIN | Signal    |
|------------|-----|-----|-----------|
| LINE2_JD   | 10  | 9   | LINE2_LIN |
|            |     | 7   | GND       |
| MIC2_JD    | 6   | 5   | LINE2_RIN |
| ACZ_DET#_R | 4   | 3   | MIC2_RIN  |
| GND        | 2   | 1   | MIC2_LIN  |

2.3.16.1 Signal Description –Audio connector 2 (JAUDIO2)

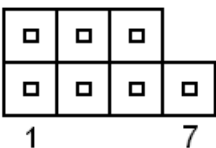
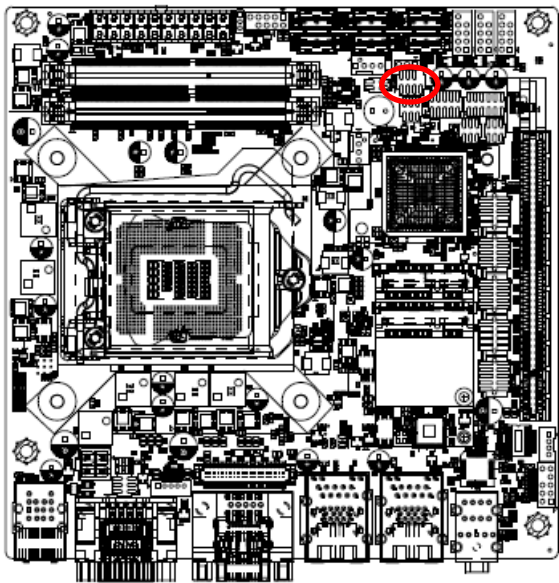
| Signal   | Signal Description               |
|----------|----------------------------------|
| LINE2_JD | AUDIO IN (LINE_RIN/LIN)sense pin |
| MIC2_JD  | MIC IN (MIC_RIN/LIN) sense pin   |

2.3.17 LPC connector (JLPC1)



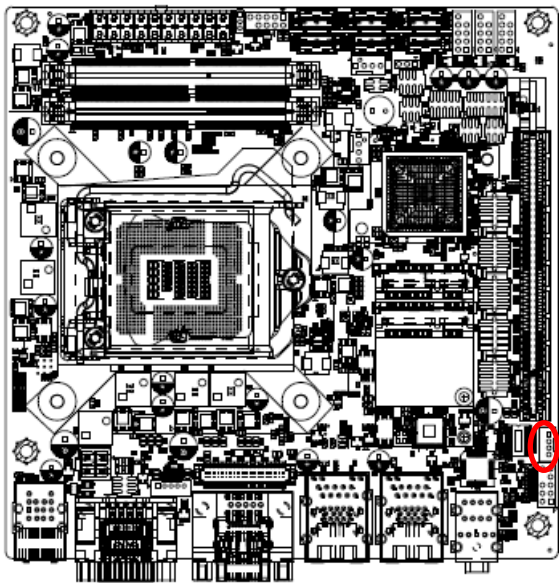
| Signal     | PIN | PIN | Signal       |
|------------|-----|-----|--------------|
| LPC_AD0    | 1   | 2   | +3.3V        |
| LPC_AD1    | 3   | 4   | BUF_PLT_RST# |
| LPC_AD2    | 5   | 6   | LPC_FRAME#   |
| LPC_AD3    | 7   | 8   | LPC_CLK      |
| LPC_SERIRQ | 9   | 10  | GND          |

2.3.18 SPI connector (JSPI1)



| Signal      | PIN | PIN | Signal      |
|-------------|-----|-----|-------------|
| +3.3V       | 1   | 2   | GND         |
| SSPI_CS0#_R | 3   | 4   | SSPI_SCLK_R |
| SSPI_SO_R   | 5   | 6   | SSPI_SI_R   |
| SSPI_HOLD#0 | 7   |     |             |

2.3.19 Amplifier connector (JSPK1)

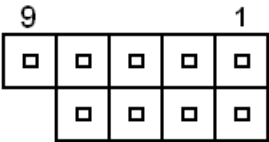
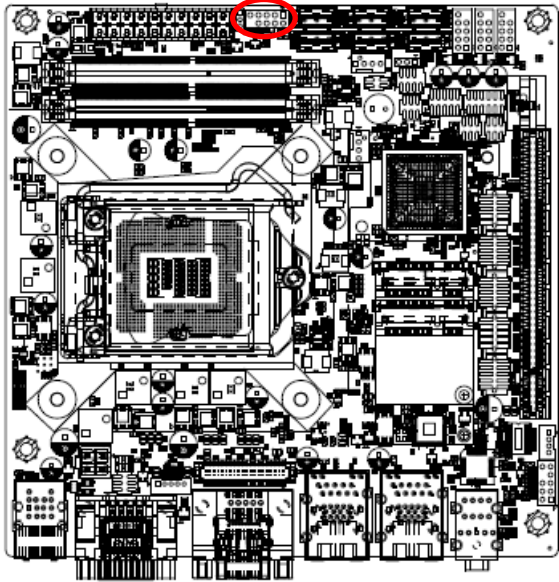


| Signal | PIN |
|--------|-----|
| SPK_L+ | 1   |
| SPK_L- | 2   |
| SPK_R+ | 3   |
| SPK_R- | 4   |

Note:

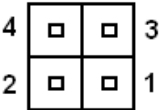
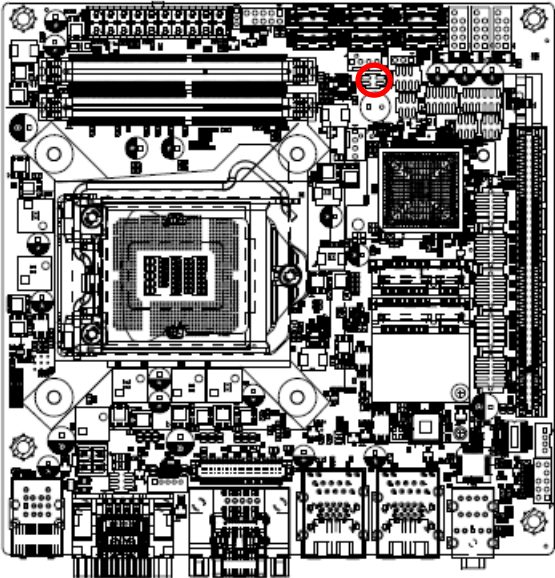
Support 6W x 2 speakers. Mapping Connector PHR-4.

2.3.20 Front panel setting connector (JFP1)



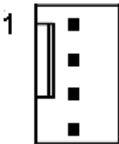
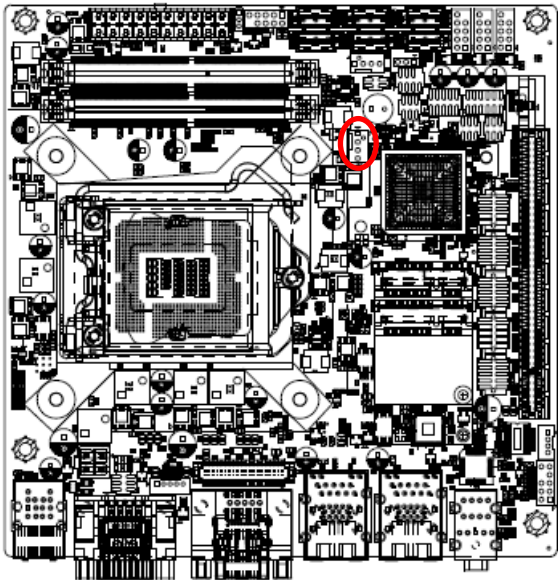
| Signal  | PIN | PIN | Signal   |
|---------|-----|-----|----------|
| +HD_LED | 1   | 2   | +PWR_LED |
| -HD_LED | 3   | 4   | -PWE_LED |
| +Reset  | 5   | 6   | +PWR_BNT |
| -Reset  | 7   | 8   | -PWR_BNT |
| NC      | 9   |     |          |

2.3.21 LAN1& LAN 2 active LED connector (JLANLED1)



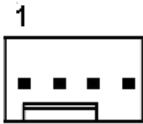
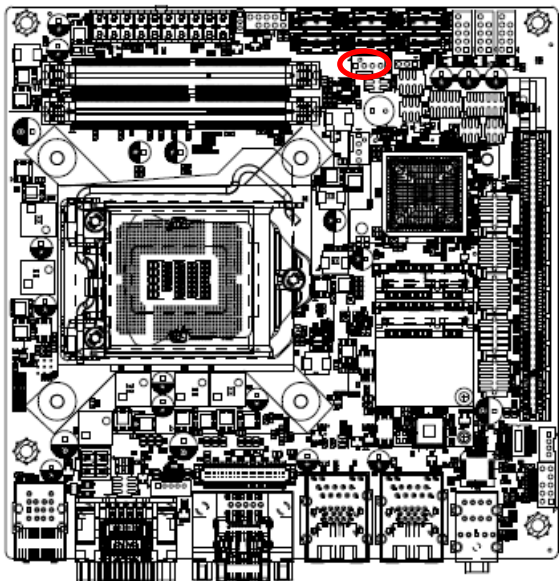
| Signal         | PIN | PIN | Signal         |
|----------------|-----|-----|----------------|
| LAN2_ACT#      | 4   | 3   | LAN1_ACT#      |
| FRONT_LAN2_ACT | 2   | 1   | FRONT_LAN1_ACT |

2.3.22 CPU fan connector (CPUFAN1)



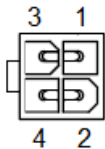
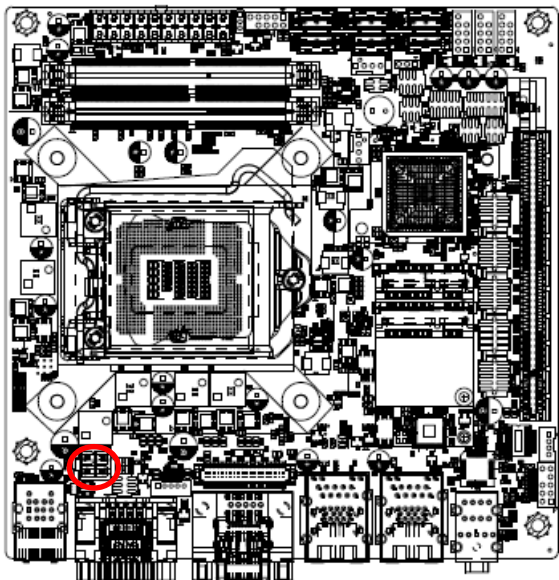
| Signal    | PIN |
|-----------|-----|
| GND       | 1   |
| +12V      | 2   |
| CPUFANIN  | 3   |
| CPUFANOUT | 4   |

2.3.23 System fan connector (SYSFAN1)



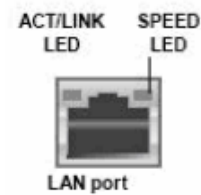
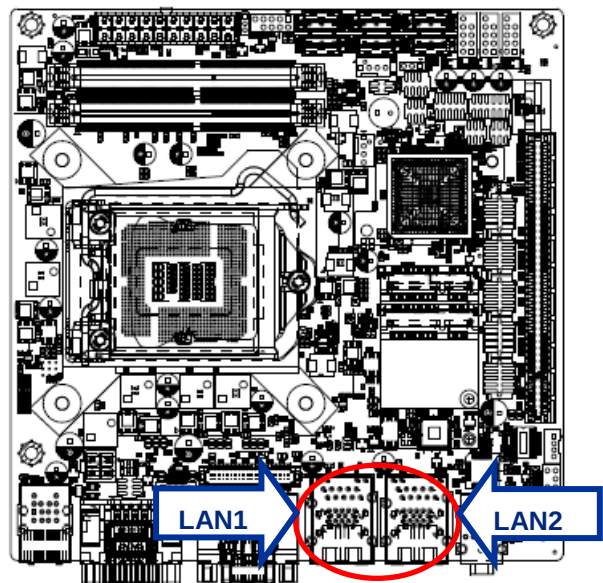
| Signal    | PIN |
|-----------|-----|
| GND       | 1   |
| +12V      | 2   |
| SYSFANIN  | 3   |
| SYSFANOUT | 4   |

2.3.24 ATX 12V power connector (ATX12V1)



| Signal | PIN | PIN | Signal |
|--------|-----|-----|--------|
| +12V   | 3   | 1   | GND    |
| +12V   | 4   | 2   | GND    |

2.3.25 Gigabit LAN (RJ-45) connector (LAN1/2)



| ACT/LINK LED |               | SPEED LED |                    |
|--------------|---------------|-----------|--------------------|
| Status       | Description   | Status    | Description        |
| OFF          | No Light      | OFF       | 10Mbps connection  |
| Orange       | Linked        | Green     | 100Mbps connection |
| Blinking     | Data activity | Orange    | 1Gbps connection   |

**Note:**

This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

## 3.BIOS Setup

---

### 3.1 Introduction

The BIOS setup program allows users to modify the basic system configuration. In this following chapter will describe how to access the BIOS setup program and the configuration options that may be changed.

### 3.2 Starting Setup

The AMI BIOS™ is immediately activated when you first power on the computer. The BIOS reads the system information contained in the NVRAM and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

By pressing <Del> or <F2> immediately after switching the system on, or

By pressing the <Del> or <F2> key when the following message appears briefly at the left-top of the screen during the POST (Power On Self Test).

**Press <Del> or <F2> to enter SETUP**

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to.

**Press F1 to Continue, DEL to enter SETUP**

### 3.3 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

| Button  | Description                                                                                                                                         |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| ↑       | Move to previous item                                                                                                                               |
| ↓       | Move to next item                                                                                                                                   |
| ←       | Move to the item in the left hand                                                                                                                   |
| →       | Move to the item in the right hand                                                                                                                  |
| Esc key | Main Menu -- Quit and not save changes into NVRAM<br>Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu |
| + key   | Increase the numeric value or make changes                                                                                                          |
| - key   | Decrease the numeric value or make changes                                                                                                          |
| F1 key  | General help, only for Status Page Setup Menu and Option Page Setup Menu                                                                            |
| F2 key  | Previous Values.                                                                                                                                    |
| F3 key  | Optimized defaults                                                                                                                                  |
| F4 key  | Save & Exit Setup                                                                                                                                   |

- **Navigating Through The Menu Bar**

Use the left and right arrow keys to choose the menu you want to be in.



**Note:** Some of the navigation keys differ from one screen to another.

- **To Display a Sub Menu**

Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A “➤” pointer marks all sub menus.

### 3.4 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

### 3.5 In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AMI BIOS supports an override to the NVRAM settings which resets your system to its defaults.

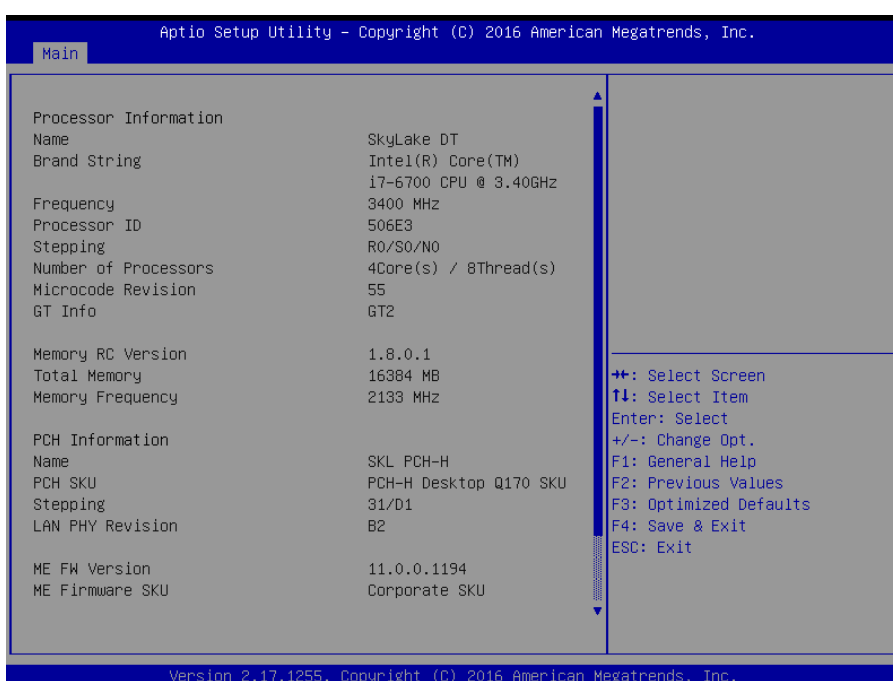
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

### 3.6 BIOS setup

Once you enter the Aptio Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

#### 3.6.1 Main Menu

This section allows you to record some basic hardware configurations in your computer and set the system clock.



### 3.6.1.1 System Language

This option allows choosing the system default language.

### 3.6.1.2 System Date

Use the system date option to set the system date. Manually enter the day, month and year.

### 3.6.1.3 System Time

Use the system time option to set the system time. Manually enter the hours, minutes and seconds.

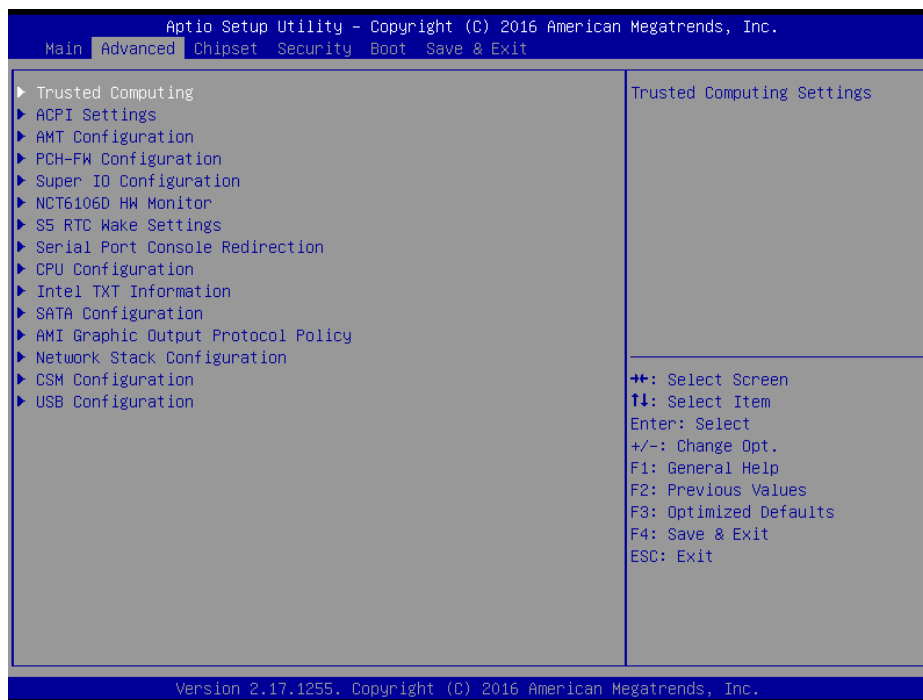


**Note:** The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.

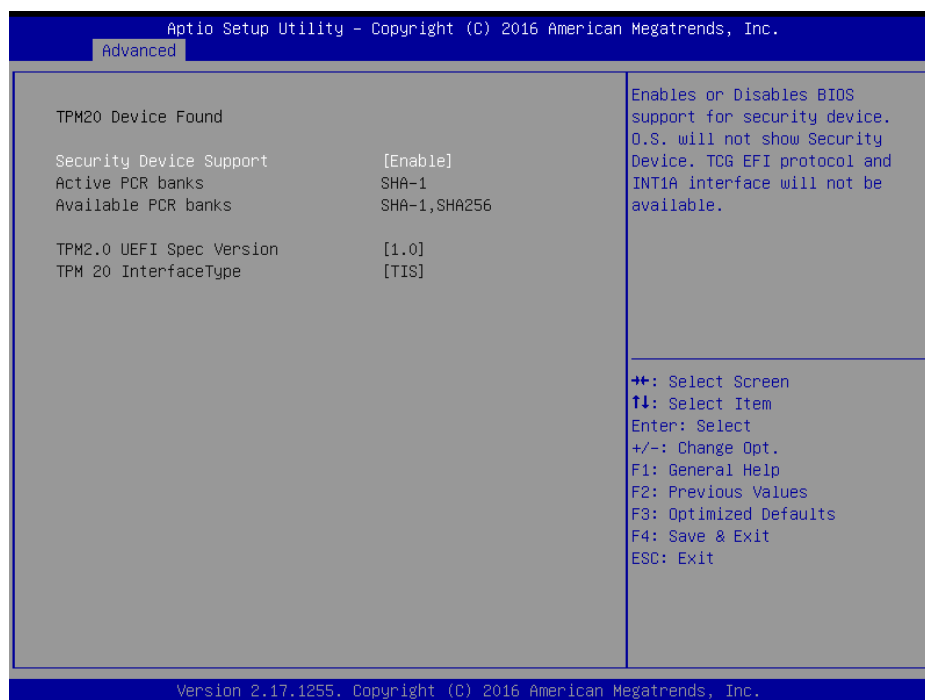
Visit the Avalue website ([www.avalue.com.tw](http://www.avalue.com.tw)) to download the latest product and BIOS information.

## 3.6.2 Advanced Menu

This section allows you to configure your CPU and other system devices for basic operation through the following sub-menus.

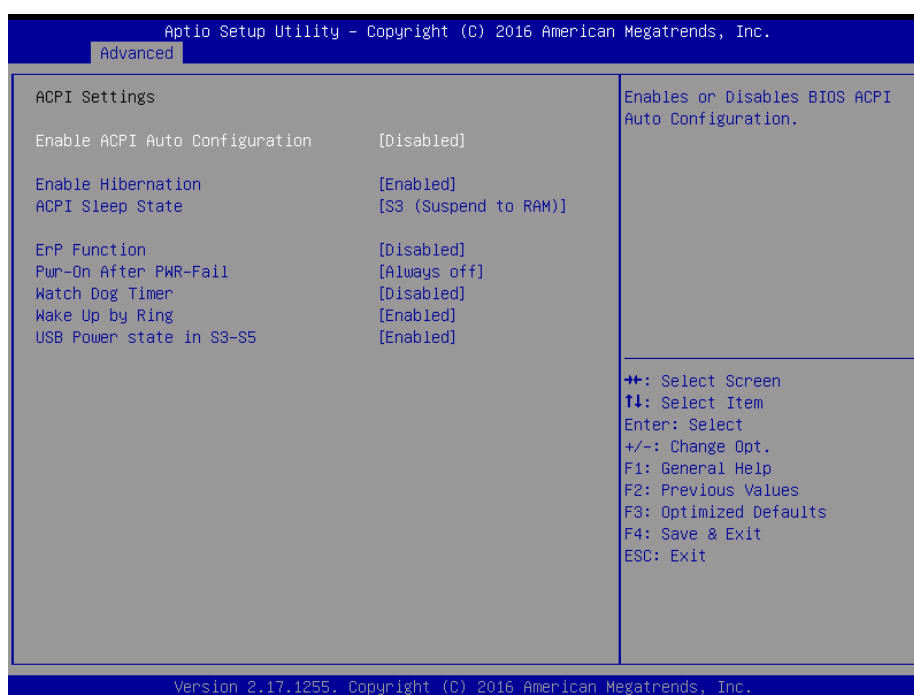


### 3.6.2.1 Trusted Computing



| Item                    | Options                     | Description                                                                                                                                          |
|-------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Security Device Support | Disable,<br>Enable[Default] | Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1Ainterface will not be available. |

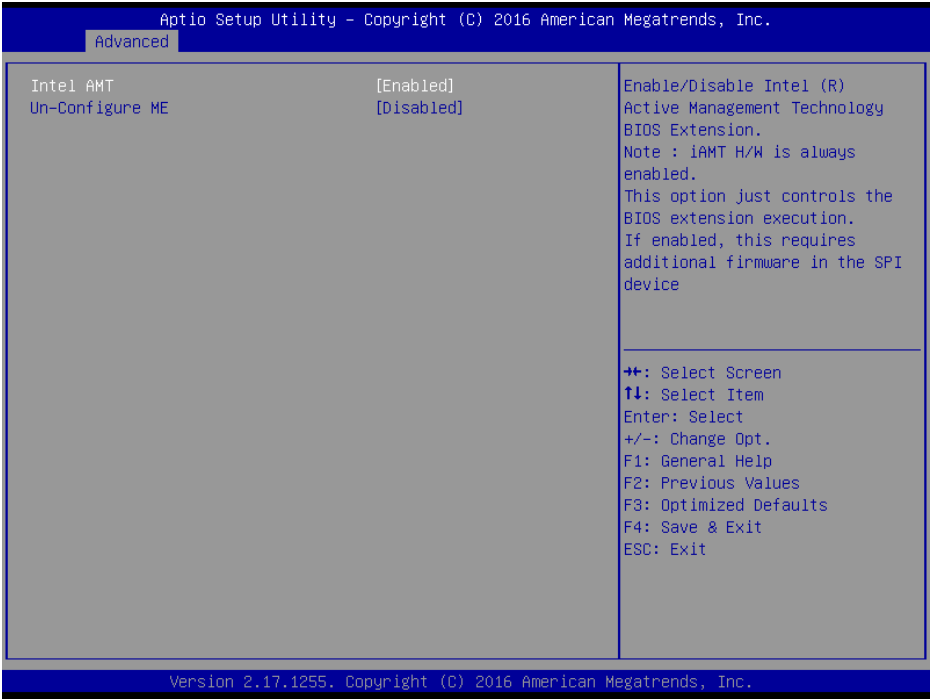
### 3.6.2.2 APCI Settings



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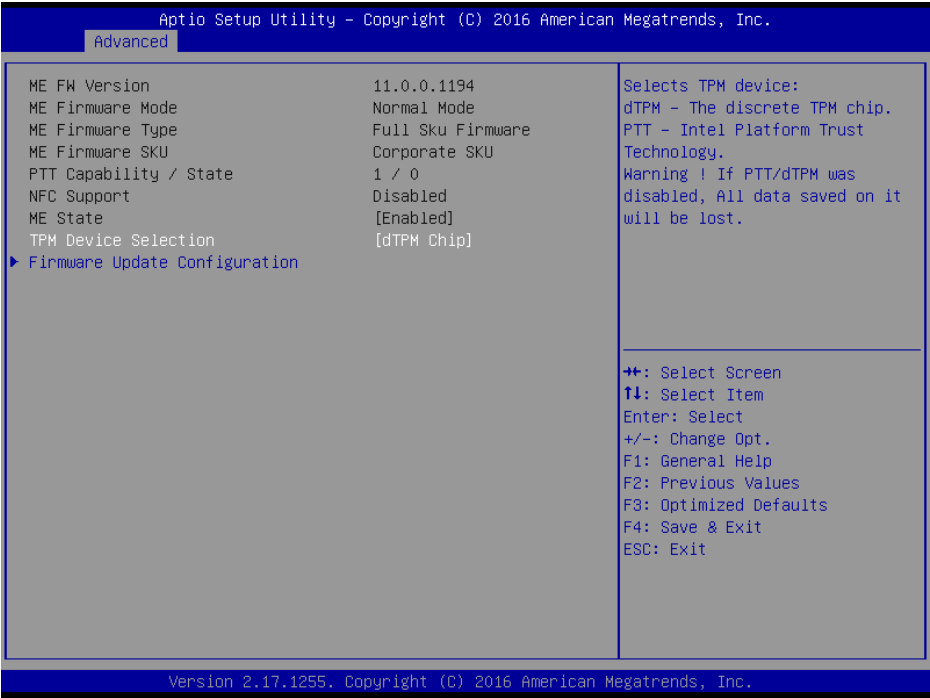
| Item                                  | Options                                                                                | Description                                                                                                           |
|---------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Enable ACPI Auto Configuration</b> | Disabled[Default],<br>Enabled                                                          | Enables or Disables BIOS ACPI Auto Configuration.                                                                     |
| <b>Enable Hibernation</b>             | Disabled<br>Enabled[Default],                                                          | Enables or Disables System ability to Hibernation (OS/S4 Sleep State). This option may be not effective with some OS. |
| <b>ACPI Sleep State</b>               | Suspend Disabled,<br>S3 (Suspend to RAM)[Default]                                      | Select the highest ACPI sleep state the system will enter when the SUSPEDN button is pressed.                         |
| <b>ErP Function</b>                   | Disabled[Default],<br>Enabled                                                          | ErP Function (Deep S5).                                                                                               |
| <b>Pwr-On After PWR-Fail</b>          | Always Off[Default]<br>Always On<br>Keep Last state                                    | Specify what state to go to when power is re-applied after a power failure (G3 state).                                |
| <b>Watch Dog Timer</b>                | Disabled[Default],<br>30 sec<br>40 sec<br>50 sec<br>1 min<br>2 min<br>10 min<br>30 min | Select Watch Dog Timer (WDT) Mode.                                                                                    |
| <b>Wake Up by Ring</b>                | Disabled<br>Enabled[Default],                                                          | Enable/Disable system waked up by Ring signal from standby states (S3~S5).                                            |
| <b>USB Power state in S3-S5</b>       | Disabled<br>Enabled[Default],                                                          | Enable/Disable USB Power delivery in S3 (Sleep), S4 (Hibernate) and S5 (Soft Off) States.                             |

3.6.2.3 AMT Configuration



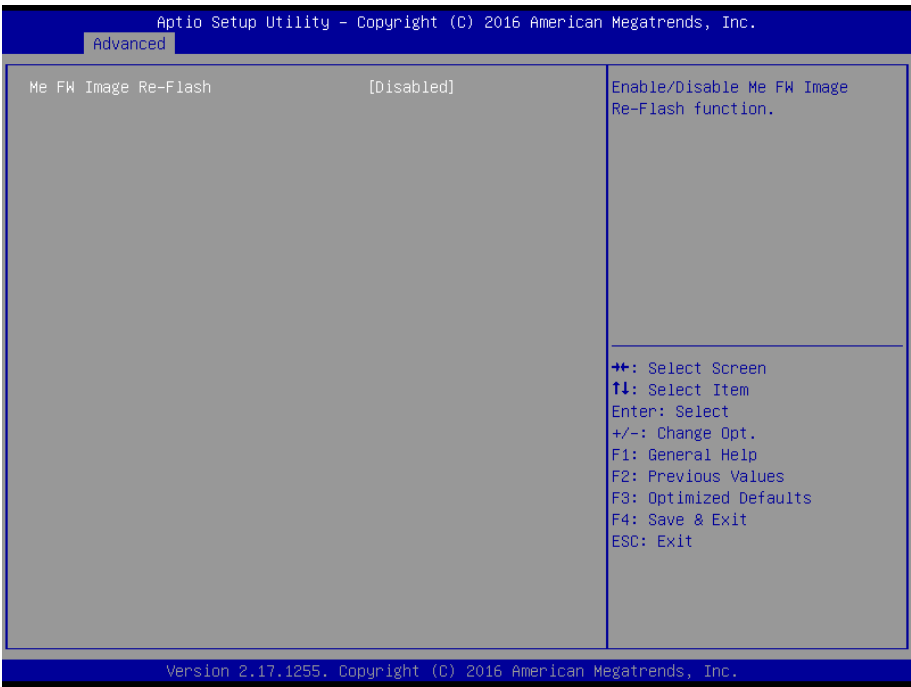
| Item            | Options                                | Description                                                                                                                                                                                                                   |
|-----------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Intel AMT       | Disabled<br>Enabled <b>[Default]</b> , | Enable/Disable Intel® Active Management Technology BIOS Extension. Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device. |
| Un-Configure ME | Disabled <b>[Default]</b><br>Enabled,  | OEMFlag Bit 15: Un-Configure ME without password.                                                                                                                                                                             |

3.6.2.4 PCH-FW Configuration



| Item                 | Options                    | Description                                                                                                                                                    |
|----------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TPM Device Selection | dTPM Chip[Default],<br>PTT | Selects TPM device: dTPM – The discrete TPM chip. PTT – Intel Platform Trust Technology. Warning! If PTT/dTPM was disabled, All data saved on it will be lost. |

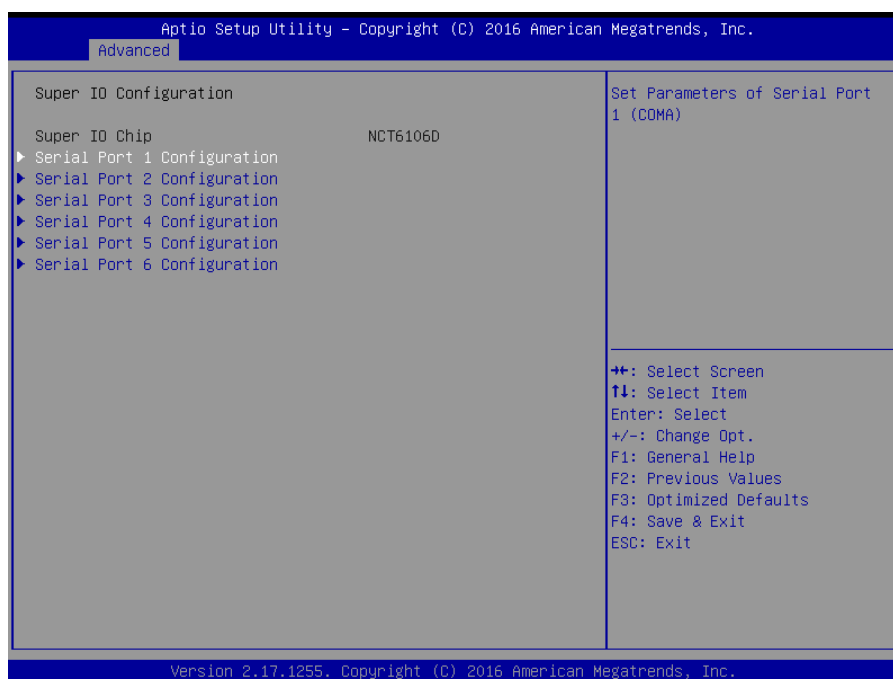
3.6.2.4.1 Firmware Update Configuration



| Item                 | Option                        | Description                                   |
|----------------------|-------------------------------|-----------------------------------------------|
| ME FW Image Re-Flash | Disabled[Default],<br>Enabled | Enable/Disable Me FW Image Re-Flash function. |

### 3.6.2.5 Super IO Configuration

You can use this item to set up or change the Super IO configuration for serial ports. Please refer to 3.6.2.5.1~ 3.6.2.5.5 for more information.



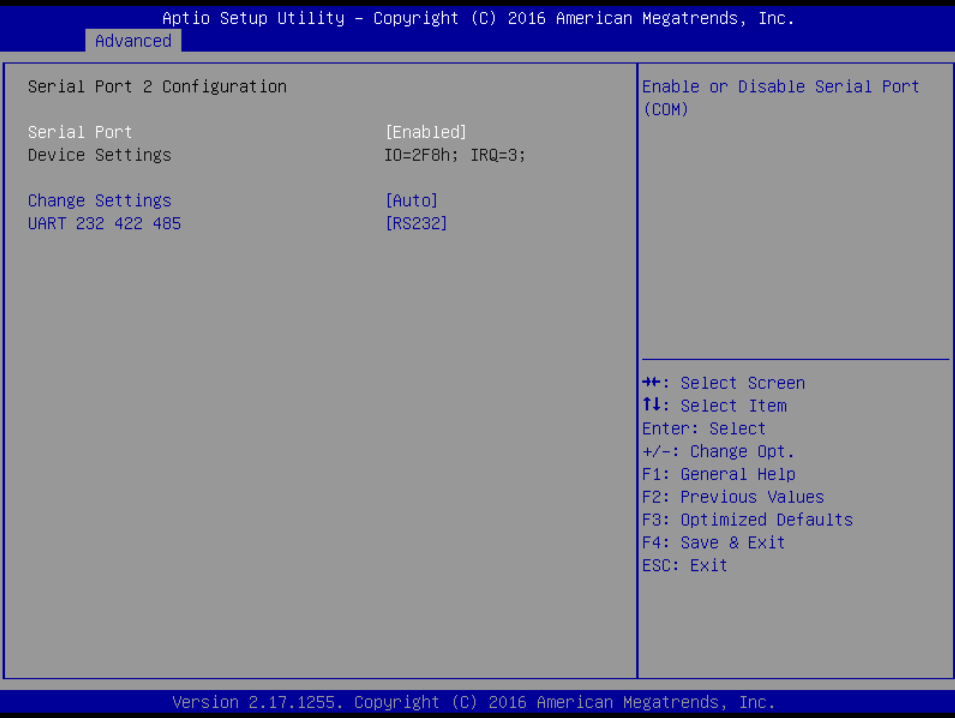
| Item                        | Description                             |
|-----------------------------|-----------------------------------------|
| Serial Port 1 Configuration | Set Parameters of Serial Port 1 (COMA). |
| Serial Port 2 Configuration | Set Parameters of Serial Port 2 (COMB). |
| Serial Port 3 Configuration | Set Parameters of Serial Port 3 (COMC). |
| Serial Port 4 Configuration | Set Parameters of Serial Port 4 (COMD). |
| Serial Port 5 Configuration | Set Parameters of Serial Port 5 (COME). |
| Serial Port 6 Configuration | Set Parameters of Serial Port 6 (COMF). |

3.6.2.5.1 Serial Port 1 Configuration



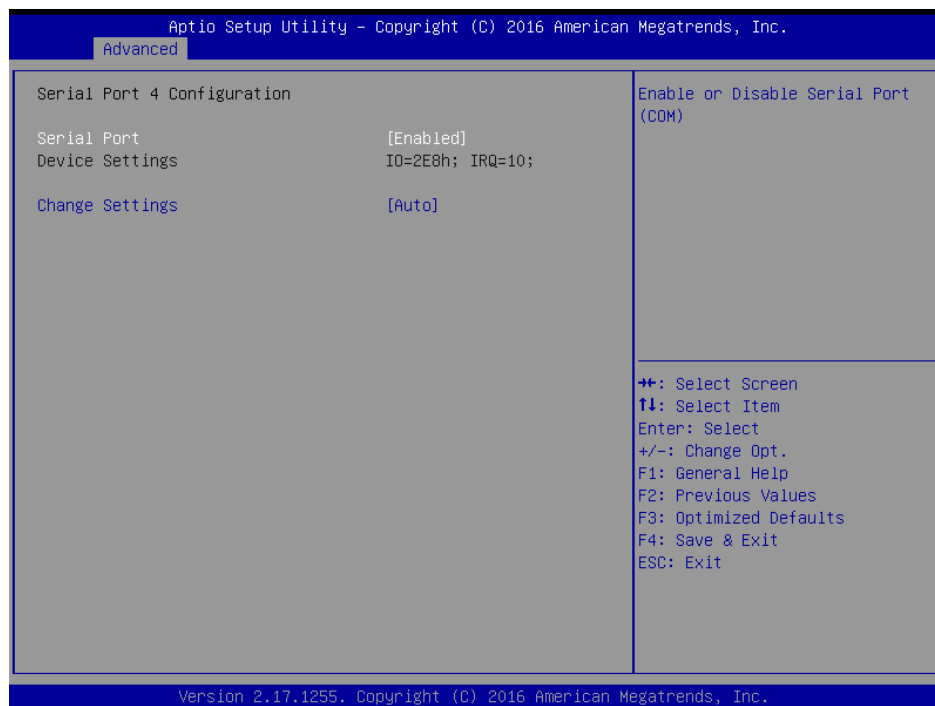
| Item            | Option                        | Description                                    |
|-----------------|-------------------------------|------------------------------------------------|
| Serial Port     | Enabled[Default],<br>Disabled | Enable or Disable Serial Port (COM).           |
| Change Settings | Auto[Default]                 | Select an optimal setting for Super IO Device. |

3.6.2.5.2 Serial Port 2 Configuration



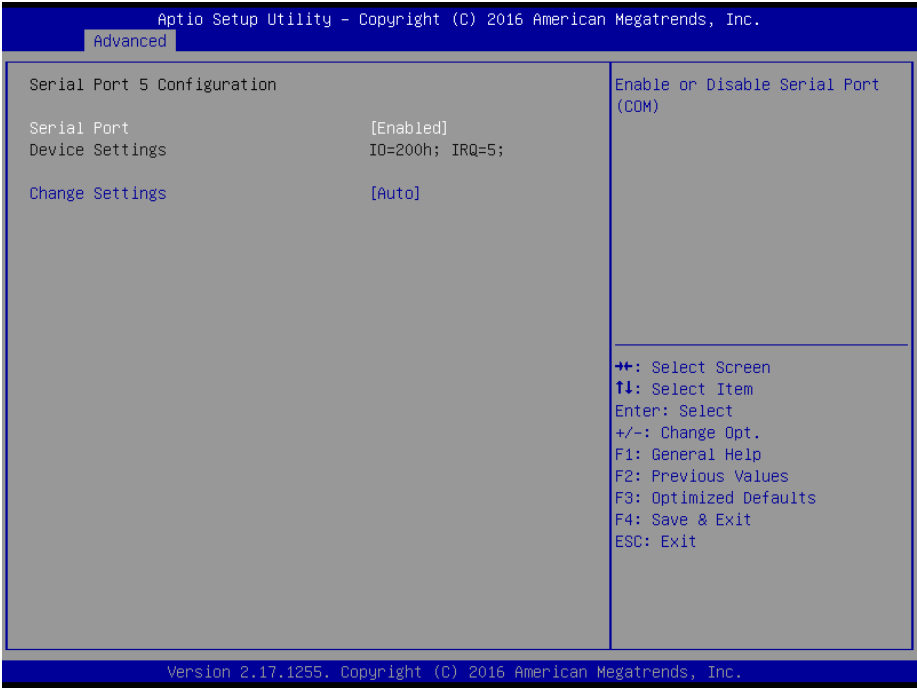
| Item             | Option                           | Description                                    |
|------------------|----------------------------------|------------------------------------------------|
| Serial Port      | Enabled[Default],<br>Disabled    | Enable or Disable Serial Port (COM).           |
| Change Settings  | Auto[Default]                    | Select an optimal setting for super IO Device. |
| UART 232 422 485 | RS232[Default]<br>RS422<br>RS485 | Set COM Port as RS232, RS422 or RS485 mode.    |

### 3.6.2.5.3 Serial Port 4 Configuration



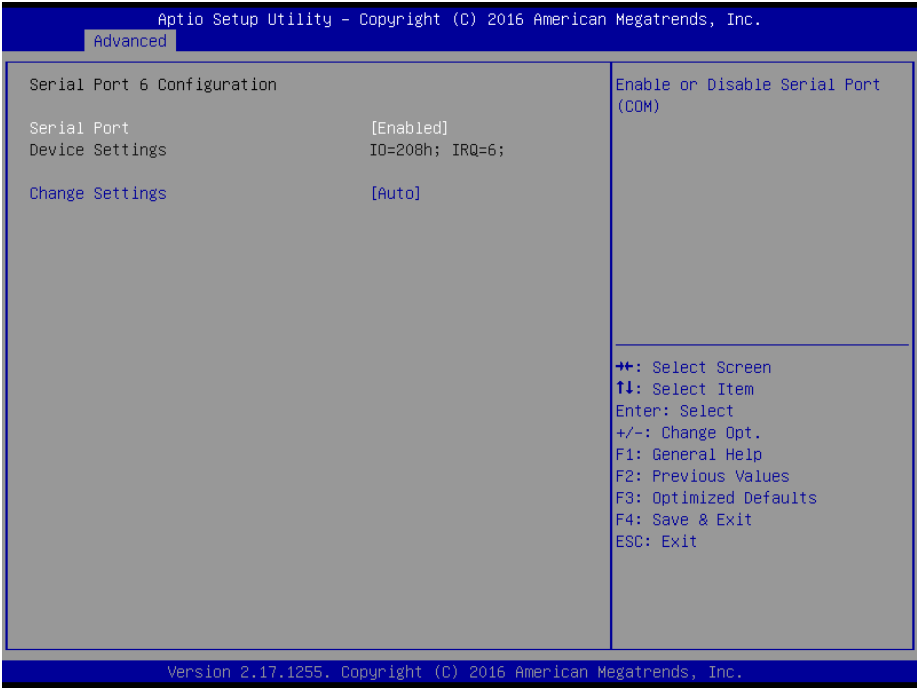
| Item            | Option                        | Description                                    |
|-----------------|-------------------------------|------------------------------------------------|
| Serial Port     | Enabled[Default],<br>Disabled | Enable or Disable Serial Port (COM).           |
| Change Settings | Auto[Default]                 | Select an optimal setting for super IO Device. |

3.6.2.5.4 Serial Port 5 Configuration



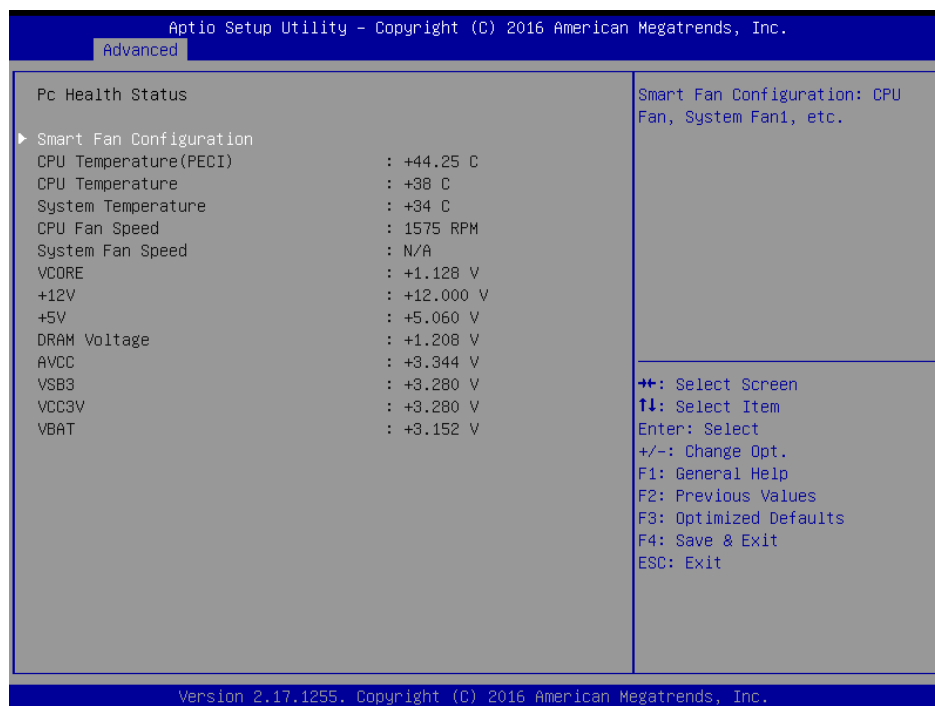
| Item            | Option                     | Description                                    |
|-----------------|----------------------------|------------------------------------------------|
| Serial Port     | Enabled[Default], Disabled | Enable or Disable Serial Port (COM).           |
| Change Settings | Auto[Default]              | Select an optimal setting for super IO Device. |

3.6.2.5.5 Serial Port 6 Configuration

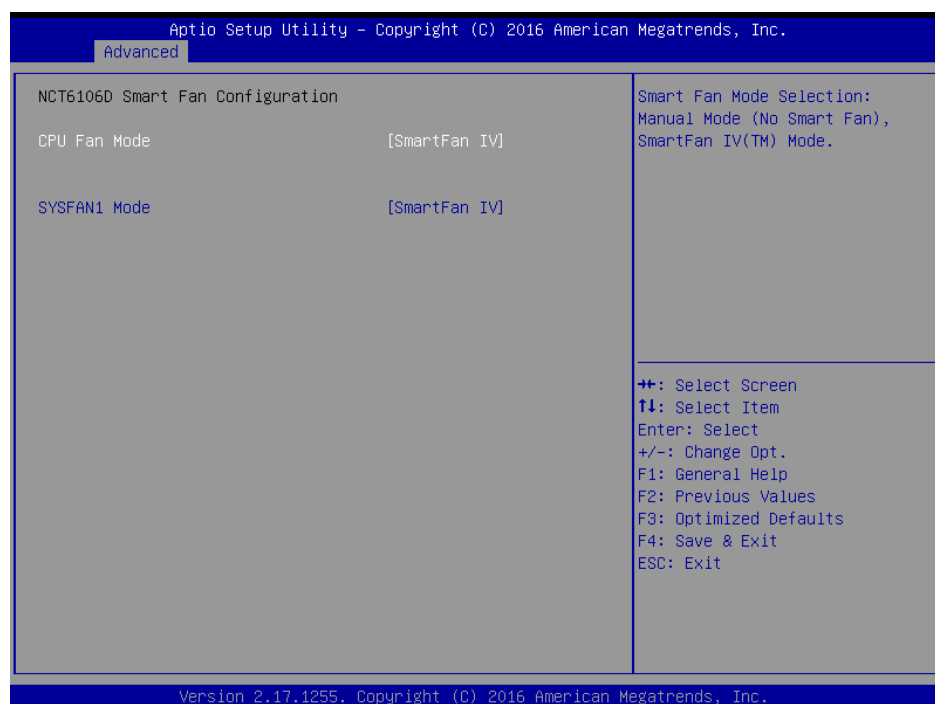


| Item            | Option                        | Description                                    |
|-----------------|-------------------------------|------------------------------------------------|
| Serial Port     | Enabled[Default],<br>Disabled | Enable or Disable Serial Port (COM).           |
| Change Settings | Auto[Default]                 | Select an optimal setting for super IO Device. |

### 3.6.2.6 NCT6106D H/W Monitor

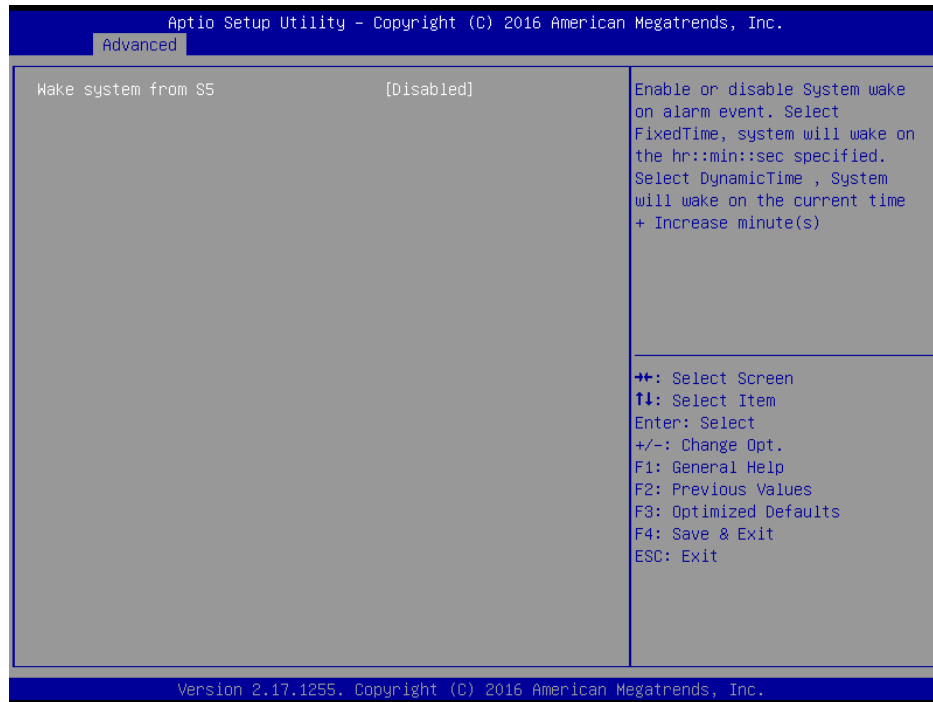


#### 3.6.2.6.1 Smart Fan Configuration



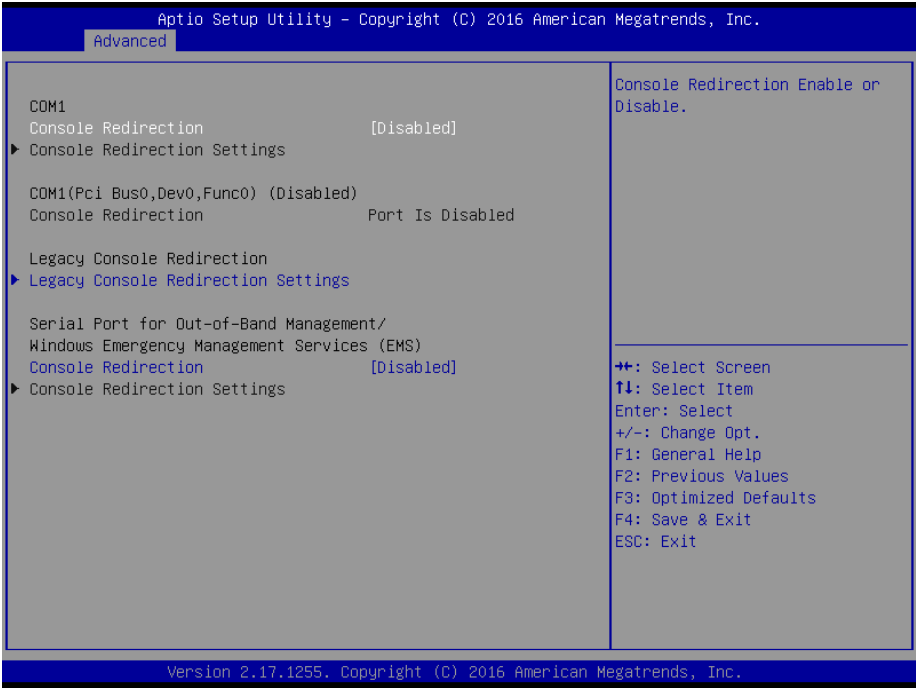
| Item         | Option                                   | Description                                                              |
|--------------|------------------------------------------|--------------------------------------------------------------------------|
| CPU Fan Mode | Manual <b>[Default]</b> ,<br>SmartFan IV | Smart Fan Mode Selection: Manual Mode (No Smart Fan), SmartFan IV™ Mode. |
| SYSFAN1 Mode | Manual<br>SmartFan IV <b>[Default]</b> , | Smart Fan Mode Selection: Manual Mode (No Smart Fan), SmartFan IV™ Mode. |

## 3.6.2.7 S5 RTC Wake Settings



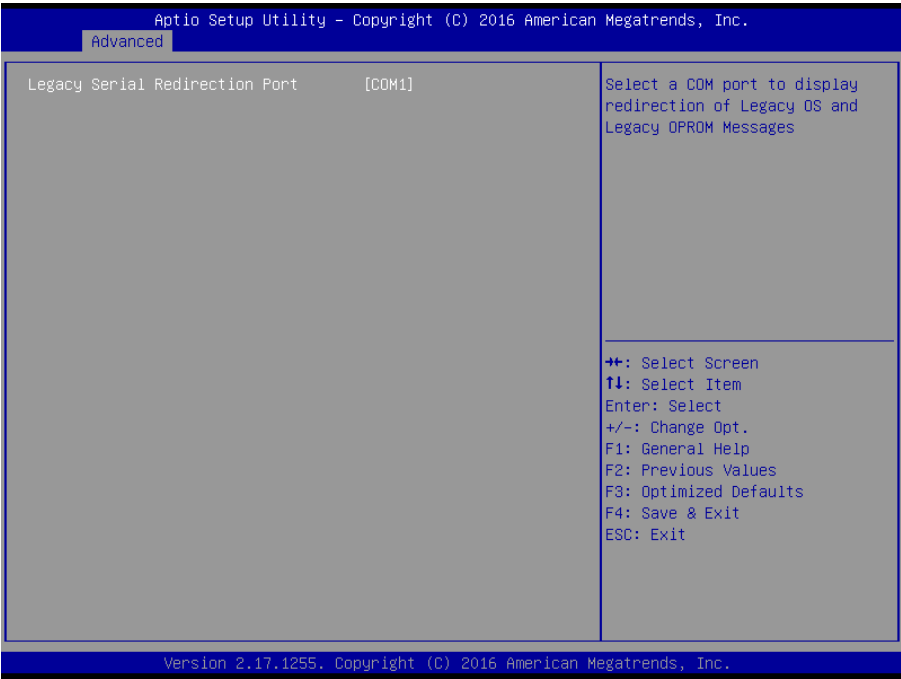
| Item                | Options                                                   | Description                                                                                                                                                                                      |
|---------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wake system from S5 | Disabled <b>[Default]</b> ,<br>Fixed Time<br>Dynamic Time | Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s). |

3.6.2.8 Serial Port Console Redirection



| Item                | Options                    | Description                            |
|---------------------|----------------------------|----------------------------------------|
| Console Redirection | Disabled[Default], Enabled | Console Redirection Enable or Disable. |

3.6.2.8.1 Legacy Console Redirection Settings

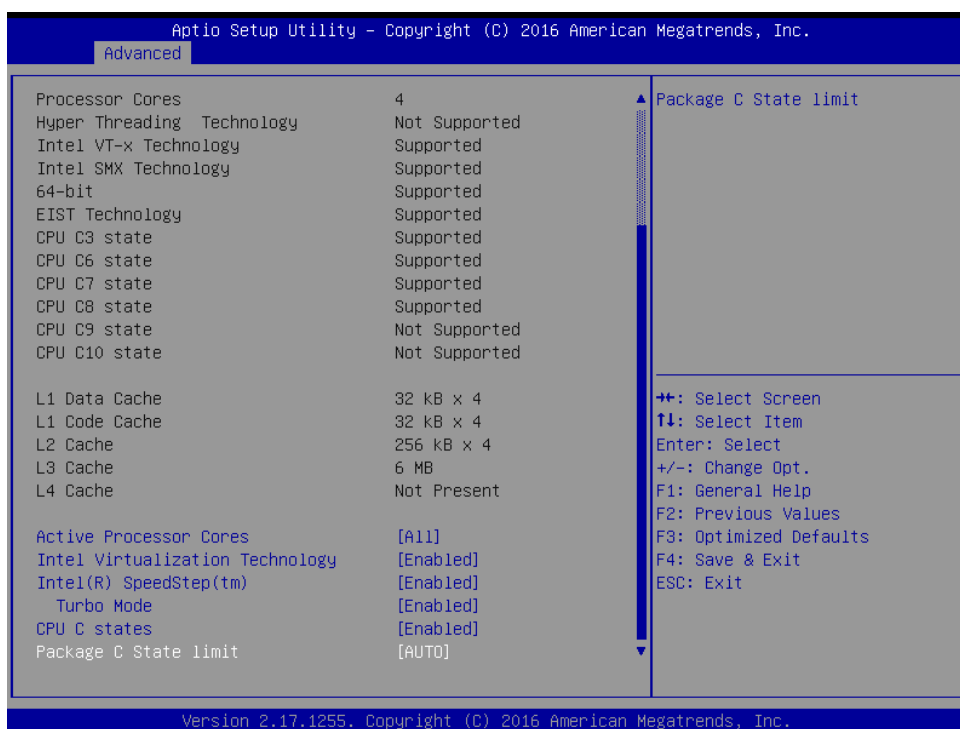
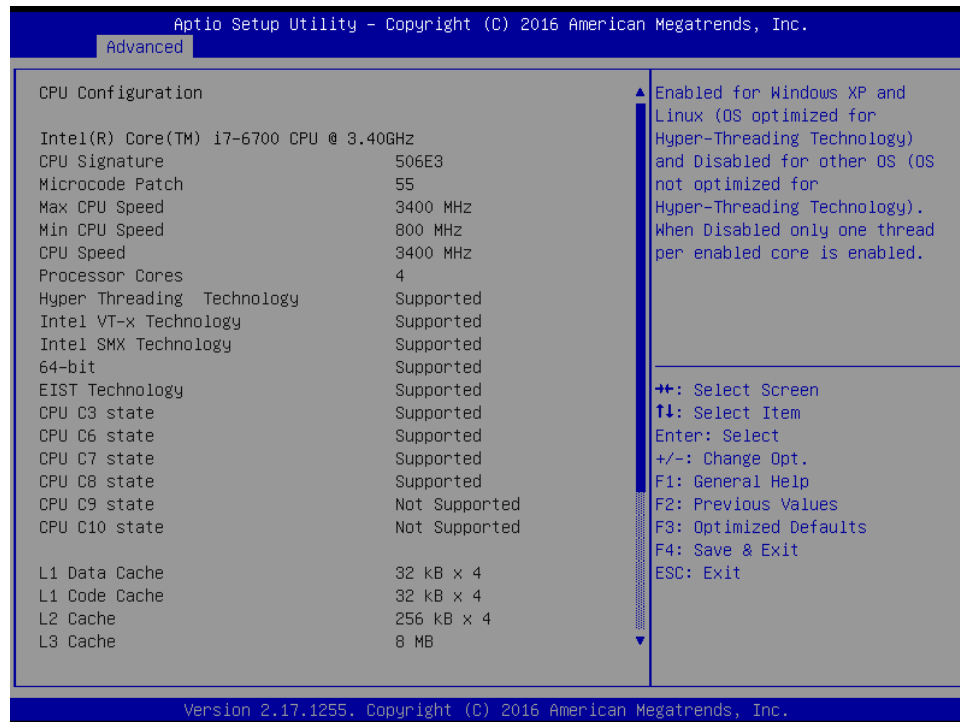


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| Item                           | Option                       | Description                                                              |
|--------------------------------|------------------------------|--------------------------------------------------------------------------|
| Legacy Serial Redirection Port | Manual[Default], SmartFan IV | Smart Fan Mode Selection: Manual Mode (No Smart Fan), SmartFan IV™ Mode. |

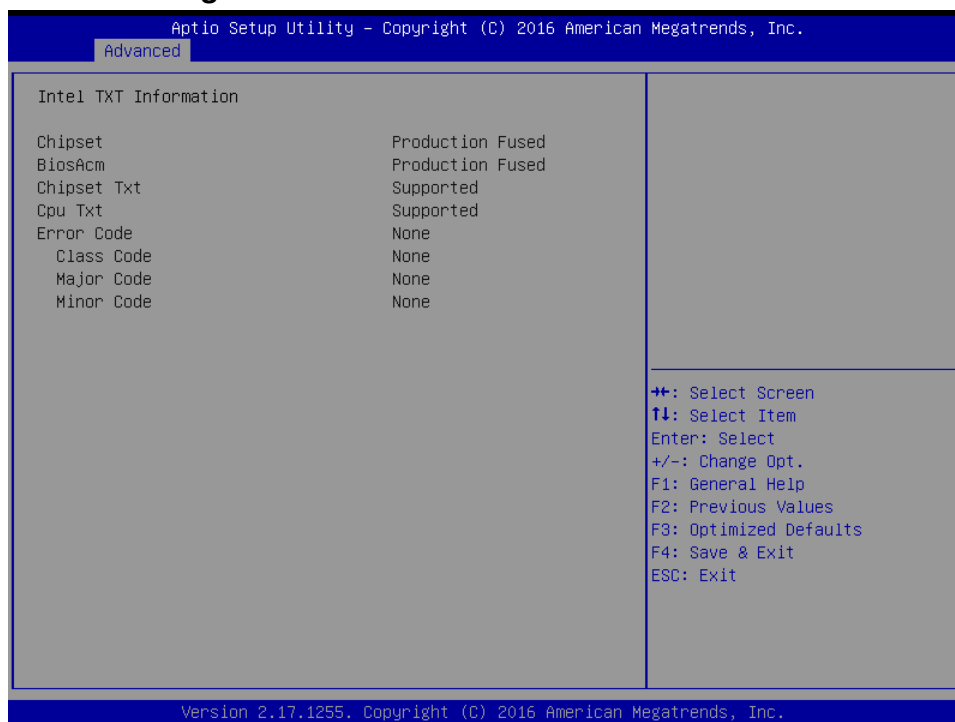
### 3.6.2.9 CPU Configuration

Use the CPU configuration menu to view detailed CPU specification and configure the CPU.

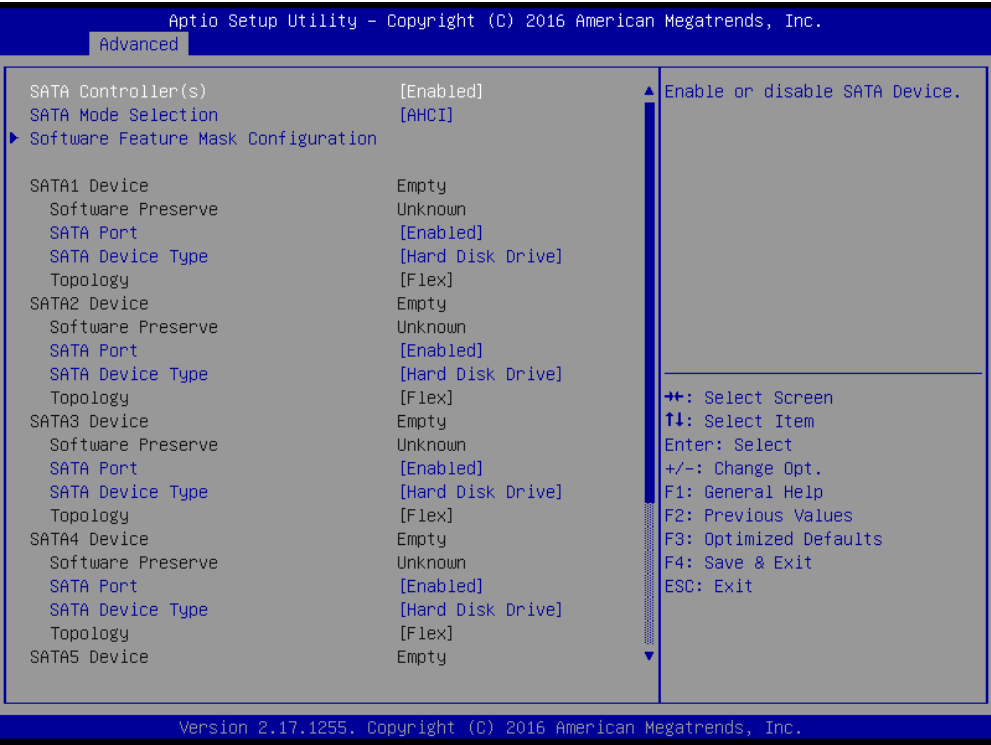


| Item                            | Options                                               | Description                                                                                             |
|---------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Active Processor Cores          | All[Default],<br>1<br>2<br>3                          | Number of cores to enable in each processor package.                                                    |
| Intel Virtualization Technology | Disabled<br>Enabled[Default]                          | When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. |
| Intel® SpeedStep™               | Disabled<br>Enabled[Default]                          | Allows more than two frequency ranges to be supported.                                                  |
| Turbo Mode                      | Disabled<br>Enabled[Default]                          | Turbo Mode.                                                                                             |
| CPU C states                    | Disabled<br>Enabled[Default]                          | Enable or disable CPU C states.                                                                         |
| Package C State limit           | C0/C1<br>C2<br>C3<br>C6<br>C7<br>C7s<br>AUTO[Default] | Package C State limit.                                                                                  |

### 3.6.2.10 Intel TXT Configuration

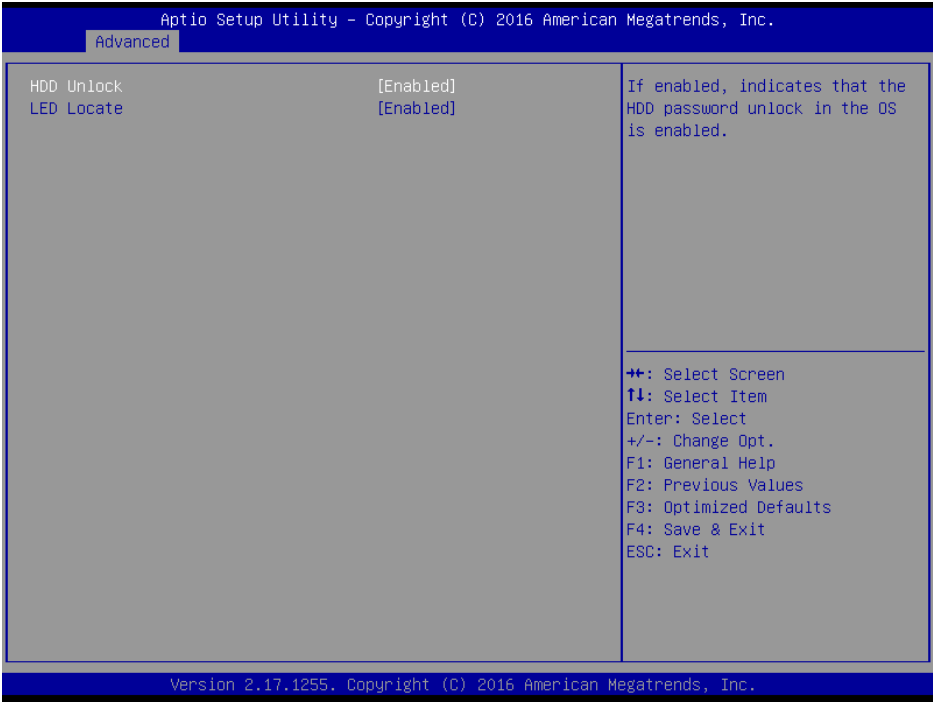


3.6.2.11 SATA Configuration



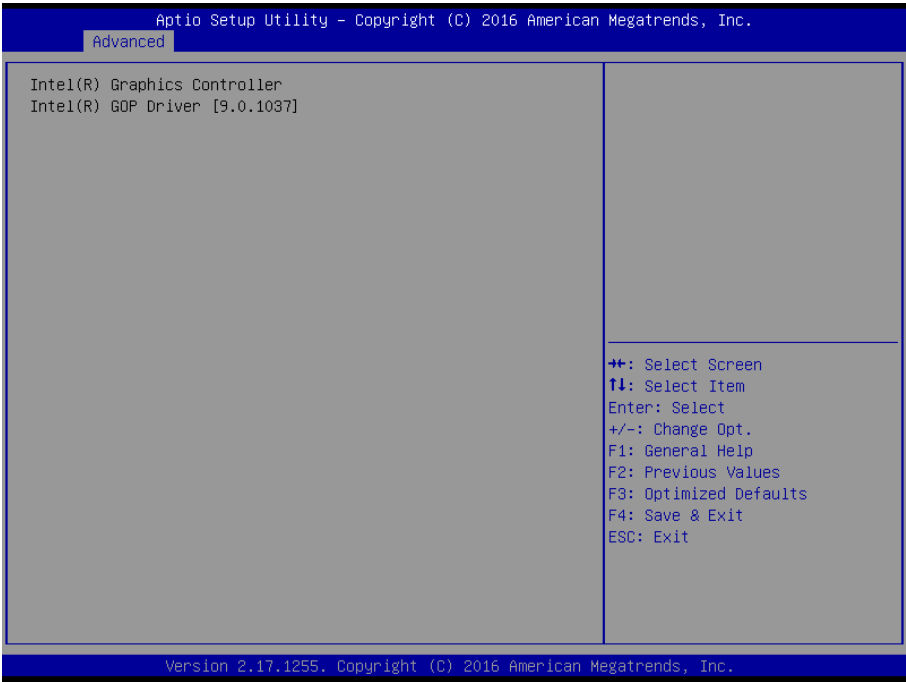
| Item                | Options                                               | Description                                                                  |
|---------------------|-------------------------------------------------------|------------------------------------------------------------------------------|
| SATA Controller(s)  | Disabled,<br>Enabled <b>[Default]</b>                 | Enable or disable SATA Device.                                               |
| SATA Mode Selection | AHCI <b>[Default]</b><br>RAID                         | Determines how SATA controller(s) operate.                                   |
| SATA Port           | Disabled,<br>Enabled <b>[Default]</b>                 | Enable or Disable SATA Port.                                                 |
| SATA Device Type    | Hard Disk Drive <b>[Default]</b><br>Solid State Drive | Identify the SATA port is connected to Solid State Drive or Hard Disk Drive. |

3.6.2.11.1 Software Feature Mask Configuration



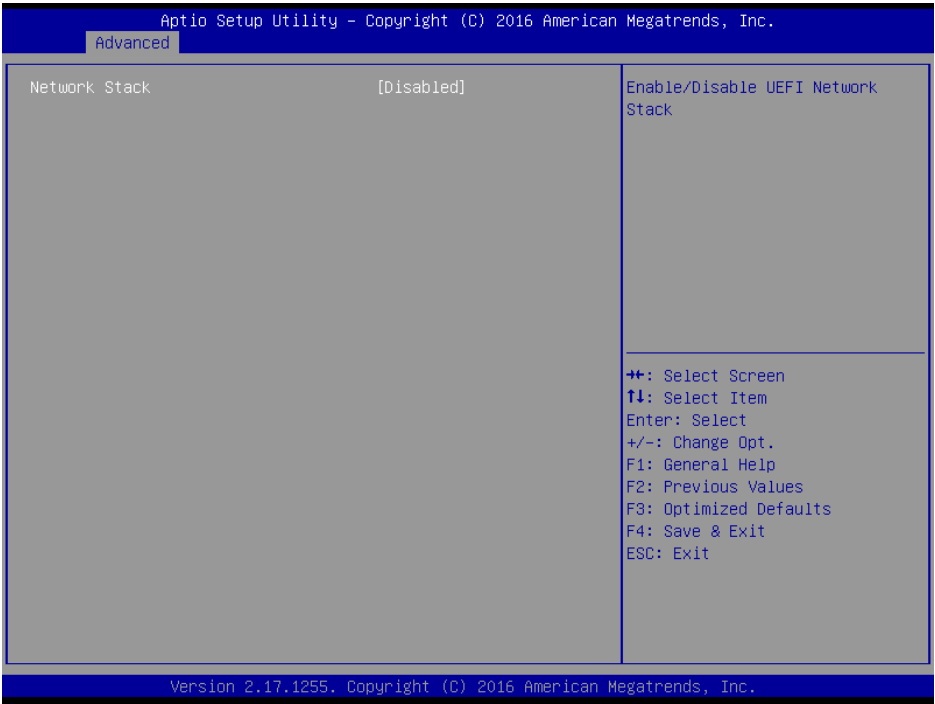
| Item       | Option                        | Description                                                                                                    |
|------------|-------------------------------|----------------------------------------------------------------------------------------------------------------|
| HDD Unlock | Disabled<br>Enabled[Default], | If enabled, indicates that the HDD password unlock in the OS is enabled.                                       |
| LED Locate | Disabled<br>Enabled[Default], | If enabled, indicates that the LED/SGPIO hardware is attached and ping to locate feature is enabled on the OS. |

3.6.2.12 AMI Graphic Output Protocol Policy



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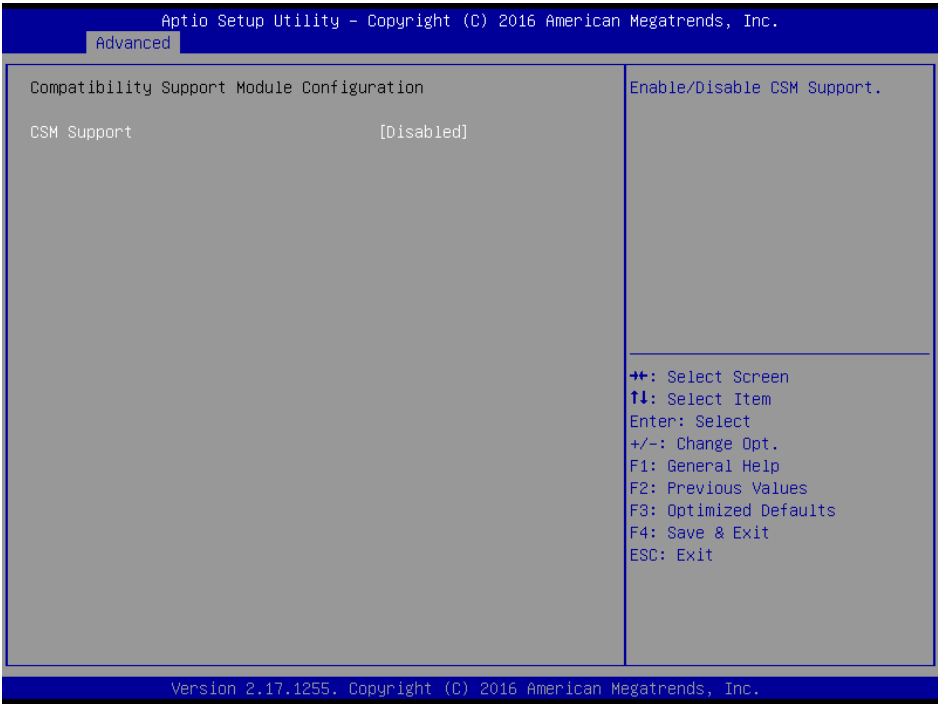
3.6.2.13 Network Stack Configuration



| Item          | Options                      | Description                        |
|---------------|------------------------------|------------------------------------|
| Network Stack | Enabled<br>Disabled[Default] | Enable/Disable UEFI Network Stack. |

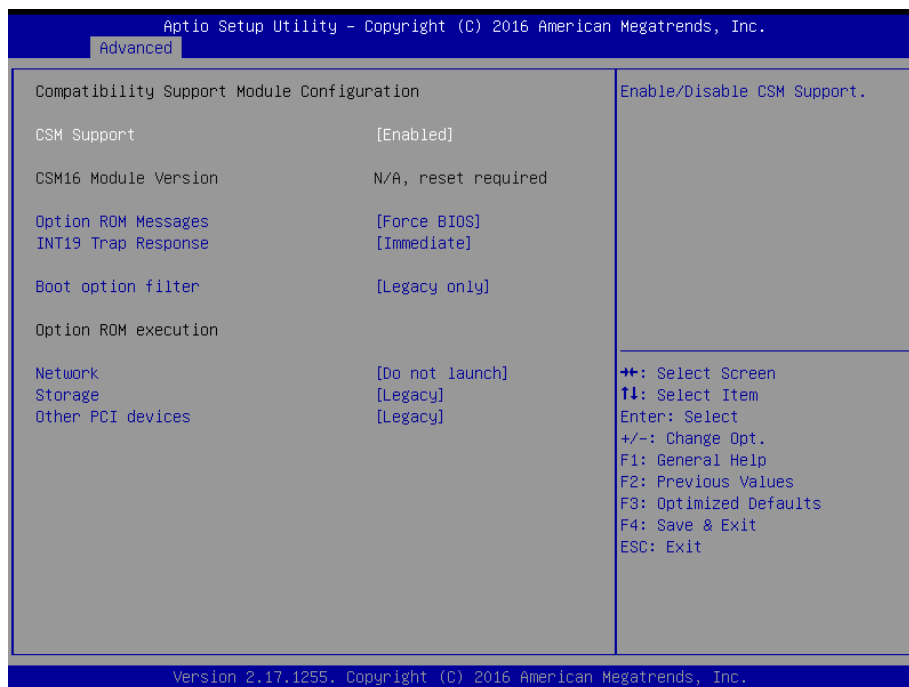
3.6.2.14 CSM Configuration

BIOS Default:



| Item               | Options                      | Description                 |
|--------------------|------------------------------|-----------------------------|
| <b>CSM Support</b> | Enabled<br>Disabled[Default] | Enable/Disable CSM Support. |

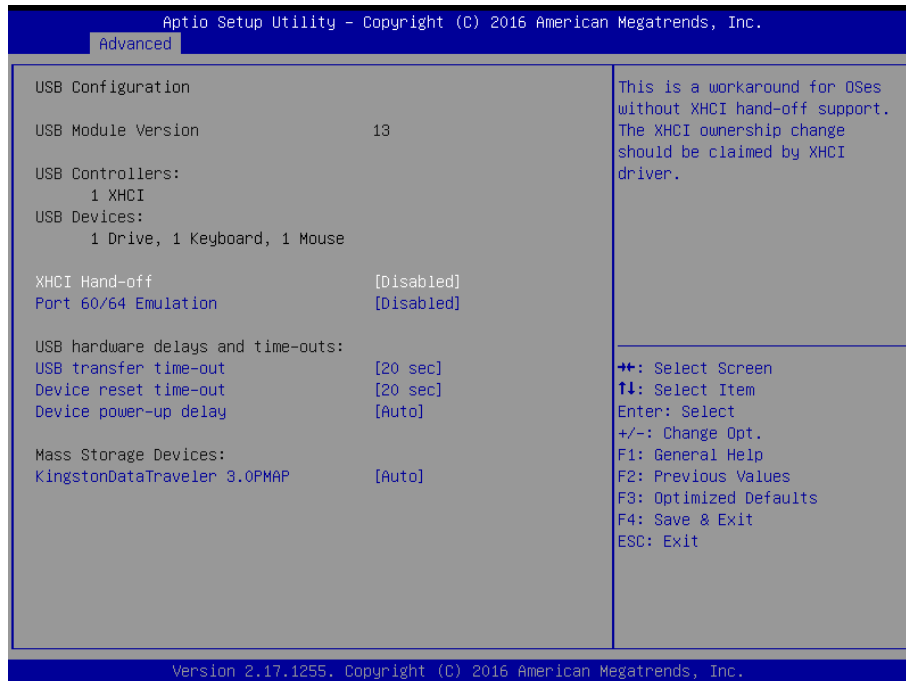
### If enable CSM Support:



| Item                       | Options                                              | Description                                                                                                                                    |
|----------------------------|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CSM Support</b>         | Enable                                               | Set to Enable CSM Support.                                                                                                                     |
| <b>Option ROM Messages</b> | Force BIOS[Default]<br>Keep Current                  | Set display mode for Option ROM.                                                                                                               |
| <b>INT19 Trap Response</b> | Immediate[Default]<br>Postponed                      | BIOS reaction on INT19 trapping by Option ROM:<br>IMMEDIATE – execute the trap right away;<br>POSTPONED – execute the trap during legacy boot. |
| <b>Boot option filter</b>  | UEFI and Legacy<br>Legacy only[Default]<br>UEFI only | This option controls Legacy/UEFI ROMs priority.                                                                                                |
| <b>Network</b>             | Do not launch[Default]<br>UEFI<br>Legacy             | Controls the execution of UEFI and Legacy PXE OpROM.                                                                                           |
| <b>Storage</b>             | Do not launch<br>UEFI<br>Legacy[Default]             | Controls the execution of UEFI and Legacy Storage OpROM.                                                                                       |
| <b>Other PCI devices</b>   | Do not launch<br>UEFI<br>Legacy[Default]             | Determines OpROM execution policy for devices other than Network, Storage, or Video.                                                           |

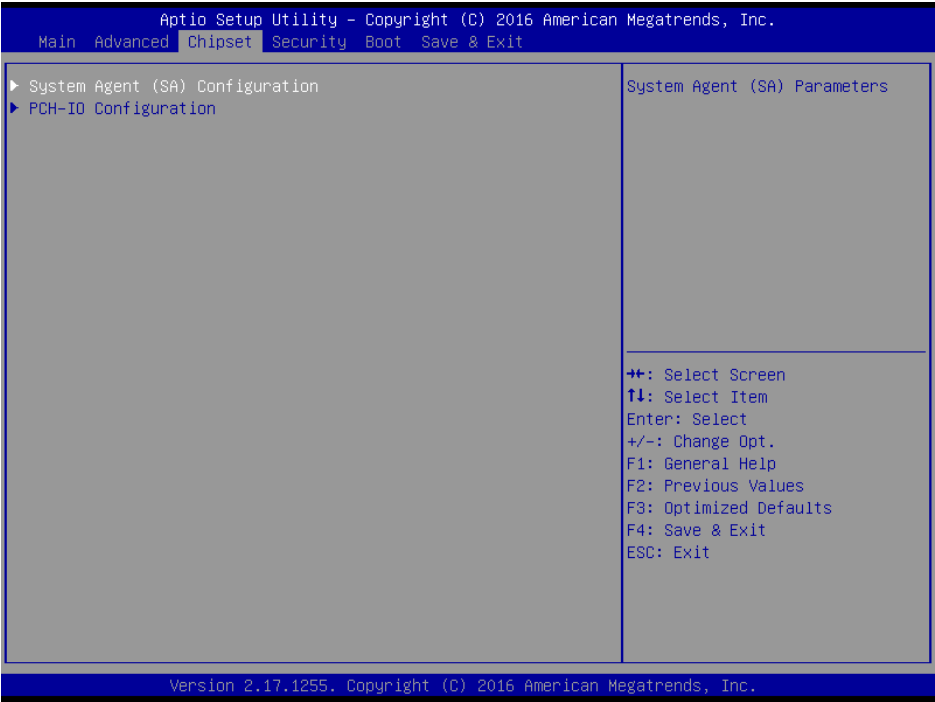
## 3.6.2.15 USB Configuration

The USB Configuration menu helps read USB information and configures USB settings.

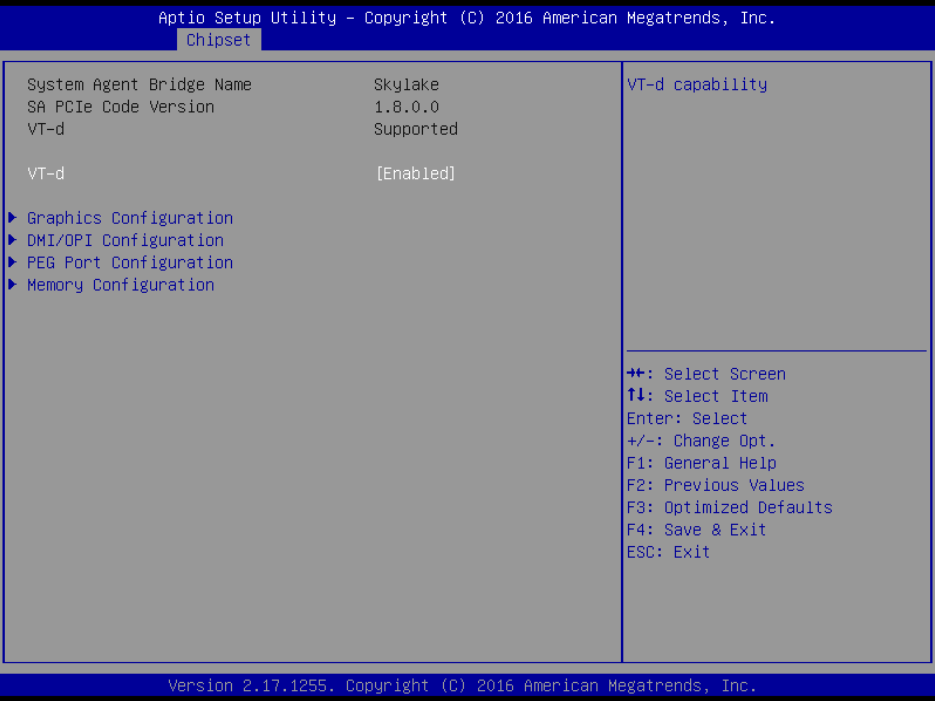


| Item                         | Options                                                              | Description                                                                                                                                                                                                |
|------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>XHCI Hand-off</b>         | Enabled<br>Disabled <b>[Default]</b>                                 | This is a workaround for OSe without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.                                                                                    |
| <b>Port 60/64 Emulation</b>  | Enabled<br>Disabled <b>[Default]</b>                                 | Enables I/O port 60h/64h emulation support.                                                                                                                                                                |
| <b>USB transfer time-out</b> | 1 sec<br>5 sec<br>10 sec<br>20 sec <b>[Default]</b>                  | The time-out value for Control, Bulk, and Interrupt transfers.                                                                                                                                             |
| <b>Device reset time-out</b> | 10 sec<br>20 sec <b>[Default]</b><br>30 sec<br>40 sec                | USB mass storage device Start Unit command time-out.                                                                                                                                                       |
| <b>Device power-up delay</b> | Auto <b>[Default]</b><br>Manual                                      | Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken form Hub descriptor. |
| <b>Mass Storage Devices</b>  | Auto <b>[Default]</b><br>Floppy<br>Forced FDD<br>Hard Disk<br>CD-ROM | Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.    |

3.6.3 Chipset

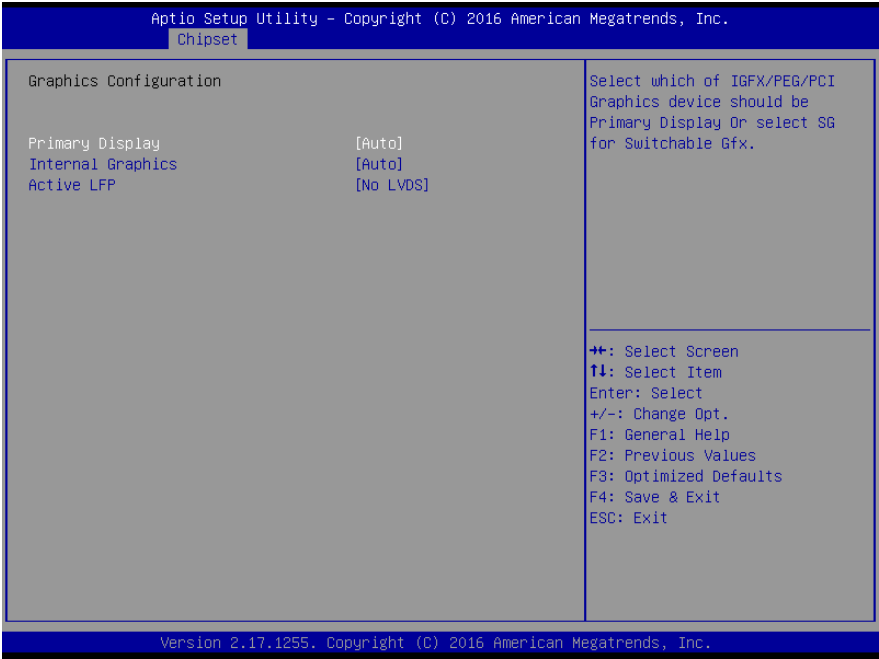


3.6.3.1 System Agent (SA) Configuration

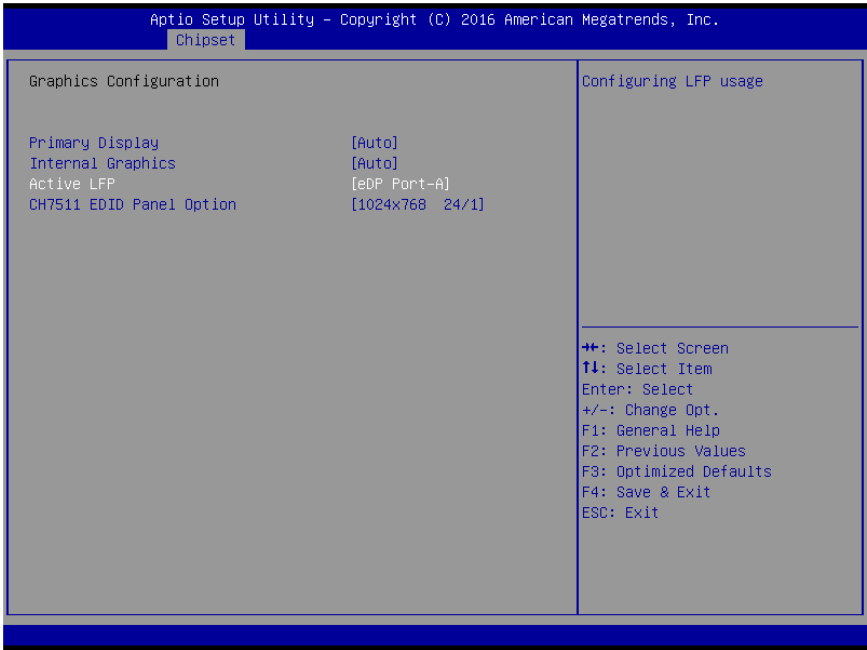


| Item | Option                               | Description      |
|------|--------------------------------------|------------------|
| VT-d | Enabled <b>[Default]</b><br>Disabled | VT-d capability. |

3.6.3.1.1 Graphics Configuration



| Item              | Option                                | Description                                                                                             |
|-------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------|
| Primary Display   | Auto[Default]<br>IGFX<br>PEG          | Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx. |
| Internal Graphics | Auto [Default]<br>Disabled<br>Enabled | Keep IGFX enabled based on the setup options.                                                           |
| Active LFP        | No LVDS[Default]<br>eDP Port-A        | Configuring LFP usage.                                                                                  |

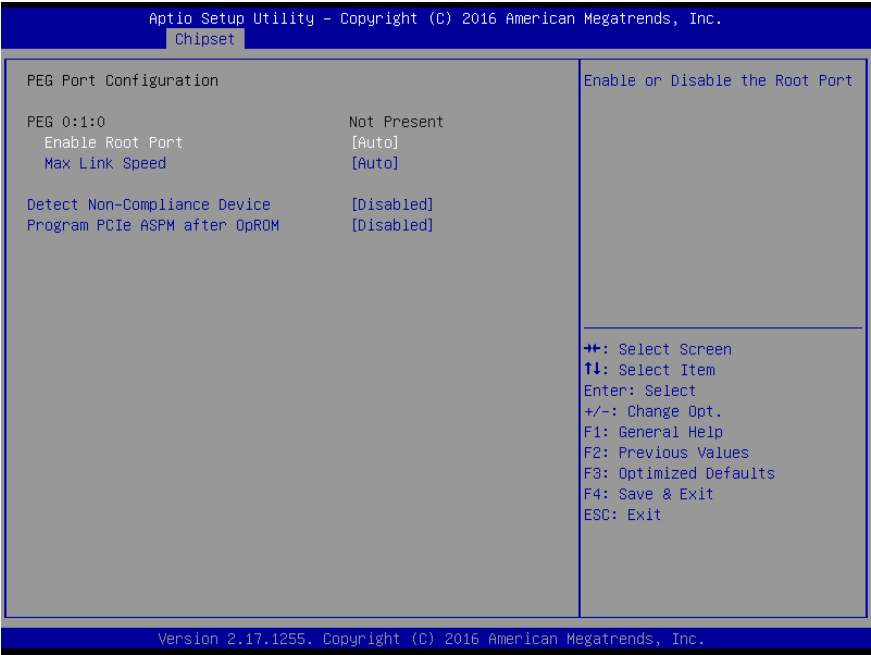


| Item                     | Option                                                                                                                                                                                                                                                   | Description                                                                                             |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Primary Display          | Auto[Default]<br>IGFX<br>PEG                                                                                                                                                                                                                             | Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx. |
| Internal Graphics        | Auto[Default]<br>Disabled<br>Enabled                                                                                                                                                                                                                     | Keep IGFX enabled based on the setup options.                                                           |
| Active LFP               | No LVDS[Default]<br>eDP Port-A                                                                                                                                                                                                                           | Configuring LFP usage.                                                                                  |
| CH7511 EDID Panel Option | 1024x768 24/1[Default]<br>800x600 18/1<br>1024x768 18/1<br>1366x768 18/1<br>1024x600 18/1<br>1280x800 18/1<br>1920x1200 24/2<br>1920x1080 18/2<br>1280x1024 24/2<br>1440x900 18/2<br>1600x1200 24/2<br>1366x768 24/1<br>1920x1080 24/2<br>1680x1050 24/2 | Port1-EDP to LVDS (Chrotel 7511) Panel EDID Option.                                                     |

### 3.6.3.1.2 DMI/OPI Configuration

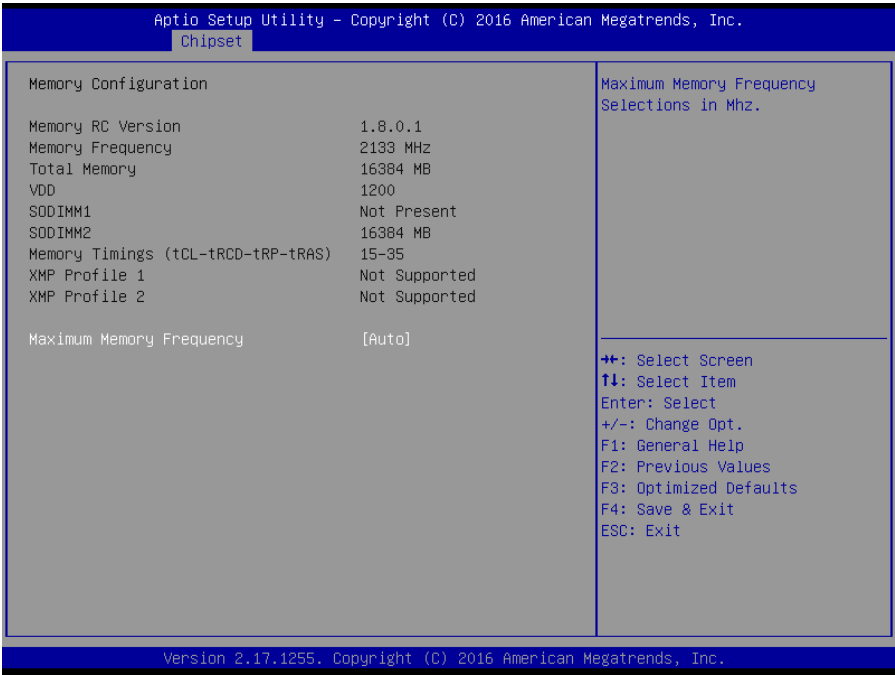


3.6.3.1.3 PEG Port Configuration



| Item                          | Option                                | Description                                                                                             |
|-------------------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------|
| Enable Root Port              | Disabled<br>Enabled<br>Auto[Default]  | Enable or Disable the Root Port.                                                                        |
| Max Link Speed                | Auto[Default]<br>Gen1<br>Gen2<br>Gen3 | Configure PEG 0:1:0 Max Speed.                                                                          |
| Detect Non-Compliance Device  | Disabled[Default]<br>Enabled          | Detect Non-Compliance PCI Express Device in PEG.                                                        |
| Program PCIe ASPM after OpROM | Disabled[Default]<br>Enabled          | Enabled: PCIe ASPM will be programmed after OpROM. Disabled: PCIe ASPM will be programmed before OpROM. |

3.6.3.1.4 Memory Configuration



| Item                     | Option                                                                                                            | Description                                 |
|--------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Maximum Memory Frequency | Auto[Default]<br>1067/1200/1333/1400/1600<br>/1800/1867/2000/2133/2200<br>/2400/2600/2667/2800/2933<br>/3000/3200 | Maximum Memory Frequency Selections in Mhz. |

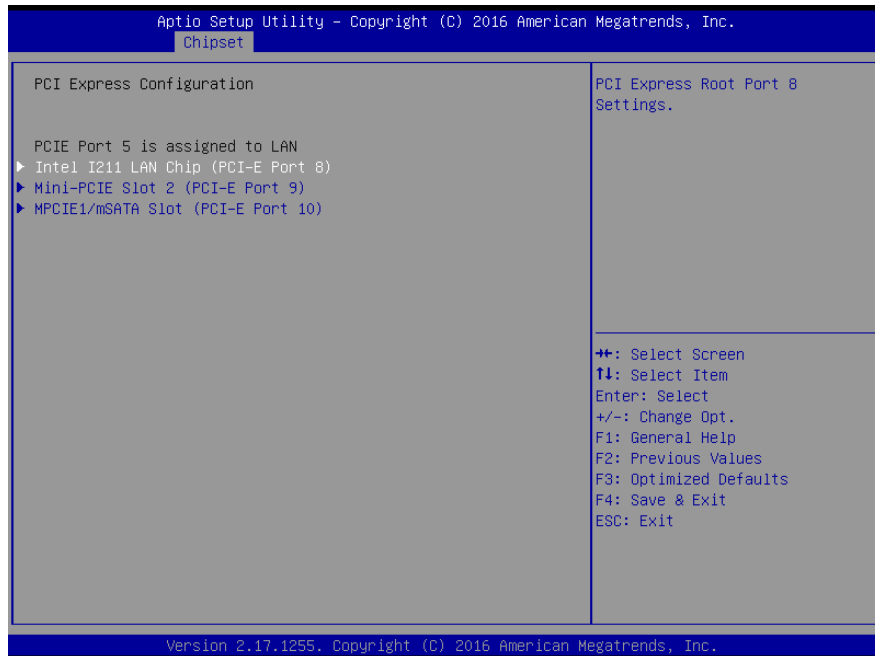
3.6.3.2 PCH-IO Configuration



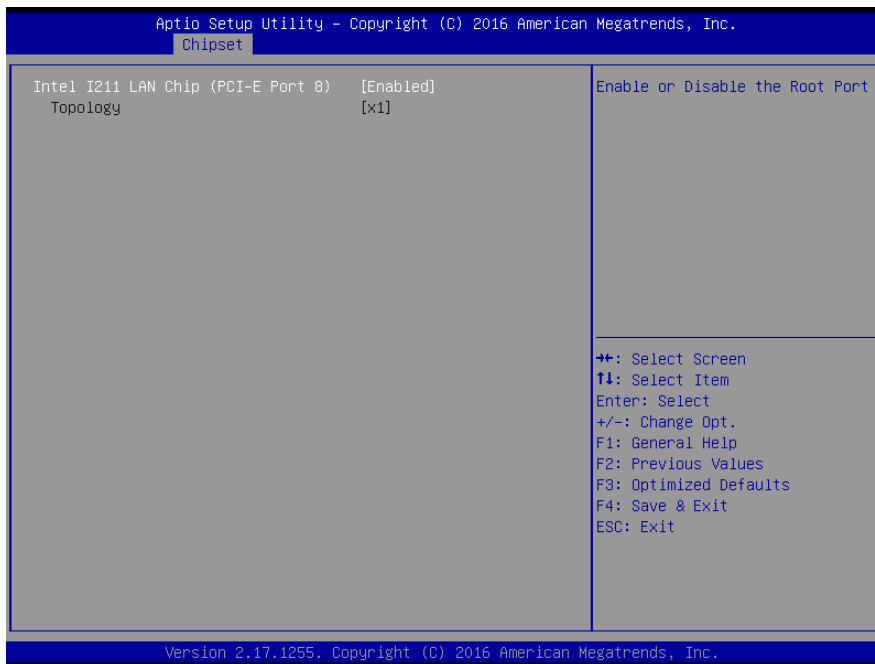
## EMX-Q170P User's Manual

| Item               | Option                       | Description                                       |
|--------------------|------------------------------|---------------------------------------------------|
| LAN PHY Controller | Disabled<br>Enabled[Default] | Enable or disable OnBoard PCH LAN PHY Controller. |
| Serial IRQ Mode    | Quiet<br>Continuous[Default] | Configure Serial IRQ Mode.                        |

### 3.6.3.2.1 PCI Express Configuration

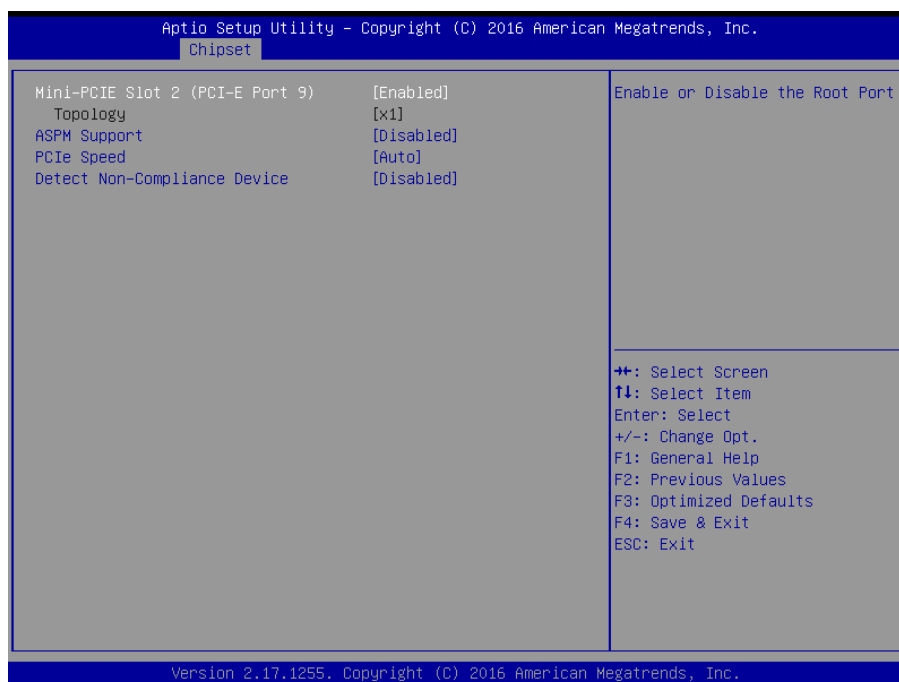


#### 3.6.3.2.1.1 Intel I211 LAN Chip (PCI-E Port 8)



| Item                               | Option                        | Description                      |
|------------------------------------|-------------------------------|----------------------------------|
| Intel I211 LAN Chip (PCI-E Port 8) | Enabled[Default],<br>Disabled | Enable or Disable the Root Port. |

### 3.6.3.2.1.2 Mini-PCIE Slot 2 (PCI-E Port 9)



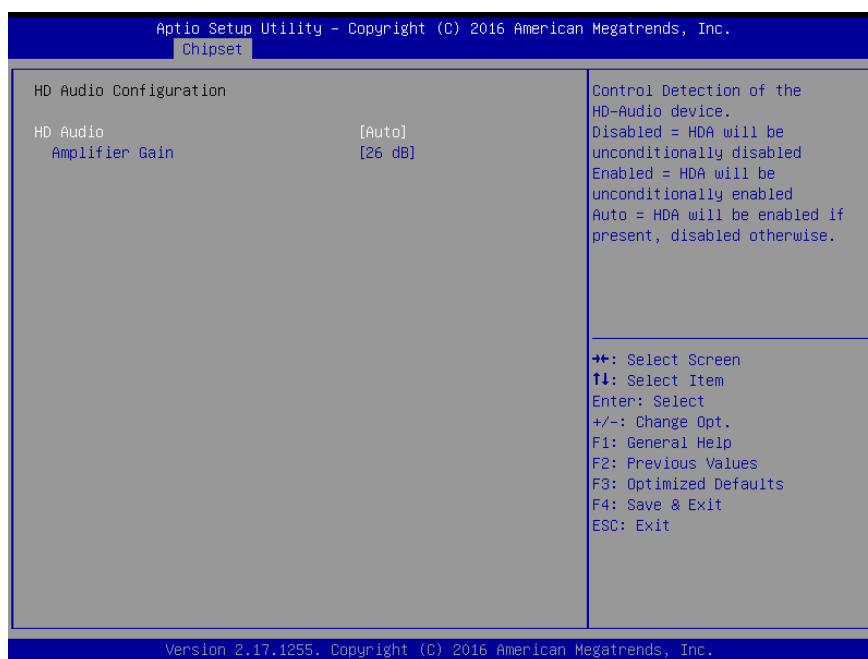
| Item                                   | Option                                                    | Description                                                                                                      |
|----------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| <b>Mini-PCIE Slot 2 (PCI-E Port 9)</b> | Enabled[ <b>Default</b> ],<br>Disabled                    | Control the PCI Express Root Port.                                                                               |
| <b>ASPM Support</b>                    | Disabled[ <b>Default</b> ],<br>L0s<br>L1<br>L0sL1<br>Auto | Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM. |
| <b>PCIe Speed</b>                      | Auto[ <b>Default</b> ]<br>Gen1<br>Gen2<br>Gen3            | Select PCI Express port speed.                                                                                   |
| <b>Detect Non-Compliance Device</b>    | Enabled,<br>Disabled[ <b>Default</b> ]                    | Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.                        |

3.6.3.2.1.3 MPCIE/mSATA Slot (PCI-E Port 10)



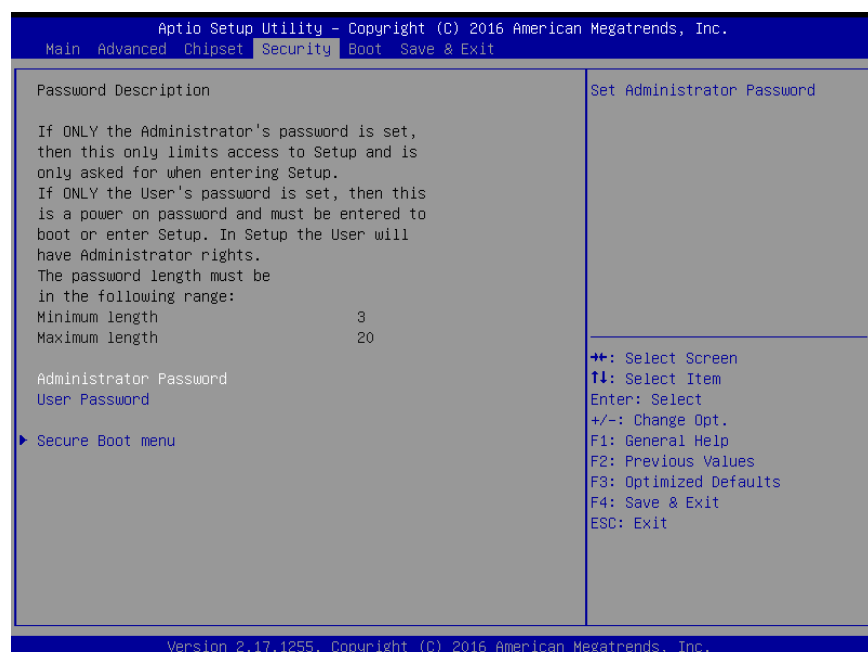
| Item                                     | Option                                                    | Description                                                                                                      |
|------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| <b>MPCIE1/mSATA Slot (PCI-E Port 10)</b> | Enabled <b>[Default]</b> ,<br>Disabled                    | Enable or Disable the Root Port.                                                                                 |
| <b>ASPM Support</b>                      | Disabled <b>[Default]</b> ,<br>L0s<br>L1<br>L0sL1<br>Auto | Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM. |
| <b>PCIe Speed</b>                        | Auto <b>[Default]</b><br>Gen1<br>Gen2<br>Gen3             | Select PCI Express port speed.                                                                                   |
| <b>Detect Non-Compliance Device</b>      | Enabled,<br>Disabled <b>[Default]</b>                     | Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.                        |

### 3.6.3.2.2 HD Audio Configuration



| Item           | Option                                | Description                                                                                                                                                                                       |
|----------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HD Audio       | Disabled<br>Enabled<br>Auto[Default], | Control Detection of the HD-Audio device. Disable = HAD will be unconditionally disabled Enabled = HAD will be unconditionally enabled Auto = HAD will be enabled if present, disabled otherwise. |
| Amplifier Gain | 20dB<br>26dB[Default]<br>32dB<br>36dB | Select Amplifier Gain (dB).                                                                                                                                                                       |

### 3.6.4 Security



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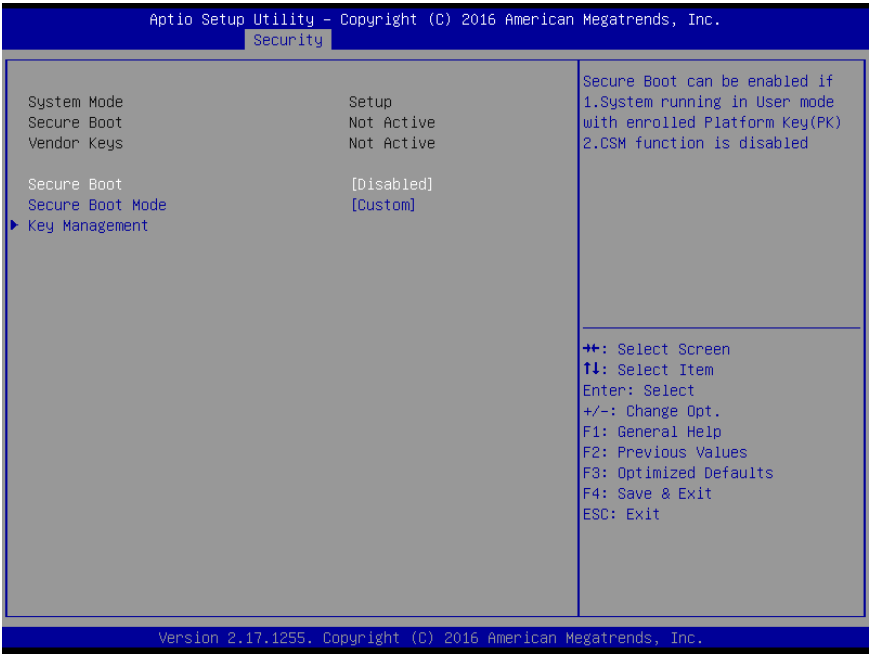
● Administrator Password

Set setup Administrator Password

● User Password

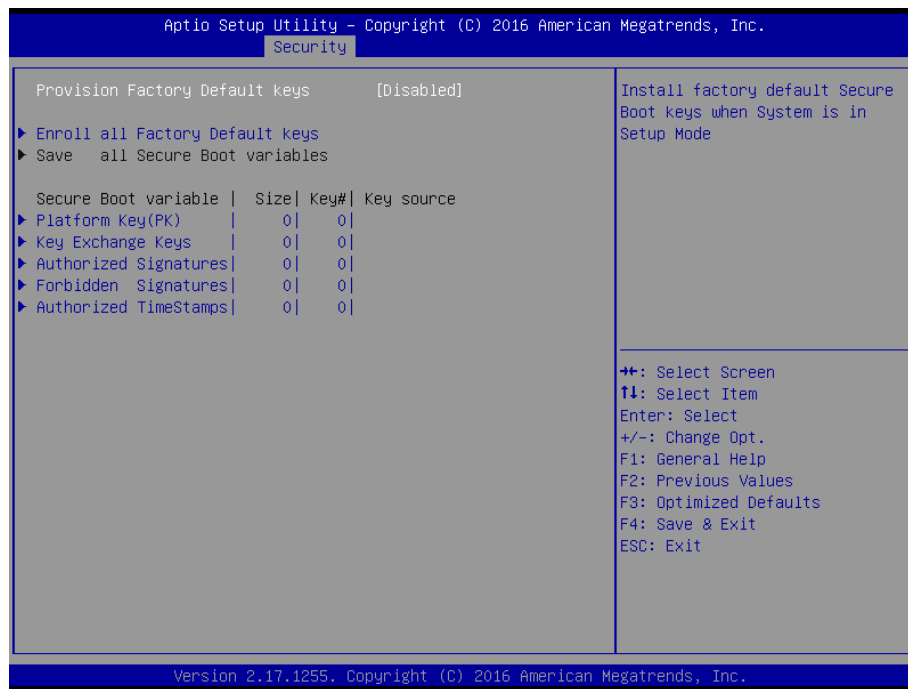
Set User Password

3.6.4.1 Secure Boot menu



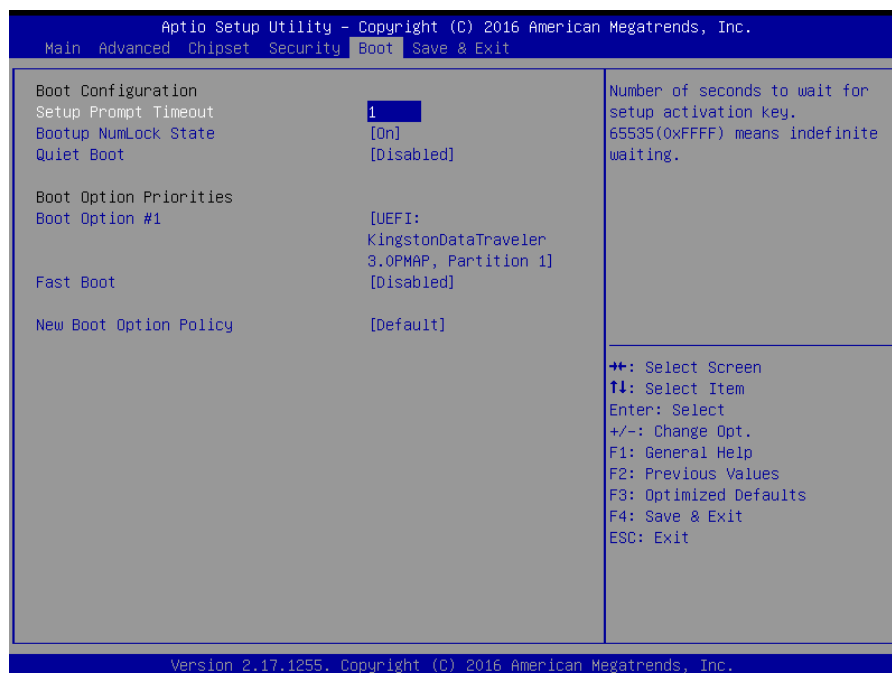
| Item             | Option                       | Description                                                                                                            |
|------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Secure Boot      | Disabled[Default]<br>Enabled | Secure Boot can be enabled if 1.System running in User mode with enrolled Platform Key(PK) 2.CSM function is disabled. |
| Secure Boot Mode | Standard<br>Custom[Default]  | Secure Boot mode selector. 'Custom' Mode enables users to change Image Execution policy and manage Secure Boot Keys.   |

### 3.6.4.1.1 Key Management



| Item                           | Option                        | Description                                                            |
|--------------------------------|-------------------------------|------------------------------------------------------------------------|
| Provision Factory Default Keys | Enabled,<br>Disabled[Default] | Install Factory default Secure Boot Keys when System is in Setup Mode. |

## 3.6.5 Boot

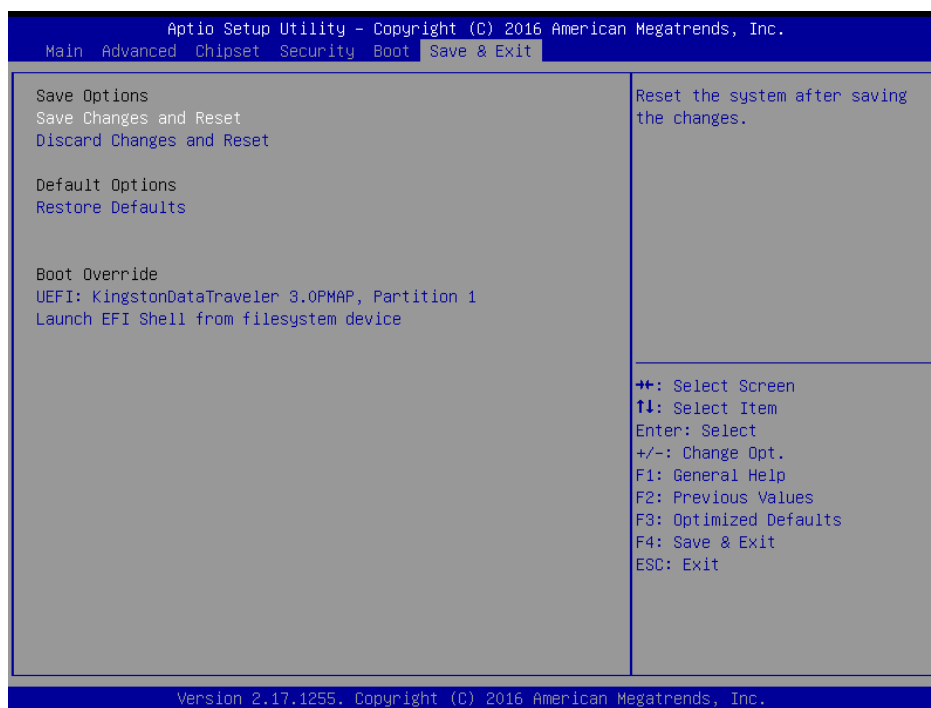


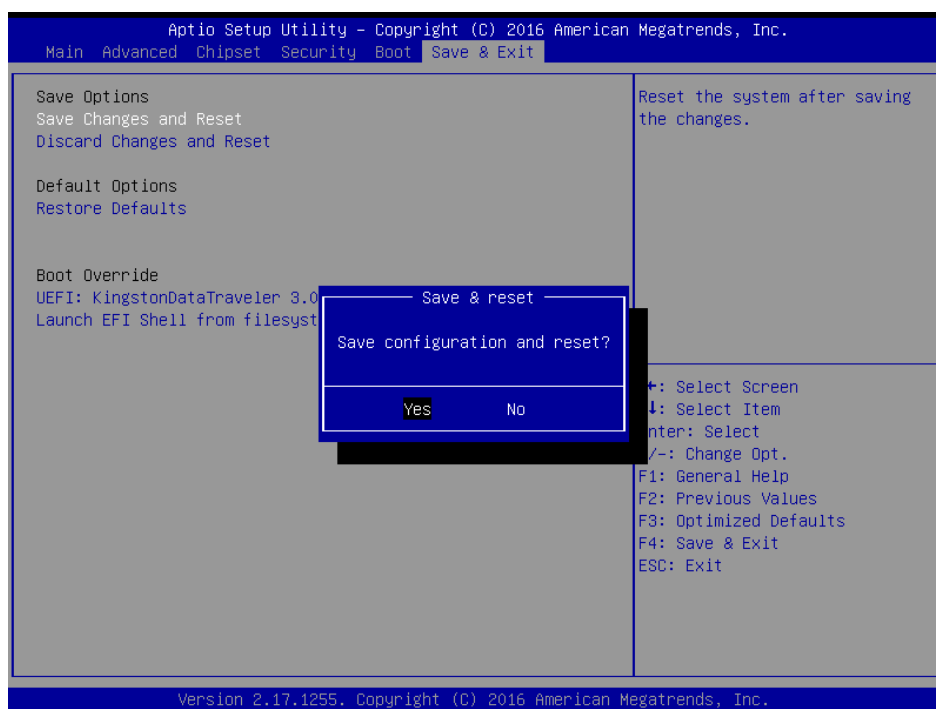
| Item                 | Option   | Description                         |
|----------------------|----------|-------------------------------------|
| Setup Prompt Timeout | 1~ 65535 | Number of seconds to wait for setup |

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|                               |                                                        |                                                                                                                                                     |
|-------------------------------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|                               |                                                        | activation key. 65535(0xFFFF) means indefinite waiting.                                                                                             |
| <b>Bootup NumLock State</b>   | On[ <b>Default</b> ]<br>Off                            | Select the Keyboard NumLock state                                                                                                                   |
| <b>Quiet Boot</b>             | Disabled[ <b>Default</b> ]<br>Enabled                  | Enables or disables Quiet Boot option                                                                                                               |
| <b>Fast Boot</b>              | Disabled[ <b>Default</b> ]<br>Enabled                  | Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options. |
| <b>New Boot Option Policy</b> | Default[ <b>Default</b> ]<br>Place First<br>Place Last | Controls the placement of newly detected UEFI boot options.                                                                                         |
| <b>Boot Option #1</b>         | Set the system boot order.                             |                                                                                                                                                     |

### 3.6.6 Save and exit





### 3.6.6.1 *Save Changes and Reset*

Reset the system after saving the changes.

### 3.6.6.2 *Discard Changes and Reset*

Any changes made to BIOS settings during this session of the BIOS setup program are discarded. The setup program then exits and reboots the controller.

### 3.6.6.3 *Restore Defaults*

This option restores all BIOS settings to the factory default. This option is useful if the controller exhibits unpredictable behavior due to an incorrect or inappropriate BIOS setting.

### 3.6.6.4 *Launch EFI Shell from filesystem device*

Attempts to Launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.

## 4. Drivers Installation



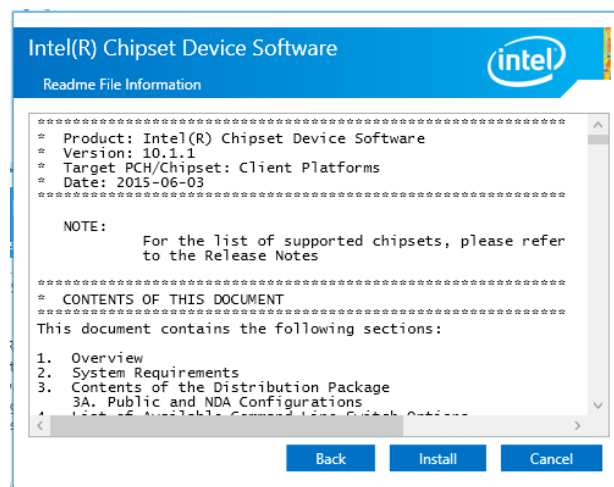
**Note:** Installation procedures and screen shots in this section are for your reference and may not be exactly the same as shown on your screen.

## 4.1 Install Chipset Driver

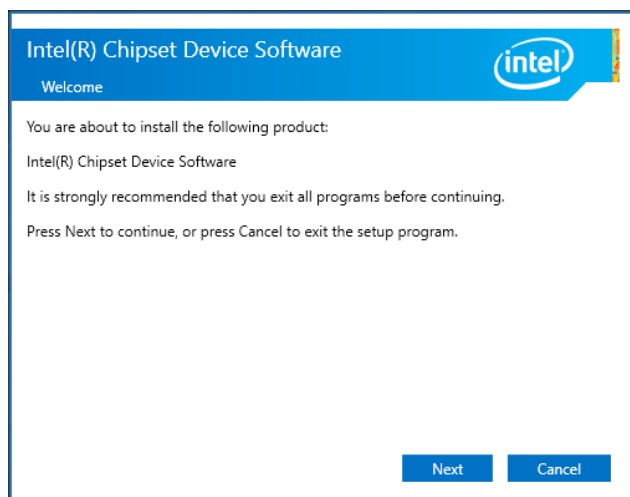
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.



**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.



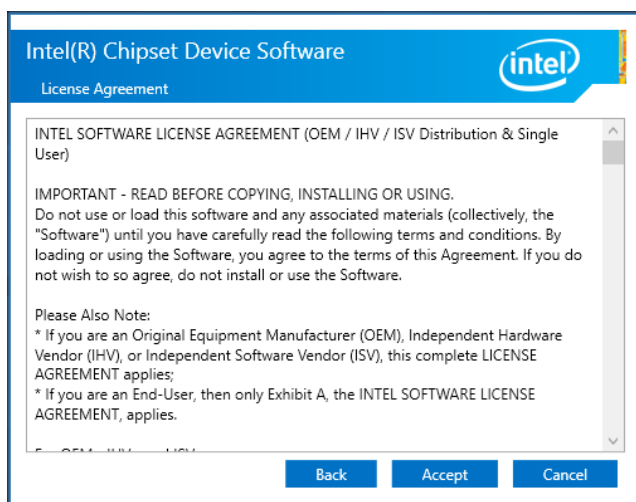
**Step 3. Click Install.**



**Step1. Click Next.**



**Step 4. Complete setup.**



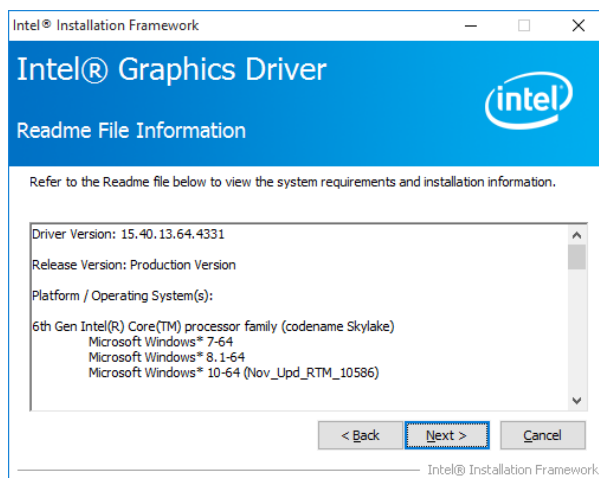
**Step 2. Click Accept.**

## 4.2 Install VGA Driver

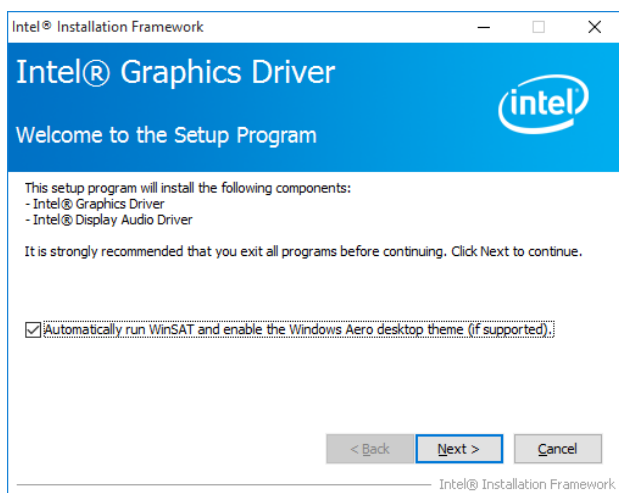
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.



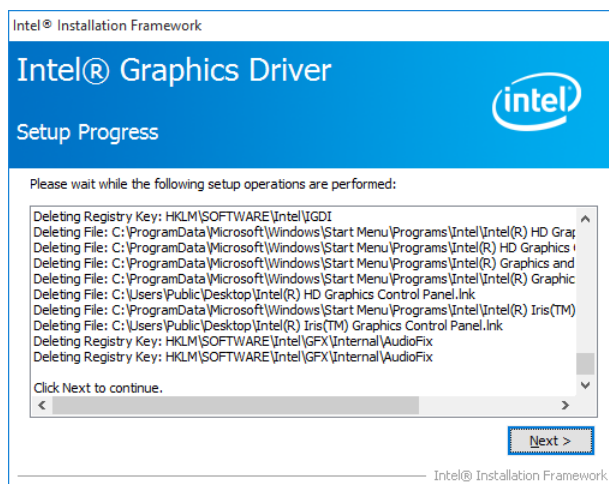
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



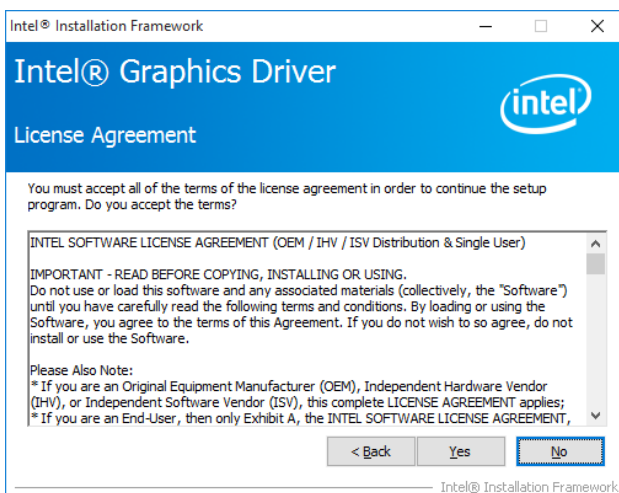
**Step 3. Click Next.**



**Step 1. Click Next** to continue installation.

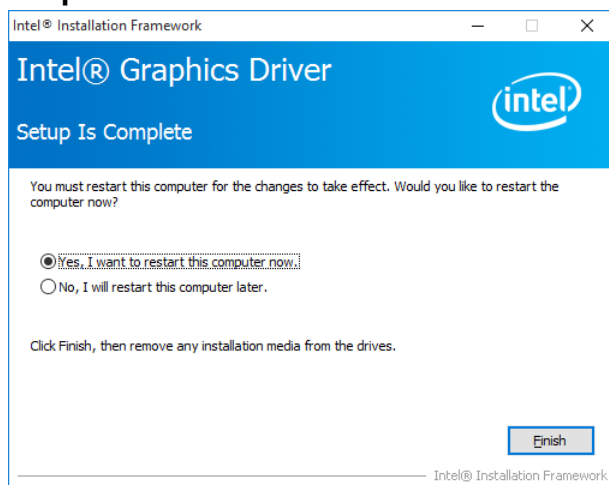


**Step 4. Click Next.**



**Step 2.**

Click **Yes** to accept license agreement.



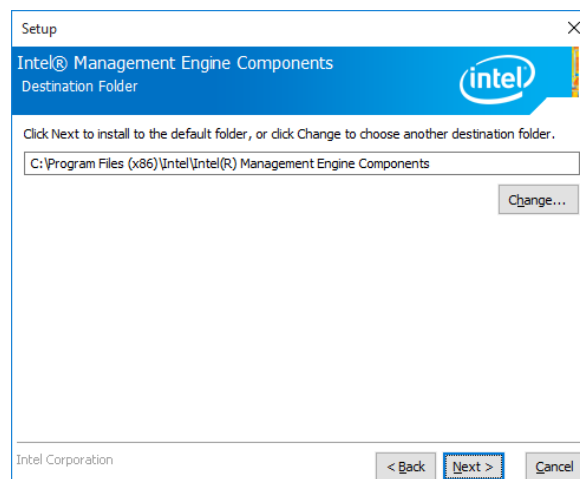
**Step 5. Click Finish** to complete setup.

## 4.3 Install ME Driver

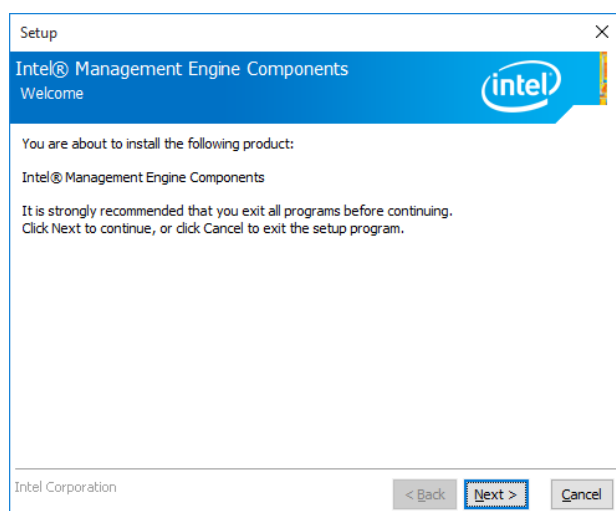
Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.



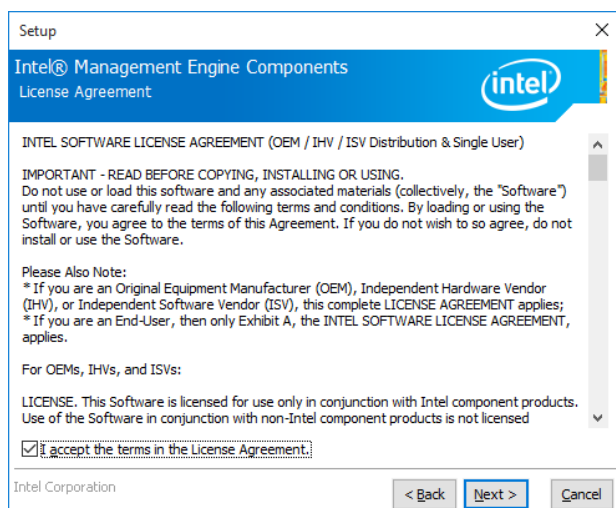
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



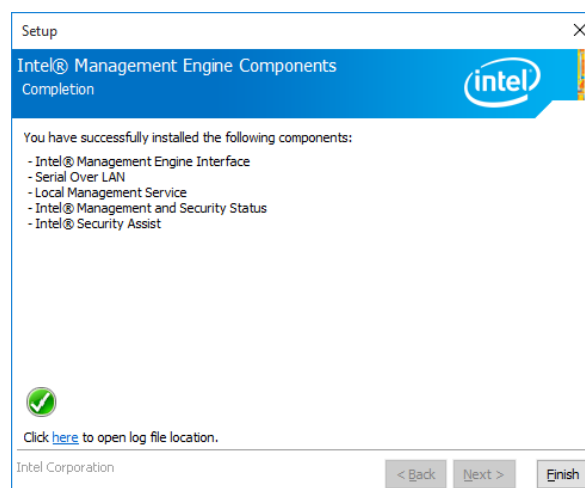
**Step 3. Click Next**



**Step 1. Click Next** to continue setup.



**Step 2. Click Next.**



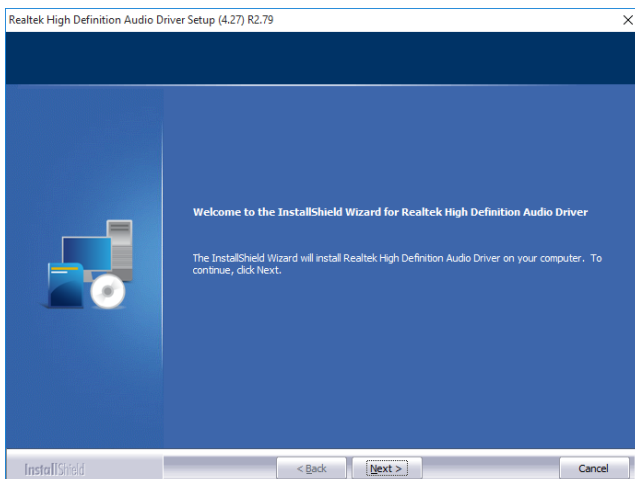
**Step 4. Click Finish** to complete the setup

### 4.4 Install Audio Driver (For Realtek ALC892 HD Audio)

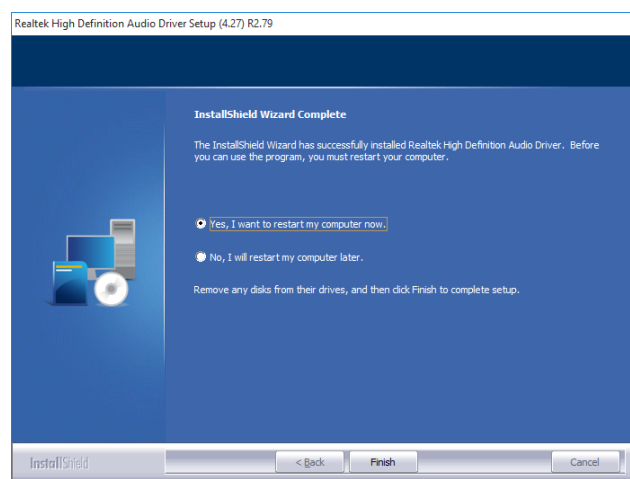
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.



**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.



**Step1.** Click **Next** to Install.



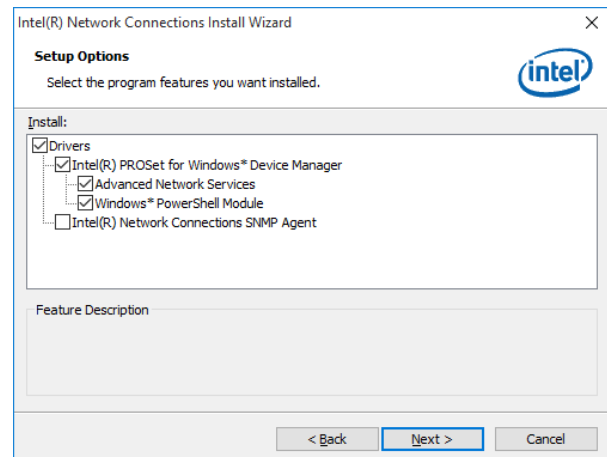
**Step 2.** Select **Finish** to complete Installation.

## 4.5 Install LAN Driver

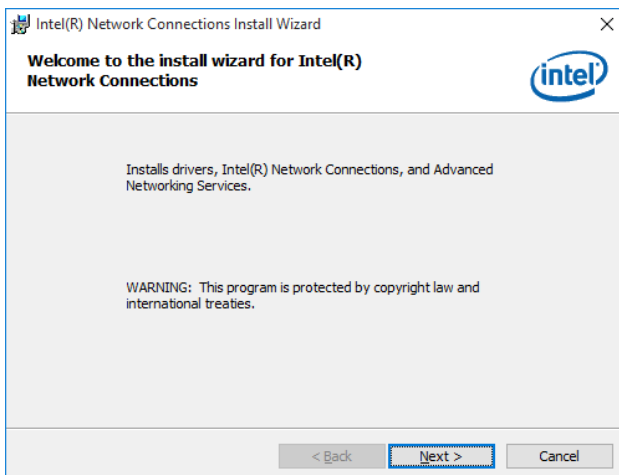
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.



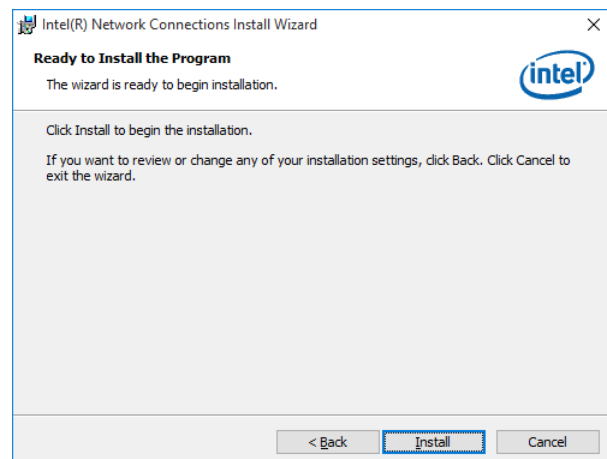
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



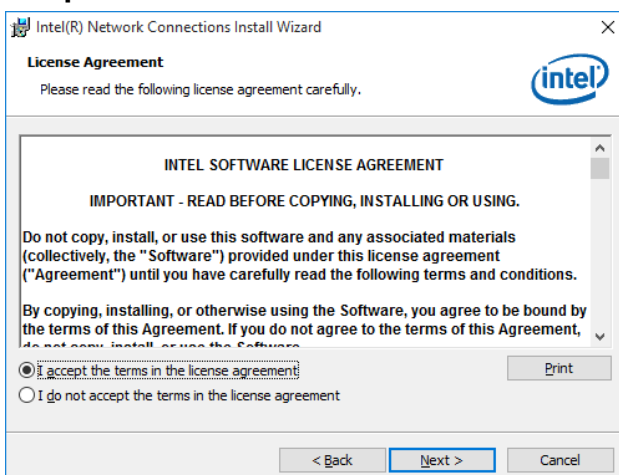
**Step 3. Click Next.**



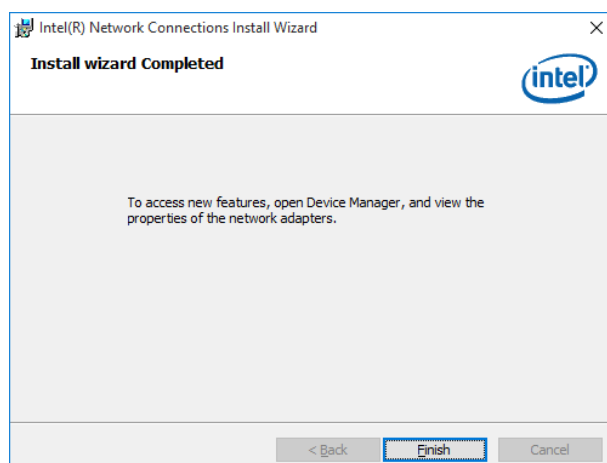
**Step 1. Click Next** to continue installation.



**Step 4. Click Install.**



**Step 2. Click Next.**



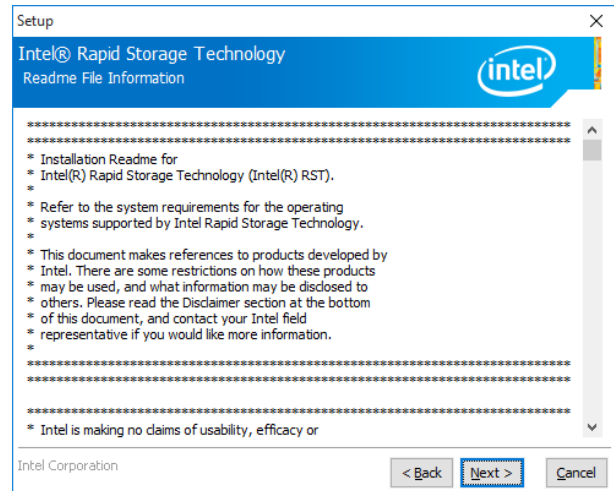
**Step 5. Click Finish** to complete setup.

## 4.6 Install RST Driver

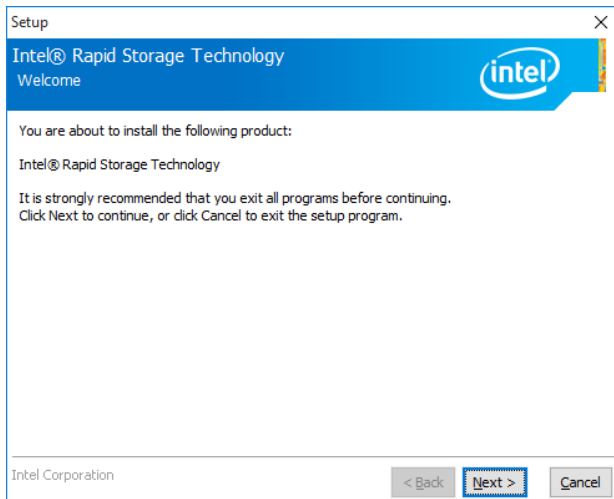
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.



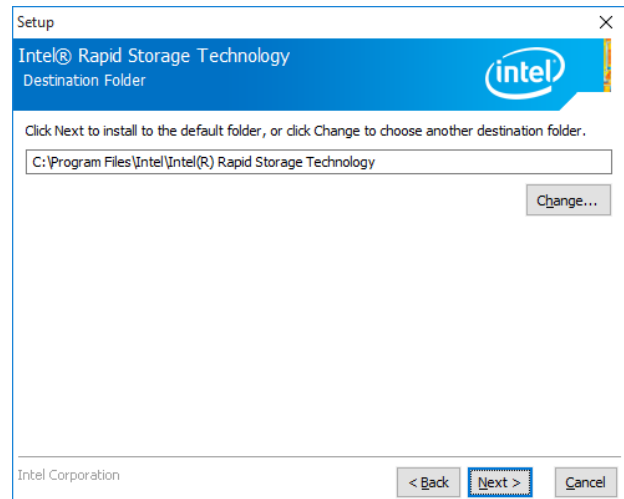
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



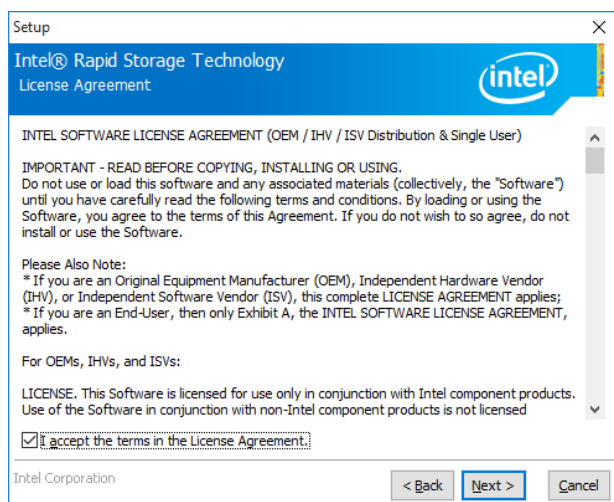
**Step 3. Click Next.**



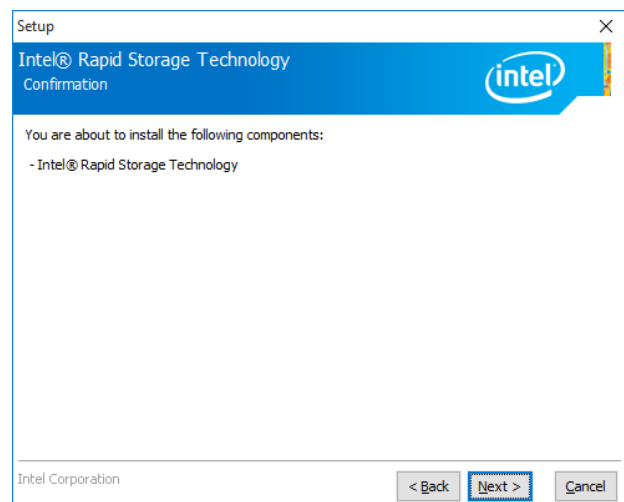
**Step 1. Click Next** to continue installation.



**Step 4. Click Next.**



**Step 2. Click Next.**

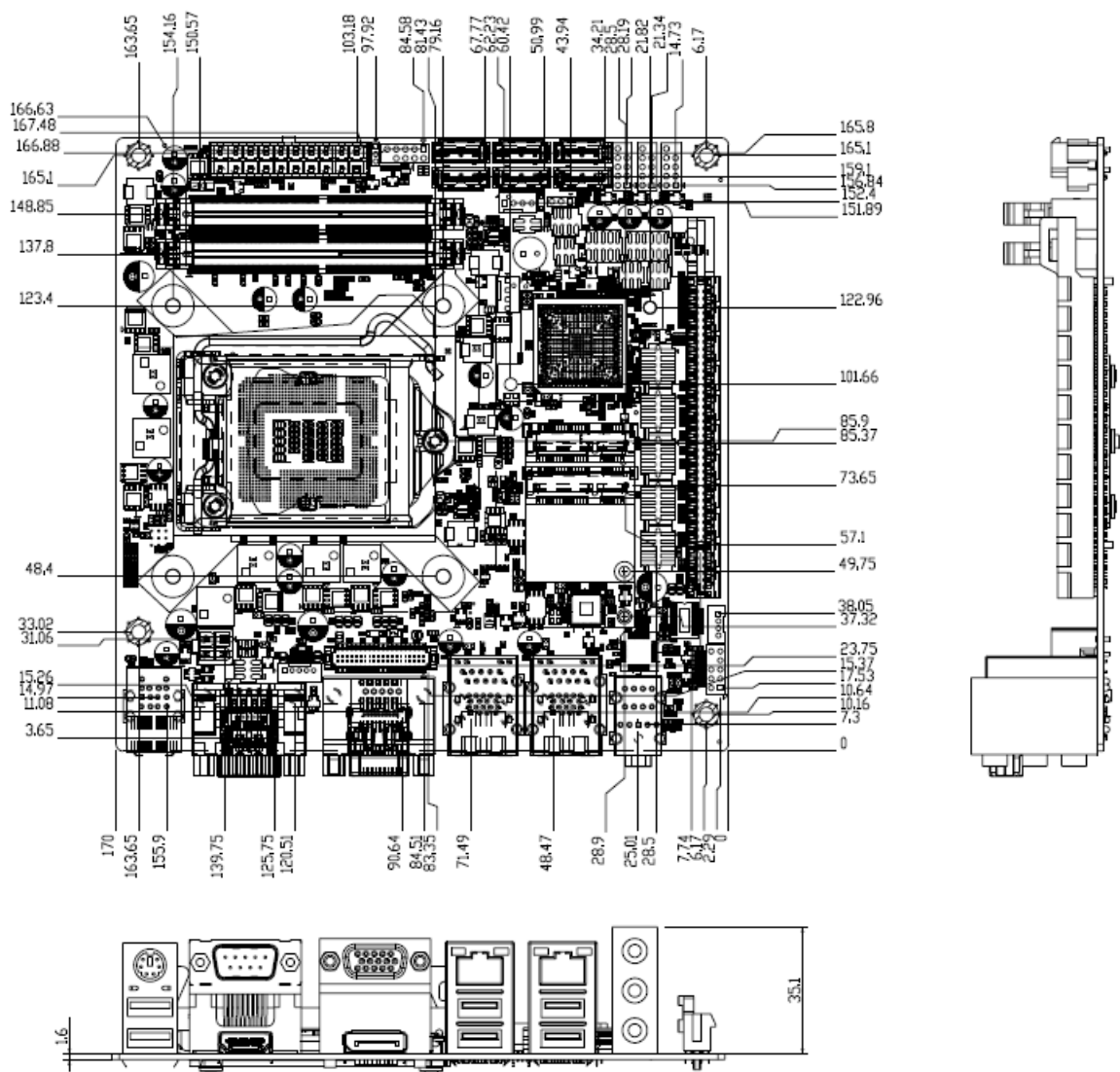


**Step 5. Click Finish** to complete setup.

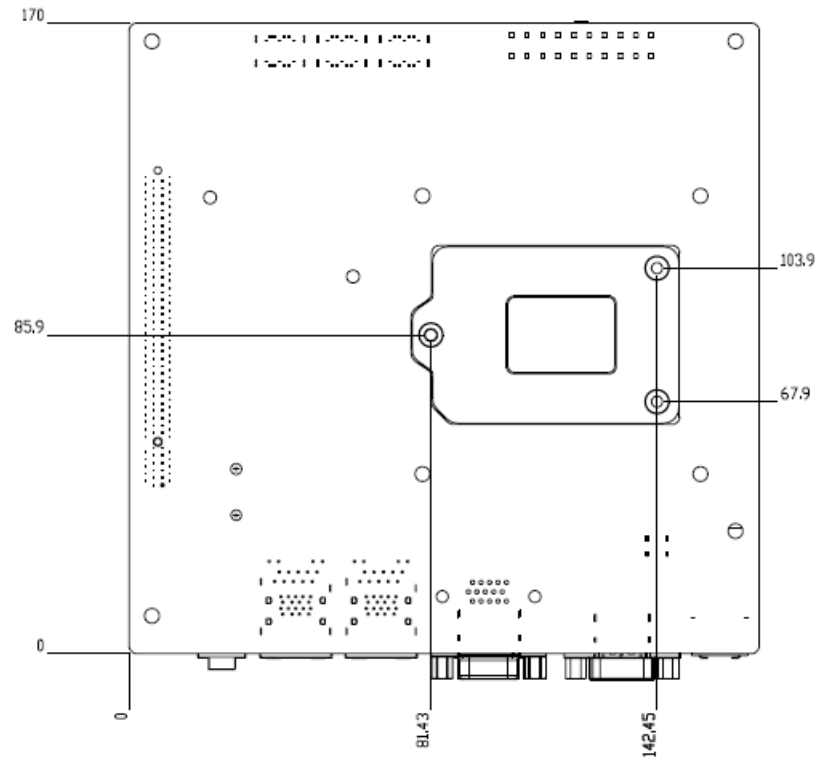


**Step 6.** Click **Finish** to complete setup.

# 5. Mechanical Drawing



Unit: mm



Unit: mm

