

# ECM-CFS

3.5" Coffee Lake-S Micro Module

## User's Manual

5<sup>th</sup> Ed – 14 November 2019

### Copyright Notice

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Part No. E2047394204R

## 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 UNDESIRABLE 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.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

## A Message to the Customer

### *Customer Services*

Each product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new device is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation.

Your satisfaction is our primary concern. Here is a guide to our customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

### *Technical Support*

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone. So please consult the user's manual first.

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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 ECM-CFS 3.5" Micro Module
- 1 x AUX-032 daughter board
- 1 x Cable set contains the followings:
  - 1 x Audio cable (12P/2.0mm-12P/ 2.0mm)
  - 1 x USB 2.0 cable (10P/2.0mm-10P/2.0mm)
  - 1 x Serial ATA cable (7P/1.27mm, standard)
  - 1 x Wire SATA power cable (15P/1.27mm-2P/2.0mm)
  - 1 x Flat Cable 9P(M)-PHD (10P/2.0mm)
- 3M foam (VHB-4622 10mm\*20mm\*1.1mm)



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

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### 1.3 Document Amendment History

| Revision        | Date          | By | Comment                                 |
|-----------------|---------------|----|---|
| 1 <sup>st</sup> | August 2018   |    | Initial Release                         |
| 2 <sup>nd</sup> | July 2019     |    | Update 2.3 Setting Jumpers & Connectors |
| 3 <sup>rd</sup> | August 2019   |    | Update 1.5 System Specifications        |
| 4 <sup>th</sup> | October 2019  |    | Remove CEC1 connector                   |
| 4th             | November 2019 |    | Update 1.5 System Specifications        |

### 1.4 Manual Objectives

This manual describes ECM-CFS Single Board in details.

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 ECM-CFS 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             |  |
|--------------------|--|
| CPU                | 8 <sup>th</sup> /9 <sup>th</sup> generation Intel® Coffee lake-S (LGA 1151) 6+2,4+2 Processor (35W)  |
| BIOS               | AMI uEFO BIOS,256 Mbit SPI Flash ROM<br>iAMT supported   |
| System Chipset     | Intel® CNL PCH-H Q370/H310 Corp  |
| I/O Chip           | EC(IT8528E)  |
| System Memory      | 1 x 260-Pin DDR4 2400/2666MTs SO-DIMM up to 32GB   |
| SSD                | mSATA from MiniPCIe  |
| Watchdog Timer     | H/W Reset, 1sec. - 65535sec./min.<br>1sec. or 1min. step   |
| H/W Status Monitor | Monitoring System Temperature, Voltage and FAN Status with Auto Throttling Control   |
| Expansion          | 1 x Full-Size Mini PCI Express Mini Card with mSATA supported  |
| I/O                |  |
| MIO                | 2 x SATA III (with 2 x (1 x 2 )pin wafer w/2.0mm pitch for SATA Power)<br>1 x RS232 (COM1)<br>1x RS232 for COM2<br>LPC,SPI<br>1 x mPCIe support PCIe / mSATA (H310 only support mSATA, Q370 support mPCIe/mSATA) |
| USB                | 4 x USB3.1 Gen2(dual deck USB connector for 2 USB3.1 port 10Gbps) (H310 support USB3.1 Gen1,Q370 support USB3.1 Gen2), 2 x USB 2.0( by 2 x 5 pin header)   |
| GPIO               | 8-bit GPIO   |
| Others             | LPC  |
| Display            |  |
| Chipset            | Intel® Coffee Lake Processor integrated Graphics   |
| Resolution         | LVDS: 1920 x 1200@60Hz<br>2 x HDMI: 4096 x 2304@30Hz (cost reduce)   |
| Multiple Display   | Q370 support Triple Display<br>H310 only support Dual Display:LVDS+HDMI1(default LVDS enable)or HDMI1+HDMI2(LVDS disabled)   |
| HDMI               | HDMI 1.4   |
| LCD Interface      | Dual channel 18/24-bit LVDS (via 7511B)  |
| Audio              |  |
| AC97 Codec         | Realtek ALC892 HD codec Supports 5.1-CH Audio  |

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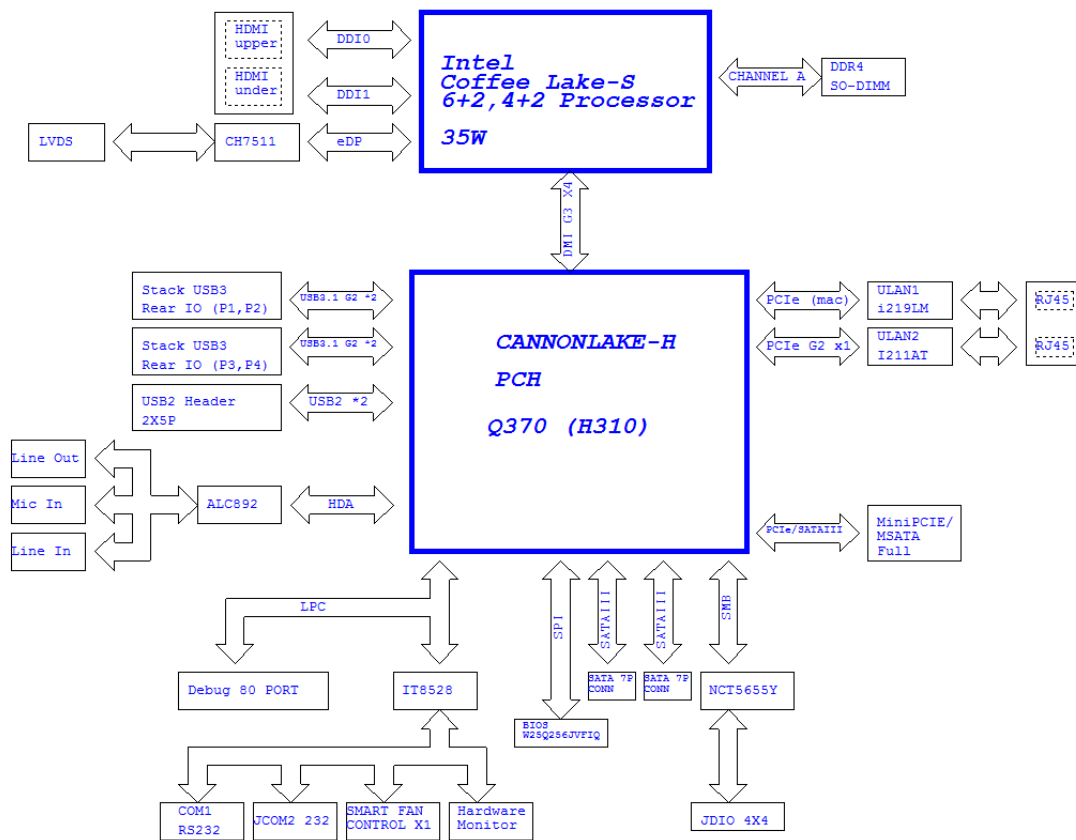
|                                       |  |
|---------------------------------------|--|
| <b>Audio Interface</b>                | Line in ,Line-Out, Mic in  |
| <b>Ethernet</b>                       |  |
| <b>LAN Chip</b>                       | 1 x Intel I211AT GbE controller<br>1 x Intel I219LM Gigabit Ethernet PHY |
| <b>Ethernet Interface</b>             | 10/100/1000 Base-Tx compatible   |
| <b>Internal I/O Connectors</b>        |  |
| <b>Fan</b>                            | CPU_FAN1 4pin 2.5mm wafer header (smart FAN)                             |
| <b>Buzzer</b>                         | With Pin header  |
| <b>CMOS Battery</b>                   | CR2032   |
| <b>Power ON</b>                       | AX / ATX selectable by jumper  |
| <b>Audio</b>                          | 6 x 2 pin header w/2.0mm pitch   |
| <b>COM</b>                            | 1 x JCOM2 (RS232)  |
| <b>SATA power</b>                     | 2 x (1 x 2)pin wafer for SATA power                                      |
| <b>Rear I/O Connectors</b>            |  |
| <b>USB</b>                            | 4 x USB3.1 (10Gbps) type-A   |
| <b>LAN</b>                            | 2 x Ethernet   |
| <b>HDMI</b>                           | 2 x HDMI   |
| <b>COM</b>                            | 1 x DB-9 male connector for COM1(RS-232)(support RI,5V,12V)              |
| <b>LED</b>                            | Stack LED for PWR and HDD LED  |
| <b>Mechanical &amp; Environmental</b> |  |
| <b>Power Requirement</b>              | +12V   |
| <b>ACPI</b>                           | Single power ATX Support S0, S3, S4, S5<br>ACPI 5.0 Compliant            |
| <b>Power Type</b>                     | AT/ATX   |
| <b>Operating Temp.</b>                | 0°C ~60°C( 32°F ~ 140°F )  |
| <b>Storage Temp.</b>                  | -40°C ~75°C ( -40°F ~ 167°F )  |
| <b>Operating Humidity</b>             | 0% ~ 90% relative humidity, non-condensing                               |
| <b>Size (L x W)</b>                   | 5.7" x 4" (146mm x 101mm)  |
| <b>Weight</b>                         | 0.44 lbs (0.2 Kg)  |
| <b>OS Support</b>                     | Win 10 / Linux   |



**Note:** Specifications are subject to change without notice.

## 1.6 Architecture Overview—Block Diagram

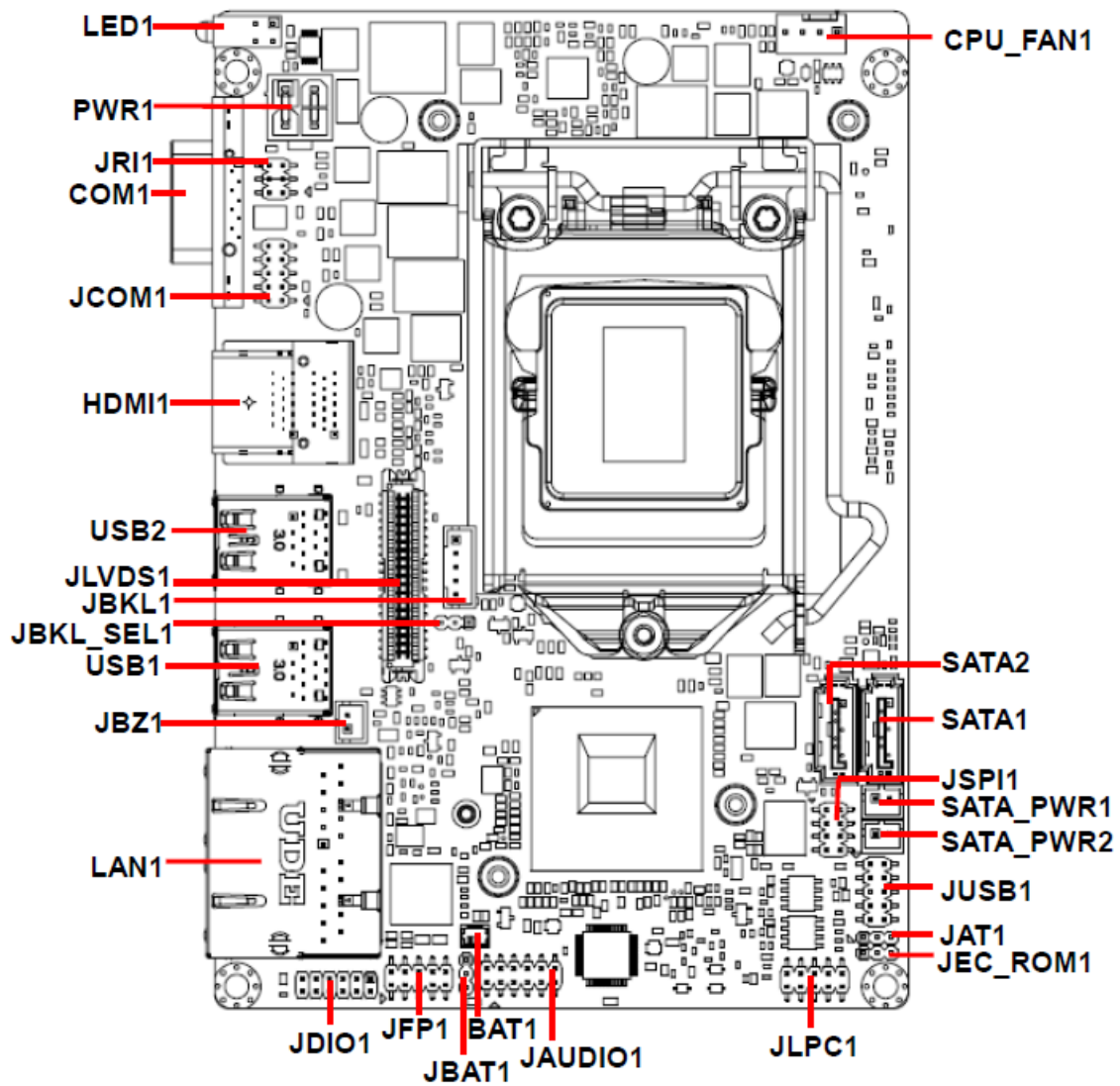
The following block diagram shows the architecture and main components of ECM-CFS.

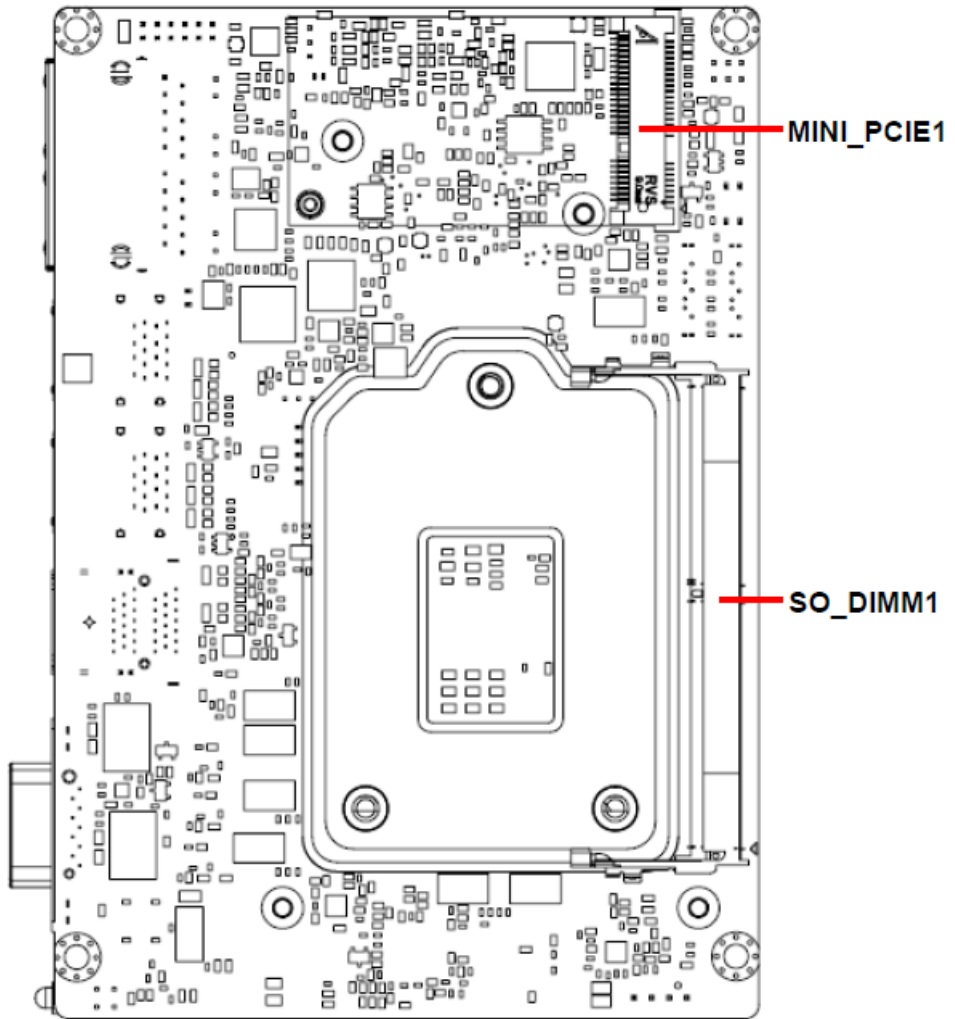


# 2. Hardware Configuration

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## 2.1 Product Overviews





## 2.2 Jumper & Connector list

### Jumpers

| Label            | Function                            | Note                        |
|------------------|-------------------------------------|-----------------------------|
| <b>JBAT1</b>     | Clear CMOS                          | 3 x 1 header, pitch 2.00 mm |
| <b>JRI1</b>      | Serial port 1 pin9 signal select    | 3 x 2 header, pitch 2.00 mm |
| <b>JAT1</b>      | AT/ATX Input power select           | 3 x 1 header, pitch 2.00 mm |
| <b>JBKL_SEL1</b> | LCD backlight brightness adjustment | 3 x 1 header, pitch 2.00 mm |

### Connectors

| Label            | Function   | Note   |
|------------------|--|--|
| <b>BAT1</b>      | Battery connector                                    | 2 x 1 wafer, pitch 1.25 mm   |
| <b>CPU_FAN1</b>  | CPU fan connector                                    | 4 x 1 wafer, pitch 2.54 mm   |
| <b>JAUDIO1</b>   | Audio connector                                      | 6 x 2 header, pitch 2.00 mm  |
| <b>JBKL1</b>     | LCD inverter connector                               | 5 x 1 wafer, pitch 2.00 mm<br>Matching Connector: JST PHR-5                |
| <b>COM1</b>      | Serial port 1 connector                              | D-sub 9-pin, male  |
| <b>JCOM1</b>     | Serial port 2 connector                              | 5 x 2 header, pitch 2.00 mm  |
| <b>JDIO1</b>     | General purpose I/O connector                        | 6 x 2 header, pitch 2.00 mm  |
| <b>JFP1</b>      | Front Panel connector                                | 5 x 2 header, pitch 2.00 mm  |
| <b>JLPC1</b>     | LPC connector  | 5 x 2 header, pitch 2.00 mm  |
| <b>JLVDS1</b>    | LVDS connector                                       | 20 x 2 header, pitch 1.25 mm<br>Matching Connector: Hirose DF13-40DS-1.25C |
| <b>JSPI1</b>     | SPI connector  | 4 x 2 header, pitch 2.00 mm  |
| <b>USB1/2</b>    | H310 support USB3.1 Gen1<br>Q370 support USB3.1 Gen2 |  |
| <b>JUSB1</b>     | On-board header for USB2.0                           | 5 x 2 header, pitch 2.00 mm  |
| <b>HDMI1</b>     | DUAL HDMI connector                                  |  |
| <b>LAN1</b>      | RJ-45 Ethernet x 2                                   |  |
| <b>LED1</b>      | HDD/Power LED indicator                              |  |
| <b>PWR1</b>      | Power connector                                      | 2 x 2 wafer, pitch 4.20 mm   |
| <b>SATA_PWR1</b> | SATA power connector 1                               | 2 x 1 wafer, pitch 2.00 mm   |
| <b>SATA_PWR2</b> | SATA power connector 2                               | 2 x 1 wafer, pitch 2.00 mm   |
| <b>SATA1/2</b>   | Serial ATA connector 1/2                             |  |

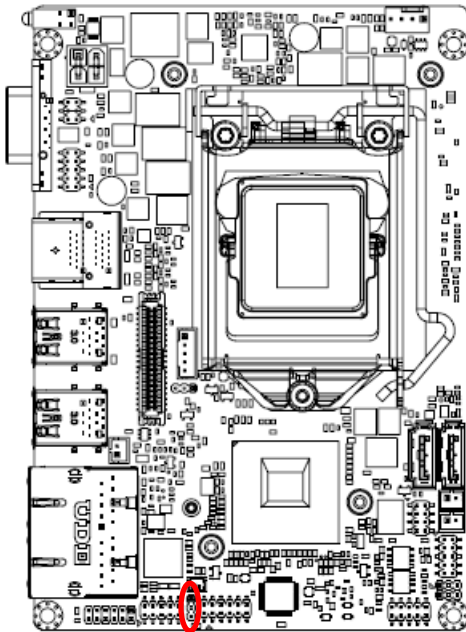
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|                   |                                |                             |
|-------------------|--------------------------------|-----------------------------|
| <b>JBZ1</b>       | PC Buzzer header               | 2 x 1 wafer, pitch 2.00 mm  |
| <b>JEC_ROM1</b>   | EC Debug connector             | 3 x 1 header, pitch 2.00 mm |
| <b>MINI_PCIE1</b> | Full size Mini-PCI-e connector |                             |
| <b>SO_DIMM1</b>   | DDR4 SODIMM socket             |                             |

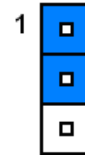


## 2.3 Setting Jumpers & Connectors

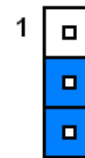
### 2.3.1 Clear CMOS (JBAT1)



Protect\*

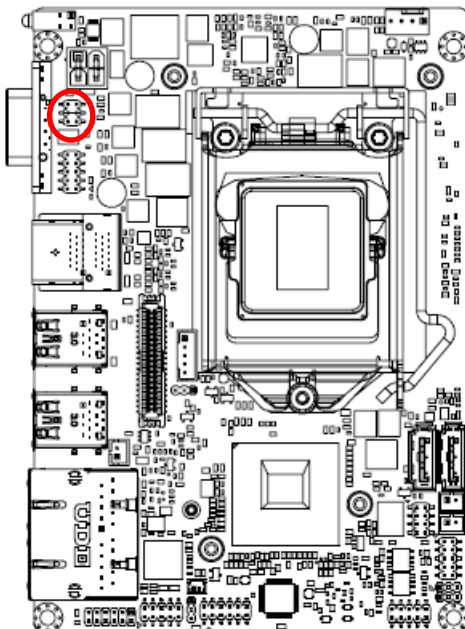


Clear CMOS

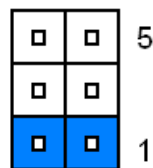


\* Default

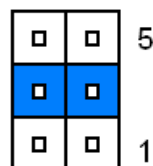
### 2.3.2 Serial port 1 pin9 signal select (JR11)



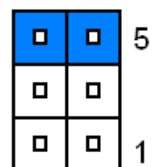
Ring\*



+5V

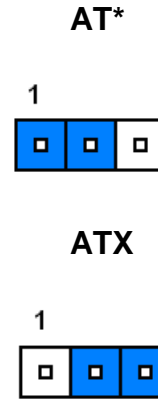
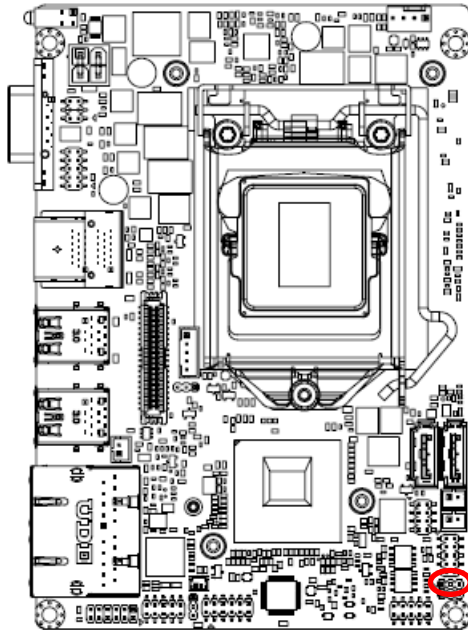


+12V

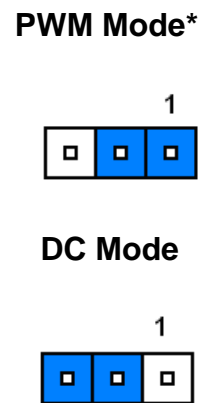
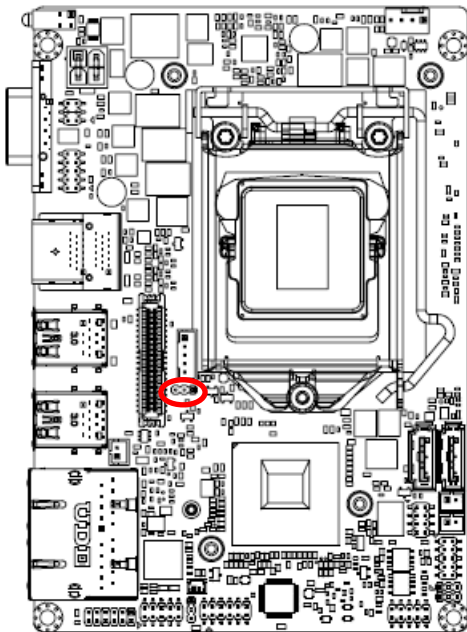


\* Default

### 2.3.3 AT/ATX Input power select (JAT1)

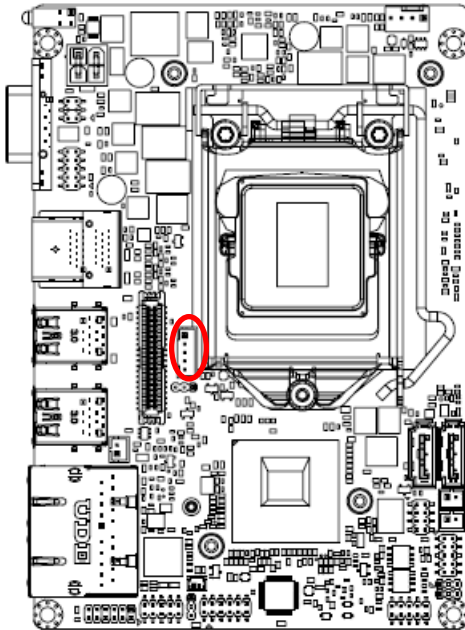


### 2.3.4 LCD backlight brightness adjustment (JBKL\_SEL1)



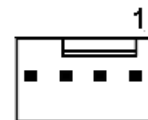
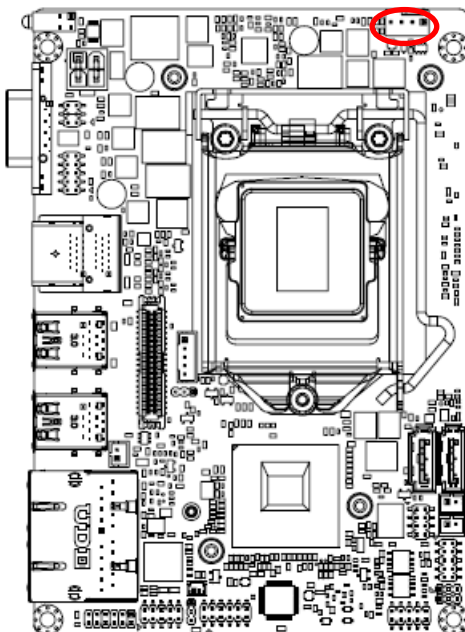
\* Default

### 2.3.5 LCD Inverter connector (JBKL1)



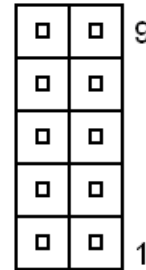
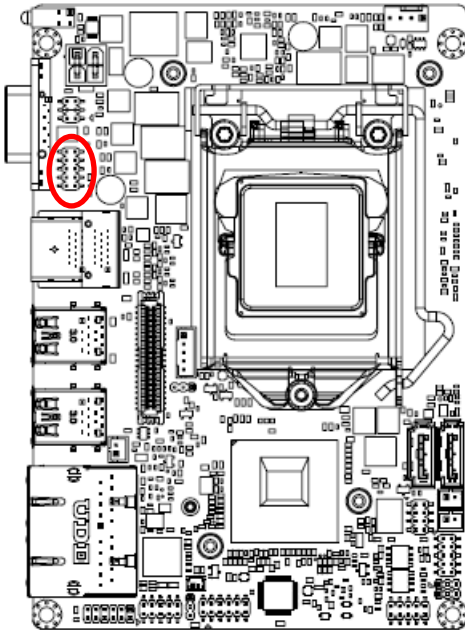
| Signal  | PIN |
|---------|-----|
| +12V    | 1   |
| GND     | 2   |
| BKLEN   | 3   |
| VBRIGHT | 4   |
| +5V     | 5   |

### 2.3.6 CPU fan connector (CPU\_FAN1)



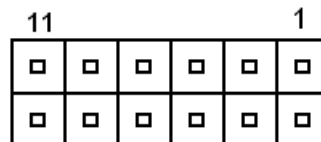
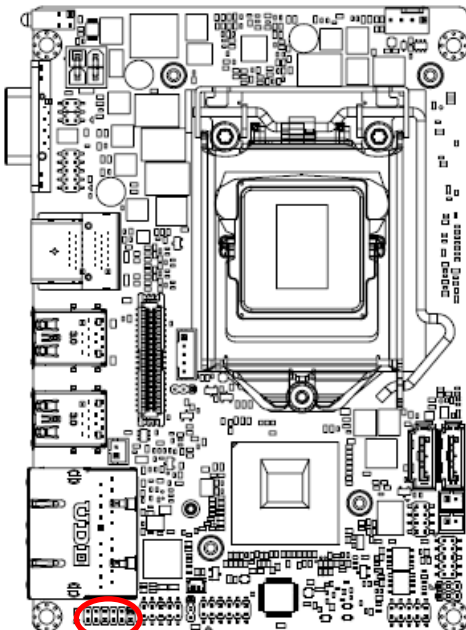
| Signal   | PIN |
|----------|-----|
| GND      | 1   |
| +12V     | 2   |
| CFAN_IN  | 3   |
| CFAN_OUT | 4   |

### 2.3.7 Serial port 2 connector (JCOM1)



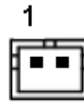
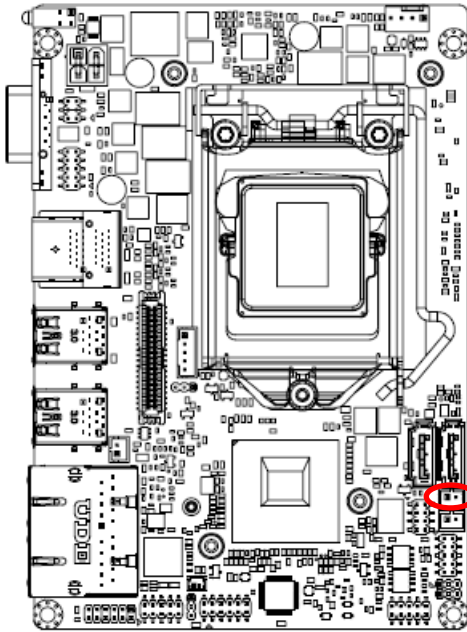
| Signal     | PIN | PIN | Signal     |
|------------|-----|-----|------------|
| NC         | 10  | 9   | COM_RI#_2  |
| COM_CTS#_2 | 8   | 7   | COM_RTS#_2 |
| COM_DSR#_2 | 6   | 5   | GND        |
| COM_DTR#_2 | 4   | 3   | COM_TXD_2  |
| COM_RXD_2  | 2   | 1   | COM_DCD#_2 |

### 2.3.8 General purpose I/O connector (JDIO1)



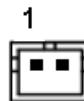
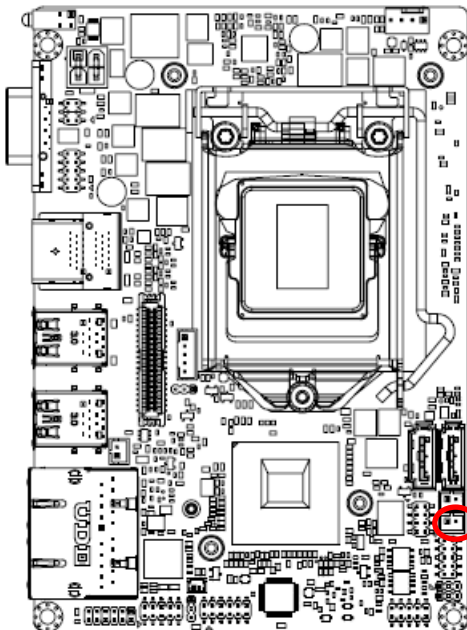
| Signal     | PIN | PIN | Signal     |
|------------|-----|-----|------------|
| DIO_GP20   | 1   | 2   | DIO_GP10   |
| DIO_GP21   | 3   | 4   | DIO_GP11   |
| DIO_GP22   | 5   | 6   | DIO_GP12   |
| DIO_GP23   | 7   | 8   | DIO_GP13   |
| SMB_SCL_S0 | 9   | 10  | SMB_SDA_S0 |
| GND        | 11  | 12  | +5V        |

### 2.3.9 SATA power connector 1 (SATA\_PWR1)



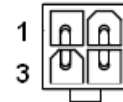
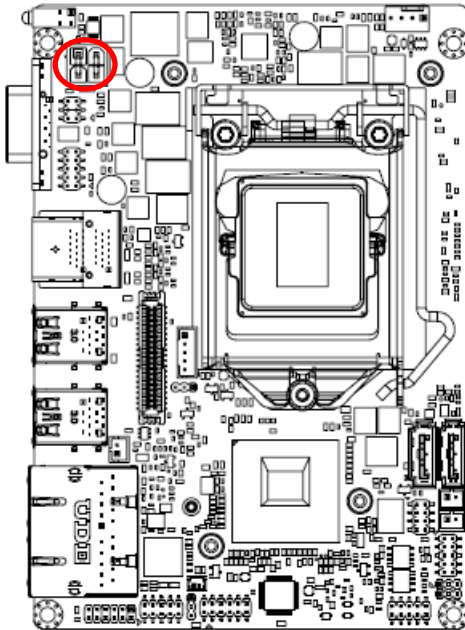
| Signal    | PIN |
|-----------|-----|
| GND       | 1   |
| SATA_PWR1 | 2   |

### 2.3.10 SATA power connector 2 (SATA\_PWR2)



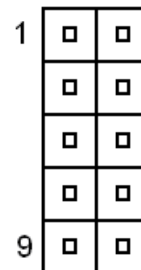
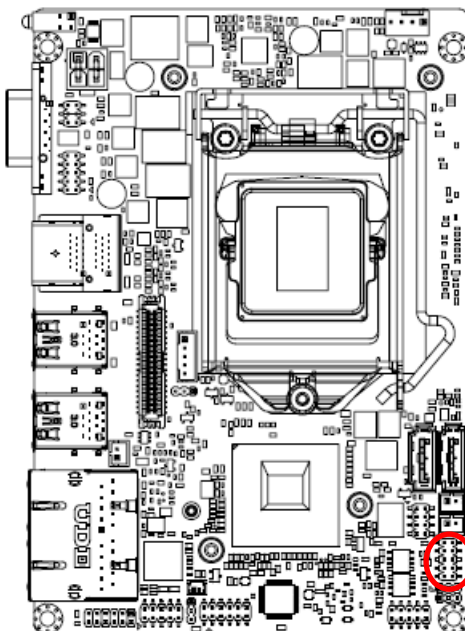
| Signal    | PIN |
|-----------|-----|
| GND       | 1   |
| SATA_PWR2 | 2   |

2.3.11 Power connector (PWR1)



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

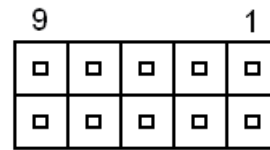
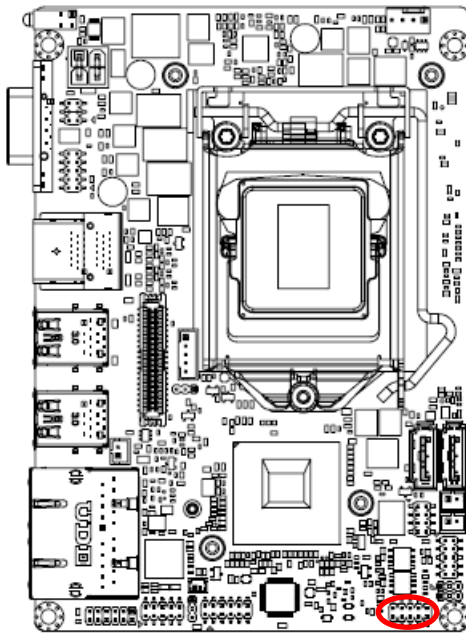
2.3.12 On-board header for USB2.0 (JUSB1)



| Signal    | PIN | PIN | Signal    |
|-----------|-----|-----|-----------|
| +5VSB     | 1   | 2   | GND       |
| USB_R_DN5 | 3   | 4   | GND       |
| USB_R_DP5 | 5   | 6   | USB_R_DP6 |
| GND       | 7   | 8   | USB_R_DN6 |
| GND       | 9   | 10  | +5VSB     |

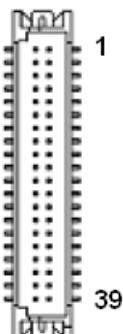
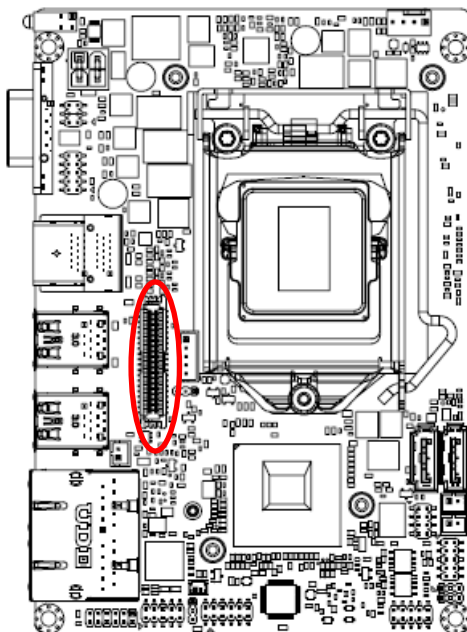


### 2.3.13 LPC connector (JLPC1)



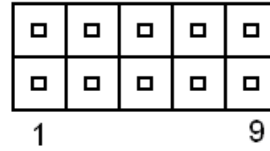
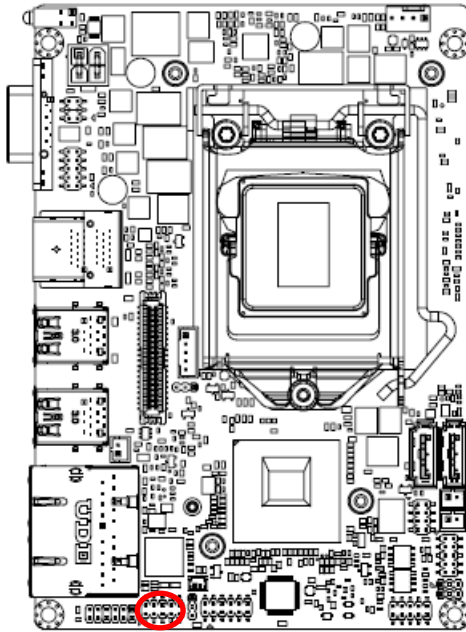
| Signal     | PIN | PIN | Signal         |
|------------|-----|-----|----------------|
| LPC_AD0    | 1   | 2   | +3.3V          |
| LPC_AD1    | 3   | 4   | RST_TPM#       |
| LPC_AD2    | 5   | 6   | LPC_LFRAME#    |
| LPC_AD3    | 7   | 8   | CLK1_LPC_DEBUG |
| LPC_SERIRQ | 9   | 10  | GND            |

### 2.3.14 LVDS connector (JLVDS1)



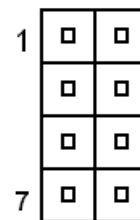
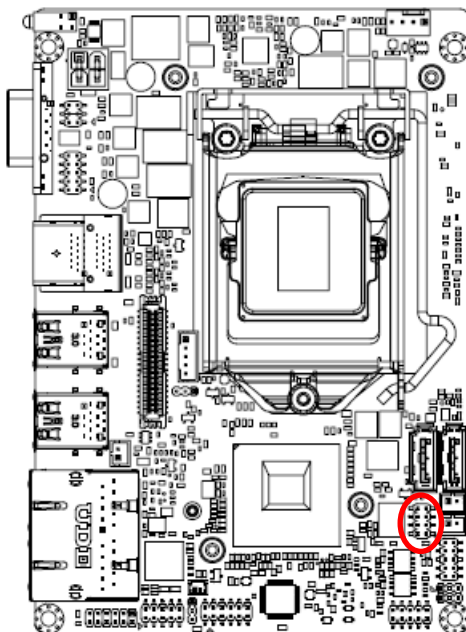
| Signal       | PIN | PIN | Signal       |
|--------------|-----|-----|--------------|
| +5V          | 2   | 1   | +3.3V        |
| +5V          | 4   | 3   | +3.3V        |
| NC           | 6   | 5   | NC           |
| GND          | 8   | 7   | GND          |
| LVDS_DATA0_P | 10  | 9   | LVDS_DATA1_P |
| 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  | +5V          |

2.3.15 Front Panel connector (JFP1)



| Signal      | PIN | PIN | Signal   |
|-------------|-----|-----|----------|
| PWRBTN_IN#  | 1   | 2   | GND      |
| PM_SYSRST#  | 3   | 4   | GND      |
| FP_PWR_LED+ | 5   | 6   | PWR_LED# |
| HDD_LED#    | 7   | 8   | +5V      |
| CASE_OPEN#  | 9   | 10  | GND      |

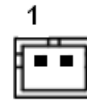
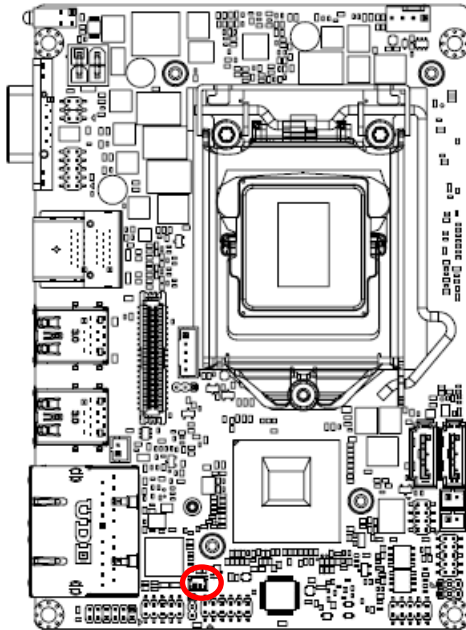
2.3.16 SPI connector (JSPI1)



| Signal     | PIN | PIN | Signal   |
|------------|-----|-----|----------|
| +3.3VSB    | 1   | 2   | GND      |
| SPI_CS0#   | 3   | 4   | SPI_CLK  |
| SPI_MISO   | 5   | 6   | SPI_MOSI |
| BIOS_HOLD# | 7   | 8   | BIOS_WP# |

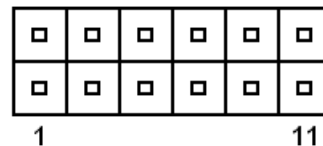
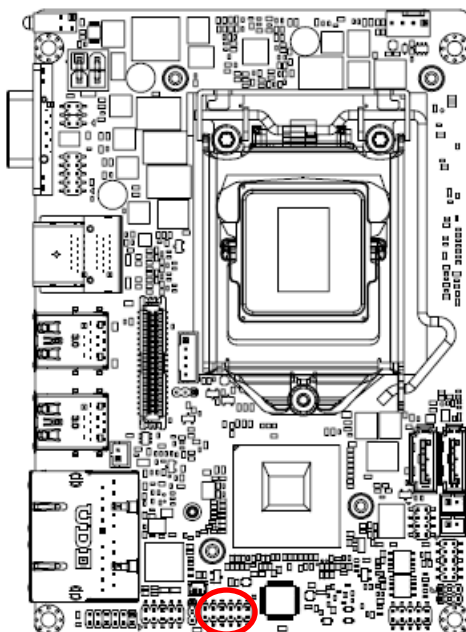


### 2.3.17 Battery connector (BAT1)



| Signal  | PIN |
|---------|-----|
| +RTCBAT | 1   |
| GND     | 2   |

### 2.3.18 Audio connector (JAUDIO1)

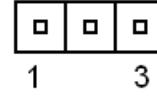
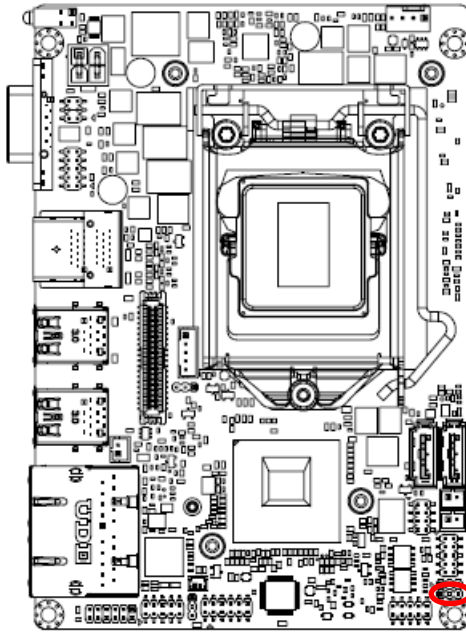


| Signal      | PIN | PIN | Signal      |
|-------------|-----|-----|-------------|
| FRONT-R-OUT | 1   | 2   | FRONT-L-OUT |
| HD_AGND     | 3   | 4   | HD_AGND     |
| LINE1-R-IN  | 5   | 6   | LIN1-L-IN   |
| MIC1-R-IN   | 7   | 8   | MIC1-L-IN   |
| FRONT-JD    | 9   | 10  | LINE1-JD    |
| MIC1-JD     | 11  | 12  | HD_AGND     |

#### 2.3.18.1 Signal Description – Audio connector (JAUDIO1)

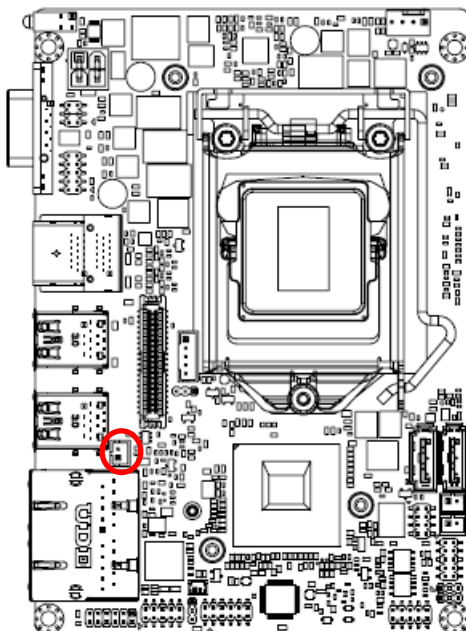
| Signal   | Signal Description               |
|----------|----------------------------------|
| LINE1-JD | AUDIO IN (LINE_RIN/LIN)sense pin |
| FRONT-JD | AUDIO Out(ROUT/LOUT) sense pin   |
| MIC1-JD  | MIC IN (MIC_RIN/LIN) sense pin   |

2.3.19 EC Debug connector (JEC\_ROM1)



| Signal       | PIN |
|--------------|-----|
| EC_SMCLK_DBG | 1   |
| EC_SMDAT_DBG | 2   |
| GND          | 3   |

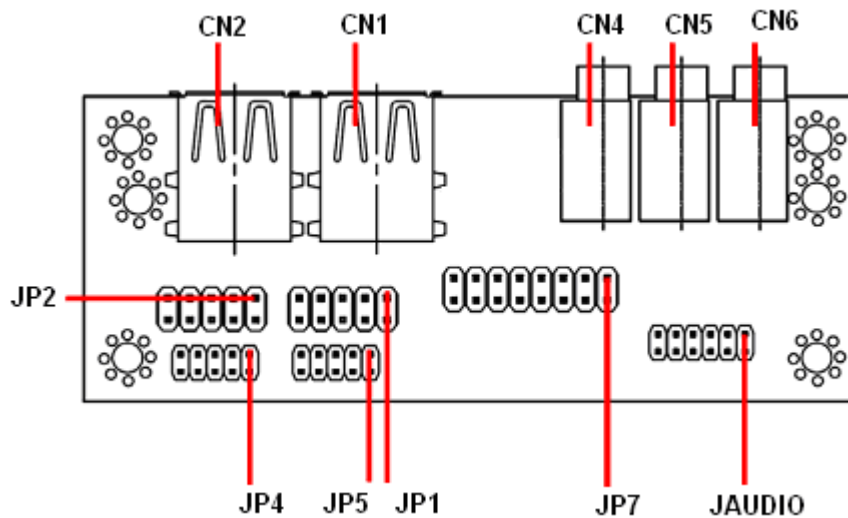
2.3.20 PC Buzzer header (JBZ1)



| Signal | PIN |
|--------|-----|
| SPKR   | 1   |
| +5V    | 2   |

## 2.4 Audio/USB Daughter Board User's Guide

### 2.4.1 Jumper and Connector Layout



### 2.4.2 Jumper and Connector List

#### Connectors

| Label    | Function             | Note                       |
|----------|----------------------|----------------------------|
| CN1, CN2 | USB connector        |                            |
| CN4      | Line out connector   | Phone Jack                 |
| CN5      | Line in connector    | Phone Jack                 |
| CN6      | Mic in connector     | Phone Jack                 |
| JAUDIO   | Audio connector      | 6 x 2 header, pitch 2.0mm  |
| JP1      | 2.54mm USB connector | 5 x 2 header, pitch 2.54mm |
| JP2      | 2.54mm USB connector | 5 x 2 header, pitch 2.54mm |
| JP4      | 2.0mm USB connector  | 5 x 2 header, pitch 2.0mm  |
| JP5      | 2.0mm USB connector  | 5 x 2 header, pitch 2.0mm  |
| JP7      | TV / Audio connector | 8 x 2 header, pitch 2.54mm |

2.4.3 Setting Jumper and Connector

Audio Connector (JAUDIO)

| Signal    | PIN | PIN | Signal    |
|-----------|-----|-----|-----------|
| OUTR      | 1   | 2   | OUTL      |
| GND       | 3   | 4   | GND       |
| INR1      | 5   | 6   | INL1      |
| MICIN1    | 7   | 8   | AREF      |
| FRONT-JD1 | 9   | 10  | LINE1-JD1 |
| MIC1-JD1  | 11  | 12  | GND       |

2.54mm USB Connector (JP1)

| Signal | PIN | PIN | Signal |
|--------|-----|-----|--------|
| +5V    | 1   | 2   | GND    |
| D1-    | 3   | 4   | GND    |
| D1+    | 5   | 6   | D2+    |
| GND    | 7   | 8   | D2-    |
| GND    | 9   | 10  | +5V    |



**Note:** Wrong USB cable configuration with your USB devices might damage your USB devices.

2.54mm USB Connector (JP2)

| Signal | PIN | PIN | Signal |
|--------|-----|-----|--------|
| +5V    | 1   | 2   | GND    |
| D3-    | 3   | 4   | GND    |
| D3+    | 5   | 6   | D4+    |
| GND    | 7   | 8   | D4-    |
| GND    | 9   | 10  | +5V    |

TV / Audio Connector (JP7)

| Signal     | PIN | PIN | Signal     |
|------------|-----|-----|------------|
| Mic In     | 1   | 2   | Mic Bais   |
| GND        | 3   | 4   | GND        |
| Line out L | 5   | 6   | Line out R |
| SPK L      | 7   | 8   | SPK R      |
| Line in L  | 9   | 10  | Line in R  |
| GND        | 11  | 12  | NC         |
| TVGND      | 13  | 14  | NC         |
| TVGND      | 15  | 16  | COMP       |

2.0mm USB Connector (JP4)

| Signal | PIN | PIN | Signal |
|--------|-----|-----|--------|
| +5V    | 1   | 2   | GND    |
| D3-    | 3   | 4   | GND    |
| D3+    | 5   | 6   | D4+    |
| GND    | 7   | 8   | D4-    |
| GND    | 9   | 10  | +5V    |

2.0mm USB Connector (JP5)

| Signal | PIN | PIN | Signal |
|--------|-----|-----|--------|
| +5V    | 1   | 2   | GND    |
| D1-    | 3   | 4   | GND    |
| D1+    | 5   | 6   | D2+    |
| GND    | 7   | 8   | D2-    |
| GND    | 9   | 10  | +5V    |

# 3. BIOS Setup

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### 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

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

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

**Press <F2> or <Del> 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.

### 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 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 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.

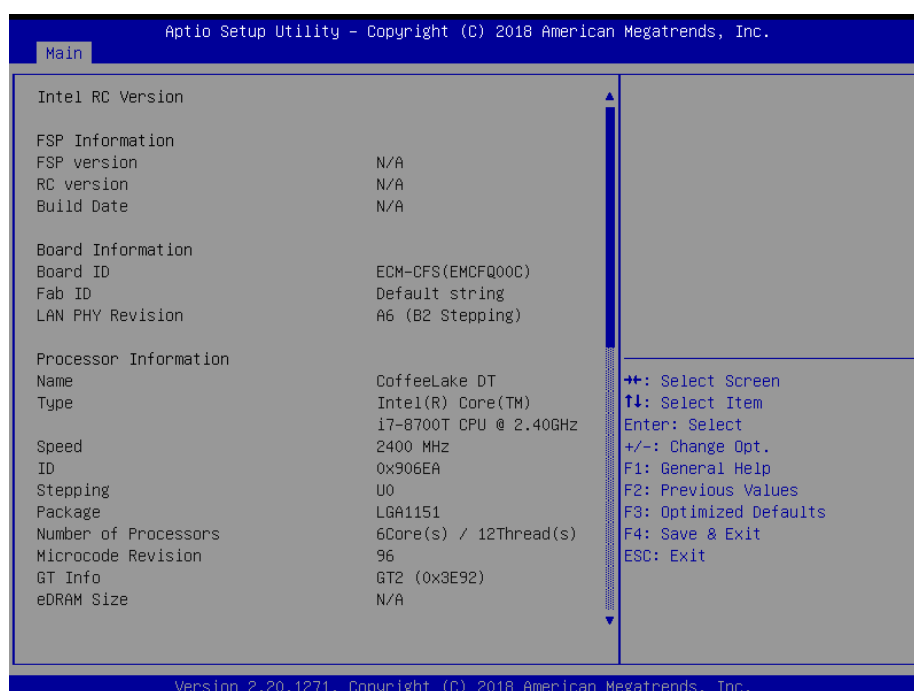
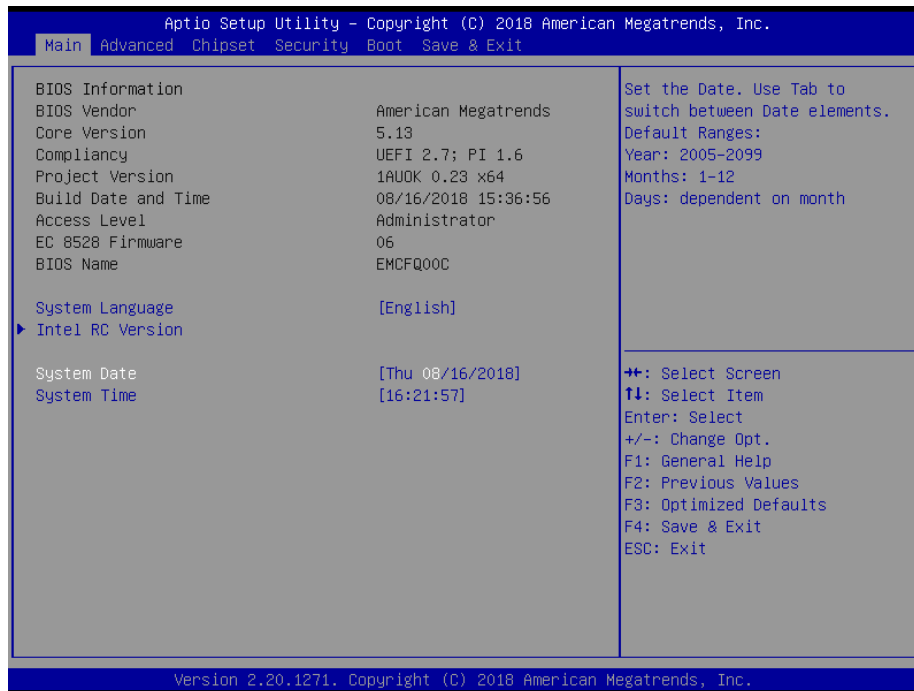


### 3.6 BIOS setup

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

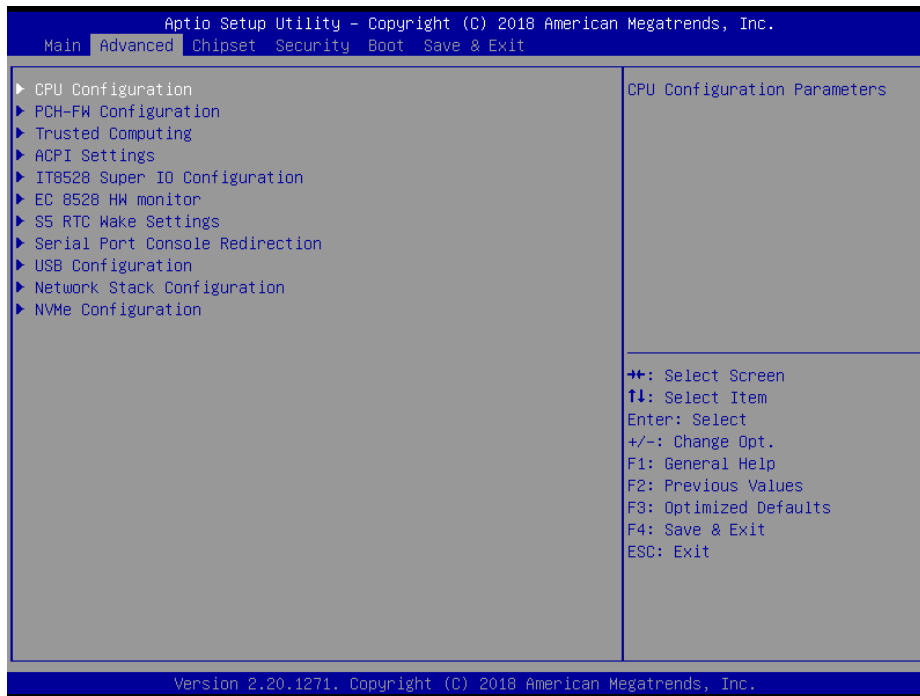
Use the system time option to set the system time. Manually enter the hours, minutes and seconds.



**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.

## 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.



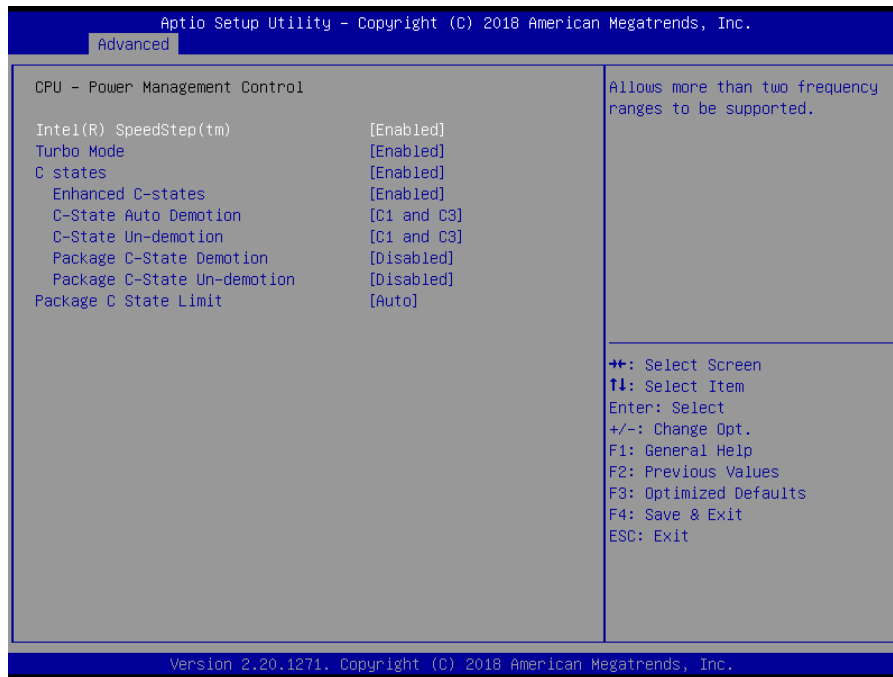
### 3.6.2.1 CPU Configuration

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



| Item   | Options  | Description   |
|--|--|---|
| <b>Intel (VMX) Virtualization Technology</b> | Disabled<br>Enabled[Default]                         | When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. |
| <b>Active Processor Cores</b>                | All[Default]<br>1<br>2<br>3<br>4<br>5<br>6<br>7<br>8 | Number of cores to enable in each processor package.  |

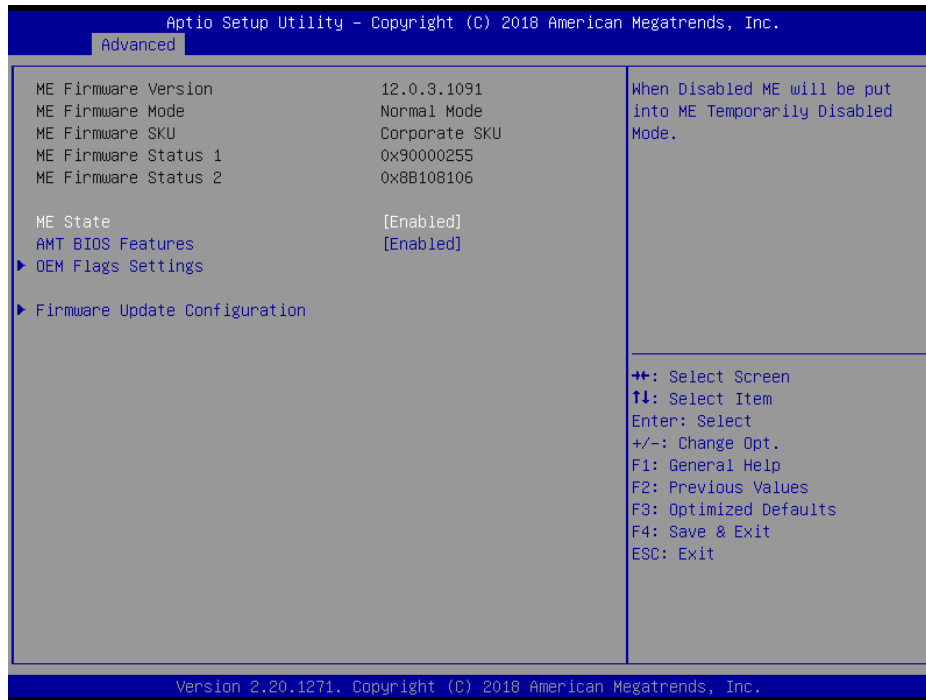
3.6.2.1.1 CPU – Power Management Control



| Item                               | Option                                      | Description  |
|------------------------------------|---|--|
| <b>Intel® SpeedStep™</b>           | Enabled[Default],<br>Disabled               | Allows more than two frequency ranges to be supported.   |
| <b>Turbo Mode</b>                  | Enabled[Default],<br>Disabled               | Enable/Disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled).                                  |
| <b>C States</b>                    | Enabled[Default],<br>Disabled               | Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not utilized.  |
| <b>Enhanced C-states</b>           | Enabled[Default],<br>Disabled               | Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.   |
| <b>C-State Auto Demotion</b>       | Disabled,<br>C1<br>C3<br>C1 and C3[Default] | Configure C-State Auto Demotion.   |
| <b>C-State Un-demotion</b>         | Disabled,<br>C1<br>C3<br>C1 and C3[Default] | Configure C-State Un-demotion.   |
| <b>Package C-State Demotion</b>    | Enabled<br>Disabled[Default],               | Package C-State Demotion.  |
| <b>Package C-State Un-demotion</b> | Enabled<br>Disabled[Default],               | Package C-State Un-demotion.   |
| <b>Package C State Limit</b>       | C0/C1<br>C2<br>C3<br>C6<br>C7               | Maximum Package C State Limit Setting. CPU Default: Leaves to Factory default value. Auto: Initializes to deepest available Package C State Limit. |

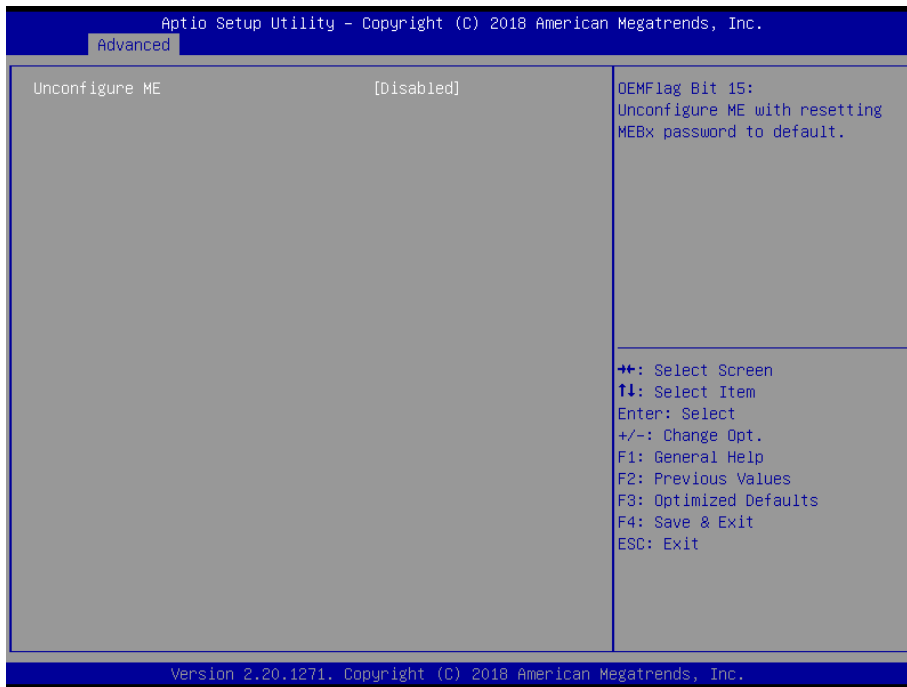
|  |  |  |
|--|--|--|
|  | <p>C7S<br/>C8<br/>C9<br/>C10<br/>CPU Default<br/>Auto[Default]</p> |  |
|--|--|--|

### 3.6.2.2 PCH-FW Configuration



| Item                     | Options                       | Description  |
|--------------------------|-------------------------------|--|
| <b>ME State</b>          | Disabled,<br>Enabled[Default] | When Disabled ME will be put into ME Temporarily Disabled Mode.  |
| <b>AMT BIOS Features</b> | Disabled,<br>Enabled[Default] | When disable AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup. Note: This option does not disable Manageability Features in FW. |

3.6.2.2.1 OEM Flags Settings



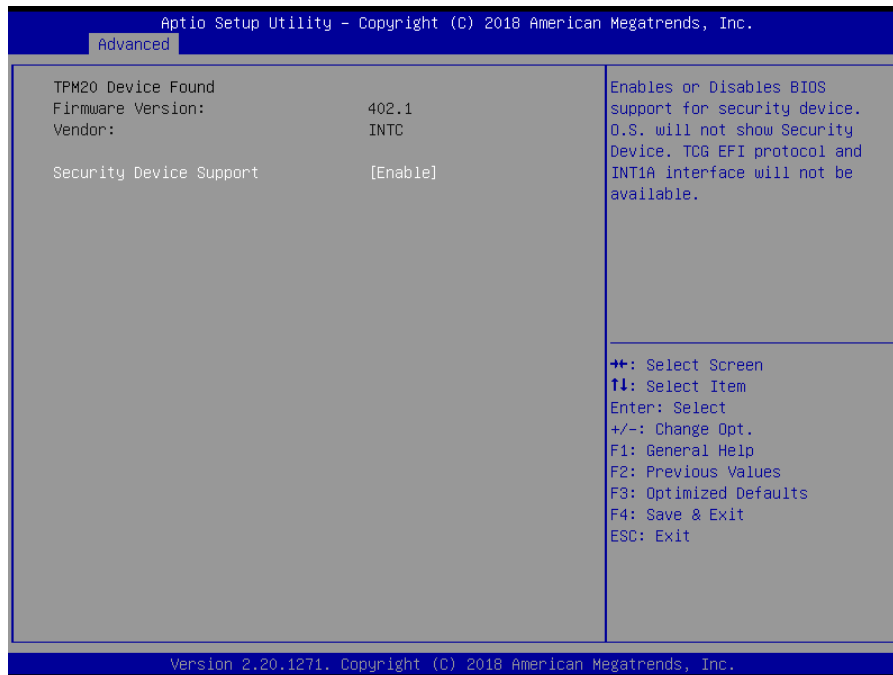
| Item           | Option                        | Description   |
|----------------|-------------------------------|---|
| Unconfigure ME | Disabled[Default],<br>Enabled | OEMFlag Bit 15: Unconfigure ME with resetting MEBx password to default. |

3.6.2.2.2 Firmware Update Configuration



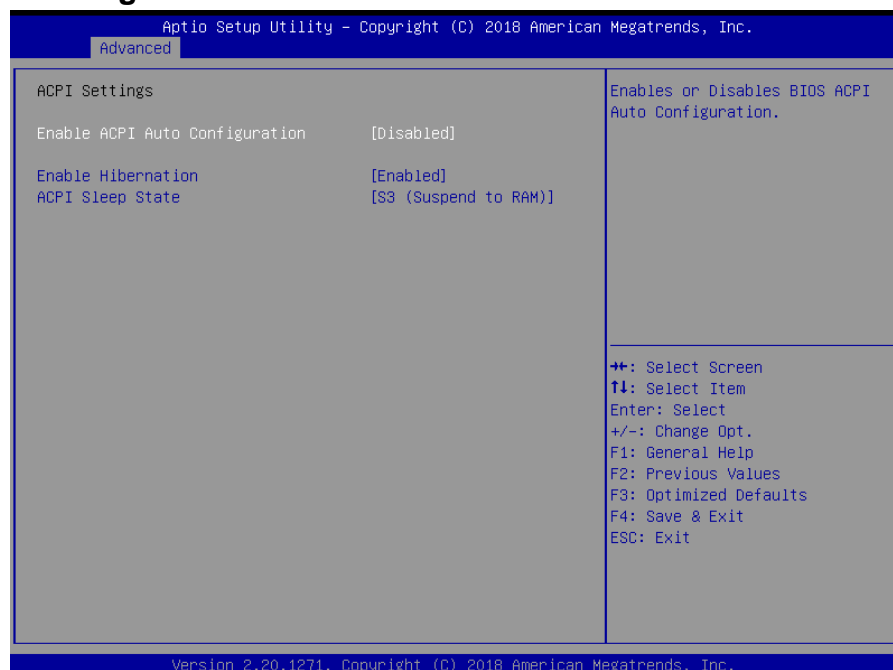
| Item           | Option                        | Description   |
|----------------|-------------------------------|---|
| Unconfigure ME | Disabled[Default],<br>Enabled | OEMFlag Bit 15: Unconfigure ME with resetting MEBx password to default. |

### 3.6.2.3 Trusted Computing



| Item                           | Options                          | Description   |
|--------------------------------|----------------------------------|---|
| <b>Security Device Support</b> | Disable, Enable <b>[Default]</b> | Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available. |

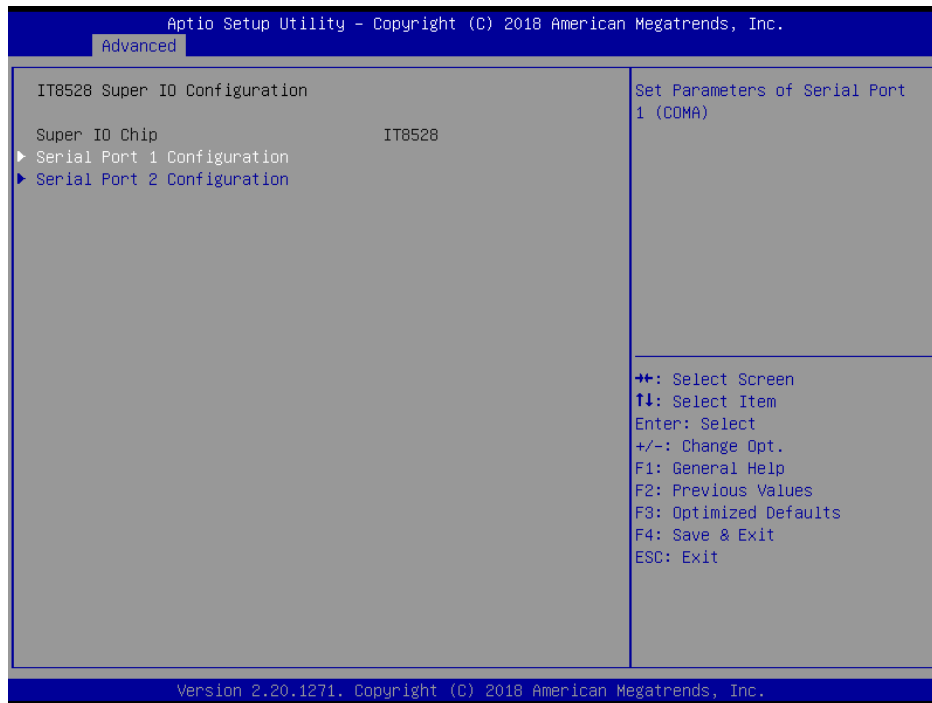
### 3.6.2.4 APCI Settings



| 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 Hibernate (OS/S4 Sleep State). This option may not be 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 SUSPEND button is pressed.                       |

### 3.6.2.5 IT8528 Super IO Configuration

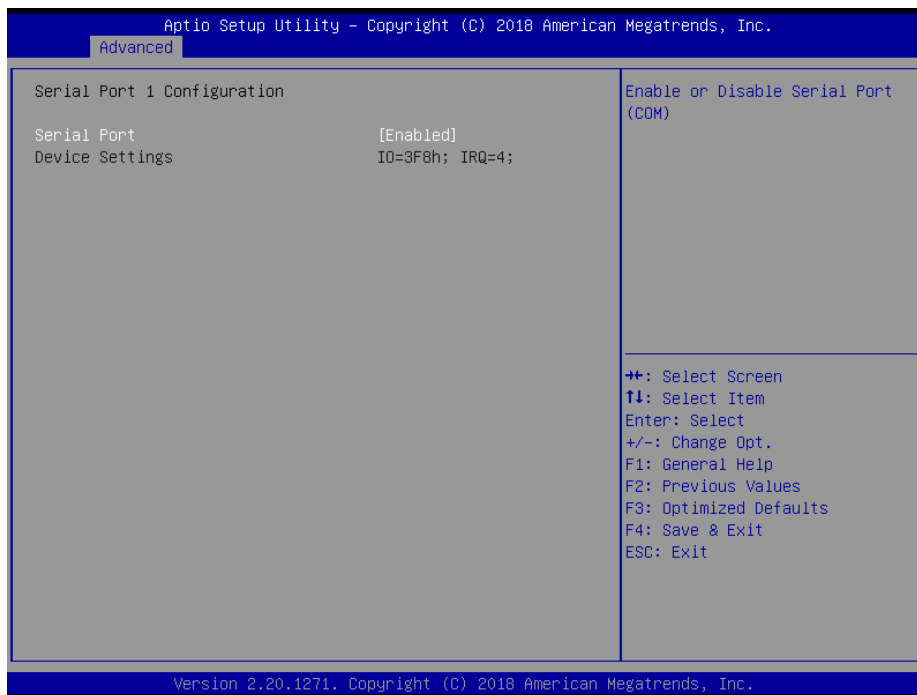
You can use this item to set up or change the IT8528 Super IO configuration for serial ports. Please refer to 3.6.2.5.1~ 3.6.2.5.2 for more information.



| Item                               | Description                             |
|------------------------------------|---|
| <b>Serial Port 1 Configuration</b> | Set Parameters of Serial Port 1 (COMA). |
| <b>Serial Port 2 Configuration</b> | Set Parameters of Serial Port 2 (COMB). |

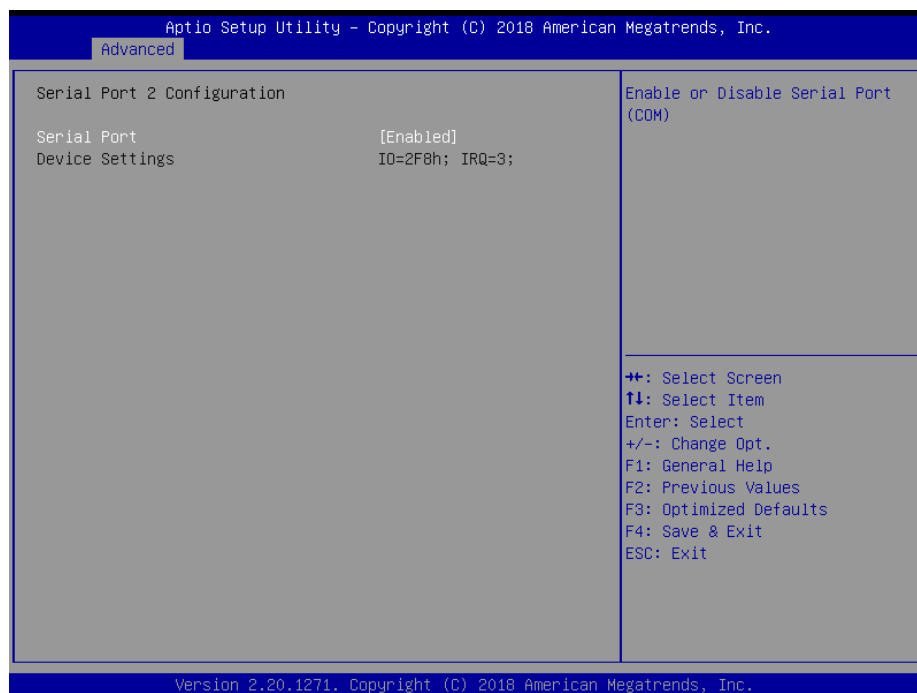


### 3.6.2.5.1 Serial Port 1 Configuration



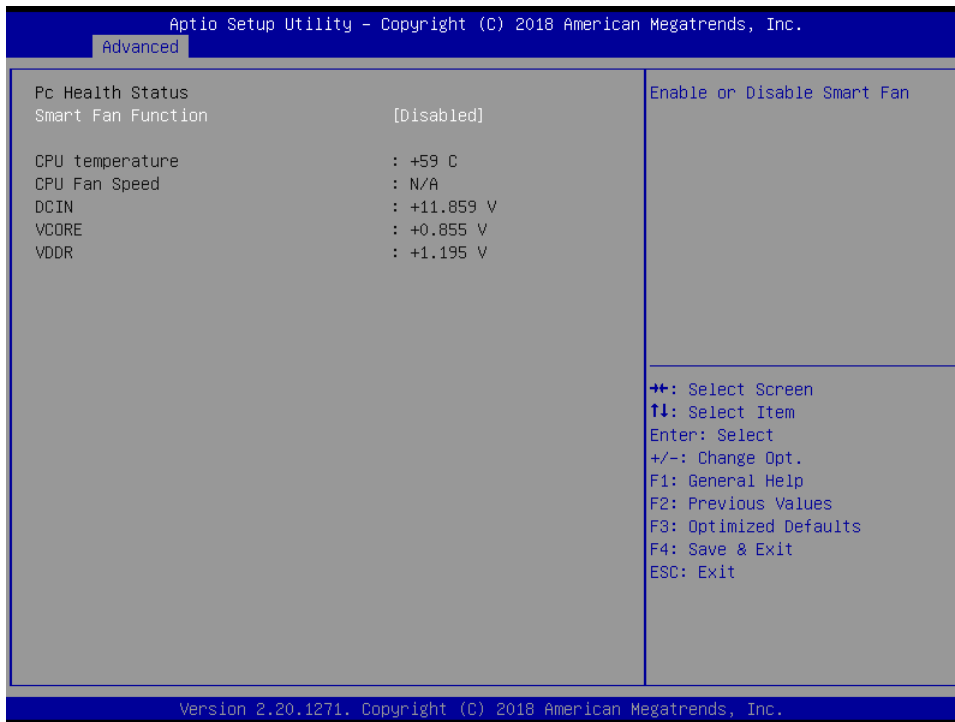
| Item        | Option                        | Description                          |
|-------------|-------------------------------|--------------------------------------|
| Serial Port | Enabled[Default],<br>Disabled | Enable or Disable Serial Port (COM). |

### 3.6.2.5.2 Serial Port 2 Configuration



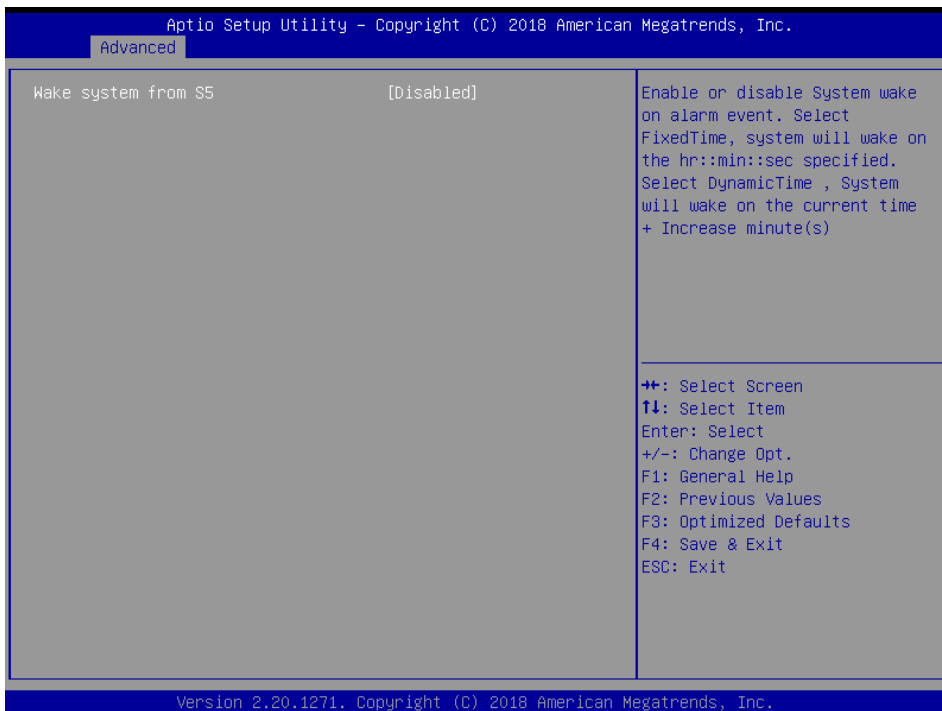
| Item        | Option                        | Description                          |
|-------------|-------------------------------|--------------------------------------|
| Serial Port | Enabled[Default],<br>Disabled | Enable or Disable Serial Port (COM). |

3.6.2.6 EC 8528 HW Monitor



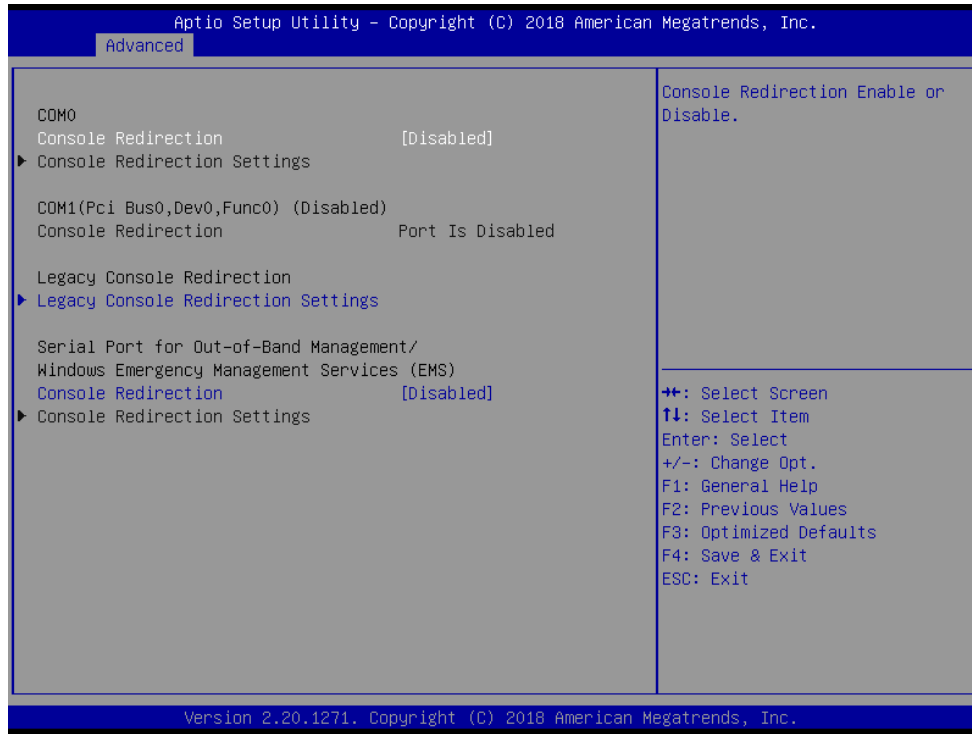
| Item               | Options                       | Description                    |
|--------------------|-------------------------------|--------------------------------|
| Smart Fan Function | Enabled,<br>Disabled[Default] | Enables or Disables Smart Fan. |

3.6.2.7 S5 RTC Wake Settings



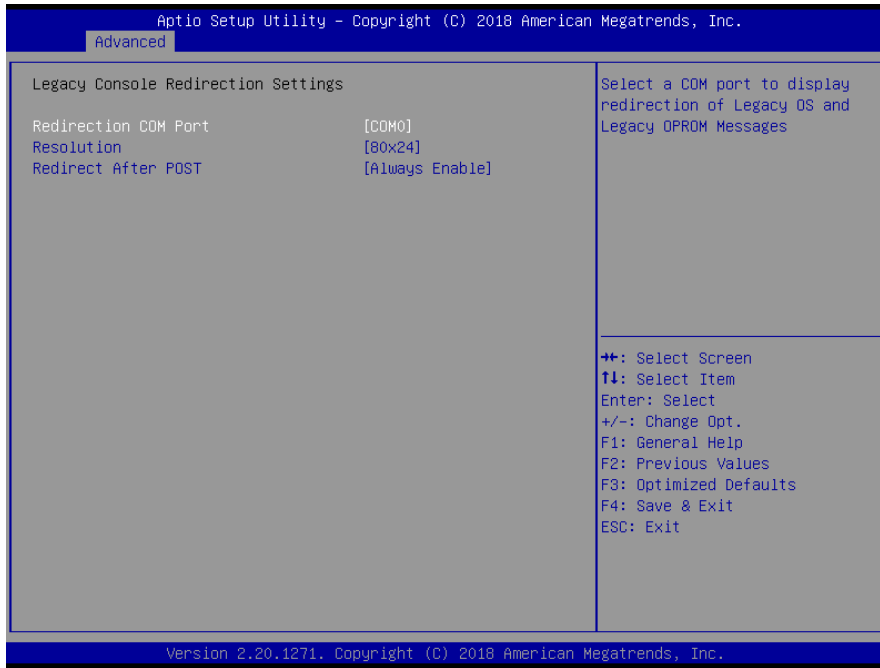
| Item                | Options  | Description  |
|---------------------|--|--|
| Wake system from S5 | Disabled[Default],<br>Fixed Time<br>Dynamic Time | Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, System will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

### 3.6.2.8 Serial Port Console Redirection



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

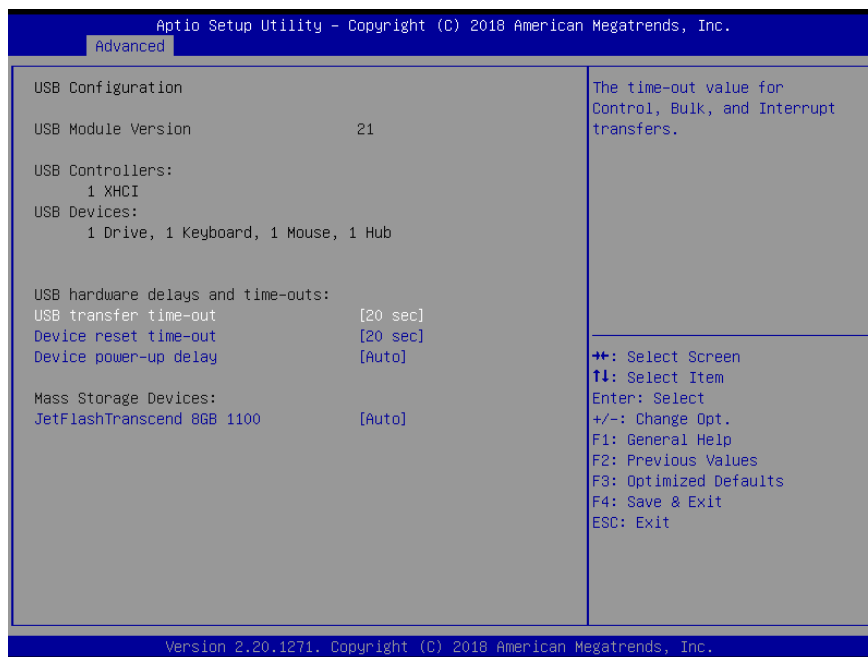
3.6.2.8.1 Legacy Console Redirection Settings



| Item                        | Option                               | Description  |
|-----------------------------|--------------------------------------|--|
| <b>Redirection COM Port</b> | COM0[Default]                        | Select a COM port to display redirection of Legacy OS and Legacy OPRM Messages.  |
| <b>Resolution</b>           | 80x24[Default]<br>80x25              | On Legacy OS, the Number of Rows and Columns supported redirection.  |
| <b>Redirect After POST</b>  | Always Enable[Default]<br>BootLoader | When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to Always Enable. |

### 3.6.2.9 USB Configuration

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



| Item                         | Options  | Description  |
|------------------------------|--|--|
| <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.    |

### 3.6.2.10 Network Stack Configuration

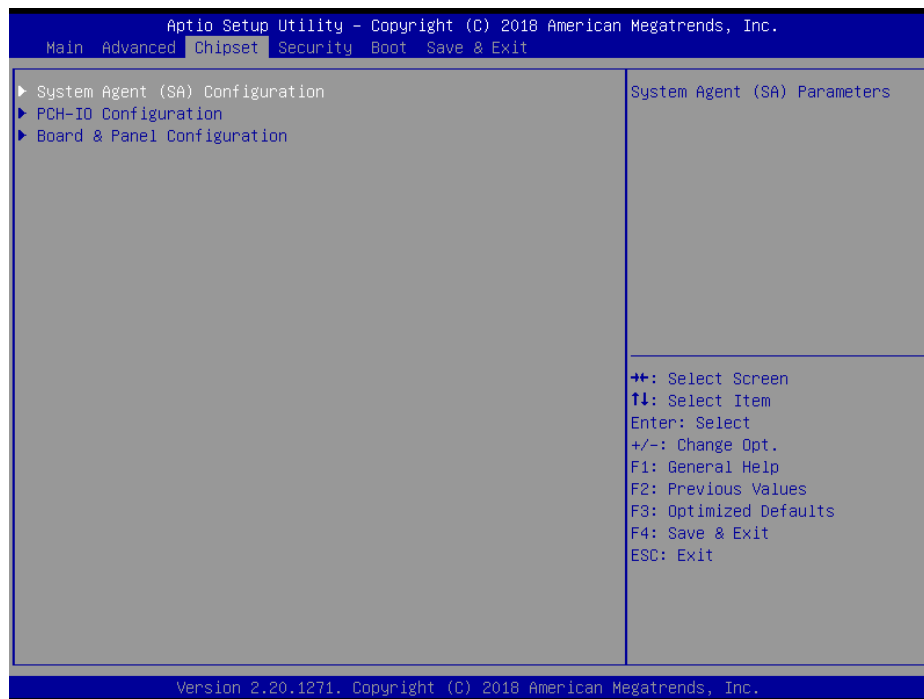


| Item          | Options                      | Description                        |
|---------------|------------------------------|------------------------------------|
| Network Stack | Enabled<br>Disabled[Default] | Enable/Disable UEFI Network Stack. |

### 3.6.2.11 NVMe Configuration



### 3.6.3 Chipset

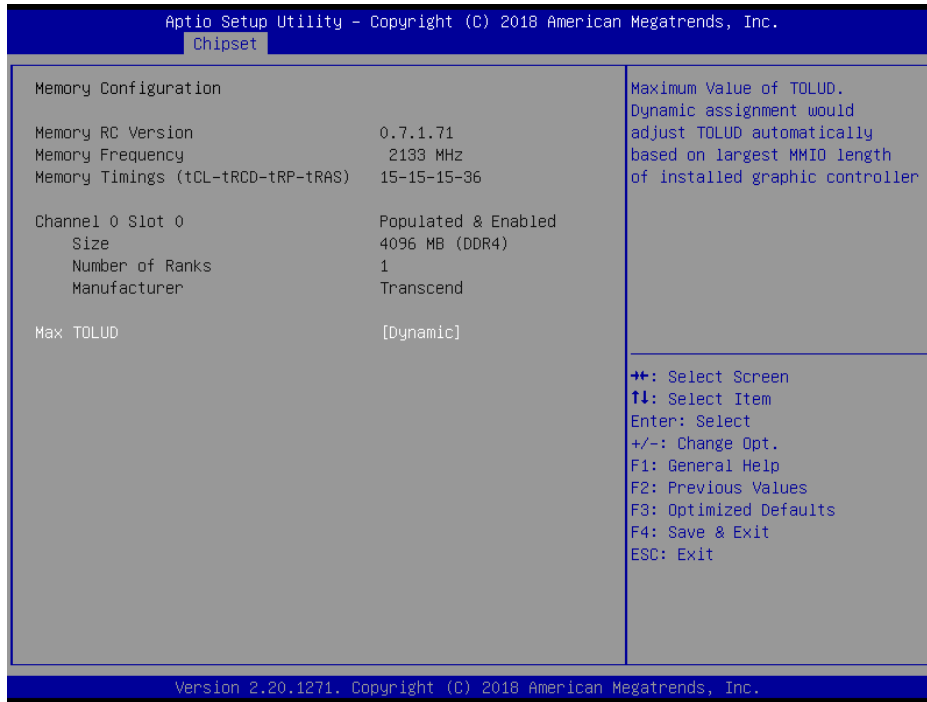


#### 3.6.3.1 System Agent (SA) Configuration



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

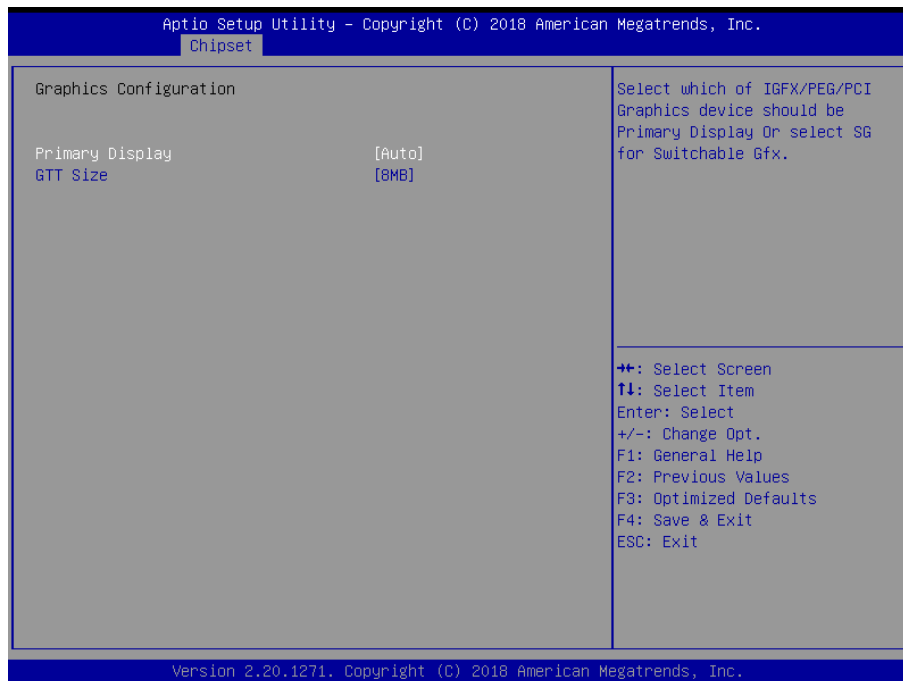
3.6.3.1.1 Memory Configuration



| Item             | Option           | Description   |
|------------------|------------------|---|
| <b>Max TOLUD</b> | Dynamic[Default] | Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller. |
|                  | 1 GB             |   |
|                  | 1.25 GB          |   |
|                  | 1.5 GB           |   |
|                  | 1.75 GB          |   |
|                  | 2 GB             |   |
|                  | 2.25 GB          |   |
|                  | 2.5 GB           |   |
|                  | 2.75 GB          |   |
|                  | 3 GB             |   |

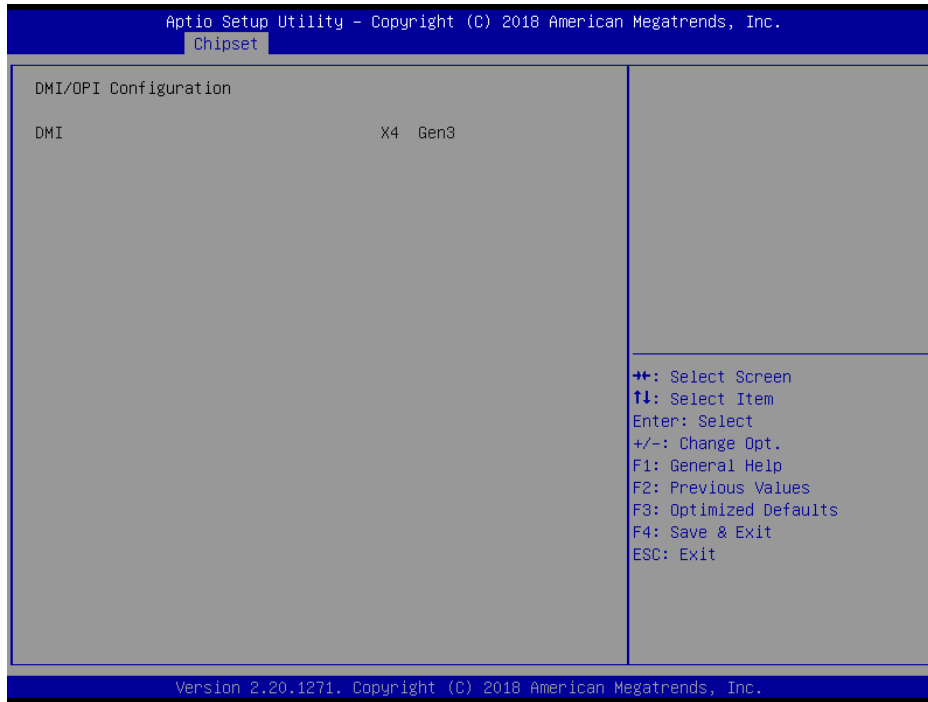


### 3.6.3.1.2 Graphics Configuration



| Item                   | Option                     | Description   |
|------------------------|----------------------------|---|
| <b>Primary Display</b> | Auto[Default]<br>IGFX      | Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx. |
| <b>GTT Size</b>        | 2MB<br>4MB<br>8MB[Default] | Select the GTT Size.  |

### 3.6.3.1.3 DMI/OPI Configuration

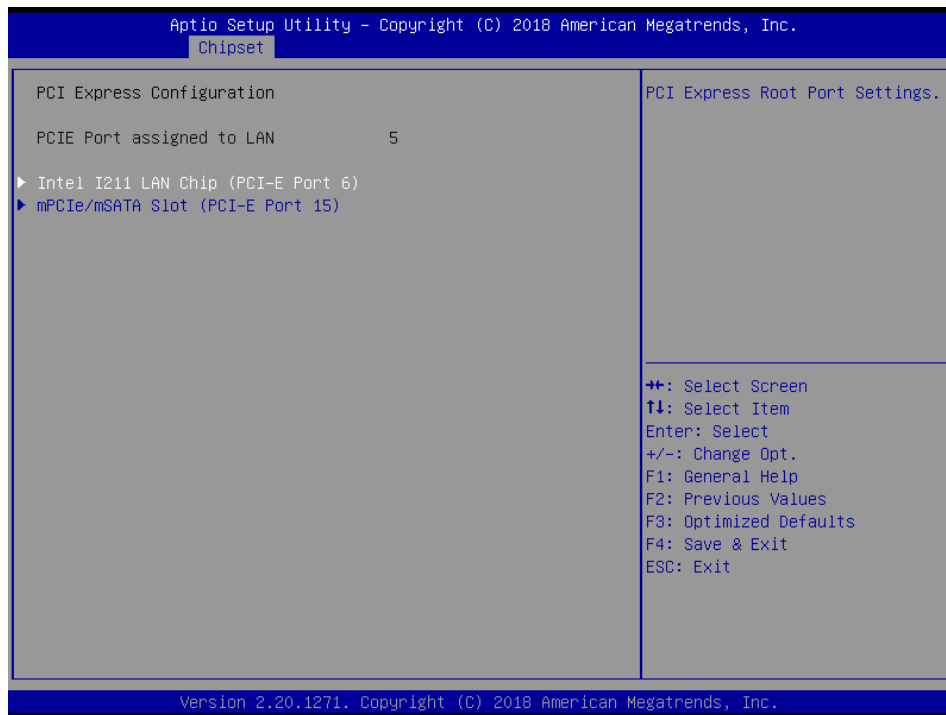


### 3.6.3.2 PCH-IO Configuration

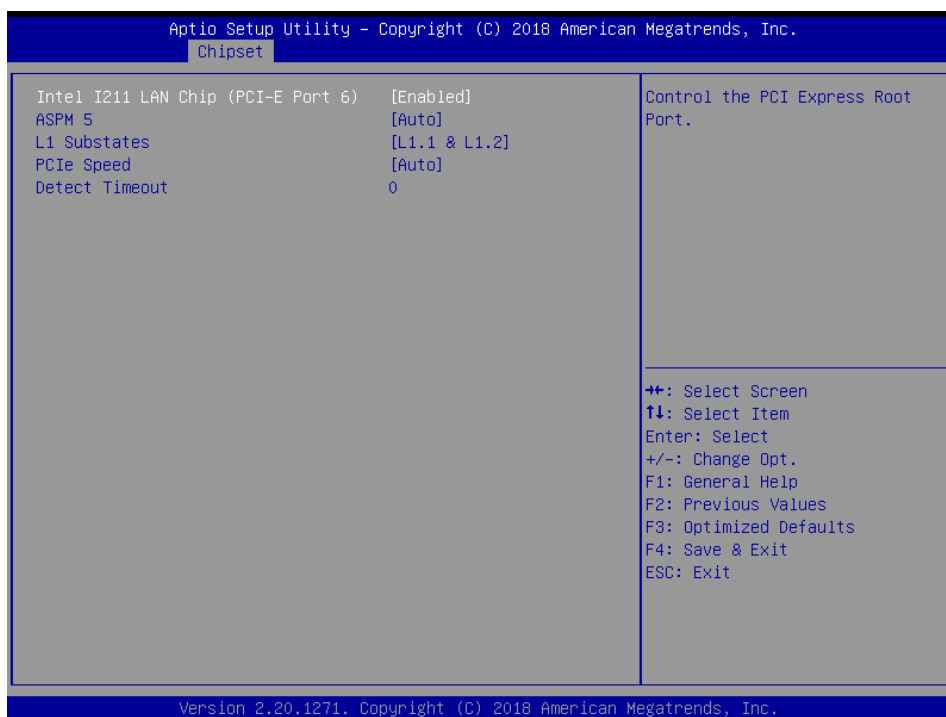


| Item                      | Option                       | Description                 |
|---------------------------|------------------------------|-----------------------------|
| <b>PCH LAN Controller</b> | Disabled<br>Enabled[Default] | Enable/Disable onboard NIC. |

### 3.6.3.2.1 PCI Express Configuration



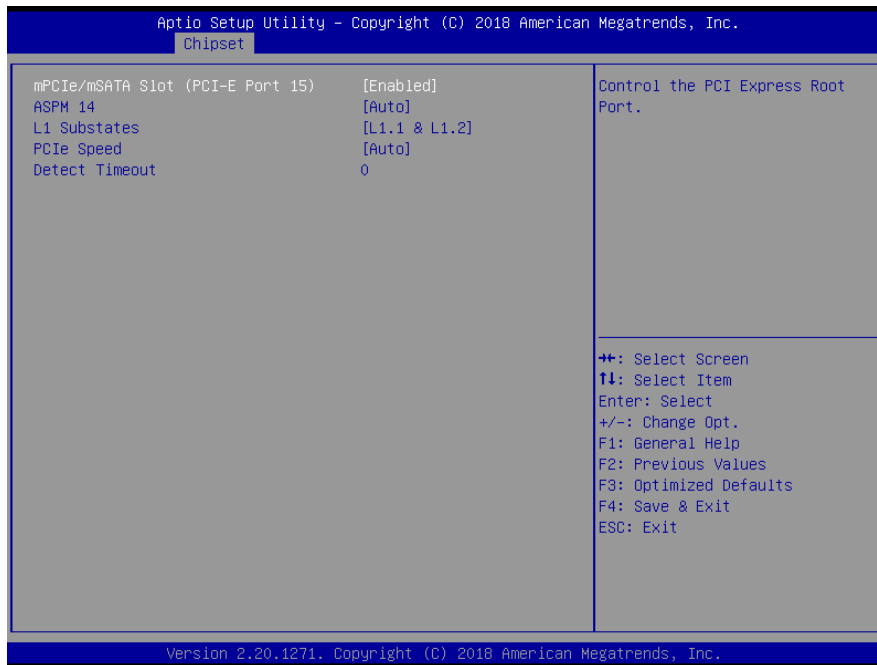
#### 3.6.3.2.1.1 Intel I211 LAN Chip (PCI-E Port 6)



| Item                                      | Option                        | Description   |
|---|-------------------------------|---|
| <b>Intel I211 LAN Chip (PCI-E Port 6)</b> | Enabled[Default],<br>Disabled | Control the PCI Express Root Port.  |
| <b>ASPM 5</b>                             | Disabled,<br>L0s              | Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto |

|                       |   |  |
|-----------------------|---|--|
|                       | L1<br>L0sL1<br>Auto[Default]              | configure DISABLE – Disables ASPM.   |
| <b>L1 Substates</b>   | Disabled,<br>L1.1<br>L1.1 & L1.2[Default] | PCI Express L1 Substates settings.   |
| <b>PCIe Speed</b>     | Auto[Default]<br>Gen1<br>Gen2<br>Gen3     | Configure PCIe Speed.  |
| <b>Detect Timeout</b> | 0   | The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port. |

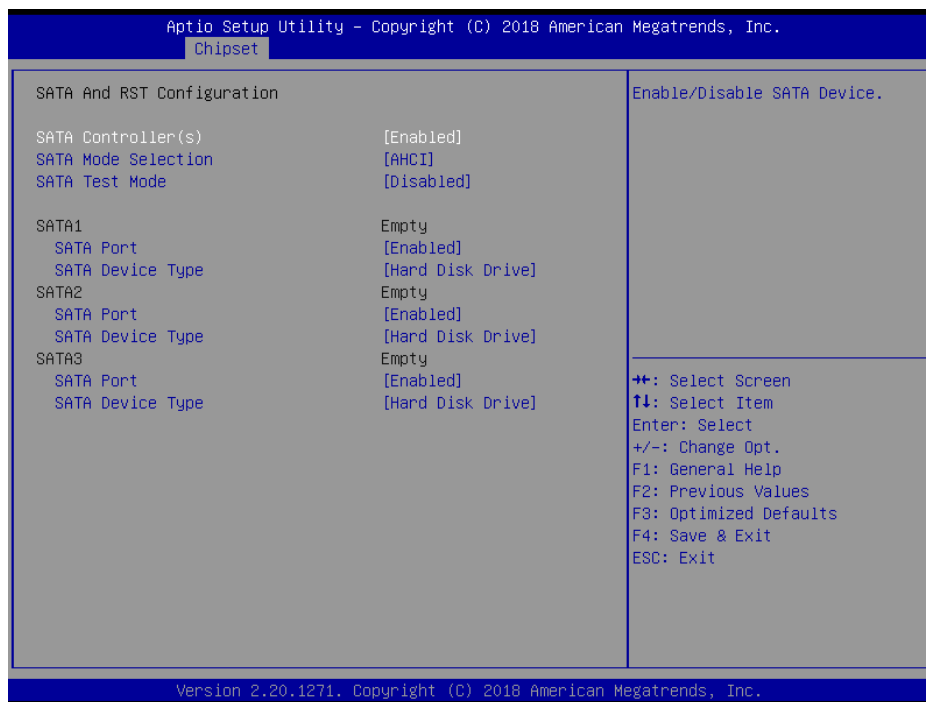
3.6.3.2.1.2 mPCIe/mSATA Slot (PEI-E Port 15)



| Item                                    | Option   | Description  |
|---|--|--|
| <b>mPCIe/mSATA Slot (PEI-E Port 15)</b> | Enabled[Default],<br>Disabled                    | Control the PCI Express Root Port.   |
| <b>ASPM 14</b>                          | Disabled,<br>L0s<br>L1<br>L0sL1<br>Auto[Default] | Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM. |
| <b>L1 Substates</b>                     | Disabled,<br>L1.1<br>L1.1 & L1.2[Default]        | PCI Express L1 Substates settings.   |
| <b>PCIe Speed</b>                       | Auto[Default]<br>Gen1<br>Gen2                    | Configure PCIe Speed.  |

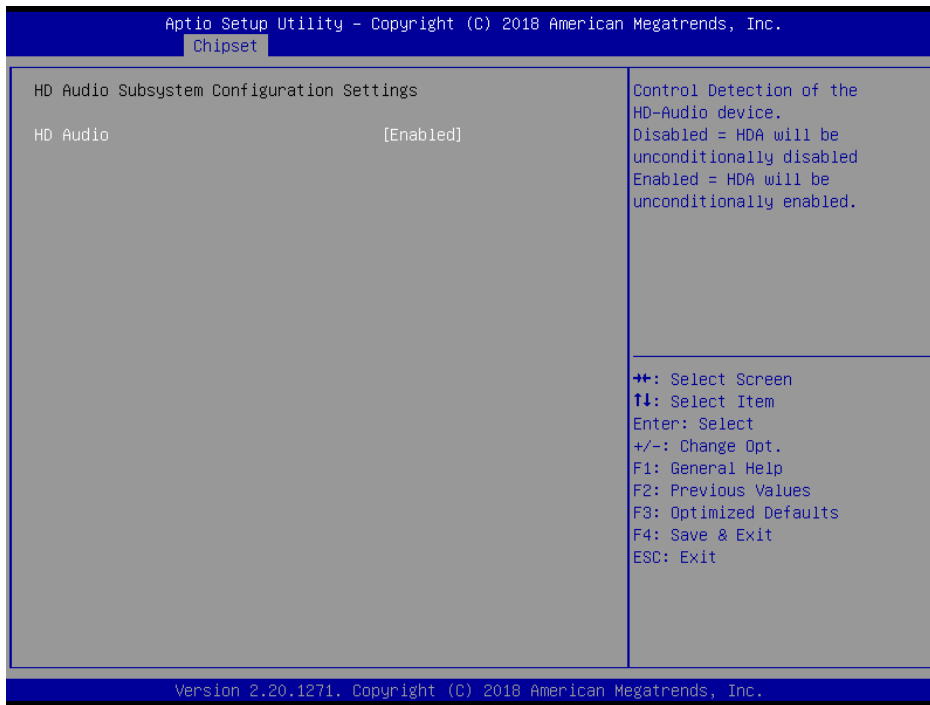
|                       |      |  |
|-----------------------|------|--|
|                       | Gen3 |  |
| <b>Detect Timeout</b> | 0    | The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port. |

### 3.6.3.2.2 SATA And RST Configuration



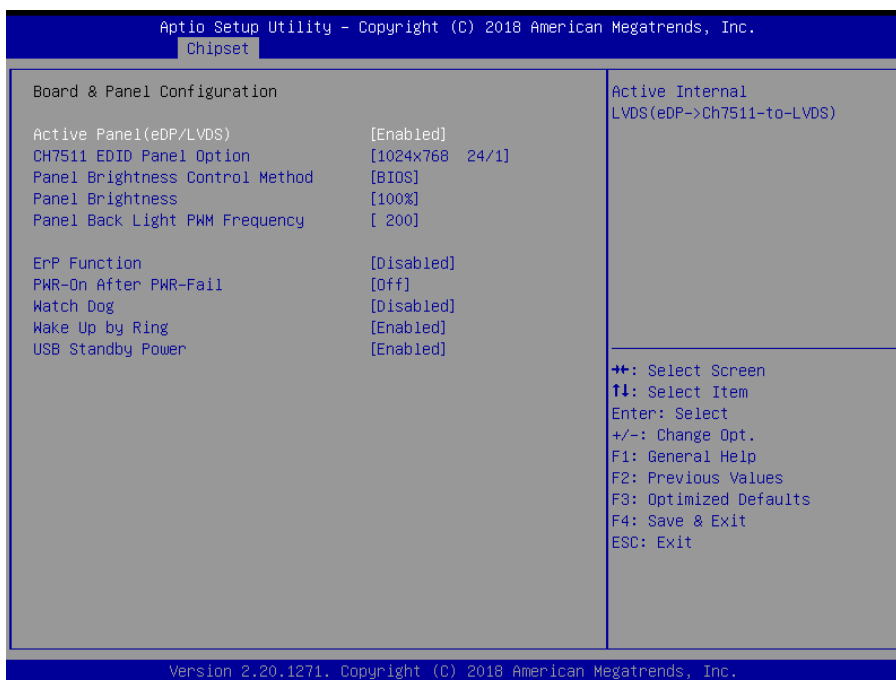
| Item                       | Options  | Description  |
|----------------------------|--|--|
| <b>SATA Controller(s)</b>  | Enabled[ <b>Default</b> ]<br>Disabled,                 | Enable/Disable SATA Device.  |
| <b>SATA Mode Selection</b> | AHCI[ <b>Default</b> ],<br>RAID                        |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

3.6.3.2.3 HD Audio Configuration



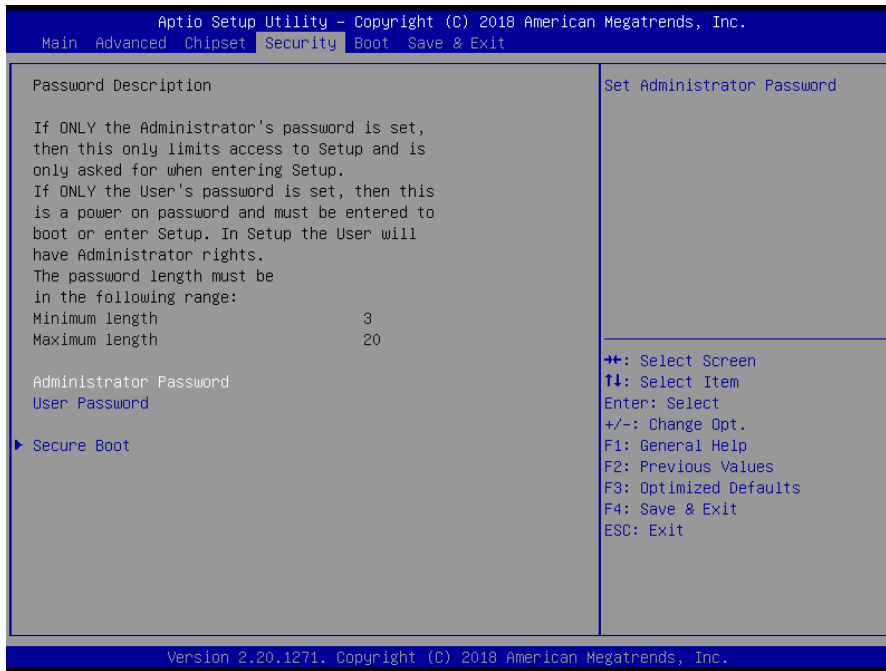
| Item     | Option                       | Description   |
|----------|------------------------------|---|
| HD Audio | Disabled<br>Enabled[Default] | Control Detection of the HD-Audio device. Disable = HDA will be unconditionally disabled. Enabled = HDA will be unconditionally enabled |

3.6.3.3 Board & Panel Configuration



| Item                                   | Option  | Description   |
|--|---|---|
| <b>Active Panel (eDP/LVDS)</b>         | Disabled<br>Enabled <b>[Default]</b>  | Active Internal LVDS(eDP->Cg7511-to-LVDS).              |
| <b>CH7511 EDID Panel Option</b>        | 1024x768 24/1 <b>[Default]</b><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>1366x768 24/1<br>1920x1080 24/2<br>1680x1050 24/2 | Port-EDP to LVDS(Chrotel 7511) Panel EDID Option.       |
| <b>Panel Brightness Control Method</b> | BIOS <b>[Default]</b><br>OS Driver  | Panel Brightness Control Method. 1.BIOS<br>2.OS Driver. |
| <b>Panel Brightness</b>                | 00%<br>25%<br>50%<br>75%<br>100% <b>[Default]</b>   | Select Panel(eDP/LVDS) back light PWM duty.             |
| <b>Panel Back Light PWM Frequency</b>  | 200 <b>[Default]</b><br>300<br>400<br>500<br>700<br>1k<br>2k<br>3k<br>5k<br>10k<br>20k  | Select Panel(eDP/LVDS) back light PWM Frequency.        |
| <b>ErP Function</b>                    | Disabled <b>[Default]</b><br>Enabled  | ErP Function (Deep S5).                                 |
| <b>PWR-On After PWR-Fail</b>           | Off <b>[Default]</b><br>On<br>Last state  | AC loss resume.   |
| <b>Watch Dog</b>                       | Disabled <b>[Default]</b><br>30 sec<br>40 sec<br>50 sec<br>1 min<br>2 min<br>10 min<br>30 min   | Select WatchDog.  |
| <b>Wake Up by Ring</b>                 | Disabled<br>Enabled <b>[Default]</b>  | Wake Up by Ring from S3/S4/S5.                          |
| <b>USB Standby Power</b>               | Disabled<br>Enabled <b>[Default]</b>  | Enable/Disabled USB Standby Power during S3/S4/S5.      |

### 3.6.4 Security



- **Administrator Password**

Set setup Administrator Password

- **User Password**

Set User Password

#### 3.6.4.1 Secure Boot



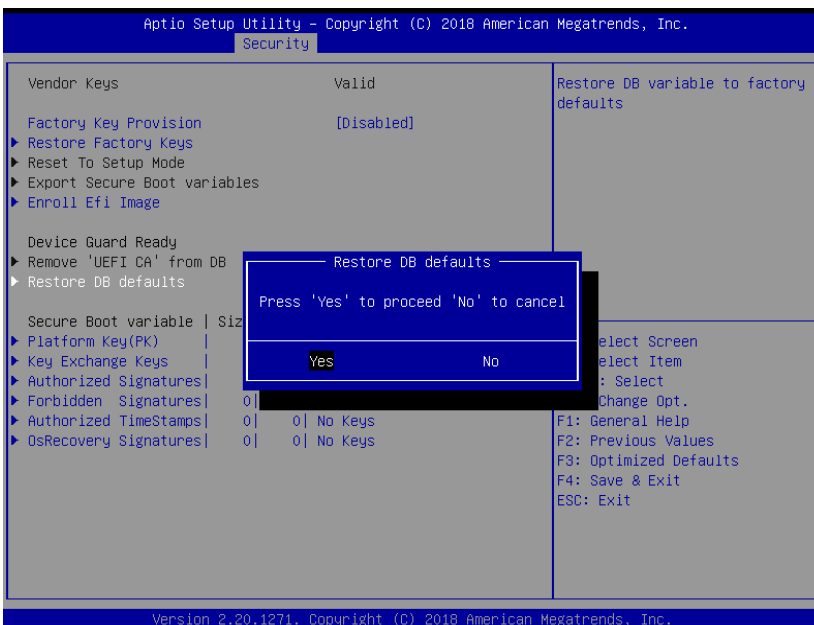
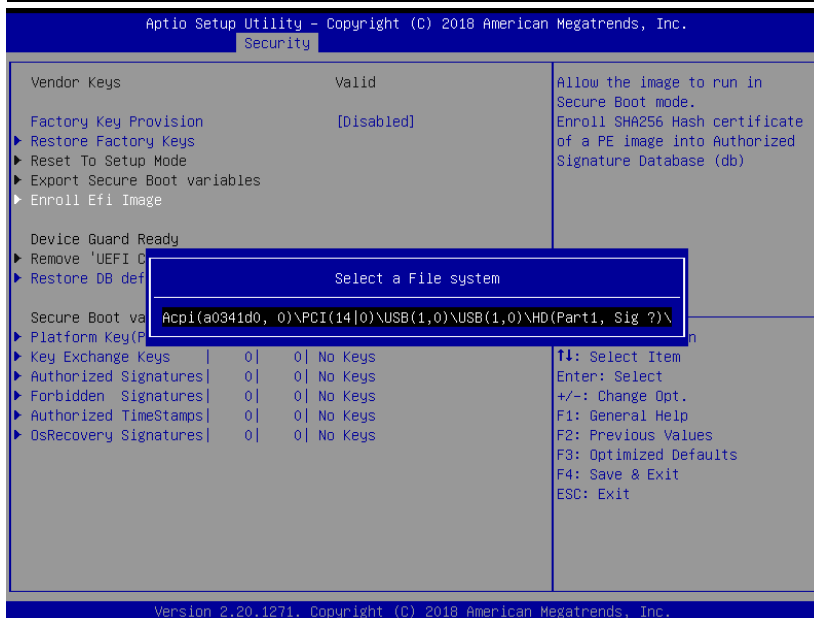
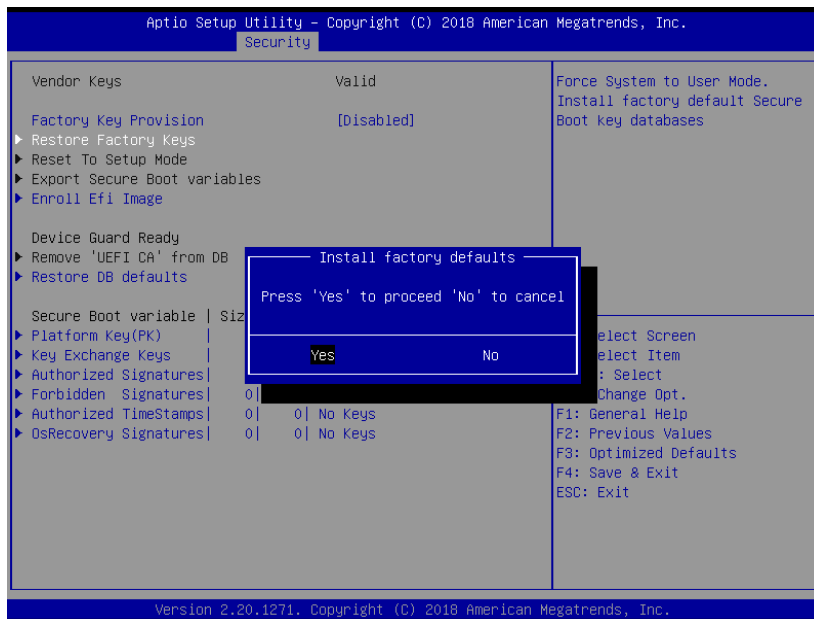




| Item                    | Option                       | Description  |
|-------------------------|------------------------------|--|
| <b>Secure Boot</b>      | Disabled[Default]<br>Enabled | Secure Boot feature is Active if Secure Boot is Enabled, Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset. |
| <b>Secure Boot Mode</b> | Standard<br>Custom[Default]  | Secure Boot mode selector: Standard/Custom. In Custom mode Secure Boot Variables can be configured without authentication.                                     |

### 3.6.4.1.1 Key Management





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Security

Vendor Keys Valid

Factory Key Provision [Disabled]

- ▶ Restore Factory Keys
- ▶ Reset To Setup Mode
- ▶ Export Secure Boot variables
- ▶ Enroll Efi Image

Device Guard Ready

- ▶ Remove 'UEFI CA' from DB
- ▶ Restore DB defaults

Secure Boot variable | Size | Ke

|                         |   |   |         |
|-------------------------|---|---|---------|
| ▶ Platform Key(PK)      | 0 |   |         |
| ▶ Key Exchange Keys     | 0 | 0 | No Keys |
| ▶ Authorized Signatures | 0 | 0 | No Keys |
| ▶ Forbidden Signatures  | 0 | 0 | No Keys |
| ▶ Authorized TimeStamps | 0 | 0 | No Keys |
| ▶ OsRecovery Signatures | 0 | 0 | No Keys |

Platform Key(PK)

Update

Enroll Factory Defaults or load certificates from a file:

- Public Key Certificate:
  - EFI\_SIGNATURE\_LIST
  - EFI\_CERT\_X509 (DER)
  - EFI\_CERT\_RSA2048 (bin)
  - EFI\_CERT\_SHAXXX
- Authenticated UEFI Variable
- EFI PE/COFF Image(SHA256)

Key Source: Factory,External,Mixed

++: Select Screen  
 ↑↓: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F3: Optimized Defaults  
 F4: Save & Exit  
 ESC: Exit

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Security

Vendor Keys Valid

Factory Key Provision [Disabled]

- ▶ Restore Factory Keys
- ▶ Reset To Setup Mode
- ▶ Export Secure Boot variables
- ▶ Enroll Efi Image

Device Guard Ready

- ▶ Remove 'UEFI CA' from DB
- ▶ Restore DB defaults

Secure Boot variable | Size | Ke

|                         |   |   |         |
|-------------------------|---|---|---------|
| ▶ Platform Key(PK)      | 0 |   |         |
| ▶ Key Exchange Keys     | 0 | 0 | No Keys |
| ▶ Authorized Signatures | 0 | 0 | No Keys |
| ▶ Forbidden Signatures  | 0 | 0 | No Keys |
| ▶ Authorized TimeStamps | 0 | 0 | No Keys |
| ▶ OsRecovery Signatures | 0 | 0 | No Keys |

Key Exchange Keys

Update

Append

Enroll Factory Defaults or load certificates from a file:

- Public Key Certificate:
  - EFI\_SIGNATURE\_LIST
  - EFI\_CERT\_X509 (DER)
  - EFI\_CERT\_RSA2048 (bin)
  - EFI\_CERT\_SHAXXX
- Authenticated UEFI Variable
- EFI PE/COFF Image(SHA256)

Key Source: Factory,External,Mixed

++: Select Screen  
 ↑↓: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F3: Optimized Defaults  
 F4: Save & Exit  
 ESC: Exit

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Security

Vendor Keys Valid

Factory Key Provision [Disabled]

- ▶ Restore Factory Keys
- ▶ Reset To Setup Mode
- ▶ Export Secure Boot variables
- ▶ Enroll Efi Image

Device Guard Ready

- ▶ Remove 'UEFI CA' from DB
- ▶ Restore DB defaults

Secure Boot variable | Size | Ke

|                         |   |   |         |
|-------------------------|---|---|---------|
| ▶ Platform Key(PK)      | 0 |   |         |
| ▶ Key Exchange Keys     | 0 | 0 | No Keys |
| ▶ Authorized Signatures | 0 | 0 | No Keys |
| ▶ Forbidden Signatures  | 0 | 0 | No Keys |
| ▶ Authorized TimeStamps | 0 | 0 | No Keys |
| ▶ OsRecovery Signatures | 0 | 0 | No Keys |

Authorized Signatures

Update

Append

Enroll Factory Defaults or load certificates from a file:

- Public Key Certificate:
  - EFI\_SIGNATURE\_LIST
  - EFI\_CERT\_X509 (DER)
  - EFI\_CERT\_RSA2048 (bin)
  - EFI\_CERT\_SHAXXX
- Authenticated UEFI Variable
- EFI PE/COFF Image(SHA256)

Key Source: Factory,External,Mixed

++: Select Screen  
 ↑↓: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F3: Optimized Defaults  
 F4: Save & Exit  
 ESC: Exit

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Security

|                                |               |   |
|--------------------------------|---------------|---|
| Vendor Keys                    | Valid         | Enroll Factory Defaults or load certificates from a file: |
| Factory Key Provision          | [Disabled]    | 1.Public Key Certificate:                                 |
| ▶ Restore Factory Keys         |               | a)EFI_SIGNATURE_LIST                                      |
| ▶ Reset To Setup Mode          |               | b)EFI_CERT_X509 (DER)                                     |
| ▶ Export Secure Boot variables |               | c)EFI_CERT_RSA2048 (bin)                                  |
| ▶ Enroll Efi Image             |               | d)EFI_CERT_SHAXXX   |
| Device Guard Ready             |               | 2.Authenticated UEFI Variable                             |
| ▶ Remove 'UEFI CA' from DB     |               | 3.EFI PE/COFF Image(SHA256)                               |
| ▶ Restore DB defaults          |               | Key Source:   |
|                                |               | Factory,External,Mixed                                    |
| Secure Boot variable           | Size  Ke      |   |
| ▶ Platform Key(PK)             | 0             |   |
| ▶ Key Exchange Keys            | 0  0  No Keys |   |
| ▶ Authorized Signatures        | 0  0  No Keys |   |
| ▶ Forbidden Signatures         | 0  0  No Keys |   |
| ▶ Authorized TimeStamps        | 0  0  No Keys |   |
| ▶ OsRecovery Signatures        | 0  0  No Keys |   |

Forbidden Signatures

---

Update

Append

++: Select Screen  
 T4: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F3: Optimized Defaults  
 F4: Save & Exit  
 ESC: Exit

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Security

|                                |               |   |
|--------------------------------|---------------|---|
| Vendor Keys                    | Valid         | Enroll Factory Defaults or load certificates from a file: |
| Factory Key Provision          | [Disabled]    | 1.Public Key Certificate:                                 |
| ▶ Restore Factory Keys         |               | a)EFI_SIGNATURE_LIST                                      |
| ▶ Reset To Setup Mode          |               | b)EFI_CERT_X509 (DER)                                     |
| ▶ Export Secure Boot variables |               | c)EFI_CERT_RSA2048 (bin)                                  |
| ▶ Enroll Efi Image             |               | d)EFI_CERT_SHAXXX   |
| Device Guard Ready             |               | 2.Authenticated UEFI Variable                             |
| ▶ Remove 'UEFI CA' from DB     |               | 3.EFI PE/COFF Image(SHA256)                               |
| ▶ Restore DB defaults          |               | Key Source:   |
|                                |               | Factory,External,Mixed                                    |
| Secure Boot variable           | Size  Ke      |   |
| ▶ Platform Key(PK)             | 0             |   |
| ▶ Key Exchange Keys            | 0  0  No Keys |   |
| ▶ Authorized Signatures        | 0  0  No Keys |   |
| ▶ Forbidden Signatures         | 0  0  No Keys |   |
| ▶ Authorized TimeStamps        | 0  0  No Keys |   |
| ▶ OsRecovery Signatures        | 0  0  No Keys |   |

Authorized TimeStamps

---

Update

Append

++: Select Screen  
 T4: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F3: Optimized Defaults  
 F4: Save & Exit  
 ESC: Exit

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Security

|                                |               |   |
|--------------------------------|---------------|---|
| Vendor Keys                    | Valid         | Enroll Factory Defaults or load certificates from a file: |
| Factory Key Provision          | [Disabled]    | 1.Public Key Certificate:                                 |
| ▶ Restore Factory Keys         |               | a)EFI_SIGNATURE_LIST                                      |
| ▶ Reset To Setup Mode          |               | b)EFI_CERT_X509 (DER)                                     |
| ▶ Export Secure Boot variables |               | c)EFI_CERT_RSA2048 (bin)                                  |
| ▶ Enroll Efi Image             |               | d)EFI_CERT_SHAXXX   |
| Device Guard Ready             |               | 2.Authenticated UEFI Variable                             |
| ▶ Remove 'UEFI CA' from DB     |               | 3.EFI PE/COFF Image(SHA256)                               |
| ▶ Restore DB defaults          |               | Key Source:   |
|                                |               | Factory,External,Mixed                                    |
| Secure Boot variable           | Size  Ke      |   |
| ▶ Platform Key(PK)             | 0             |   |
| ▶ Key Exchange Keys            | 0  0  No Keys |   |
| ▶ Authorized Signatures        | 0  0  No Keys |   |
| ▶ Forbidden Signatures         | 0  0  No Keys |   |
| ▶ Authorized TimeStamps        | 0  0  No Keys |   |
| ▶ OsRecovery Signatures        | 0  0  No Keys |   |

OsRecovery Signatures

---

Update

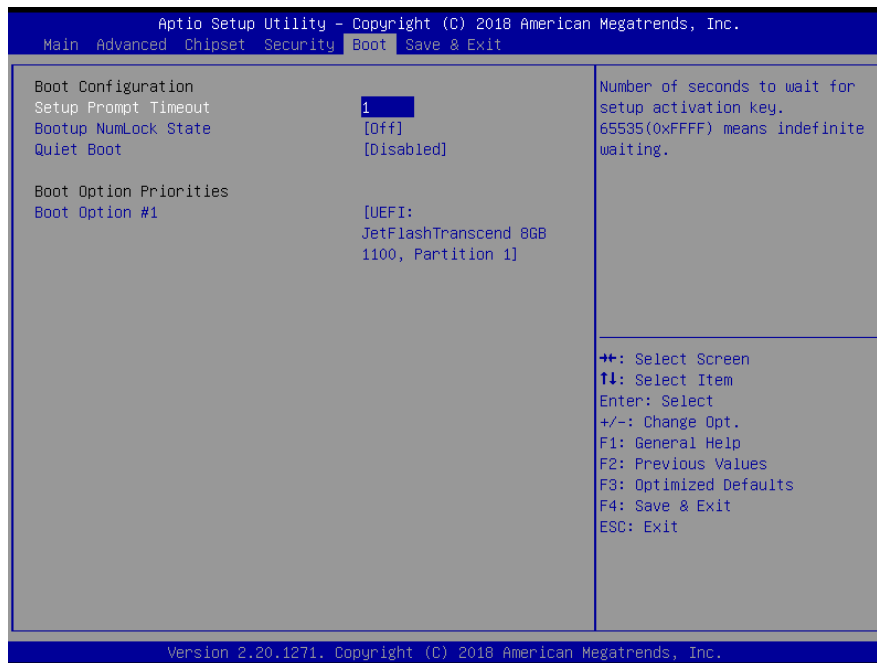
Append

++: Select Screen  
 T4: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F3: Optimized Defaults  
 F4: Save & Exit  
 ESC: Exit

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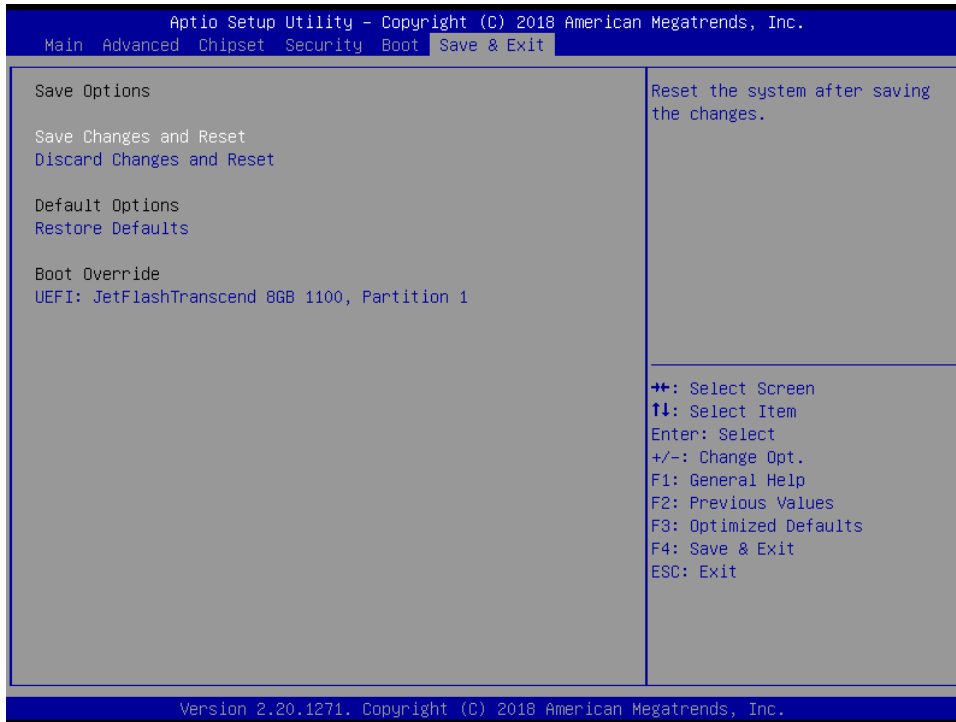
| Item                         | Option                       | Description  |
|------------------------------|------------------------------|--|
| <b>Factory Key Provision</b> | Disabled[Default]<br>Enabled | Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode. |

### 3.6.5 Boot



| Item                        | Option                       | Description   |
|-----------------------------|------------------------------|---|
| <b>Setup Prompt Timeout</b> | 1~ 65535                     | Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting. |
| <b>Bootup NumLock State</b> | On<br>Off[Default]           | Select the Keyboard NumLock state   |
| <b>Quiet Boot</b>           | Disabled[Default]<br>Enabled | Enables or disables Quiet Boot option   |
| <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

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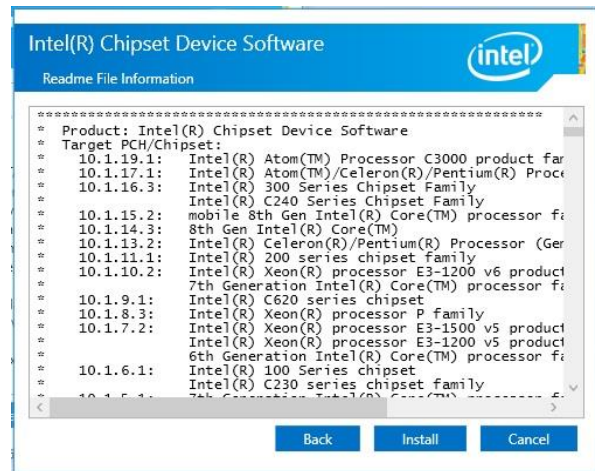


**Note:** Installation procedures and screen shots in this section are for your reference and may not be exactly the same as shown on your screen.

## 4.1 Install Chipset Driver



**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.**



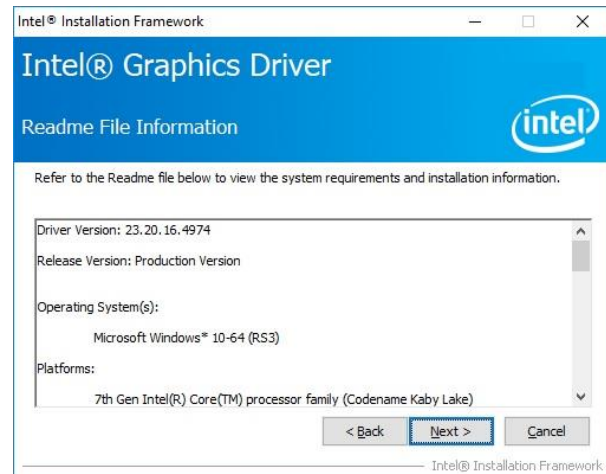
**Step 2. Click Accept.**



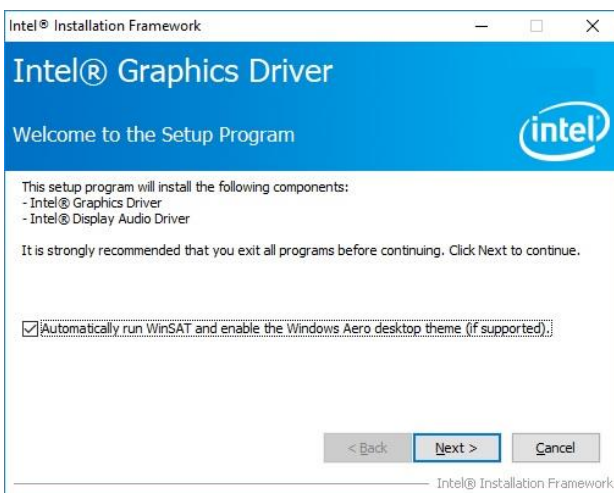
## 4.2 Install Display Driver



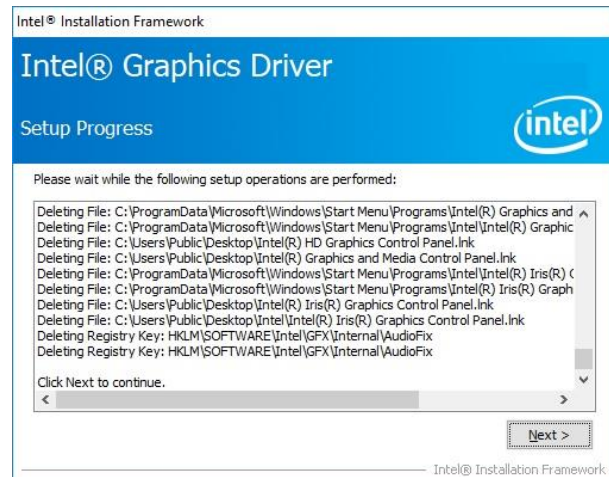
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



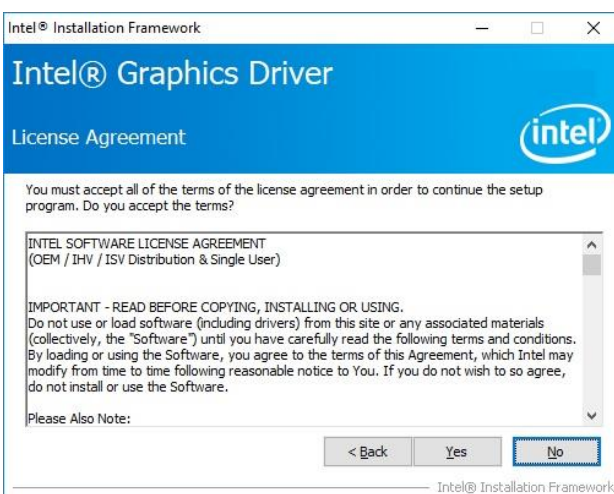
**Step 3. Click Next.**



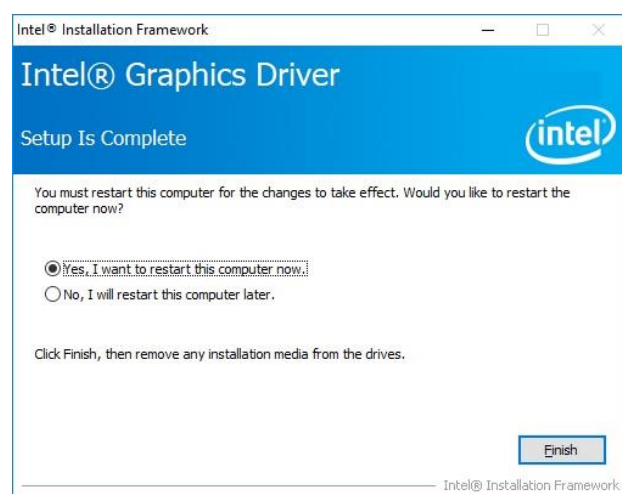
**Step 1. Click Next** to continue installation.



**Step 4. Click Next.**



**Step 2. Click Yes** to accept license agreement.

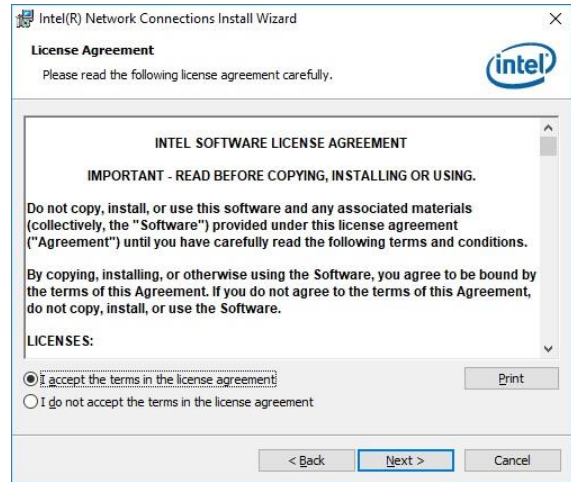


**Step 5. Click Finish** to complete setup.

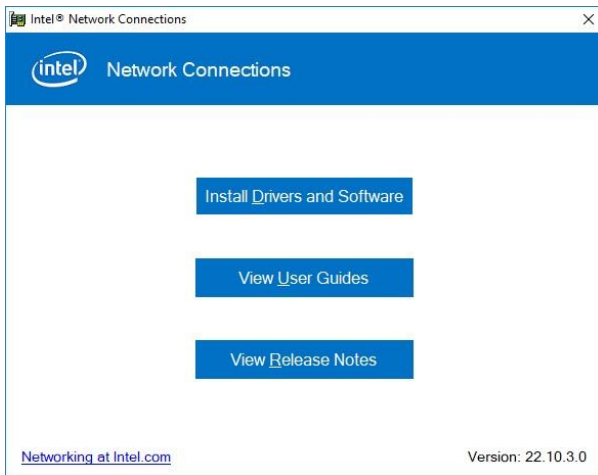
## 4.3 Install LAN Driver



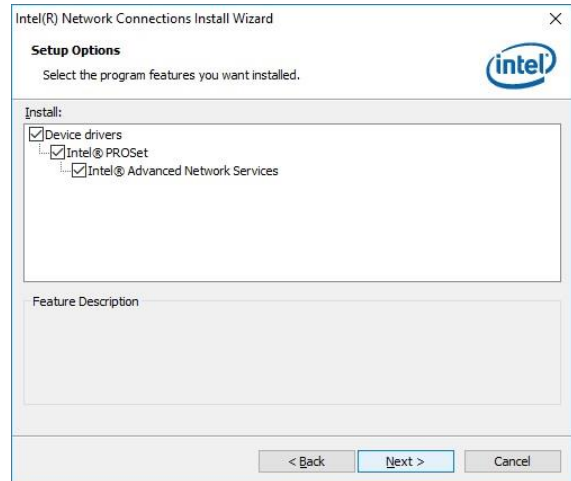
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



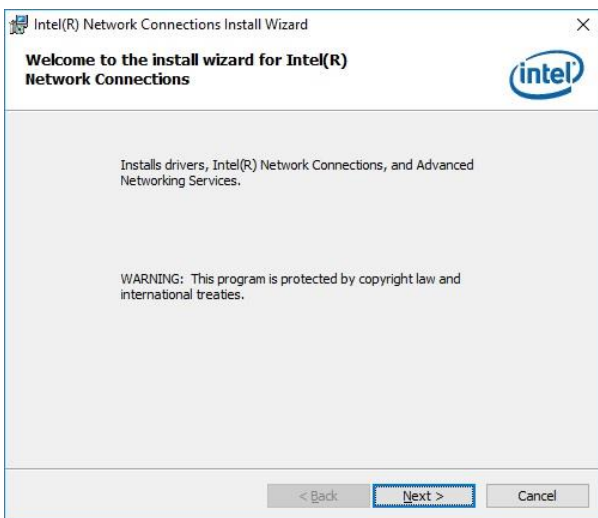
**Step 3. Click Next.**



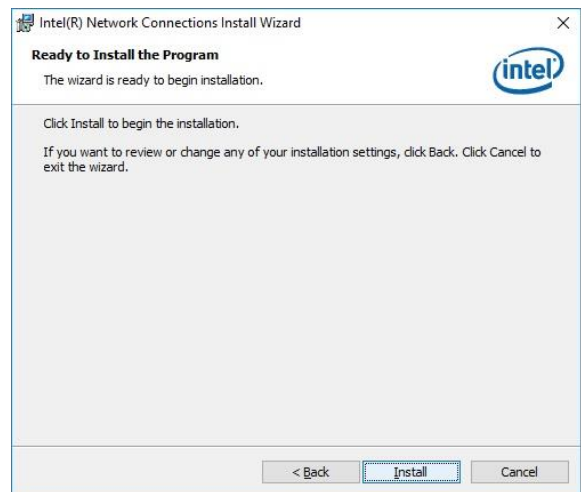
**Step 1. Click Install Drivers and Software.**



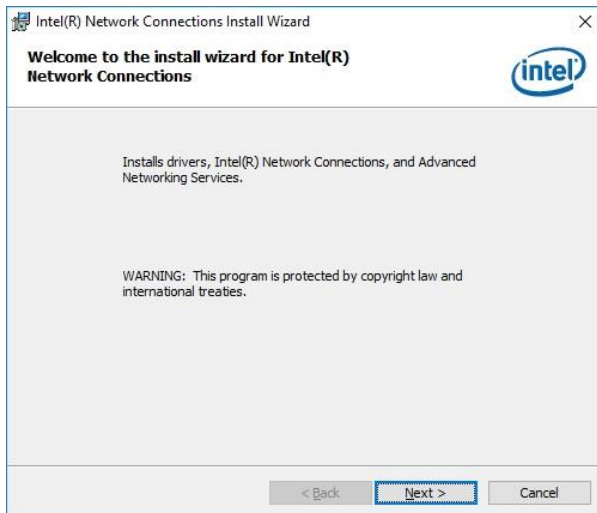
**Step 4. Click Next.**



**Step 2. Click Next.**



**Step 5. Click Install.**

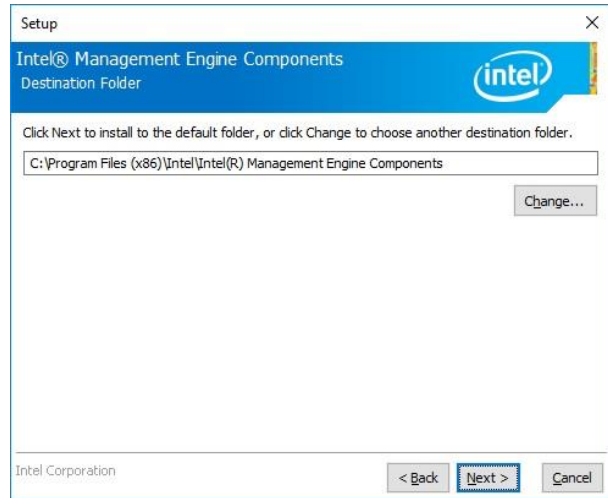


**Step 6.** Click **Finish** to complete setup.

## 4.4 Install ME Driver



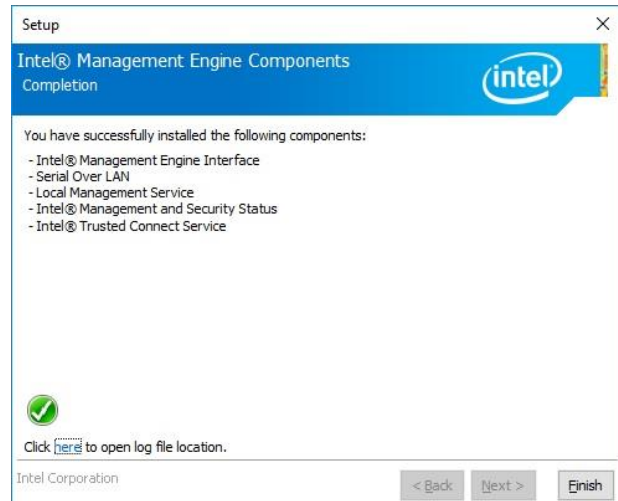
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.



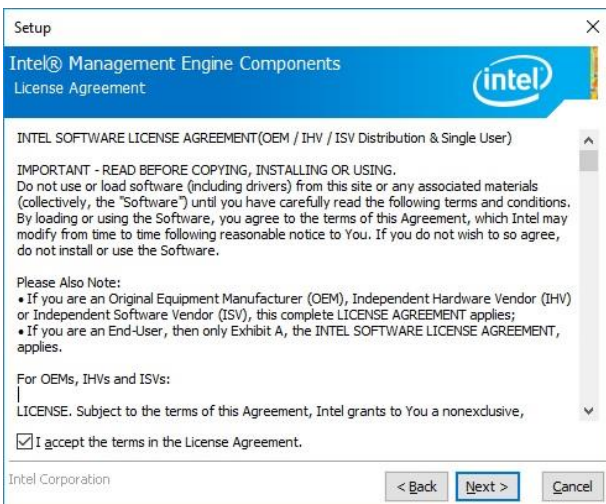
**Step 3. Click Next.**



**Step1. Click Next** to start installation.



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

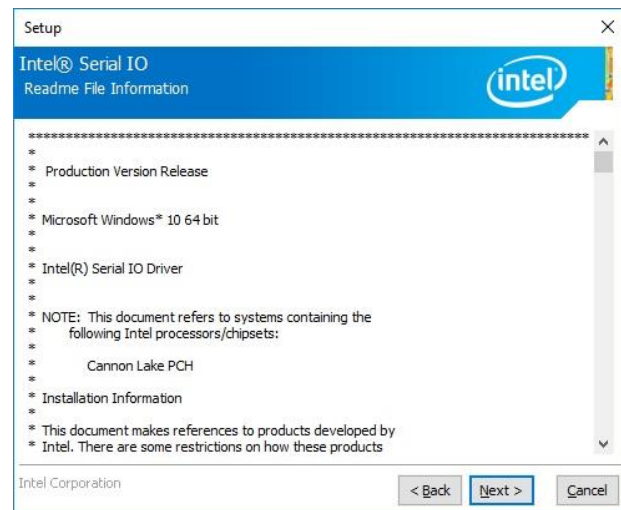


**Step 2. Click Next.**

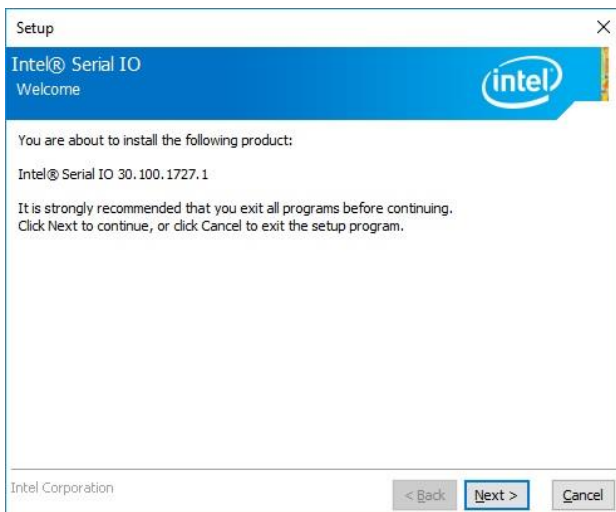
## 4.5 Install Serial IO Driver



**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.**

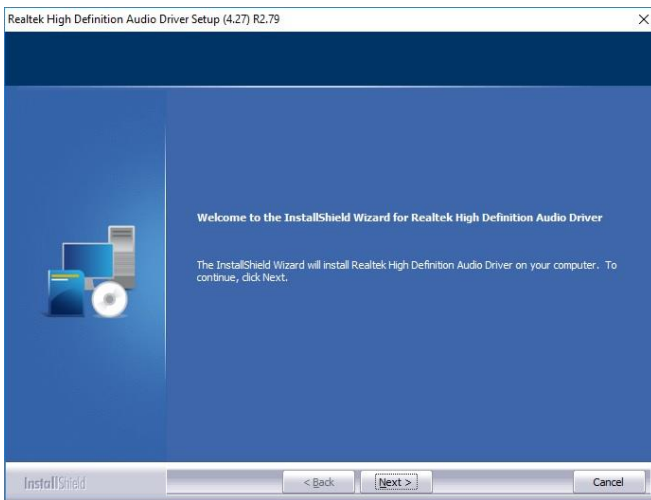


**Step 5. Complete setup.**

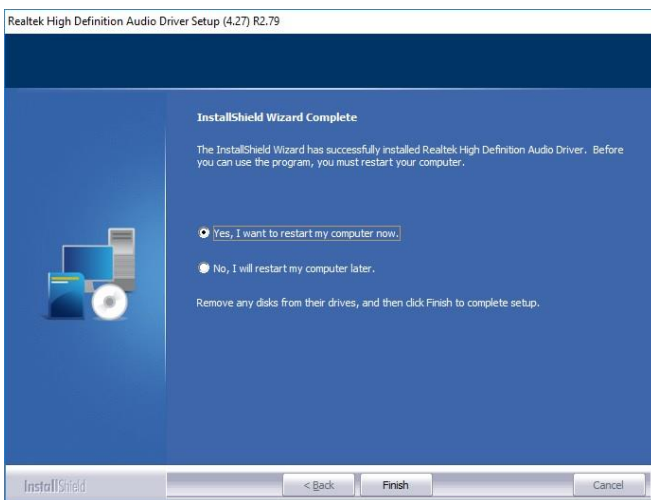
## 4.6 Install Audio Driver (For Realtek ALC892)



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



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



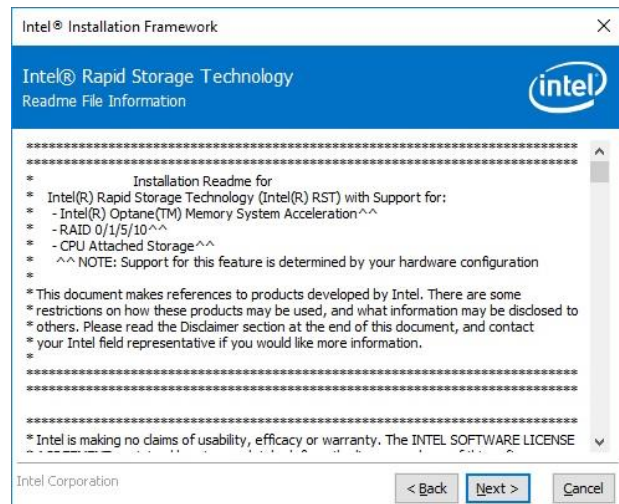
**Step 2.** Click **Finish** to complete setup.



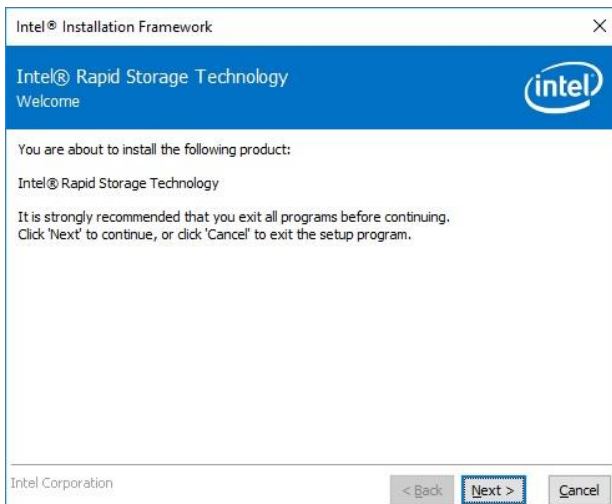
## 4.7 Install IRST Driver



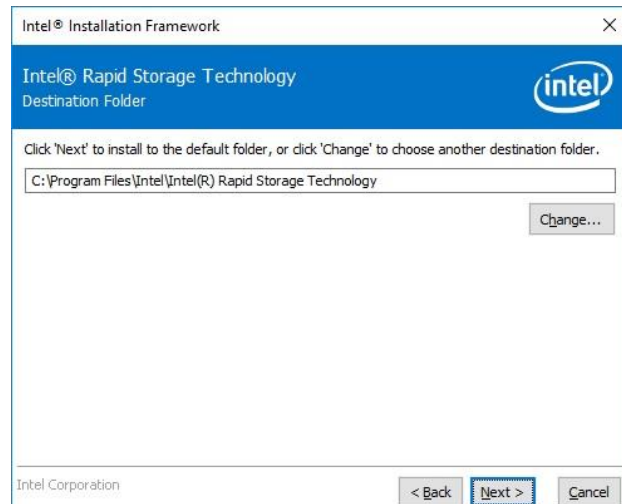
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



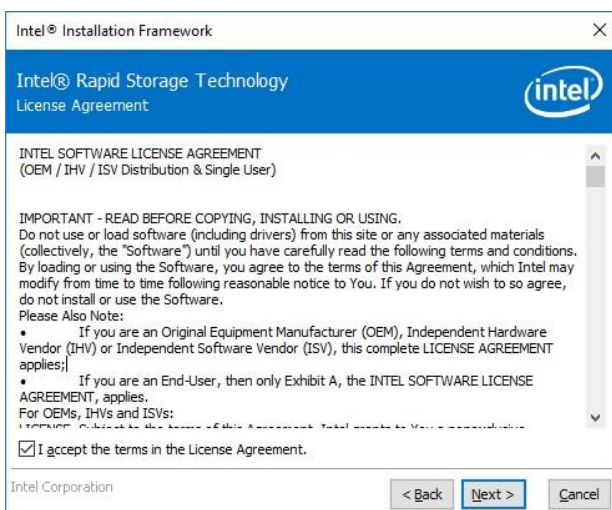
**Step 3. Click Next.**



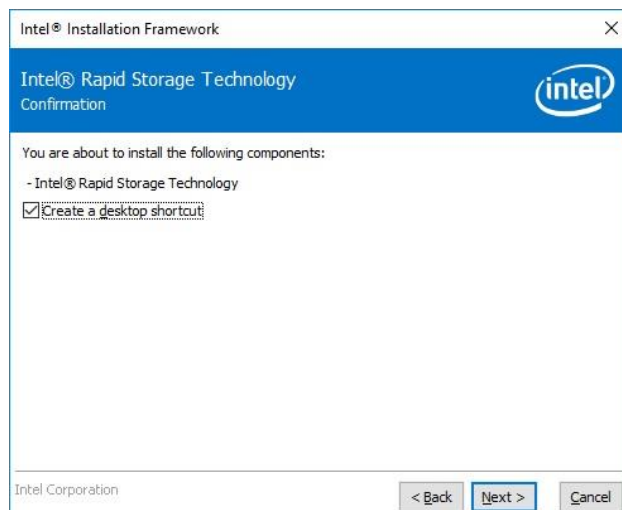
**Step 1. Click Next** to continue installation.



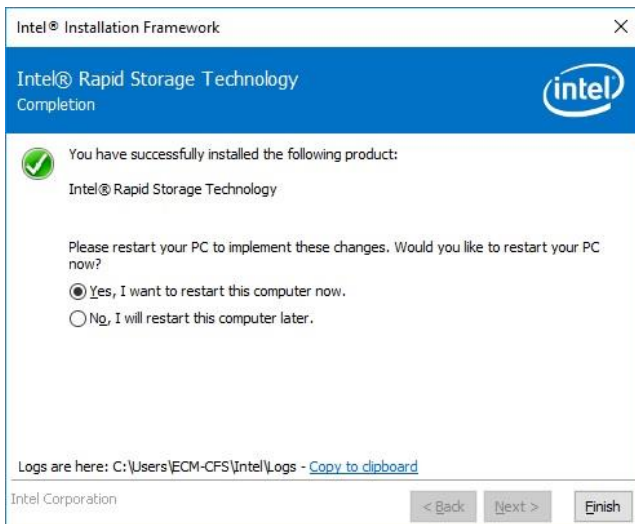
**Step 4. Click Next.**



**Step 2. Click Next.**



**Step 5. Complete setup.**

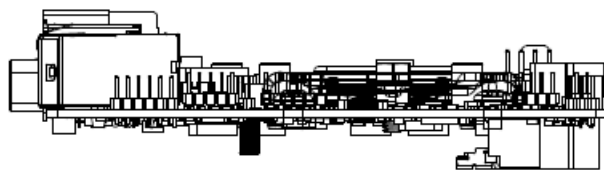
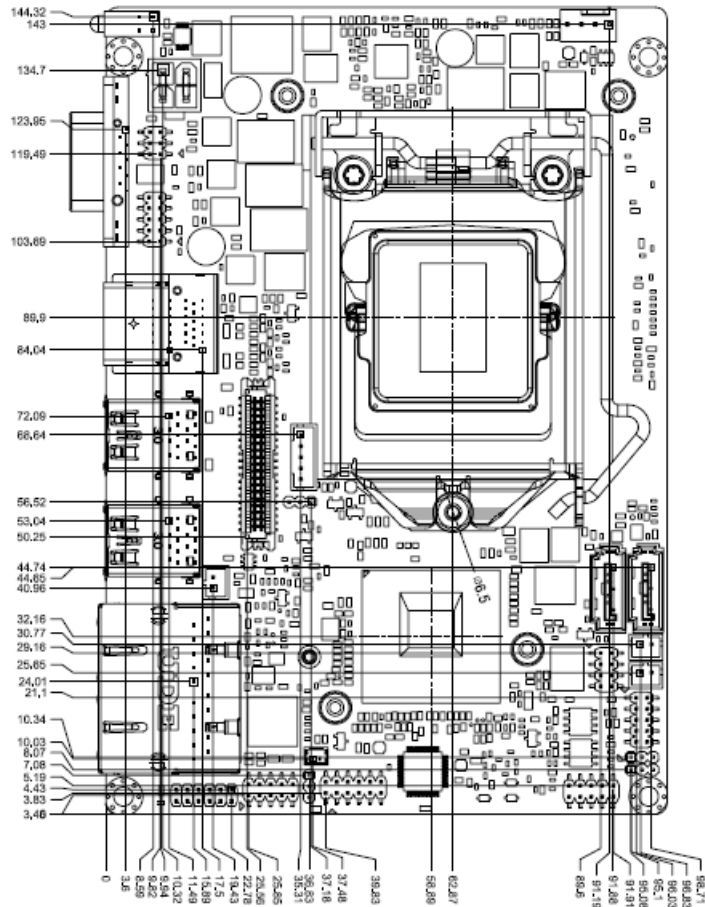
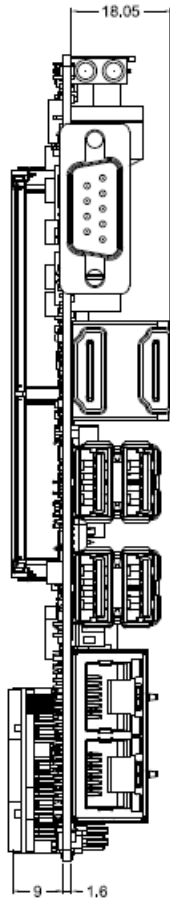


**Step 6.** Click **Finish** to complete setup.

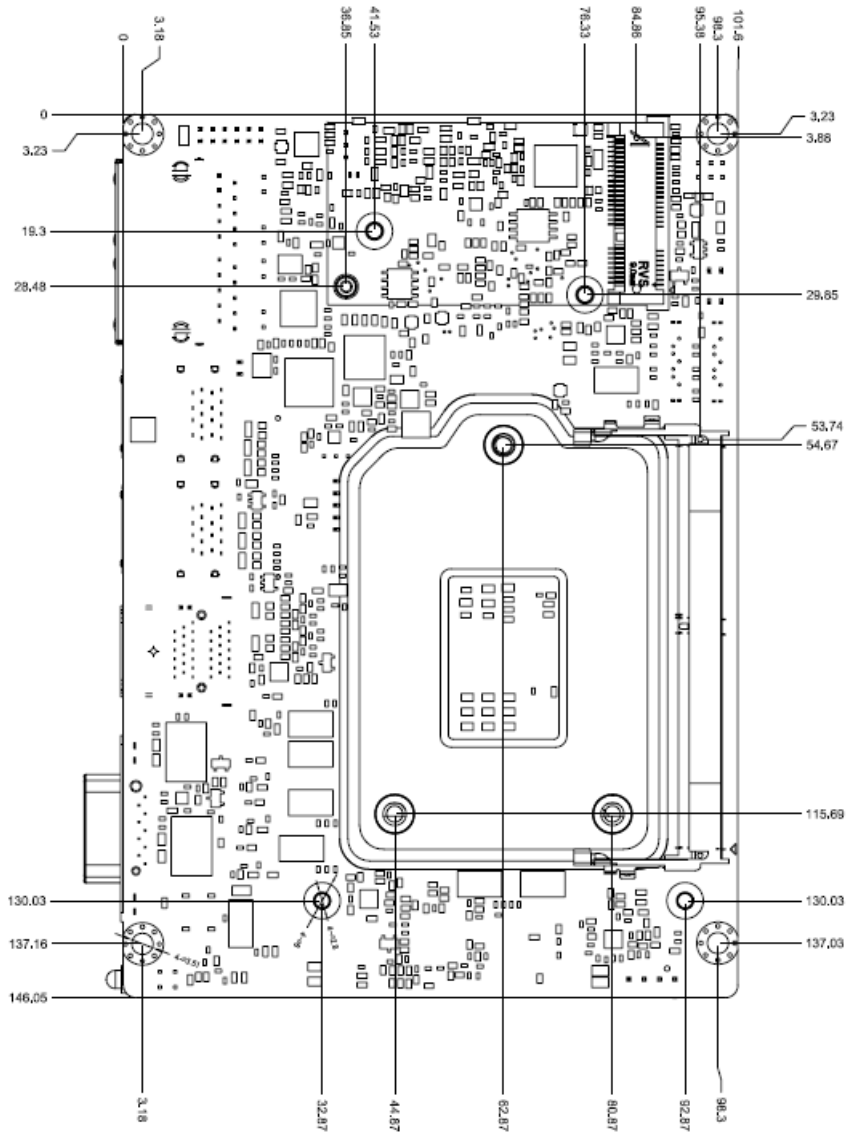


# 5. Mechanical Drawing





Unit: mm



Unit: mm