# ROBO-8114VG2AR

## PICMG 1.3 Single Host Board

Version 1.4

**Revision History**

| | |
|---|---|
| R1.0 | Preliminary |
| R1.1 | Page 11/33,add VGA resolution limitation |
| R1.2 | Correct memory information |
| R1.3 | Update typo |
| R1.4 | Update RS485 information about remove Auto flow control |

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## Preface

This user's guide provides information about the components, features, connectors and BIOS Setup menus available on the ROBO-8114VG2AR. This document should be referred to when designing PICMG 1.3 application. The other reference documents that should be used include the following:

- ✧Intel Coffee Lake-S Design Guide
- ✧Intel Coffee Lake-S Specification

Please contact Portwell Sales Representative for above documents.

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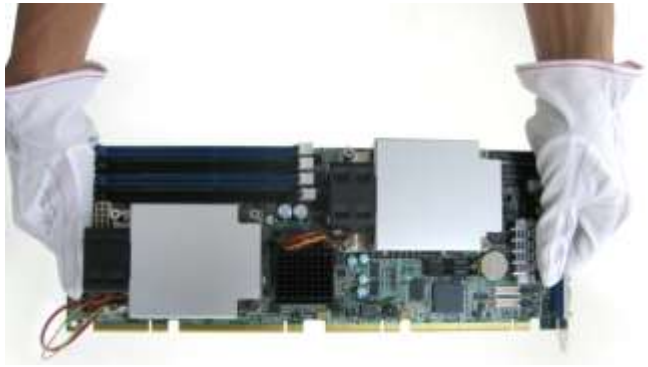
# Notice

## SBC Handling and Installation Notice

- Handling and Installing SBC

***Caution: Do not just hold any single side of the SBC; hold evenly on both sides!***

- Heavy processor cooler may bend the SBC when SBC being held just on one side.
- The bending may cause soldering or components damaged.



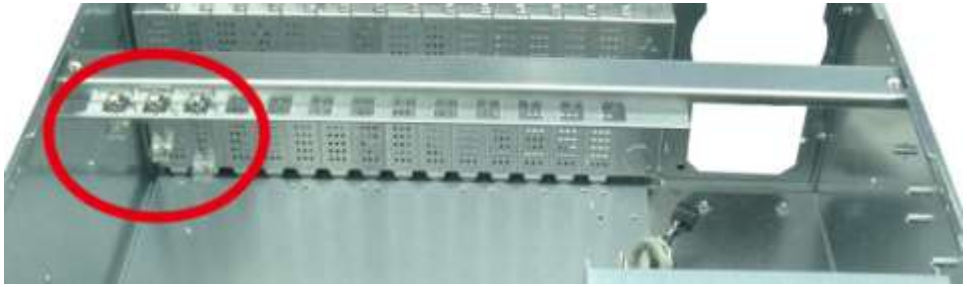
- Fix your SBC in System

***Caution: Suggest your S.I or vendor to use a metal bracket to hold/fix the desktop or server grade SBC to avoid the vibration damage during transportation. Heavy processor cooler may bend the SBC when systems are during transportation without any holder.***

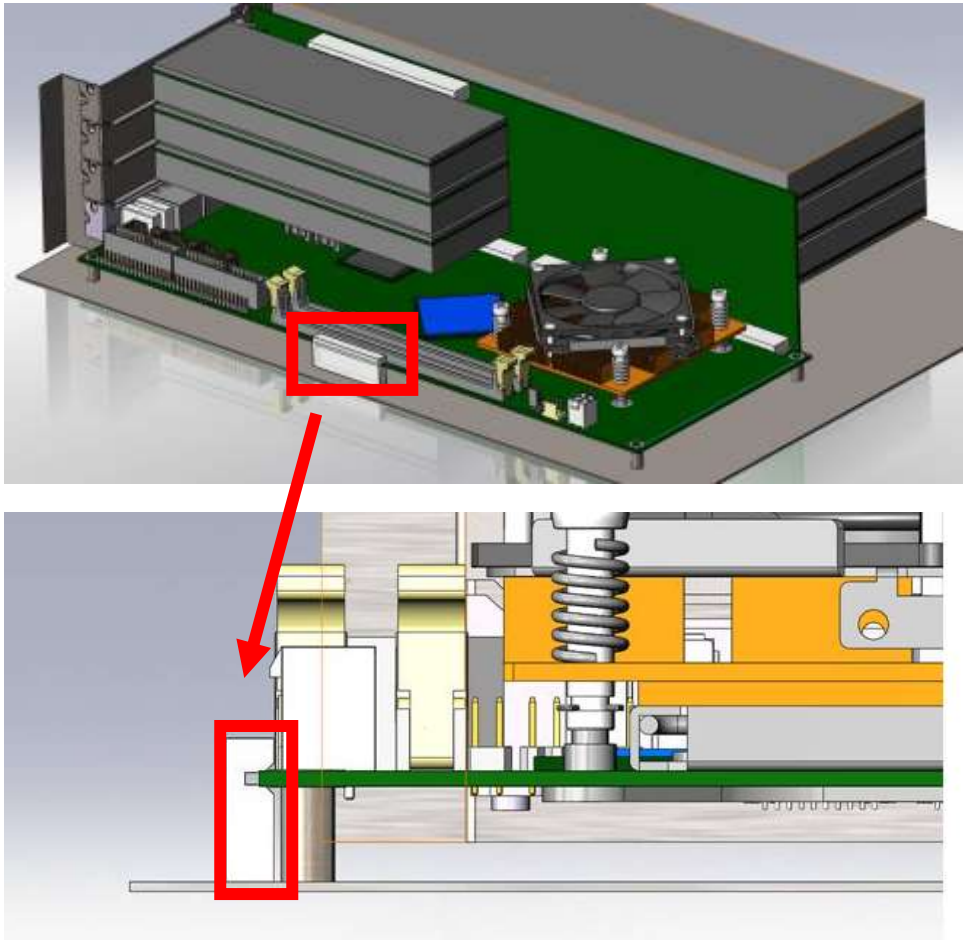
Example:

- 4U chassis :

➔ Use L type mental or plastic or rubber bracket to hold SBC.



- 2U or 1U chassis: a mental bracket on the bottom of chassis to balance and support SBC from bending.



# 1 Introduction

ROBO-8114VG2AR, a PICMG 1.3 Single Host Board (SHB) with the latest Intel 8th Generation Core processors supported from E3 class Xeon processors to Core i3 processors. Portwell's ROBO-8114VG2AR implements flexible PCI Express Gen 3 expansion by one PCI Express x16 or two PCI Express x 8 or one PCI Express x8 and two PCI Express x4 with dedicated processor sku, which is ideal for a range of applications, such as Industrial Automation, Digital Signage, and Medical.

ROBO-8114VG2AR adopt Intel C246 and Q370 PCH. Providing up to 128GB DDR4 2133 SO-DIMM system memory supported with ECC or non-ECC option. ROBO-8114VG2AR with the 8th generation Intel® processor family features and integrated, enhanced graphics engine which provides significant 3D performance, up to DirectX® 12. It supports triple display function via DVI-I (VGA and DVI-D) and HDMI up to 4Kx2K. Rich I/O functions are also provided by ROBO-8114VG2AR single host board, which is 2x USB 3.1, 8x USB 3.0, 5x SATA III ports (dual ports via backplane), 2x RS232 ports, 2x smart COM ports which select RS232/422/485 mode by bios adjustment, and dual Intel GbE LAN ports. It also supports on board TPM 2.0 to secure your applications.

For the industries who already have large install based systems, ROBO-8114VG2AR not only provides a way to upgrade to use the latest Intel processors, but also supporting legacy elements such as VGA, four PCI expansion, four Serial ports and PS/2 Keyboard and Mouse.

# 2 Specifications

| | |
|---|---|
| **Main Processor** | ◆ Intel® Coffee Lake-S E3-2xxxv and Core™ i Processors |
| **System BIOS** | ◆ AMI UEFI BIOS |
| **Main Memory** | ◆ Up to 128 GB ECC or non-ECC DDR4 on four so-DIMM sockets. Supports dual channel DDR4 2133 MHz SDRAM |
| **Graphics** | ◆ Controller: Intel® Gfx Gen 9, HD graphics<br>◆ VGA: Resolution up to 1920 x 1200 @ 60Hz<br>◆ DVI-D: Resolution up to 1920 x 1200 @ 60Hz<br>(VGA+DVI-D on bracket by DVI-I port)<br>**Note(VGA resolution limitation)**<br>If use the B6903351(DVI-D +VGA Y cable) to connect with DVI-D & VGA monitor simultaneously, the VGA resolution only can up to 1920x1080.And only DVI-D can be to show correct information about type of monitor & resolution.<br>◆ HDMI: Resolution up to 4096 x 2160 @ 24Hz |
| **Expansion Interface** | ◆ From CPU: 1x PCI Express x16 or 2x PCI Express x8 or 1x PCI Express x8 + 2x PCI Express x4 by jumper setting (Gen3 up to 8.0 GT/s)<br>◆ From PCH: 1x PCI Express x4 or 4x PCI Express x1 by different bios support (Gen 3 up to 8.0 GT/s) |
| **SATA Interface** | ◆ Five SATA III ports (SATA 6Gb/s), dual ports via backplane |
| **Input/Output** | ◆ Serial Ports: 2x RS-232 & 2x RS-232/422/485 selectable by bios<br>◆ USB Port: 2x USB 3.2(Gen1) on bracket, 8x USB 3.2(Gen2) on board header<br>◆ GPIO connector: 8GPI + 8GPO<br>◆ Audio Interface: Mic-In / Line-Out / Line-in (on-board header) |

| | |
|---|---|
| **Ethernet** | ◆ Supports dual 10/100/1000 Mbps Ethernet port (s) via PCI Express x1 interface by Intel WGI219LM and WGI210AT controller<br>◆ Dual RJ45 connector on bracket |
| **TPM** | ◆ On-board TPM 2.0 support (TPM IC: Infineon SLB9665TT2.0) |
| **High Drive GPIO** | ◆ One pin-header for GPIO (8bit in &8bit out) |
| **Mechanical and environmental specifications** | ◆ Operating temperature: 0 ~ 60° C<br>◆ Storage temperature:-20 ~ 80° C<br>◆ Humidity: 5 ~ 90% non-condensing<br>◆ Power supply voltage: ATX<br>◆ Board size: 338.5mm x 126.39mm, 13.33" (L) x 4.98" (W) |

## 2.1 Supported Operating Systems

The ROBO-8114VG2AR supports the following operating systems.

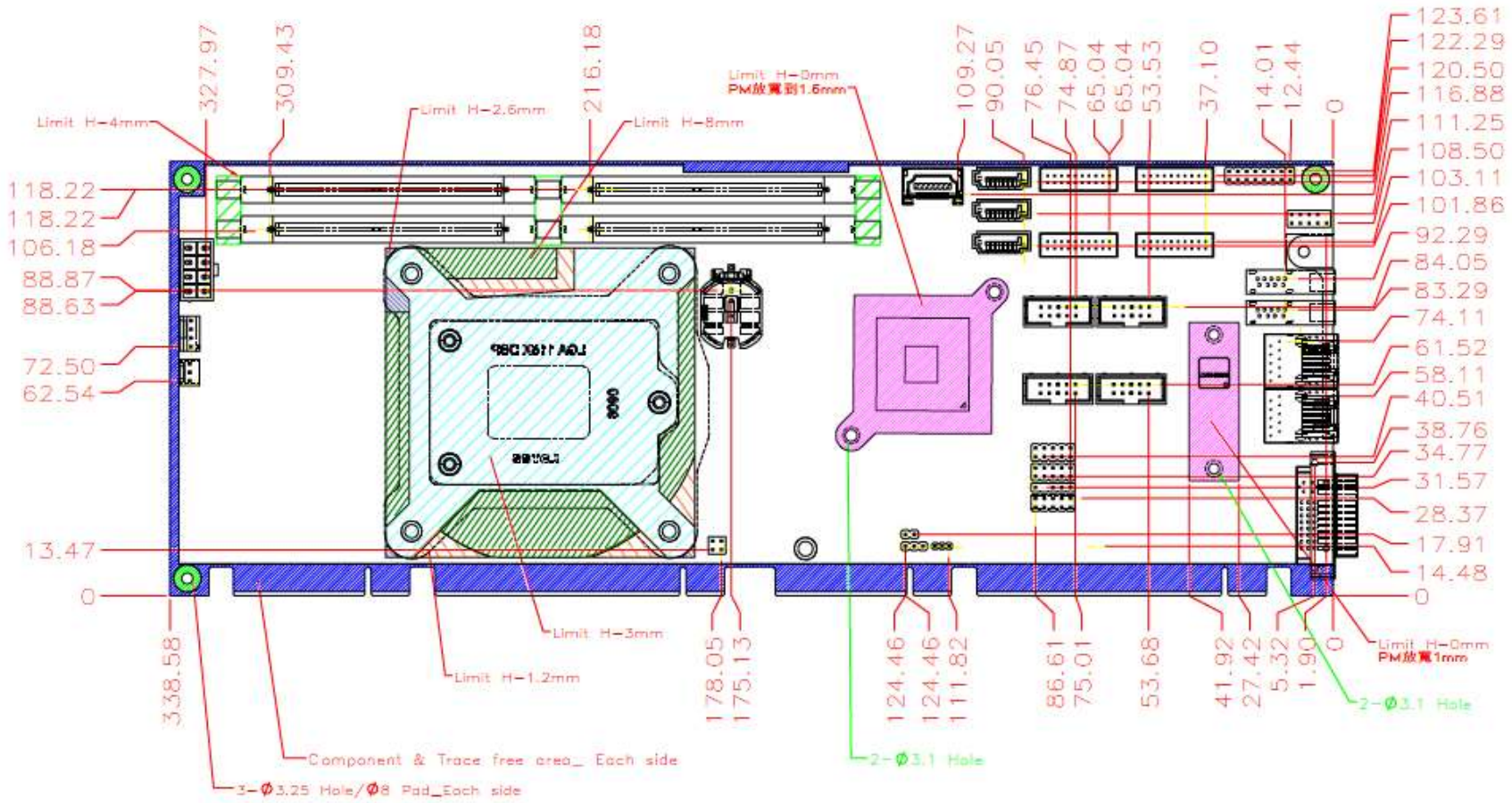
✧ Windows 10 Enterprise & IOT Enterprise (64b) RS3

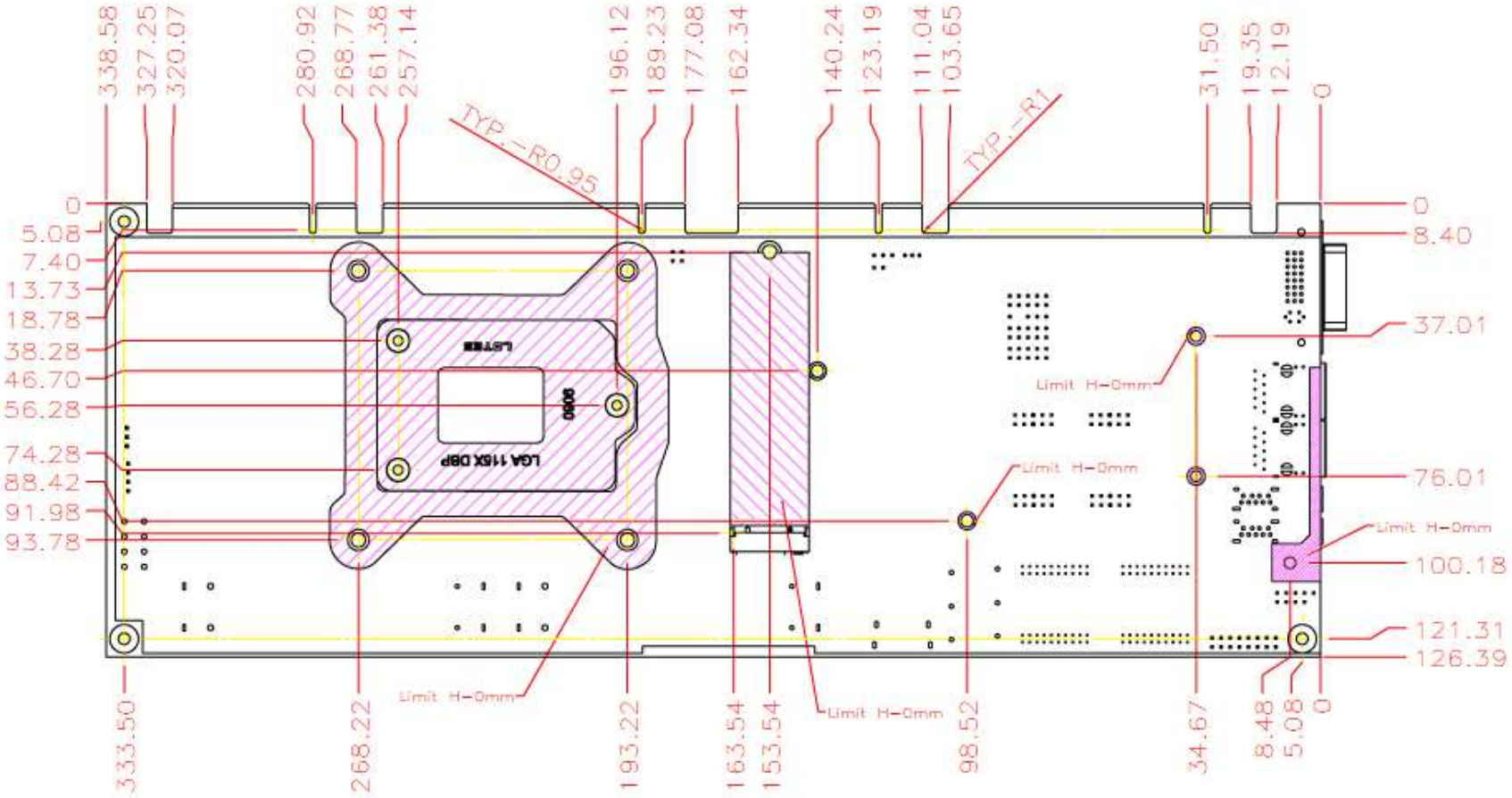
✧ Ubuntu, SuSe, Redhat Enterprise 1,2 (Kernel 4.14)

✧ Yocto 2.4 Tool-based Embedded Linux Distribution

✧ Wind River VxWorks 7

## 2.2 Mechanical Dimensions




338.58
327.25
320.07
280.92
268.77
261.38
257.14
196.12
189.23
177.08
162.34
140.24
123.19
111.04
103.65
31.50
19.35
12.19
0
TYP. -R0.95
TYP. -R1
0
5.08
7.40
13.73
18.78
38.28
46.70
56.28
74.28
88.42
91.98
93.78
0
8.40
37.01
76.01
100.18
121.31
126.39
Limit H-0mm
Limit H-0mm
Limit H-0mm
Limit H-0mm
333.50
268.22
193.22
163.54
153.54
98.52
34.67
8.48
5.08
0

## 2.3 Power Consumption

| Test Configuration | |
|---|---|
| CPU Type | Intel® Core™ i7-9700E CPU @ 2.6GHz |
| SBC BIOS | Portwell, Inc. ROBO-8114VG2AR BIOS Rev.: 0.0.6 (07092019) |
| Memory | WARIS DDR4 SO-DIMM 2400/16GB *4 |
| VGA Card | Onboard Intel® UHD Graphics 630 |
| VGA Driver | Intel® UHD Graphics 630 ,Version: 26.20.100.6888 |
| LAN Card | Onboard Intel® Ethernet Connection (7) I219LM |
| LAN Driver | Intel® Ethernet Connection (7) I219LM ,Version:12.17.10.8 |
| LAN Card | Onboard Intel® I210 Gigabit Network Connection |
| LAN Driver | Intel® I210 Gigabit Network Connection ,Version:12.12.226.0 |
| Audio Card | Onboard Realtek High Definition Audio |
| Audio Driver | Realtek High Definition Audio ,Version: 6.0.8720.1 |
| Chip Driver | Intel® Chipset Device Software ,Version: 10.1.19.1 |
| USB3.1 Driver | Intel® USB3.1 eXtensible Host Controller-1.10(Microsoft),ver:10.0.18362.1 |
| EC Version | R00.E00 (06/28/2019) |
| CDROM | Pioneer DVR-S19LBK |
| Power Supply | PULTO-D3501PJ |
| Carrier Board | PBPE-11A3 |
| USB3.0 HDD | SP Armor A30 |
| SATA SSD | PLEXTOR DRAH1T-A74658844 |

| Power consumption | | | | |
|---|---|---|---|---|
| **ATX:** | | | | |
| | *Item* | *Power ON* | *Full Loading 10Min* | *Full Loading 30Min* |
| | CPU +12V | 1.09A | 2.46A | 2.38A |
| | System +12V | 0.31A | 0.41A | 0.38A |
| | System +3.3V | 1.27A | 1.01A | 1.02A |
| | System +5V | 1.19A | 1.63A | 1.63A |
| | System+ Device +12V | 0.40A | 0.94A | 0.89A |
| | System+ Device +5V | 2.39A | 2.64A | 2.68A |

## 2.4 Environmental Specifications

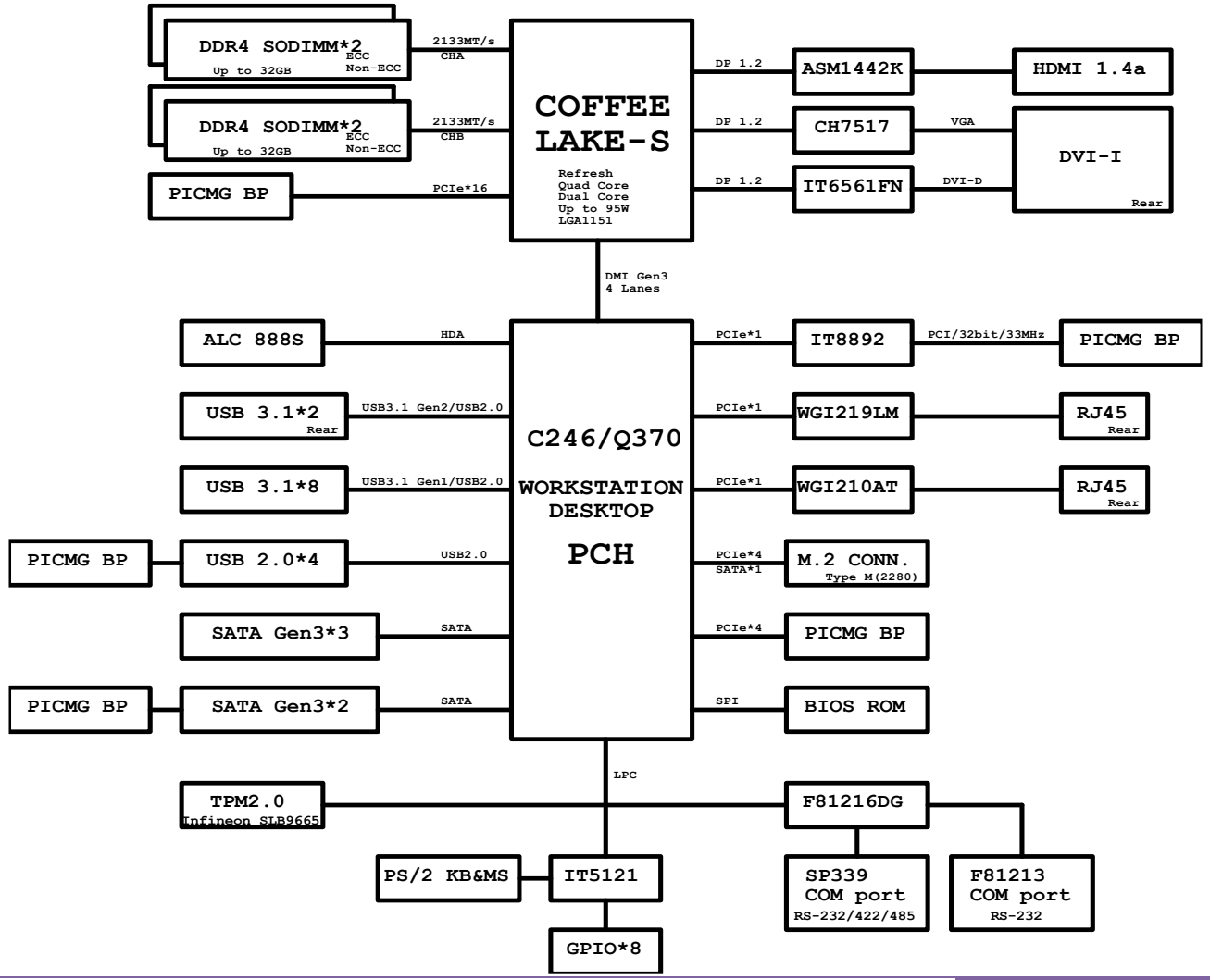
Storage Temperature : -20~80°C

Operation Temperature : 0~60°C

Storage Humidity : 5~90%

Operation Humidity: 10~90%

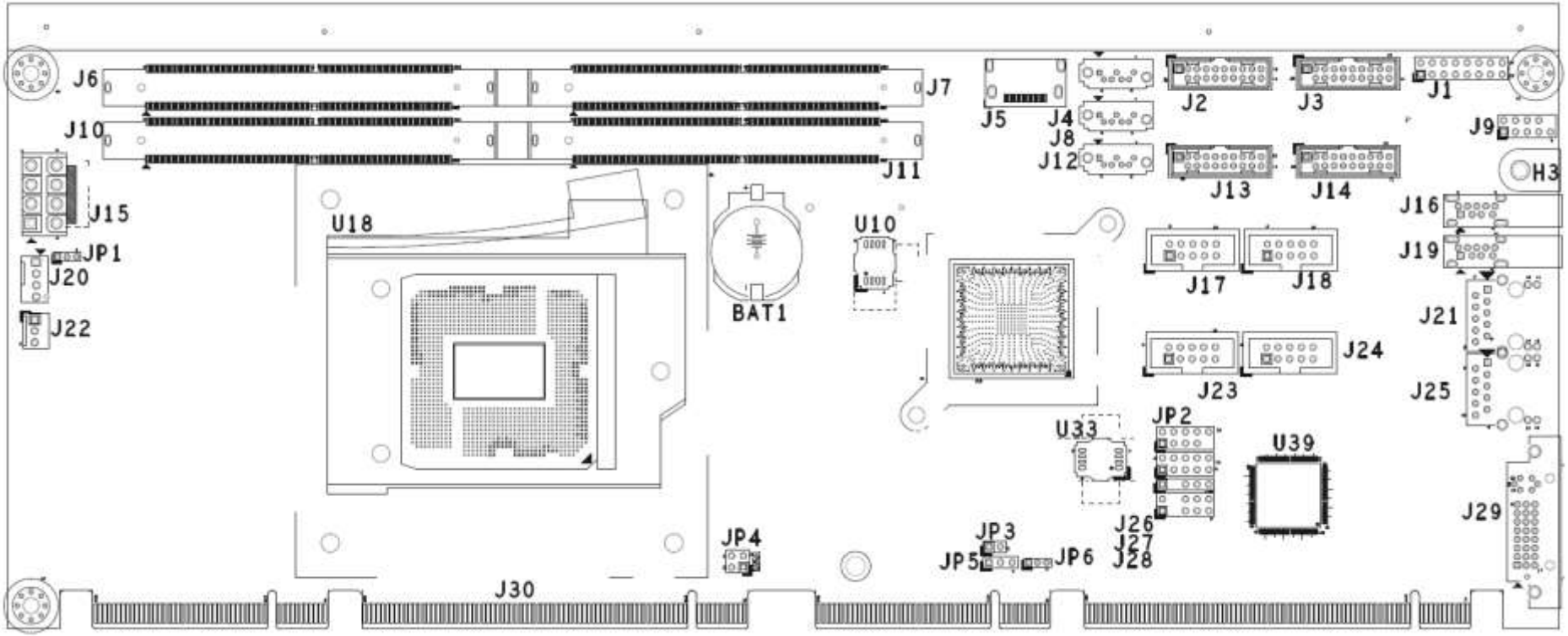
Block Diagram

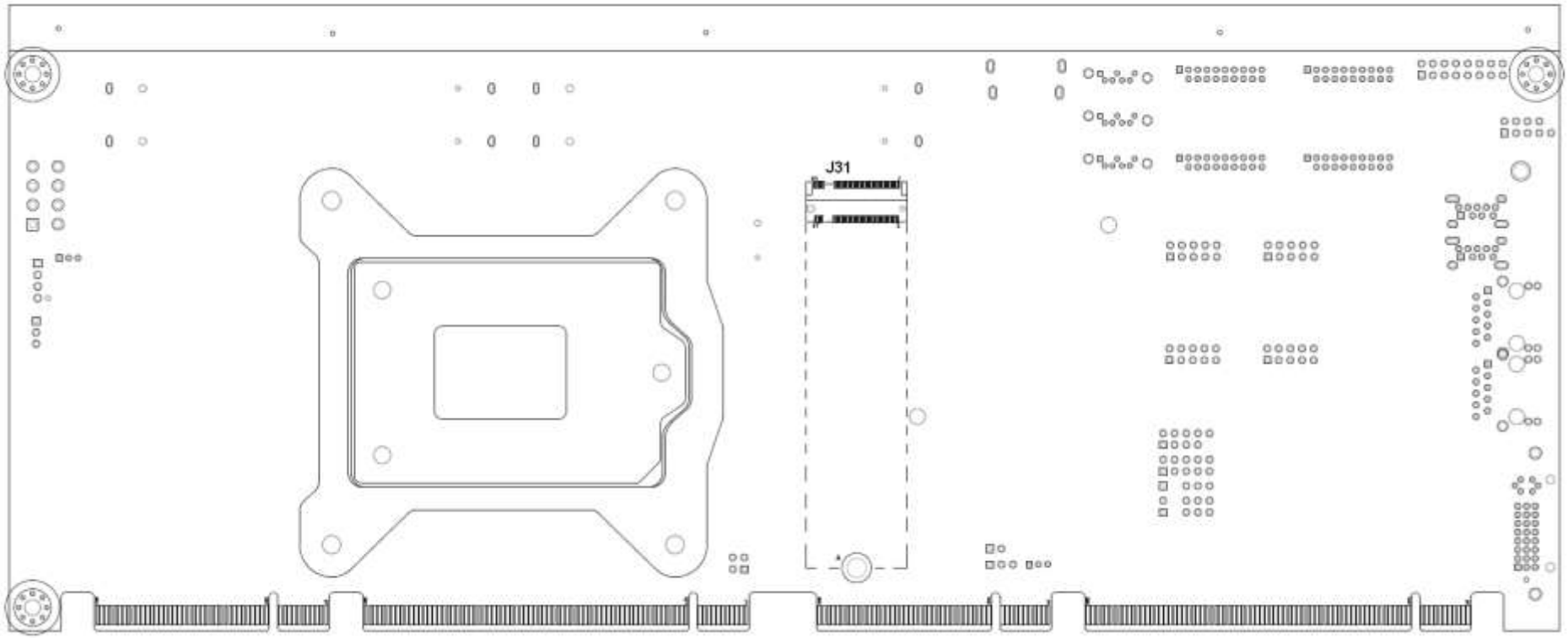


# 3 Hardware Configuration

## 3.1 Jumpers and Connectors

This chapter indicates jumpers', headers' and connectors' locations. Users may find useful information related to hardware settings in this chapter.




J31

## 3.2 Jumpers Settings

For users to customize ROBO-8114VG2AR's features. In the following sections, Short means covering a jumper cap over jumper pins; Open or N/C (Not Connected) means removing a jumper cap from jumper pins. Users can refer to Figure 1 for the Jumper allocations.

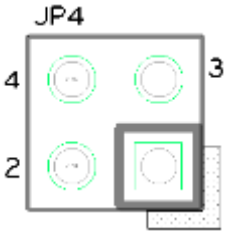
**Jumper Table**

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

**Jump Function List:**

| Jumper | Function | Remark |
|---|---|---|
| JP1 | IR35201 FW update/debug header(Reserve) | PH3Px1/2.54mm |
| JP2 | LPC 80 Port Pin Header | Header5Px2/2.54mm |
| JP3 | Auto Power Button(Reserve) | PH2Px1/2.54mm |
| JP4 | Configure PCIEx16, x8, x4 | Header2Px2/2.54mm |
| JP5 | Clear CMOS Setup | PH3Px1/2.54mm |
| JP6 | ATX/AT Select Pin | PH3Px1/2mm |

**JP4: PCI Express* Bifurcation**

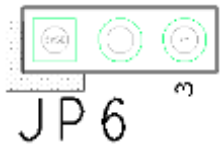



| PIN No. | Description |
|---|---|
| 1-2, Short<br>3-4, Short | 1x8 , 2x4 |
| 1-2, Open<br>3-4, Short | Reserved |
| 1-2, Short<br>3-4, Open | 2x8 |
| 1-2, Open<br>3-4, Open | 1x16 |

**JP5: Clear CMOS Setup**


| PIN No. | Description |
|---|---|
| 1-2, Short | Normal |
| 2-3, Short | Clear CMOS |

**JP6: ATX/AT Select Pin**




| PIN No. | Description |
|---|---|
| 1-2 Short | AT mode |
| 1-2 Open | ATX mode |

## 3.3 Connector Settings

Connector Allocation

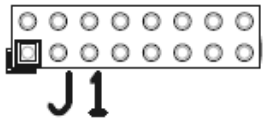
I/O peripheral devices are connected to the interface connectors

**Connector Function List**

| Connector | Function | Remark |
|---|---|---|
| J1 | Front Panel Pin Header | Header 8Px2/2.54mm |
| J2/J3/13/14 | USB2.0/3.1 connector | |
| J4/J8/J12 | SATA Connector | |
| J5 | HDMI Connector | |
| J6/J10 | DDR4 Channel A Slot | |
| J7/J11 | DDR4 Channel B Slot | |
| J9 | Audio Pin Header | Header 5Px2/2.54mm |
| J15 | ATX 8 Pin Connector(For CPU Power) | |
| J16/J19 | USB2.0/3.1(Gen2) connector(Type-A) | |
| J17 | COM1 Pin Header | |
| J18 | COM2 Pin Header | |
| J20 | CPU Fan | |
| J21 | RJ45 Connector for I210 | |

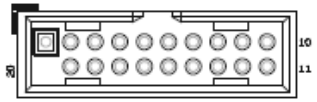
| | | |
|---|---|---|
| J22 | System Fan | |
| J23 | COM4 Pin Header | |
| J24 | COM3 Pin Header | |
| J25 | RJ45 Connector for I219 | |
| J26 | GPIO Pin Header | Header 5Px2/2.54mm |
| J27 | SM Bus Pin Header | PH5Px1/2.54mm |
| J28 | Keyboard/Mouse Connector | Header 5X2/2.54mm |
| J29 | DVI-I Connector | |
| J31 | M.2 KEY-M slot | |

**J1: Front Panel Connector**



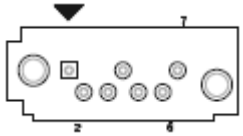

| PIN No. | Description | PIN No. | Description |
|---|---|---|---|
| 1 | PWR_LED (+) | 2 | VCC |
| 3 | PWR_LED (-) | 4 | NC |
| 5 | I219_LAN (+) | 6 | NC |
| 7 | I219_LAN (-) | 8 | BUZZER |
| 9 | I210_LAN (-) | 10 | Ground |
| 11 | I210_LAN (+) | 12 | Power Button Signal |
| 13 | HDD_LED (+) | 14 | Reset Signal |
| 15 | HDD_LED (-) | 16 | Ground |

**J2/J3/13/14: USB2.0/3.1 connector**



| PIN No. | Description | PIN No. | Description |
|---|---|---|---|
| 1 | 5VDual | | |
| 2 | USB3_RX_N | 19 | 5VDual |
| 3 | USB3_RX_P | 18 | USB3_RX_N |
| 4 | Ground | 17 | USB3_RX_P |
| 5 | USB3_TX_N | 16 | Ground |
| 6 | USB3_TX_P | 15 | USB3_TX_N |
| 7 | Ground | 14 | USB3_TX_P |
| 8 | USB2_N | 13 | Ground |
| 9 | USB2_P | 12 | USB2_N |
| 10 | Ground | 11 | USB2_P |

**J4/J8/J12：SATA Connector**

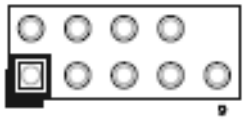


| PIN No. | DESCRIPTION |
|---|---|
| 1 | Ground |
| 2 | TX_P |
| 3 | TX_N |
| 4 | Ground |
| 5 | RX_N |
| 6 | RX_P |
| 7 | Ground |

**J5: HDMI connector**

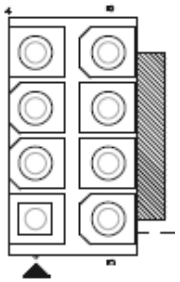
| PIN No. | Description | PIN No. | Description |
|---|---|---|---|
| 1 | HDMI_D0_P | 2 | Ground |
| 3 | HDMI_D0_N | 4 | HDMI_D1_P |
| 5 | Ground | 6 | HDMI_D1_N |
| 7 | HDMI_D2_P | 8 | Ground |
| 9 | HDMI_D2_N | 10 | HDMI_D3_P |
| 11 | Ground | 12 | HDMI_D3_N |
| 13 | N/C | 14 | N/C |
| 15 | HDMI_DDC_CLK | 16 | HDMI_DDC_DATA |
| 17 | Ground | 18 | 5V_HDMI |
| 19 | HDMI_HPD | | |

**J9: Audio Pin Header**



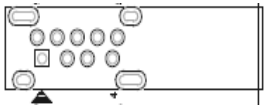
| PIN No. | Description | PIN No. | Description |
|---|---|---|---|
| 1 | MIC_IN | 2 | Ground |
| 3 | LINE_IN_L | 4 | Ground |
| 5 | LINE_IN_R | 6 | Ground |
| 7 | AUDIO_OUT_L | 8 | Ground |
| 9 | AUDIO_OUT_R | | |

**J15: ATX 8 Pin Connector(For CPU Power)**



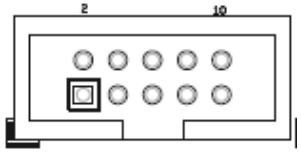
| PIN No. | Description | PIN No. | Description |
|---|---|---|---|
| 1 | Ground | 5 | +12V |
| 2 | Ground | 6 | +12V |
| 3 | Ground | 7 | +12V |
| 4 | Ground | 8 | +12V |

**J16/J19：USB2.0/USB3.1(Gen2) Connector**



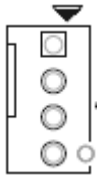
| PIN No. | DESCRIPTION |
|---|---|
| 1 | 5VDual |
| 2 | USB2_N |
| 3 | USB2_P |
| 4 | Ground |
| 5 | USB3_RX_N |
| 6 | USB3_RX_P |
| 7 | Ground |
| 8 | USB3_TX_N |
| 9 | USB3_TX_P |

### J17/J18/J23/J24: COM1/COM2/COM3/COM4 Pin Header



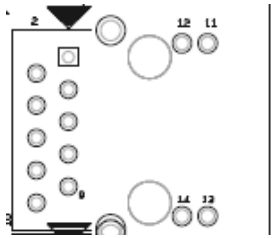

| PIN No. | Description | PIN No. | Description |
|---|---|---|---|
| 1 | DCD# | 2 | RXD# |
| 3 | TXD# | 4 | DTR# |
| 5 | Ground | 6 | DSR# |
| 7 | RTS# | 8 | CTS# |
| 9 | RI# | 10 | NC |

### J20: CPU FAN



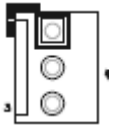
| PIN No. | Description |
|---|---|
| 1 | Ground |
| 2 | 12V |
| 3 | Fanin |
| 4 | Fanout |

**J21: RJ45 Connector for I210**



| PIN No. | Description | PIN No. | Description |
|---|---|---|---|
| 1 | MDI0_P | 2 | MDI0_N |
| 3 | MDI1_P | 4 | MDI1_N |
| 5 | LAN_CT1 | 6 | LAN_CT2 |
| 7 | MDI2_P | 8 | MDI2_N |
| 9 | MDI3_P | 10 | MDI3_N |
| 11 | LED_100 | 12 | LED _1000 |
| 13 | LED_LINK#/ACT# | 14 | ACT_LED |

**J22: System Fan**

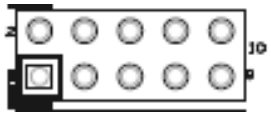


| PIN No. | Description |
|---|---|
| 1 | Ground |
| 2 | Fanout |
| 3 | Fanin |

**J25: RJ45 Connector for I219**

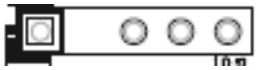
| PIN No. | Description | PIN No. | Description |
|---|---|---|---|
| 1 | MDI0_P | 2 | MDI0_N |
| 3 | MDI1_P | 4 | MDI1_N |
| 5 | LAN_CT1 | 6 | LAN_CT2 |
| 7 | MDI2_P | 8 | MDI2_N |
| 9 | MDI3_P | 10 | MDI3_N |
| 11 | LED_100 | 12 | LED _1000 |
| 13 | LED_LINK#/ACT# | 14 | ACT_LED |

**J26: GPIO Pin Header**



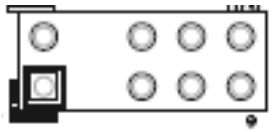
| PIN No. | Description | PIN No. | Description |
|---|---|---|---|
| 1 | GPIO_0 | 2 | GPIO_4 |
| 3 | GPIO_1 | 4 | GPIO_5 |
| 5 | GPIO_2 | 6 | GPIO_6 |
| 7 | GPIO_3 | 8 | GPIO_7 |
| 9 | Ground | 10 | VCC |

### J27: SM Bus Pin Header



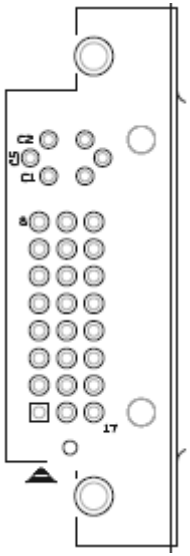
| PIN No. | Description |
|---|---|
| 1 | Clock |
| 2 | NC |
| 3 | Ground |
| 4 | Data |
| 5 | VCC |

### J28: Keyboard/Mouse Connector



| PIN No. | Signal Description | PIN No. | Signal Description |
|---|---|---|---|
| 1 | Mouse Data | 2 | Keyboard Data |
| 3 | N/C | 4 | N/C |
| 5 | Ground | 6 | Ground |
| 7 | PS2 Power | 8 | PS2 Power |
| 9 | Mouse Clock | 10 | Keyboard Clock |

**J29: DVI-I Connector**



| PIN No. | Description | PIN No. | Description |
|---|---|---|---|
| 1 | HDMI_D2_N | 16 | HDMI_HPD |
| 2 | HDMI_D2_P | 17 | HDMI_D0_N |
| 3 | Ground | 18 | HDMI_D0_P |
| 4 | N/C | 19 | Ground |
| 5 | N/C | 20 | N/C |
| 6 | DDC_CLK | 21 | N/C |
| 7 | DDC_DATA | 22 | Ground |
| 8 | VSYNC | 23 | HDMI_CLK_P |
| 9 | HDMI_D1_N | 24 | HDMI_CLK_N |
| 10 | HDMI_D1_P | C1 | RED |
| 11 | Ground | C2 | GREEN |
| 12 | N/C | C3 | BLUE |
| 13 | N/C | C4 | HSYNC |
| 14 | DVI_VCC | C5 | Ground |
| 15 | Ground | C6 | Ground |

**Note (VGA resolution limitation)**

If use the B6903351(DVI-D +VGA Y cable) to connect with DVI-D & VGA monitor simultaneously, the VGA resolution only can up to 1920x1080.And only DVI-D can be to show correct information about type of monitor & resolution.

**J31: M.2 KEY-M slot**


| PIN No. | Description | PIN No. | Description |
|---|---|---|---|
| 1 | Ground | 2 | 3.3V |
| 3 | Ground | 4 | 3.3V |
| 5 | RX3_N | 6 | N/C |
| 7 | RX3_P | 8 | N/C |
| 9 | Ground | 10 | LED# |
| 11 | TX3_N | 12 | 3.3V |
| 13 | TX3_P | 14 | 3.3V |
| 15 | Ground | 16 | 3.3V |
| 17 | RX2_N | 18 | 3.3V |
| 19 | RX2_P | 20 | N/C |
| 21 | Ground | 22 | N/C |
| 23 | TX2_N | 24 | N/C |
| 25 | TX2_P | 26 | N/C |
| 27 | Ground | 28 | N/C |
| 29 | RX1_N | 30 | N/C |
| 31 | RX1_P | 32 | N/C |
| 33 | Ground | 34 | N/C |
| 35 | TX1_N | 36 | N/C |

| | | | |
|---|---|---|---|
| 37 | TX1_P | 38 | DEVSLP |
| 39 | Ground | 40 | N/C |
| 41 | RX0_N/SATA_B+ | 42 | N/C |
| 43 | RX0_P/SATA_B- | 44 | N/C |
| 45 | Ground | 46 | N/C |
| 47 | TX0_N/SATA_A- | 48 | N/C |
| 49 | TX0_P/SATA_A+ | 50 | PERST# |
| 51 | Ground | 52 | CLKREQ# |
| 53 | CLK_N | 54 | PEWAKE# |
| 55 | CLK_P | 56 | N/C |
| 57 | Ground | 58 | N/C |
| 59 | KEY-M | 60 | KEY-M |
| 61 | KEY-M | 62 | KEY-M |
| 63 | KEY-M | 64 | KEY-M |
| 65 | KEY-M | 66 | KEY-M |
| 67 | N/C | 68 | SUSCLK |
| 69 | PEDET | 70 | 3.3V |
| 71 | Ground | 72 | 3.3V |
| 73 | Ground | 74 | 3.3V |
| 75 | Ground | | |

# 4 Signal Descriptions

## 4.1 Watch Dog Signal

```
#Define WDTCFG 0x06   // WDT Timer Coutrol Register
#Define WDTMIN 0x07    // WDT Timer Counter Register (Minute)
#Define WDTSEC 0x08   // WDT Timer Counter Register (Second)
#Define EC_IOPort 0xE300              // Default, reference to BIOS configuration


VOID    Write_EC_SRAM(UINT8 Offset,UINT8 Value){

        IoWrite8(EC_IOPort+Offset,Value);
}

Byte Read_EC_SRAM(UINT8 Offset){
        IoRead8(EC_IOPort+offset,Value);
        return Value;
}

void WDT()
{
```

```
// Enable WDT 30sec
Write_EC_SRAM(WDTSEC,30);
Write_EC_SRAM(WDTCFG,0x01);//Bit0: WDT Enable, BIT1: 0:Second Mode

// Enable WDT 5min
Write_EC_SRAM(WDTSEC,5);
Write_EC_SRAM(WDTCFG,0x03);//Bit0: WDT Enable, BIT1: 1:Minute Mode

// Enable WDT 10min, 20sec
Write_EC_SRAM(WDTSEC,20);
Write_EC_SRAM(WDTSEC,10);
Write_EC_SRAM(WDTCFG,0x03);//Bit0: WDT Enable, BIT1: 1:Minute Mode}
```

## 4.2 GPIO Signal

```
#Define GPCR 0x2B  // GPIO Coutrol Register, Bit7 = GPO3, Bit6 = GPO2, ...,
                                          //    Bit3 = GPI3, Bit2 = GPI2, ...,
                                          // 0: Output; 1: Input

#Define GPDR 0x2C  // GPIO Status Register, Bit7 = GPO3, Bit6 = GPO2, ...,
                                          //    Bit3 = GPI3, Bit2 = GPI2, ...,
                                          // 0: Low; 1: High

#Define EC_IOPort 0xE300              // Default, reference to BIOS configuration

VOID Write_EC_SRAM(UINT8 Offset,UINT8 Value){
      IoWrite8(EC_IOPort+Offset,Value);
}

Byte Read_EC_SRAM(UINT8 Offset){
      IoRead8(EC_IOPort+offset,Value);
      return Value;
}

void GPIO()
{
      int Temp;
```

```
    // Get GPI status
    Temp = Read_EC_SRAM(GPDR);                    //Bit3-0: GPI3-0 status

    // Set GPO4 Output & High
    Temp = Read_EC_SRAM(GPDR);
    Write_EC_SRAM(GPDR,Temp|0x80);                //Bit7-4: Set GPO3-0 status, 0: Low 1: High
}
```

# 5 System Resources

## 5.1 Intel® Coffee lake-S PCH

Intel® Q370 Chipset
Intel® C246 Chipset

## 5.2 Main Memory

ROBO-8114VG2AR provides 4 x 260-pin SO-DIMM sockets which supports DDR4 ECC/non-ECC memory. The maximum memory can be up to 128GB. Memory clock and related settings can be detected by BIOS via SPD interface.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install memory module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

## 5.3 Installing the Single Board Computer

To install your ROBO-8114VG2AR into standard chassis or proprietary environment, please perform the following:
Step 1 : Check all jumpers setting on proper position
Step 2 : Install and configure CPU,CPU cooling and memory module on right position
Step 3 : Place ROBO-8114VG2AR into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

**WARNING**

Please ensure that mother board is properly inserted and fixed by mechanism.

**Note:**

Please refer to section 6.3.1 to 6.3.4 to install INF/Graphic/LAN

### 5.3.1 Chipset Component Driver

ROBO-8114VG2AR is based on Intel® Q370/C246 chipset and desktop/workstation processors including Xeon E3-12XX /Core™ i7 / i5 / i3 sku . It's a new chipset that some old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 8, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in ROBO-8114VG2AR CD-title

### 5.3.2 Intel® HD Graphics 630

ROBO-8114VG2AR has integrated Intel® HD Graphics 630 which supports DirectX 12、OpenCL 2.0、OpenGL 4.5. It is the most advanced design to gain an outstanding graphic performance. ROBO-8114VG2AR supports VGA+DVI-D by DVI-I connector on bracket, and on board HDMI display output. This combination makes ROBO-8114VG2AR an excellent performance hardware.

**Drivers Support**

Please find the Graphic driver in the ROBO-8114VG2AR CD-title. The driver supports Windows 8.

### 5.3.3 Intel LAN I210AT/I219LM Gigabit Ethernet Controller

- Intel I210AT Gigabit Ethernet controller and 1x RJ45 connectors on bracket
- Intel I219LM Gigabit Ethernet controller and 1x RJ45 connectors on bracket

**Drivers Support**

Please find Intel I210AT/I219LM LAN driver in /Ethernet directory of ROBO-8114VG2AR CD-title. The driver supports Windows 10.

PCI Express Base Specification, Revision 2.0 https://www.pcisig.com/specifications

# 6 System Resources

## 6.1 Intel® Coffee Lake -S PCH

Intel® Q370 Chipset (Intel® GL82Q370 PCH)

## 6.2 Main Memory

ROBO-8114-Q370 provides 4xDDR4 So-DIMM sockets. The maximum memory can be up to 64GB. Memory clock and related settings can be detected by BIOS via SPD interface.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install memory module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

## 6.3 Installing the Single Board Computer

To install your ROBO-8114 into standard chassis or proprietary environment, please perform the following:
Step 1 : Check all jumpers setting on proper position
Step 2 : Install and configure CPU,CPU cooling and memory module on right position
Step 3 : Place ROBO-8114-Q370 into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

**WARNING**

Please ensure that mother board is properly inserted and fixed by mechanism.

**Note:**

Please refer to section 6.3.1 to 6.3.4 to install INF/Graphic/LAN

### 6.3.1 Chipset Component Driver

RUBY-D811-Q370 is based on Intel® Q370 chipset and desktop processors including Core™ i7 / i5 / i3 sku . It's a new chipset that some old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 8, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in ROBO-8114 CD-title

### 6.3.2 Intel® UHD Graphics 630

ROBO-8114 has integrated Intel® UHD Graphics 630 which supports DirectX 12、OpenGL 4.4. It is the most advanced design to gain an outstanding graphic performance. ROBO-8114 supports VGA, DVI, HDMI display output. This combination makes ROBO-8114-Q370 an excellent performance hardware.

**Drivers Support**

Please find the Graphic driver in the ROBO-8114 CD-title. The driver supports Windows 10.

### 6.3.3 Intel LAN I210AT/I219LM Gigabit Ethernet Controller

- Intel I210AT Gigabit Ethernet controller and 1x RJ45 connectors on rear I/O
- Intel I219LM Gigabit Ethernet controller and 1x RJ45 connectors on rear I/O

**Drivers Support**

Please find Intel I210AT/I219LM LAN driver in /Ethernet directory of ROBO-8114-Q370 CD-title. The driver supports Windows 8.

# 7 BIOS Setup Items

## 7.1 Introduction

The following section describes the BIOS setup program. The BIOS setup program can be used to view and change the BIOS settings for the module. Only experienced users should change the default BIOS settings.

## 7.2 BIOS Setup

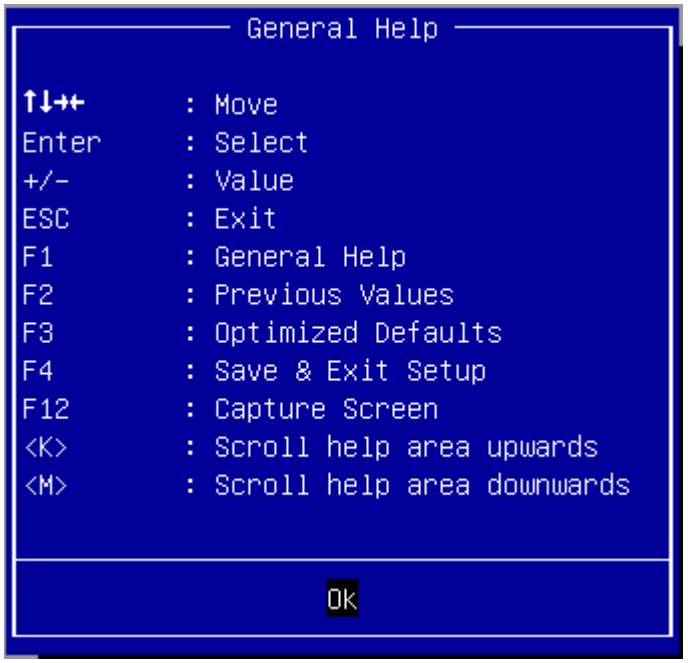
Power on the computer and the system will start POST (Power on Self Test) process. When the message below appears on the screen, press <Delete> or <ESC> key will enter BIOS setup screen.

**Press <ESC > or <Delete> to enter SETUP**

If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

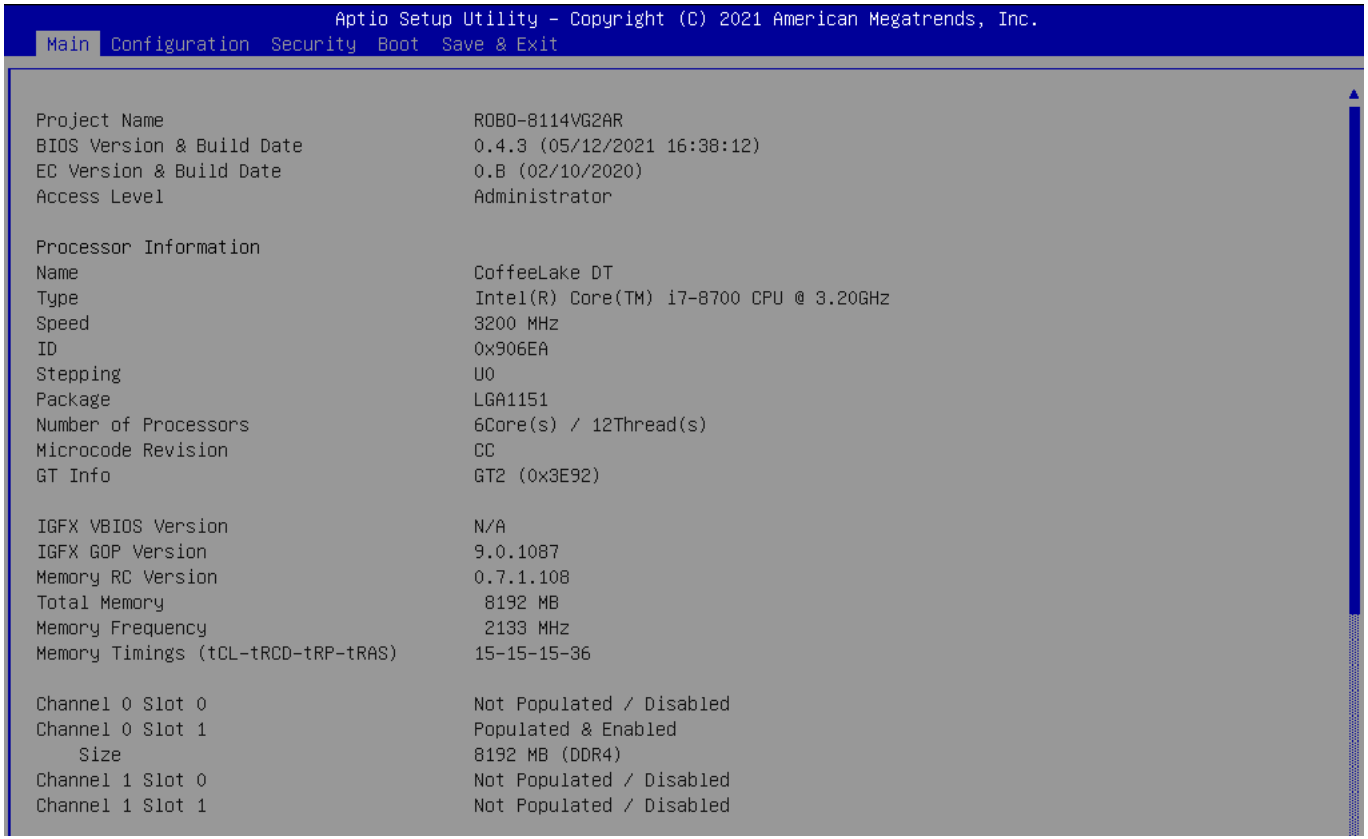
**Press <F1> to Run General Help or Resume**

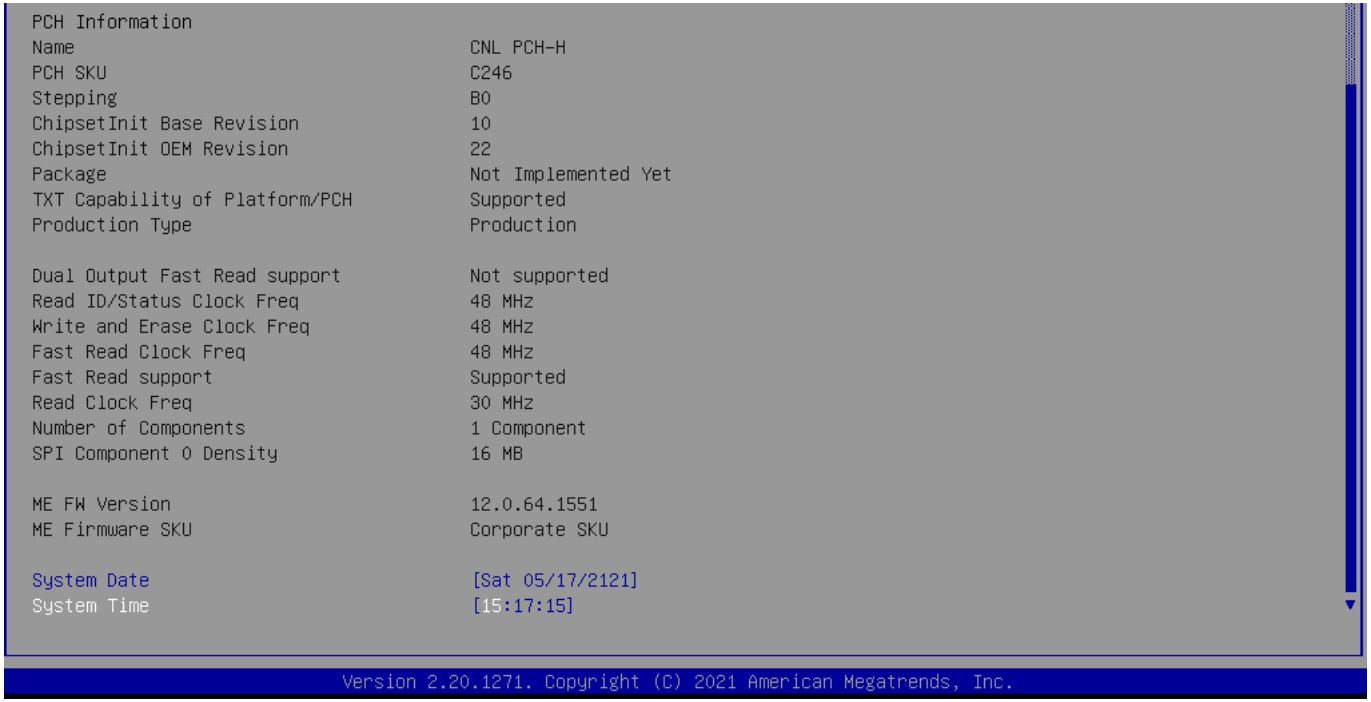
The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help Screen.



### 7.2.1 Main

Use this menu for basic system configurations, such as time, date etc.

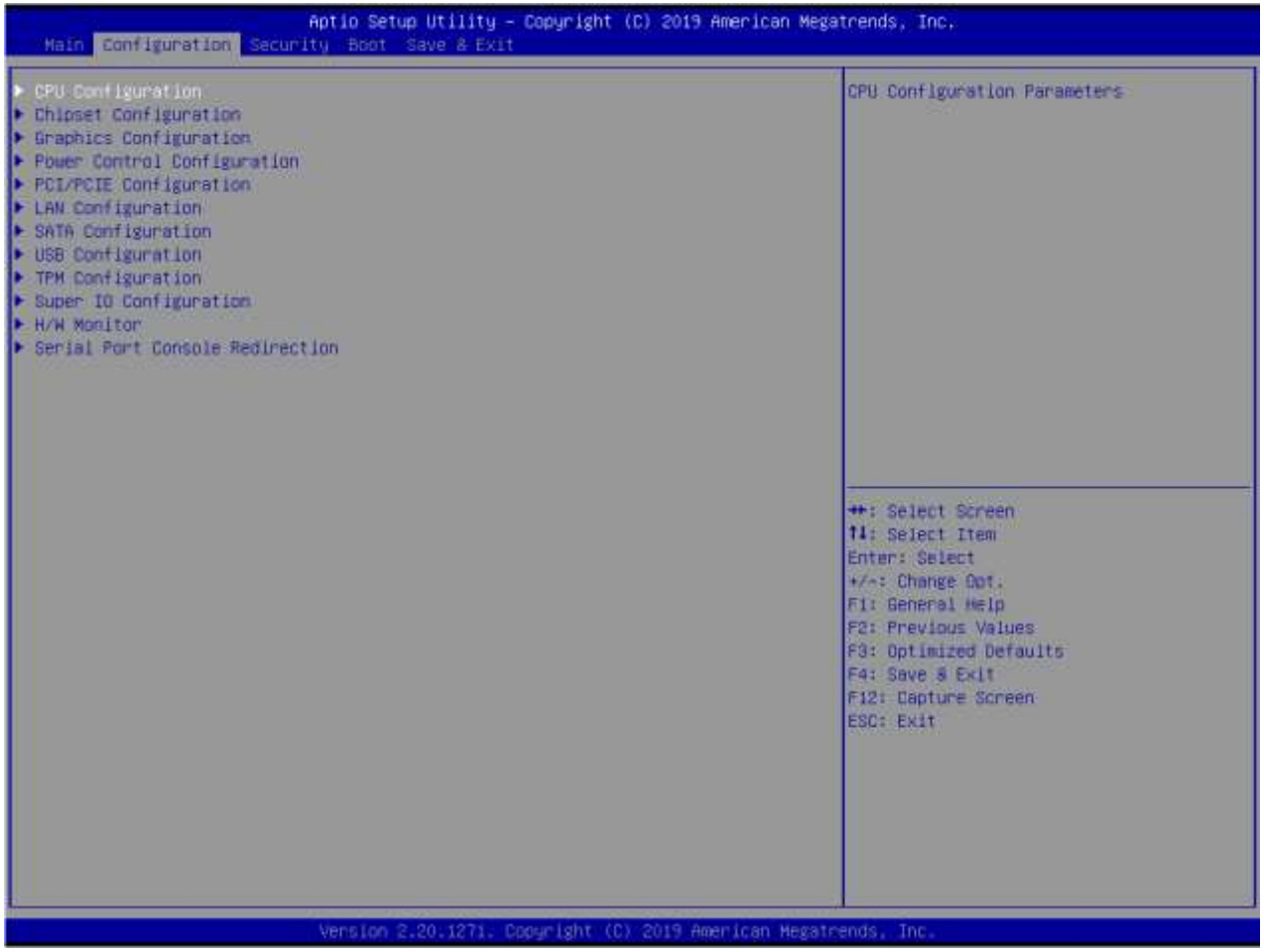





| Feature | Description | Options |
|---|---|---|
| **System Date** | The date format is <Day>, <Month> <Date> <Year>. Use [+] or [—] to configure system Date. | |
| **System Time** | The time format is <Hour> <Minute> <Second>. Use [+] or [—] to configure system Time. | |

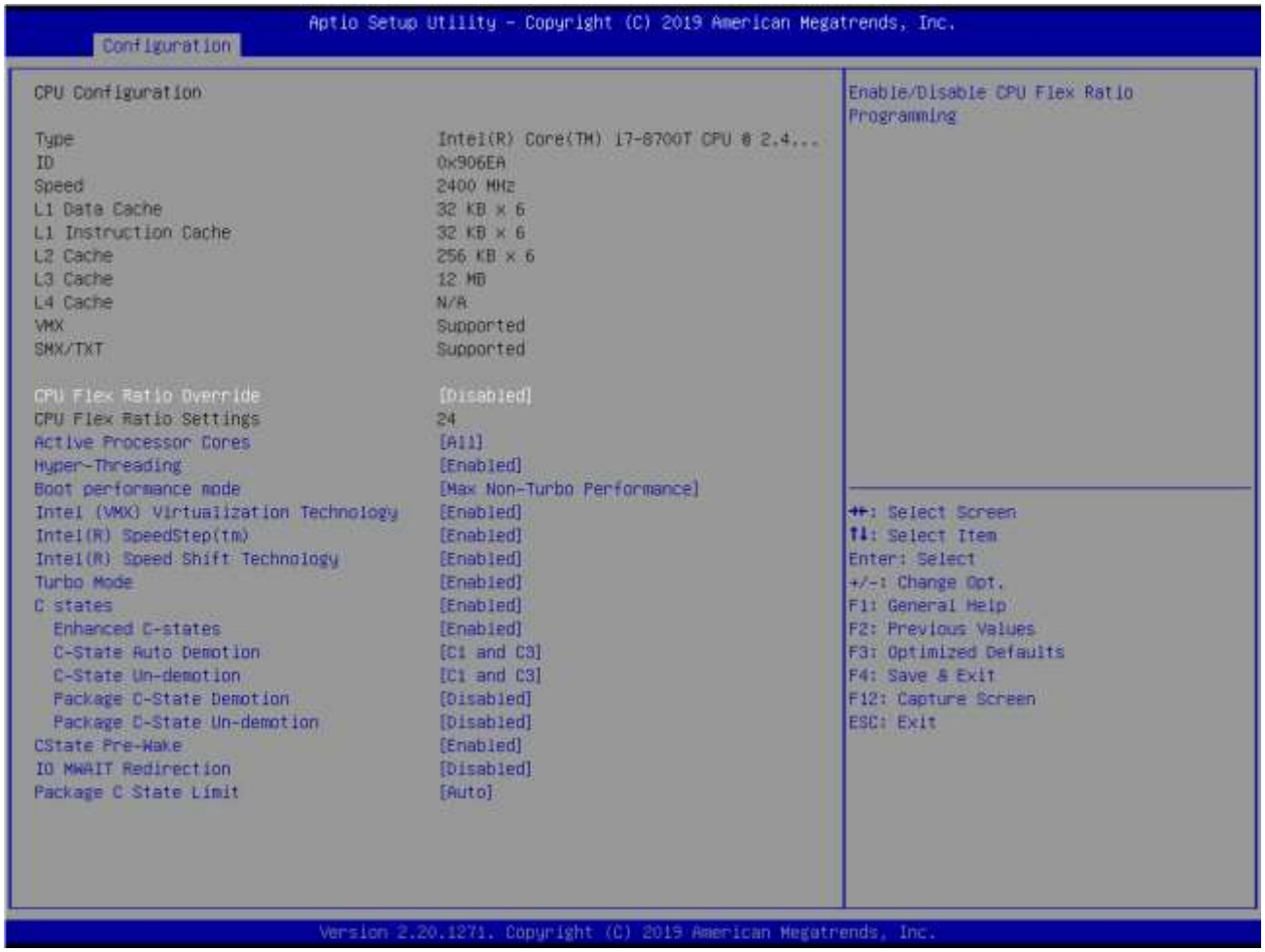
### 7.2.2 Configuration

Use this menu to set up the items of special enhanced features



**CPU Configuration**

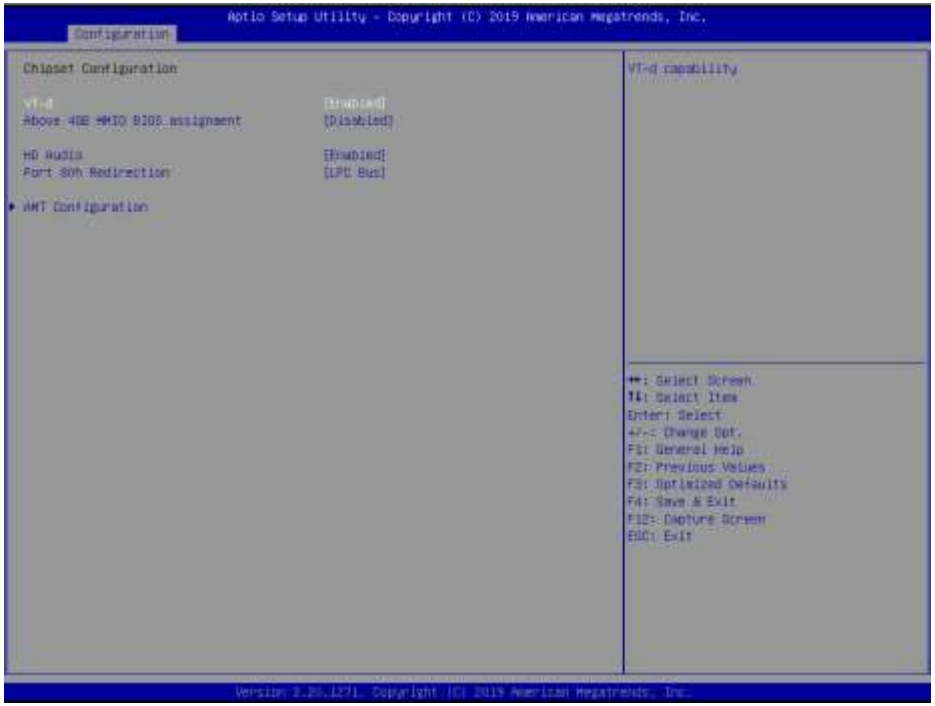
CPU Configuration Parameters



| Feature | Description | Options |
|---|---|---|
| **CPU Flex Ratio Override** | Enable/Disable CPU Flex Ratio Programming | ★Disabled, Enabled |
| **Active Processor Cores** | Number of cores to enable in each processor package. | ★All, 1, 2, 3,4,5 |
| **Hyper-Threading** | Enable or Disable Hyper-Threading Technology | Disabled,★Enabled |
| **Boot performance mode** | Select the performance state that the BIOS will set starting from reset vector | Max Battery<br>★Max Non-Turbo Performance<br>Turbo Performance |
| **Intel (VMX) Virtualization Technology** | When enabled, a VMM can utilize the additional hardware capabilities provided by Vander pool Technology. | Disabled,★Enabled |
| **Intel® Speed Step™** | Allows more than two frequency ranges to be supported. | Disabled,★Enabled |
| **Intel® Speed Shift Technology** | Enable/Disable Intel® Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states | Disabled,★Enabled |
| **Turbo Mode** | Enable/Disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled) | Disabled,★Enabled |
| **C states** | Enable/disable CPU Power Management. Allows CPU to go to C states It's not 100% utilized | Disabled,★Enabled |
| **Enhanced C-states** | Enable/Disable C1E.When enabled, CPU will switch to minimum speed when all cores enter C-state | Disabled,★Enabled |
| **C-State Auto Demotion** | Configure C-State Auto Demotion | Disable, C1 ,C3 ★C1 and C3 |
| **C-State Un-demotion** | Configure C-State Un-demotion | Disable, C1 ,C3 ★C1 and C3 |
| **Package C State Demotion** | Package C-State Demotion | ★Disabled, Enabled |
| **Package C State Un-demotion** | Package C-State Un-demotion | ★Disabled, Enabled |
| **CState Pre-Wake** | Disable – Sets bit 30 of POWER_CTL MSR(0x1FC) to 1 to disable the Cstate Pre-Wake | Disabled,★Enabled |
| **IO MWAIT Redirection** | When set, will map IO_read instructions sent to IO registers PMG_IO_BASE_ADDRBASE+offset to MWAIT(offset) | Disabled,★Enabled |
| **Package C State Limit** | Maximum Package C State Limit Setting. Cpu Default: Leaves to Factory default value. Auto: Initializes to deepest available Package C States Limit | C0/C1,C2,C3,C6,C7,C7S,C8,C9,C10,Cpu Default,★Auto |

## Chipset Configuration

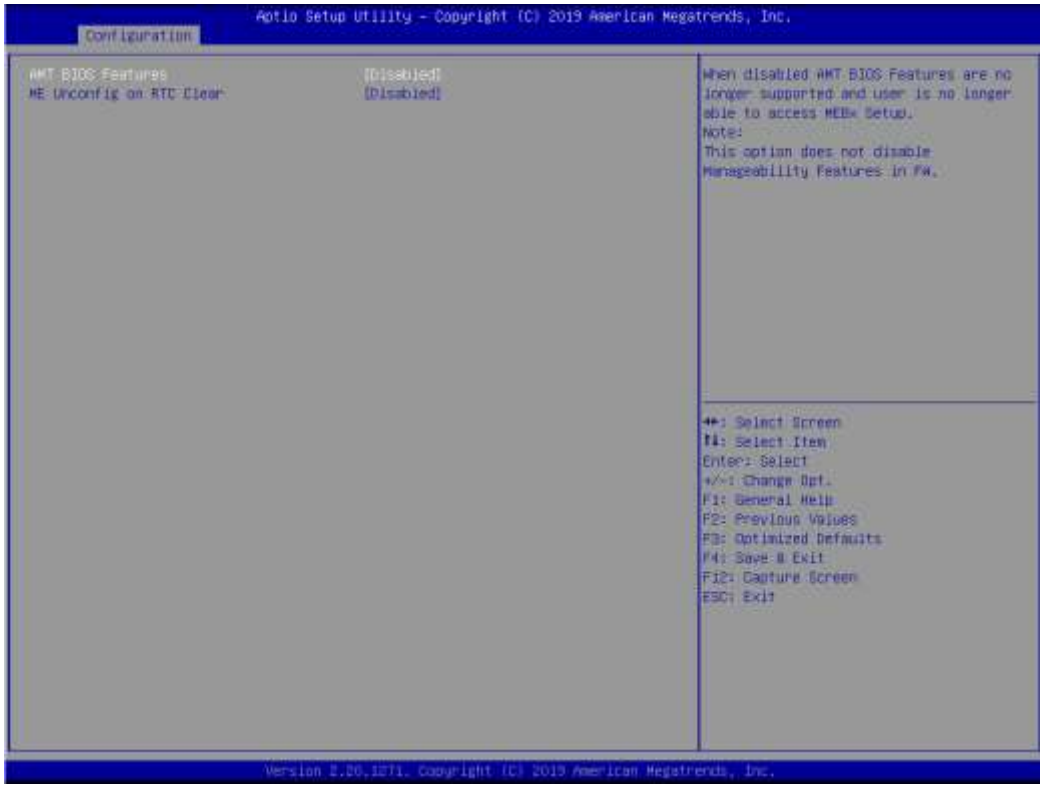
Configuration Chipset feature




| Feature | Description | Options |
|---|---|---|
| **VT-d** | VT-d Capability | Disabled, ★ Enabled |
| **Above 4GB MMIO BIOS assignment** | Enable/Disable above 4GB MemoryMappedIO BIOS assignment<br>This is enabled automatically when Aperture Size is set to 2048MB | ★Disabled, Enabled |
| **HD Audio** | Control Detection of the HD-Audio device | Disabled, ★ Enabled |
| **Port 80h Redirection** | Control where the Port 80h cycles are sent | ★ LPC Bus, PCIE Bus |

## AMT Configuration

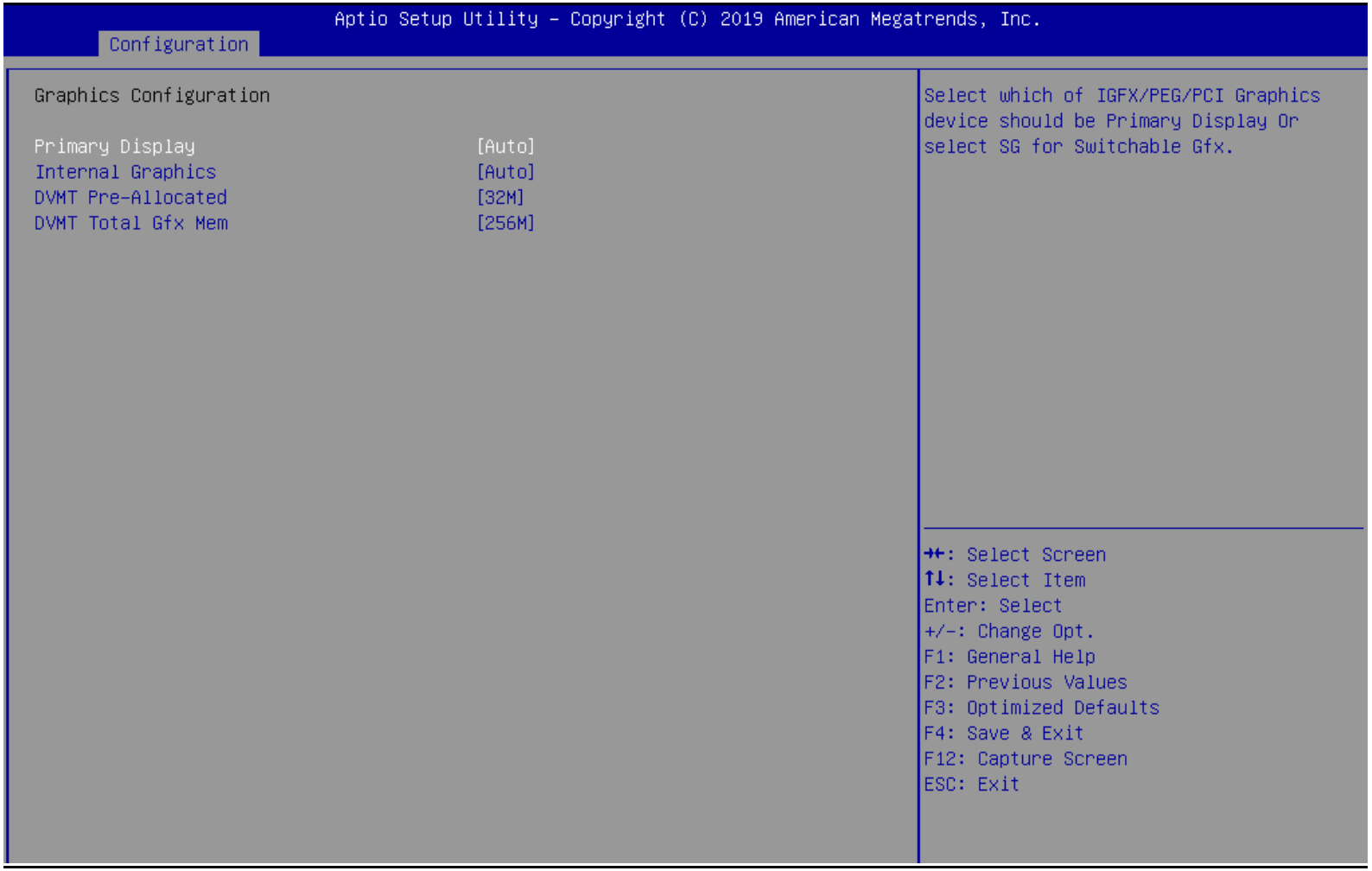
Configure Intel® Active Management Technology Parameters




| Feature | Description | Options |
|---|---|---|
| **AMT BIOS Features** | 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 | ★Disabled, Enabled |
| **ME Unconfig on RTC Clear** | When Disable ME will not be unconfigured on RTC Clear | ★Disabled, Enabled |

**Graphics Configuration**

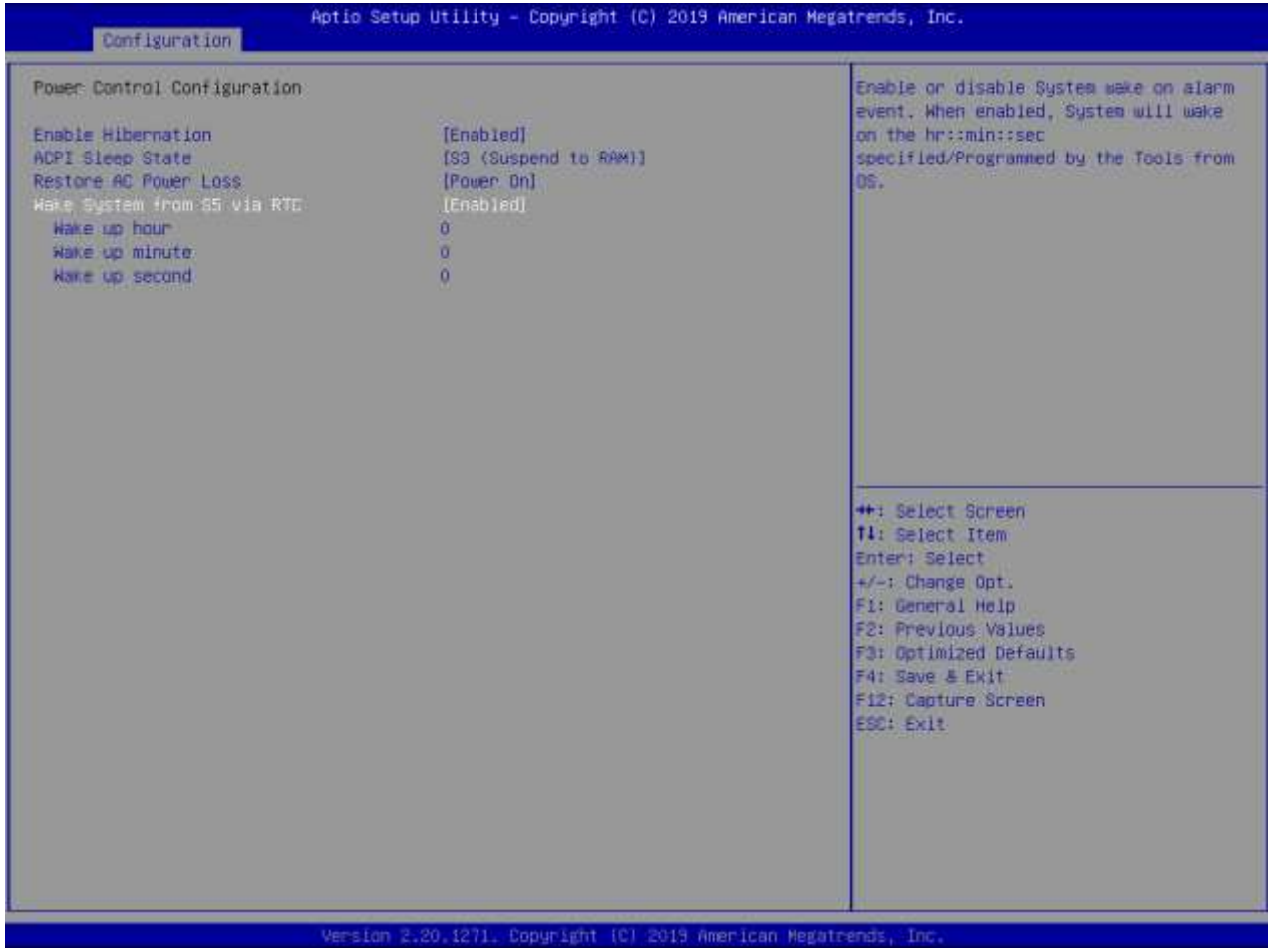
Configuration Graphics Settings



| Feature | Description | Options |
|---|---|---|
| **Primary Display** | Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx. | ★Auto, IGFX, PEG, PCIE |
| **Internal Graphics** | Keep IGFX enable based on the setup options. | ★Auto, Disable, Enable |
| **DVMT Pre-Allocated** | Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device. | ★32M,64M,96M,128M, 160M,192M,224M,256M, 288M,320M,352M,384M, 416M,448M,480M,512M, 1024M,1536M,2048M, 4M, 8M,12M,16M,20M,24M, 28M,32M,/F7,36M,40M,44M, 48M,52M,56M,60M |
| **DVMT Total Gfx Mem** | Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device | ★256M, 128M, MAX |

## Power Control Configuration

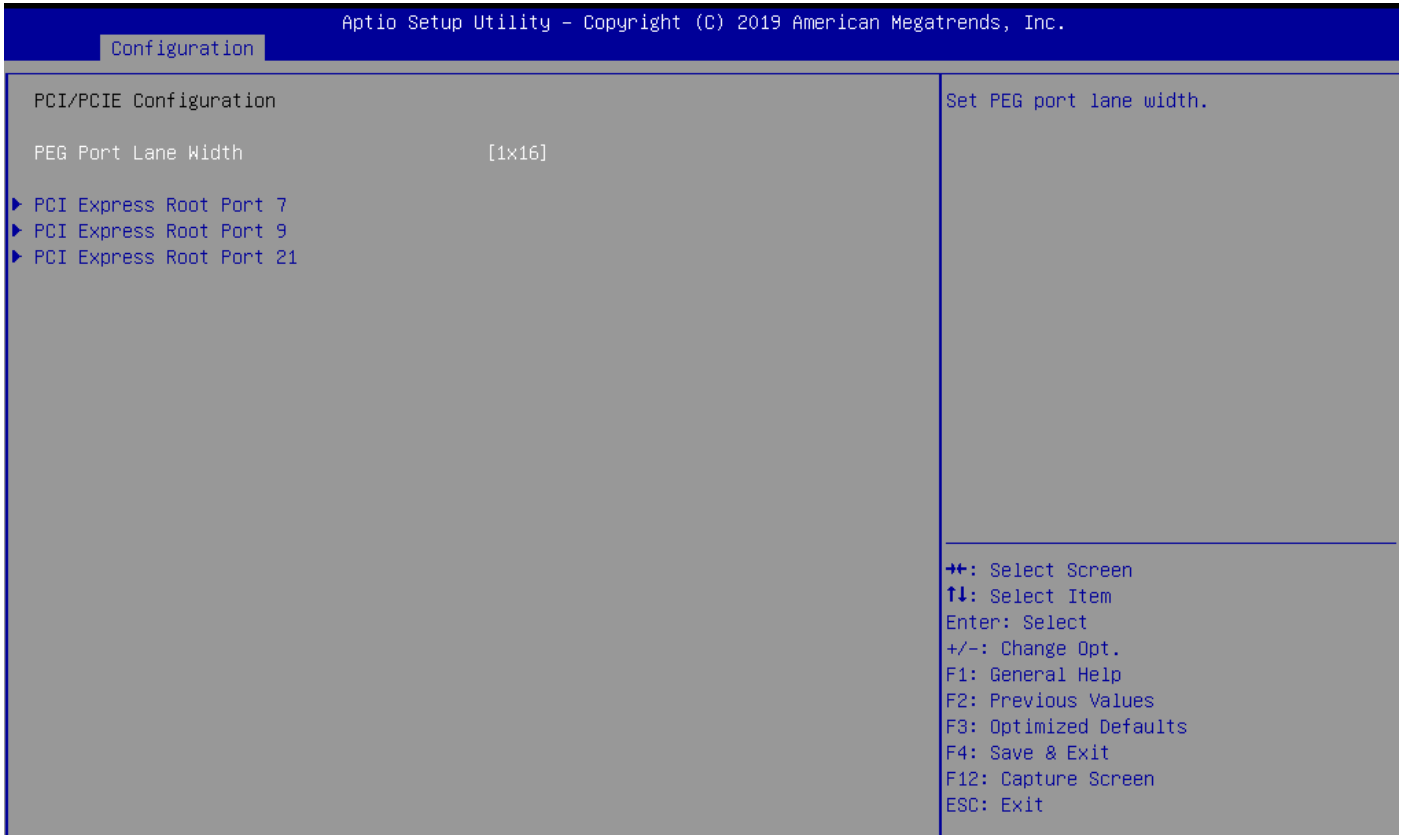
System Power Control Configuration Parameters



| Feature | Description | Options |
|---|---|---|
| **Enable Hibernation** | Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS. | ★Enabled , Disabled |
| **ACPI Sleep State** | Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed. | ★S3 (Suspend to RAM), Suspend Disabled |
| **Restore AC Power Loss** | Specify what state to go to when power is re-applied after a power failure (G3 state) | Power Off ,<br>★Power On |
| **Wake System from S5 via RTC** | Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec<br>Specified/programmed by the Tools from OS | ★Disabled, Enabled |

## PCI/PCIE Configuration

PCI, PCI-X and PCI Express Settings



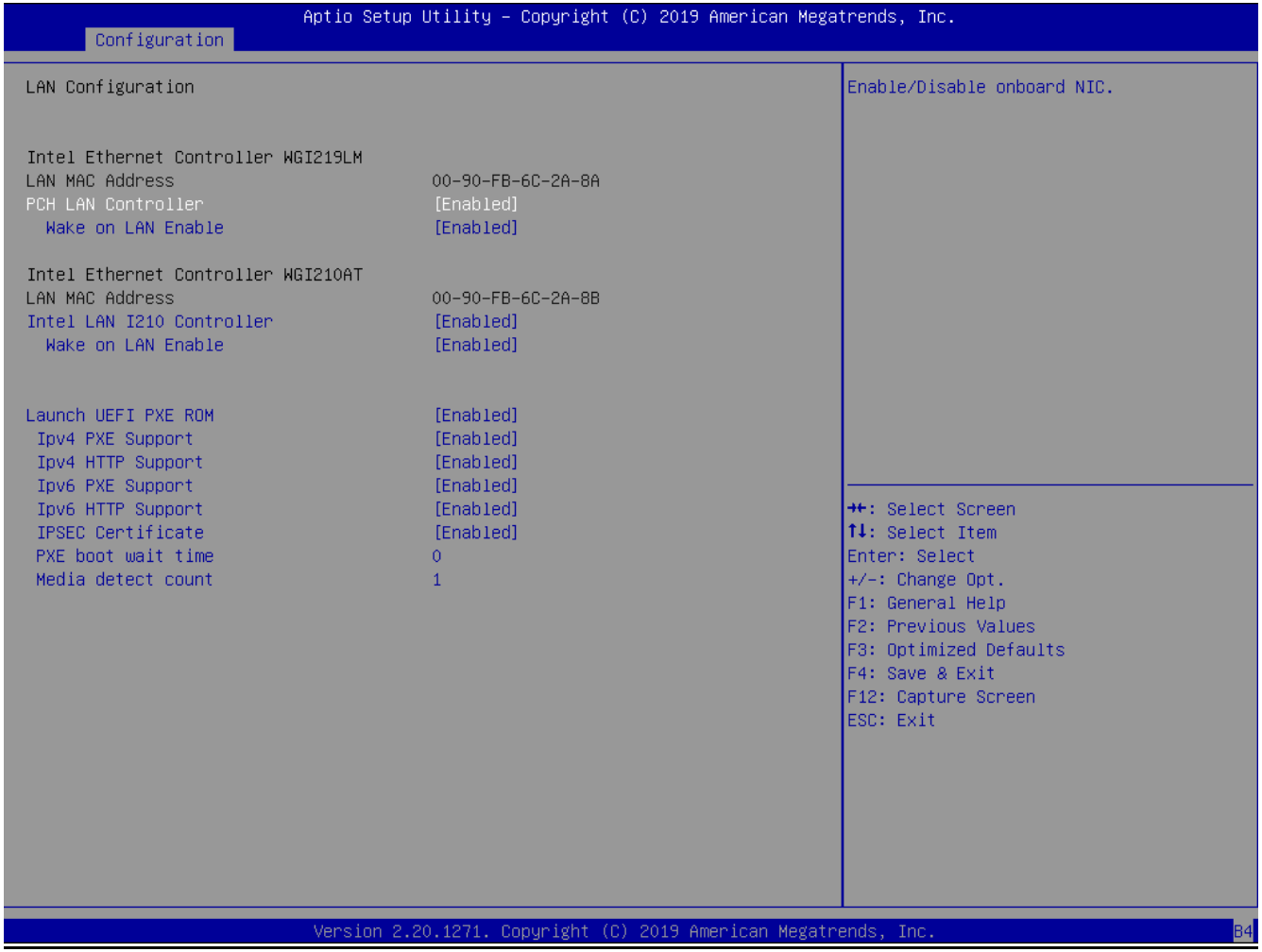

| Feature | Description | Options |
|---|---|---|
| **PEG Port Lane Width** | Set PEG port Lane width | ★1x16, 2x8,1x8. 2x4 |

**PCI Express Root Port7, Port9,Port21**


| Feature | Description | Options |
|---|---|---|
| **PCI Express Root Port 7/9/21** | Control the PCI Express Root Port. | ★Enabled , Disabled |
| **ASPM 7/9/21** | Set the ASPM Level:<br>Force L0s – Force all links to L0s State<br>AUTO-BIOS auto configure<br>DISABLE – Disables ASPM | ★Disabled, L0s, L1, L0sL1, Auto |
| **PCIe Speed** | Select PCI Express port speed | ★Auto, Gen1, Gen2, Gen3 |

## LAN Configuration

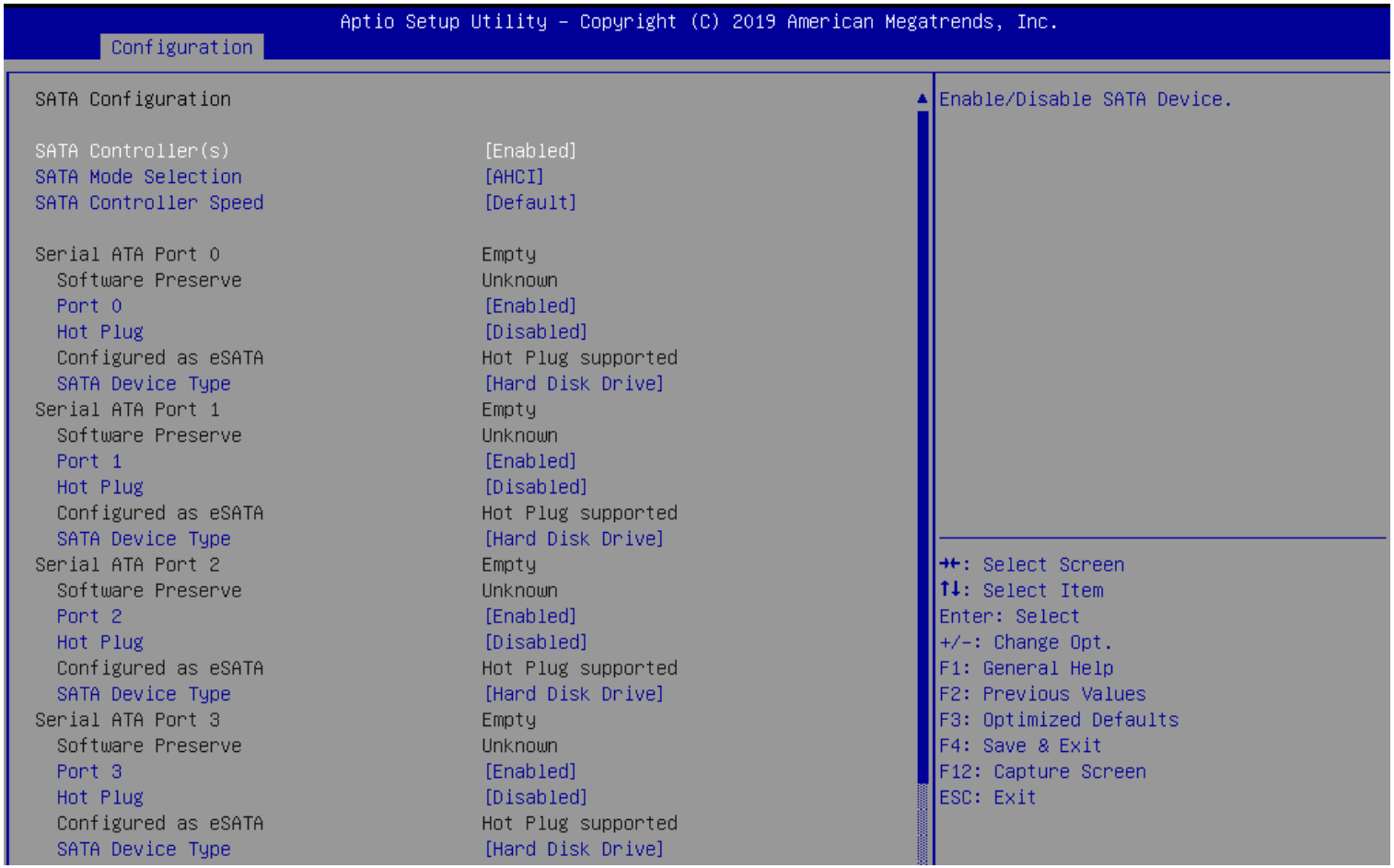
Configuration on Board LAN device.

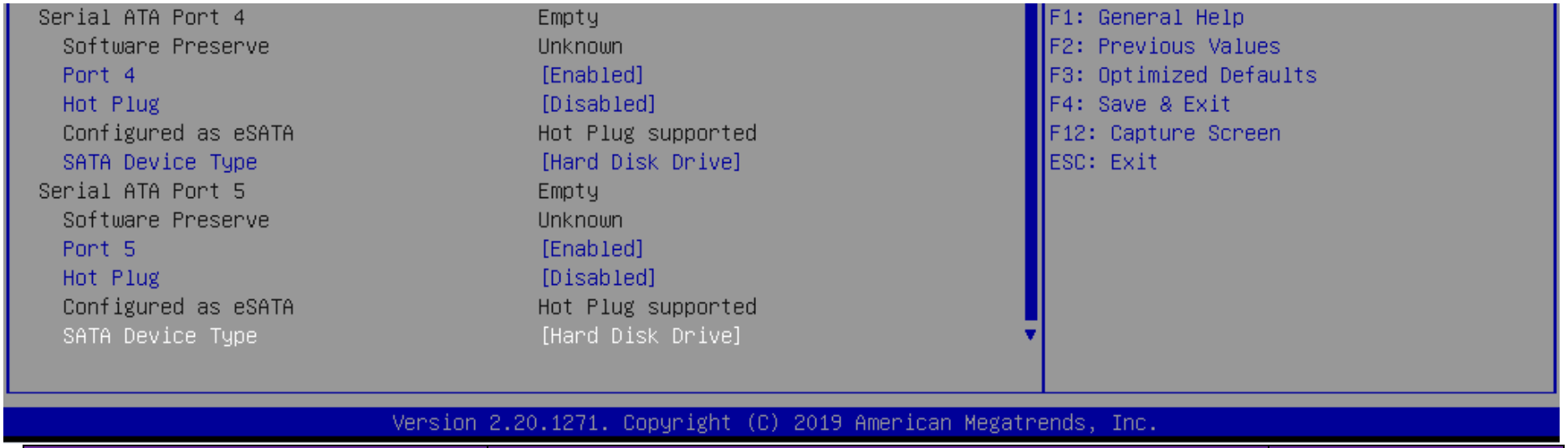


| Feature | Description | Options |
|---|---|---|
| **PCH LAN Controller** | Enable or disable onboard NIC | ★Enabled , Disabled |
| **Wake on LAN** | Enable or disable integrated LAN to wake the system. | ★Enabled , Disabled |
| **Intel I210 LAN Controller** | Intel I210 LAN Controller. | Disabled, ★Enabled |
| **Wake on LAN** | Enable or disable integrated LAN to wake the system. | ★Enabled , Disabled |
| **Launch UEFI PXE Rom** | Enable/Disable UEFI Network Stack | ★Disabled, Enabled |
| **Ipv4 PXE Support** | If disable, IPv4 PXE boot support will not be available. | Disabled, ★Enabled |
| **Ipv4 HTTP Support** | If disable, IPv4 HTTP boot support will not be available. | Disabled, ★Enabled |
| **Ipv6 PXE Support** | If disable, IPv6 PXE boot support will not be available. | Disabled, ★Enabled |
| **Ipv6 HTTP Support** | If disable, IPv6 HTTP boot support will not be available. | Disabled, ★Enabled |
| **IPSEC Certificate** | Support to Enable/Disable IPSEC certificate for Ikev | Disabled, ★Enabled |
| **PXE boot wait time** | Wait time in seconds to press ESC key to abort the PXE boot | ★0 |
| **Media detect count** | Number of times the presence of media will be checked | ★1 |

**SATA Configuration**

SATA Device Options Settings

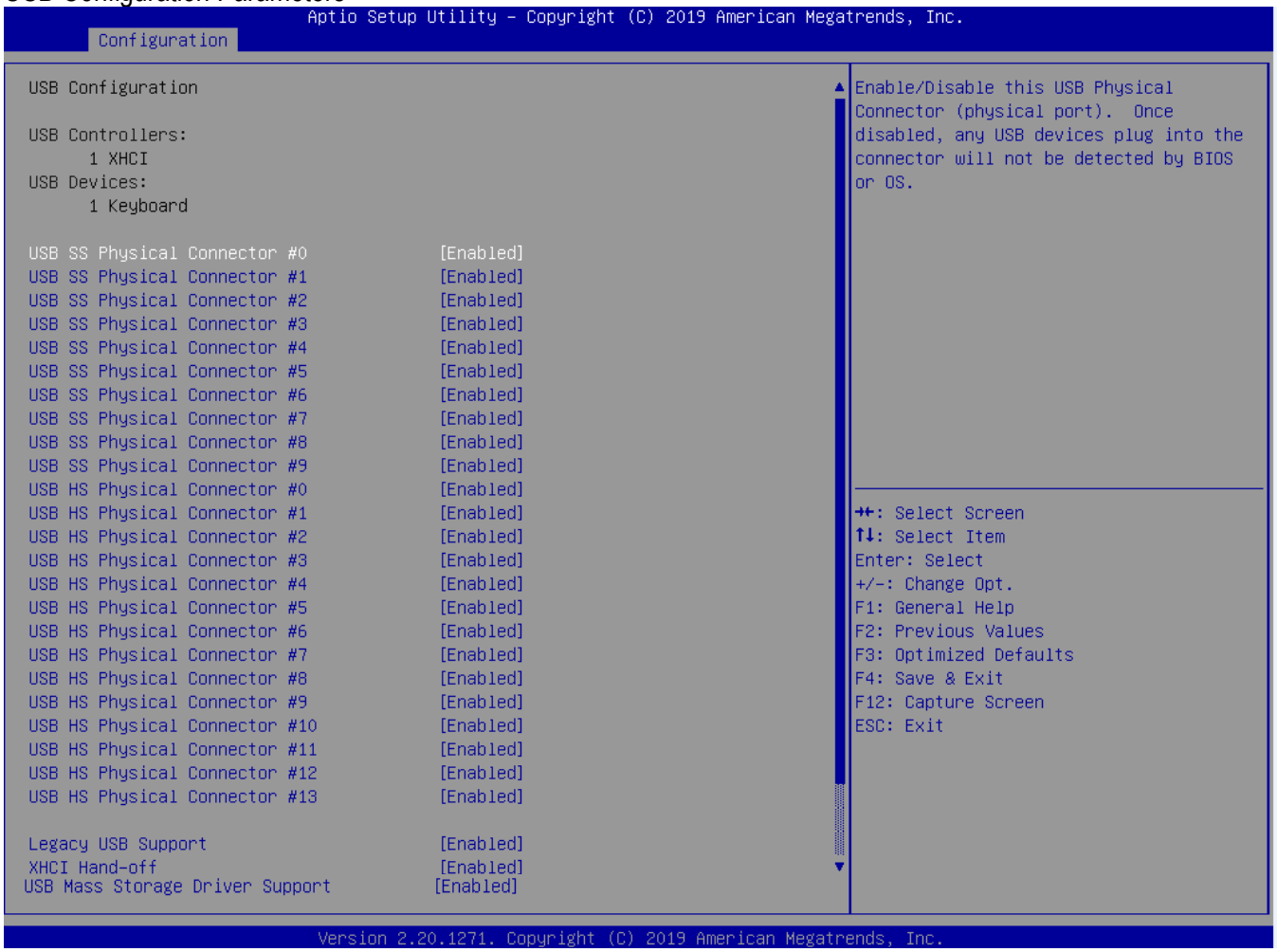





| Feature | Description | Options |
|---|---|---|
| **SATA Controller(s)** | Enable/disable the SATA controllers. | ★Enabled , Disabled |
| **SATA Mode Selection** | Determines how SATA controller(s) operate. | ★AHCI, RAID |
| **SATA Controller Speed** | Indicates the maximum speed the SATA controller can support | ★Default,Gen1,Gen2,Gen3 |
| **Serial ATA Port 0~5** | | |
| **Port 0~5** | Enable or Disable SATA Port | Disabled, ★ Enabled |
| **Hot Plug** | Designates this port as Hot Pluggable | ★Disabled, Enabled |
| **SATA Device Type** | Identify the SATA port is connected to Solid State Drive or Hard Disk Drive | ★Hard Disk Drive,<br>Solid State Drive |

## USB Configuration

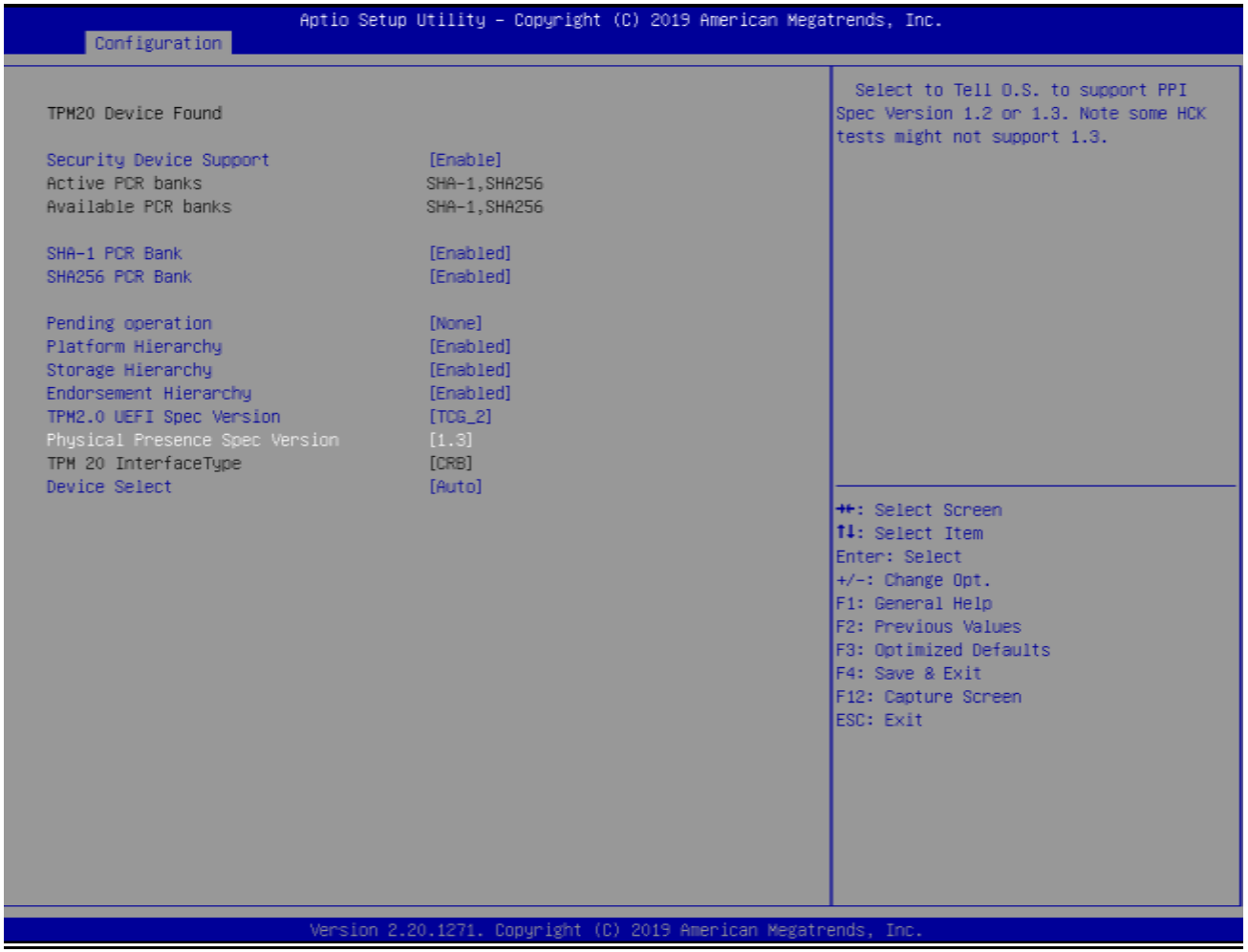
USB Configuration Parameters



| Feature | Description | Options |
|---|---|---|
| **USB SS Physical Connector #0~13** | Enable/Disable this USB Physical Connector. Once disable, any USB devices plug into the connector will not be detected by BIOS or OS | Disabled, ★Enabled |
| **Legacy USB Support** | Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI application | ★Enabled , Disabled, Auto |
| **XHCI Hand-off** | This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver | ★Enabled , Disabled |
| **USB Mass Storage Driver Support** | Enable/Disable USB Mass Storage Driver Support | ★Enabled , Disabled |

## TPM Configuration

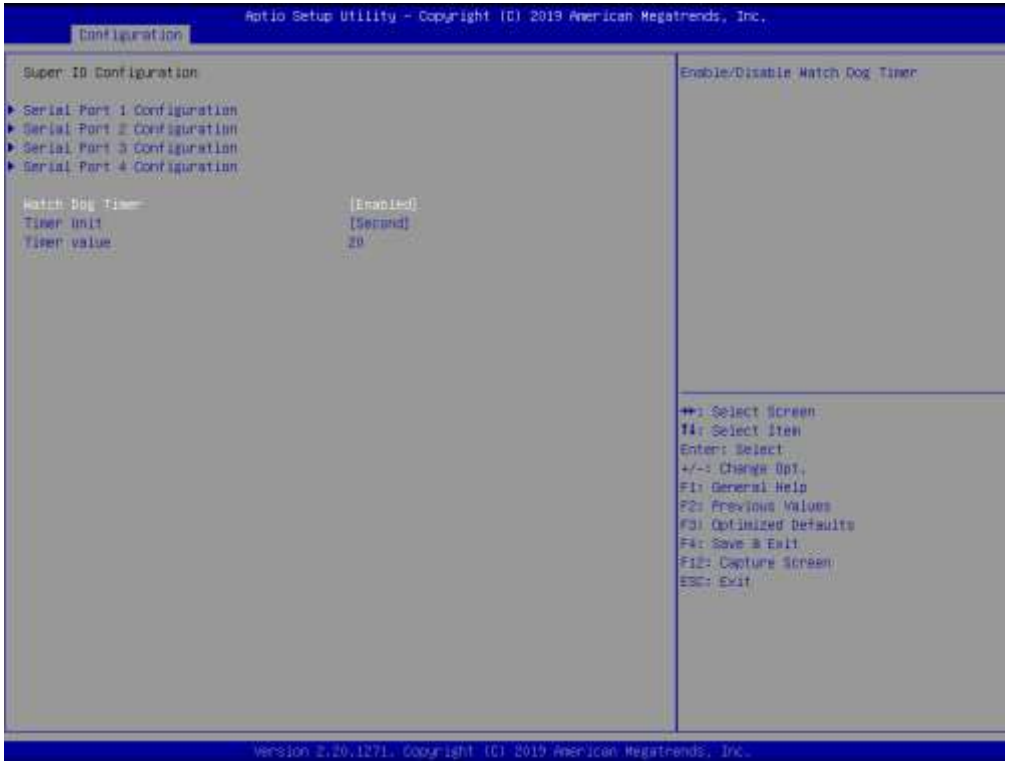
Trusted Computing Setting



| Feature | Description | Options |
|---|---|---|
| **Security Device Support** | 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. | Disabled, ★Enabled |
| **SHA-1 PCR Bank** | Enables or Disables SHA-1 PCR Bank | Disabled, ★Enabled |
| **SHA256 PCR Bank** | Enables or Disables SHA256 PCR Bank | Disabled, ★Enabled |
| **Pending operation** | Schedule an Operation for the Security Device. Note: Your Computer will reboot during restart in order to change State of Security Device | ★None, TPM Clear |
| **Platform Hierarchy** | Enables or Disables Platform Hierarchy | Disabled, ★Enabled |
| **Storage Hierarchy** | Enables or Disables Storage Hierarchy | Disabled, ★Enabled |
| **Endorsement Hierarchy** | Enables or Disables Endorsement Hierarchy | Disabled, ★Enabled |
| **TPM2.0 UEFI Spec Version** | Select the TCG2 Spec Version Support<br>TCG_1_2: the Compatible mode for Win8/Win10<br>TCG_2: Support new TCG2 protocol and event format for Win10 or later | TCG_1_2, ★TCG_2 |
| **Physical Presence Spec Version** | Select to Tell O.S. to Support PPI Spec Version 1.2 or 1.3 | 1.2, ★1.3 |
| **Device Select** | TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated. | ★Auto, TPM 1.2, TPM 2.0 |

**Super IO Configuration**

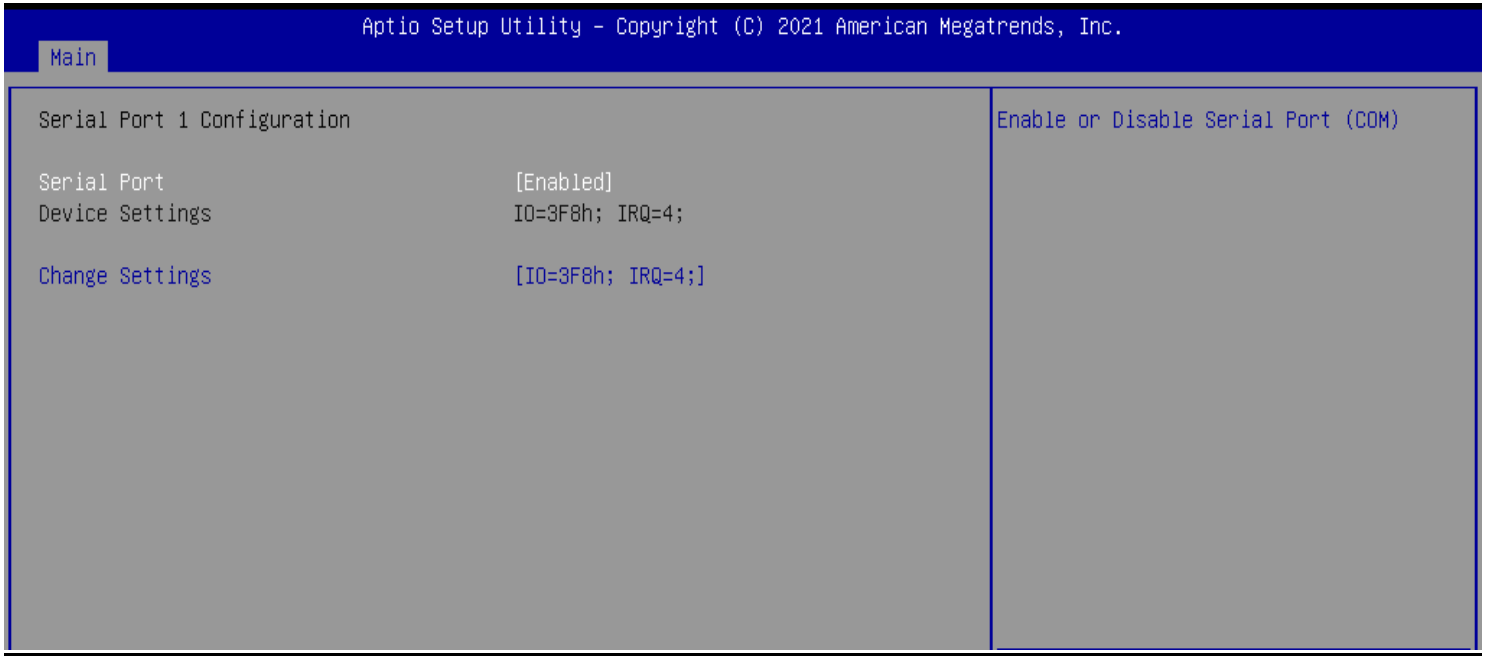
System Super IO Chip Parameters.




| Feature | Description | Options |
|---|---|---|
| **Watch Dog Timer** | Enable/Disable Watch Dog Timer | ★Disabled, Enabled |
| **Timer Unit** | Select Timer count unit of WDT | ★Second, Minute |
| **Timer value** | Set WDT Timer value | ★20 |

**Serial Port 1 Configuration**

Set Parameters of Serial Port 1 (COM A)




| Feature | Description | Options |
|---|---|---|
| **Serial Port** | Enable or Disable Serial Port (COM) | ★Enabled, Disabled |
| **Change Settings** | Select an optimal settings for Super IO Device | ★IO=3F8h; IRQ=4, Auto,<br>IO=240h; IRQ=3,4,5,6,7,10,11,12<br>IO=248h; IRQ=3,4,5,6,7,10,11,12<br>IO=250h; IRQ=3,4,5,6,7,10,11,12<br>IO=258h; IRQ=3,4,5,6,7,10,11,12 |

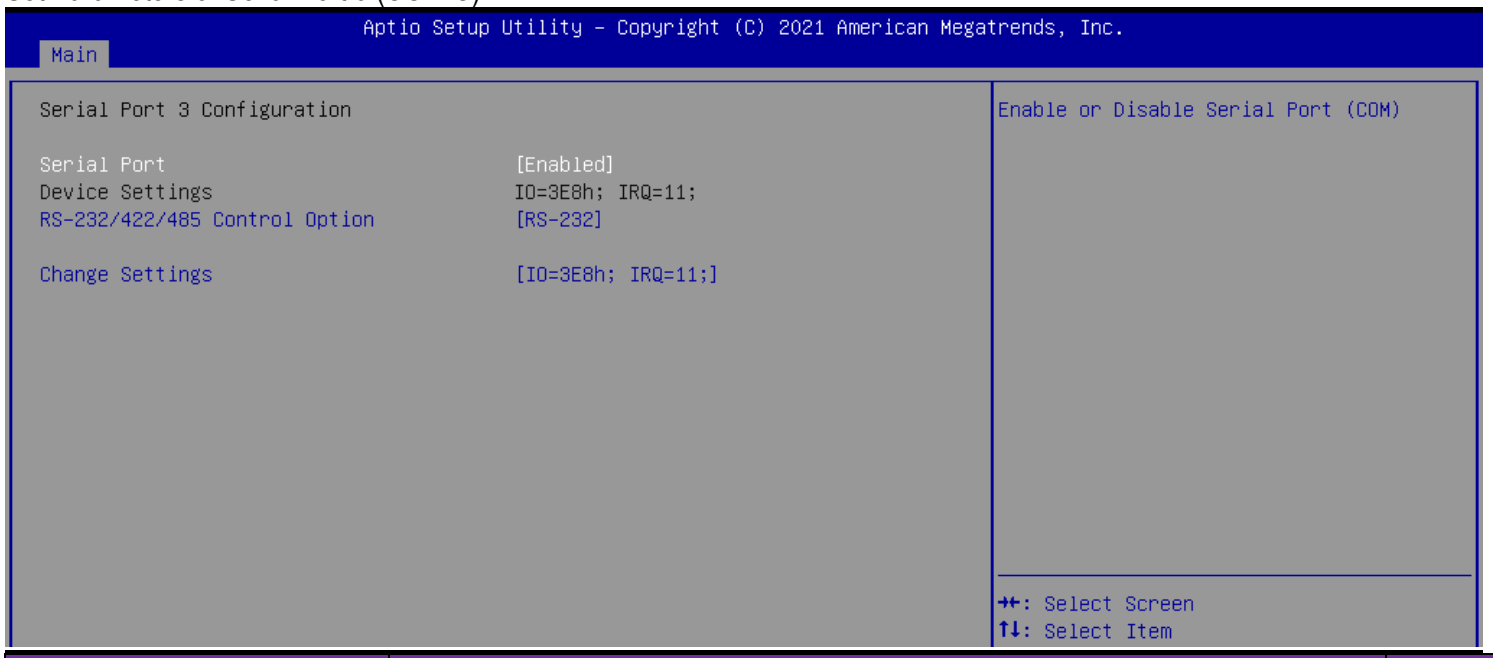
**Serial Port 2 Configuration**

Set Parameters of Serial Port 2 (COM B)


| Feature | Description | Options |
|---|---|---|
| **Serial Port** | Enable or Disable Serial Port (COM) | ★Enabled, Disabled |
| **Change Settings** | Select an optimal settings for Super IO Device | ★IO=2F8h; IRQ=3, Auto,<br>IO=240h; IRQ=3,4,5,6,7,10,11,12<br>IO=248h; IRQ=3,4,5,6,7,10,11,12<br>IO=250h; IRQ=3,4,5,6,7,10,11,12<br>IO=258h; IRQ=3,4,5,6,7,10,11,12 |

**Serial Port 3 Configuration**

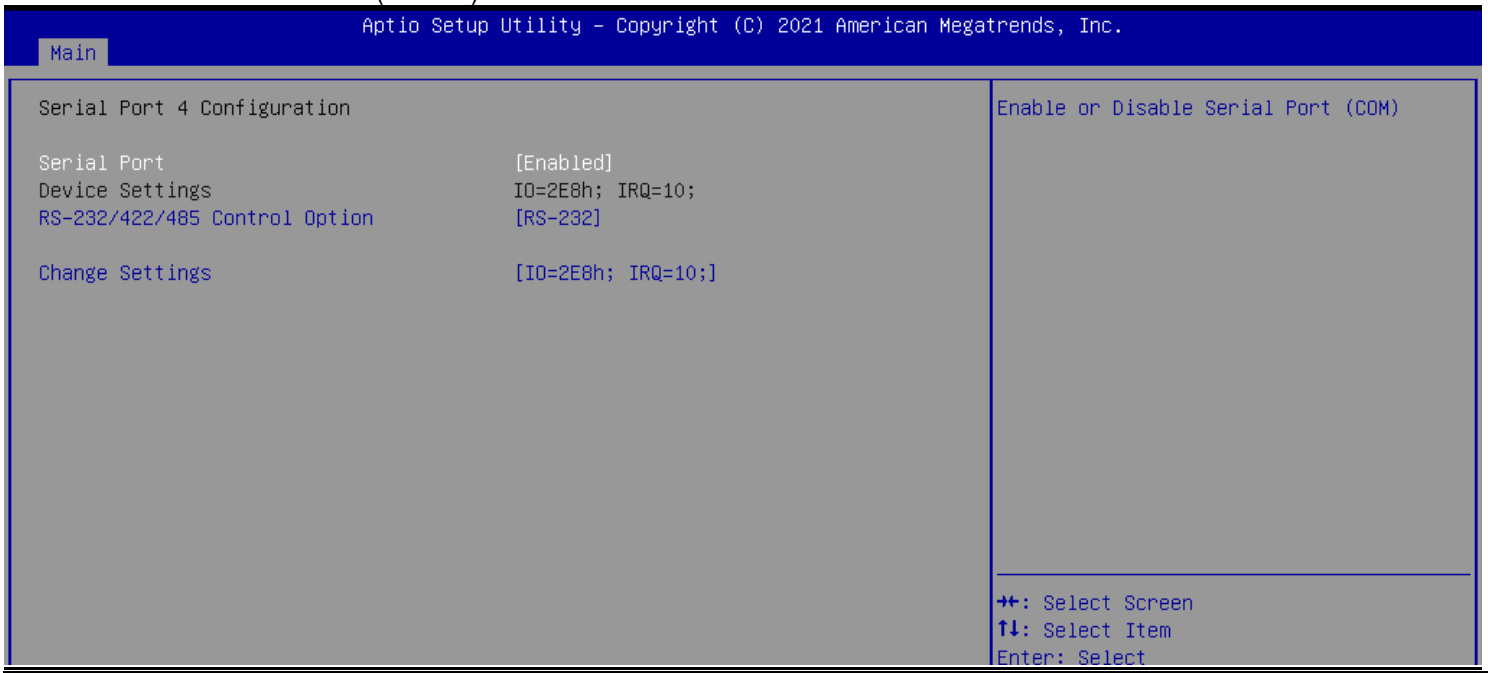
Set Parameters of Serial Port 3 (COM C)




| Feature | Description | Options |
|---|---|---|
| **Serial Port** | Enable or Disable Serial Port (COM) | ★Enabled, Disabled |
| **RS-232/422/485 Control Option** | Serial port 3 RS-232/422/485 Control Option | ★RS-232, RS 485 HALF DUPLEX, RS-422 FLL DUPLEX |
| **Change Settings** | Select an optimal settings for Super IO Device | ★IO=3E8h; IRQ=11, Auto,<br>IO=240h; IRQ=3,4,5,6,7,10,11,12<br>IO=248h; IRQ=3,4,5,6,7,10,11,12<br>IO=250h; IRQ=3,4,5,6,7,10,11,12<br>IO=258h; IRQ=3,4,5,6,7,10,11,12 |

**Serial Port 4 Configuration**

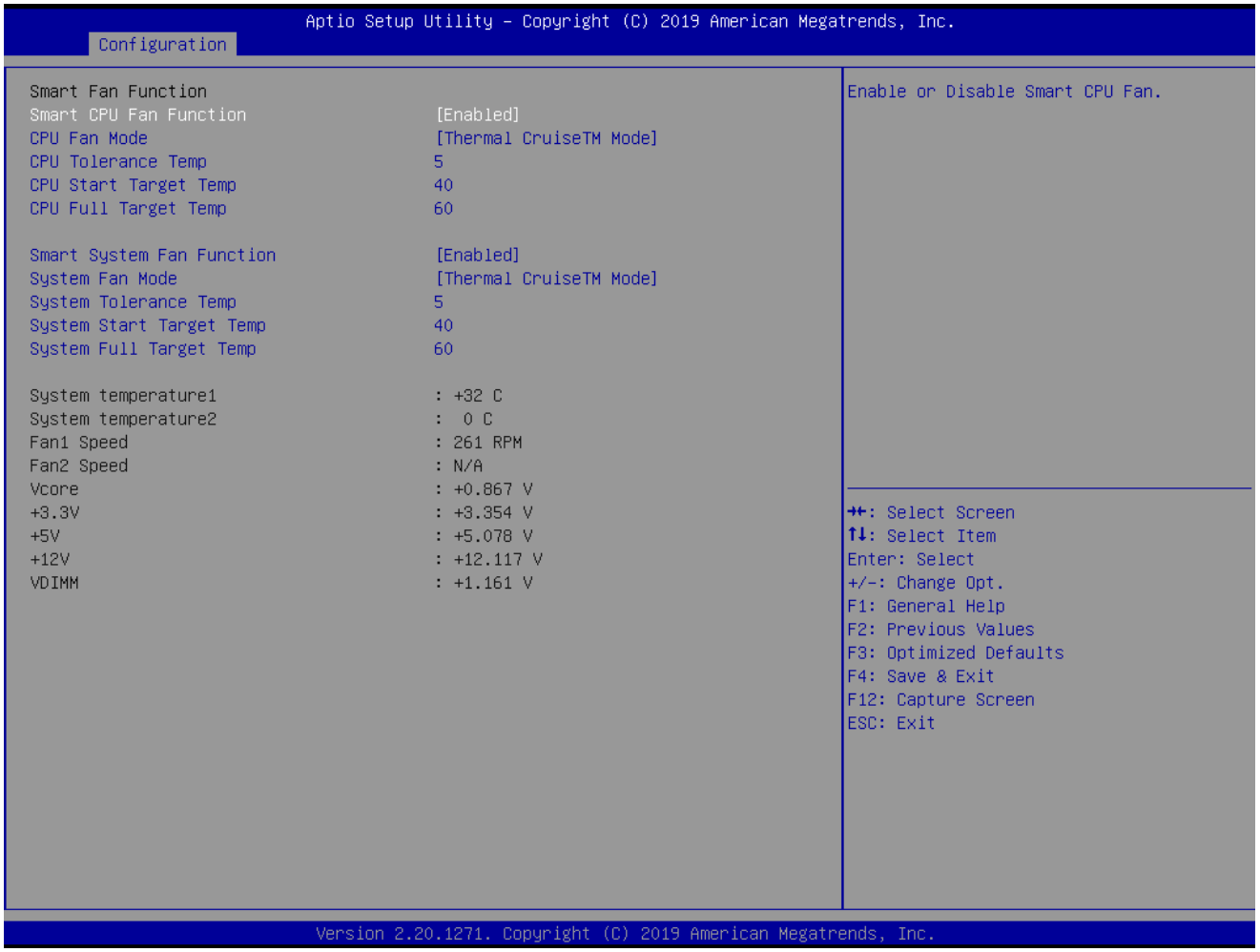
Set Parameters of Serial Port 4 (COM D)




| Feature | Description | Options |
|---|---|---|
| **Serial Port** | Enable or Disable Serial Port (COM) | ★Enabled, Disabled |
| **RS-232/422/485 Control Option** | Serial port 3 RS-232/422/485 Control Option | ★RS-232, RS 485 HALF DUPLEX, RS-422 FLL DUPLEX |
| **Change Settings** | Select an optimal settings for Super IO Device | ★IO=2E8h; IRQ=10, Auto,<br>IO=240h; IRQ=3,4,5,6,7,10,11,12<br>IO=248h; IRQ=3,4,5,6,7,10,11,12<br>IO=250h; IRQ=3,4,5,6,7,10,11,12<br>IO=258h; IRQ=3,4,5,6,7,10,11,12 |

## H/W Monitor

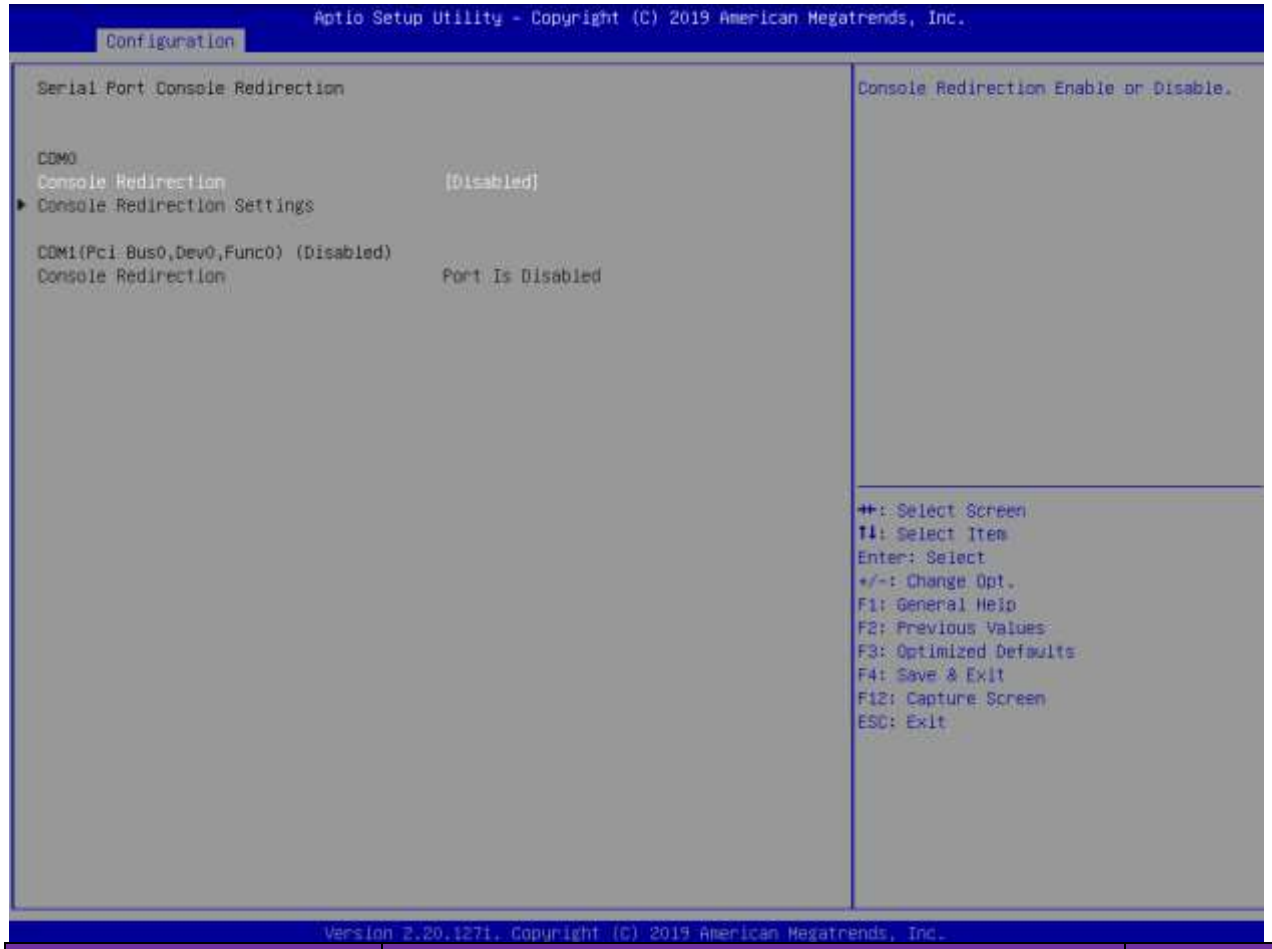
Monitor hardware status



| Feature | Description | Options |
|---|---|---|
| **Smart CPU Fan Function** | Enable or Disable Smart CPU Fan | ★Disabled, Enabled |
| **CPU Fan Mode** | Smart Fan Mode Select | ★Thermal Cruise™ Mode, Fan Speed Cruise™ Smart Fan™ III Mode |
| **CPU Tolerance Temp** | CPU Fan Tolerance Temperature | ★5 |
| **CPU Start Target Temp** | CPU Start Fan Target Temperature. | ★40 |
| **CPU Full Target Temp** | CPU Full Fan Target Temperature. | ★60 |
| **Smart System Fan Function** | Enable or Disable Smart System Fan | ★Disabled, Enabled |
| **System Fan Mode** | Smart Fan Mode Select | ★Thermal Cruise™ Mode, Fan Speed Cruise™ Smart Fan™ III Mode |
| **System Tolerance Temp** | System Fan Tolerance Temperature | ★5 |
| **System Start Target Temp** | System Start Fan Target Temperature. | ★40 |
| **System Full Target Temp** | System Full Fan Target Temperature. | ★60 |

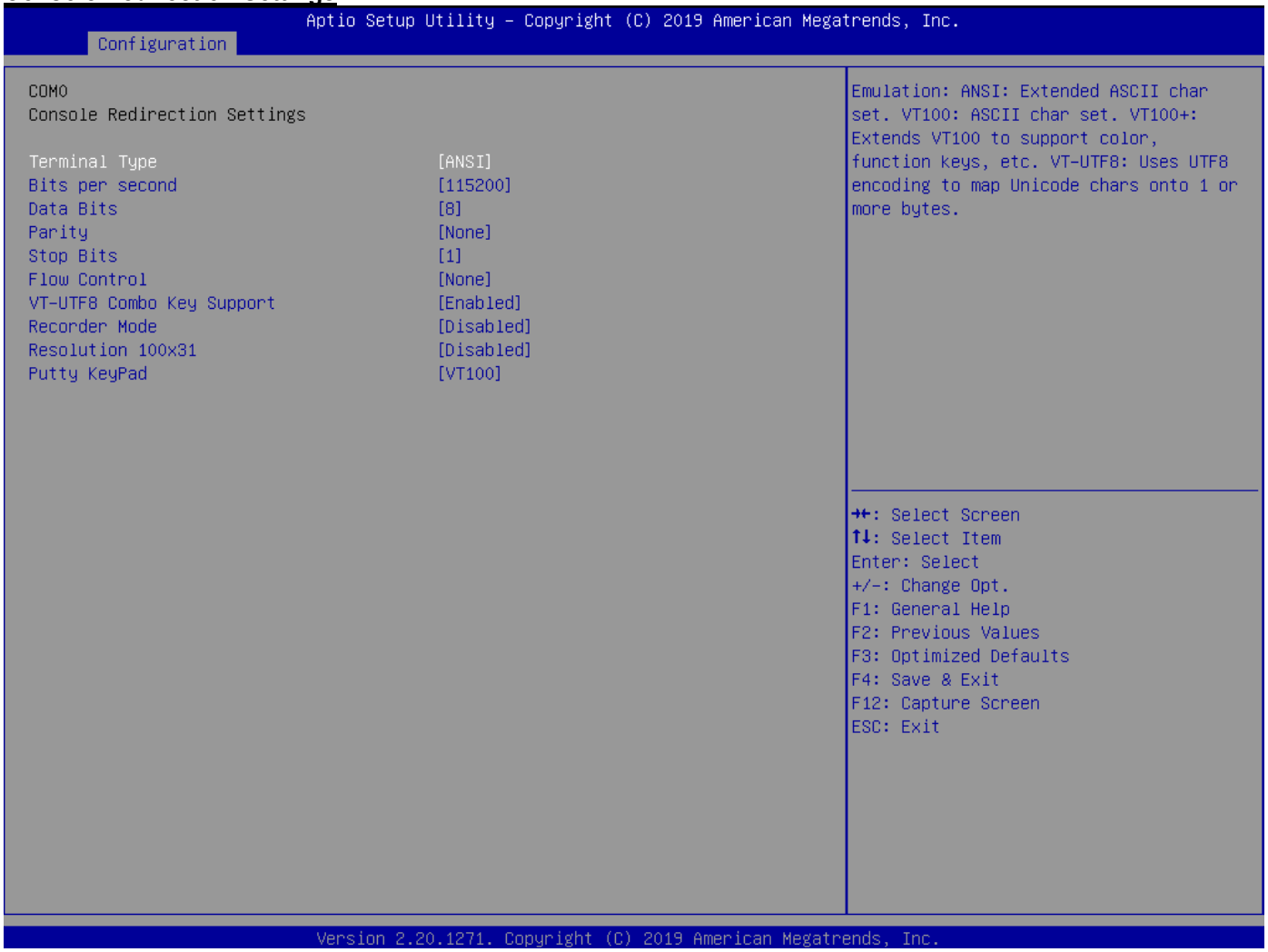
**Serial Port Console Redirection**

Serial Port Console Redirection



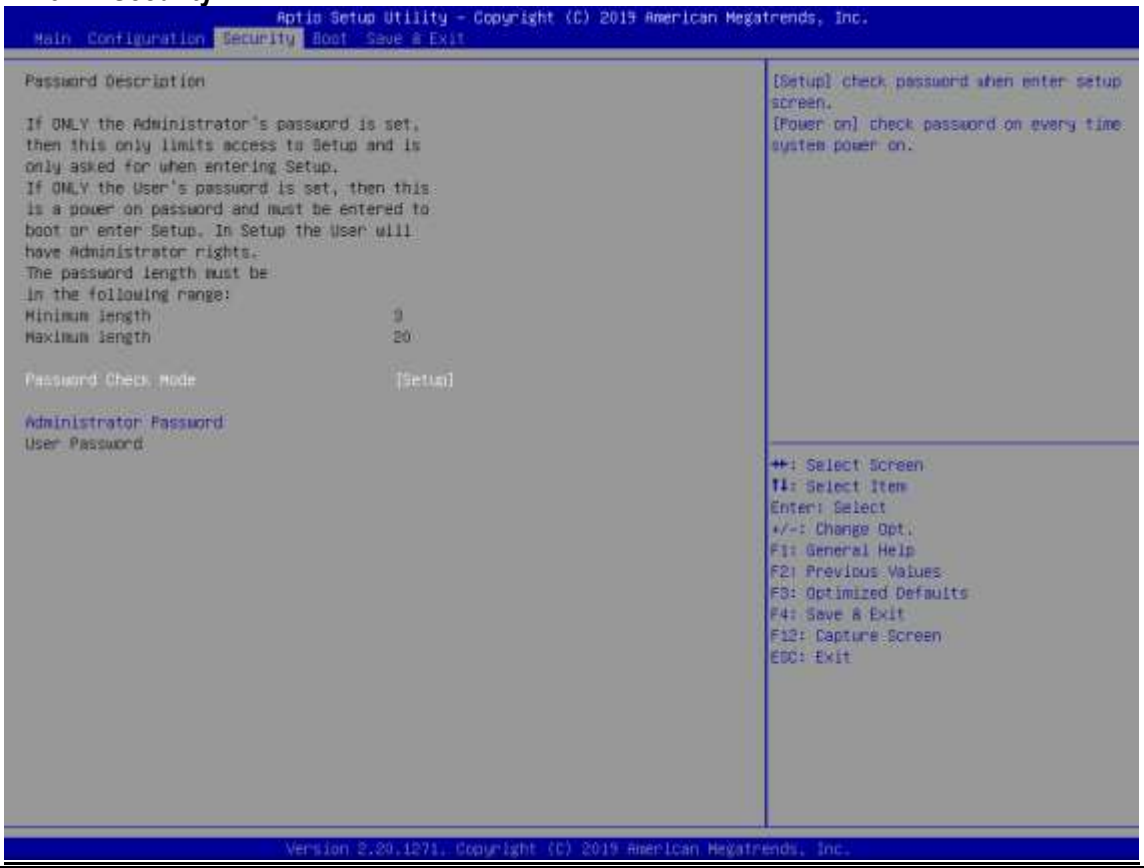

| Feature | Description | Options |
|---|---|---|
| **Console Redirection** | Console Redirection Enable or Disable | ★Disabled, Enabled |

**Console Redirection Settings**



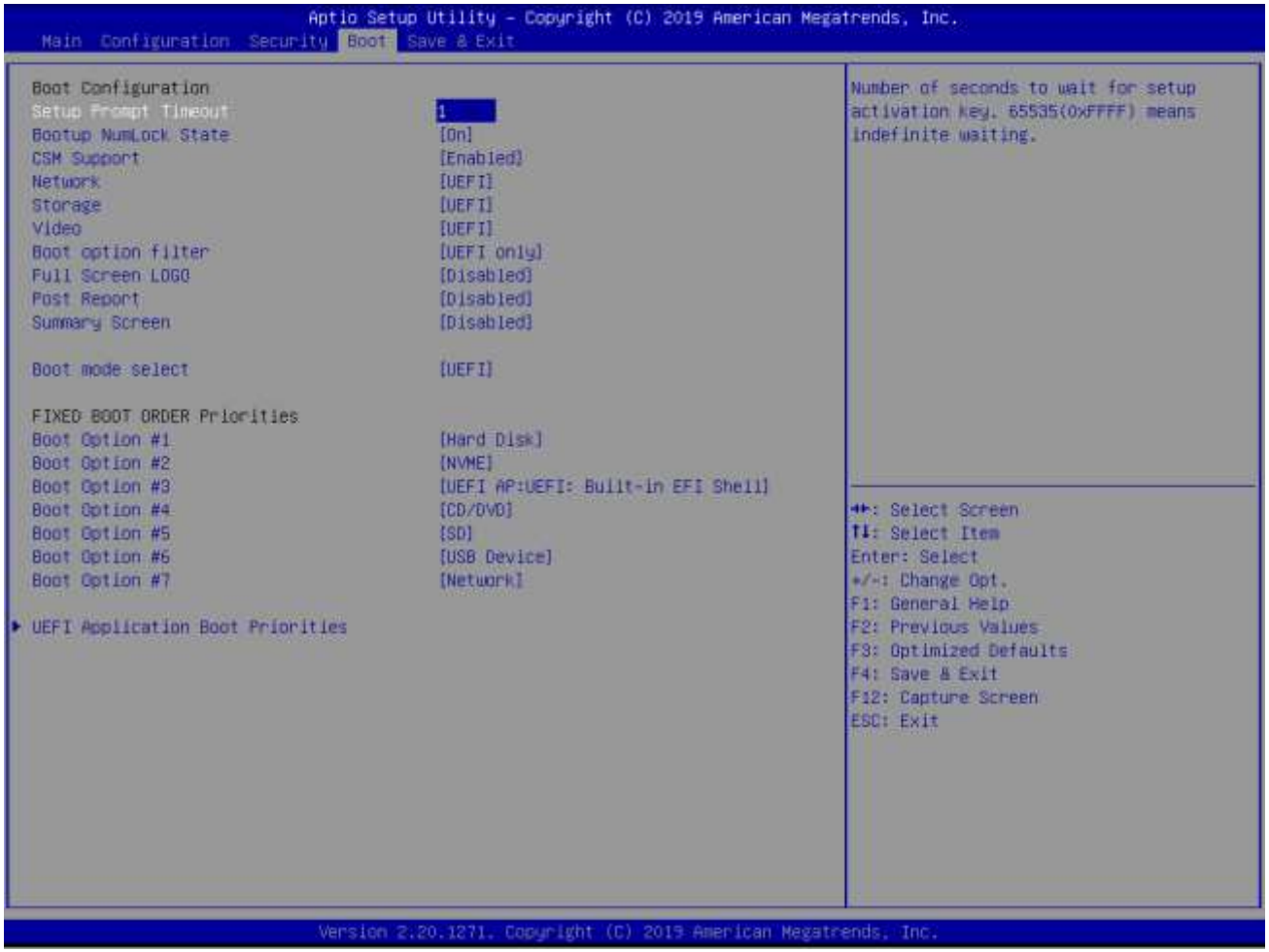
| Feature | Description | Options |
|---|---|---|
| **Terminal Type** | Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes. | ★ANSI, VT100, VT100+, VT-UTF8 |
| **Bits per second** | Select Serial port transmission speed. The speed must be matched on other side. Long or noisy lines may require lower speeds. | ★115200, 9600, 19200, 38400, 57600 |
| **Data bits** | Data bits | ★8, 7 |
| **Parity** | A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space parity bit is always 0. Mark and Space Parity do not allow for error detection. They can be used as an additional data bit. | ★None, Even, Odd, Mark, Space |
| **Stop Bits** | Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit. | ★1,2 |
| **Flow Control** | Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signal. | ★None, Hardware RTS/CTS |
| **VT-UTFB Combo Key Support** | Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals | ★Enabled, Disabled |
| **Recorder Mode** | With this mode enabled only text will be sent. This is to capture Terminal data. | ★Disabled, Enabled |
| **Resolution 100x31** | Enables or disables extended terminal resolution | ★Disabled, Enabled |
| **Putty KeyPad** | Select FunctionKey and KeyPad on Putty | ★VT100, LINUX,XTERMR6, SCO,ESCN,VT400 |

### 7.2.3 Security



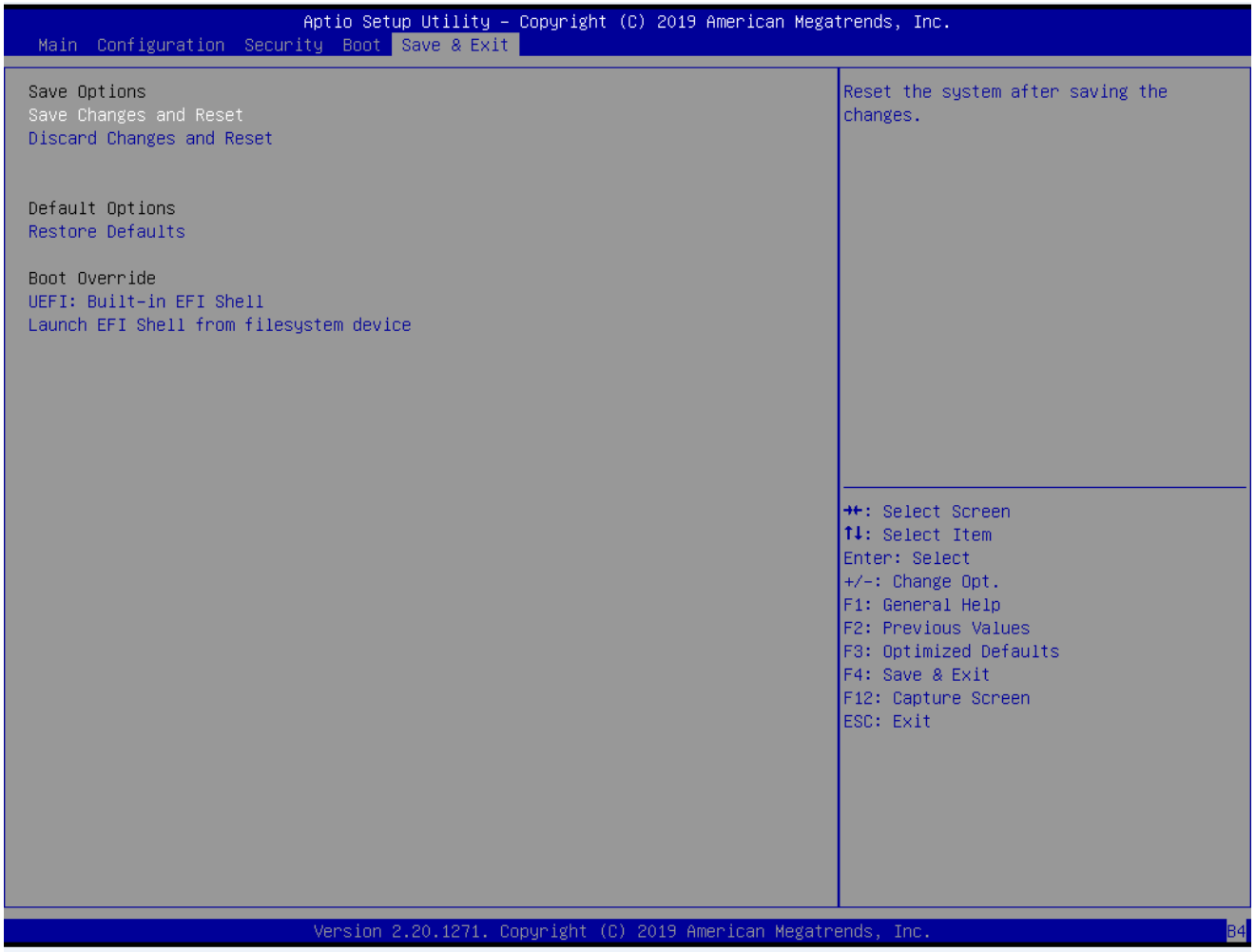

| Feature | Description | Options |
|---|---|---|
| **Password Check Mode** | [Setup] check password when enter setup screen. [Power on] check password on every time system power on. | ★Setup, Power on |
| **Administrator Password** | Set Administrator Password | |

### 7.2.4 Boot


Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Main Configuration Security Boot Save & Exit
Boot Configuration
Setup Prompt Timeout 1
Bootup NumLock State [On]
CSM Support [Enabled]
Network [UEFI]
Storage [UEFI]
Video [UEFI]
Boot option filter [UEFI only]
Full Screen LOGO [Disabled]
Post Report [Disabled]
Summary Screen [Disabled]
Boot mode select [UEFI]
FIXED BOOT ORDER Priorities
Boot Option #1 [Hard Disk]
Boot Option #2 [NVME]
Boot Option #3 [UEFI AP:UEFI: Built-in EFI Shell]
Boot Option #4 [CD/DVD]
Boot Option #5 [SD]
Boot Option #6 [USB Device]
Boot Option #7 [Network]
UEFI Application Boot Priorities
Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
F12: Capture Screen
ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.

| Feature | Description | Options |
|---|---|---|
| **Setup Prompt Timeout** | Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting. | ★1 |
| **Bootup NumLock State** | Select the keyboard NumLock state | ★On, Off |
| **CSM Support** | Enable/Disable CSM support | ★Disabled, Enabled |
| **Network** | Controls the execution of UEFI and Legacy Network 0pROM | Do not launch, ★UEFI, Legacy |
| **Storage** | Controls the execution of UEFI and Legacy Storage 0pROM | Do not launch, ★UEFI, Legacy |
| **Video** | Controls the execution of UEFI and Legacy Video 0pROM | Do not launch, ★UEFI, Legacy |
| **Boot option** | This option controls Legacy/UEFI ROMs priority | UEFI and Legacy, Legacy only ★UEFI only |
| **Full Screen LOGO** | Enables or disables Quiet Boot option and Full screen Logo. | ★Disabled, Enabled |
| **Post Report** | Post Report Support Enabled/Disabled | ★Disabled, Enabled |
| **Summary Screen** | Summary Screen Support Enabled/Disabled | ★Disabled, Enabled |
| **Boot mode select** | Select boot mode LEGACY/UEFI | Legacy, ★UEFI |
| **Boot Option #1~7** | Sets the system boot order | Legacy, ★UEFI |
| **UEFI Application Boot Priorities** | Specifies the Boot Device Priority sequence from available UEFI Application | |

### 7.2.5 Save & Exit



| Feature | Description | Options |
|---|---|---|
| **Save Changes and Reset** | Reset the system after saving the changes. | |
| **Discard Changes and Reset** | Reset system setup without saving any changes. | |
| **Restore Defaults** | Restore/Load Default values for all the setup options. | |
| **UEFI: Built-in EFI Shell** | Reset the system after saving the changes.<br>(Boot option filter: UEFI only) | |
| **Launch EFI Shell from filesystem device** | Attempts to Launch EFI Shell application (Shell.efi) from one of the available filesystem devices. | |

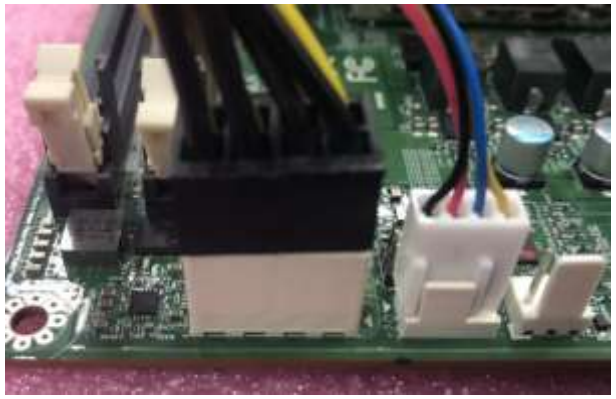
# 8 Troubleshooting

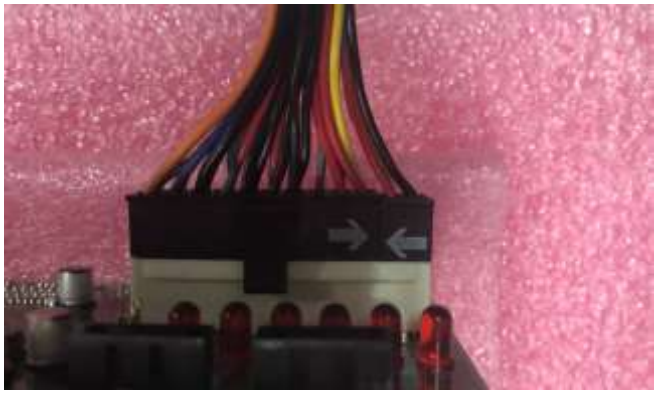
This section provides a few useful tips to quickly get ROBO-8114-Q370 running with success. This section will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

## 8.1 Hardware Quick Installation

**ATX Power Setting**

Unlike other Single board computer, ROBO-8114-Q370 supports ATX only. Therefore, there is no other setting that needs to be set up. However, there are only two connectors that must be connected— J15 (ATX 8 Pin Connector (For CPU Power)) on the ROBO-8114-Q370 board & 20 pins ATX Power Connector on the carrier board

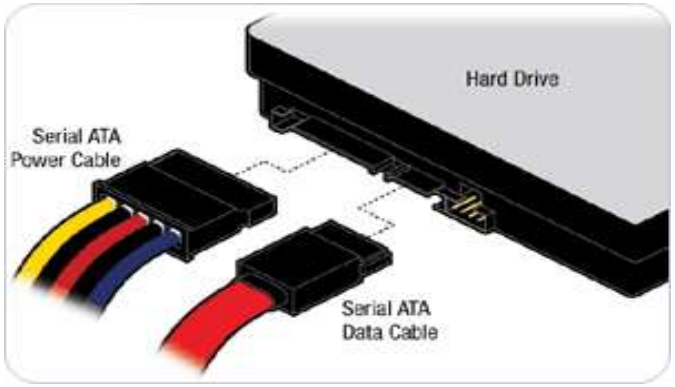




**Serial ATA**

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time;

The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation.




ROBO-8114-Q370 can support four SATA interface (SATAIII, 6.0Gb/s) on board. It has SATA ports on board.

## 8.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. DDR4 So-DIMM Memory, keyboard, mouse, SATA hard disk, VGA connector, power cable of the device, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with ROBO-8114-Q370, it is recommended, when going with the boot-up sequence, to hit "delete" or "ESC" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

**Loading the default optimal setting**

When prompted with the main setup menu, please scroll down to “Restore Defaults”, press “Enter” and select “Yes” to load default optimal BIOS setup. This will force your BIOS setting back to the initial factory configurations. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting at any time when system appears to be unstable in boot up sequence.

## 8.3 FAQ

**Information & Support**

**Question:** I forgot my password of system BIOS, what am I supposed to do?

**Answer:** You can switch off your power supply then find the JP24 on the RUBY-D811-Q370 board to set it from 1-2 short to 2-3 short and wait 5 seconds to clean your password then set it back to 1-2 short to switch on your power supply.

**JP5：Clear CMOS Setup**

| | Jumper Setting Describe |
|---|---|
| *1-2 | Normal |
| 2-3 | Clean CMOS |

**Question:** How to update the BIOS file of ROBO-8114-Q370

**Answer:**

1. Please visit web site of Portwell download center as below hyperlink
https://www.portwell.com.tw/support-center/download-center/
2. Select "Search download" and type the keyword "ROBO-8114-Q370".
3. Find the **"BIOS "**page and download the ROM file and flash utility.
4. Unzip file to bootable USB flash drive which can boot to dos mode. Then execute the "update.bat" or "update.efi ". It will start to update BIOS. NOTE: Once you use "update.efi" to update BIOS, it must be get into the SHELL MODE to update BIOS
5. When you see the "FPT Operation Passed" message, which means the BIOS update processes finished. Please cut the AC power off and **wait for 10 seconds** before powering on.
6. When you see the "Programming success" message, which means the BIOS update processes finished. Please cut the AC power off and **wait for 10 seconds** before powering on.

**Question: What are the display options while using ROBO-8114-Q370 board?**

**Answer: -** The ROBO-8114-Q370 supports DVI、HDMI and FGA display output.

Note:

Please visit our Download Center to get the Catalog, User manual, BIOS, and driver files.

https://www.portwell.com.tw/support-center/download-center/

If you have other additional technical information or request which is not covered in this manual, please fill in the technical request form as below hyperlink.

https://www.portwell.com.tw/support-center/technical-request/?lang=zh-hant

We will do our best to provide a suggestion or solution for you.

Thanks

# 9 Portwell Software Service

1. If you have customized requirements of BIOS, you can contact person of our company or branch.
2. If you have requirements of WDT、GPIO APP, you can contact our headquarter or branch, and we can render you assistance on developing.

| Portwell Worldwide: | |
|---|---|
| Portwell, Inc. | E-mail: info@portwell.com.tw |
| Shanghai Portwell | E-mail: info@portwell.com.cn |
| Portwell Japan, Inc | E-mail: info@portwell.co.jp |
| American Portwell Technology | E-mail: info@portwell.com |
| European Portwell Technology | E-mail: info@portwell.eu |
| Portwell UK Ltd. | E-mail: info@portwell.co.uk |
| Portwell Deutschland GmbH | E-mail: info@portwell.eu |
| Portwell India Technology | E-mail: info@portwell.in |
| Portwell Korea, Inc. | E-mail: info@portwell.co.kr |
| Portwell Latin America | E-mail: vendas@portwell.com.br |

# 10 Industry Specifications

## 10.1 Industry Specifications

The list below provides links to industry specifications that apply to Portwell modules.

Low Pin Count Interface Specification, Revision 1.0 (LPC) http://www.intel.com/design/chipsets/industry/lpc.htm
Universal Serial Bus (USB) Specification, Revision 2.0 http://www.usb.org/home
PCI Specification, Revision 2.3 https://www.pcisig.com/specifications
Serial ATA Specification, Revision 3.0 http://www.serialata.org/
PCI Express Base Specification, Revision 2.0 https://www.pcisig.com/specifications