



ROBO-8114VG2AR

PICMG 1.3 Single Host Board

Version 1.7

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 I225LM LAN chip information
R1.5	Update I225LM LAN chip information(Page17 & 61)
R1.6	Update priority of Memory slot information and size recommendations of CPU cooler
R.1.7	Update PCIe select controller(P.62) information

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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

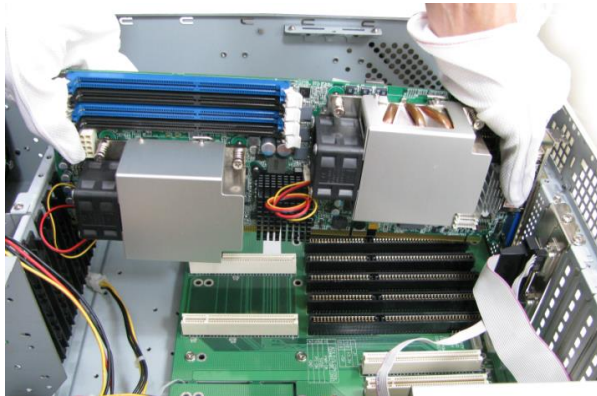
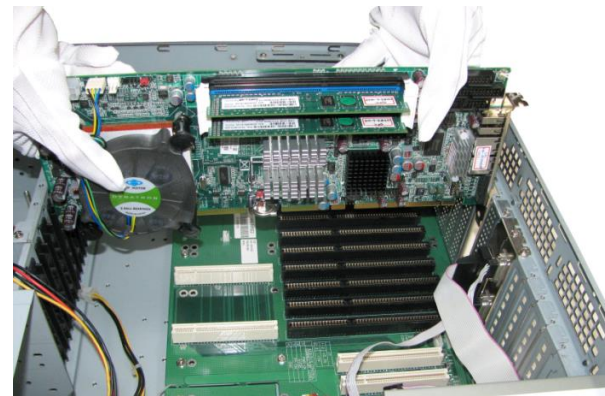
SBC Handling and Installation Notice

■ 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.

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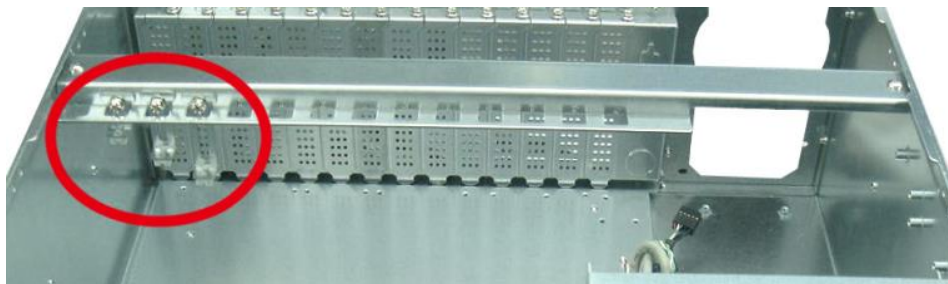
■ Fix your SBC in System

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:

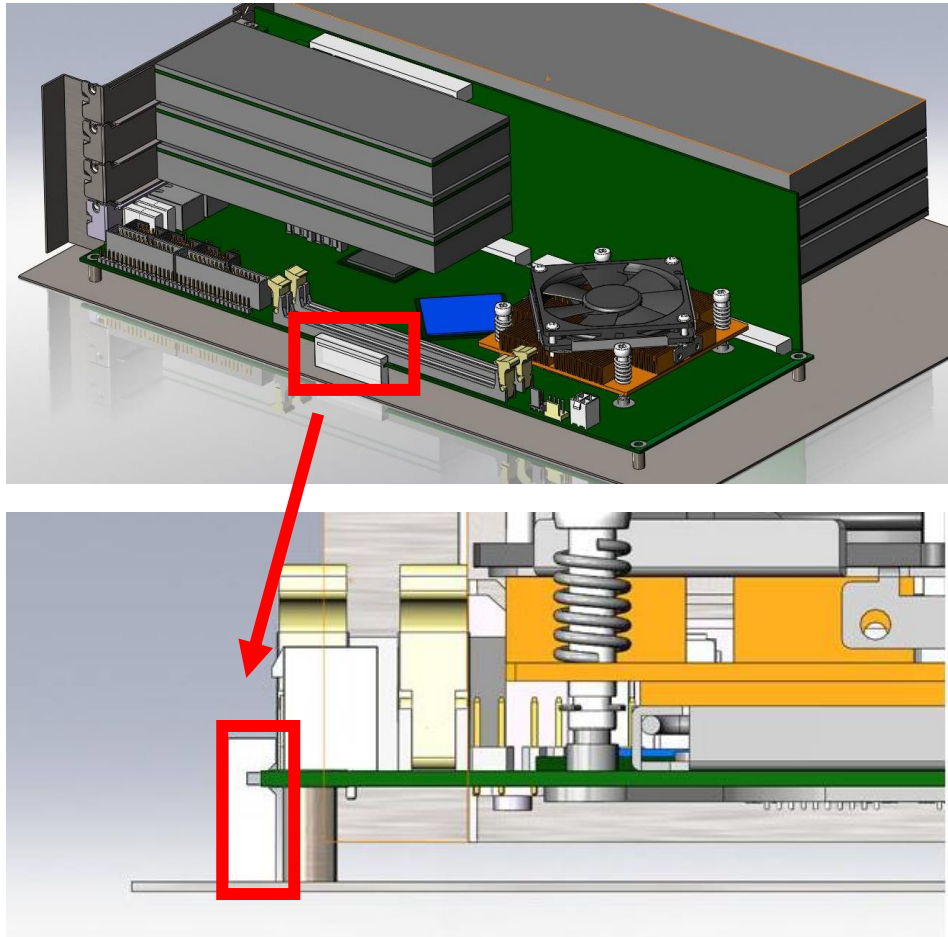
- 4U chassis :

→ Use L type metal or plastic or rubber bracket to hold SBC.



ROBO-8114VG2AR

- 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 ◆ VGA: Resolution up to 1920 x 1200 @ 60Hz ◆ DVI-D: Resolution up to 1920 x 1200 @ 60Hz (VGA+DVI-D on bracket by DVI-I port) 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. ◆ 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) ◆ 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 ◆ USB Port: 2x USB 3.2(Gen1) on bracket, 8x USB 3.2(Gen2) on board header ◆ GPIO connector: 8GPI + 8GPO ◆ Audio Interface: Mic-In / Line-Out / Line-in (on-board header)

ROBO-8114VG2AR

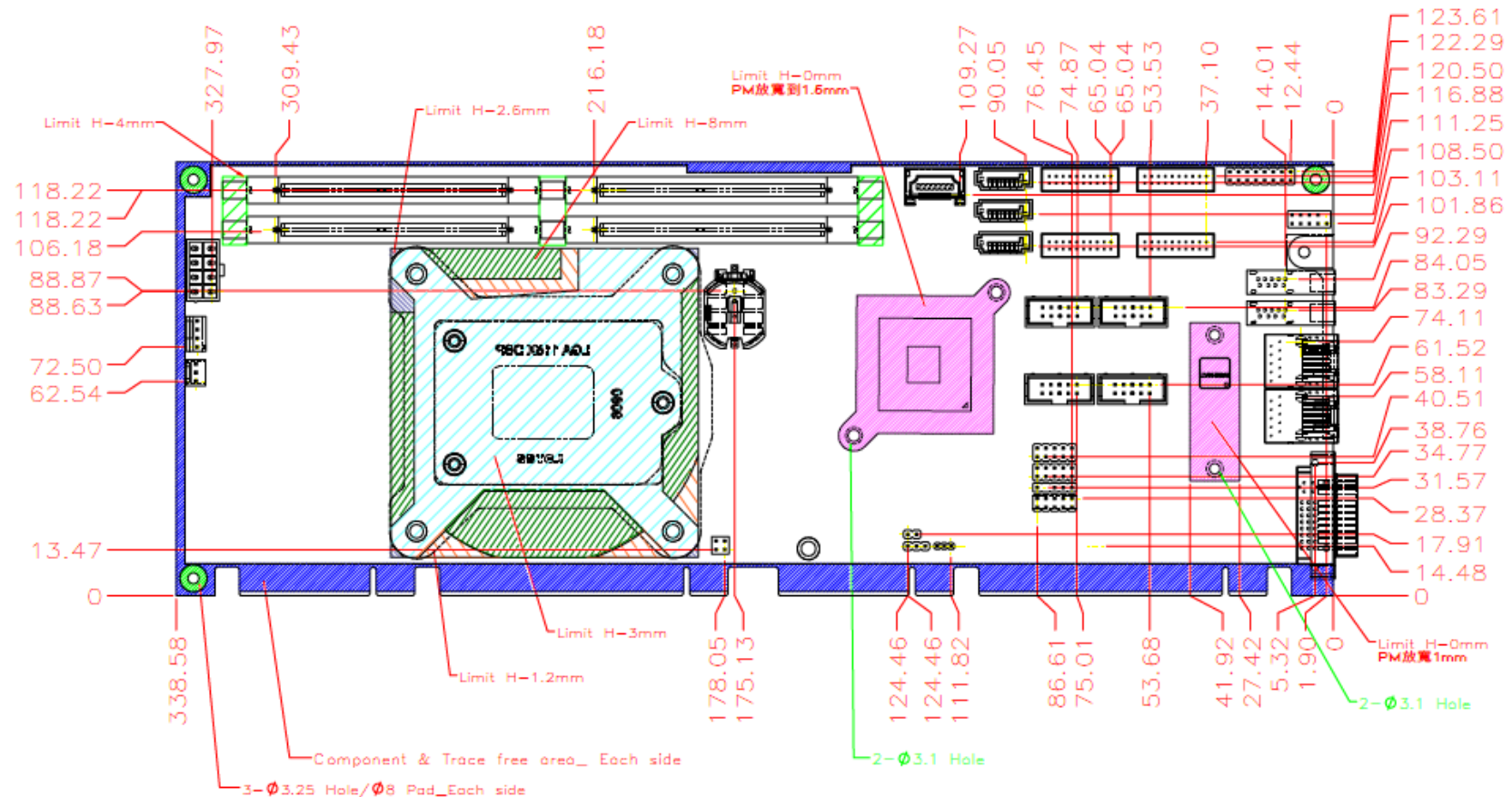
Ethernet	<ul style="list-style-type: none">◆ Supports dual 10/100/1000 Mbps Ethernet port (s) via PCI Express x1 interface by Intel WGI219LM and WGI225LM controller◆ Dual RJ45 connector on bracket
TPM	<ul style="list-style-type: none">◆ On-board TPM 2.0 support (TPM IC: Infineon SLB9665TT2.0)
High Drive GPIO	<ul style="list-style-type: none">◆ One pin-header for GPIO (8bit in & 8bit out)
Mechanical and environmental specifications	<ul style="list-style-type: none">◆ Operating temperature: 0 ~ 60° C◆ Storage temperature:-20 ~ 80° C◆ Humidity: 5 ~ 90% non-condensing◆ Power supply voltage: ATX◆ 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.

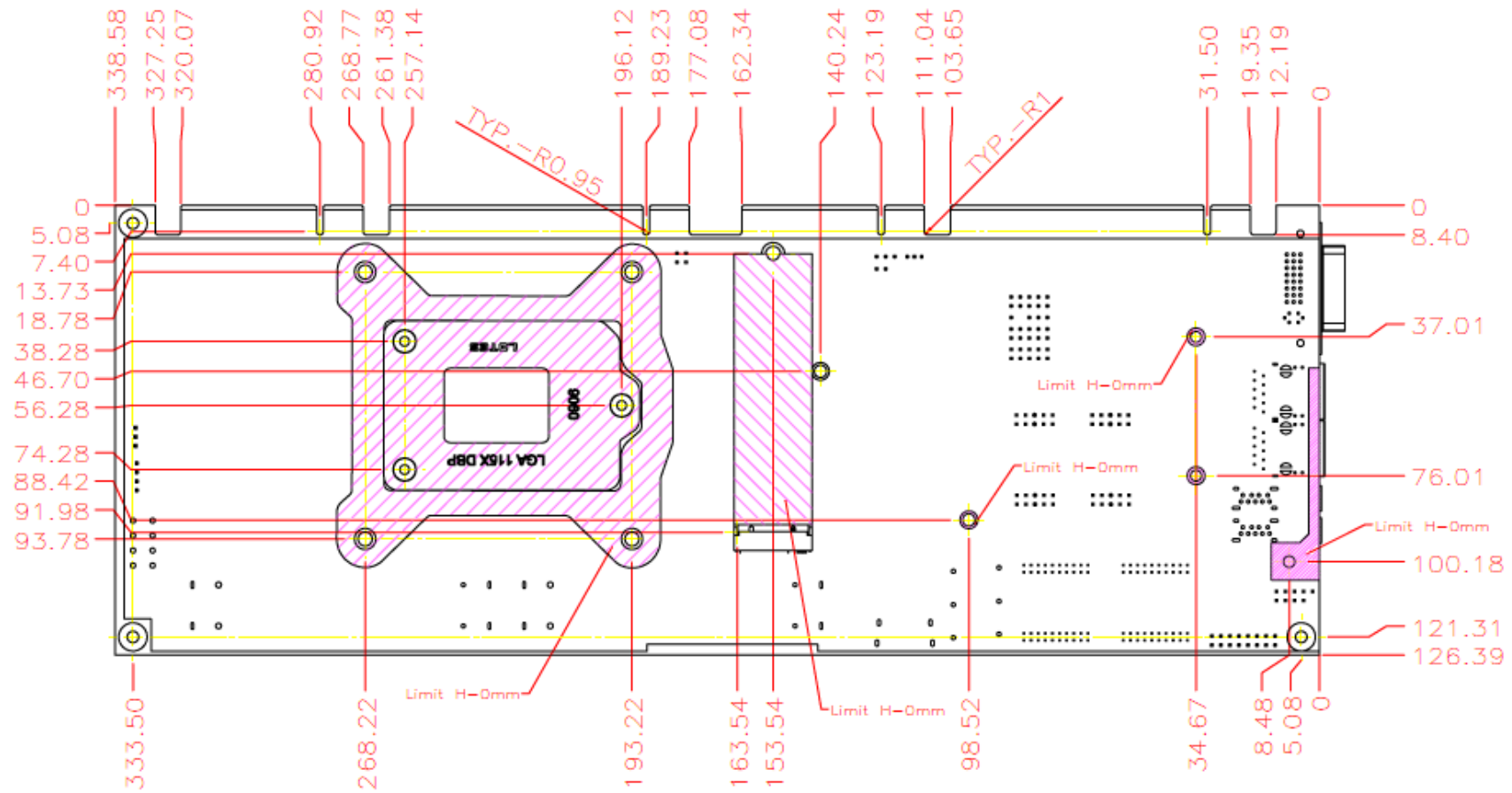
- ✧ Windows 10 Enterprise & IOT Enterprise (64b) RS3
- ✧ Ubuntu, SuSe, Redhat Enterprise 1,2 (Kernel 4.14)
- ✧ Yocto 2.4 Tool-based Embedded Linux Distribution
- ✧ Wind River VxWorks 7

2.2 Mechanical Dimensions



Noted : The CPU cooler space on the ROBO-8114 is limited to 90x90mm. Therefore, we recommend customers to select a CPU cooler of the same size 90x90mm.

ROBO-8114VG2AR



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® I225 Gigabit Network Connection
LAN Driver	Intel® I225 Gigabit Network Connection
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:			
<i>Item</i>	<i>Power ON</i>	<i>Full Loading 10Min</i>	<i>Full Loading 30Min</i>
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

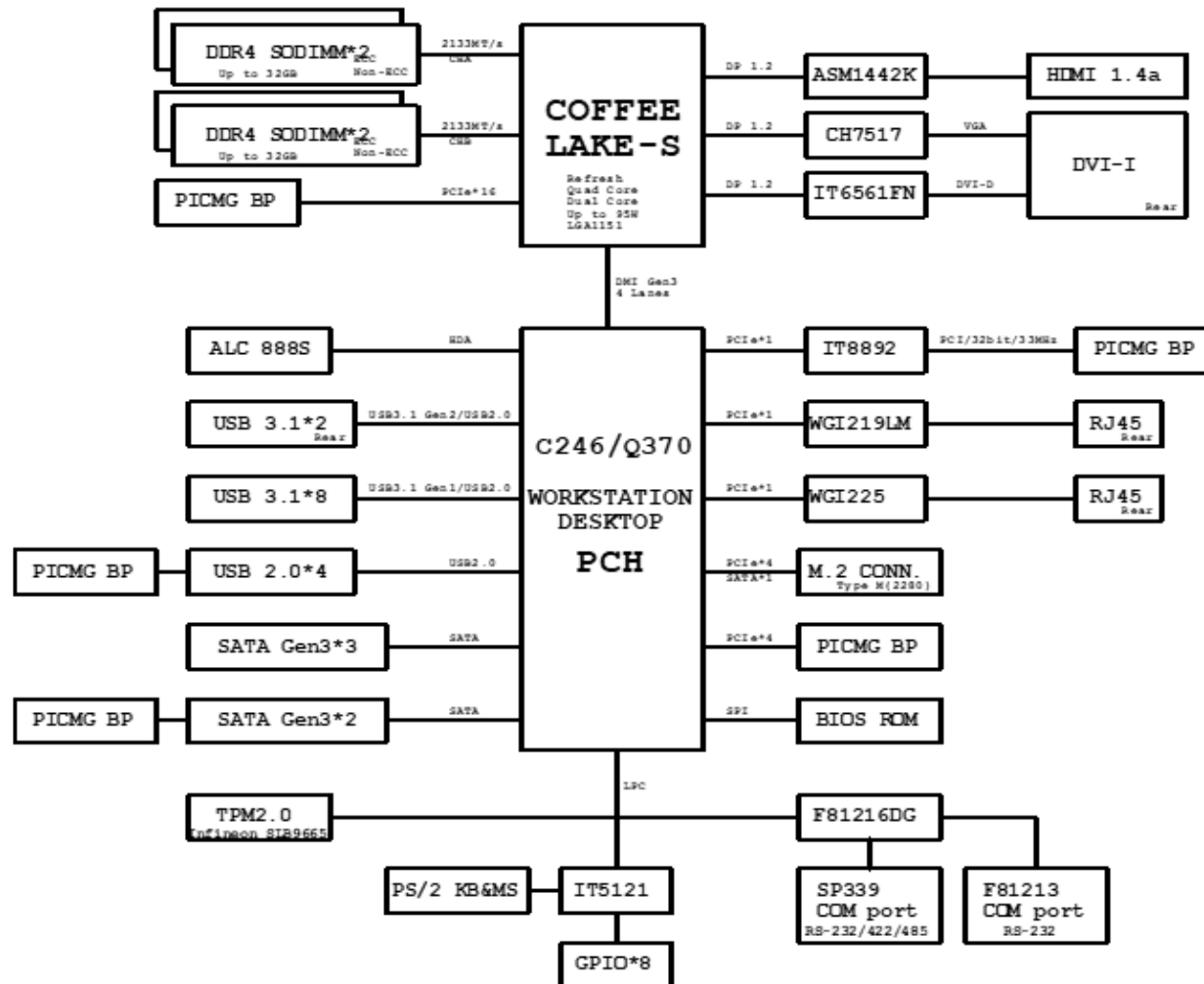
Operation Temperature : 0~60°C

Storage Humidity : 5~90%

Operation Humidity: 10~90%

ROBO-8114VG2AR

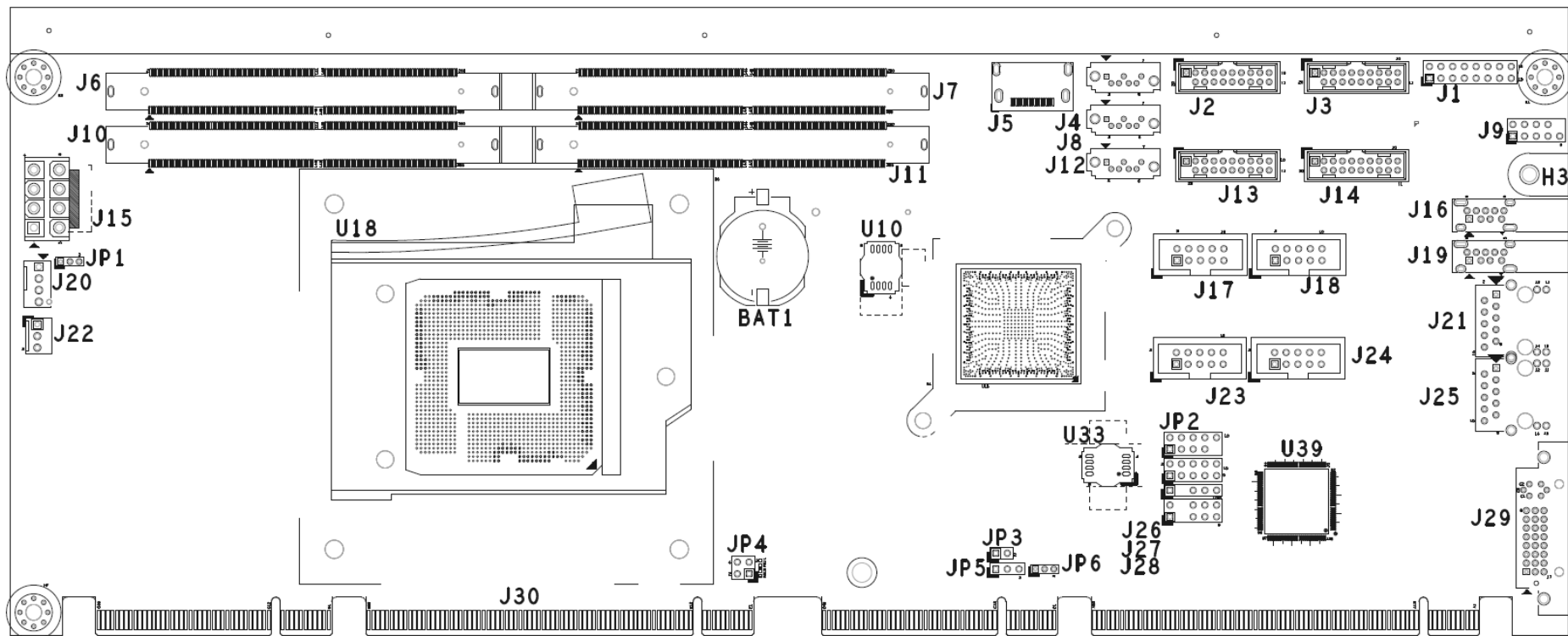
Block Diagram

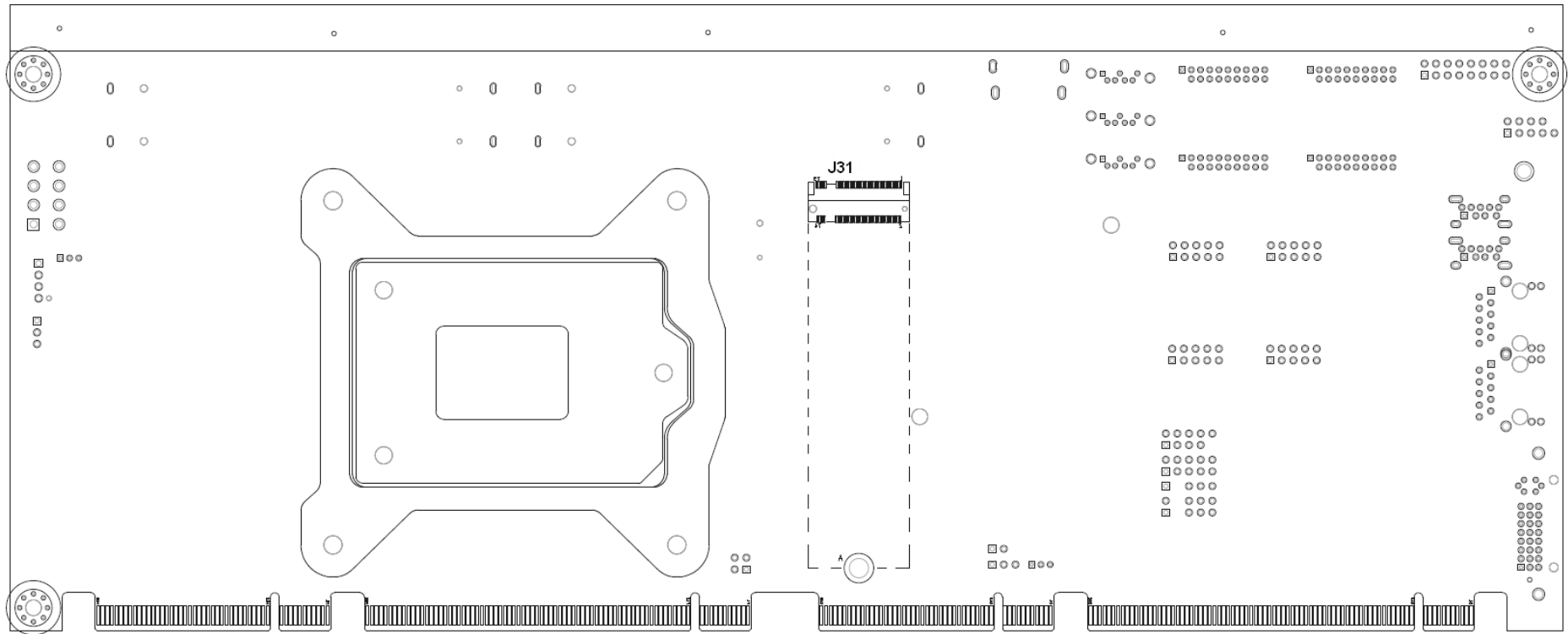


3 Hardware Configuration

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.





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.

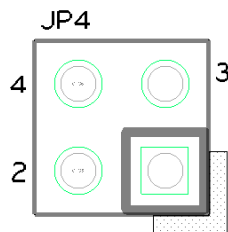
Jumper Table

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

Jump Function List:

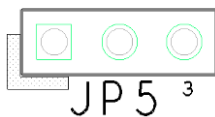
Jumper	Function	Remark
JP1	IR35201 FW update/debug header(Reserve)	PH3Px1/2.54mm
JP2	LPC 80 Port Pin Header	Header5Px2/2.54mm
JP3	Auto Power Button(Reserve)	PH2Px1/2.54mm
JP4	Configure PCIe x16, x8, x4	Header2Px2/2.54mm
JP5	Clear CMOS Setup	PH3Px1/2.54mm
JP6	ATX/AT Select Pin	PH3Px1/2mm

JP4: PCI Express* Bifurcation



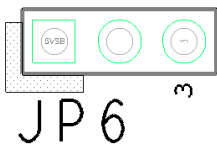
PIN No.	Description
1-2, Short 3-4, Short	1x8 , 2x4
1-2, Open 3-4, Short	Reserved
1-2, Short 3-4, Open	2x8
1-2, Open 3-4, Open	1x16

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

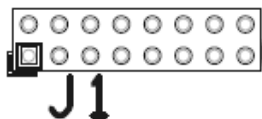
Connector Allocation

I/O peripheral devices are connected to the interface connectors

Connector Function List

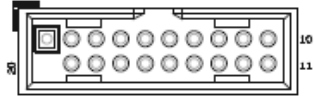
Connector	Function	Remark
J1	Front Panel Pin Header	Header 8Px2/2.54mm
J2/J3/13/14	USB2.0/3.1 connector	
J4/J8/J12	SATA Connector	
J5	HDMI Connector	
J6/J10	DDR4 Channel A Slot	
J7/J11	DDR4 Channel B Slot	
J9	Audio Pin Header	Header 5Px2/2.54mm
J15	ATX 8 Pin Connector(For CPU Power)	
J16/J19	USB2.0/3.1(Gen2) connector(Type-A)	
J17	COM1 Pin Header	
J18	COM2 Pin Header	
J20	CPU Fan	
J21	RJ45 Connector for I225	

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

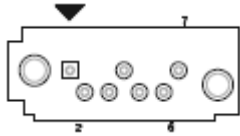
PIN No.	Description	PIN No.	Description
1	PWR_LED (+)	2	VCC
3	PWR_LED (-)	4	NC
5	I219_LAN (+)	6	NC
7	I219_LAN (-)	8	BUZZER
9	I225_LAN (-)	10	Ground
11	I225_LAN (+)	12	Power Button Signal
13	HDD_LED (+)	14	Reset Signal
15	HDD_LED (-)	16	Ground

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



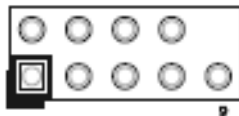
PIN No.	DESCRIPTION
1	Ground
2	TX_P
3	TX_N
4	Ground
5	RX_N
6	RX_P
7	Ground

J5: HDMI connector



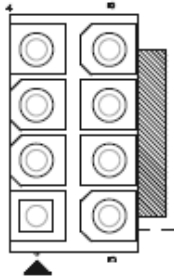
PIN No.	Description	PIN No.	Description
1	HDMI_D0_P	2	Ground
3	HDMI_D0_N	4	HDMI_D1_P
5	Ground	6	HDMI_D1_N
7	HDMI_D2_P	8	Ground
9	HDMI_D2_N	10	HDMI_D3_P
11	Ground	12	HDMI_D3_N
13	N/C	14	N/C
15	HDMI_DDC_CLK	16	HDMI_DDC_DATA
17	Ground	18	5V_HDMI
19	HDMI_HPD		

J9: Audio Pin Header



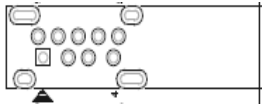
PIN No.	Description	PIN No.	Description
1	MIC_IN	2	Ground
3	LINE_IN_L	4	Ground
5	LINE_IN_R	6	Ground
7	AUDIO_OUT_L	8	Ground
9	AUDIO_OUT_R		

J15: ATX 8 Pin Connector(For CPU Power)



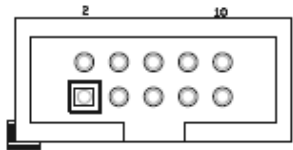
PIN No.	Description	PIN No.	Description
1	Ground	5	+12V
2	Ground	6	+12V
3	Ground	7	+12V
4	Ground	8	+12V

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



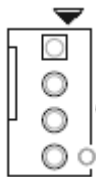
PIN No.	DESCRIPTION
1	5VDual
2	USB2_N
3	USB2_P
4	Ground
5	USB3_RX_N
6	USB3_RX_P
7	Ground
8	USB3_TX_N
9	USB3_TX_P

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



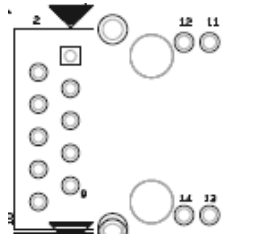
PIN No.	Description	PIN No.	Description
1	DCD#	2	RXD#
3	TXD#	4	DTR#
5	Ground	6	DSR#
7	RTS#	8	CTS#
9	RI#	10	NC

J20: CPU FAN



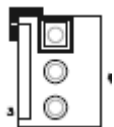
PIN No.	Description
1	Ground
2	12V
3	Fanin
4	Fanout

J21: RJ45 Connector for I225



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

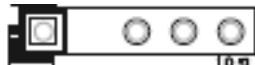
PIN No.	Description	PIN No.	Description
1	MDIO_P	2	MDIO_N
3	MDI1_P	4	MDI1_N
5	LAN_CT1	6	LAN_CT2
7	MDI2_P	8	MDI2_N
9	MDI3_P	10	MDI3_N
11	LED_100	12	LED_1000
13	LED_LINK#/ACT#	14	ACT_LED

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

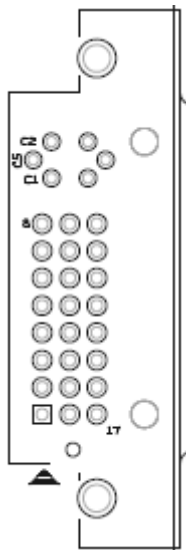


PIN No.	Description
1	Clock
2	NC
3	Ground
4	Data
5	VCC

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 Control 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()
{
```

ROBO-8114VG2AR

```
// 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 Control 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;
```

ROBO-8114VG2AR

```
// 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

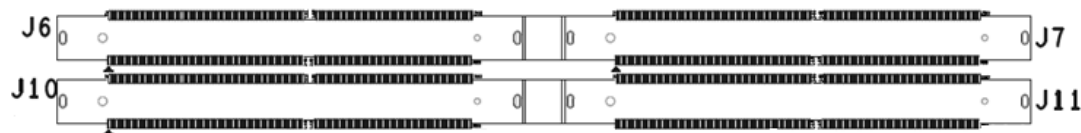
5.2 Main Memory

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.

Noted:

Base Intel daisy chain routing design, when inserting one memory stick, use DIMM slot J6 or J7 first; when inserting two memory sticks, it should be inserted in J6 and J7.



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 I225LM /I219LM Gigabit Ethernet Controller

- Intel I225LM 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 I225LM /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 I225LM /I219LM Gigabit Ethernet Controller

- Intel I225LM 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 I225LM /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

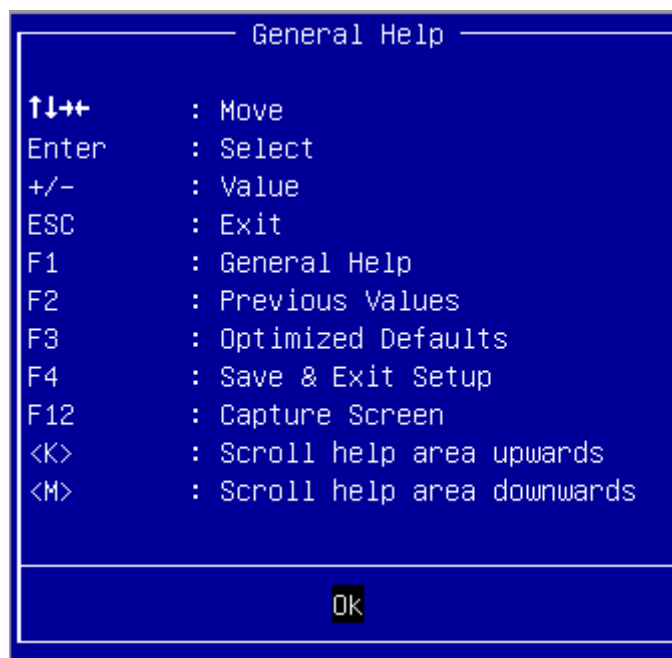
Power on the computer and the system will start POST (Power on Self Test) process. When the message below appears on the screen, press <Delete> or <ESC> key will enter BIOS setup screen.

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

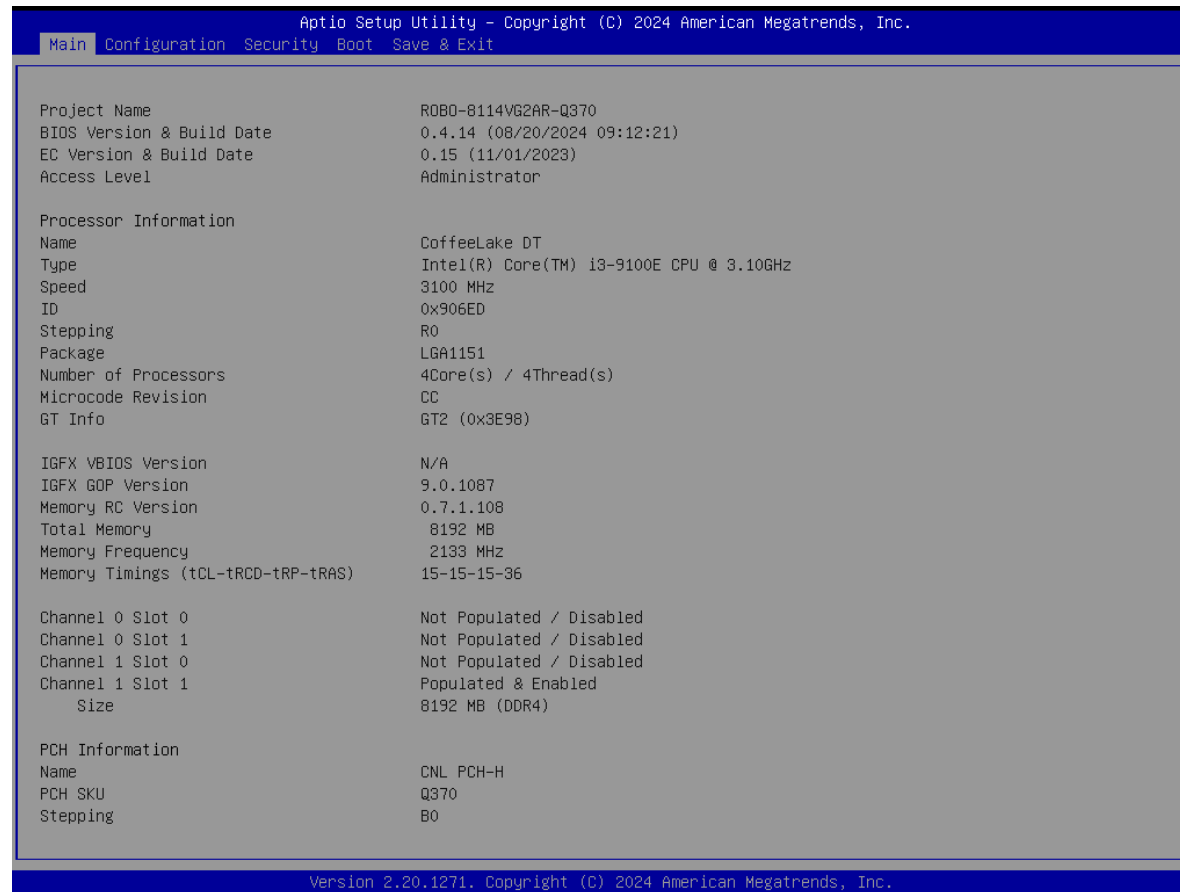
The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help Screen.



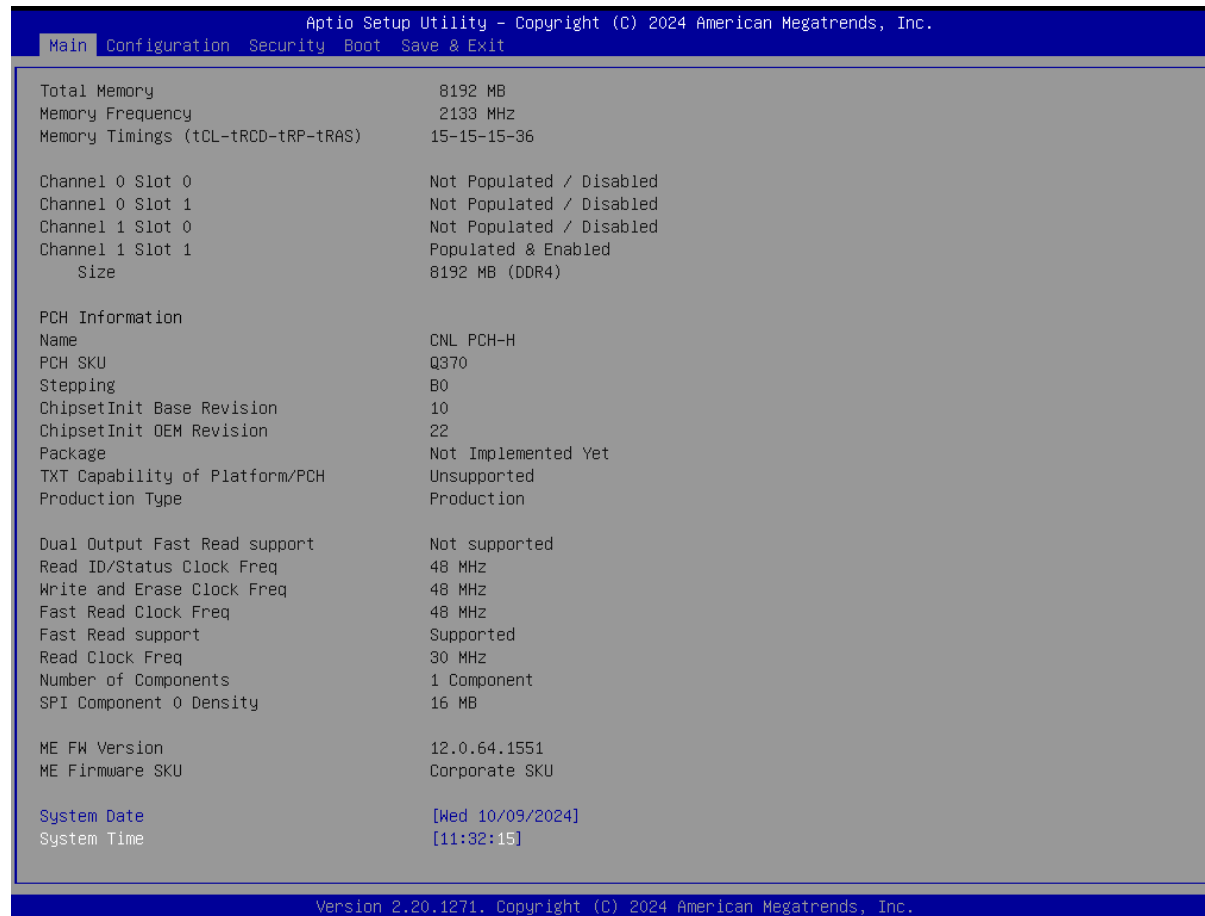
ROBO-8114VG2AR

7.2.1 Main

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



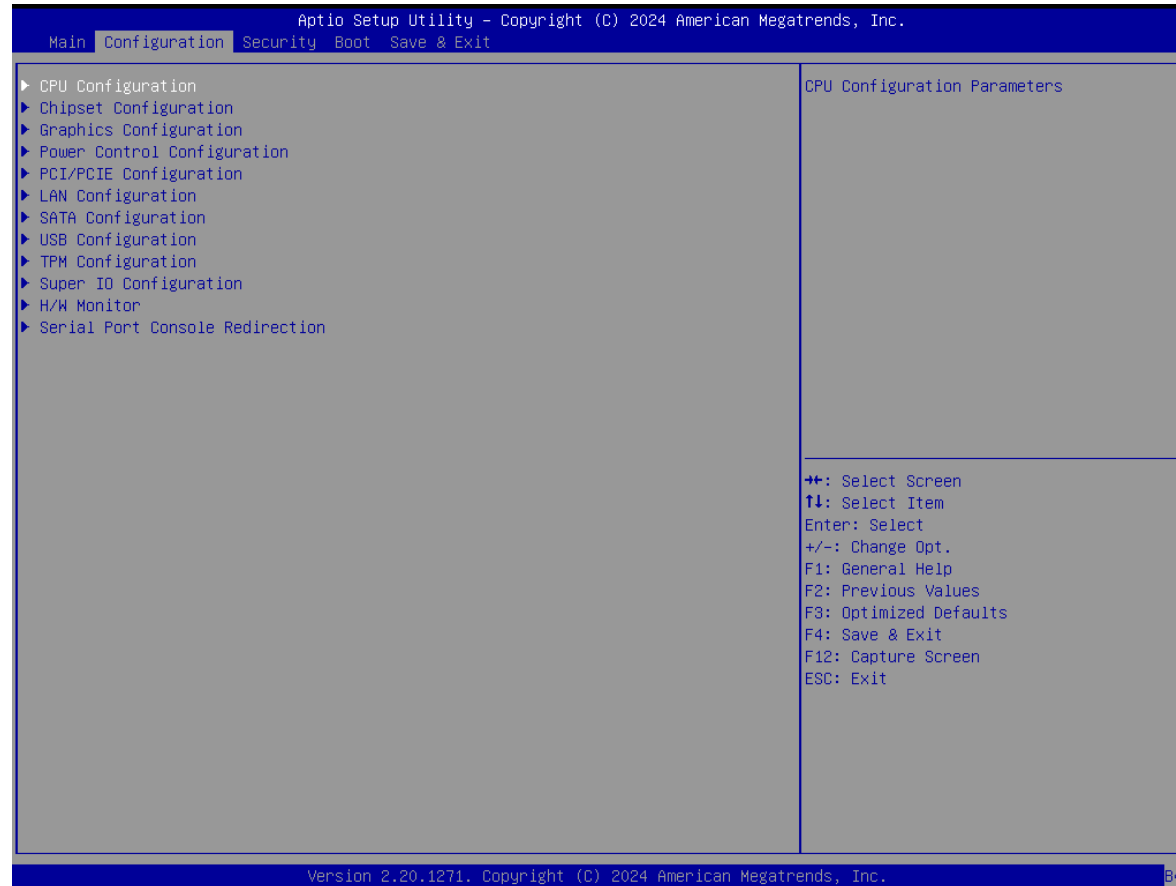
ROBO-8114VG2AR



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



ROBO-8114VG2AR

CPU Configuration

CPU Configuration Parameters

Configuration

CPU Configuration

Type	Intel(R) Core(TM) i3-9100E CPU @ 3.1...
ID	0x906ED
Speed	3100 MHz
L1 Data Cache	32 KB x 4
L1 Instruction Cache	32 KB x 4
L2 Cache	256 KB x 4
L3 Cache	6 MB
L4 Cache	N/A
VMX	Supported
SMX/TXT	Not Supported

CPU Flex Ratio Override

CPU Flex Ratio Settings

Active Processor Cores

Boot performance mode

Intel (VMX) Virtualization Technology

Intel(R) SpeedStep(tm)

Intel(R) Speed Shift Technology

Turbo Mode

C states

Enhanced C-states

C-State Auto Demotion

C-State Un-demotion

Package C-State Demotion

Package C-State Un-demotion

CState Pre-Wake

IO MWAIT Redirection

Package C State Limit

[Disabled]

31

[All]

[Max Non-Turbo Performance]

[Enabled]

[Enabled]

[Enabled]

[Enabled]

[Enabled]

[Enabled]

[C1 and C3]

[C1 and C3]

[Disabled]

[Disabled]

[Enabled]

[Disabled]

[Auto]

Enable/Disable CPU Flex Ratio Programming

++: 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

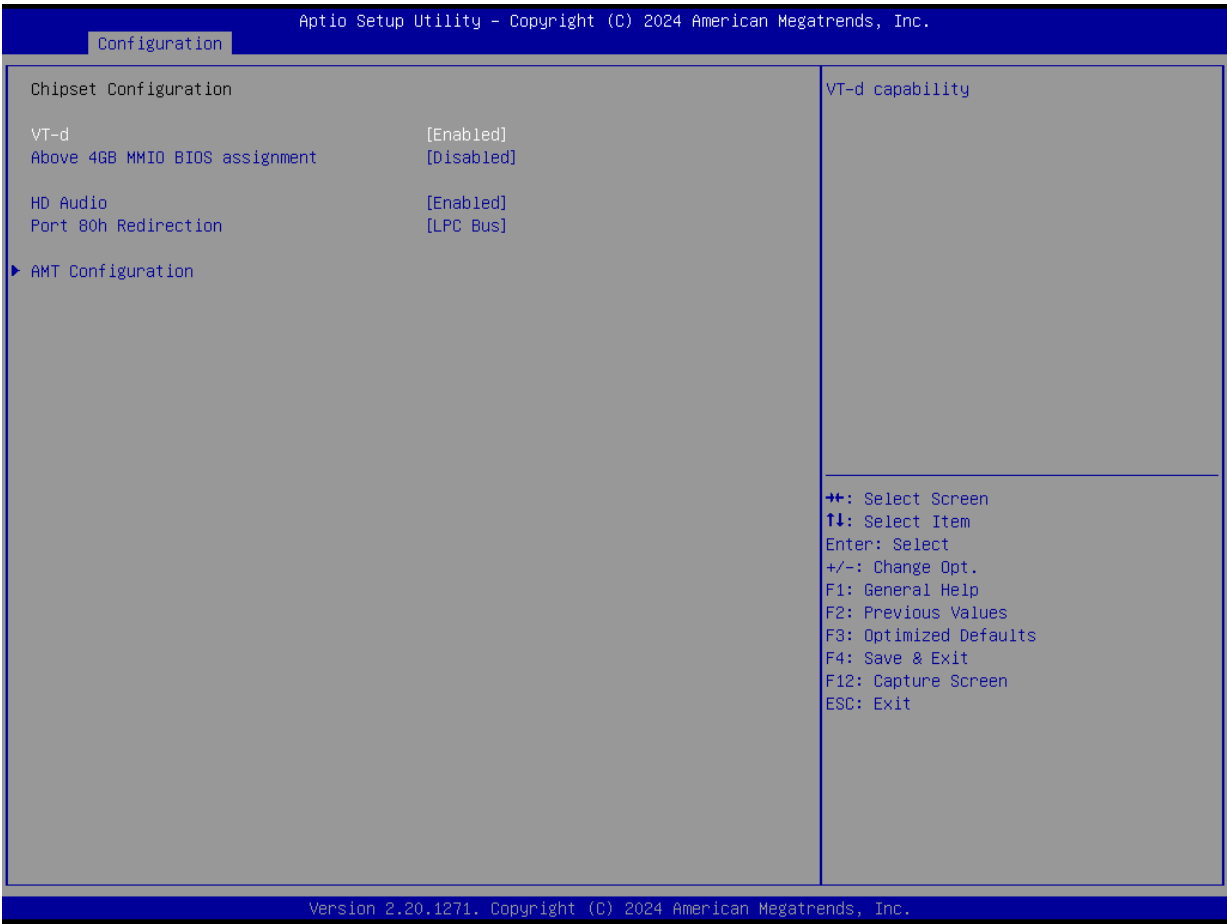
Version 2.20.1271. Copyright (C) 2024 American Megatrends, Inc.

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
Boot performance mode	Select the performance state that the BIOS will set starting from reset vector	Max Battery ★Max Non-Turbo Performance Turbo Performance
Intel (VMX) Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vander pool Technology.	★Enabled, Disabled
Intel® Speed Step™	Allows more than two frequency ranges to be supported.	★Enabled, Disabled
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	★Enabled, Disabled
Turbo Mode	Enable/Disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled)	★Enabled, Disabled
C states	Enable/disable CPU Power Management. Allows CPU to go to C states It's not 100% utilized	★Enabled, Disabled
Enhanced C-states	Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-state	★Enabled, Disabled
C-State Auto Demotion	Configure C-State Auto Demotion	★C1 and C3, Disable, C1 ,C3
C-State Un-demotion	Configure C-State Un-demotion	★C1 and C3, Disable, C1 ,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	★Enabled, Disabled
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	★Auto C0/C1,C2,C3,C6,C7, C7S, C8,C9,C10,Cpu Default,

ROBO-8114VG2AR

Chipset Configuration

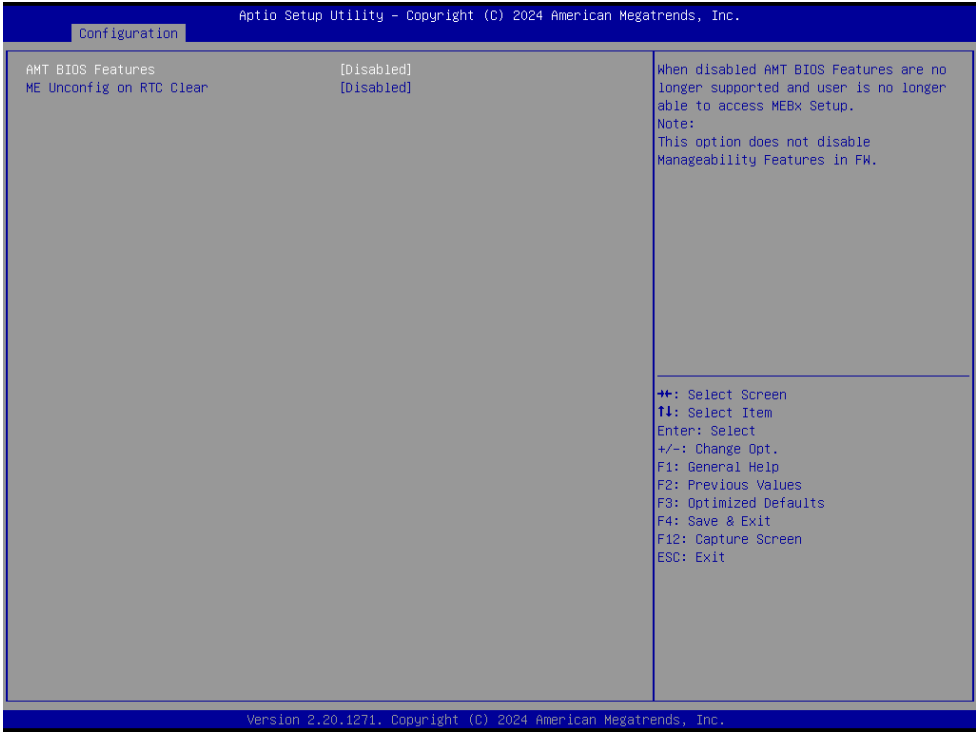
Configuration Chipset feature



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

AMT Configuration

Configure Intel® Active Management Technology Parameters

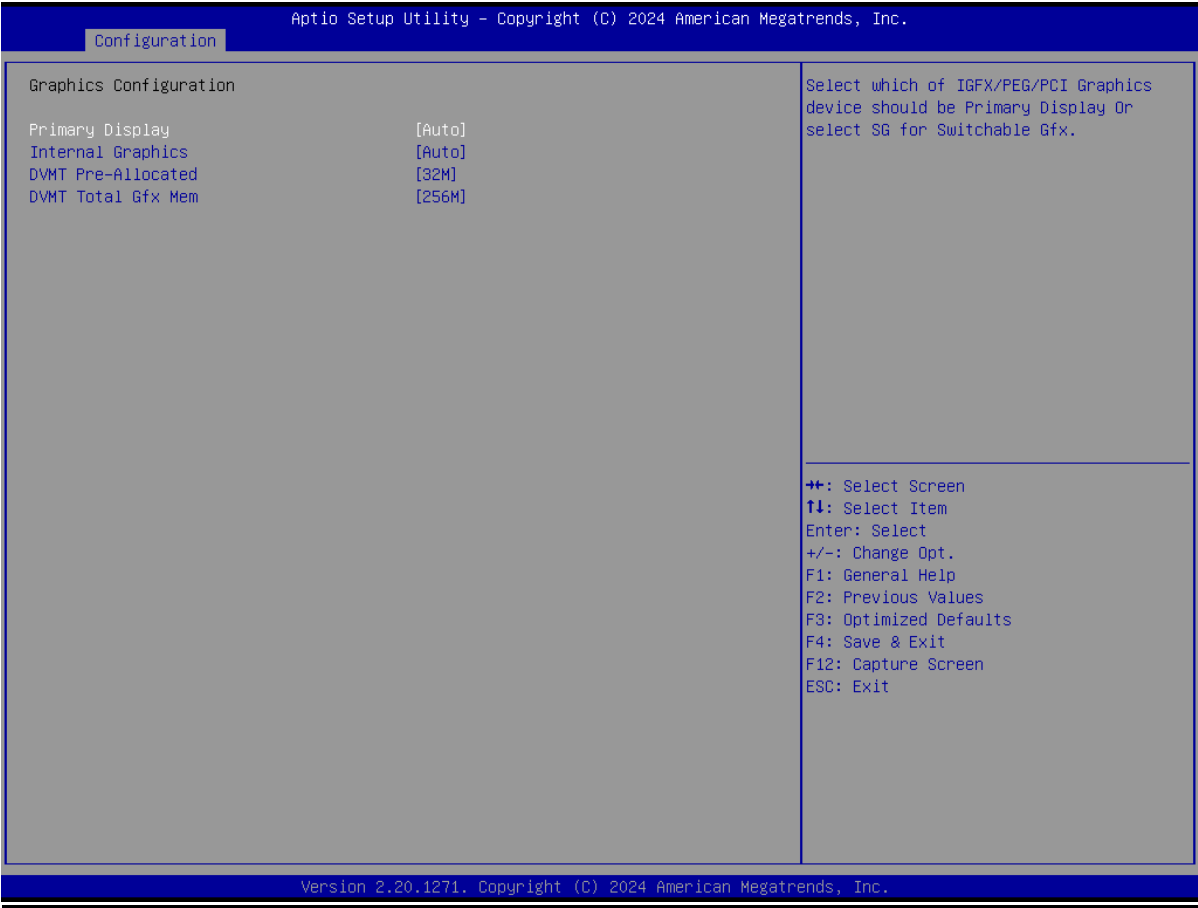


Feature	Description	Options
AMT BIOS Features	When disable AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup. Note: This option does not disable Manageability Features in FW	★Disabled, Enabled
ME Unconfig on RTC Clear	When Disable ME will not be unconfigured on RTC Clear	★Disabled, Enabled

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Graphics Configuration

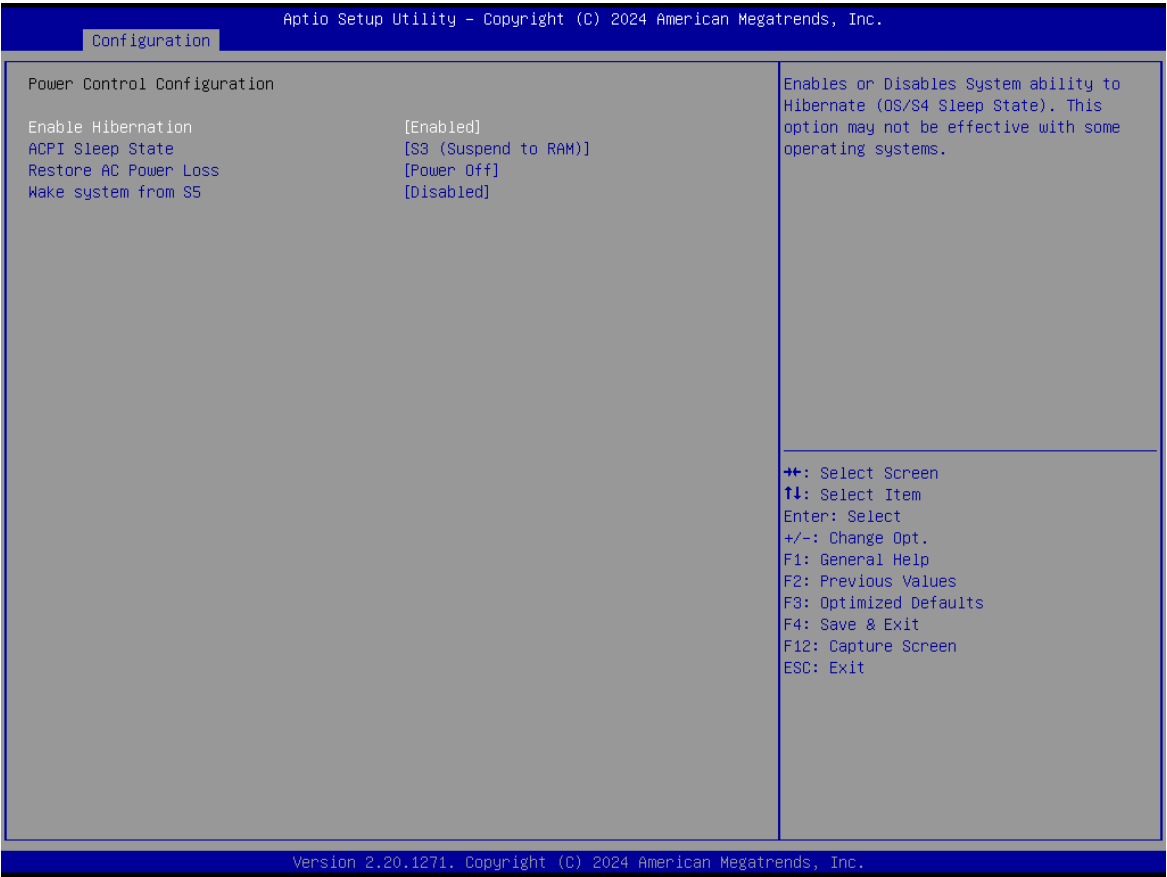
Configuration Graphics Settings



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, PCI
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,0M,64M, 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

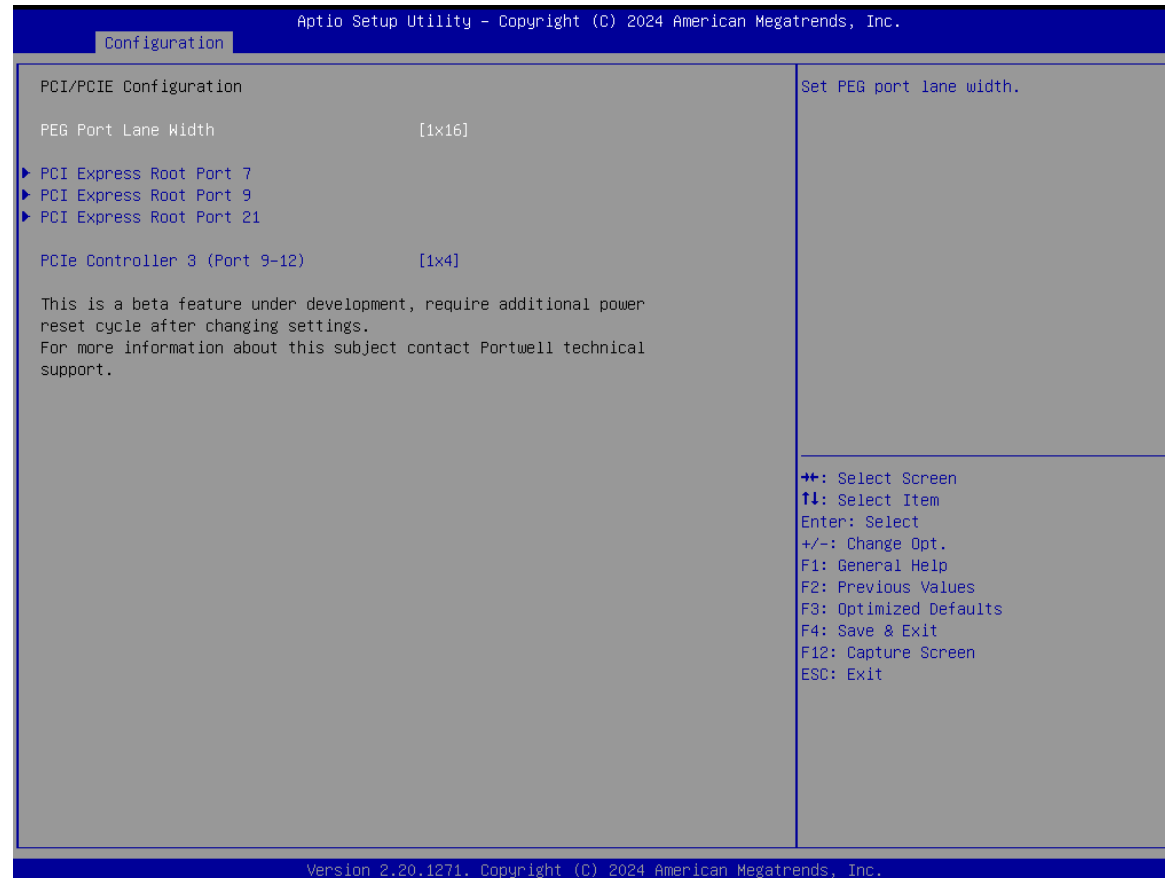
System Power Control Configuration Parameters

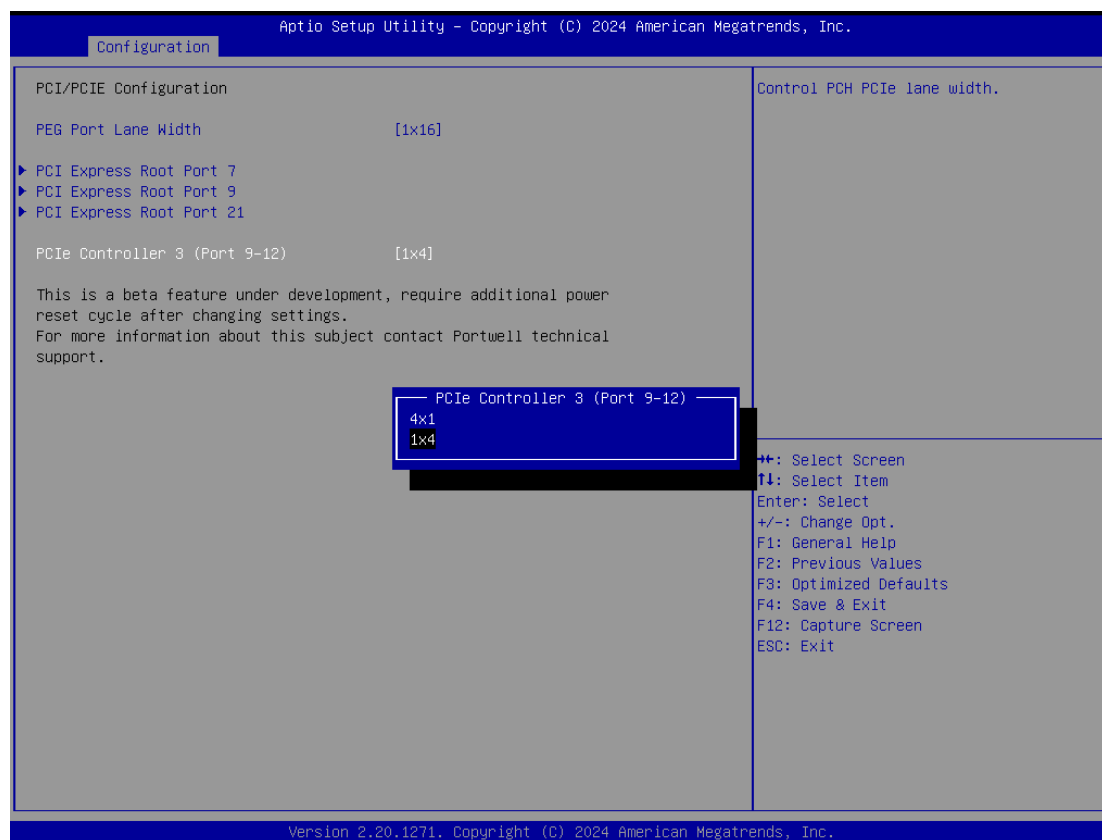


Feature	Description	Options
Enable Hibernation	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.	★Enabled , Disabled
ACPI Sleep State	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.	★S3 (Suspend 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, Power On , Last State
Wake System from S5 via RTC	Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec Specified/programmed by the Tools from OS	★Disabled, Enabled

PCI/PCIE Configuration

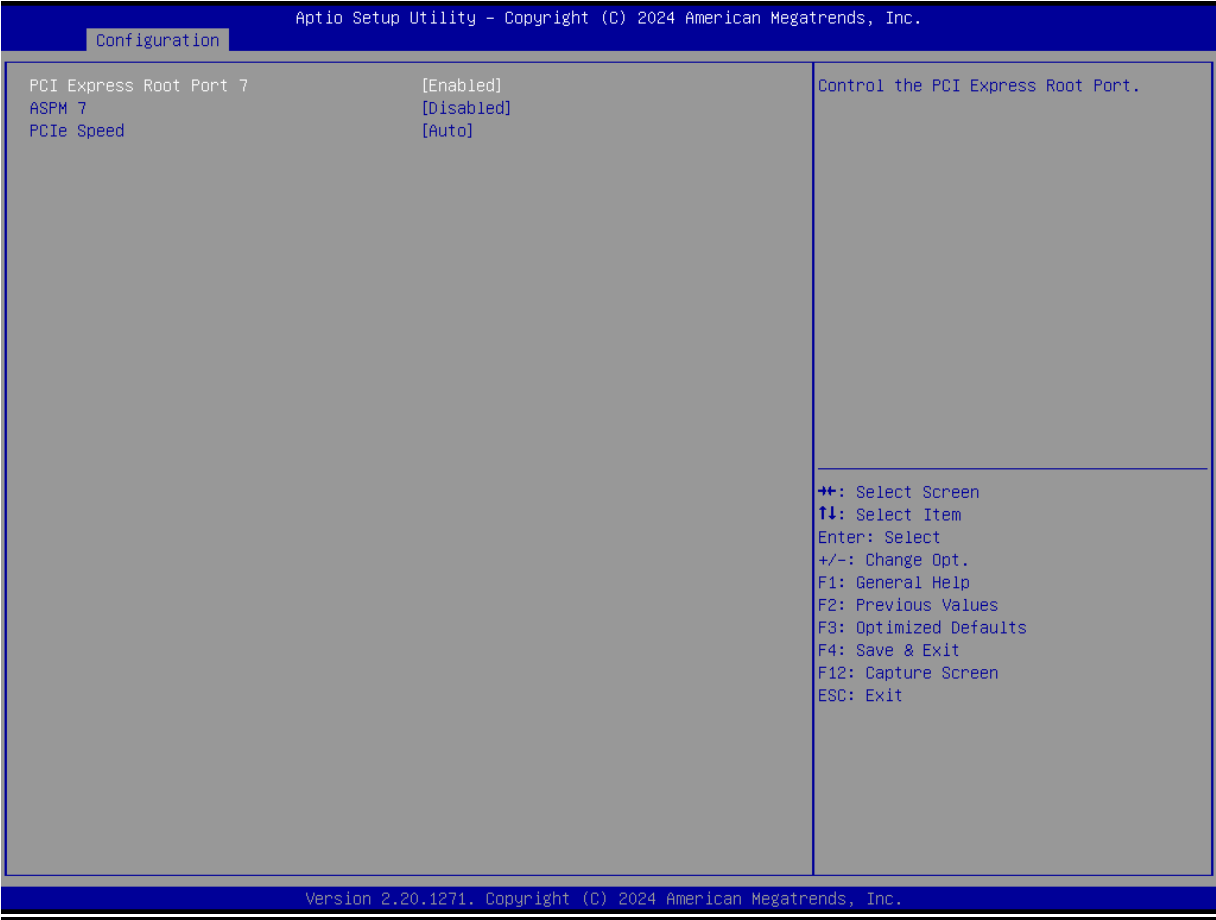
PCI, PCI-X and PCI Express Settings





Feature	Description	Options
PEG Port Lane Width	Set PEG port Lane width	★ 1x16, 2x8, 1x8, 2x4
PCIe Controller 3 (port 9-12)	Control PCH PCIe lane width.	★ 1x4, 4x1

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: Force L0s – Force all links to L0s State AUTO-BIOS auto configure DISABLE – Disables ASPM	★Disabled, L0s, L1, L0sL1, Auto
PCIe Speed	Select PCI Express port speed	★Auto, Gen1, Gen2, Gen3

LAN Configuration

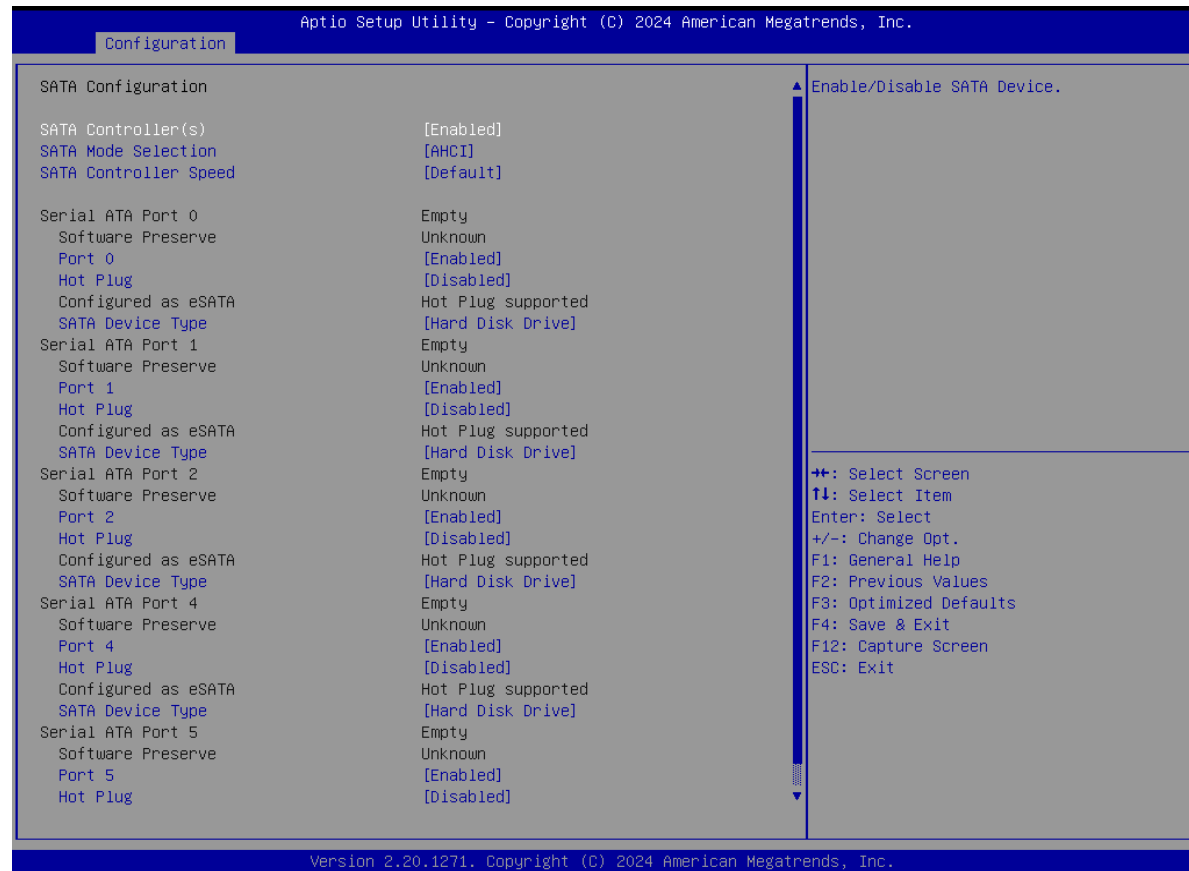
Configuration on Board LAN device.



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

SATA Configuration

SATA Device Options Settings

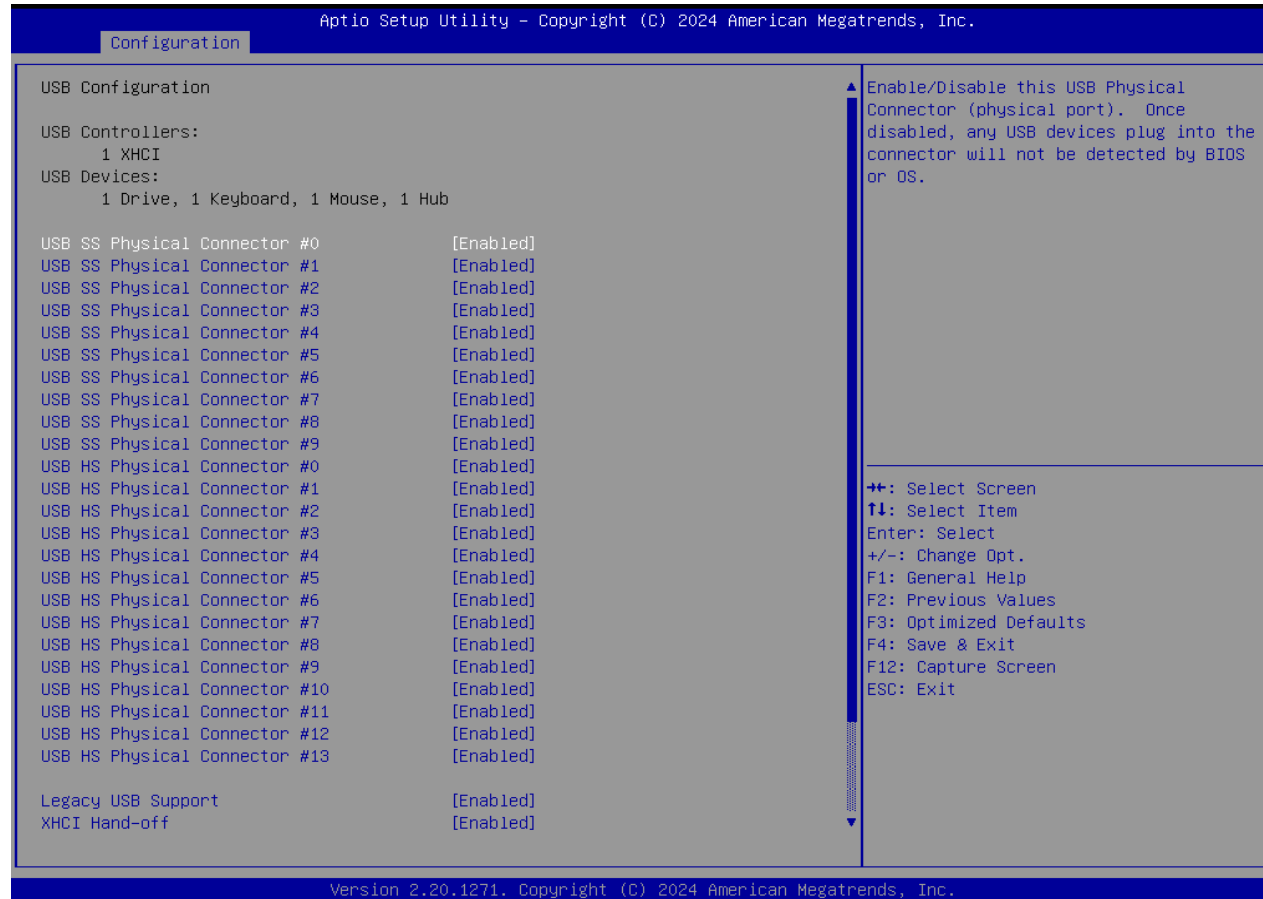


Feature	Description	Options
SATA Controller(s)	Enable/disable the SATA controllers.	★Enabled , Disabled
SATA Mode Selection	Determines how SATA controller(s) operate.	★AHCI, Intel RST Premium with Intel Optane System Acceleration
SATA Mode Selection – [Intel RST Premium with Intel Optane System Acceleration]		
RAID Device ID	Choose RAID Device ID	★Client, Alternate
SATA Controller Speed	Indicates the maximum speed the SATA controller can support	★Default, Gen1, Gen2, Gen3
Serial ATA Port 0 ~ Serial ATA Port 5		
Port 0 ~ Port 5	Enable or Disable SATA Port	★Enabled , Disabled
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, Solid State Drive

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USB Configuration

USB Configuration Parameters



Feature	Description	Options
USB SS Physical Connector #0~9	Enable/Disable this USB Physical Connector (physical port). Once disable, any USB devices plug into the connector will not be detected by BIOS or OS.	★Enabled , Disabled
USB HS Physical Connector #0~13	Enable/Disable this USB Physical Connector (physical port). Once disable, any USB devices plug into the connector will not be detected by BIOS or OS.	★Enabled , Disabled
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

ROBO-8114VG2AR

TPM Configuration

Trusted Computing Setting

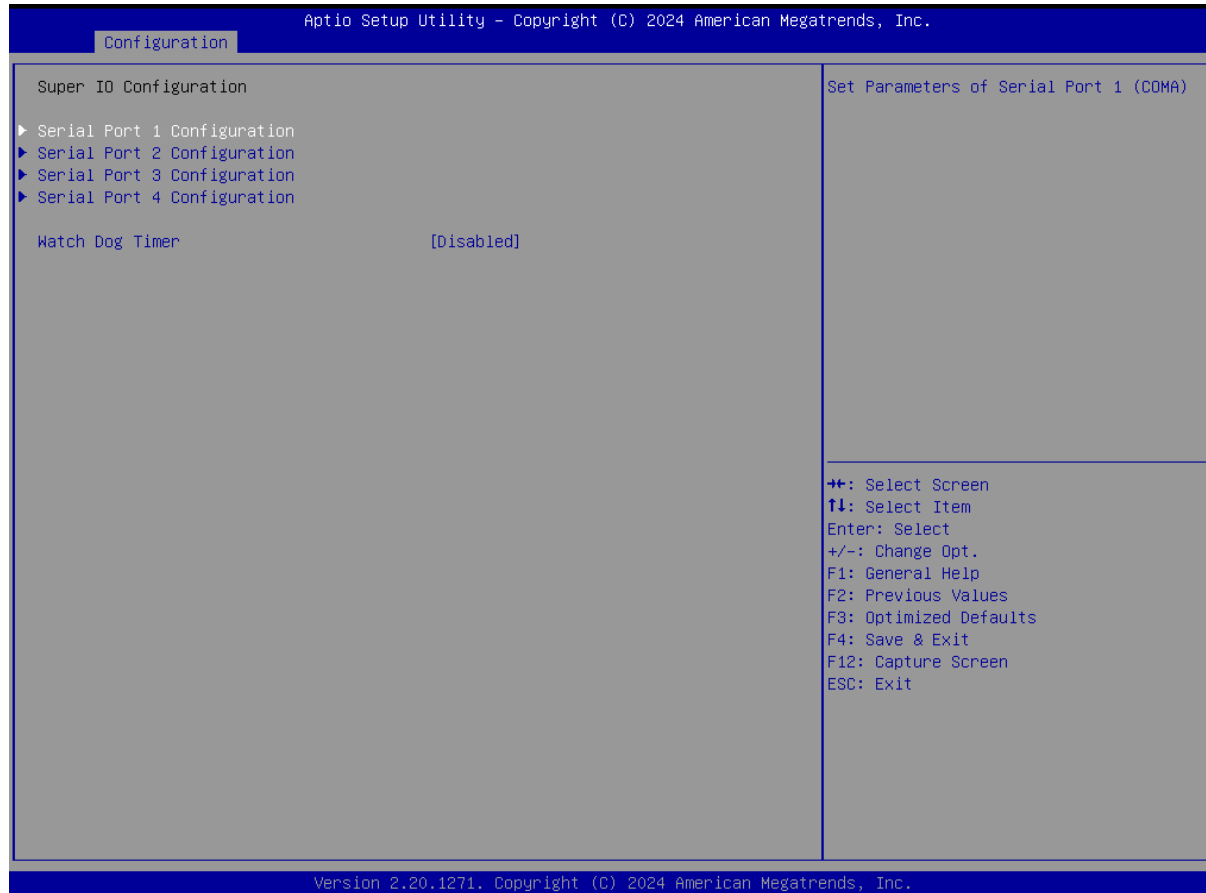
Aptio Setup Utility - Copyright (C) 2024 American Megatrends, Inc.		
Configuration		
TPM20 Device Found		Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Security Device Support	[Enable]	
Active PCR banks	SHA-1,SHA256	
Available PCR banks	SHA-1,SHA256	
SHA-1 PCR Bank	[Enabled]	
SHA256 PCR Bank	[Enabled]	
Pending operation	[None]	
Platform Hierarchy	[Enabled]	
Storage Hierarchy	[Enabled]	
Endorsement Hierarchy	[Enabled]	
TPM2.0 UEFI Spec Version	[TCG_2]	**+: 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
Physical Presence Spec Version	[1.3]	
TPM 20 InterfaceType	[TIS]	
Device Select	[Auto]	
Version 2.20.1271. Copyright (C) 2024 American Megatrends, Inc.		

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.	★Enabled , Disabled
SHA-1 PCR Bank	Enables or Disables SHA-1 PCR Bank	★Enabled , Disabled
SHA256 PCR Bank	Enables or Disables SHA256 PCR Bank	★Enabled , Disabled
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	★Enabled , Disabled
Storage Hierarchy	Enables or Disables Storage Hierarchy	★Enabled , Disabled
Endorsement Hierarchy	Enables or Disables Endorsement Hierarchy	★Enabled , Disabled
TPM2.0 UEFI Spec Version	Select the TCG2 Spec Version Support TCG_1_2: the Compatible mode for Win8/Win10 TCG_2: Support new TCG2 protocol and event format for Win10 or later	★TCG_2, TCG_1_2
Physical Presence Spec Version	Select to Tell O.S. to Support PPI Spec Version 1.2 or 1.3	★1.3, 1.2
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

ROBO-8114VG2AR

Super IO Configuration

System Super IO Chip Parameters.





Feature	Description	Options
Watch Dog Timer	Enable/Disable Watch Dog Timer	★Disabled, Enabled
Watch Dog Timer – [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

The screenshot shows the 'Serial Port 1 Configuration' screen within the Aptio Setup Utility. The title bar at the top reads 'Aptio Setup Utility - Copyright (C) 2024 American Megatrends, Inc.' and a 'Main' tab is visible. The screen is divided into two main sections. The left section, titled 'Serial Port 1 Configuration', contains the following settings: 'Serial Port' is set to '[Enabled]', 'Device Settings' are 'IO=3F8h; IRQ=4;', and 'Change Settings' are '[IO=3F8h; IRQ=4;]'. The right section is titled 'Enable or Disable Serial Port (COM)'. At the bottom right of the screen, a list of keyboard shortcuts is provided: '+*': Select Screen, '↑↓': Select Item, 'Enter': Select, '+/-': Change Opt., 'F1': General Help, 'F2': Previous Values, 'F3': Optimized Defaults, 'F4': Save & Exit, 'F12': Capture Screen, and 'ESC': Exit. The footer of the screen displays 'Version 2.20.1271. Copyright (C) 2024 American Megatrends, Inc.'

Serial Port 1 Configuration	
Serial Port	[Enabled]
Device Settings	IO=3F8h; IRQ=4;
Change Settings	[IO=3F8h; IRQ=4;]

Enable or Disable Serial Port (COM)

+*: 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

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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, IO=240h; IRQ=3,4,5,6,7,10,11,12 IO=248h; IRQ=3,4,5,6,7,10,11,12 IO=250h; IRQ=3,4,5,6,7,10,11,12 IO=258h; IRQ=3,4,5,6,7,10,11,12

Serial Port 2 Configuration

Set Parameters of Serial Port 2

The screenshot shows the 'Aptio Setup Utility' interface with the 'Main' tab selected. The title bar reads 'Aptio Setup Utility - Copyright (C) 2024 American Megatrends, Inc.'. The main content area is titled 'Serial Port 2 Configuration' and contains the following settings:

Serial Port	[Enabled]
Device Settings	IO=2F8h; IRQ=3;
Change Settings	[IO=2F8h; IRQ=3;]

On the right side of the screen, there is a section titled 'Enable or Disable Serial Port (COM)' which is currently empty. Below this section, a list of keyboard shortcuts is provided:

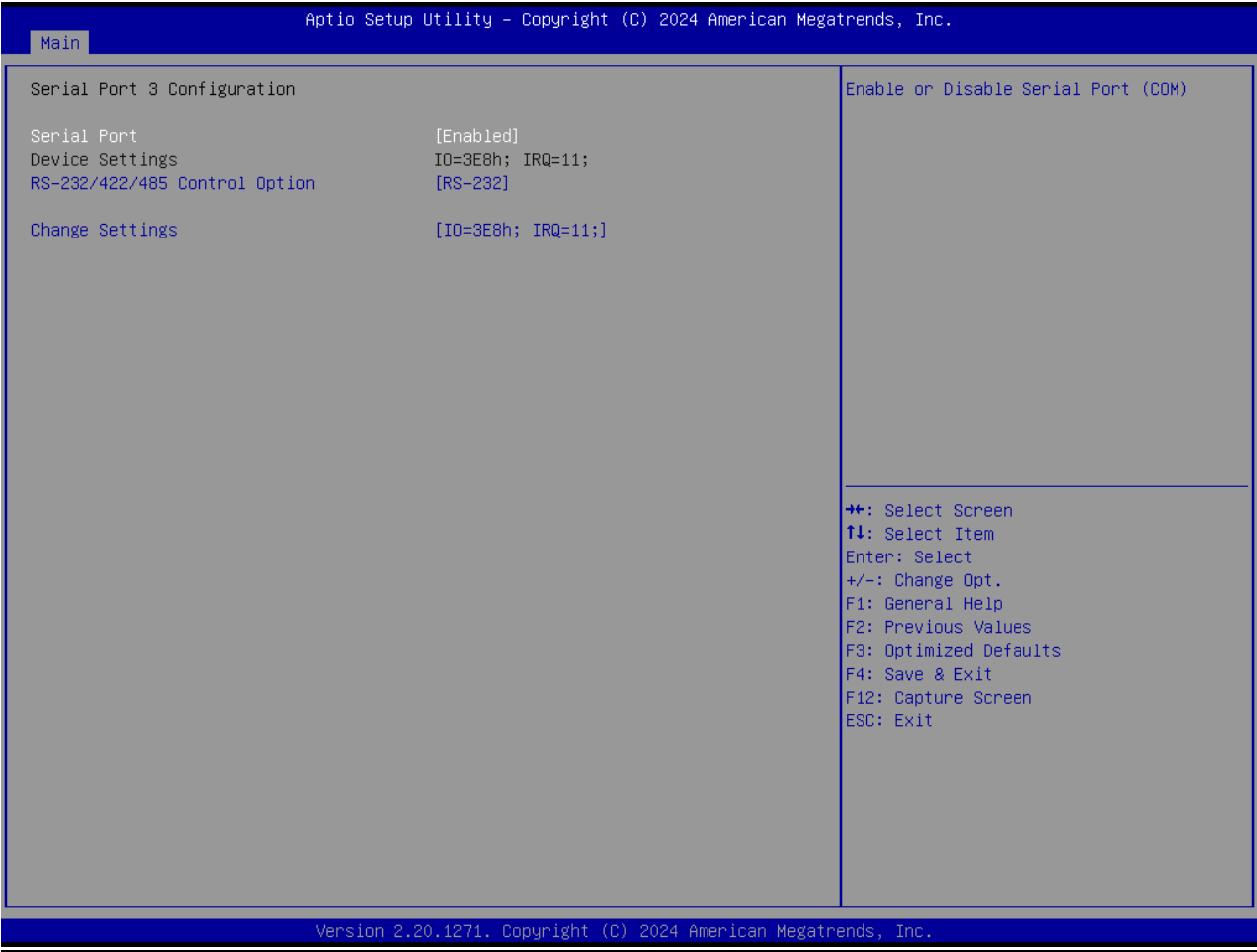
- +/: Select Screen
- ↑↓: Select Item
- Enter: Select
- +/-: Change Opt.
- F1: General Help
- F2: Previous Values
- F3: Optimized Defaults
- F4: Save & Exit
- F12: Capture Screen
- ESC: Exit

The bottom status bar indicates 'Version 2.20.1271. Copyright (C) 2024 American Megatrends, Inc.'.

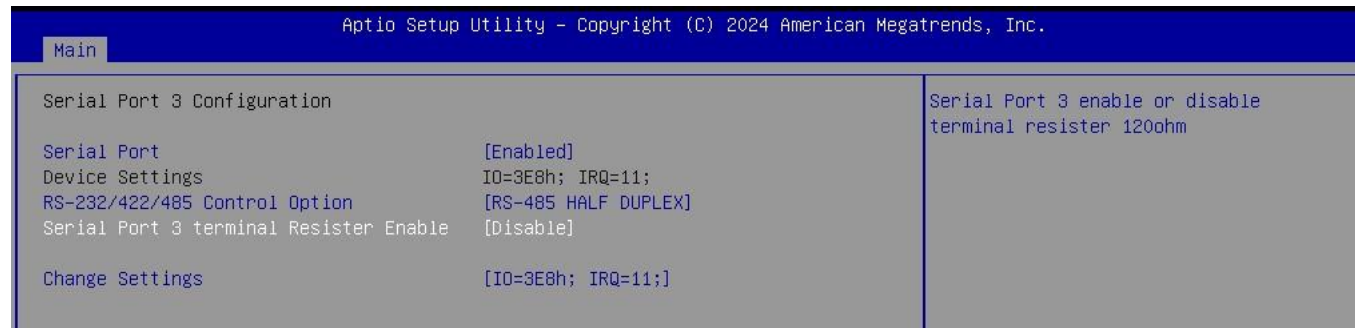
Feature	Description	Options
Serial Port	Enable or Disable Serial Port (COM)	★ Enabled, Disabled
Change Settings	Select an optimal settings for Super IO Device	★ IO=2F8h; IRQ=3, Auto, IO=240h; IRQ=3,4,5,6,7,10,11,12 IO=248h; IRQ=3,4,5,6,7,10,11,12 IO=250h; IRQ=3,4,5,6,7,10,11,12 IO=258h; IRQ=3,4,5,6,7,10,11,12

Serial Port 3 Configuration

Set Parameters of Serial Port 3



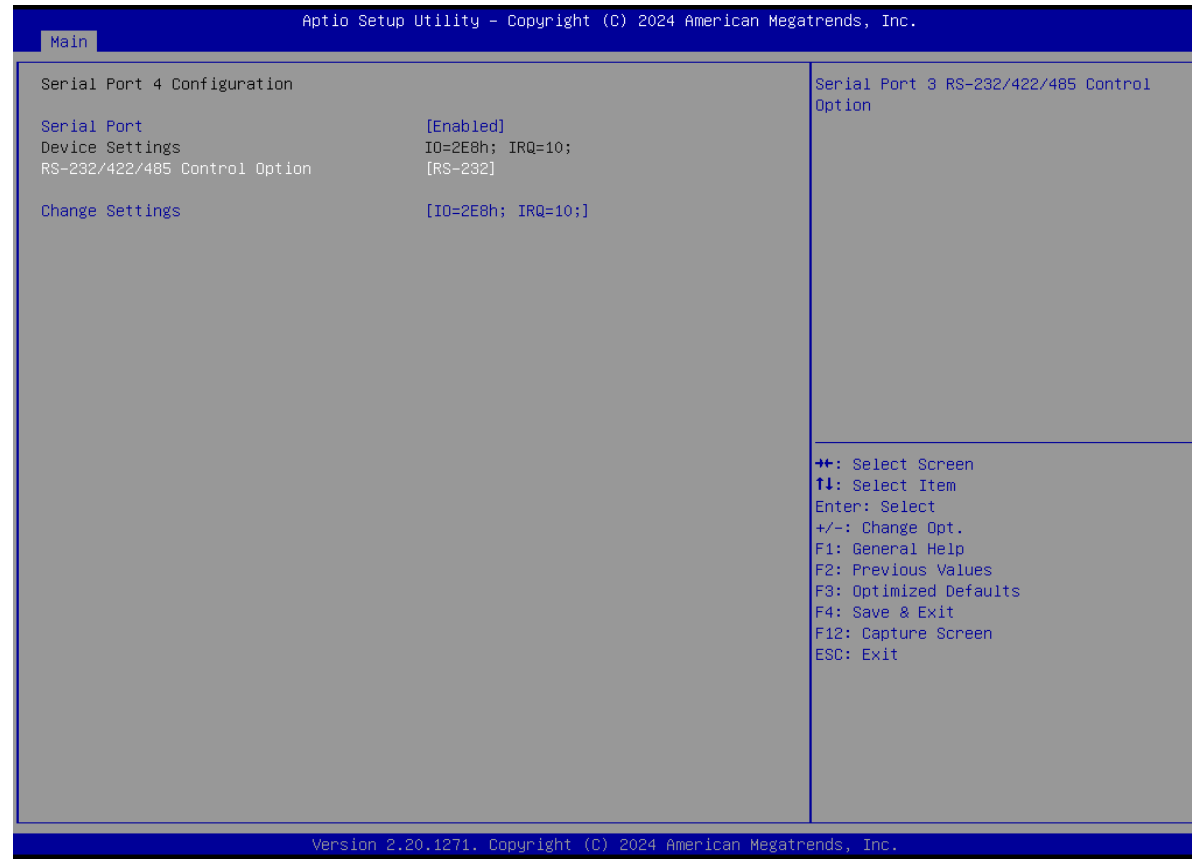
ROBO-8114VG2AR

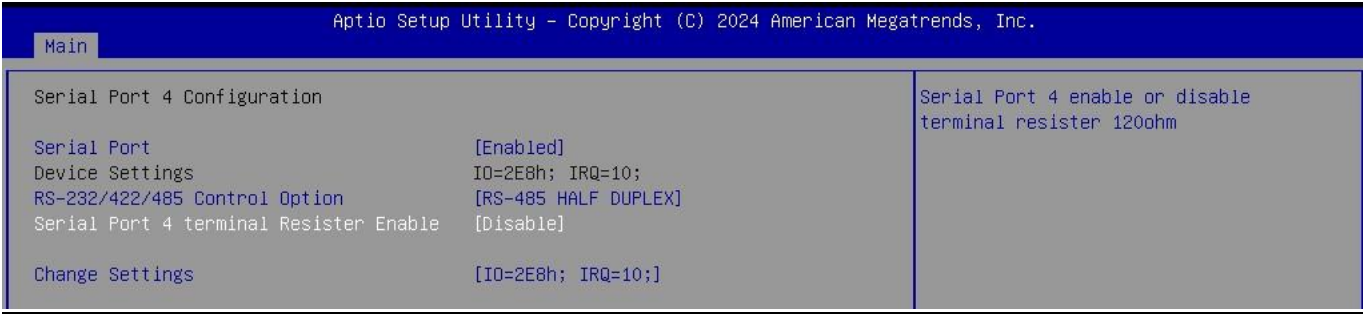


Feature	Description	Options
Serial Port	Enable or Disable Serial Port (COM)	★Enabled, Disabled
RS-232/422/485 Control Option	Serial port 3 RS-232/422/485 Control Option	★RS-232, RS 485 HALF DUPLEX, RS-422 FLL DUPLEX
RS-232/422/485 Control Option – [RS-422 FLL DUPLEX / RS 485 HALF DUPLEX]		
Serial Port 3 terminal Resister Enabled	Serial Port 3 enable or disable terminal Resister 120ohm	★Disabled, Enabled
Change Settings	Select an optimal settings for Super IO Device	★IO=3E8h; IRQ=11, Auto, IO=240h; IRQ=3,4,5,6,7,10,11,12 IO=248h; IRQ=3,4,5,6,7,10,11,12 IO=250h; IRQ=3,4,5,6,7,10,11,12 IO=258h; IRQ=3,4,5,6,7,10,11,12

Serial Port 4 Configuration

Set Parameters of Serial Port 4

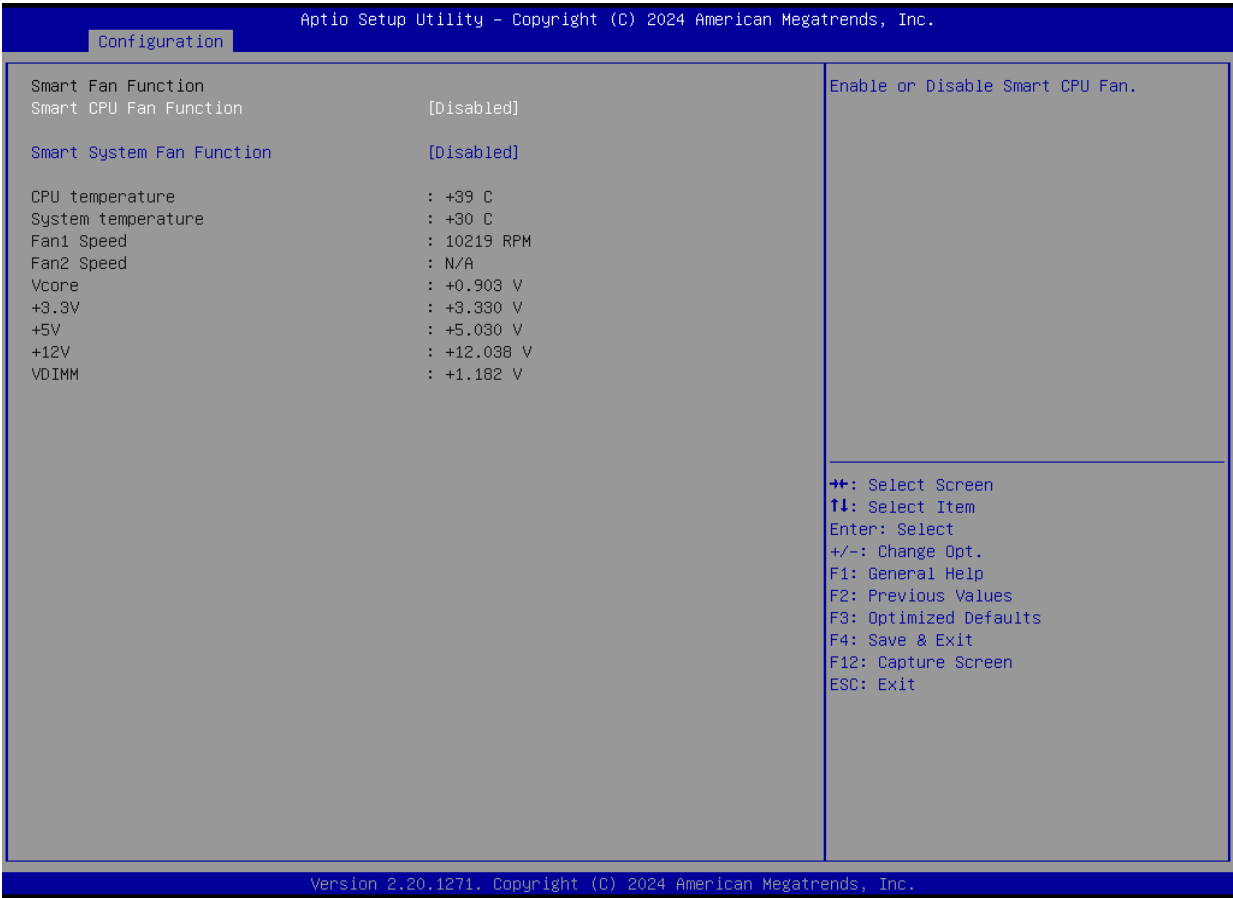


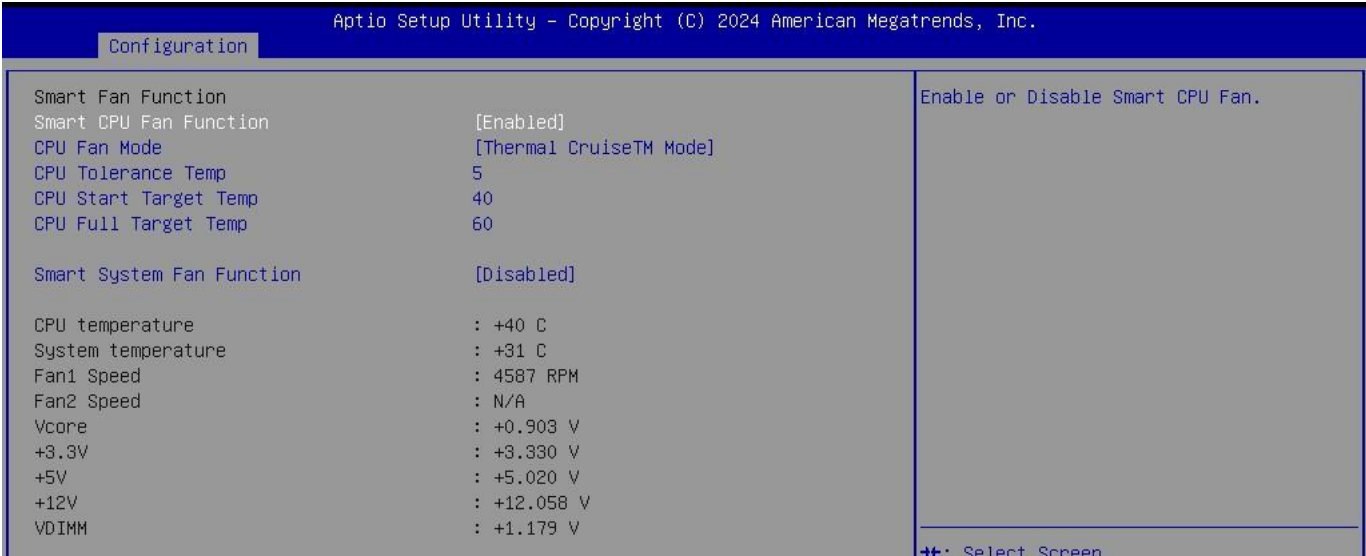


Feature	Description	Options
Serial Port	Enable or Disable Serial Port (COM)	★Enabled, Disabled
RS-232/422/485 Control Option	Serial port 4 RS-232/422/485 Control Option	★RS-232, RS 485 HALF DUPLEX, RS-422 FLL DUPLEX
RS-232/422/485 Control Option – [RS-422 FLL DUPLEX / RS 485 HALF DUPLEX]		
Serial Port 4 terminal Resister Enabled	Serial Port 4 enable or disable terminal Resister 120ohm	★Disabled, Enabled
Change Settings	Select an optimal settings for Super IO Device	★IO=2E8h; IRQ=10, Auto, IO=240h; IRQ=3,4,5,6,7,10,11,12 IO=248h; IRQ=3,4,5,6,7,10,11,12 IO=250h; IRQ=3,4,5,6,7,10,11,12 IO=258h; IRQ=3,4,5,6,7,10,11,12

H/W Monitor

Monitor hardware status

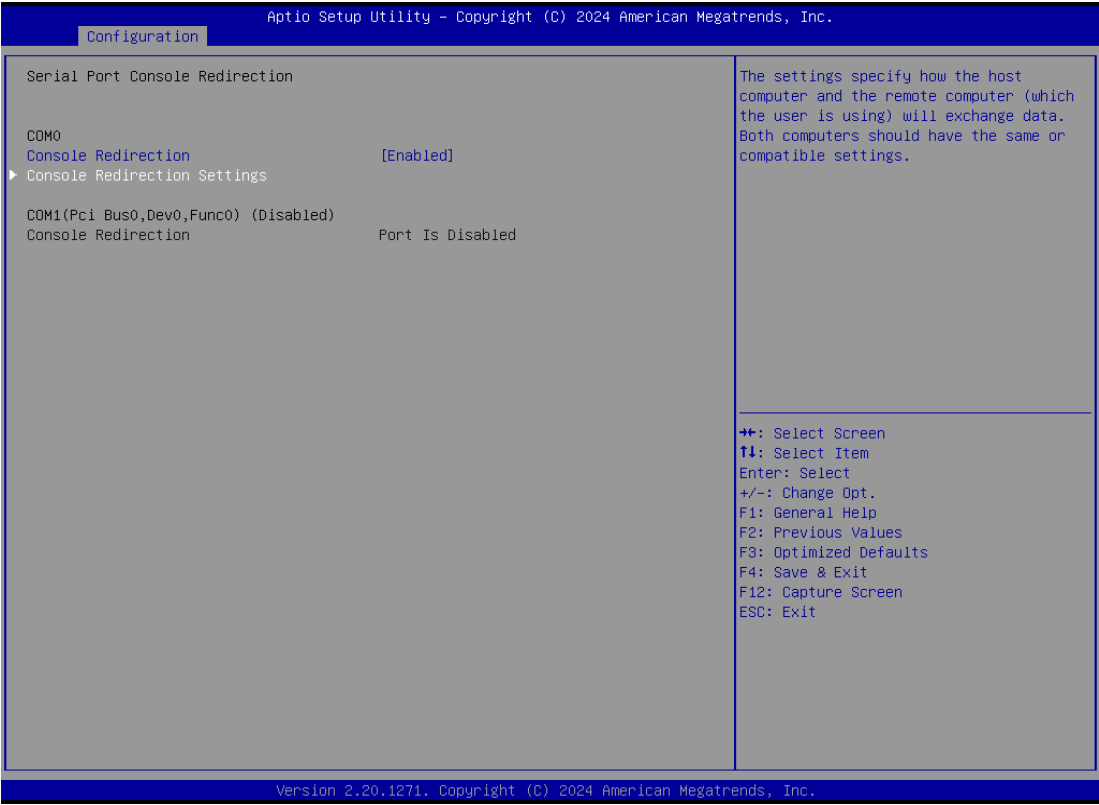




Feature	Description	Options
Smart CPU Fan Function	Enable or Disable Smart CPU Fan	★Disabled, Enabled
Smart CPU Fan Function – [Enabled]		
CPU Fan Mode	Smart Fan Mode Select	★Thermal Cruise™ Mode, Fan Speed Cruise™ Smart Fan™ III Mode
CPU Tolerance Temp	CPU Fan Tolerance Temperature	★5
CPU Start Target Temp	CPU Start Fan Target Temperature.	★40

Feature	Description	Options
CPU Full Target Temp	CPU Full Fan Target Temperature.	★60
Smart System Fan Function	Enable or Disable Smart System Fan	★Disabled, Enabled
Smart System Fan Function – [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

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Configuration

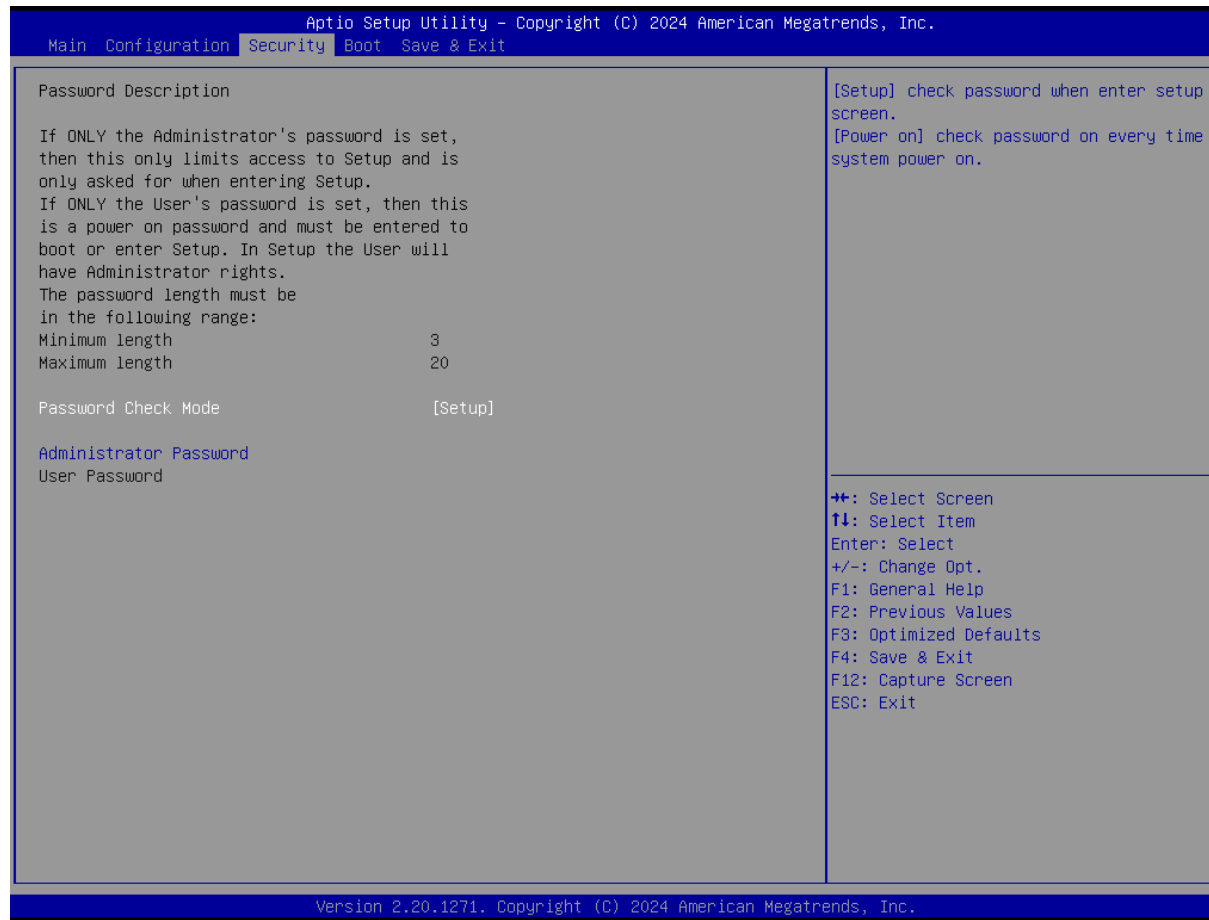
COMO		Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Console Redirection Settings		
Terminal Type	[ANSI]	
Bits per second	[115200]	
Data Bits	[8]	
Parity	[None]	
Stop Bits	[1]	
Flow Control	[None]	
VT-UTF8 Combo Key Support	[Enabled]	
Recorder Mode	[Disabled]	
Resolution 100x31	[Disabled]	
Putty KeyPad	[VT100]	

++: 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

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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

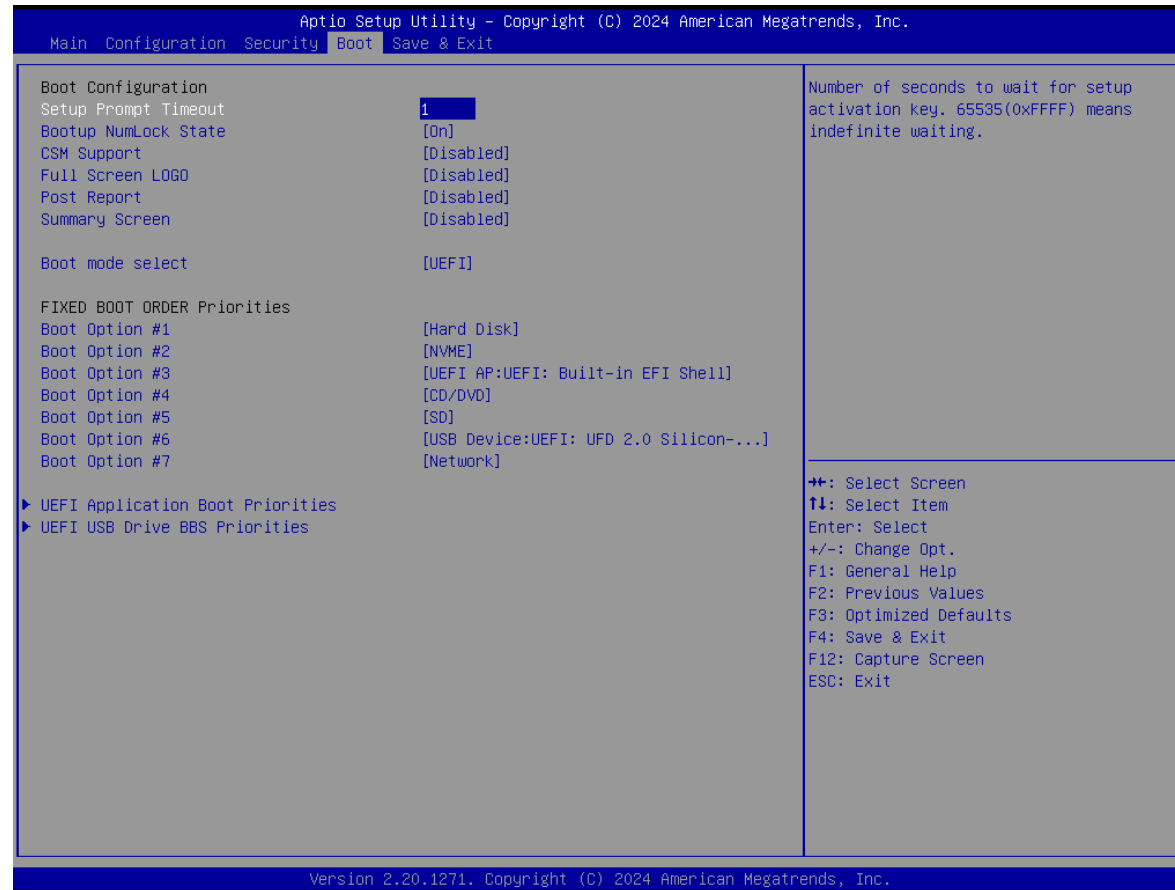
7.2.3 Security



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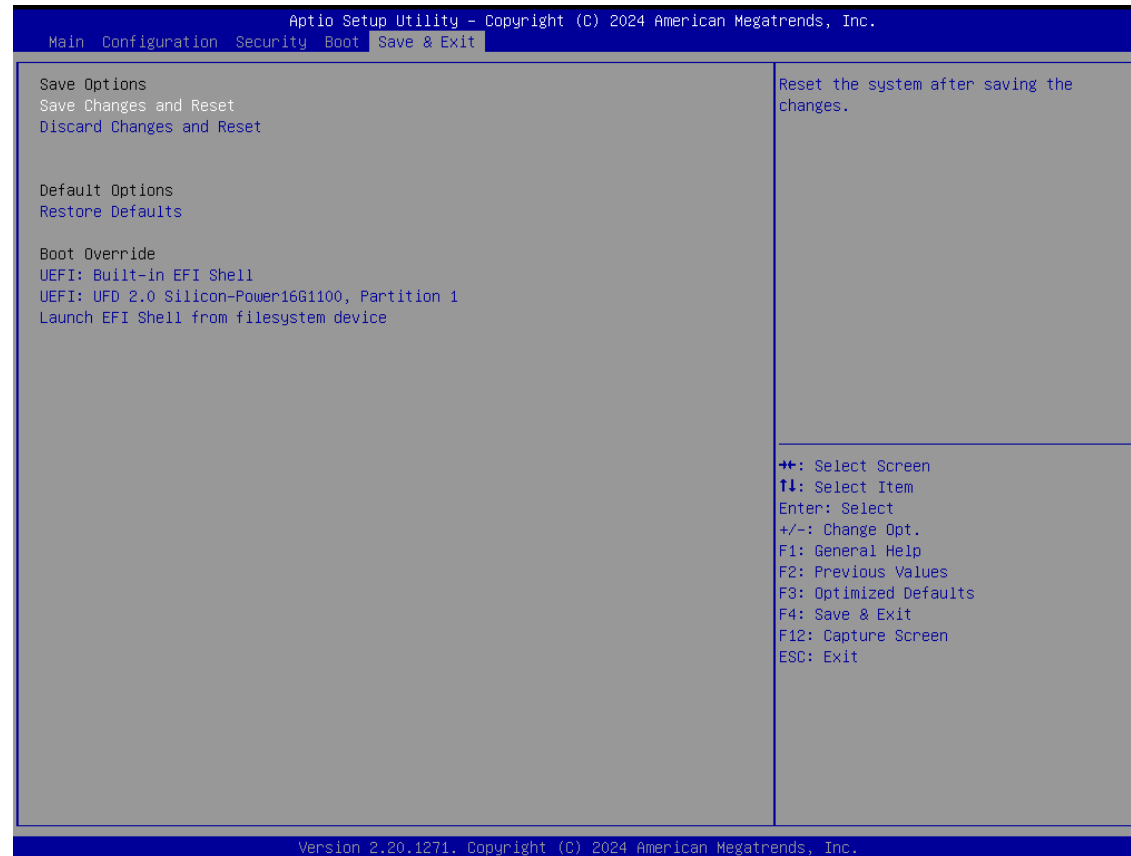
Feature	Description	Options
Password Check Mode	[Setup] check password when enter setup screen. [Power on] check password on every time system power on.	★ Setup, Power on
Administrator Password	Set Administrator Password	

7.2.4 Boot



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
CSM Support – [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. (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.	

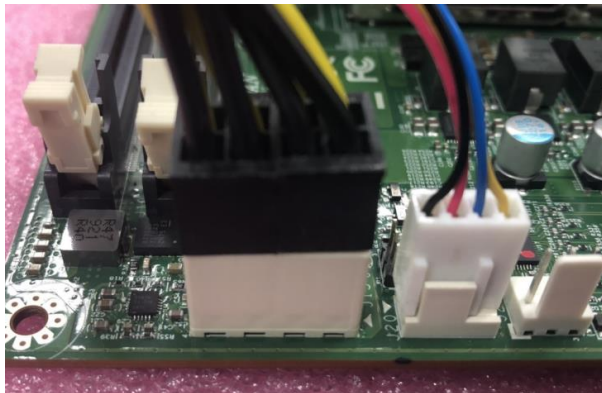
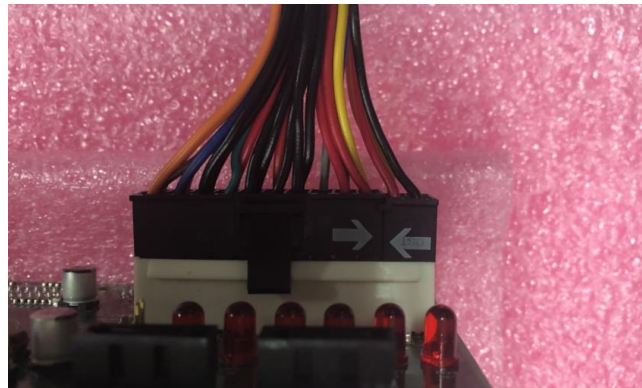
8 Troubleshooting

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

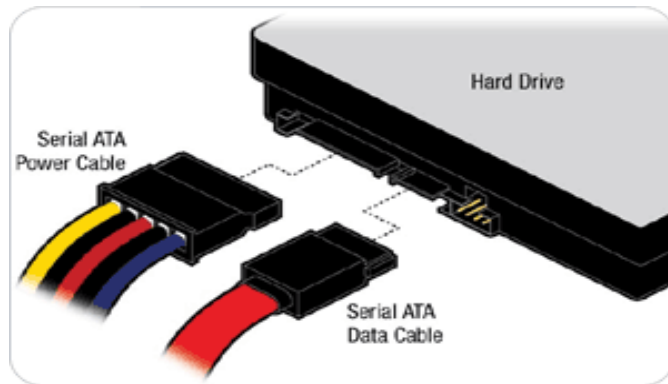
Unlike other Single board computer, ROBO-8114-Q370 supports ATX only. Therefore, there is no other setting that needs to be set up. However, there are only two connectors that must be connected— J15 (ATX 8 Pin Connector (For CPU Power)) on the ROBO-8114-Q370 board & 20 pins ATX Power Connector on the 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](http://www.portwell.com.tw/support/download_center.php) as below hyperlink

http://www.portwell.com.tw/support/download_center.php

Registering an account in advance is a must. (The E-Mail box should be an existing Company email address that you check regularly.)

<http://www.portwell.com.tw/member/newmember.php>

2. Type in your User name and password and log in the download center.
3. Select "[Search download](#)" and type the keyword "[ROBO-8114-Q370](#)".
4. Find the "[BIOS](#)" page and download the ROM file and flash utility.
5. 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
6. 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.

7. 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.

ROBO-8114VG2AR

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.

http://www.portwell.com.tw/support/download_center.php

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.

http://www.portwell.com.tw/support/problem_report.php

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>