

ROBO-8113VG2AR



# ROBO-8113VG2AR

PICMG 1.3 Single Host Board

Version 1.5

## Revision History

R1.0	Preliminary
R1.1	
R1.2	Page22 J1 mark 標記有誤
R1.3	Page11 add VGA resolution limitation
R1.4	Page12 add Soft reminder about power supply discharge
R1.4-1	Page11 add Noted 2 about VGA limit with external cable
R1.5	Update JP6 ATX/AT select pin 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-8113VG2AR. This document should be referred to when designing PICMG 1.3 application. The other reference documents that should be used include the following:

- ✧ Intel SkyLake-S/KabyLake-S Design Guide
- ✧ Intel SkyLake-S/KabyLake-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.



# ROBO-8113VG2AR

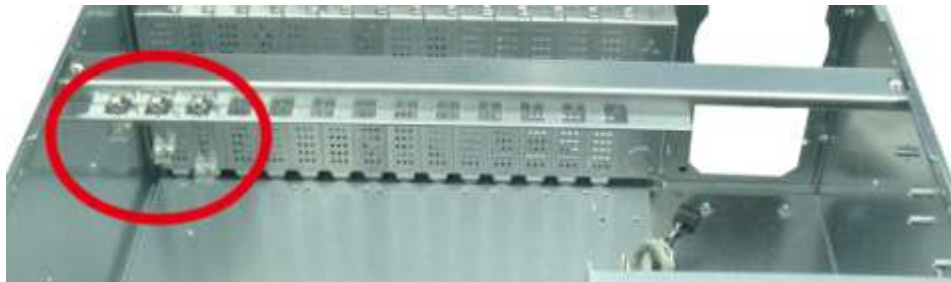


## ■ Fix your SBC in System

**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:

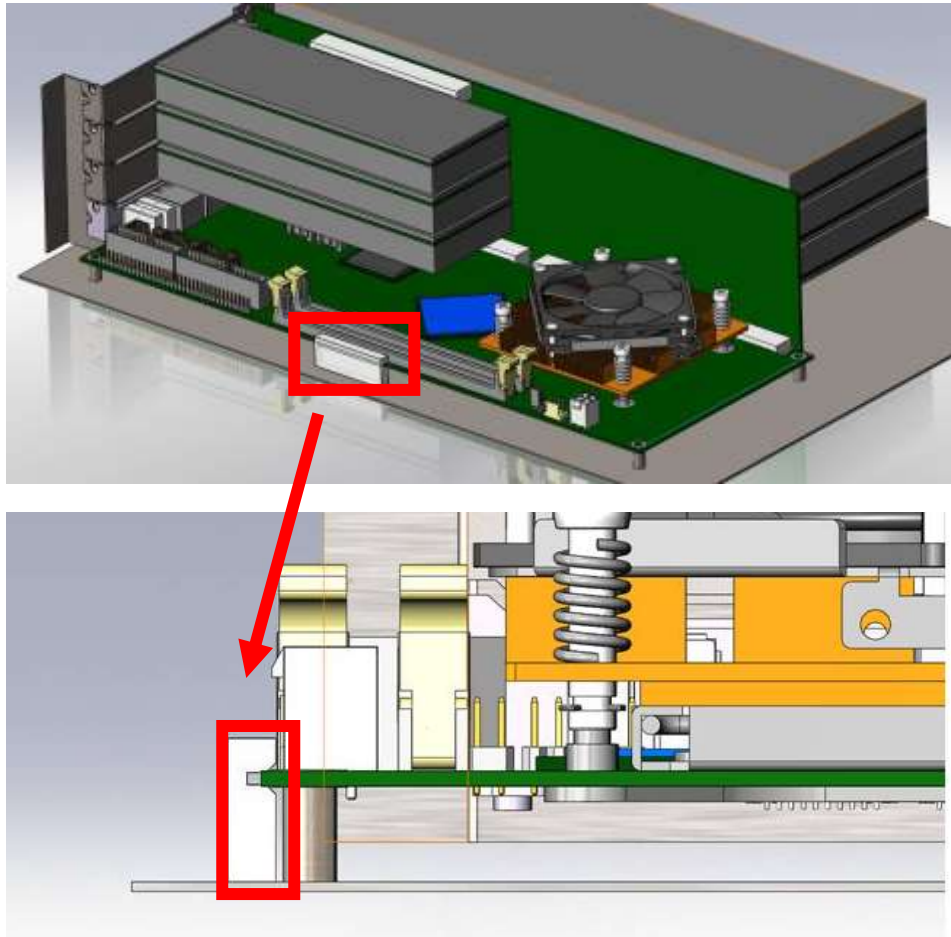
- 4U chassis :
- Use L type metal or plastic or rubber bracket to hold SBC.





# ROBO-8113VG2AR

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



## 1 Introduction

ROBO-8113VG2AR, a PICMG 1.3 Single Host Board (SHB) with the latest Intel 7<sup>th</sup> and 6<sup>th</sup> Generation Core processors supported from E3 class Xeon processors to Core i3 processors. Portwell's ROBO-8113VG2AR 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-8113VG2AR adopt Intel C236 and Q170 PCH. Providing up to 32GB DDR4 system memory supported with ECC or non-ECC option.

ROBO-8113VG2AR with the 7<sup>th</sup> and 6<sup>th</sup> 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-8113VG2AR single host board, which is 10x USB 3.0, 2x USB 2.0, 6x 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-8113VG2AR 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

<b>Main Processor</b>	◆ Intel® Kaby Lake-S/Skylake -S E3-12xxv5/v6 and Core™ i Processors
<b>System BIOS</b>	◆ AMI UEFI BIOS
<b>Main Memory</b>	◆ Up to 32 GB ECC or non-ECC DDR4 on two Long-DIMM sockets. Supports dual channel DDR4 1866/2133 MHz SDRAM
<b>Graphics</b>	<ul style="list-style-type: none"> <li>◆ Controller: Intel® Gfx Gen 9, HD graphics</li> <li>◆ VGA: Resolution up to 1920 x 1200 @ 60Hz</li> <li>◆ DVI-D: Resolution up to 1920 x 1200 @ 60Hz (VGA+DVI-D on bracket by DVI-I port)</li> </ul> <p><b>Note 1(VGA resolution limitation)</b> If use the B6903351(DVI-D +VGA Y cable) to connect with DVI-D &amp; 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 &amp; resolution.</p> <p><b>Note 2 (VGA limit with external cable )</b> When using external Y cable (or DVI to VGA cable only) to connect with a VGA screen, and has requirement for USB3.0 on REAR I/O, we recommended using USB3.0 J17 port (On board USB3.0 is without limitation)</p> <ul style="list-style-type: none"> <li>◆ HDMI: Resolution up to 4096 x 2160 @ 24Hz</li> </ul>
<b>Expansion Interface</b>	<ul style="list-style-type: none"> <li>◆ 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)</li> <li>◆ From PCH: 1x PCI Express x4 or 4x PCI Express x1 by different bios support (Gen 3 up to 8.0 GT/s)</li> </ul>
<b>SATA Interface</b>	◆ Six SATA III ports (SATA 6Gb/s), dual ports via backplane

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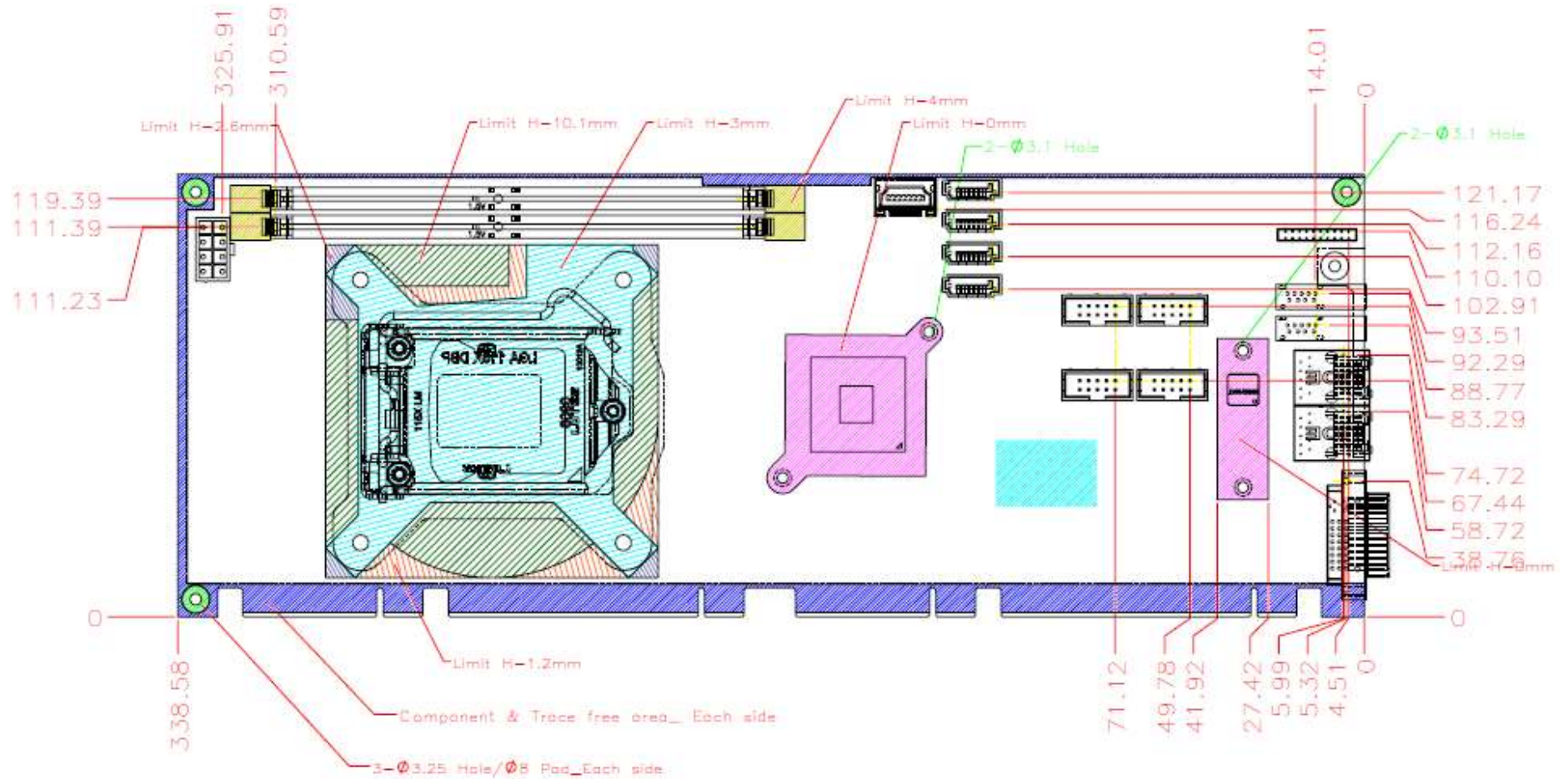
<b>Input/Output</b>	<ul style="list-style-type: none"><li>◆ Serial Ports: 2x RS-232 &amp; 2x RS-232/422/485 selectable by bios</li><li>◆ USB Port: 2x USB 3.0 on bracket, 8x USB 3.0 on board header, 4x USB 2.0 ports through backplane</li><li>◆ GPIO connector: 8GPI + 8GPO</li><li>◆ Audio Interface: Mic-In / Line-Out / Line-in (on-board header)</li></ul>
<b>Ethernet</b>	<ul style="list-style-type: none"><li>◆ Supports dual 10/100/1000 Mbps Ethernet port (s) via PCI Express x1 interface by Intel WGI219LM and WGI210AT controller</li><li>◆ Dual RJ45 connector on bracket</li></ul>
<b>TPM</b>	<ul style="list-style-type: none"><li>◆ On-board TPM 2.0 support (TPM IC: Infineon SLB9665TT2.0)</li></ul>
<b>High Drive GPIO</b>	<ul style="list-style-type: none"><li>◆ One pin-header for GPIO (8bit in &amp; 8bit out)</li></ul>
<b>Mechanical and environmental specifications</b>	<ul style="list-style-type: none"><li>◆ Operating temperature: 0 ~ 60° C</li><li>◆ Storage temperature: -20 ~ 80° C</li><li>◆ Humidity: 5 ~ 90% non-condensing</li><li>◆ Power supply voltage: ATX</li></ul> <p><b>Soft reminder</b></p> <p>Because the power supply discharge sequence is not standardized, the difference between the 5v / 3.3v discharge sequence during shutdown ,maybe cause malfunction or abnormal waveform.</p> <ul style="list-style-type: none"><li>◆ Board size: 338.5mm x 126.39mm, 13.33" (L) x 4.98" (W)</li></ul>

## 2.1 Supported Operating Systems

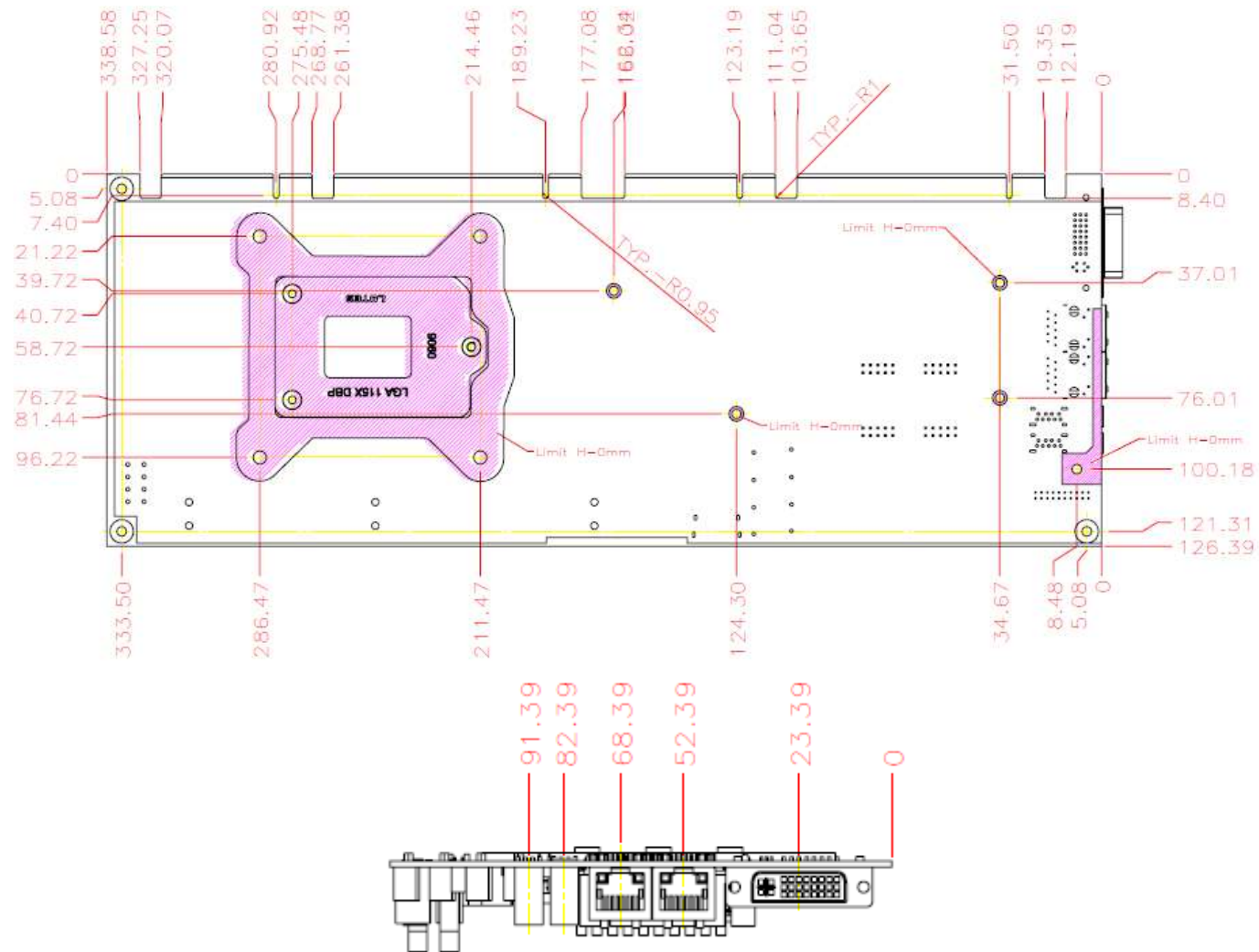
The ROBO-8113VG2AR supports the following operating systems.

- ✧ Windows 7 support
- ✧ Windows 8.1 / WEI 8.1 support
- ✧ Windows 10 full support
- ✧ Kernel.org Distribution

## 2.2 Mechanical Dimensions



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## 2.3 Power Consumption

Test Configuration	
CPU Type	Intel® Core™ i5-6500TE CPU @ 3.2GHz (ES) L3: 6MByte
SBC BIOS	Portwell, Inc. ROBO-8113VG2AR-Q170-PCIE1 TEST BIOS (60105T00)
Memory	WARIS UB-DIMM DDR4 2133 8GB*2 (SEC K4A4G085WD)
VGA Card	Onboard Intel® HD Graphics 530
VGA Driver	Intel® HD Graphics 530 Version: 20.19.15.4312
LAN Card	Onboard Intel® Ethernet Connection(2) I219-LM
LAN Driver	Intel® Ethernet Connection(2) I219-LM Version: 12.13.17.7
LAN Card	Onboard Intel® I210 Gigabit Network Connection
LAN Driver	Intel® I210 Gigabit Network Connection Version: 12.14.7.0
Audio Card	Onboard Realtek ALC886 High Definition Audio
Audio Driver	Realtek ALC886 High Definition Audio Version: 6.0.1.7312
Chip Driver	Intel® Skylake-S Chipset Device Software Version: 10.0.27
USB3.0 Driver	Intel® USB 3.0 eXtensible Host Controller Adaptation Driver Version: 1.0.1.45
EC Version	51124T00 (11/24/2015)
CDROM	Pioneer DVR-S19LBK
Power Supply	FSP460-60PFB 460W
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

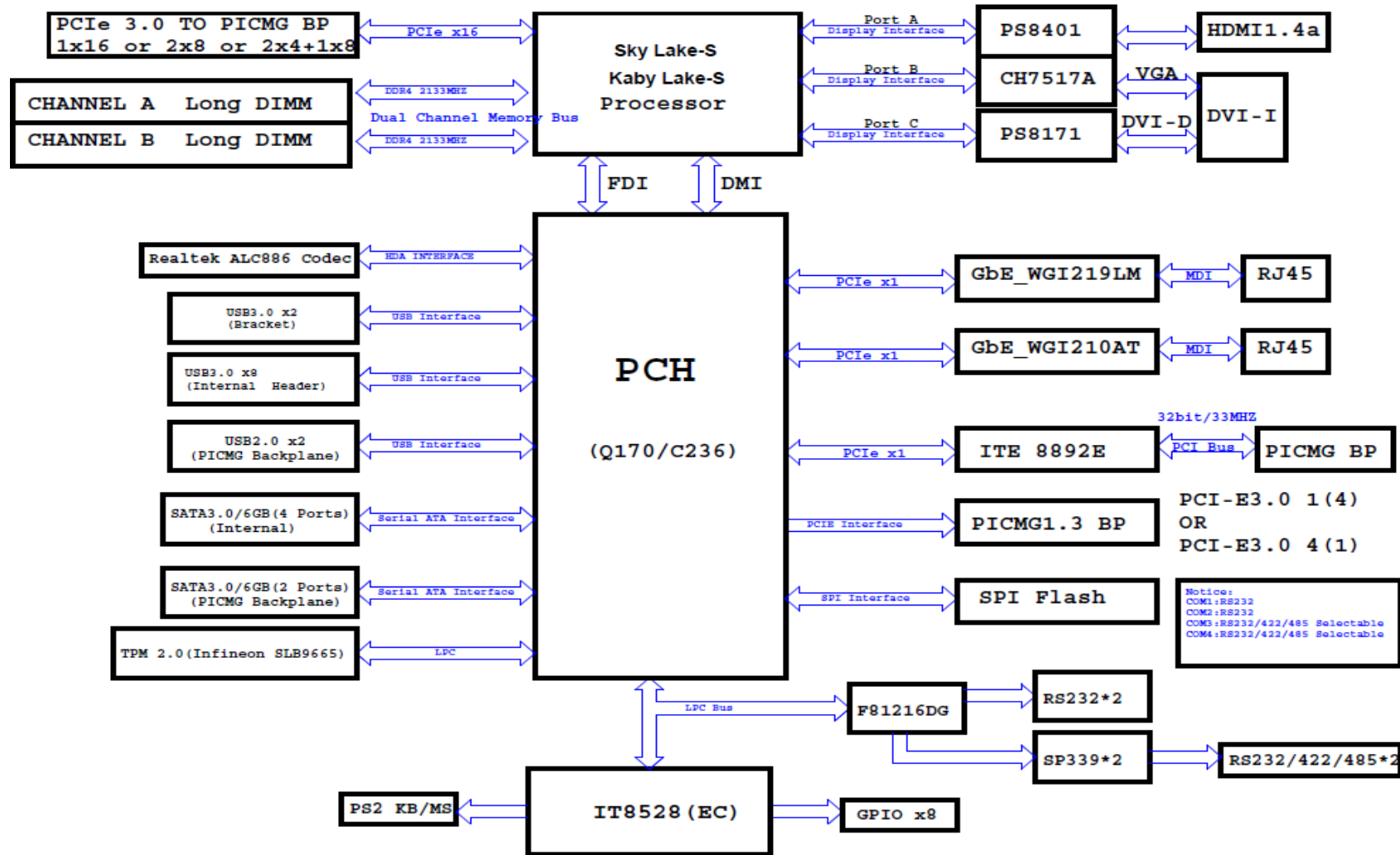
Storage Humidity : 5~90%

Operation Humidity: 10~90%



# ROBO-8113VG2AR

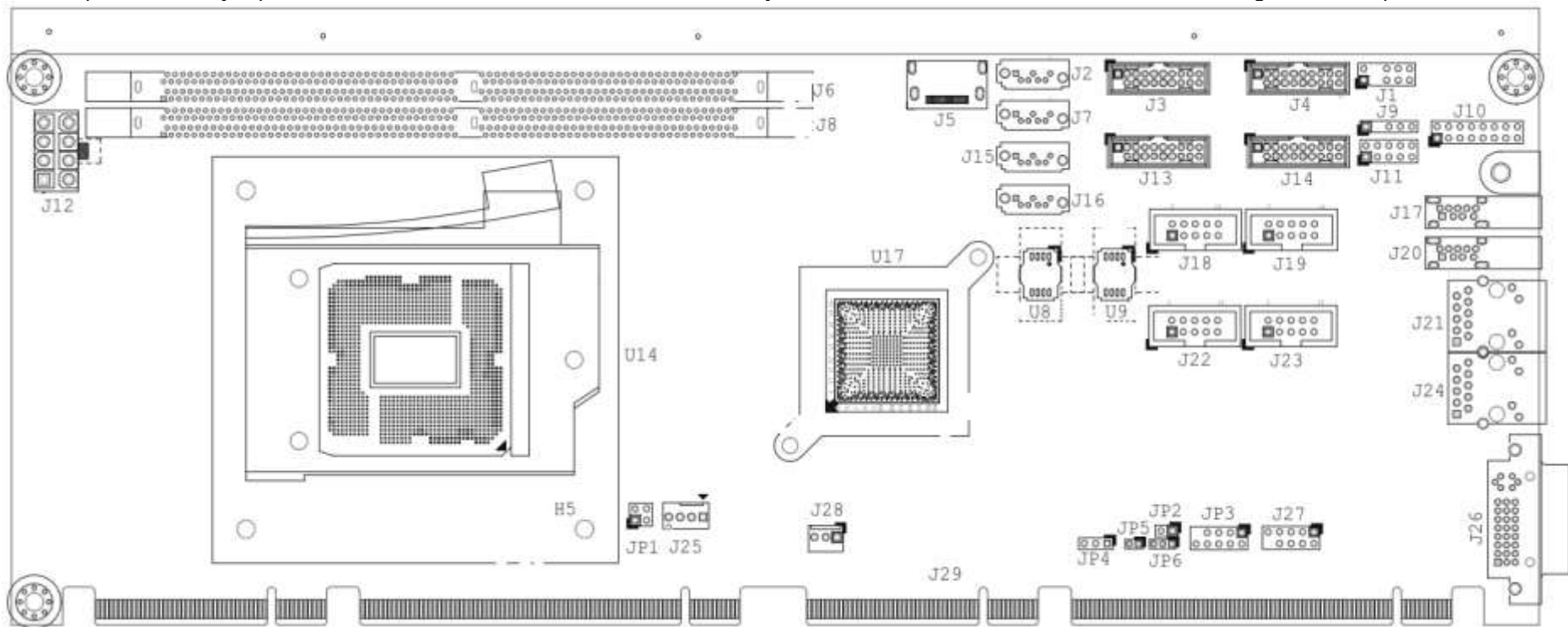
## Block Diagram



### 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-8113VG2AR'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.

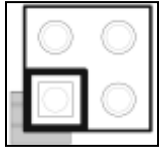
### Jumper Table

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

#### Jump Function List:

Jumper	Function	Remark
JP1	Configure PCIEx16, x8 (For C236/Q170 only)	Header2Px2/2.54mm
JP2	Auto Power Button(Reserve)	PH2Px1/2.54mm
JP3	LPC 80 Port Pin Header	Header5Px2/2mm
JP4	Clear CMOS Setup	PH3Px1/2.54mm
JP5	WDT Enable/Disable Pin	PH2Px1/2.54mm
JP6	ATX/AT Select Pin	PH3Px1/2.54mm

**JP1: 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

**JP4: Clear CMOS Setup**



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

## JP5: WDT Enable/Disable Pin



PIN No.	Description
1-2 Short	WDT Enable
1-2 Open	WDT Disable

## JP6: ATX/AT Select Pin



PIN No.	Description
1-2 Short	AT mode
2-3 Short	ATX mode

## 3.3 Connector Settings

Connector Allocation

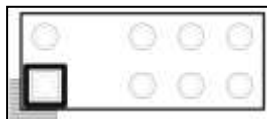
I/O peripheral devices are connected to the interface connectors

### Connector Function List

Connector	Function	Remark
J1	Keyboard/Mouse Connector	Header 5Px2/2.54mm
J2/J7/J15/J16	SATA Connector	
J3/J4/13/14	USB2.0/3.0 connector	
J5	HDMI Connector	
J6	DDR4 Channel B Slot	
J8	DDR4 Channel A Slot	
J9	SM Bus Pin Header	PH5Px1/2.54mm
J10	Front Panel Pin Header	Header 8Px2/2.54mm
J11	GPIO Pin Header	Header 5Px2/2.54mm
J12	ATX 8 Pin Connector(For CPU Power)	
J17/J20	USB2.0/3.0 connector(D-Sub)	
J18	COM1 Pin Header	
J19	COM2 Pin Header	

J21	RJ45 Connector for I210	
J22	COM4 Pin Header	
J23	COM3 Pin Header	
J24	RJ45 Connector for I219	
J25	CPU Fan	
J26	DVI-I Connector	
J27	Audio Pin Header	Header 5Px2/2.54mm
J28	System Fan	

**J1: 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

**J2/J7/J15/J16 : SATA Connector**



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



## J3/J4/13/14: USB2.0/3.0 connector



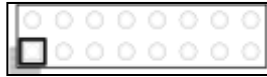
PIN No.	Description	PIN No.	Description
1	5V_Dual		
2	USB3.0_RX_N	19	5V_Dual
3	USB3.0_RX_P	18	USB3.0_RX_N
4	Ground	17	USB3.0_RX_P
5	USB3.0_TX_N	16	Ground
6	USB3.0_TX_P	15	USB3.0_TX_N
7	Ground	14	USB3.0_TX_P
8	USB2.0_N	13	Ground
9	USB2.0_P	12	USB2.0_N
10	Ground	11	USB2.0_P

## J9: SM Bus Pin Header



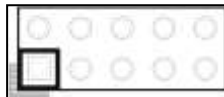
PIN No.	Description
1	Clock
2	NC
3	Ground
4	Data

## J10: Front Panel Connector



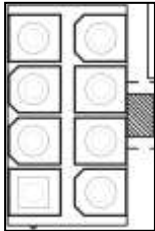
PIN No.	Description	PIN No.	Description
1	PWR_LED (+)	2	VCC
3	PWR_LED (-)	4	NC
5	I219_LAN (+)	6	NC
7	I219_LAN (-)	8	BUZZER
9	I210_LAN (-)	10	Ground
11	I210_LAN (+)	12	Power Button Signal
13	HDD_LED (+)	14	Reset Signal
15	HDD_LED (-)	16	Ground

## J11: GPIO Pin Header



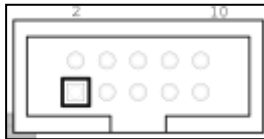
PIN No.	Description	PIN No.	Description
1	GPIO_0	2	GPIO_4
3	GPIO_1	4	GPIO_5
5	GPIO_2	6	GPIO_6
7	GPIO_3	8	GPIO_7
9	Ground	10	VCC

## J12: ATX 8 Pin Connector(For CPU Power)



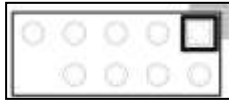
PIN No.	Description	PIN No.	Description
1	Ground	5	+12V
2	Ground	6	+12V
3	Ground	7	+12V
4	Ground	8	+12V

## J18/J19/J22/J23: 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

**J27: 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	10	Ground

## 4 Signal Descriptions

### 4.1 Watch Dog Signal

```
#Define WDTCFG 0x06 //WDT Timer Counter Register  
#Define WDTMIN 0x07 //WDT Timer Counter Register (Minute)  
#Define WDTSEC 0x08 //WDT Timer Counter Register (Second)
```

```
VOID Write_EC_SRAM(UINT8 Offset,UINT8 Value){
```

```
    IoWrite8(0xE300+Offset,Value);  
}
```

```
Byte Read_EC_SRAM(UINT8 Offset){  
    IoRead8(0xE300+offset,Value);  
    return Value;  
}
```

```
void WDT()  
{  
    // Enable WDT 30sec
```

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```
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 Counter Register, Bit7 = GPIO7, Bit6 = GPIO6, ..., 0: Output; 1: Input

#Define GPDR 0x2C//GPIO Data Register, Bit7 = GPIO7, Bit6 = GPIO6, ..., 0: Low; 1: High

```
VOID Write_EC_SRAM(UINT8 Offset,UINT8 Value){  
  
    IoWrite8(0xE300+Offset,Value);  
}  
  
Byte Read_EC_SRAM(UINT8 Offset){  
    IoRead8(0xE300+offset,Value);  
    return Value;  
}  
  
void GPIO()  
{  
    int Temp;  
    // Get GPIO data  
    Temp = Read_EC_SRAM(GPDR);  
  
    // Set GPIO7 High  
    Temp |= 0x80;  
    Write_EC_SRAM(GPDR,Temp);           //Bit7: GPIO7 status, 0: Low 1: High  
}
```

## 5 System Resources

### 5.1 Intel® Skylake-S PCH

Intel® Q170 Chipset (Intel® GL82Q170 PCH)

Intel® C236 Chipset (Intel® GL82C236 PCH)

### 5.2 Main Memory

ROBO-8113VG2AR provides 2 x 288-pin Long-DIMM sockets which supports DDR4 ECC/non-ECC memory. The maximum memory can be up to 32GB. 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-8113VG2AR 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-8113VG2AR 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-8113VG2AR is based on Intel® Q170/C236 chipset and desktop/workstation processors including Xeon E3-1200v5/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-8113VG2AR CD-title

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## 5.3.2 Intel® HD Graphics 530

ROBO-8113VG2AR has integrated Intel® HD Graphics 530 which supports DirectX 12 、 OpenCL 2.0 、 OpenGL 4.4. It is the most advanced design to gain an outstanding graphic performance. ROBO-8113VG2AR supports VGA+DVI-D by DVI-I connector on bracket, and on board HDMI display output. This combination makes ROBO-8113VG2AR an excellent performance hardware.

### **Drivers Support**

Please find the Graphic driver in the ROBO-8113VG2AR 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-8113VG2AR CD-title. The driver supports Windows 8.

## 6 BIOS Setup Items

### 6.1 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.

### 6.2 BIOS Setup

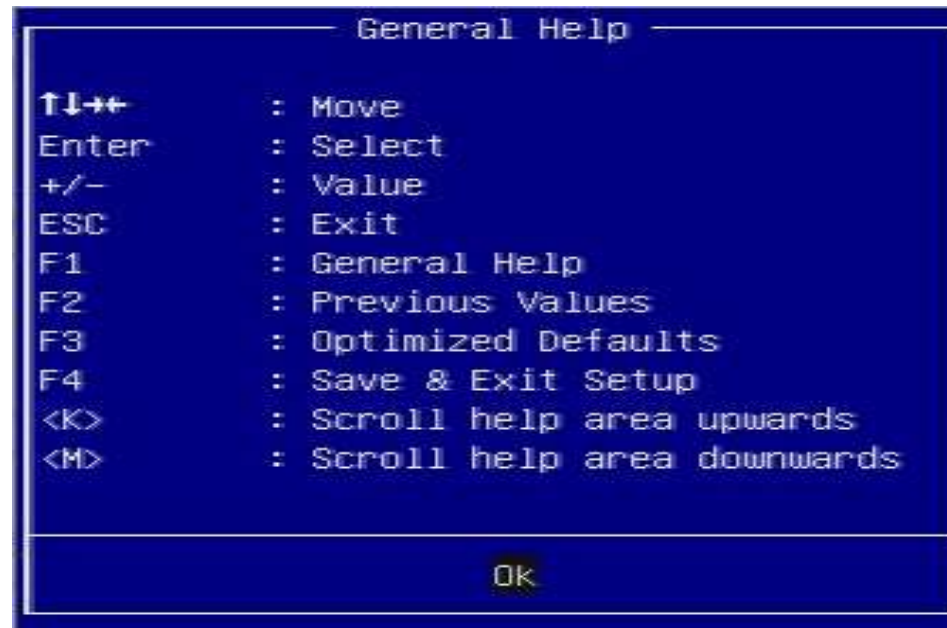
Power on the computer and the system will start POST (Power on Self Test) process. When the message below appears on the screen, press <Delete> or <ESC> key will enter BIOS setup screen.

#### **Press<Delete> or <ESC> 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-8113VG2AR

## 6.2.1 Main

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

```
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Main Configuration Security Boot Save & Exit

Project Name                ROBO-8113VG2AR-Q170
BIOS Version & Build Date   R1.00.E0 (01/28/2016 18:13:25)
EC Version & Build Date     R04.E01

Processor Information
Name                        SkyLake DT
Brand String                Intel(R) Core(TM) i7-6700TE CPU @ 2.40GHz

Total Memory                16384 MB
Memory Frequency            2133 MHz

PCH Information
Name                        SKL PCH-H
PCH SKU                    PCH-H Desktop Q170 SKU
Stepping                   31/D1
LAN PHY Revision           B2

ME FW Version               0.0.0.0
ME Firmware Mode           Normal Mode
ME Firmware SKU            Unidentified

System Date                 [Tue 05/03/2016]
System Time                 [09:31:59]

Access Level                Administrator

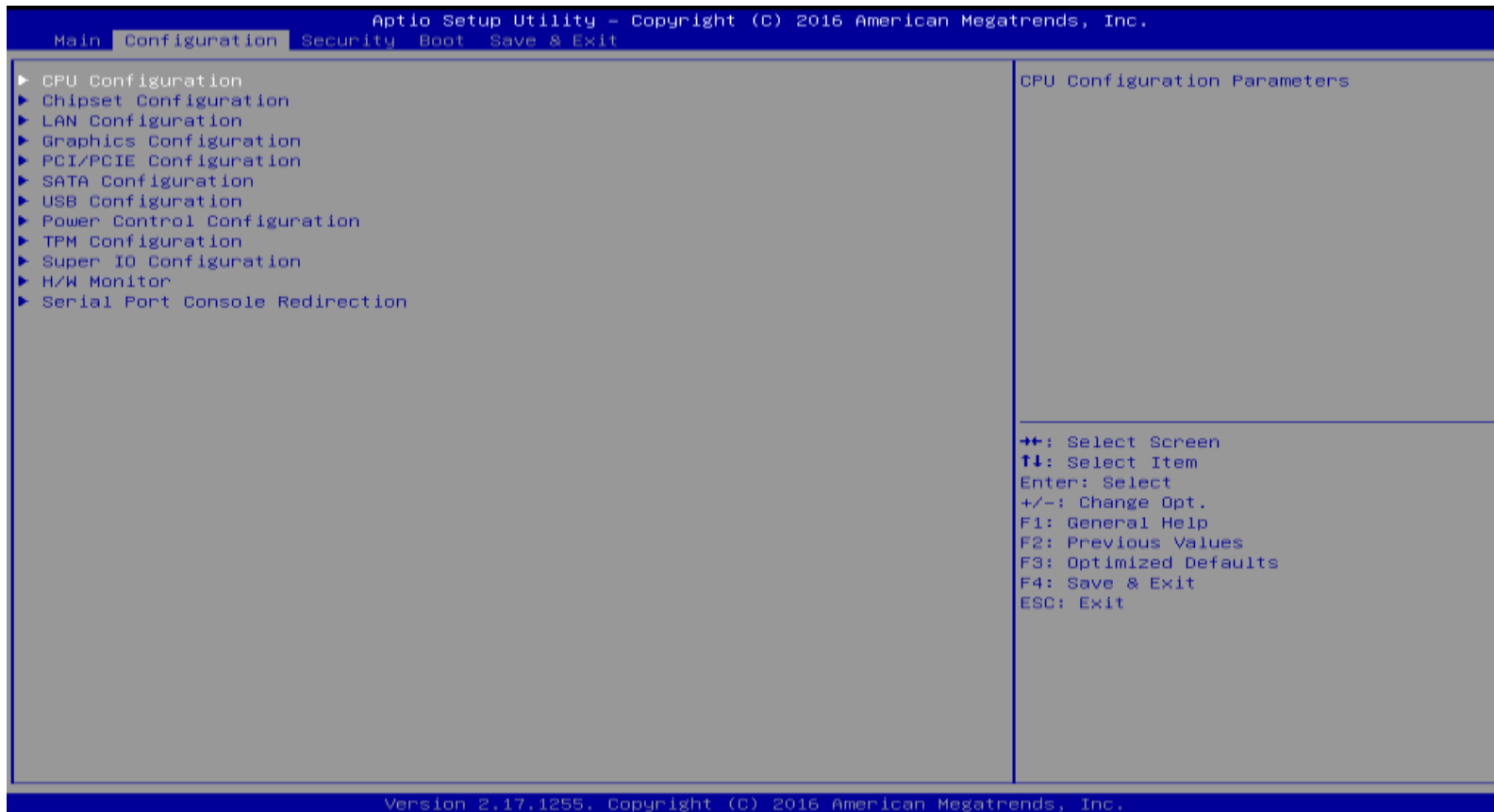
Version 2.17.1255. Copyright (C) 2016 American Megatrends, Inc.
```

## ROBO-8113VG2AR

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

## 6.2.2 Configuration

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



# ROBO-8113VG2AR

## CPU Configuration

### CPU Configuration Parameters

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.

Configuration

CPU Configuration

Intel(R) Core(TM) i7-6700TE CPU @ 2.40GHZ	
CPU Signature	506E3
Max CPU Speed	2400 MHz
Min CPU Speed	800 MHz
CPU Speed	2400 MHz
Processor Cores	4
Hyper Threading Technology	Supported
Intel VT-x Technology	Supported
Intel SMX Technology	Supported
64-bit	Supported
EIST Technology	Supported
CPU C3 state	Supported
CPU C6 state	Supported
CPU C7 state	Supported
L1 Data Cache	32 KB x 4
L1 Code Cache	32 KB x 4
L2 Cache	256 KB x 4
L3 Cache	8 MB
L4 Cache	Not Present
Hyper-threading	[Enabled]
Active Processor Cores	[All]
Intel Virtualization Technology	[Enabled]
Intel(R) SpeedStep(tm)	[Enabled]
Turbo Mode	[Enabled]
CPU C states	[Enabled]
Enhanced C-states	[Enabled]
C-State Auto Demotion	[C1 and C3]
C-State Un-demotion	[C1 and C3]
Package C state demotion	[Enabled]
Package C state undemotion	[Enabled]

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.

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

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Feature	Description	Options
<b>Hyper-threading</b>	Enabled for Windows XP and Linux (OS optimized for Hyper-threading Technology) and Disabled for other OS (OS not optimized for Hyper-threading Technology). When Disabled only one thread per enabled core is enabled.	★Enabled, Disabled
<b>Active Processor Cores</b>	Number of cores to enable in each processor package.	★All, 1, 2, 3
<b>Intel Virtualization Technology</b>	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.	★Enabled, Disabled
<b>Intel® Speed Step™</b>	Allows more than two frequency ranges to be supported.	★Enabled, Disabled
<b>Turbo Mode</b>	Turbo Mode.	★Enabled, Disabled
<b>Configurable TDP Boot Mode</b>	Configurable TDP Mode as Nominal /Up/ Down/ Deactivate TDP selection. Deactivate option will set MSR to Nominal and MMIO to Zero.	★Nominal, Down, Up, Deactivate
<b>CPU C states (Enabled)</b>	Enable or disable CPU C states	★Disabled, Enabled
<b>Enhanced C-states</b>	Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.	★Enabled, Disabled
<b>C-State Auto Demotion</b>	Configure C-State Auto Demotion.	★C1 and C3, Disabled, C1, C3,
<b>C-State Un-demotion</b>	Configure C-State Un-demotion.	★C1 and C3, Disabled, C1, C3,

## ROBO-8113VG2AR

<b>Package C State demotion</b>	Enable Package C state demotion.	★Enabled, Disabled
<b>Package C state undemotion</b>	Enable Package C state undemotion	★Enabled, Disabled
<b>C State Pre-Wake</b>	Disable – Sets bit 30 of POWER_CTL MSR(0x1FC) to 1 to disable the C State Pre-Wake	★Enabled, Disabled
<b>Package C State limit</b>	Package C State limit	★AUTO, C0/C1, C2, C3, C6, C7, C7s, C8
<b>CFG lock</b>	Configure MSR 0xE2 [15], CFG lock bit.	★Enabled, Disabled

# ROBO-8113VG2AR

## Chipset Configuration

### Configuration Chipset feature

The screenshot shows the Aptio Setup Utility interface. At the top, it reads "Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc." and "Configuration". The main area is titled "Chipset Configuration" and contains the following settings:

Total Memory	16384 MB
DIMM#0	8192 MB
DIMM#1	8192 MB
VT-d	[Enabled]
Above 4GB MMIO BIOS assignment	[Disabled]
HD Audio	[Enabled]
Port 80h Redirection	[LPC Bus]

Below these settings is a section for "AMT Configuration" which is currently collapsed. To the right of the main configuration area, there is a "VT-d capability" section which is currently empty. At the bottom right, a list of navigation keys is provided:

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

At the very bottom of the screen, it reads "Version 2.17.1255. Copyright (C) 2016 American Megatrends, Inc."

Feature	Description	Options
<b>VT-d</b>	VT-d capability	★Enabled, Disabled
<b>Above 4GB MMIO BIOS assignment</b>	Enable/Disable above 4GB Memory Mapped IO BIOS assignment. This is disabled automatically when Aperture Size is set to 2048MB.	★Disabled, Enabled
<b>HD Audio</b>	Control Detect of the HD-Audio device. Disabled = HAD will be unconditionally disabled Enabled = HAD will be unconditionally Enabled	★Enabled, Disabled
<b>Port 80h Redirection</b>	Control where the port 80h cycles are sent.	★LPC Bus, PCIE Bus

# ROBO-8113VG2AR

## AMT Configuration

### Configure Active Management Technology Parameters

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.

Configuration

Intel AMT	[Disabled]	Enable/Disable Intel (R) Active Management Technology BIOS Extension. Note : iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device
Un-Configure ME	[Disabled]	

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

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

# ROBO-8113VG2AR

## LAN Configuration

Configuration on Board LAN device.

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.

Configuration

LAN Configuration

Enable or disable onboard NIC.

Intel Ethernet Controller I219-LM	
LAN MAC Address	00-90-FB-58-71-07
PCH LAN Controller	[Enabled]
Wake on LAN	[Enabled]
Launch Legacy PXE Rom	[Disable]
Intel Ethernet Controller WGI210AT	
LAN MAC Address	00-90-FB-12-34-56
Intel I210 LAN Controller	[Enabled]
Launch Legacy PXE Rom	[Disable]

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

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Feature	Description	Options
<b>PCH LAN Controller</b>	Enable or disable onboard NIC	★Enabled, Disabled
<b>Wake on LAN</b>	Enable or disable integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state.)	★Enabled, Disabled
<b>Launch Legacy PXE Rom</b>	Launch Legacy PXE Rom. [Disable] Not launch Rom, [Enable] Force launch Rom, [Auto] Auto detect LAN Cable state to Enable/Disable Rom initial.	★Disable, Enable, Auto
<b>Intel I210 LAN Controller</b>	Intel I210 LAN Controller.	Disabled, ★Enabled
<b>Launch Legacy PXE Rom</b>	Launch Legacy PXE Rom. [Disable] Not launch Rom, [Enable] Force launch Rom, [Auto] Auto detect LAN Cable state to Enable/Disable Rom initial.	★Disable, Enable, Auto



# ROBO-8113VG2AR

## Graphics Configuration Configuration Graphics Settings

The screenshot shows the Aptio Setup Utility interface for Graphics Configuration. The title bar reads "Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc." and the menu bar shows "Configuration". The main area is split into two columns. The left column, titled "Graphics Configuration", lists various settings with their current values in brackets. The right column, titled "Select Secondary Display Device", is currently empty. A legend at the bottom right explains the navigation keys.

Graphics Configuration	
Primary Display	[Auto]
Primary PEG	[Auto]
Primary PCIe	[Auto]
Internal Graphics	[Auto]
GTT Size	[8MB]
Aperture Size	[256MB]
DVMT Pre-Allocated	[32M]
DVMT Total Gfx Mem	[256M]
Primary IGFX Boot Display	[HDMI]
Secondary IGFX Boot Display	[Disabled]

Select Secondary Display Device

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

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Feature	Description	Options
<b>Primary Display</b>	Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.	★Auto, IGFX, PEG, PCIE
<b>Primary PEG</b>	Select Auto/PEG11/ PEG12 Graphics device should be Primary PEG.	★Auto, PEG11, PEG12
<b>Primary PCIE</b>	Select Auto/PCIE9 of D29: F1, Graphics device should be Primary PCIE.	★Auto, PCIE9
<b>Internal Graphics</b>	Keep IGFX enable based on the setup options.	★Auto, Disabled, Enabled
<b>GTT Size</b>	Select the GTT Size	★8MB, 2MB, 4MB
<b>Aperture Size</b>	Select the Aperture Size Note: Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.	★256MB, 128MB, 512MB, 1024MB,2048MB,4096MB
<b>DVMT Pre-Allocated</b>	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,448 M,480M,512M, 1024M,1536M,2048M, 4M, 8M,12M,16M,20M,24M,28M,3 2M,/F7,36M,40M,44M,48M,52 M,56M,60M

<b>DVMT Total Gfx Mem</b>	Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device	★256M, 128M, MAX
<b>Primary IGFX Boot Display</b>	Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.	★VBIOS Default, HDMI, DVI, VGA
<b>Secondary IGFX Boot Display</b>	Select Secondary Display Device.	★Disabled, HDMI, DVI, VGA

# ROBO-8113VG2AR

## PCI/PCIE Configuration

PCI, PCI-X and PCI Express Settings.

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.

Configuration

PCI/PCIE Configuration

PCI Express Clock Gating [Enabled]  
DMI Link ASPM Control [Enabled]

PCIE Port 5 is assigned to LAN  
PCIE Port 6 is assigned to LAN

- ▶ PCI Express Root Port 7
- ▶ PCI Express Root Port 9
- ▶ PCI Express Root Port 10
- ▶ PCI Express Root Port 11
- ▶ PCI Express Root Port 12

PCIE Port	PCIE Port Config	Current Link Width	Current Link Speed
P1(D27/F0)	x1	--	--
P2(D27/F1)	x1	--	--
P3(D27/F2)	x1	--	--
P4(D27/F3)	x1	--	--
P5(D28/F0)	x1	--	GEN1 (2.5GT/s)
P6(D28/F1)	x1	--	--
P7(D28/F2)	x1	--	--
P8(D28/F3)	x1	--	--
P9(D28/F4)	x4	--	--
P10(D28/F5)	--	--	--
P11(D28/F6)	--	--	--
P12(D28/F7)	--	--	--
P13(D29/F0)	x1	x1	GEN1 (2.5GT/s)
P14(D29/F1)	x1	--	--
P15(D29/F2)	x1	--	--
P16(D29/F3)	x1	--	--
P17(D29/F4)	x1	--	--

Enable or disable PCI Express Clock Gating for each root port.

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

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Feature	Description	Options
PCI Express Clock Gating	Enable or disable PCI Express Clock Gating for each root port.	Disabled ★Enabled
DMI Link ASPM Control	Enable/Disable the control of Active State Power Management on SA side of the DMI Link.	Disabled ★Enabled

# ROBO-8113VG2AR

## PCI Express Root Port7, Port9, Port10, Port11, Port12

PCI Express Root Port7, Port9, Port10, Port11, Port12



Feature	Description	Options
<b>PCI Express Root Port7, Port9, Port10, Port11, Port12</b>	Control the PCI Express Root Port.	★Enabled, Disabled
<b>ASPM Support</b>	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO-BIOS auto configure DISABLE – Disables ASPM	★Disabled, L0s, L1, L0sL1, Auto
<b>PCIe Speed</b>	Select PCI Express port speed	★Auto, Gen1, Gen2, Gen3

# ROBO-8113VG2AR

## SATA Configuration SATA Device Options Settings

Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.

Configuration

SATA Configuration		▲ Determines how SATA controller(s) operate.
SATA Controller(s)	[Enabled]	
SATA Mode Selection	[RAID]	
Alternate ID	[Disabled]	
Serial ATA Port 0		
Software Preserve	Unknown	
Port 0	[Enabled]	
Hot Plug	[Disabled]	
External SATA	[Disabled]	
SATA Device Type	[Hard Disk Drive]	
Serial ATA Port 1		
Software Preserve	Unknown	
Port 1	[Enabled]	
Hot Plug	[Disabled]	
External SATA	[Disabled]	
SATA Device Type	[Hard Disk Drive]	
Serial ATA Port 2		
Software Preserve	Unknown	
Port 2	[Enabled]	
Hot Plug	[Disabled]	
External SATA	[Disabled]	
SATA Device Type	[Hard Disk Drive]	
Serial ATA Port 3		
Software Preserve	Unknown	
Port 3	[Enabled]	
Hot Plug	[Disabled]	
External SATA	[Disabled]	
SATA Device Type	[Hard Disk Drive]	
Serial ATA Port 4		
Software Preserve	Unknown	
Port 4	[Enabled]	
Hot Plug	[Disabled]	

↕

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

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Feature	Description	Options
<b>SATA Controller(s)</b>	Enable or disable SATA Device.	★Enabled, Disabled
<b>SATA Mode Selection</b>	Determines how SATA controller(s) operate.	★AHCI, RAID
<b>Alternate ID</b>	Report alternate Device ID	★Disabled, Enabled
<b>Port 0 – Port 5</b>	Enable or Disable SATA Port	★Enabled, Disabled
<b>Hot Plug</b>	Designates this port as Hot Pluggable	★Disabled, Enabled
<b>External SATA</b>	External SATA Support.	★Disabled, Enabled
<b>SATA Device Type</b>	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.	★hard Disk Drive, Solid State Drive

# ROBO-8113VG2AR

## USB Configuration

### USB Configuration Parameters.

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.

Configuration

USB Configuration

USB Devices:  
1 Drive, 1 Keyboard

Legacy USB Support [Enabled]  
XHCI Legacy Support [Enabled]  
XHCI Hand-off [Disabled]  
USB Mass Storage Driver Support [Enabled]  
▶ PCH USB Configuration

Mass Storage Devices:  
UFD 3.0 Silicon-Power16G1.00 [Auto]

UFD 3.0 Silicon-Power16G1.00

- Auto
- Floppy
- Forced FDD
- Hard Disk
- CD-ROM

Mass storage device emulation type.  
'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.

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

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Feature	Description	Options
<b>Legacy USB Support</b>	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 applications.	★Enabled, Disabled, Auto
<b>XHCI Legacy Support</b>	Enable/Disable XHCI Controller Legacy support.	★Enable, Disabled
<b>XHCI Hand-off</b>	This is workaround for Oses without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.	★Disabled, Enabled
<b>USB Mass Storage Driver Support</b>	Enable/Disable USB Mass Storage Driver Support.	★Enable, Disabled
<b>Mass Storage Devices</b>	Mass Storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.	★Auto, Floppy, Forced FDD, Hard Disk, CD-ROM

# ROBO-8113VG2AR

## PCH USB Configuration

### PCH USB Configurion

```
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Configuration
USB Configuration
USB Precondition                [Disabled]
xHCI Support                    [Disabled]
USB Port Disable Override       [Select Per-Pin]
USB HS Physical Connector #0     [Enabled]
USB HS Physical Connector #1     [Enabled]
USB HS Physical Connector #2     [Enabled]
USB HS Physical Connector #3     [Enabled]
USB HS Physical Connector #4     [Enabled]
USB HS Physical Connector #5     [Enabled]
USB HS Physical Connector #6     [Enabled]
USB HS Physical Connector #7     [Enabled]
USB HS Physical Connector #8     [Enabled]
USB HS Physical Connector #9     [Enabled]
USB HS Physical Connector #10    [Enabled]
USB HS Physical Connector #11    [Enabled]
USB HS Physical Connector #12    [Enabled]
USB HS Physical Connector #13    [Enabled]
Precondition work on USB host
controller and root ports for faster
enumeration.
++: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.17.1255. Copyright (C) 2016 American Megatrends, Inc.
```

Feature	Description	Options
<b>USB Precondition</b>	Precondition work on USB host controller and root ports for faster Enumeration.	★Disabled, Enabled
<b>xDCI Support</b>	Enable/Disable xDCI (USB OTG Device).	★Disabled, Enabled
<b>USB Port Disable Override</b> (Select Per-Pin)	Selectively Enable/Disable the corresponding USB port from reporting a Device Connection to the controller.	★Disabled, Select Per-Pin
<b>USB HS Physical Connector #0 - #13</b>	Enable/Disable USB Port.	★Enabled, Disabled

# ROBO-8113VG2AR

## Power Control Configuration

### System Power Control Configuration Parameters

```
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Configuration
Power Control Configuration
Enable Hibernation           [Enabled]
ACPI Sleep State             [S3 (Suspend to RAM)]
Restore AC Power Loss        [Power Off]
RTC Wakeup                   [Enabled]
System Time                   [02:37:43]
Wake up day                   0
Wake up Time(HH:mm:ss)       [00:00:00]

Enable or disable System wake on alarm
event.
[Enabled], system will wake on the
Hour:Min:Sec specified.
[Disabled] Turn off RTC Wakeup.

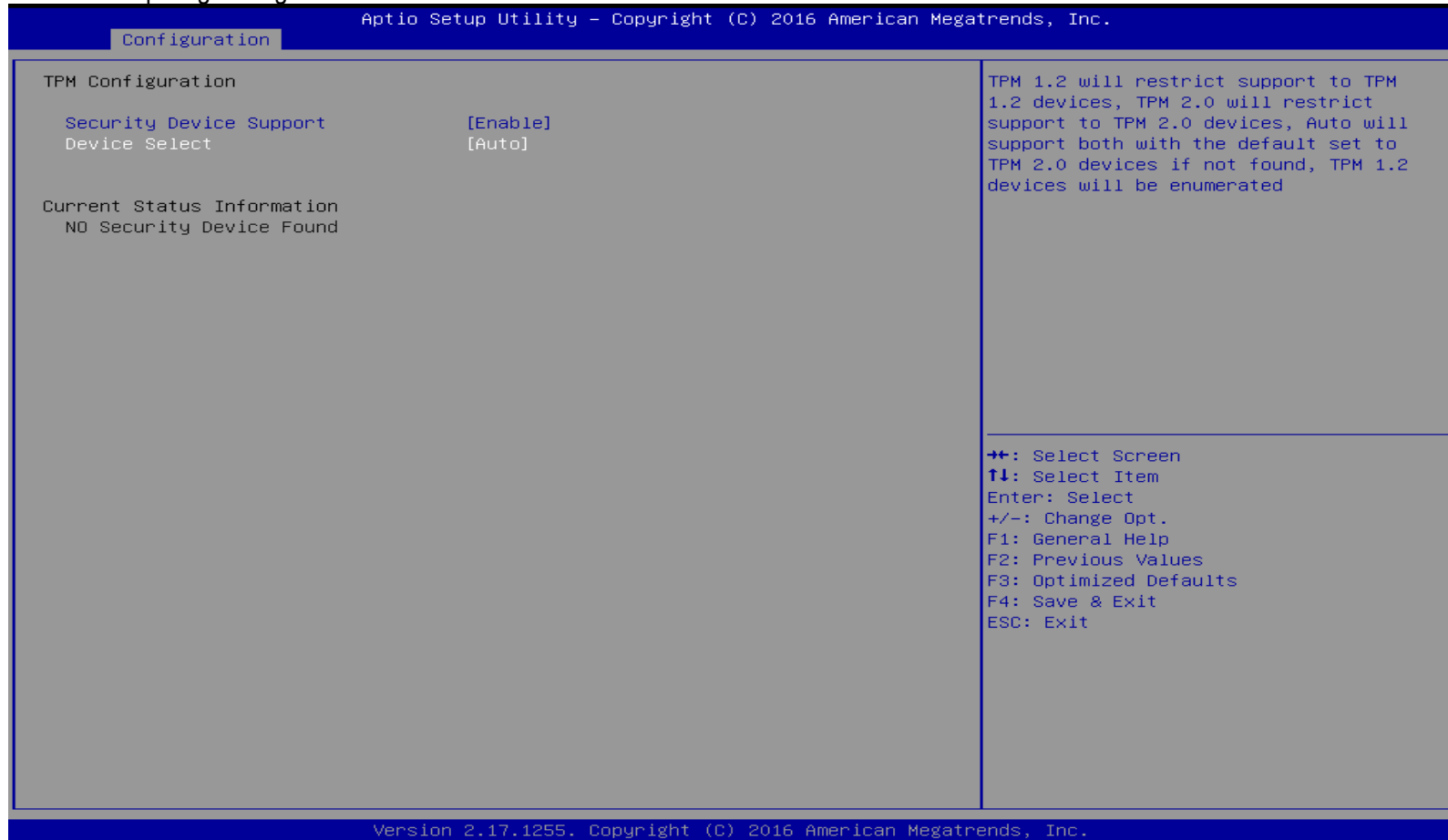
--+: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.17.1255. Copyright (C) 2016 American Megatrends, Inc.
```

Feature	Description	Options
<b>Enable Hibernation</b>	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.	★Enabled, Disabled
<b>ACPI Sleep State</b>	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.	★S3 (Suspend to RAM), Suspend Disabled
<b>Restore AC Power Loss</b>	Specify what state to go to when power is re-applied after a power failure (G3 state)	★Power Off , Power On
<b>RTC Wake up</b> (Enabled)	Enable or disable System wake on alarm event. [Enabled], system will wake up the Hour: Min: Sec specified. [Disabled] Turn off RTC Wakeup.	★Disabled, Enabled
<b>Wake up day</b>	Select 0 for daily system wake up 1-31 for which day of the month that you would like the system to wake up	1-31
<b>Wake up Time(HH: mm: ss)</b>	Use [Enter], [TAB] to select field, HH: 0-23, mm: 0-59, ss: 0-59	HH: 0-23, mm: 0-59, ss: 0-59

## TPM Configuration

### Trusted Computing settings



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Configuration

TPM Configuration

Security Device Support	[Enable]
Device Select	[Auto]

Current Status Information  
NO Security Device Found

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

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

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Feature	Description	Options
<b>Security Device Support</b> (Enabled)	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
<b>Device Select</b>	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-8113VG2AR

## Super IO Configuration

System Super IO Chip Parameters.



Feature	Description	Options
<b>Watch Dog Timer</b> (Enabled)	Enable/Disable Watch Dog Timer	★Disabled, Enabled
<b>Timer Unit</b>	Select Timer count unit of WDT	★Second, Minute
<b>Timer value</b>	Set WDT Timer value	★20

# ROBO-8113VG2AR

## Serial Port 1 Configuration

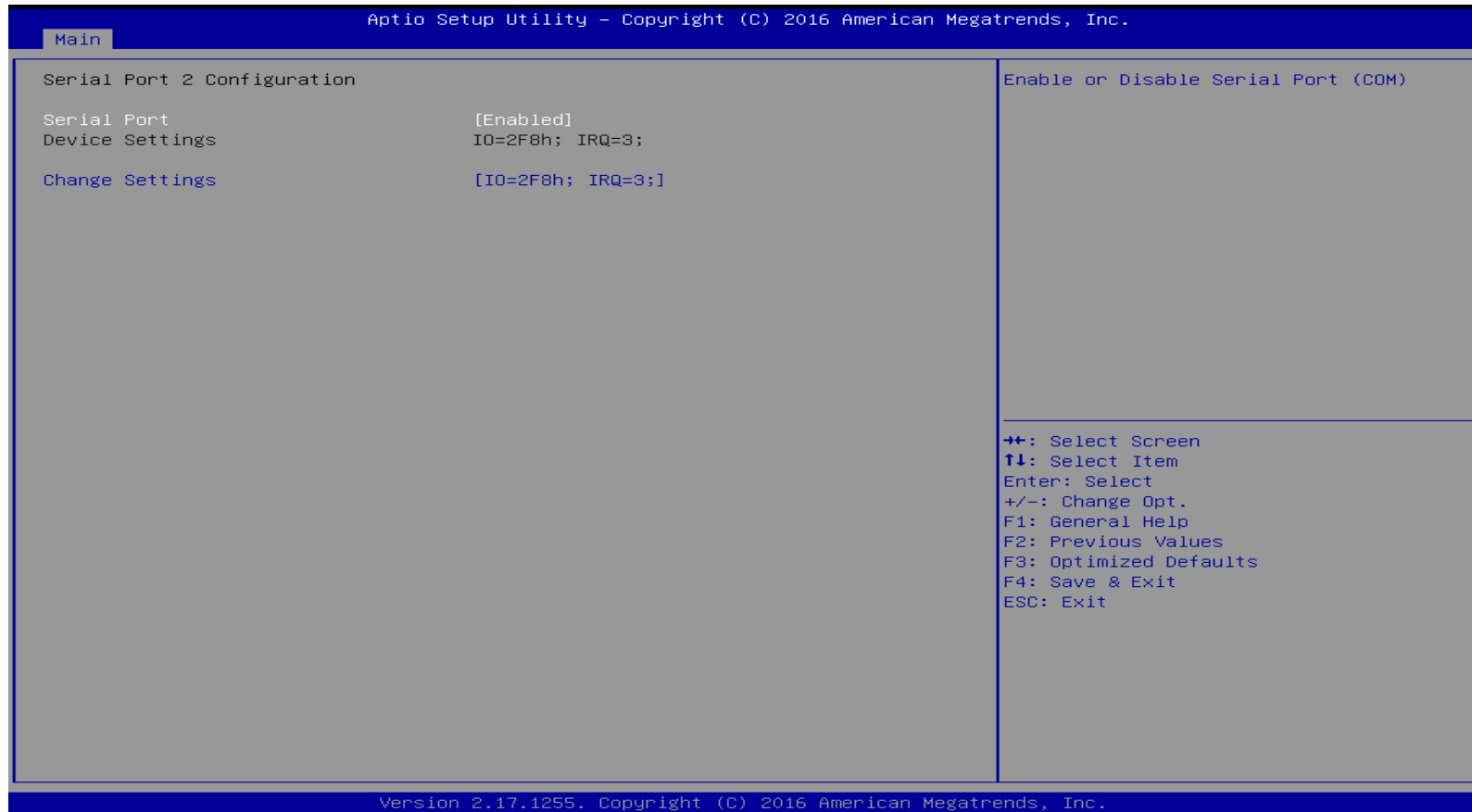
### Set Parameters of Serial Port 1 (COM 1)

The screenshot shows the 'Serial Port 1 Configuration' screen in the Aptio Setup Utility. The title bar reads 'Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.' and the main menu is labeled 'Main'. The screen is divided into two columns. The left column contains the following text: 'Serial Port 1 Configuration', 'Serial Port [Enabled]', 'Device Settings IO=3F8h; IRQ=4;', and 'Change Settings [IO=3F8h; IRQ=4;]'. The right column contains the text: 'Select an optimal settings for Super IO Device' and a list of navigation instructions: '++: Select Screen', '↑↓: Select Item', 'Enter: Select', '+/-: Change Opt.', 'F1: General Help', 'F2: Previous Values', 'F3: Optimized Defaults', 'F4: Save & Exit', and 'ESC: Exit'. At the bottom of the screen, the version information 'Version 2.17.1255. Copyright (C) 2016 American Megatrends, Inc.' is displayed.

Feature	Description	Options
<b>Serial Port</b>	Enable or Disable Serial Port (COM)	★Enabled, Disabled
<b>Change Settings</b>	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 (COM 2)



Feature	Description	Options
<b>Serial Port</b>	Enable or Disable Serial Port (COM)	Disabled, ★Enabled
<b>Change Settings</b>	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 (COM 3)

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.

Main

Serial Port 3 Configuration

Serial Port [Enabled]  
Device Settings IO=3E8h; IRQ=11;  
RS-232/422/485 Control Option [RS-232]  
Change Settings [IO=3E8h; IRQ=11;]

Serial Port 3 RS-232/422/485 Control Option

RS-232/422/485 Control Option  
RS-232  
RS-485 HALF DUPLEX  
RS-485/422 FULL DUPLEX

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

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Feature	Description	Options
<b>Serial Port</b>	Enable or Disable Serial Port (COM)	★Enabled, Disabled
<b>RS-232/422/485 Control Option</b>	Serial Port 3 RS-232/422/485 Control Option	★ RS-232, RS-485 HALF DUPLEX RS-485/422 FULL DUPLEX
<b>Change Settings</b>	Select an optimal setting for Super IO Device.	★IO=240h; 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 (COM 4)



Feature	Description	Options
<b>Serial Port</b>	Enable or Disable Serial Port (COM)	Disabled, ★Enabled
<b>RS-232/422/485 Control Option</b>	Serial Port 4 RS-232/422/485 Control Option	★ RS-232, RS-485 HALF DUPLEX RS-485/422 FULL DUPLEX
<b>Change Settings</b>	Select an optimal settings for super IO Device	★IO=248h; 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;

# ROBO-8113VG2AR

## H/W Monitor Configuration

### Monitor hardware status

```
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Configuration
Pc Health Status
Smart CPU Fan Function      [Enabled]
CPU Start Target Temp      30
CPU Full Target Temp       50
Smart System Fan Function  [Enabled]
System Start Target Temp   30
System Full Target Temp    50

CPU temperature             : +31 ℃
System temperature         : +33 ℃
CPU Fan Speed               : 10317 RPM
System Fan Speed           : 8422 RPM
Vcore                      : +0.996 V
VBAT                      : +3.444 V
+5V                        : +5.184 V
+12V                       : +12.295 V
VDIMM                      : +1.218 V

Enable or Disable Smart CPU Fan.

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

Version 2.17.1255. Copyright (C) 2016 American Megatrends, Inc.
```

Feature	Description	Options
<b>Smart CPU Fan Function (Enabled)</b>	Enable or Disable Smart CPU Fan	★Disabled, Enabled
<b>CPU Start Target Temp</b>	CPU Start Fan Target Temperature.	30
<b>CPU Full Target Temp</b>	CPU Full Fan Target Temperature.	50
<b>Smart System Fan Function (Enabled)</b>	Enable or Disable Smart System Fan	★Disabled, Enabled
<b>System Start Target Temp</b>	System Start Fan Target Temperature.	30
<b>System Full Target Temp</b>	System Full Fan Target Temperature.	50

# ROBO-8113VG2AR

## Serial Port Console Redirection

### Serial Port Console Redirection

The screenshot shows the 'Configuration' screen of the Aptio Setup Utility. The title bar reads 'Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.'. The main content area is divided into two columns. The left column is titled 'Serial Port Console Redirection' and contains the following settings:

- COM0  
Console Redirection [Enabled]
- Console Redirection Settings
- COM1(Pci Bus0,Dev0,Func0) (Disabled)  
Console Redirection Port Is Disabled

The right column is titled 'Console Redirection Enable or Disable.' and contains a list of navigation and function keys:

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

The footer of the screen reads 'Version 2.17.1255. Copyright (C) 2016 American Megatrends, Inc.'.

Feature	Description	Options
<b>Console Redirection (COM 0-5)</b> (Enabled)	Console Redirection Enable or Disable.	★Disabled, Enabled

# ROBO-8113VG2AR

## COM 0 Serial Port Console Redirection

### COM0 Serial Port Console Redirection

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Configuration

COM0  
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]
Legacy OS Redirection Resolution	[80x24]
Putty KeyPad	[VT100]
Redirection After BIOS POST	[Always Enable]

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.

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

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Feature	Description	Options
<b>Terminal Type</b>	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
<b>Bits per second</b>	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
<b>Data bits</b>	Data bits	★8, 7
<b>Parity</b>	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
<b>Stop Bits</b>	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
<b>Flow Control</b>	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

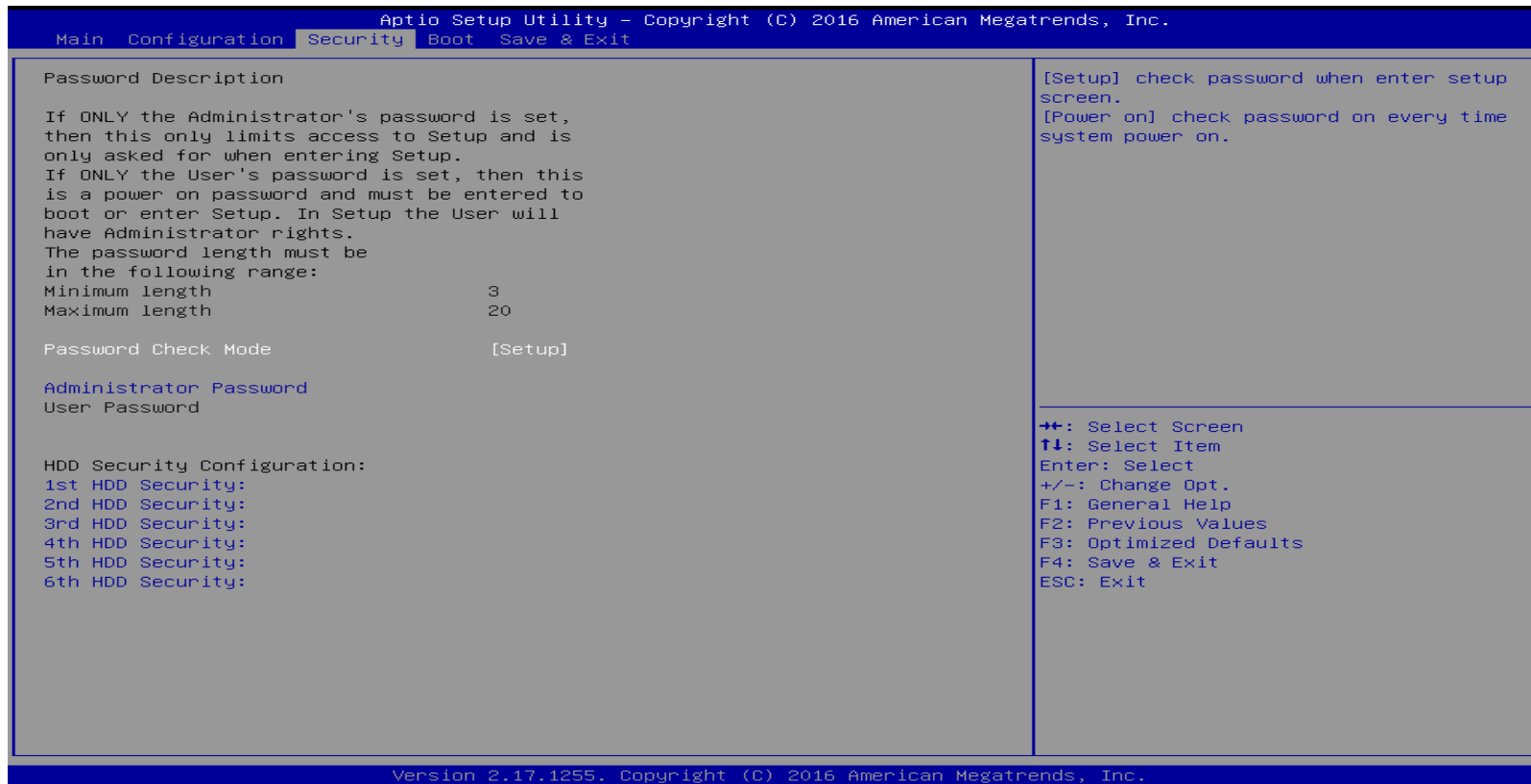
## ROBO-8113VG2AR

<b>VT-UTFB Combo Key Support</b>	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals	★Enabled, Disabled
<b>Recorder Mode</b>	With this mode enabled only text will be sent. This is to capture Terminal data.	★Disabled, Enabled
<b>Resolution 100x31</b>	Enables or disables extended terminal resolution	★Disabled, Enabled
<b>Legacy OS Redirection Resolution</b>	On Legacy OS, the Number of Rows and Columns supports redirection	★80x24, 80x25
<b>Putty KeyPad</b>	Select FunctionKey and KeyPad on Putty	★VT100, LINUX,XTERMR6, SCO,ESCN,VT400
<b>Redirection After BIOS POST</b>	The settings specify if BootLoader is selected then Legacy console redirection is disabled before booting to legacy OS. Default value is Always Enable with means Legacy console Redirection is enabled for Legacy OS.	★Always Enable, BootLoader

# ROBO-8113VG2AR

## 6.2.3 Security

This section lets you set security passwords to control access to the system at boot time and/or when entering the BIOS setup program.

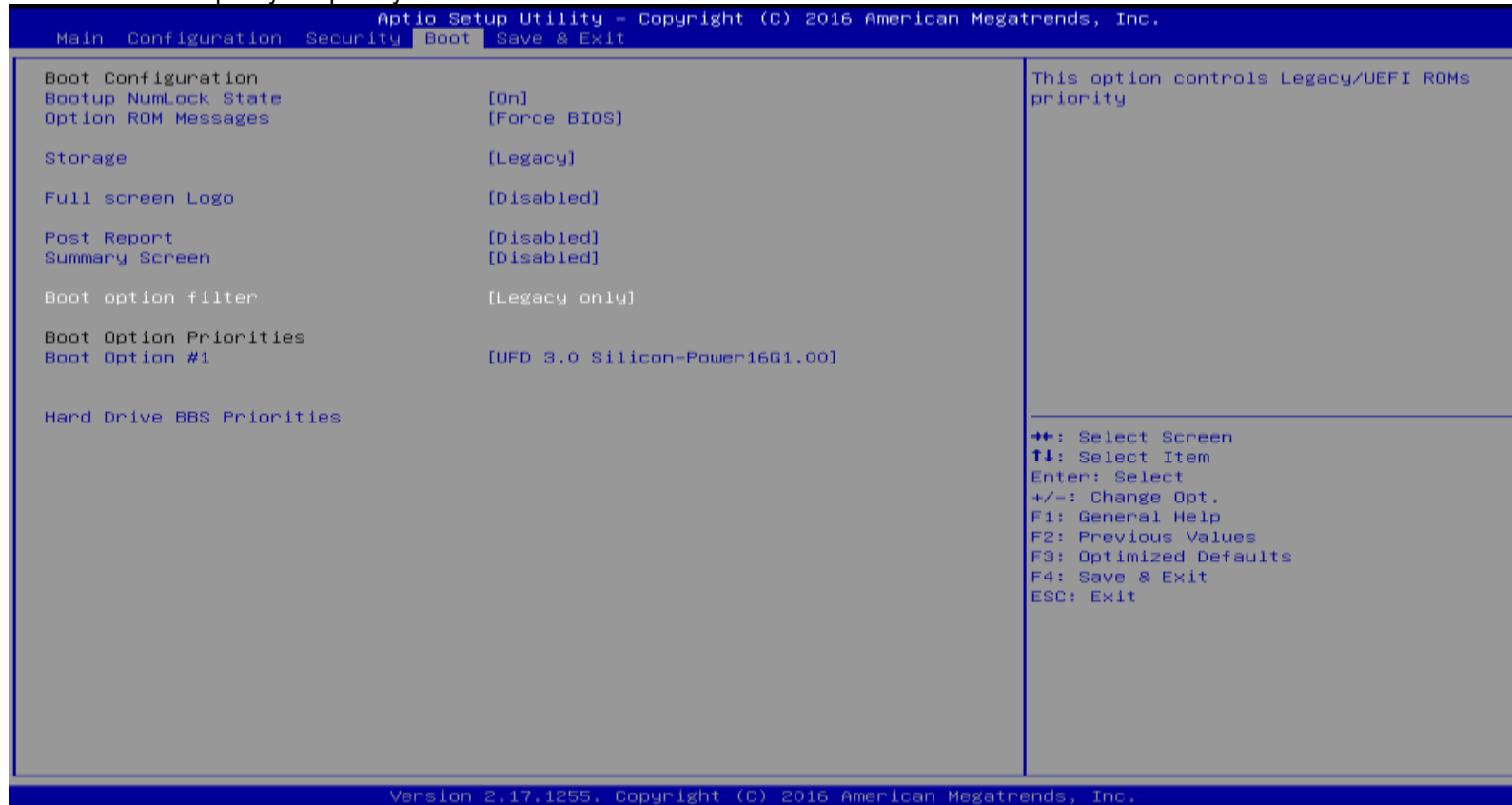


Feature	Description	Options
<b>Password Check Mode</b>	[Setup] check password when enter setup screen. [Power on] check password on every time system power on.	★ Setup, Power on
<b>Administrator Password</b>	Set Administrator Password	★ No default setting
<b>1st-6th HDD Security</b>	HDD Security Configuration for selected drive.	

# ROBO-8113VG2AR

## 6.2.4 Boot

Use this menu to specify the priority of boot devices.



Feature	Description	Options
<b>Bootup NumLock State</b>	Select the keyboard NumLock state	★On, Off
<b>Option ROM Messages</b>	Set display mode for Option ROM	★Force BIOS, Keep Current
<b>Storage</b>	Controls the execution of the UEFI and Legacy Storage OpROM	★Legacy, Do not Launch, UEFI
<b>Full screen Logo</b>	Enables or disables Quiet Boot option and Full screen Logo.	★Disabled, Enabled
<b>Post Report</b>	Post Report Support Enabled/Disabled	★Disabled, Enabled
<b>Summary Screen</b>	Summary Screen Support Enabled/Disabled	★Disabled, Enabled
<b>Boot option filter</b>	This option controls Legacy/UEFI ROMs priority	★Legacy only, UEFI only
<b>Hard Drive BBS Priorities</b>	Set the order of the legacy devices in this group	

## 6.2.5 Save & Exit



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



## 7 Troubleshooting

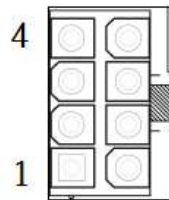
This chapter provides a few useful tips to quickly get ROBO-8113VG2AR running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

### 7.1 Hardware Quick Installation

#### ATX Power Setting

Unlike other Single board computer, ROBO-8113VG2AR supports ATX only. Therefore, there is no other setting that really needs to be set up. However, there are only two connectors that must be connected—J12 ATX 8Pin Connector (4 pins CPU+12V main power connector) & 24 pins ATX Power Connector (On PICMG Backplane).

**J12: ATX 8 Pin Connector(For CPU Power)**

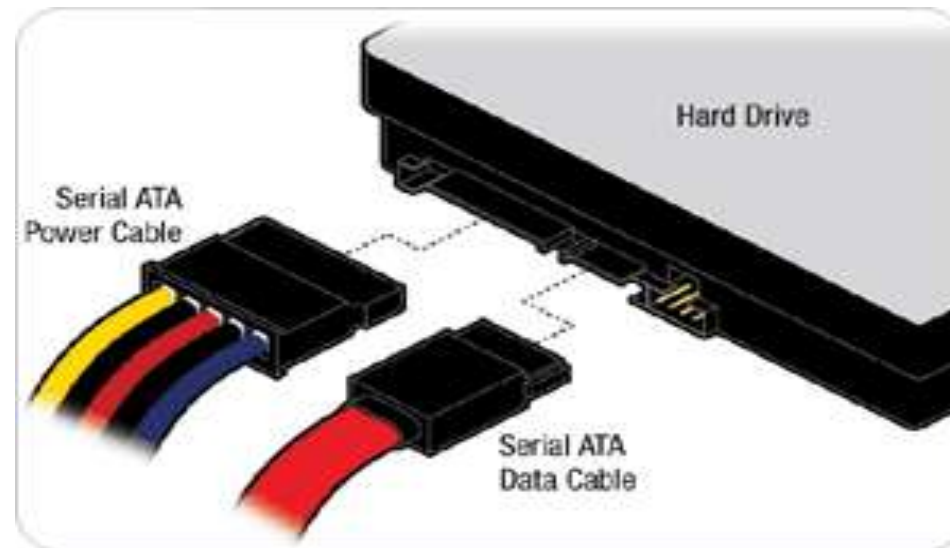


PIN No.	Description	PIN No.	Description
1	Ground	5	+12V
2	Ground	6	+12V
3	Ground	7	+12V
4	Ground	8	+12V

### Serial ATA

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time; there are total six connectors, SATA0~5 port. 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. All you need to operate AHCI, RAID (0/1/5/10) application for system, please follow up setting guide in BIOS setup utility.

ROBO-8113VG2AR can support six SATA interface (SATAIII, 6.0Gb/s) on board. It has four J2/J7/J15/J16 SATA ports on board; two SATA ports on PICMG Backplane. The SATA interface shall support both 1.5/3.0Gb & 6.0Gb operation per the SATA specification.



## 7.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. CPU, CPU Fan, 288-Pin DDR4 memory, keyboard, mouse, SATA hard disk, DVI-I connector, device power cables, 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-8113VG2AR, 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.

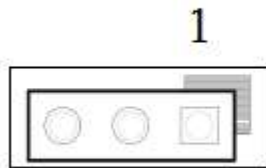
## 7.3 FAQ

### 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 JP4 on the ROBO-8113VG2AR SBC 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.

### JP4: Clear CMOS Setup



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

## ROBO-8113VG2AR

**Question:** How to update the BIOS file of ROBO-8113VG2AR?

**Answer:** 1. Please visit web site of **Portwell download center** as below hyperlink

[http://www.portwell.com.tw/support/download\\_center.php](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-8113VG2AR”**.

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.

[http://www.portwell.com.tw/support/download\\_center.php](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](http://www.portwell.com.tw/support/problem_report.php)

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

Thanks

**Question:** The steps of windows7 OS installation with USB3.0 driver.

**Answer:** 1. Windows 7\* installation media does not include the native driver supports for USB 3.0, so during the installation, once you get into the screen for select your preferred language, when the keyboard or mouse connect to the USB 3.0 port, it won't have any response. In order to solve this problem, you could refer the following steps to install the Windows 7 on Skylake platform.

2. Installation needs:

(1) Preparing the valid copyright of Windows 7 on ISO or DVD, as the following you have administrator access to another working computer (the Admin system) with Windows 7 or later to follow these steps.

(2) To download and unzip the Windows 7 USB 3.0 driver.

<https://downloadcenter.intel.com/download/22824/USB-3-0-Driver-Intel-USB-3-0-eXtensible-Host-Controller-Driver-for-Intel-8-9-100-Series-and-C220-C610-Chipset-Family>

3. Create a USB flash drive installer:

Using the Windows 7 DVD or ISO image to create a bootable USB flash drive.

A. Using Windows USB/DVD Download Tool to create a bootable USB flash drive. You could find this tool in our driver CD or download it via <http://wudt.codeplex.com/>

B. Click the Windows Start button, and click Windows7 USB/DVD Download Tool to execute.

C. Choosing the ISO file, type the name and path of your Windows ISO file, or click Browse and select the file from the open dialog box. Click Next.

- D. Select USB device to create a copy on the USB flash drive.
- E. If you are copying the file to a USB flash drive, select your USB device in the drop-down list and click Begin copying.
- F. Then you can see it starts to create the bootable USB device.
- G. It shows the “Bootable USB device created successfully” message after finish all processes.

#### 4. Extract the USB3.0 drivers:

The USB3.0 drivers which you downloaded must make a folder to place the driver. Example: “USB3 Fix”. Please create 2 folders in the USB3 Fix folder: “USB3” & “mount”. Then extract the USB3.0 drivers and copy the “Drivers” folder into USB3 folder.

#### 5. Get the “boot.wim” & “install.wim” files from USB bootable device:

Please copy those two files to the “USB3 Fix” folder from \source of the root of your USB bootable device.

#### 6. Update the “boot.wim” & “install.wim” files by “dism” command:

Please execute the cmd shell as an administrator. (Click Start on windows 7, type in “cmd” and then right click on the cmd application and choose Run as Administrator.)

Please navigate to the USB3\_Fix folder in the cmd shell, and type in the following commands in this order to update the boot.wim file:

(1) `dism /mount-wim /wimfile:boot.wim /index:2 /mountdir:mount`

(2) `dism /image:mount /add-driver:"usb3" /recurse`

(3) `dism /unmount-wim /mountdir:mount /commit`

(4) Please type the command to get which type of your Win7 O/S.

```
dism /Get-WimInfo /WimFile:install.wim
```

Please select the correct index number for your Win7 O/S. (Example: We used the Win7 Ultimate N then we must choose “**index 5**”)

(5) Please type the command as below lists.

```
dism /mount-wim /wimfile:install.wim /index:5 /mountdir:mount
```

(6) Please type the command as below lists.

```
dism /image:mount /add-driver:"usb3" /recurse
```

(7) Please type the command as below lists.

```
dism /unmount-wim /mountdir:mount /commit
```

7. Please copy both two file back to the \source of the root of your USB bootable device.

Then you can install the Win7 O/S which has been included the USB3.0 driver by USB bootable device.



## 8 Portwell Software Service

### Portwell Evaluation Tool (PET)

The Portwell Evaluation Tool (PET) is an API which Portwell's customers can access the GPIO, I2C, SMBus, etc under Windows and Linux OS. For more information please contact Portwell.

### Portwell BIOS web Tool (PBT)

The Portwell BIOS web Tool (PBT) is a brand new on-line utility which innovated by Portwell. PBT now is available for Portwell's premiere customers who are able to [add customized BIOS logo and change BIOS default settings on](#) American Megatrends (AMI) BIOS. Please contact Portwell for more information.

### Portwell EC Auto Test Tool (PECAT)

The Portwell EC Auto Test Tool (PECAT) is a brand new utility which innovated by Portwell. PECAT now is available for Portwell's premiere customers, who are able to [Test Embedded Controller Function](#) in UEFI Mode. Please contact Portwell for more information.

## 9 Industry Specifications

### 9.1 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>