

# USER MANUAL

## **BA-2601**

**ATX Intel® 8th Gen. Core™  
i7/i5/i3/ Pentium® /  
Celeron® / Xeon® 2100G  
Processor**

**BA-2601 M1**

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# ***BA-2601***

## ***ATX Intel<sup>®</sup> 8th Gen. Core<sup>™</sup> i7/i5/i3/ Pentium<sup>®</sup> / Celeron<sup>®</sup> / Xeon<sup>®</sup> 2100G Processor***

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### **DISCLAIMER**

This user's manual is meant to assist users in installing and setting up the system. The information contained in this document is subject to change without any notice.

### **CE NOTICE**

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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## FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.



**CAUTION:** Danger of explosion may occur when the battery is incorrectly replaced. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.



**WARNING:** Some internal parts of the system may have high electrical voltage. We strongly recommend that only qualified engineers are allowed to service and disassemble the system. If any damages should occur on the system and are caused by unauthorized servicing, it will not be covered by the product warranty.

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## Revision History

The revision history of BA-2601 User Manual is described below:

Version No.	Revision History	Date
M1	Initial Release	2018/07

# 1 Introduction

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This chapter provides the introduction for the BA-2601 system as well as the framework of the user manual.

The following topic is included:

- About This Manual

## **1.1 About This Manual**

Thank you for purchasing our BA-2601 system. The BA-2601 provides faster processing speed, greater expandability and can handle more tasks than before. This manual is designed to assist you how to install and set up the whole system. It contains 5 chapters and 1 appendix. Users can configure the system according to their own needs. This user manual is intended for service personnel with strong hardware background. It is not intended for general users.

The following section outlines the structure of this user manual.

### ***Chapter 1 Introduction***

This chapter provides the introduction for the BA-2601 system as well as the framework of the user manual.

### ***Chapter 2 Getting Started***

This chapter describes the package contents and outlines BA-2601 specifications. Read the safety reminders carefully on how to take care of your system properly.

### ***Chapter 3 Hardware Configuration***

This chapter outlines the locations of the motherboard components and their respective functions. You will learn how to set the jumpers and configure the system to meet your own needs.

### ***Chapter 4 Software Utilities***

This chapter contains helpful information for proper installations of the Intel Chipset Software Installation Utility, Graphics Driver Utility, LAN Driver Utility, Sound Driver Utility, Intel® Management Engine Components Installer, Intel® Rapid Storage Utility and Intel® Serial I/O Driver Utility.

### ***Chapter 5 BIOS Setup***

This chapter indicates you how to change the BIOS configurations.

### ***Appendix A Technical Summary***

This appendix provides the information about the allocation maps for BA-2601 block diagram, system resources, Watchdog Timer Configuration and Flash BIOS Update.

# 2

## Getting Started

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This chapter provides the information for the BA-2601 system. It describes the package contents and outlines the BA-2601 specifications.

The following topics are included:

- Package List
- BA-2601 Specification
- Safety Precautions

**Experienced users can go to Chapter 3 Hardware Configuration on page 3-1 for a quick start.**

## **2.1 Packing List**

If you discover any of the items listed below are damaged or lost, please contact your local distributor immediately.

<b>Item</b>	<b>Q'ty</b>
BA-2601	1
Quick Reference Guide	1
Manual / Driver DVD	1
Mini Jumper (2.0 mm)	6
SATA Cable (500mm)	1
I/O Shield	1

## 2.2 BA-2601 Specifications

System	
<b>CPU Support</b>	<ul style="list-style-type: none"> <li>➤ LGA1151 socket for Intel® 8th Gen. Core™ i7/i5/i3 / Pentium® / Celeron® desktop CPU</li> <li>➤ Intel® Xeon® 2100G server CPU</li> </ul>
<b>CPU List</b>	<ul style="list-style-type: none"> <li>➤ <b>Xeon®</b>: E-2176G, E-2124G</li> <li>➤ <b>8th Core™</b>: i7-8700(T), i5-8500(T), i3-8100(T)</li> <li>➤ <b>Pentium®</b>: G5400(T)</li> <li>➤ <b>Celeron®</b>: G4900(T)</li> </ul>
<b>Chipset</b>	<ul style="list-style-type: none"> <li>➤ Intel® C246 (supports Xeon® / Core™ / Pentium® / Celeron® CPU)</li> <li>➤ Intel® H310 /Q370 (supports Core™ / Pentium® / Celeron® CPU)</li> </ul>
<b>Memory Support</b>	<p><b>DIMM1/3, DIMM2/4</b></p> <ul style="list-style-type: none"> <li>➤ Dual channel, DDR4-2400/2666, up to 64GB, 4 x 288-Pin DIMM for <b>C246/Q370</b> only</li> </ul> <p><b>DIMM1/3</b></p> <ul style="list-style-type: none"> <li>➤ Supports ECC (C246) / non-ECC (C246/Q370/H310)</li> <li>➤ Dual channel, DDR4-2400/2666, up to 32GB, 2 x 288-Pin DIMM for <b>H310</b> only</li> </ul>
<b>BIOS</b>	<ul style="list-style-type: none"> <li>➤ AMI UEFI BIOS</li> </ul>
<b>Hardware Monitor</b>	<ul style="list-style-type: none"> <li>➤ CPU, System FAN (smart FAN connector*2), 12V, 5V, 5Vsb, Vcore</li> </ul>
<b>Watchdog Timer</b>	<ul style="list-style-type: none"> <li>➤ 1~255 seconds watchdog timer selectable</li> </ul>
<b>Power Supply</b>	<ul style="list-style-type: none"> <li>➤ Supports ATX power (24+4 pins)</li> </ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>➤ +12V: 2.9A; -12V: 0.1A; +3.3V: 0.54A; +5V: 1.18A; 5Vsb: 0.1A</li> </ul>
<b>Speaker</b>	<ul style="list-style-type: none"> <li>➤ 1 x internal buzzer</li> </ul>
<b>Dimensions</b>	<ul style="list-style-type: none"> <li>➤ 305 x 244mm (12" x 9.6")</li> </ul>
<b>O.S. Support</b>	<ul style="list-style-type: none"> <li>➤ Windows® 10 IoT Enterprise</li> </ul>
<b>Certificate</b>	<ul style="list-style-type: none"> <li>➤ CE/FCC</li> </ul>
I/O Ports	
<b>SATA Interface</b>	<ul style="list-style-type: none"> <li>➤ <b>C246 and Q370 SKU</b>: 6 x SATA III (6.0Gb/s) with RAID 0,1,5,10</li> <li>➤ <b>H310 SKU</b>: 4 x SATA III (6.0Gb/s) without RAID</li> </ul>
<b>USB</b>	<p><b>10 x USB ports for C246/Q370 SKU:</b></p> <ul style="list-style-type: none"> <li>➤ 4 x USB 3.1 (rear I/O)</li> </ul>

	<ul style="list-style-type: none"> <li>➤ 2 x USB 3.0 box header (on-board)</li> <li>➤ 4 x USB 2.0 box header (on-board)</li> </ul> <p><b>8 x USB ports for H310 SKU:</b></p> <ul style="list-style-type: none"> <li>➤ 2 x USB 3.1 (rear I/O)</li> <li>➤ 2 x USB 2.0 (rear I/O)</li> <li>➤ 2 x USB 3.0 box header (on-board)</li> <li>➤ 4 x USB 2.0 pin header (on-board)</li> </ul> <p><b>Note:</b> All USB 3.1 ports on H310 SKU support Gen. 1 only.</p>
<b>Serial Ports</b>	<ul style="list-style-type: none"> <li>➤ 6 x COM ports</li> <li>➤ COM1~COM2: D-Sub 9, Rear I/O</li> <li>➤ COM2: RS232/422/485 selectable under BIOS, default: RS232</li> <li>➤ COM3~COM6: internal wafer (2 x 5 pins) for <b>C246</b> SKU only</li> <li>➤ COM3~COM4: internal wafer (2 x 5 pins) for all SKUs</li> <li>➤ COM3 / COM4 for 5V and 12V selectable by jumper</li> <li>➤ COM5 / COM6 for <b>C246</b> SKU only</li> </ul>
<b>Parallel Port</b>	<ul style="list-style-type: none"> <li>➤ 1 x LPT connector for <b>C246/Q370</b> SKU only</li> </ul>
<b>LAN</b>	<ul style="list-style-type: none"> <li>➤ Dual ports to support 10/100/1000Mbps, RJ45, rear I/O</li> <li>➤ <b>LAN1:</b> Intel® PHY I219-LM (10/100/1000 Mbps)</li> <li>➤ <b>LAN2:</b> Intel® PHY I211-AT (10/100/1000 Mbps)</li> <li>➤ Supports Wake-On-LAN &amp; PXE</li> </ul>
<b>Digital I/O</b>	<ul style="list-style-type: none"> <li>➤ 8 in / 8 out (pin header)</li> </ul>
<b>GPIO / DIO</b>	<ul style="list-style-type: none"> <li>➤ 8bits GPIO programmable</li> </ul>
<b>FAN</b>	<ul style="list-style-type: none"> <li>➤ 1 x CPU fan, 2 x system fans (internal connectors)</li> </ul>
<b>Keyboard / Mouse</b>	<ul style="list-style-type: none"> <li>➤ 2 x PS/2 connectors (rear I/O)</li> </ul>
<b>Audio</b>	<ul style="list-style-type: none"> <li>➤ Mic In / Line In / Line Out (rear I/O); High definition audio with Realtek ALC888S</li> </ul>
<b>Expansion Bus</b>	<p><b>C246/Q370 SKU:</b></p> <ul style="list-style-type: none"> <li>➤ 1 x PCIe (x16), 1 x PCIe (x4), 1 x Mini PCIe</li> <li>➤ 5 x PCI (PCIe to PCI bridge)</li> </ul> <p><b>H310 SKU:</b></p> <ul style="list-style-type: none"> <li>➤ 1 x PCIe (x16), 1 x PCIe (x4)</li> <li>➤ 5 x PCI (PCIe to PCI bridge)</li> </ul>
<b>LPC</b>	<ul style="list-style-type: none"> <li>➤ 1 x LPC pin header</li> </ul>
<b>Display</b>	
<b>Flexible Display</b>	<ul style="list-style-type: none"> <li>➤ <b>Standard SKU:</b> 1 x VGA, 1 x DVI-D, 1 x eDP</li> <li>➤ <b>Customized SKU:</b> 1 x DP, 1 x eDP (no compatible I/O Shield)</li> </ul>

<b>VGA</b>	➤ 1 x VGA (rear I/O ) up to 1920x1200 @60Hz (default)
<b>DVI</b>	➤ 1 x DVI-D (rear I/O) up to 1920x1200 @60Hz (default)
<b>eDP (option)</b>	➤ 1 x eDP (internal) up to 4096x2304@60Hz (default)
<b>DisplayPort (option)</b>	➤ 1 x display port (rear I/O) up to 4096x2304 @60Hz for customized SKU (replace VGA and DVI-D) <b>Note:</b> The discrete graphics card is necessary for display if the integrated graphics support is not available in CPU.
<b>Others</b>	
<b>I<sup>2</sup>C</b>	➤ 1 x I <sup>2</sup> C 4-pin wafer
<b>Front Panel LED Indicator</b>	➤ HDD LED, Power LED, Power Switch, Reset Switch ➤ On-board Power LED (Green)
<b>Front Panel Audio</b>	➤ 1 x Front Panel Audio Header (2 x 5 pins)
<b>TPM on board (option)</b>	➤ Co-lay TPM1.2 / TPM2.0 chip
<b>Case Open Detection</b>	➤ 1 x 2-pin jumper for case intrusion detection
<b>Shock</b>	➤ 15G peak-to-peak, 11ms duration, non-operation
<b>Vibration</b>	➤ Non-operation: 2G, 5-200Hz, X, Y, Z axis
<b>Environment</b>	
<b>Operating Temp.</b>	➤ 0°C ~ 60°C (32°F ~ 140°F)
<b>Storage Temp.</b>	➤ -40°C ~ 85°C (-40°F ~ 185°F)
<b>Operation Humidity</b>	➤ 20%~ 90% (non-condensing)



## **2.3 Safety Precautions**

Follow the instructions below to avoid your system from damages:

1. Keep your system away from static electricity on all occasions.
2. Prevent electric shock. Don't touch any components of this board when it is powered on. Always disconnect power when the system is not in use.
3. Disconnect power source when you change any hardware devices.  
For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

# 3

## Hardware Configuration

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This chapter contains helpful information about the jumper & connector settings, and component locations.

The following sections are included:

- Jumper & Connector Quick Reference Table
- Component Locations
- Configuration and Jumper Settings
- Connector Pin Assignments

**3.1 JUMPER & CONNECTOR QUICK REFERENCE TABLE**

<b>JUMPER Description</b>	<b>NAME</b>
Clear CMOS Data Selection	JCMOS1
Hardware Power Failure ON Selection	JP_AT1
Mini PCI Express and *mSATA Selection (For C246/Q370 SKU Only)	JP_SW1
PCH Configuration / Recovery Selection	JP2
Flash Descriptor Override Selection	JP3
VCCIO Voltage Selection	JP6
COM3 Pin9 RI/5V/12V Selection	JPCOM3
COM4 Pin9 RI/5V/12V Selection	JPCOM4

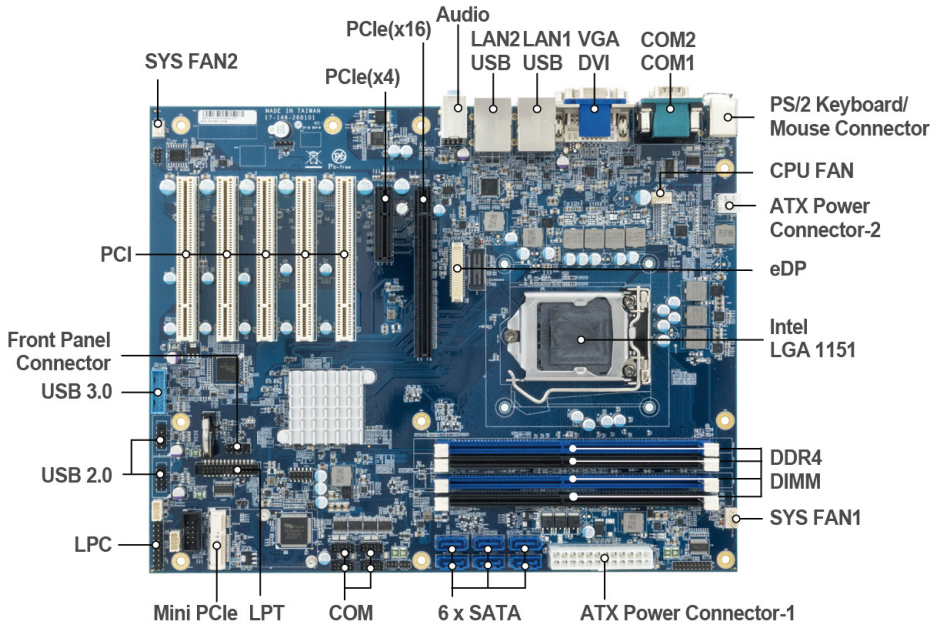
**Note:** mSATA function is for customized BOM option.

<b>CONNECTOR Description</b>	<b>NAME</b>
Power Input Connectors	ATX_PWR1, ATX_PWR2
Line In, Line Out and MIC In Port	AUDIO1
COM Port	COM1, COM2
COM Connectors	COM3, COM4, COM5, COM6
CPU / System FAN Connectors	CPU_FAN1, SYS_FAN1, SYS_FAN2
Embedded Display Port (EDP) Connector	EDP1
DisplayPort Connector (option)	DP1
DVI (Digital Video Interface) Port	DVI-D
Front Panel Connector	JFP1
Programmable GPIO Pin Header	JDIO1
LPC Connector	JLPC1
Speaker Connector	JSPK1
Keyboard / Mouse Connector	KB_MS1
LAN + USB Connectors	LAN_USB1, LAN_USB2
Mini PCI Express Slot (For C246/Q370 SKU Only)	M_PCIE1
PCI Express Slots	PCI_E1, PCI_E2

<b>CONNECTOR Description</b>	<b>NAME</b>
PCI Bus Slots	PCI1~PCI5
SATA Connectors	SATA1, SAT2, SATA3, SATA4, SATA5, SATA6
Universal Serial Bus 3.0 Connector	USB1
Universal Serial Bus 2.0 Connector	USB2, USB3
VGA Port	CN14
Parallel Port (LPT) Connector (For C246/Q370 SKU Only)	LPT1
Front Panel Audio Connector	JAUDIO1
I2C Wafer	J12C1
Case Open Connector	JP5

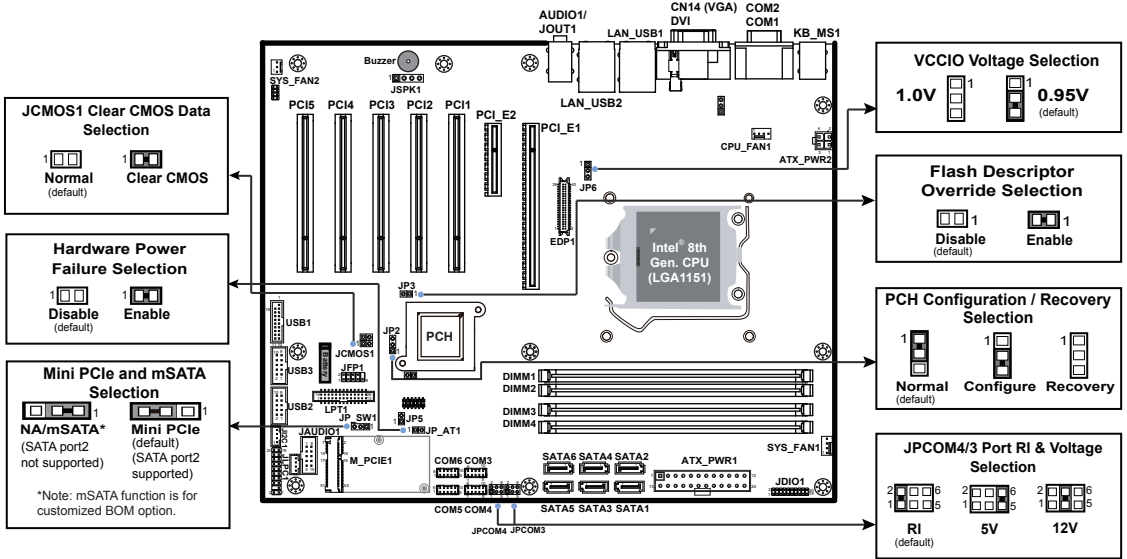
## 3.2 COMPONENT LOCATIONS

### 3.2.1 BA-2601 Top View



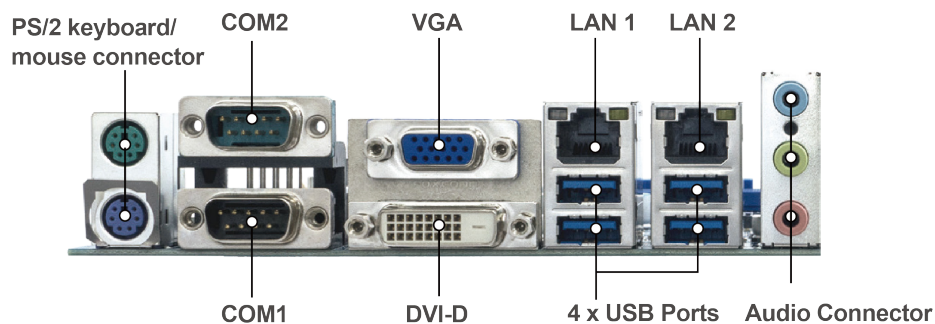
	<b>WARNING:</b> Always disconnect the power cord when you are working with connectors and jumpers on the main board. Make sure both the system and peripheral devices are turned OFF as sudden surge of power could damage sensitive components. Make sure BA-2601 is properly grounded.
	<b>CAUTION:</b> Observe precautions while handling electrostatic sensitive components. Make sure to ground yourself to prevent static charge while you are working on the connectors and jumpers. Use a grounding wrist strap and place all electronic components in any static-shielded devices.
	<b>CAUTION:</b> Always touch the motherboard components by the edges. Never touch components such as a processor by its pins. Take special cares while you are holding electronic circuit boards by the edges only. Do not touch the main board components.

### 3.2.2 BA-2601 Jumper Setting



**Note:** C246/Q370 SKU supports M\_PCIE1, SATA1~6, DIMM1~4, PCI\_E1~2.  
 LPT1 is only available for C246/Q370 SKU.  
 H310 SKU only supports SATA1~4, DIMM1/3, PCI\_E1~2 available.

### **3.2.3 BA-2601 I/O View**

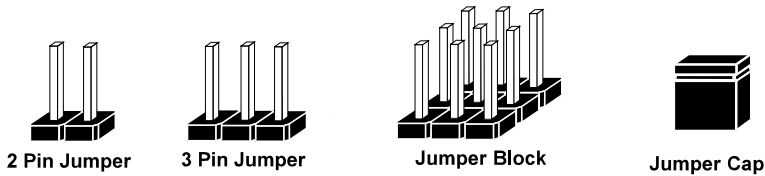


### **3.3 HOW TO SET JUMPERS**

You can configure your board by setting jumpers. Jumper is consists of two or three metal pins with a plastic base mounted on the card, and by using a small plastic "cap", Also known as the jumper cap (with a metal contact inside), you are able to connect the pins. So you can set-up your hardware configuration by "open" or "close" pins.

The jumper can be combined into sets that called jumper blocks. When the jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows how this looks like.

### **JUMPERS AND CAPS**



If a jumper has three pins (for examples, labeled PIN1, PIN2, and PIN3), you can connect PIN1 & PIN2 to create one setting by shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams look and what they represent.



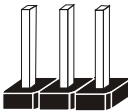
## Jumper Diagrams



Jumper Cap  
looks like this



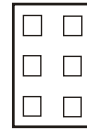
2 pin Jumper  
looks like this



3 pin Jumper  
looks like this



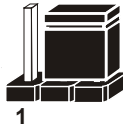
Jumper Block  
looks like this



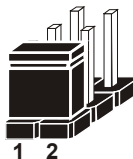
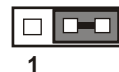
## Jumper Settings



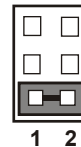
2 pin Jumper close(enabled)  
Looks like this



3 pin Jumper  
2-3 pin close(enabled)  
Looks like this



Jumper Block  
1-2 pin close(enabled)  
Looks like this



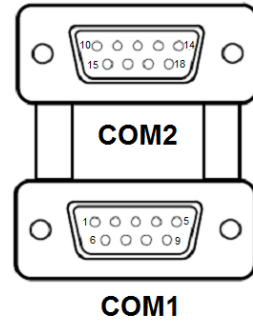
### 3.4 Setting Connectors and Jumpers

#### 3.4.1 COM1 and COM2 PORT

**Port Location: COM1, COM2**

**Description:** COM1 and COM2 Connectors, fixed as RS-232

PIN	ASSIGNMENT
1	DCD#
2	RX
3	TX
4	DTR#
5	GND
6	DSR#
7	RTS#
8	CTS#
9	RI#



**COM2:** COM2 Connector, selectable as RS-232/422/485.

The pin assignments are as follows:

PIN	Signal		
	RS-232	RS-422	RS-485
10	DCD#	TX-	RS-485-
11	RX	TX+	RS-485+
12	TX	RX+	NC
13	DTR#	RX-	NC
14	GND	GND	GND
15	DSR#	NC	NC
16	RTS#	NC	NC
17	CTS#	NC	NC
18	RI#	NC	NC

**Notes:**

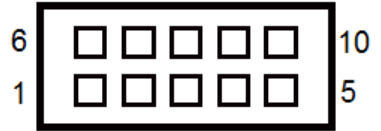
1. COM2 is selectable as RS232, RS422, RS485 by BIOS setting.
2. Default setting is RS232. Please see **Chapter 5 “Advanced – Super IO Configuration”** for details.

### **3.4.2 COM3, COM4, COM5, COM6 CONNECTOR**

**Connector Location: COM3, COM4, COM5, COM6**

**Description:** COM Connector, fixed as RS-232

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCD#	6	DSR#
2	RX	7	RTS#
3	TX	8	CTS#
4	DTR#	9	RI#
5	GND	-	-



**COM3/  
COM4/  
COM5/  
COM6**

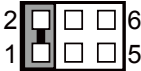

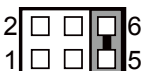
**Notes:**

1. COM3, COM4: Pin 9 is selectable for RI, +5V or +12V by jumper setting. Default setting is RI. Please see “**COM3 and COM4 PIN9 Definition Selection Guide**” for details.
2. COM5 and COM6 are available for C246 SKU only.

### 3.4.3 COM3 and COM4 PIN9 DEFINITION SELECTION GUIDE

**Jumper Location: JPCOM3 / JPCOM4**

**Description:** COM3 and COM4 RI & Voltage Selection

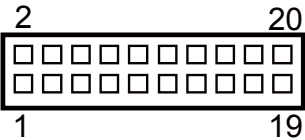
Selection	Jumper Setting (Pin Closed)	Jumper Illustration
RI	1-2 (Default Setting)	 <p><b>JPCOM3/JPCOM4</b></p>
12V	3-4	 <p><b>JPCOM3/JPCOM4</b></p>
5V	5-6	 <p><b>JPCOM3/JPCOM4</b></p>

3.4.4 Programmable GPIO PIN HEADER

Connector Location: JDIO1

Description: General Purpose Input / Output Pin Header

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC5	2	VCC12
3	DIN0	4	DOUT0
5	DIN1	6	DOUT1
7	DIN2	8	DOUT2
9	DIN3	10	DOUT3
11	DIN4	12	DOUT4
13	DIN5	14	DOUT5
15	DIN6	16	DOUT6
17	DIN7	18	DOUT7
19	GND	20	GND



JDIO1

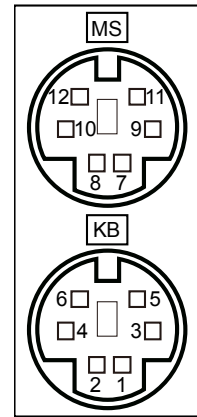
### 3.4.5 KEYBOARD & MOUSE PORT

**Port Location: KB\_MS1****Description:** PS/2 Keyboard & Mouse Port**Mouse:**

PIN	ASSIGNMENT	PIN	ASSIGNMENT
12	NC	11	MSCLK
10	VCC5	9	GND
8	NC	7	MSDATA

**Keyboard:**

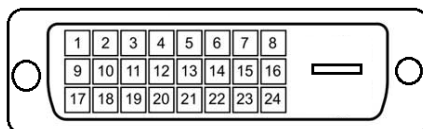
PIN	ASSIGNMENT	PIN	ASSIGNMENT
6	NC	5	KBCLK
4	VCC5	3	GND
2	NC	1	KBDATA

**KB\_MS1**

### 3.4.6 DVI (Digital Video Interface) PORT

**Port Location: DVI-D**

**Description:** DVI-D (Digital Video Interface – Digital) function is supported.



**DVI-D**

PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	TMDS_D2-	9	TMDS_D1-	17	TMDS_D0-
2	TMDS_D2+	10	TMDS_D1+	18	TMDS_D0+
3	GND	11	GND	19	GND
4	NC	12	NC	20	NC
5	NC	13	NC	21	NC
6	TMDS_CLK	14	VCC5	22	GND
7	TMDS_DATA	15	GND	23	TMDS_D3+
8	NC	16	TMDS_HPD	24	TMDS_D3-

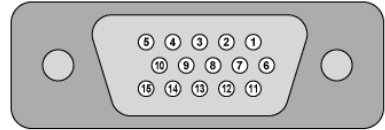
A DVI-D connector transfer only digital signals, providing faster transfer rates and better quality than their predecessor, the VGA cable. It is most commonly used to connect computer video cards to LCD monitors.

### 3.4.7 VGA PORT

#### Port Location: CN14 (VGA)

**Description:** VGA (Video Graphics Array) Connector

PIN	ASSIGNMENT
1	CRT_RED
2	CRT_GREEN
3	CRT_BLUE
4	NC
5	GND
6	NC
7	GND
8	GND
9	CRT_VCC
10	GND
11	NC
12	CRT_SDA
13	CRT_HSYNC
14	CRT_VSYNC
15	CRT_SCL



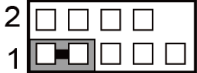
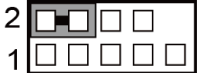
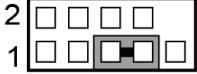
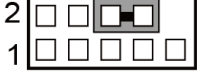
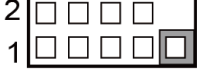
**CN14 (VGA)**



### 3.4.8 FRONT PANEL CONNECTOR

Connector Location: JFP1

Description: Front Panel Connector

SELECTION	PIN & ASSIGNMENT	JUMPER SETTINGS	JUMPER ILLUSTRATION
HDD LED	1. HDD_LED+	1-3	 <p><b>JFP1</b></p>
	3. HDD_LED-		
Power LED	2. PWR_LED+	2-4	 <p><b>JFP1</b></p>
	4. PWR_LED-		
Reset Button	5. GND	5-7	 <p><b>JFP1</b></p>
	7. RST_BTN		
Power Button	6. PWR_BTN	6-8	 <p><b>JFP1</b></p>
	8. GND		
5V	9. VCC5	9	 <p><b>JFP1</b></p>

### 3.4.9 LAN & USB PORT

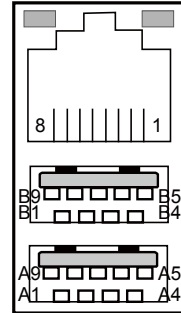
Dual LAN ports are provided to support 10/100/1000Mbps, RJ45, rear I/O, and supports Wake-On-LAN & PXE.

#### Port Location: LAN\_USB1

**Description:** LAN & Two USB 3.1 Ports

**LAN1:** Intel® PHY I219-LM (10/100/1000 Mbps)

**Green/Orange    Yellow**



**LAN\_USB1**

#### LAN1 pin assignment:

PIN	ASSIGNMENT
1	MDI_P0
2	MDI_N0
3	MDI_1P
4	MDI_2P
5	MDI_2N
6	MDI_1N
7	MDI_P3
8	MDI_N3

#### LAN1 LED Indicator:

Left Side LED

Green Color On	10/100Mbps LAN Speed Indicator
Orange Color On	Giga LAN Speed Indicator
Off	No LAN Switch/HUB connected

Right Side LED

Yellow Color Blinking	LAN Message Active
Off	No LAN Message Active

#### USB 3.1 signals:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	VCC	A9	USB3_TX_P1
A2	USB_N1	A8	USB3_TX_N1
A3	USB_P1	A7	GND
A4	GND	A6	USB3_RX_P1
-	-	A5	USB3_RX_N1

PIN	ASSIGNMENT	PIN	ASSIGNMENT
B1	VCC	B9	USB3_TX_P2
B2	USB_N2	B8	USB3_TX_N2
B3	USB_P2	B7	GND
B4	GND	B6	USB3_RX_P2
-	-	B5	USB3_RX_N2

### Port Location: LAN\_USB2

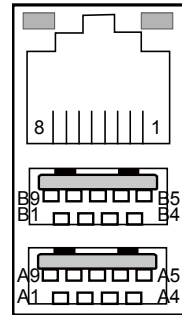
**Description:** LAN2 & Two USB 3.1 Ports

**LAN2:** Intel® PHY I211-AT (10/100/1000 Mbps)

**Green/Orange    Yellow**

### LAN2 Pin Assignment:

PIN	ASSIGNMENT
1	MDI_P0
2	MDI_N0
3	MDI_1P
4	MDI_2P
5	MDI_2N
6	MDI_1N
7	MDI_P3
8	MDI_N3



**LAN\_USB2**

### LAN2 LED Indicator:

Left Side LED

Green Color On	10/100Mbps LAN Speed Indicator
Orange Color On	Giga LAN Speed Indicator
Off	No LAN Switch/HUB connected

Right Side LED

Yellow Color Blinking	LAN Message Active
Off	No LAN Message Active

### USB 3.1 signals:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	VCC	A9	USB3_TX_P5
A2	USB_N5	A8	USB3_TX_N5
A3	USB_P5	A7	GND
A4	GND	A6	USB3_RX_P5
-	-	A5	USB3_RX_N5

PIN	ASSIGNMENT	PIN	ASSIGNMENT
B1	VCC	B9	USB3_TX_P6
B2	USB_N6	B8	USB3_TX_N6
B3	USB_P6	B7	GND
B4	GND	B6	USB3_RX_P6
-	-	B5	USB3_RX_N6

### 3.4.10 LINE IN, LINE OUT, MIC IN PORT

#### Connector Location: AUDIO1

**Description:** Line In, Line Out & Microphone  
The connector can also support only Microphone.

#### Line In:

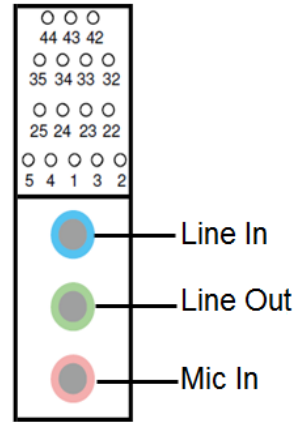
PIN	ASSIGNMENT
32	HD_LINE-IN-L
33	GND
34	GND
35	HD_LINE-IN-R

#### Line Out:

PIN	ASSIGNMENT
22	LINE-OUT-L
23	GND
24	GND
25	LINE-OUT-R

#### Mic In:

PIN	ASSIGNMENT
2	HD_MIC1-L_L
3	GND
1	GND
4	GND
5	HD_MIC1-R_L



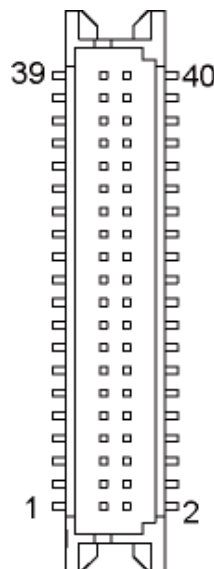
**AUDIO1**

### 3.4.11 EMBEDDED DISPLAY PORT (EDP) CONNECTOR

#### Connector Location: EDP1

**Description:** Embedded Display Port (EDP) Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	NC	2	GND
3	EDP_TX3_DN	4	EDP_TX3_DP
5	GND	6	EDP_TX2_DN
7	EDP_TX2_DP	8	GND
9	EDP_TX1_DN	10	EDP_TX1_DP
11	GND	12	EDP_TX0_DN
13	EDP_TX0_DP	14	GND
15	EDP_AUX_DP_C	16	EDP_AUX_DN_C
17	GND	18	LCDVCC
19	LCDVCC	20	LCDVCC
21	LCDVCC	22	NC
23	LCDGND	24	LCDGND
25	LCDGND	26	LCDGND
27	EDP_PANEL_HPD	28	BackLight GND
29	BackLight GND	30	BackLight GND
31	BackLight GND	32	EDP_BKLTEN
33	EDP_BKLTCTL	34	NC
35	NC	36	VCC12
37	VCC12	38	VCC12
39	VCC12	40	NC

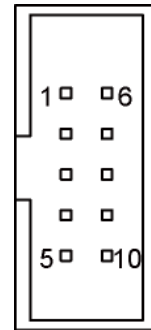


**EDP1**



**eDP** (Embedded DisplayPort) was developed to be used specifically in embedded display applications, such as Notebook and Notepad PCs. eDP is based on the VESA DisplayPort Standard. It aims to define a standardized display panel interface for internal connections; e.g., graphics cards to notebook display panels. It has advanced power-saving features including seamless refresh rate switching. It has become the new mainstream display panel interface for LCD panels with the realized higher resolution.

**3.4.12 FRONT PANEL AUDIO CONNECTOR****Connector Location:** JAUDIO1**Description:** Front Panel Audio Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	MIC1-L	6	MIC1-R
2	GND	7	GND
3	LINE-IN-L	8	LINE-IN-R
4	GND	9	GND
5	LINE-OUT-L	10	LINE-OUT-R

**JAUDIO1**

**3.4.13 HARDWARE POWER FAILURE SELECTION****Jumper Location:** JP\_AT1**Description:** Hardware Power Failure Selection



Selection	Jumper Setting (Pin Closed)	Jumper Illustration
Enable	1-2	 <b>JP_AT1</b>
Disable	Open (Default Setting)	 <b>JP_AT1</b>



3.4.14 FLASH DESCRIPTOR OVERRIDE SELECTION

Jumper Location: JP3



Description: Flash Descriptor Override Selection

Selection	Jumper Setting (Pin Closed)	Jumper Illustration
Enable	1-2	 1 <b>JP3</b>
Disable	Open (Default Setting)	 1 <b>JP3</b>

### 3.4.15 MINI PCIE and MSATA SELECTION (For C246/Q370 SKU Only)

**Jumper Location:** JP\_SW1

**Description:** Mini PCIe and mSATA Selection

Selection	Jumper Setting (Pin Closed)	Jumper Illustration
*mSATA / NA	1-2	 <b>JP_SW1</b>
Mini PCIe*	2-3 (Default Setting)	 <b>JP_SW1</b>

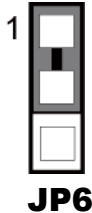

**Note 1:** mSATA function is for customized BOM option.

**Note 2:** Mini PCIe function is only supported in C246/Q370 SKU only.

### 3.4.16 VCCIO VOLTAGE SELECTION

**Jumper Location:** JP6



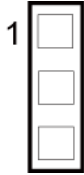
**Description:** VCCIO Voltage Selection

Selection	Jumper Setting (Pin Closed)	Jumper Illustration
1.0V	1-2	 <p><b>JP6</b></p>
0.95V	2-3 (Default Setting)	 <p><b>JP6</b></p>

### 3.4.17 PCH CONFIGURATION / RECOVERY SELECTION

**Jumper Location: JP2**

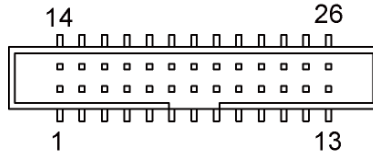
**Description:** PCH Configuration / Recovery Selection

Selection	Jumper Setting (Pin Closed)	Jumper Illustration
Normal	1-2 (Default Setting)	 <p><b>JP2</b></p>
Configure	2-3	 <p><b>JP2</b></p>
Recovery	Open	 <p><b>JP2</b></p>

### 3.4.18 PARALLEL PORT (LPT) CONNECTOR (For C246/Q370 SKU Only)

**Connector Location:** LPT1

**Description:** Parallel Port Connector



#### LPT1

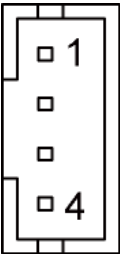
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	PRN_STRBJ_R	14	PRN_AFD
2	PRN_R_D0	15	PRN_ERRJ
3	PRN_R_D1	16	PRN_INIT
4	PRN_R_D2	17	PRN_SLIN
5	PRN_R_D3	18	GND
6	PRN_R_D4	19	GND
7	PRN_R_D5	20	GND
8	PRN_R_D6	21	GND
9	PRN_R_D7	22	GND
10	PRN_ACKJ	23	GND
11	PRN_BUSY	24	GND
12	PRN_PE	25	GND
13	PRN_SLCT	26	GND

**3.4.19 I2C WAFER**

**Connector Location:** JI2C1

**Description:** I2C Wafer

PIN	ASSIGNMENT
1	GND
2	3.3V
3	I2C_SCL
4	I2C_SDA



**JI2C1**

**3.4.20 Case Open Connector**

**Connector Location:** JP5

**Description:** Case Open Connector

PIN	ASSIGNMENT
1	COPENJ
2	GND



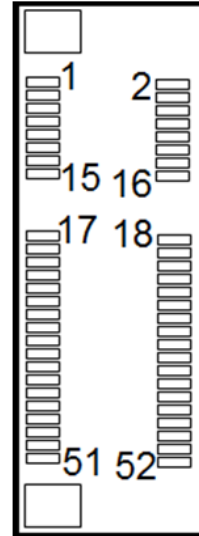
**JP5**

### 3.4.21 MINI PCI EXPRESS SLOT (For C246/Q370 Only)

Connector Location: M\_PCIE1

Description: Mini-PCI Express Slot

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	WAKE_N	2	3.3V_SB
3	NC	4	GND
5	NC	6	1.5V
7	CLKREQ#	8	NC
9	GND	10	NC
11	REFCLK+	12	NC
13	REFCLK-	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	PERST#
23	PE_RX_N	24	3.3V_SB
25	PE_RX_P	26	GND
27	GND	28	1.5V
29	GND	30	SMB_CLK
31	PE_TX_N	32	SMB_DATA
33	PE_TX_P	34	GND
35	GND	36	USB_N
37	GND	38	USB_P
39	3.3V_SB	40	GND
41	3.3V_SB	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	1.5V
49	NC	50	GND
51	NC	52	3.3V_SB

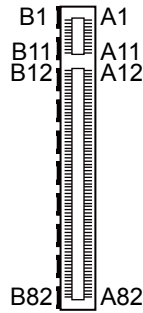


**M\_PCIE1**

### 3.4.22 PCIe Bus

Connector Location: PCI\_E1

Description: 164-pin PCIe Bus (x16)



**PCI\_E1**

PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT
B2	+12V	B1	+12V	A2	+12V	A1	PRST#1
B4	GND	B3	+12V	A4	GND	A3	+12V
B6	SMB DATA	B5	SMB CLK	A6	NC	A5	NC
B8	+3.3V	B7	GND	A8	NC	A7	NC
B10	+3.3V_AUX	B9	NC	A10	+3.3V	A9	+3.3V
-	-	B11	WAKE#	-	-	A11	PERST#
B12	RSVD	B13	GND	A12	GND	A13	REFCLK+
B14	HSOP0	B15	HSO0	A14	REFCLK-	A15	GND
B16	GND	B17	PRST#2	A16	HSIP0	A17	HSIN0
B18	GND	B19	HSOP1	A18	GND	A19	RSVD
B20	HSO1	B21	GND	A20	GND	A21	HSIP1
B22	GND	B23	HSOP2	A22	HSIN1	A23	GND
B24	HSO2	B25	GND	A24	GND	A25	HSIP2
B26	GND	B27	HSOP3	A26	HSIN2	A27	GND
B28	HSO3	B29	GND	A28	GND	A29	HSIP3
B30	RSVD	B31	PRST#2	A30	HSIN3	A31	GND
B32	GND	B33	HSOP4	A32	RSVD	A33	RSVD
B34	HSO4	B35	GND	A34	GND	A35	HSIP4
B36	GND	B37	HSOP5	A36	HSIN4	A37	GND
B38	HSO5	B39	GND	A38	GND	A39	HSIP5
B40	GND	B41	HSOP6	A40	HSIN5	A41	GND
B42	HSO6	B43	GND	A42	GND	A43	HSIP6
B44	GND	B45	HSOP7	A44	HSIN6	A45	GND
B46	HSO7	B47	GND	A46	GND	A47	HSIP7
B48	PRST#2	B49	GND	A48	HSIN7	A49	GND
B50	HSOP8	B51	HSO8	A50	RSVD	A51	GND
B52	GND	B53	GND	A52	HSIP8	A53	HSIN8
B54	HSOP9	B55	HSO9	A54	GND	A55	GND
B56	GND	B57	GND	A56	HSIP9	A57	HSIN9
B58	HSOP10	B59	HSO10	A58	GND	A59	GND
B60	GND	B61	GND	A60	HSIP10	A61	HSIN10



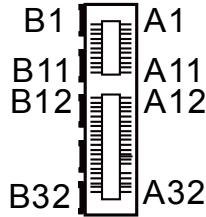
### *Chapter 3 Hardware Configuration*

PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT
B62	HSOP11	B63	HSOP11	A62	GND	A63	GND
B64	GND	B65	GND	A64	HSIP11	A65	HSIN11
B66	HSOP12	B67	HSOP12	A66	GND	A67	GND
B68	GND	B69	GND	A68	HSIP12	A69	HSIN12
B70	HSOP13	B71	HSOP13	A70	GND	A71	GND
B72	GND	B73	GND	A72	HSIP13	A73	HSIN13
B74	HSOP14	B75	HSIN14	A74	GND	A75	GND
B76	GND	B77	GND	A76	HSIP14	A77	HSIN14
B78	HSIP15	B79	HSIN15	A78	GND	A79	GND
B80	GND	B81	PRSNT#2	A80	HSIP15	A81	HSIN15
B82	RSVD	-	-	A82	GND	-	-

**Connector Location: PCI\_E2 (x4)**

**Description:** PCIe Bus (x4)

You will find the **PCI\_E2** connector with 64 pins on BA-2601.



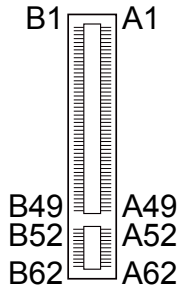
**PCI\_E2**

PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT
B2	+12V	B1	+12V	A2	+12V	A1	PRSNT#1
B4	GND	B3	+12V	A4	GND	A3	+12V
B6	SMB DATA	B5	SMB CLK	A6	NC	A5	NC
B8	+3.3V	B7	GND	A8	NC	A7	NC
B10	+3.3V_AUX	B9	NC	A10	+3.3V	A9	+3.3V
-	-	B11	WAKE#	-	-	A11	PERST#
B12	RSVD	B13	GND	A12	GND	A13	REFCLK+
B14	HSOP0	B15	HSOP0	A14	REFCLK-	A15	GND
B16	GND	B17	PRSNT#2	A16	HSIP0	A17	HSIN0
B18	GND	B19	HSOP1	A18	GND	A19	RSVD
B20	HSOP1	B21	GND	A20	GND	A21	HSIP1
B22	GND	B23	HSOP2	A22	HSIN1	A23	GND
B24	HSOP2	B25	GND	A24	GND	A25	HSIP2
B26	GND	B27	HSOP3	A26	HSIN2	A27	GND
B28	HSOP3	B29	GND	A28	GND	A29	HSIP3
B30	RSVD	B31	PRSNT#2	A30	HSIN3	A31	GND
B32	GND	-	-	A32	RSVD	-	-

### 3.4.23 PCI BUS CONNECTOR

Connector Location: PCI1, PCI2, PCI3, PCI4, PCI5

Description: 124-pin PCI Bus Connector



#### PCI1~PCI5

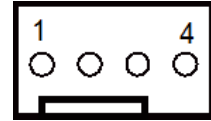
PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT
B2	+12V	B1	TRST#	A2	TCK	A1	-12V
B4	TDI	B3	TMS	A4	TDO	A3	GND
B6	INTA#	B5	+5V	A6	+5V	A5	+5V
B8	+5V	B7	INTC#	A8	INTD#	A7	INTB#
B10	+5V(I/O)	B9	CLKC	A10	REQ1#	A9	REQ3#
-	-	B11	CLKD	-	-	A11	GNT3#
B12	GND	B13	GND	A12	GND	A13	GND
B14	GNT1#	B15	RST#	A14	CLKA	A15	GND
B16	+5V(I/O)	B17	GNT0#	A16	CLKB	A17	GND
B18	GND	B19	REQ2#	A18	REQ0#	A19	+5V(I/O)
B20	AD30	B21	+3.3V	A20	AD31	A21	AD29
B22	AD28	B23	AD26	A22	GND	A23	AD27
B24	GND	B25	AD24	A24	AD25	A25	+3.3V
B26	GNT2#	B27	+3.3V	A26	C/BE3#	A27	AD23
B28	AD22	B29	AD20	A28	GND	A29	AD21
B30	GND	B31	AD18	A30	AD19	A31	+3.3V
B32	AD16	B33	+3.3V	A32	AD17	A33	C/BE2#
B34	FRAME#	B35	GND	A34	GND	A35	IRDY#
B36	TRDY#	B37	GND	A36	+3.3V	A37	DEVSEL#
B38	STOP#	B39	+3.3V	A38	GND	A39	LOCK#
B40	SDONE	B41	SB0#	A40	PERR#	A41	+3.3V
B42	GND	B43	PAR	A42	SERR#	A43	+3.3V
B44	AD15	B45	+3.3V	A44	C/BE1#	A45	AD14
B46	AD13	B47	AD11	A46	GND	A47	AD12
B48	GND	B49	AD09	A48	AD10	A49	GND
-	-	-	-	-	-	-	-
B52	C/BE0#	B53	+3.3V	A52	AD08	A53	AD07
B54	AD06	B55	AD04	A54	+3.3V	A55	AD05
B56	GND	B57	AD02	A56	AD03	A57	GND
B58	AD00	B59	+5V(I/O)	A58	AD01	A59	+5V(I/O)
B60	REQ64#	B61	+5V	A60	ACK64#	A61	+5V
B62	+5V	-	-	A62	+5V	-	-

### 3.4.24 CPU / SYSTEM FAN CONNECTOR

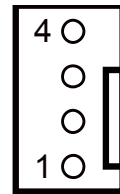
**Connector Location:** CPU\_FAN1, SYS\_FAN1

**Description:** CPU Fan Connector (CPU\_FAN1),  
System Fan Connector 1 (SYS\_FAN1)

PIN	ASSIGNMENT
1	GND
2	VCC12
3	CPU_FANTAC
4	CPU_FANCTRL



**CPU\_FAN1**

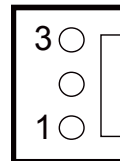


**SYS\_FAN1**

**Connector Location:** SYS\_FAN2

**Description:** System Fan Connector 2

PIN	ASSIGNMENT
3	NC
2	VCC12
1	GND



**SYS\_FAN2**

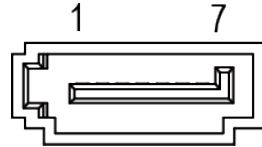
### 3.4.25 SERIAL ATA (SATA) CONNECTOR

**Connector Location:** SATA1, SATA2, SATA3, SATA4, SATA5, SATA6

**Description:** SATA Connectors

**SATA1 Pin Assignment:**

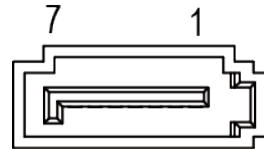
PIN	ASSIGNMENT
1	GND
2	SATA_TXP0
3	SATA_TXN0
4	GND
5	SATA_RXN0
6	SATA_RXP0
7	GND



**SATA1/  
SATA3/  
SATA5**

**SATA2 Pin Assignment:**

PIN	ASSIGNMENT
1	GND
2	SATA_TXP1
3	SATA_TXN1
4	GND
5	SATA_RXN1
6	SATA_RXP1
7	GND



**SATA2/  
SATA4/  
SATA6**

**SATA3 Pin Assignment:**

PIN	ASSIGNMENT
1	GND
2	SATA_TXP2
3	SATA_TXN2
4	GND
5	SATA_RXN2
6	SATA_RXP2
7	GND

**SATA4 Pin Assignment:**

PIN	ASSIGNMENT
1	GND
2	SATA_TXP3
3	SATA_TXN3
4	GND
5	SATA_RXN3
6	SATA_RXP3
7	GND

**SATA5 Pin Assignment:**

PIN	ASSIGNMENT
1	GND
2	SATA_TXP4
3	SATA_TXN4
4	GND
5	SATA_RXN4
6	SATA_RXP4
7	GND

**SATA6 Pin Assignment:**

PIN	ASSIGNMENT
1	GND
2	SATA_TXP5
3	SATA_TXN5
4	GND
5	SATA_RXN5
6	SATA_RXP5
7	GND

**Notes:**

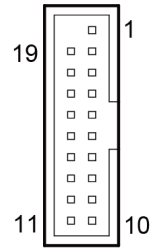
1. C246 SKU supports SATA1~SATA6.
2. Q370 SKU supports SATA1~SATA4.
3. H310 SKU supports SATA1~SATA4.

### 3.4.26 INTERNAL USB 3.0 CONNECTOR

Connector Location: **USB1**

Description: Internal USB 3.0 Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC5	11	USB2_P
2	USB3_RX_N	12	USB2_N
3	USB3_RX_P	13	GND
4	GND	14	USB3_TX_P
5	USB3_TX_N	15	USB3_TX_N
6	USB3_TX_P	16	GND
7	GND	17	USB3_RX_P
8	USB2_N	18	USB3_RX_N
9	USB2_P	19	VCC5
10	GND	-	-



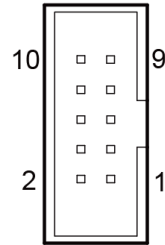
**USB1**

### 3.4.27 INTERNAL USB 2.0 CONNECTOR

**Connector Location:** USB2, USB3

**Description:** Internal USB 2.0 Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC5	2	VCC5
3	USB2_N	4	USB2_N
5	USB2_P	6	USB2_P
7	GND	8	GND
9	NC	10	GND



**USB2/  
USB3**

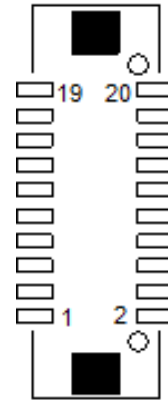


### 3.4.28 DISPLAYPORT CONNECTOR (OPTION)

Connector Location: DP1

Description: DisplayPort Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DATA0+	2	GND
3	DATA0-	4	DATA1+
5	GND	6	DATA1-
7	DATA2+	8	GND
9	DATA2-	10	DATA3+
11	GND	12	DATA3-
13	AUX_EN#	14	GND
15	AUX+	16	GND
17	AUX-	18	HPD
19	GND	20	3.3V



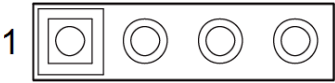
**DP1**

3.4.29 SPEAKER CONNECTOR

Connector Location: JSPK1

Description: Speaker Connector

PIN	ASSIGNMENT
1	SPKR_VCC
2	SPKR_SIGNAL
3	SPKR_SIGNAL
4	SPKR_SIGNAL



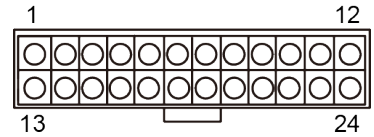
**JSPK1**

### 3.4.30 POWER INPUT CONNECTOR

Connector Location: ATX\_PWR1

Description: ATX Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PSON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	POK	20	-5V
9	+5V_SB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+12V	24	GND

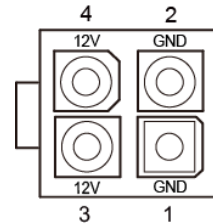


**ATX\_PWR1**

Connector Location: ATX\_PWR2

Description: Power Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
4	+12V	2	GND
3	+12V	1	GND



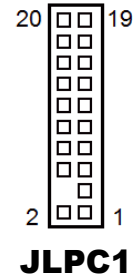
**ATX\_PWR2**

### 3.4.31 LPC CONNECTOR

**Connector Location:** JLPC1

**Description:** LPC Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	CLK	2	GND
3	FRAME	4	NC
5	RESET	6	VCC5
7	LAD3	8	LAD2
9	VCC3	10	LAD1
11	LAD0	12	GND
13	SMBCLK	14	SMBDATA
15	3VSB	16	SERIRQ
17	GND	18	CLK RUN
19	SUS_TAT	20	DREQ0



### **3.4.32 CLEAR CMOS DATA SELECTION**

**Jumper Location: JCMOS1**

**Description:** Clear CMOS Data Selection



**Step 1.** Remove the main power of the PC.

**Step 2.** Close JCMOS1 (pins 1-2) for 6 seconds by a cap.

**Step 3.** Remove the cap which is just used on JCMOS1 (1-2), so that JCMOS1 returns to “OPEN”.

**Step 4.** Power on the PC and the PC will then auto-reboot for once in order to set SoC’s register.

**Step 5.** Done!

<b>Selection</b>	<b>Jumper Setting (Pin Closed)</b>	<b>Jumper Illustration</b>
<b>Normal</b>	<b>Open (Default Setting)</b>	<div>1 </div> <b>JCMOS1</b>
Clear CMOS	1-2	<div>1 </div> <b>JCMOS1</b>

# 4 Software Utilities

---

This chapter provides the detailed information that guides users to install driver utilities for the system. The following topics are included:

- Installing Intel® Chipset Software Installation Utility
- Installing Graphics Driver Utility
- Installing LAN Driver Utility
- Installing Sound Driver Utility
- Installing Intel® Management Engine Components Installer
- Installing Intel® Rapid Storage Utility
- Installing Intel® Serial I/O Driver Utility

## 4.1 Introduction

Enclosed with the BA-2601 Series package is our driver utilities contained in a DVD-ROM disk. Refer to the following table for driver locations:

Filename (Assume that DVD-ROM drive is D:)	Purpose
D:\BA-2601_V1.0\Platform\ 1_Main Chip\Win10(64Bit)	Intel® Chipset Device Software installer
D:\BA-2601_V1.0\Platform\ 2_Graphics\Win10(64Bit)	Intel HD Graphics Family For Graphics driver installation
D:\BA-2601_V1.0\Platform\ 3_Sound\Win10(64Bit)	Realtek ALC888S-VD2-GR HD Audio codec System Software
D:\BA-2601_V1.0\Platform\ 4_ME\ Win10 (64Bit)\ H310	Intel® Management Engine Components Installer for Intel H310 chipset
D:\BA-2601_V1.0\Platform\ 4_ME\ Win10 (64Bit)\ Q370&C246	Intel® Management Engine Components Installer for Intel Q370 or C246 chipset
D:\BA-2601_V1.0\Platform\ 5_LAN Chip\ Win10 (64Bit)	Intel® I219-LM & Intel® I211-AT For LAN Driver installation
D:\BA-2601_V1.0\Platform\ 6_Serial IO\Win10 (64Bit)	Intel® Serial I/O Driver
D:\BA-2601_V1.0\Platform\ 7_RAID\Win10(64Bit)	Intel® Rapid Storage Technology

**Note:** Install the driver utilities immediately after the OS installation is completed.

**For more details on the installation sequence, refer to the Readme.txt file.**

## **4.2 Installing Intel® Chipset Software Installation Utility**

### **Introduction**

The Intel® Chipset Software Installation Utility installs the Windows \*.INF files to the target system. These files outline to the operating system how to configure the Intel chipset components in order to ensure that the following functions work properly:

- Core PCI and ISAPNP Services
- PCI-e Support
- SATA Storage Support
- USB Support
- Identification of Intel® Chipset Components in the Device Manager

### **Intel® Chipset Software Installation Utility**

The utility pack is to be installed only for Windows 10 (64-bit), and it should be installed immediately after the OS installation is finished. Please follow the steps below:

- 1** Connect the USB DVD-ROM device to BA-2601 and insert the driver disk.
- 2** Enter the **Main Chip** folder where the Chipset driver is located (depending on your OS platform).
- 3** Click **Setup.exe** file for driver installation.
- 4** Follow the on-screen instructions to install the driver.
- 5** Once the installation is completed, shut down the system and restart BA-2601 for the changes to take effect.



### **4.3 Installing Graphics Driver Utility**

The Graphics interface embedded in BA-2601 can support dual displays via VGA, DVI, DP (option) and eDP (option) interfaces and make the system work simultaneously.

To install the Graphics driver utility, follow the steps below:

- 1** Connect the USB DVD-ROM device to BA-2601 and insert the driver disk.
- 2** Enter the **Graphics** folder where the driver is located (depending on your OS platform).
- 3** Click the **Setup.exe** file for driver installation.
- 4** Follow the on-screen instructions to complete the installation.
- 5** Once the installation is completed, shut down the system and restart BA-2601 for the changes to take effect.

## **4.4 Installing LAN Driver Utility**

Enhanced with LAN function, BA-2601 supports various network adapters. To install the LAN Driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to BA-2601 and insert the driver disk.
- 2** Enter the **LAN** folder where the driver is located (depending on your OS platform).
- 3** Click **Autorun.exe** file for driver installation.
- 4** Follow the on-screen instructions to complete the installation.
- 5** Once the installation is completed, shut down the system and restart BA-2601 for the changes to take effect.

## **4.5 Installing Sound Driver Utility**

To install the Sound Driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to BA-2601 and insert the driver disk.
- 2** Open the **Sound** folder where the driver is located (depending on your OS platform).
- 3** Click the **Setup.exe** file for driver installation.
- 4** Follow the on-screen instructions to complete the installation.
- 5** Once the installation is completed, shut down the system and restart BA-2601 for the changes to take effect.

## **4.6 Intel® Management Engine Components Installer Installation**

### **Installation Instructions for Intel® Management Engine Components Installer**

- 1** Connect the USB DVD-ROM device to BA-2601 and insert the driver disk.
- 2** Enter the **ME** folder where the driver is located.
- 3** Select Windows 10 (64-bit) for your OS platform.
- 4** Click **Setup.exe** file for ME driver installation.
- 5** Follow the on-screen instructions to complete the installation.
- 6** Once the installation is completed, shut down the system and restart BA-2601 for the changes to take effect.

## 4.7 Installing RAID Utility (Only for C246/Q370, Optional)

The Intel® Rapid Storage Technology option ROM provides the following functions:

- Pre-operating system user interface for RAID volume management
- Ability to create, delete and reset RAID volumes
- RAID recovery

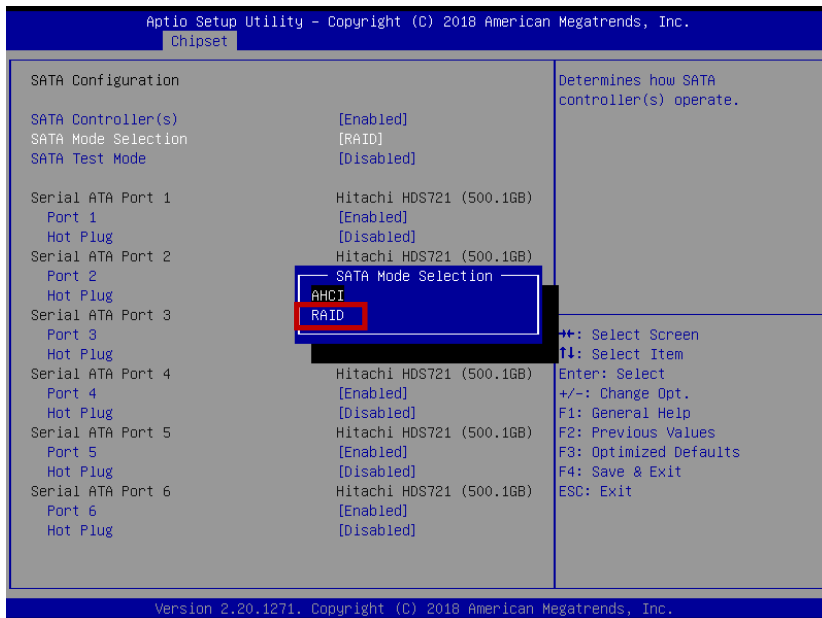
### Entering option ROM User Interface from BIOS Setup Utility

Follow the instructions below to enter the Intel® Rapid Storage Technology option ROM user interface:

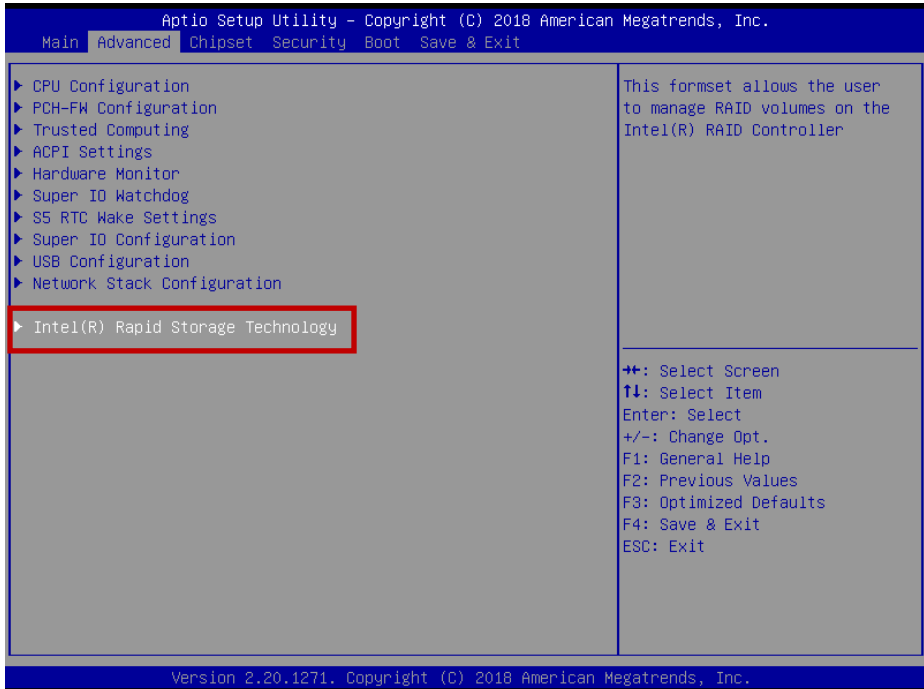
**1** Press <Del> to access the BIOS Setup Utility program when prompted during the Power-On Self-Test (POST).

**2** Enter **Chipset > PCH-IO Configuration > SATA**

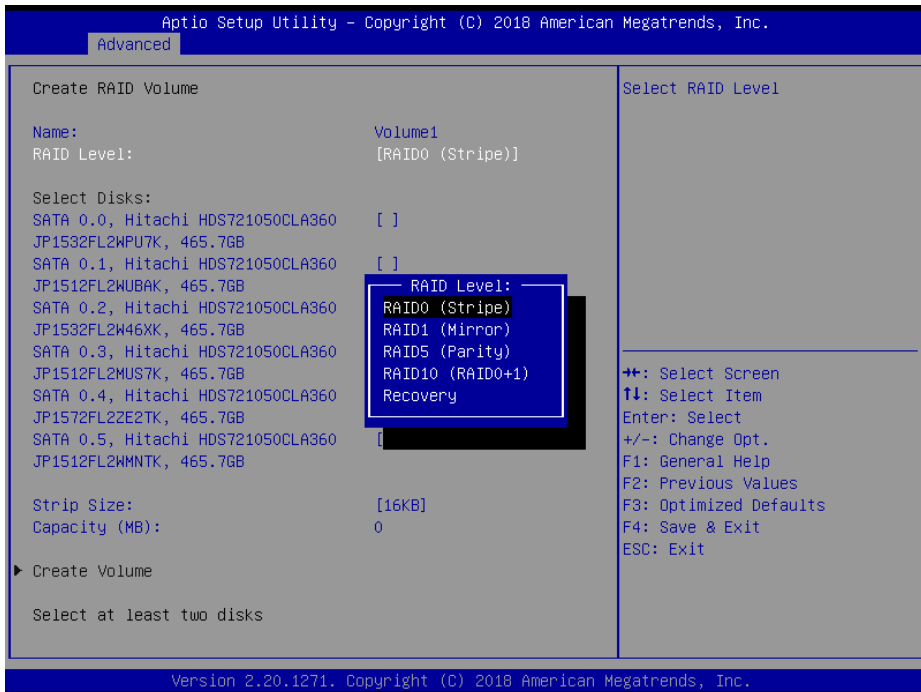
**Configuration** menu screen and select “**RAID**” option for **SATA Controller(s)** option item. See the picture below:



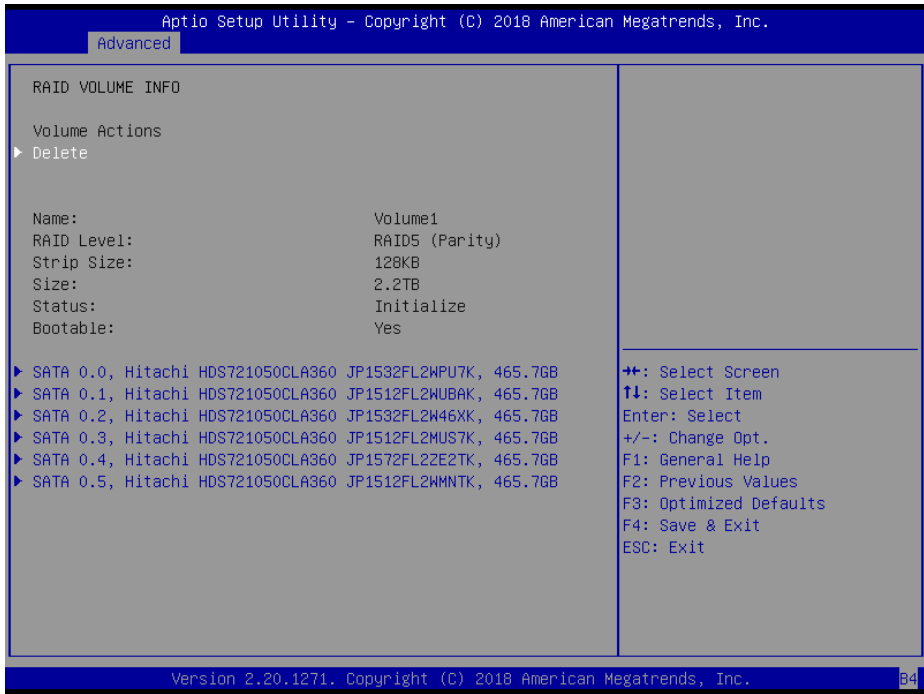
- 3 Press **F4** to save and validate the changed BIOS configuration and reset the system.
- 4 Press **<Del>** to enter the BIOS Setup Utility program again and the **Intel(R) Rapid Storage Technology** option item will display under the **Advanced** menu screen as below:



- 5 Select the **Intel(R) Rapid Storage Technology** option item and press **<Enter>**, and the following screen will display. Select a RAID level that you want to enter and press **<Enter>**.



The hard drive(s) and hard drive information of the RAID level you selected in the previous step will display:



Heed that in the user interface, the hard drive(s) and hard drive information listed for your system will differ from the example above.



### **Installing RAID Utility (Only for C246/Q370, Optional)**

The Intel® Rapid Storage Technology (Intel® RST) utility supports RAID 0, 1, 5, 10 in C246/Q370 SKU.

To install the RAID utility, follow the steps below:

- 1** Connect the USB DVD-ROM device to BA-2601 and insert the driver disk.
- 2** Enter the **RAID** folder where the utility is located.
- 3** Select Windows 10 (64-bit) for your OS platform.
- 4** Click **Setup.exe** file for utility installation.
- 5** Follow the on-screen instructions to complete the installation.
- 6** Once the installation is completed, shut down the system and restart BA-2601 for the changes to take effect.

**Note:** The RAID utility is not supported for H310 SKU.

## **4.8 Installing Intel® Serial I/O Driver Utility**

To install the Serial I/O Driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to BA-2601 and insert the driver disk.
- 2** Open the **Serial I/O** folder where the driver is located.
- 3** Select Windows 10 (64-bit) for your OS platform.
- 4** Click the **Setup.exe** file for driver installation.
- 5** Follow the on-screen instructions to complete the installation.
- 6** Once the installation is completed, shut down the system and restart BA-2601 for the changes to take effect.

# 5 BIOS SETUP

---

This chapter guides users how to configure the basic system configurations via the BIOS Setup Utilities. The information of the system configuration is saved in battery-backed CMOS RAM and BIOS NVRAM so that the Setup information is retained when the system is powered off. The BIOS Setup Utilities consist of the following menu items:

- Main Menu
- Advanced Menu
- Chipset Menu
- Security Menu
- Boot Menu
- Save & Exit Menu

## **5.1 Introduction**

The BA-2601 main board uses an AMI (American Megatrends Incorporated) Aptio BIOS that is stored in the Serial Peripheral Interface Flash Memory (SPI Flash) and can be updated. The SPI Flash contains the built-in BIOS setup program, Power-On Self-Test (POST), PCI auto-configuration utility, LAN EEPROM information, and Plug and Play support.

Aptio is AMI's BIOS firmware based on the UEFI (Unified Extensible Firmware Interface) specifications and the Intel Platform Innovation Framework for EFI. The UEFI specification defines an interface between the operating system and platform firmware. The interface consists of data tables that contain platform-related information, boot service calls, and runtime service calls that are available to the operating system and its loader. These elements have combined to provide a standard environment for booting the operating system and running pre-boot applications.

The diagram below shows the Extensible Firmware Interface's location in the software stack.

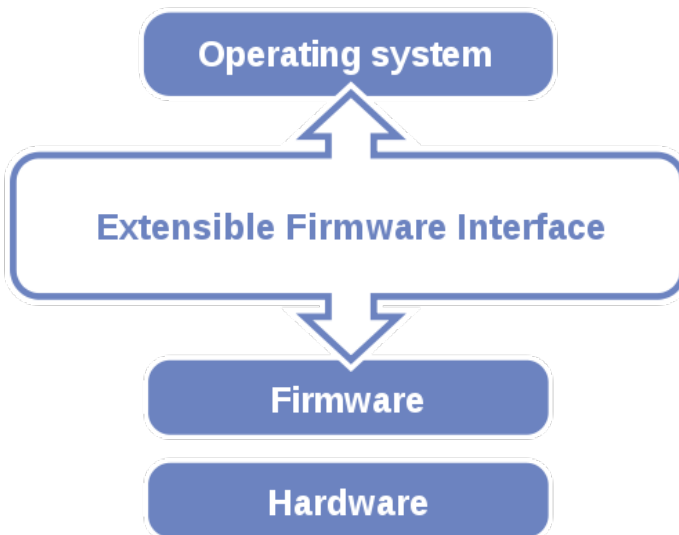


Figure 5-1. Extensible Firmware Interface Diagram

EFI BIOS provides an user interface that allows you to modify hardware configuration, e.g. change the system date and time, enable/disable a system component, determine bootable device priority, set up personal password, etc., which is convenient for engineers to perform modifications and customize the computer

system and allows technicians to troubleshoot the occurred errors when the hardware is faulty.

The BIOS setup menu allows users to view and modify the BIOS settings for the computer. After the system is powered on, users can access the BIOS setup menu by pressing <Del> or <Esc> immediately while the POST message is running before the operating system is loading.

All the menu settings are described in details in this chapter.

## **5.2 Accessing Setup Utility**

After the system is powered on, BIOS will enter the Power-On Self-Test (POST) routines and the POST message will be displayed:



Figure 5-2. POST Screen with AMI Logo

Press <Del> or <Esc> to access the Setup Utility program and the **Main** menu of the Aptio Setup Utility will appear on the screen as below:



### BIOS Setup Menu Initialization Screen

You may move the cursor by <↑> and <↓> keys to highlight the individual menu items. As you highlight each item, a brief description of the highlighted selection will appear on the right side of the screen.

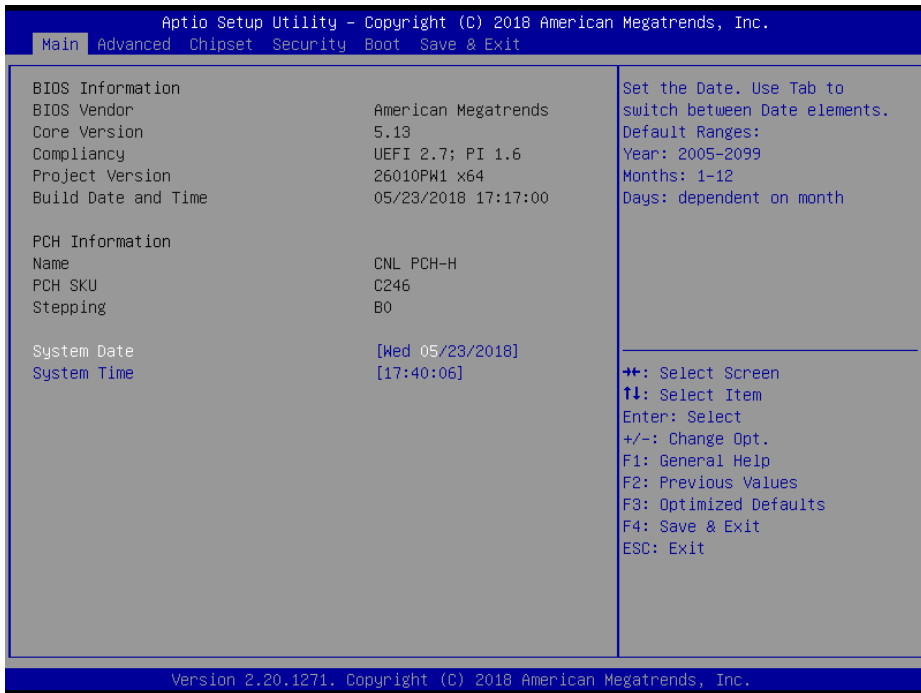
The language of the BIOS setup menu interface and help messages are shown in US English. You may use <↑> or <↓> key to select among the items and press <Enter> to confirm and enter the sub-menu. The following table provides the list of the navigation keys that you can use while operating the BIOS setup menu.

<b>BIOS Setup Navigation Key</b>	<b>Description</b>
<←> and <→>	Select a different menu screen (move the cursor from the selected menu to the left or right).
<↑> and <↓>	Select a different item (move the cursor from the selected item upwards or downwards)
<Enter>	Execute the command or select the sub-menu.
<F2>	Load the previous configuration values.
<F3>	Load the default configuration values.
<F4>	Save the current values and exit the BIOS setup menu.
<Esc>	Close the sub-menu. Trigger the confirmation to exit BIOS setup menu.

## 5.3 Main

Menu Path                      *Main*

The **Main** menu allows you to view the BIOS Information and change the system date and time. Use tab to switch between date elements. Use <↑> or <↓> arrow keys to highlight the item and enter the value you want in each item. This screen also displays the BIOS version (project) and BIOS Build Date and Time.



**Main Screen**

BIOS Setting	Options	Description/Purpose
BIOS Vendor	No changeable options	Displays the name of the BIOS vendor.
Core Version	No changeable options	Displays the current BIOS core version.
Compliance	No changeable options	Displays the current UEFI version.
Project Version	No changeable options	Displays the version of the BIOS currently installed on the platform.
Build Date and Time	No changeable options	Displays the date that the current BIOS version is built.
Name	No changeable options	Displays the name of the PCH.
PCH SKU	No changeable options	Displays the SKU for the PCH.
Stepping	No changeable options	Displays the stepping of the PCH.

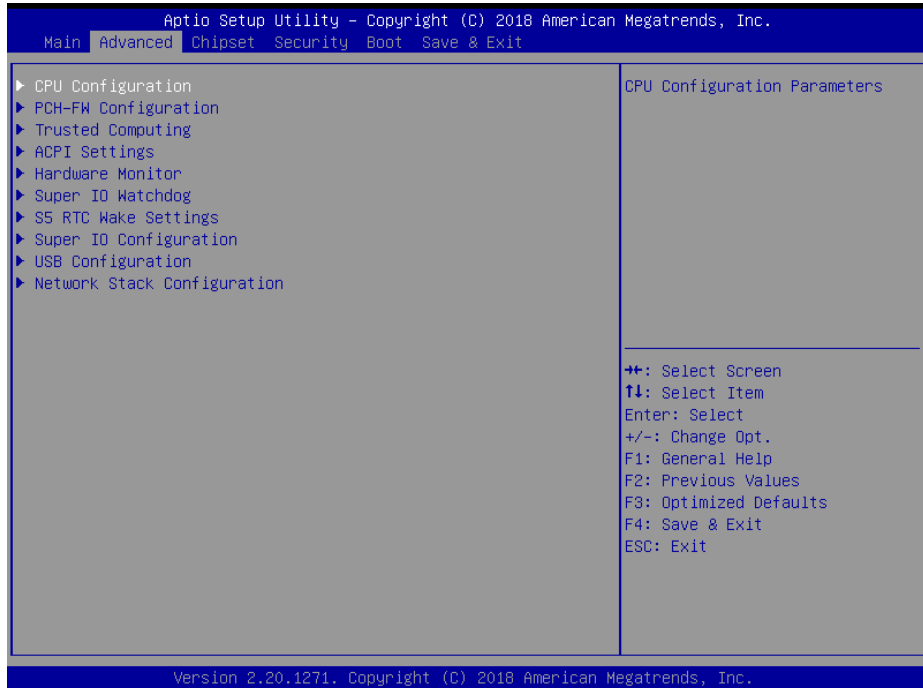


<b>BIOS Setting</b>	<b>Options</b>	<b>Description/Purpose</b>
System Date	Month, day, year	Sets the system date. The format is [Day Month/ Date/ Year]. Users can directly enter values or use <+> or <-> arrow keys to increase/decrease it. The “Day” is automatically changed.
System Time	Hour, minute, second	Sets the system time. The format is [Hour: Minute: Second]. Users can directly enter values or use <+> or <-> arrow keys to increase/decrease it.

## 5.4 Advanced

Menu Path *Advanced*

This menu provides advanced the sub-menu items such as CPU Configuration, PCH-FW Configuration, Trusted Computing, ACPI Settings, Hardware Monitor, Super IO Watchdog, S5 RTC Wake Settings, Super IO Configuration, USB Configuration and Network Stack Configuration.



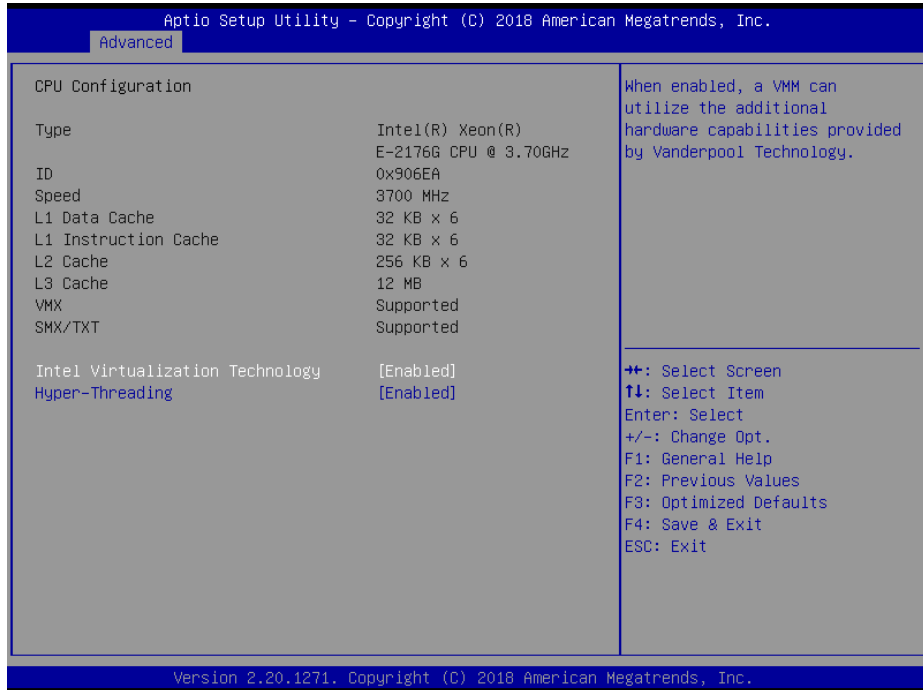
**Advanced Menu Screen**

BIOS Setting	Options	Description/Purpose
CPU Configuration	Sub-Menu	CPU Configuration Parameters.
PCH-FW Configuration	Sub-Menu	Management Engine Technology Parameters.
Trusted Computing	Sub-Menu	Trusted Computing Settings.
ACPI Settings	Sub-Menu	System ACPI Parameters.
Hardware Monitor	Sub-Menu	Monitors hardware status
Super IO Watchdog	Sub-Menu	Super I/O Watchdog Parameters.
S5 RTC Wake Settings	Sub-Menu	S5 RTC Wake Parameters.
Super IO Configuration	Sub-Menu	System Super I/O Chip Parameters
USB Configuration	Sub-Menu	USB Configuration Parameters.
Network Stack Configuration	Sub-Menu	Network Stack Settings.

## 5.4.1 Advanced – CPU Configuration

Menu Path *Advanced > CPU Configuration*

The **CPU Configuration** provides advanced CPU settings and some information about CPU.



**CPU Configuration Screen**

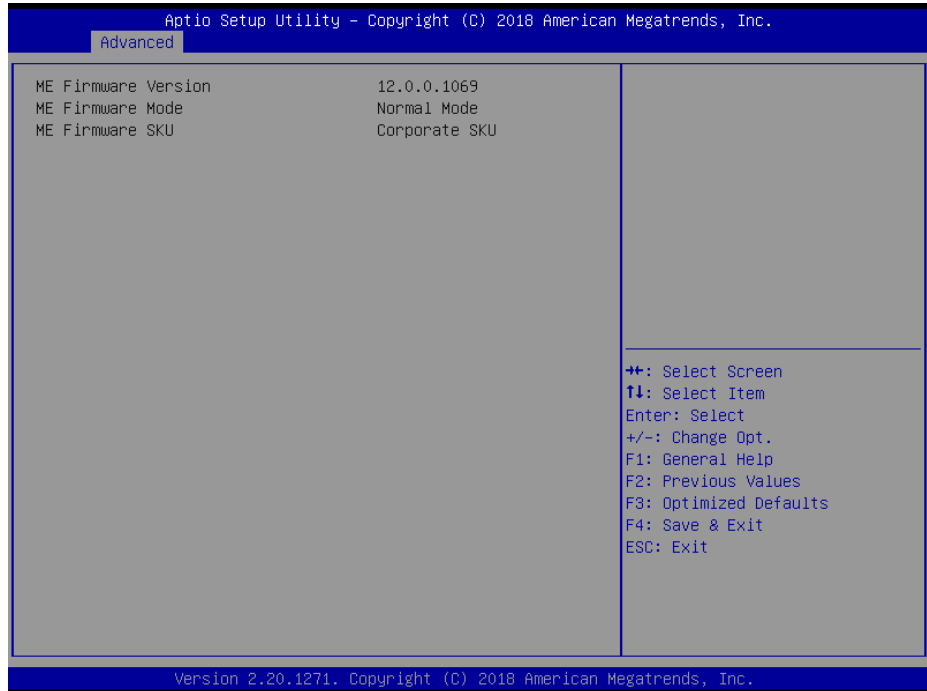
BIOS Setting	Options	Description/Purpose
Type	No changeable options	Displays the CPU Type.
ID	No changeable options	Displays the CPU ID.
Speed	No changeable options	Displays the CPU Speed.
L1 Data Cache	No changeable options	L1 Data Cache Size.
L1 Instruction Cache	No changeable options	L1 Instruction Cache Size.
L2 Cache	No changeable options	L2 Cache Size.
L3 Cache	No changeable options	L3 Cache Size.
VMX	No changeable options	CPU VMX hardware support for virtual machines.
SMX (Secure Mode Extensions) / TXT	No changeable options	Secure Mode extensions support.
Intel Virtualization Technology	- Disabled - Enabled	When enabled, VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

BIOS Setting	Options	Description/Purpose
Hyper-Threading	- Disabled - Enabled	When Disabled, only one thread per enabled core is enabled.

### 5.4.2 Advanced – PCH-FW Configuration

Menu Path *Advanced > PCH-FW Configuration*

The **PCH-FW** allows users to view the information about ME (Management Engine) firmware information, such ME firmware version, firmware mode and firmware SKU.



**PCH-FW Configuration Screen**

BIOS Setting	Options	Description/Purpose
ME Firmware Version	No changeable options	Displays the ME Firmware Version.
ME Firmware Mode	No changeable options	Displays the ME Firmware Mode.
ME Firmware SKU	No changeable options	Displays the ME Firmware SKU.

### 5.4.3 Advanced – Trusted Computing

Menu Path *Advanced > Trusted Computing*

The Trusted Computing allows users to enable/disable BIOS support for security device. The operating system will not show Security Device. The TCG EFI protocol and INT1A interface will not be available.



**Trusted Computing Screen**

BIOS Setting	Options	Description/Purpose
Security Device Support	- Disable - Enable	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.

## 5.4.4 Advanced – ACPI Settings

Menu Path *Advanced > ACPI Settings*

The **ACPI Settings** allows users to configure relevant ACPI (Advanced Configuration and Power Management Interface) settings, such as enable/disable Hibernation, ACPI Sleep State, lock legacy resources and S3 Video Repost.



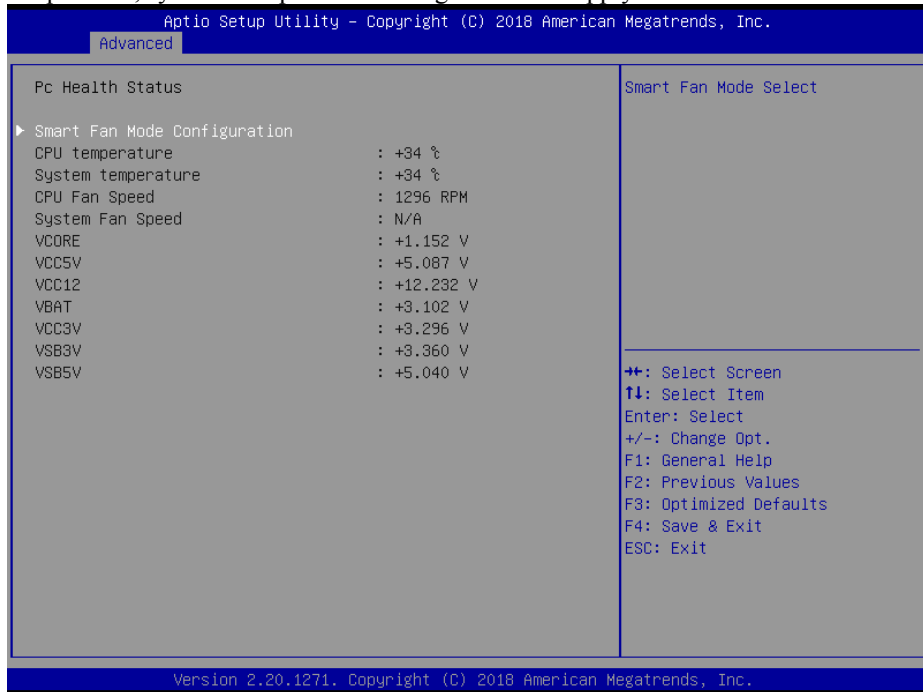
**ACPI Settings Screen**

BIOS Setting	Options	Description/Purpose
Enable Hibernation	- Disabled - Enabled	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	- Suspend Disabled - S3 (Suspend to RAM)	Selects the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
Lock Legacy Resources	- Disabled - Enabled	Enables or Disables Lock of Legacy Resources.
S3 Video Repost	- Disabled - Enabled	Enables or Disables S3 Video Repost.

## 5.4.5 Advanced – Hardware Monitor

Menu Path *Advanced > Hardware Monitor*

The **Hardware Monitor** allows users to configure Smart Fan Mode for CPU fan, monitor the health and status of the system such as CPU temperature, system temperature, system fan speed and voltage levels in supply.



**Hardware Monitor Screen**

BIOS Setting	Options	Description/Purpose
Smart Fan Mode Configuration	Sub-Menu	Smart Fan Mode Selection.
CPU Temperature	No changeable options	Displays the processor's temperature.
System Temperature	No changeable options	Displays the system's temperature.
CPU Fan Speed	No changeable options	Display CPU Fan speed.
System Fan Speed	No changeable options	Display System Fan speed.
VCore	No changeable options	Displays the voltage level of VCore in supply.
VCC5V	No changeable options	Displays the voltage level of VCC5V in supply.
VCC12	No changeable options	Displays the voltage level of VCC12 in supply.

BIOS Setting	Options	Description/Purpose
VBAT	No changeable options	Displays the voltage level of VBAT in supply.
VCC3V	No changeable options	Displays the voltage level of VCC3V in supply.
VS3V	No changeable options	Displays the voltage level of VS3V in supply.
VS5V	No changeable options	Displays the voltage level of VS5V in supply.

## Smart Fan Mode Configuration

Menu Path *Advanced > Hardware Monitor > Smart Fan Mode Configuration*



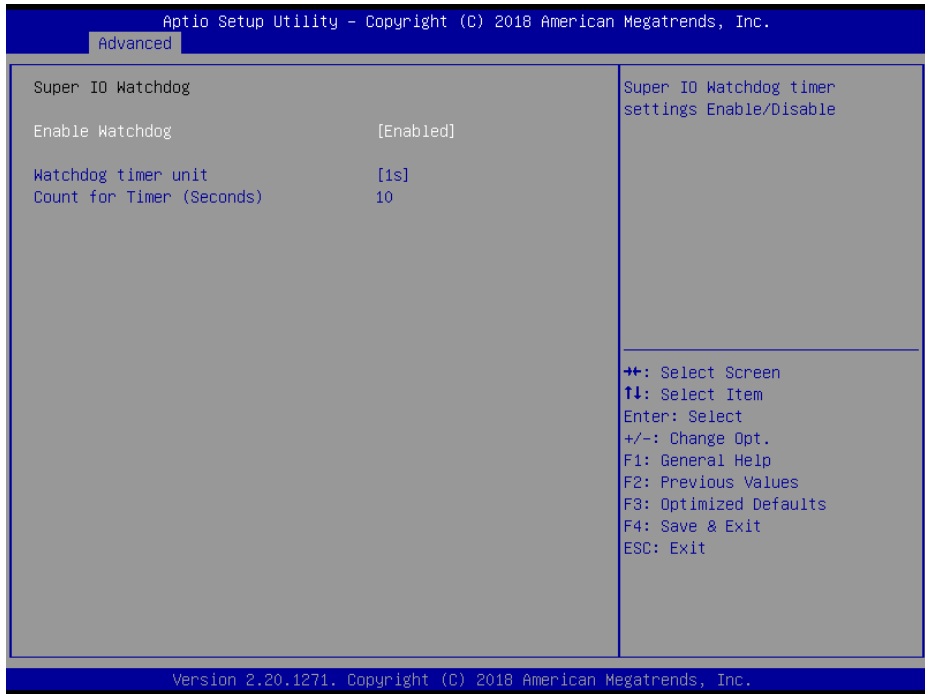
### Smart Fan Mode Configuration Screen

BIOS Setting	Options	Description/Purpose
CPU Fan Smart Fan Control	- Manual Duty Mode - Auto Duty-Cycle Mode	Smart Fan Mode selection for CPU Fan.
Manual Duty Mode	Numeric (from 1 to 100)	Manual mode fan control. Users can write expected duty cycle (PWM fan type) from 1 to 100.



## 5.4.6 Advanced – Super IO Watchdog

Menu Path

*Advanced > Super IO Watchdog*

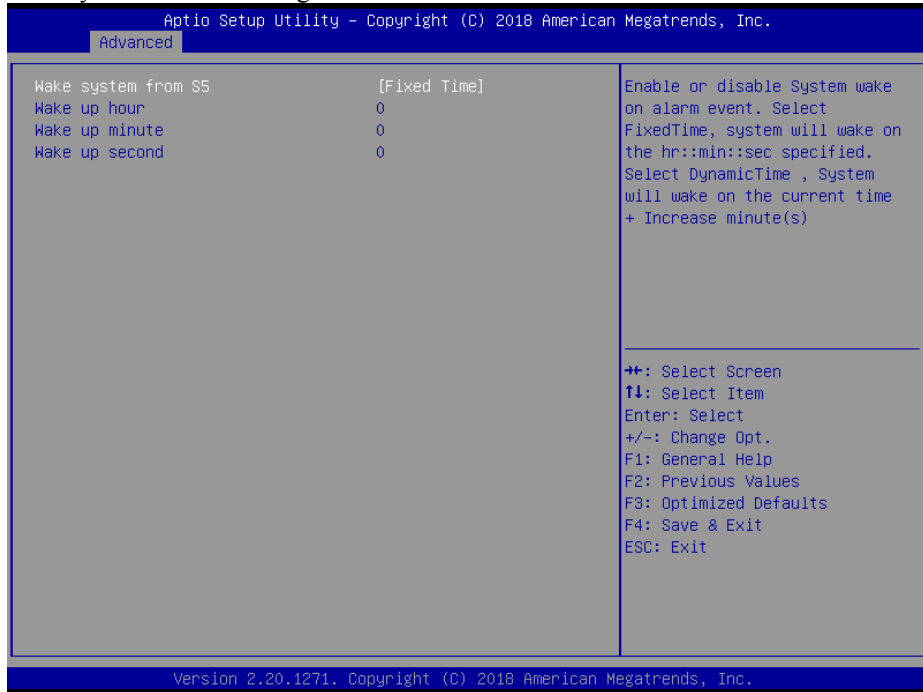
**Super IO Watchdog Screen**

BIOS Setting	Options	Description/Purpose
Enable Watchdog	- Enabled - Disabled	Enables/Disables Super I/O Watchdog timer settings.
Watchdog timer unit	- 1s - 60s	Watchdog timer unit.
Count for Timer (Seconds)	Numeric (from 10 to 255)	The number of count for Timer.

## 5.4.7 Advanced – S5 RTC Wake Settings

Menu Path *Advanced > S5 RTC Wake Settings*

The **S5 RTC Wake Settings** enables/disables the system to wake up at a preset time of a day from S5 State using RTC alarm.

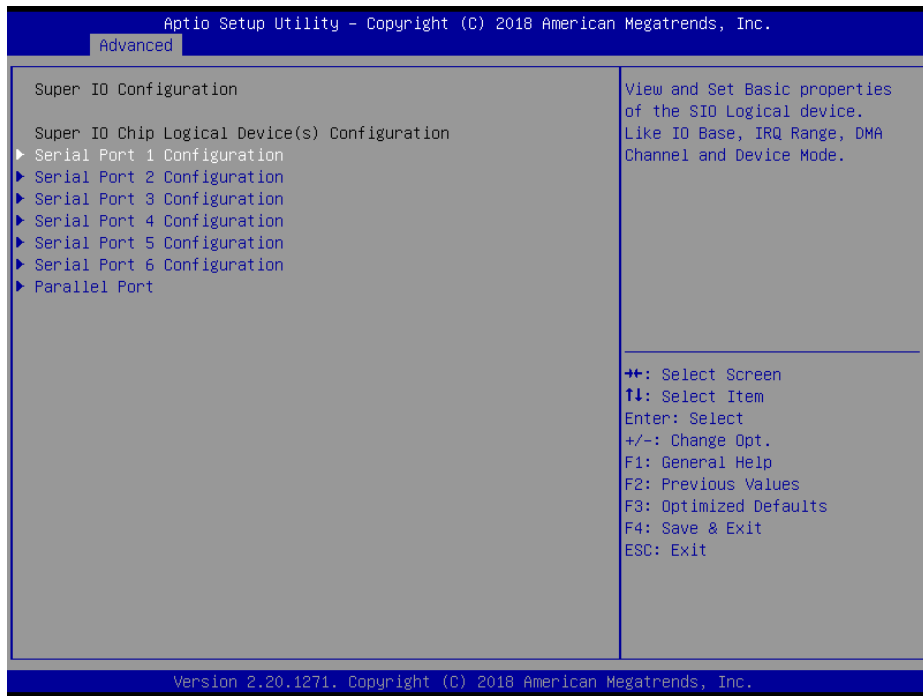


**S5 RTC Wake Settings Screen**

BIOS Setting	Options	Description/Purpose
Wake system from S5	<ul style="list-style-type: none"> <li>- Disabled</li> <li>- Fixed Time</li> <li>- Dynamic Time</li> </ul>	Enables or disables System wake on alarm events. <ul style="list-style-type: none"> <li>• <b>Fixed Time:</b> The system will wake on the time (hr::min::sec) specified.</li> <li>• <b>Dynamic Time:</b> The system will wake on the current time + Increase minute(s).</li> </ul>
Wake up hour	Numeric (from 0 to 23)	Enters <b>0-23</b> to set the wake-up hour, e.g.: enters 3 for 3 a.m. and 15 for 3 p.m.
Wake up minute	Numeric (from 0 to 59)	Enters <b>0-59</b> to set the wake-up minute.
Wake up second	Numeric (from 0 to 59)	Enters <b>0-59</b> to set the wake-up second.
Wake up minute increase	Numeric (from 1 to 5)	Enters <b>1-5</b> to set the increased minute(s) for dynamic wake-up time.

## 5.4.8 Advanced – Super IO Configuration

Menu Path

*Advanced > Super IO Configuration*

**Super IO Configuration Screen**

BIOS Setting	Options	Description/Purpose
Serial Port 1 Configuration	Sub-Menu	Sets Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Sub-Menu	Sets Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Sub-Menu	Sets Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Sub-Menu	Sets Parameters of Serial Port 4 (COMD).
Serial Port 5 Configuration	Sub-Menu	Sets Parameters of Serial Port 5 (COME).
Serial Port 6 Configuration	Sub-Menu	Sets Parameters of Serial Port 6 (COMF).
Parallel Port	Sub-Menu	Sets Parameters of Parallel Port (LPT).

## Super IO Configuration – Serial Port 1 Configuration

Menu Path      *Advanced > Super IO Configuration > Serial Port 1 Configuration*

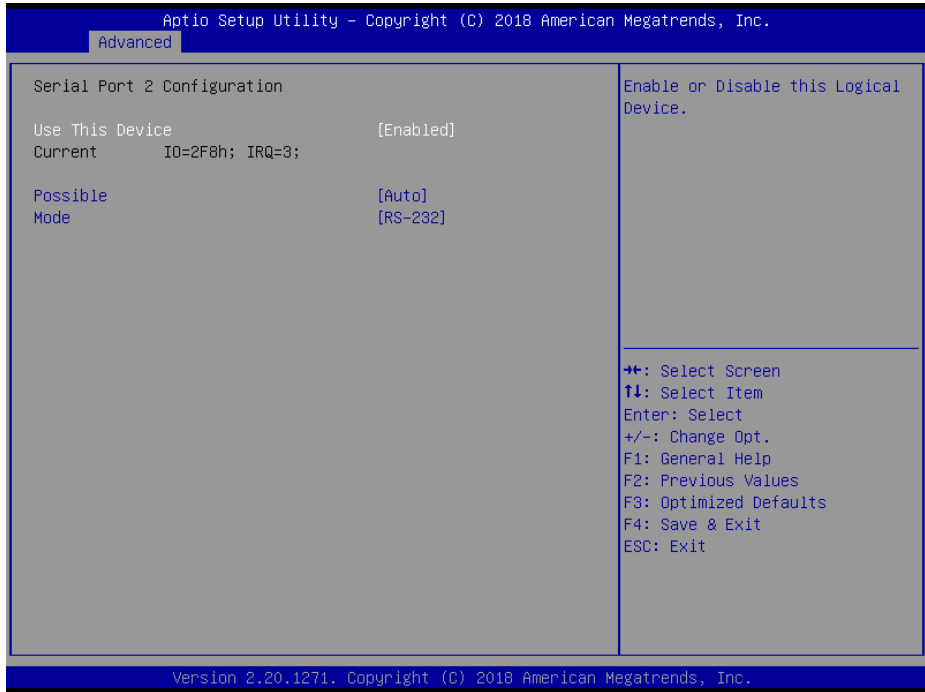


**Serial Port 1 Configuration Screen**

BIOS Setting	Options	Description/Purpose
Use This Device	- Disabled - Enabled	Enables or Disables Serial Port 1.
Current	No changeable options	Displays the current settings of Serial Port 1.
Possible	- Auto - IO=3F8h; IRQ=4; - IO=3F8h; IRQ=3,4,5,6,7,10,11; - IO=2F8h; IRQ=3,4,5,6,7,10,11; - IO=3E8h; IRQ=3,4,5,6,7,10,11; - IO=2E8h; IRQ=3,4,5,6,7,10,11;	Selects IRQ and I/O resource for the Serial Port 1.

## Super IO Configuration – Serial Port 2 Configuration

Menu Path *Advanced > Super IO Configuration > Serial Port 2 Configuration*



**Serial Port 2 Configuration Screen**

BIOS Setting	Options	Description/Purpose
Use This Device	- Disabled - Enabled	Enables or Disables Serial Port 2.
Current	No changeable options	Displays the current settings of Serial Port 2.
Possible	- Auto - IO=2F8h; IRQ=3; - IO=3F8h; IRQ=3,4,5,6,7,10,11; - IO=2F8h; IRQ=3,4,5,6,7,10,11; - IO=3E8h; IRQ=3,4,5,6,7,10,11; - IO=2E8h; IRQ=3,4,5,6,7,10,11;	Selects IRQ and I/O resource for the Serial Port 2.
Mode	- RS-232 - RS-422 - RS-485	Selects COM2 mode.

## Super IO Configuration – Serial Port 3 Configuration

Menu Path *Advanced > Super IO Configuration > Serial Port 3 Configuration*



**Serial Port 3 Configuration Screen**

BIOS Setting	Options	Description/Purpose
Use This Device	- Disabled - Enabled	Enables or Disables Serial Port 3.
Current	No changeable options	Displays the current settings of Serial Port 3.
Possible	- Auto - IO=3E8h; IRQ=7; - IO=3E8h; IRQ=3,4,5,6,7,10,11; - IO=2E8h; IRQ=3,4,5,6,7,10,11; - IO=2F0h; IRQ=3,4,5,6,7,10,11; - IO=2E0h; IRQ=3,4,5,6,7,10,11;	Selects IRQ and I/O resource for the Serial Port 3.

## Super IO Configuration – Serial Port 4 Configuration

Menu Path *Advanced > Super IO Configuration > Serial Port 4 Configuration*

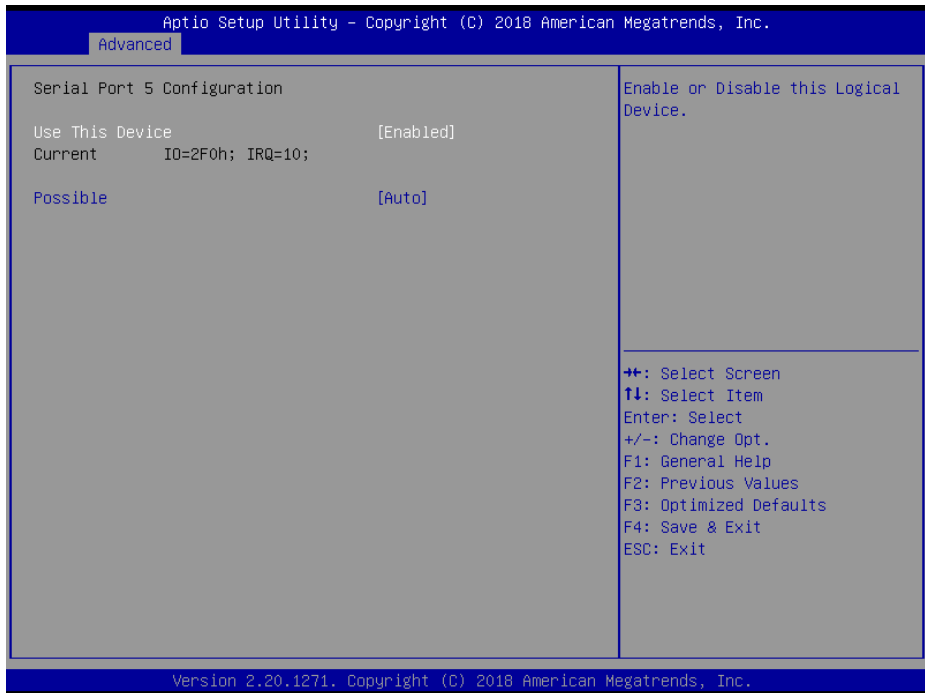


**Serial Port 4 Configuration Screen**

BIOS Setting	Options	Description/Purpose
Use This Device	- Disabled - Enabled	Enables or Disables Serial Port 4.
Current	No changeable options	Displays the current settings of Serial Port 4.
Possible	- Auto - IO=2E8h; IRQ=6; - IO=3E8h; IRQ=3,4,5,6,7,10,11; - IO=2E8h; IRQ=3,4,5,6,7,10,11; - IO=2F0h; IRQ=3,4,5,6,7,10,11; - IO=2E0h; IRQ=3,4,5,6,7,10,11;	Selects IRQ and I/O resource for the Serial Port 4.

## Super IO Configuration – Serial Port 5 Configuration (For C246 SKU Only)

Menu Path *Advanced > Super IO Configuration > Serial Port 5 Configuration*



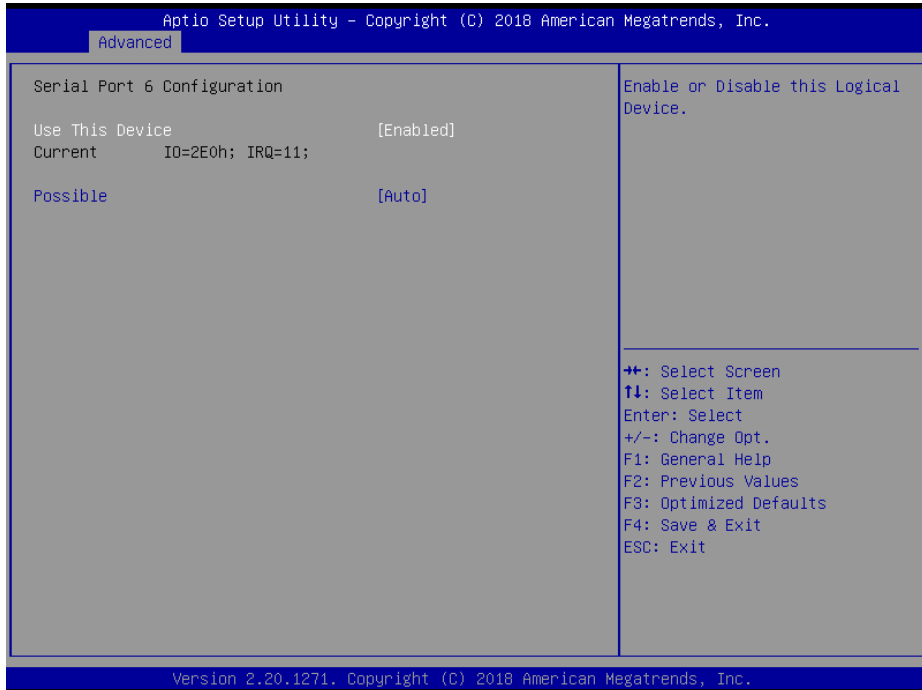
**Serial Port 5 Configuration Screen**

BIOS Setting	Options	Description/Purpose
Use This Device	- Disabled - Enabled	Enables or Disables Serial Port 5.
Current	No changeable options	Displays the current settings of Serial Port 5.
Possible	- Auto - IO=2F0h; IRQ=10; - IO=3E8h; IRQ=3,4,5,6,7,10,11; - IO=2E8h; IRQ=3,4,5,6,7,10,11; - IO=2F0h; IRQ=3,4,5,6,7,10,11; - IO=2E0h; IRQ=3,4,5,6,7,10,11;	Selects IRQ and I/O resource for the Serial Port 5.



## Super IO Configuration – Serial Port 6 Configuration (For C246 SKU Only)

Menu Path *Advanced > Super IO Configuration > Serial Port 6 Configuration*

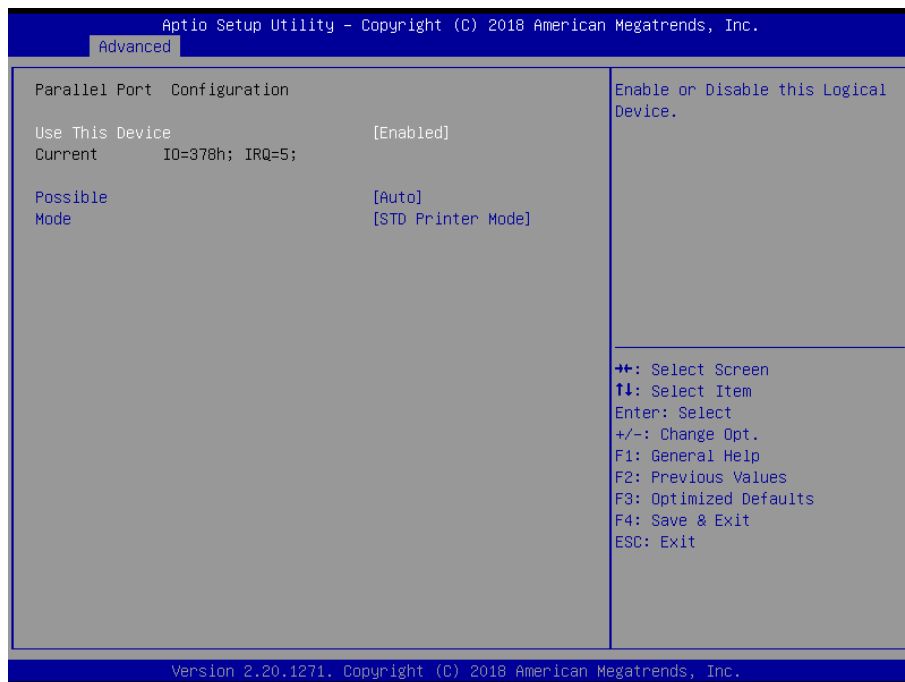


**Serial Port 6 Configuration Screen**

BIOS Setting	Options	Description/Purpose
Use This Device	- Disabled - Enabled	Enables or Disables Serial Port 6.
Current	No changeable options	Displays the current settings of Serial Port 6.
Possible	- Auto - IO=2E0h; IRQ=11; - IO=3E8h; IRQ=3,4,5,6,7,10,11; - IO=2E8h; IRQ=3,4,5,6,7,10,11; - IO=2F0h; IRQ=3,4,5,6,7,10,11; - IO=2E0h; IRQ=3,4,5,6,7,10,11;	Selects IRQ and I/O resource for the Serial Port 6.

## Super IO Configuration – Parallel Port Configuration (For C246 / Q370 SKU Only)

Menu Path

*Advanced > Super IO Configuration > Parallel Port*

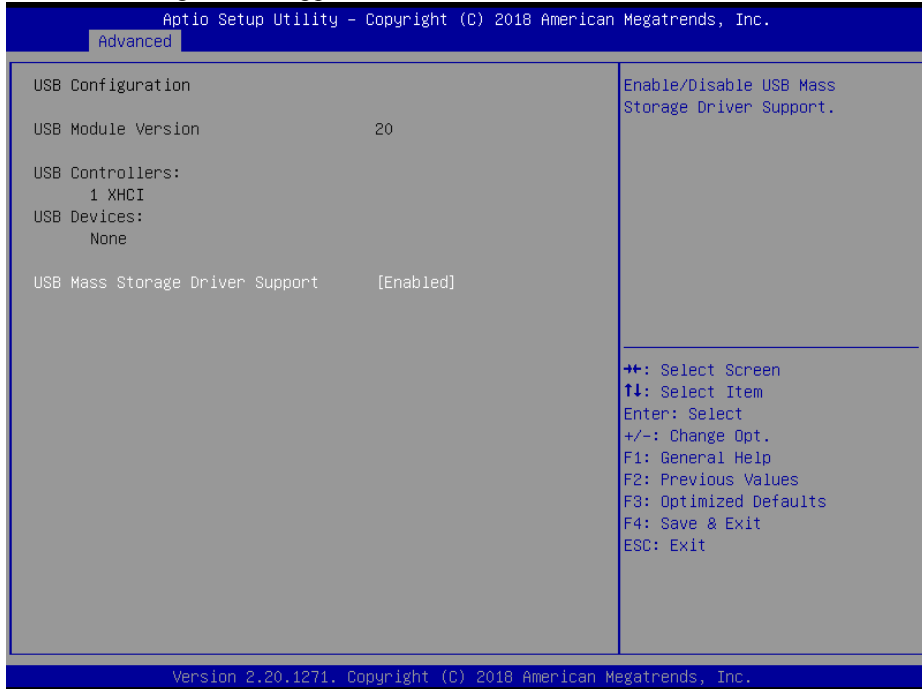
Parallel Port Screen

BIOS Setting	Options	Description/Purpose
Use This Device	<ul style="list-style-type: none"> <li>- Disabled</li> <li>- Enabled</li> </ul>	Enables or Disables Parallel Port.
Current	No changeable options	Displays the current settings of Parallel Port.
Possible	<ul style="list-style-type: none"> <li>- Auto</li> <li>- IO=3F8h; IRQ=4;</li> <li>- IO=3F8h; IRQ=3,4,5,6,7,10,11;</li> <li>- IO=2F8h; IRQ=3,4,5,6,7,10,11;</li> <li>- IO=3E8h; IRQ=3,4,5,6,7,10,11;</li> <li>- IO=2E8h; IRQ=3,4,5,6,7,10,11;</li> </ul>	Selects IRQ and I/O resource for the Parallel Port.
Mode	<ul style="list-style-type: none"> <li>- STD Printer Mode</li> <li>- SPP Mode</li> <li>- EPP-1.9 and SPP Mode</li> <li>- EPP-1.7 and SPP Mode</li> <li>- ECP Mode</li> <li>- ECP and EPP 1.9 Mode</li> <li>- ECP and EPP 1.7 Mode</li> </ul>	Changes Parallel Port mode. Some of the Modes required a DMA resource. After the mode is changed, reset the system to reflect the actual device settings.

### 5.4.9 Advanced – USB Configuration

Menu Path *Advanced > USB Configuration*

The **USB Configuration** allows users to configure advanced USB settings such as USB mass storage driver support.



**USB Configuration Screen**

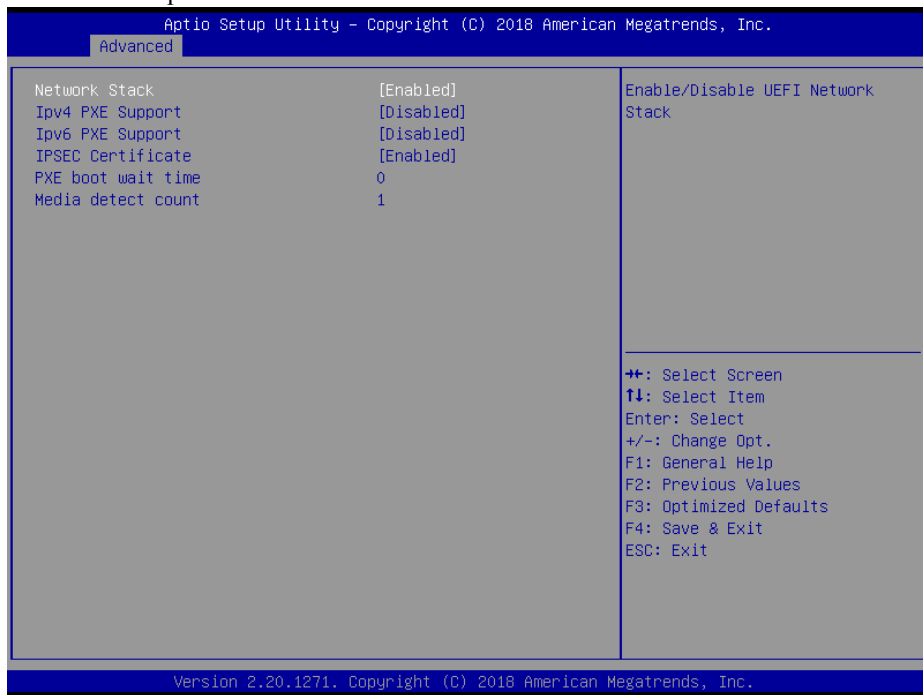
BIOS Setting	Options	Description/Purpose
USB Mass Storage Driver Support	- Disabled - Enabled	Enables/Disables USB Mass Storage Driver Support.

### 5.4.10 Advanced – Network Stack Configuration

Menu Path *Advanced > Network Stack Configuration*

The **Network Stack Configuration** allows users to enable/disable UEFI Network Stack, IPv4/IPv6 PXE (Pre-Boot Execution) support and configure PXE boot wait time and detects the media presence.

PXE allows a workstation to boot from a server on a network prior to booting the operating system on the local hard drive. A PXE-enabled workstation connects its NIC to the LAN via a jumper, which keeps the workstation connected to the network even when the power is turned off.



**Network Stack Configuration Screen**

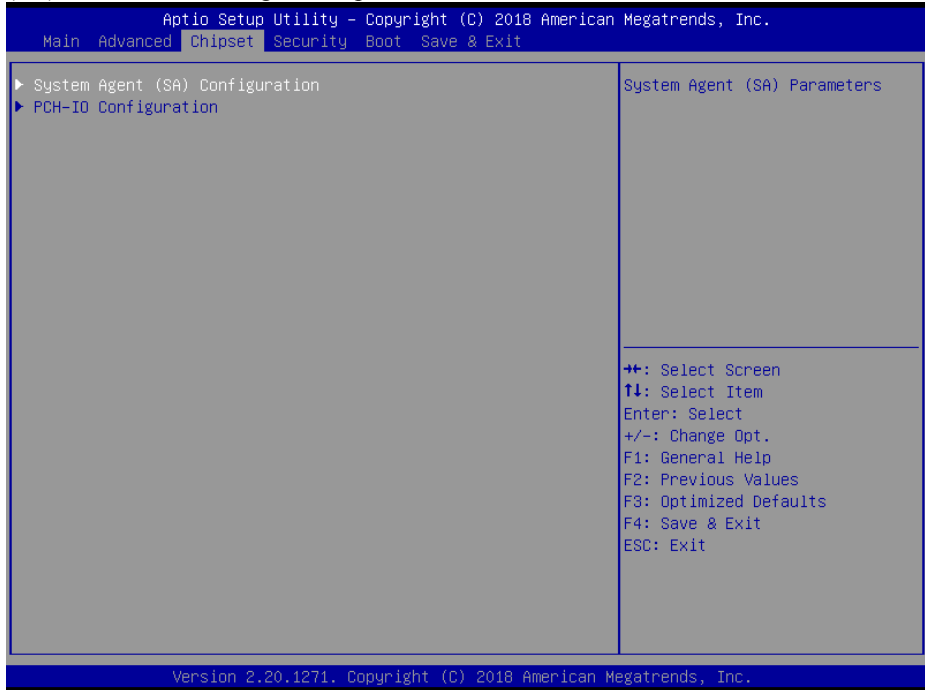
BIOS Setting	Options	Description/Purpose
Network Stack	- Disabled - Enabled	Enables or Disables UEFI Network Stack.
Ipv4 PXE Support	- Disabled - Enabled	Enables Ipv4 PXE Boot Support. If disabled, Ipv4 PXE boot option will not be created.
Ipv6 PXE Support	- Disabled - Enabled	Enables Ipv6 PXE Boot Support. If disabled, Ipv6 PXE boot option will not be created.

BIOS Setting	Options	Description/Purpose
IPSEC Certificate	- Disabled - Enabled	Supports to enable/disable IPSEC certificate for Ikev.
PXE boot wait time	Numeric (from 0 to 5)	Number of seconds to wait for PXE boot to abort after the Esc key is pressed.
Media detect count	Numeric (from 1 to 50)	Number of times that the media presence will be checked.

## 5.5 Chipset

Menu Path *Chipset*

This menu allows users to configure advanced Chipset settings such as System Agent (SA) and PCH-IO configuration parameters.

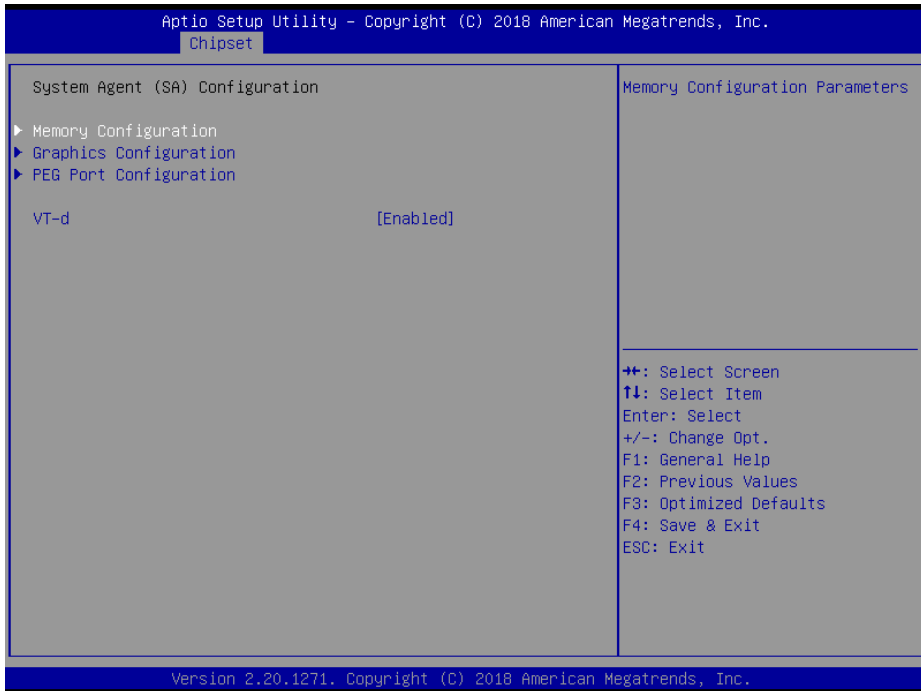


**Chipset Screen**

BIOS Setting	Options	Description/Purpose
System Agent (SA) Parameters	Sub-Menu	System Agent (SA) Parameters.
PCH-IO Configuration	Sub-Menu	PCH Parameters.

### 5.5.1 Chipset – System Agent (SA) Configuration

Menu Path *Chipset > System Agent (SA) Configuration*

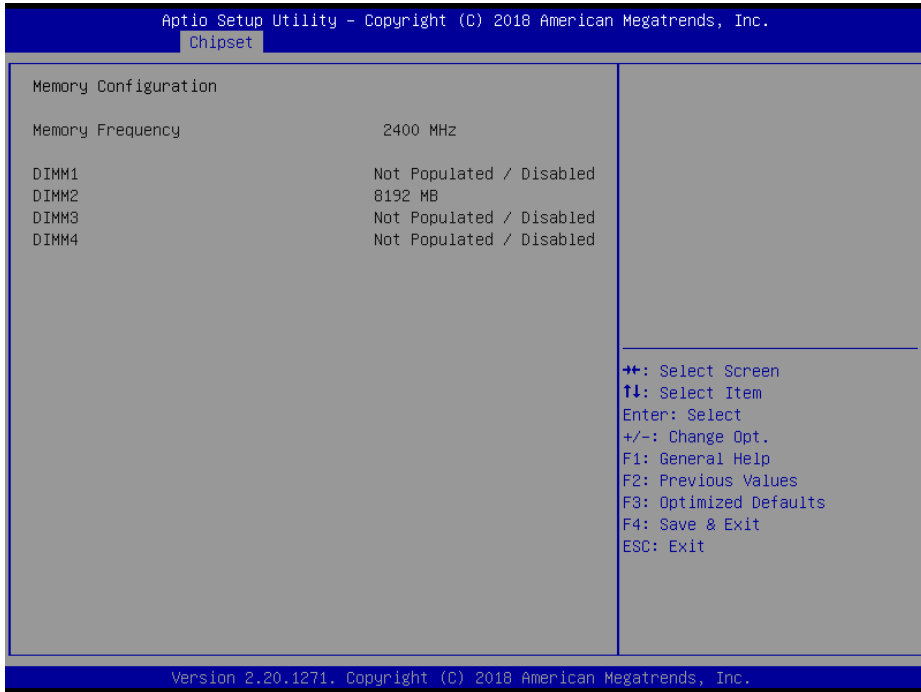


**System Agent (SA) Configuration Screen**

BIOS Setting	Options	Description/Purpose
Memory Configuration	Sub-Menu	Memory Configuration.
Graphics Configuration	Sub-Menu	Graphics Configuration.
PEG Port Configuration	Sub-Menu	PEG Port Configuration.
VT-d	- Disabled - Enabled	Enables or Disables VT-d function.

## System Agent (SA) Configuration – Memory Configuration

Menu Path      *Chipset > System Agent (SA) Configuration > Memory Configuration*



**Memory Configuration Screen**

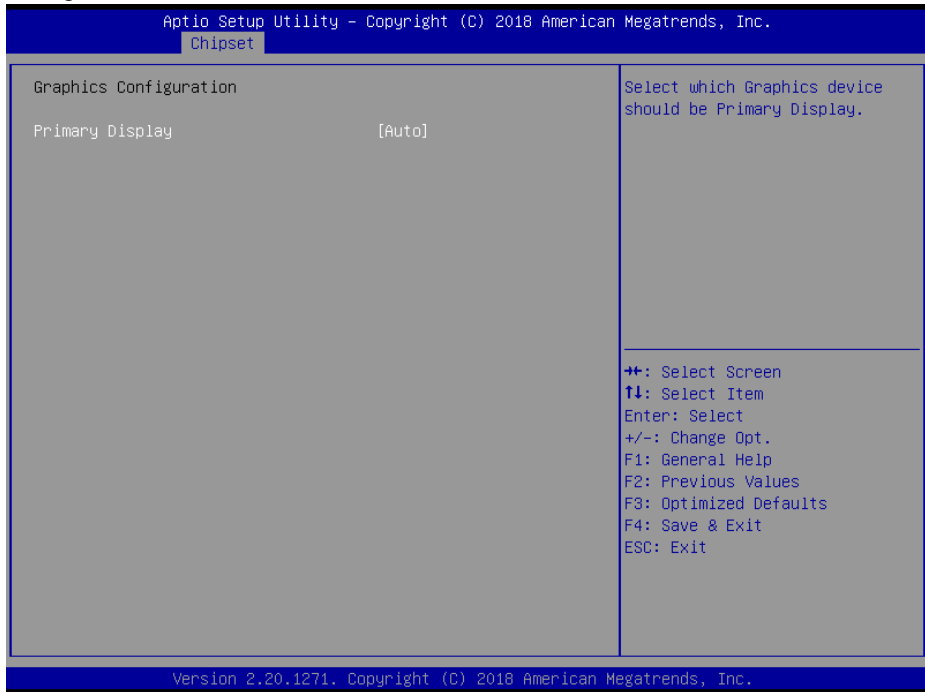
BIOS Setting	Options	Description/Purpose
Memory Frequency	No changeable options	Displays the Frequency of Memory.
DIMM1	No changeable options	Displays the size of DIMM1.
DIMM2 (for H310 SKU only)	No changeable options	Displays the size of DIMM2.
DIMM3	No changeable options	Displays the size of DIMM3.
DIMM4 (for H310 SKU only)	No changeable options	Displays the size of DIMM4.



## System Agent (SA) Configuration – Graphics Configuration

Menu Path *Chipset > System Agent (SA) Configuration >  
Graphics Configuration*

The **Graphics Configuration** allows users to configure the display settings for the LCD panel.



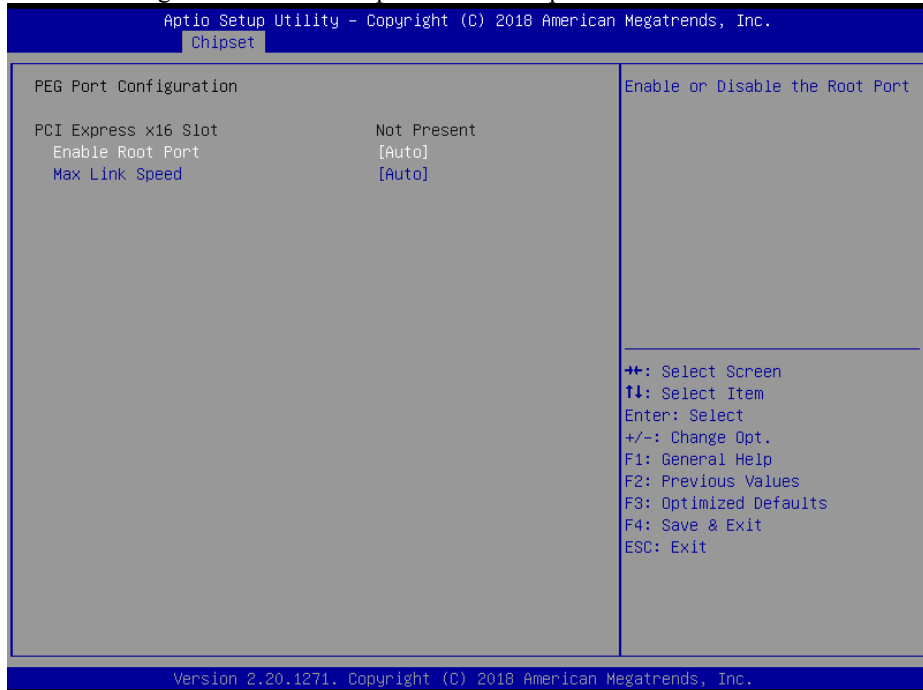
**Graphics Configuration Screen**

BIOS Setting	Options	Description/Purpose
Primary Display	- Auto - IGFX	Selects which Graphics device should be Primary Display.

## System Agent (SA) Configuration – PEG Port Configuration

Menu Path *Chipset > System Agent (SA) Configuration > PEG Port Configuration*

The **PEG Port Configuration** allows users to display the PEG status, enable Root Port and configure the maximum speed for PCI Express x16 slot.



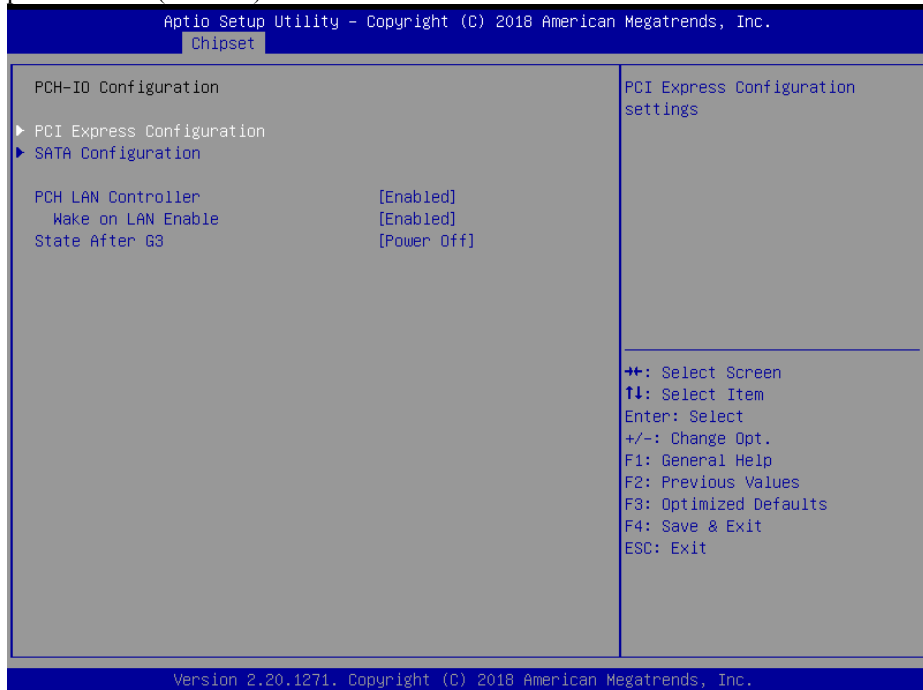
**PEG Port Configuration Screen**

BIOS Setting	Options	Description/Purpose
PCI Express x16 Slot	No changeable options	PCI Express x16 Slot Link and speed information.
Enable Root Port	- Disabled - Enabled - Auto	Enables or Disables the Root Port.
Max Link Speed	- Auto - Gen1 - Gen2 - Gen3	Configures the maximum speed for PCI_E1.

## 5.5.2 Chipset – PCH IO Configuration

Menu Path *Chipset > PCH-IO Configuration*

The **PCH-IO Configuration** allows users to configure PCI Express and SATA configuration parameters, enable/disable PCH LAN Controller and Wake-On-LAN function and determine the power on/off state that the system will go to following a power failure (G3 state).

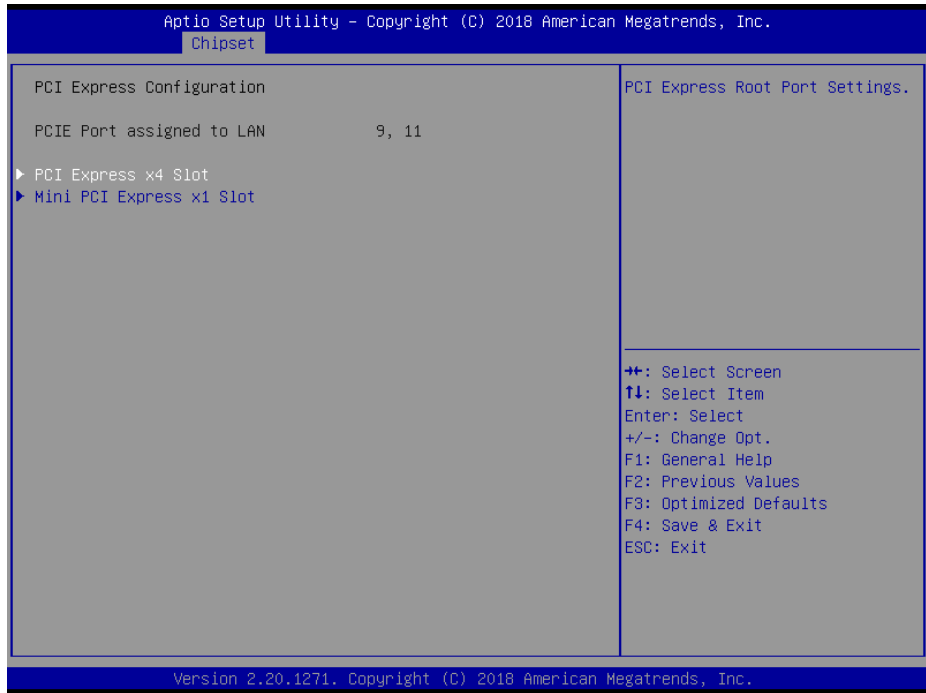


**PCH-IO Configuration Screen**

BIOS Setting	Options	Description/Purpose
PCI Express Configuration	Sub-Menu	PCI Express Configuration settings.
SATA Configuration	Sub-Menu	SATA Configuration settings.
PCH LAN Controller	- Disabled - Enabled	Enables or Disables onboard NIC.
Wake on LAN Enable	- Disabled - Enabled	Enables or Disables integrated LAN to wake up the system.
State After G3	- Power On - Power Off	Specifies the Power On/Off state that the system will go to when the power is re-applied following a power failure (G3 state).

## PCH-IO Configuration – PCI Express Configuration

Menu Path      *Chipset > PCH-IO Configuration > PCI Express Configuration*

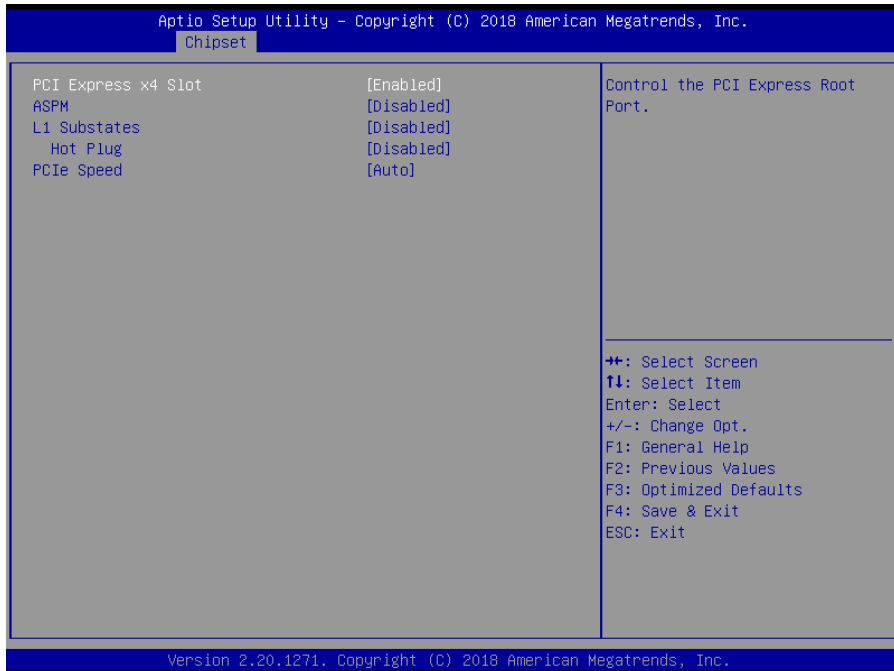


**PCI Express Configuration Screen**

BIOS Setting	Options	Description/Purpose
PCIE Port assigned to LAN	No changeable options	Displays the PCIE Port that is assigned to LAN.
PCI Express x4 Slot	Sub-Menu	PCI Express x4 slot settings.
Mini PCI Express x1 Slot (For C246/Q370 SKU Only)	Sub-Menu	Mini PCI Express Port settings.

## PCH-IO Configuration – PCI Express Configuration – PCI Express x4 Slot

Menu Path *Chipset > PCH-IO Configuration > PCI Express Configuration > PCI Express x4 Slot*



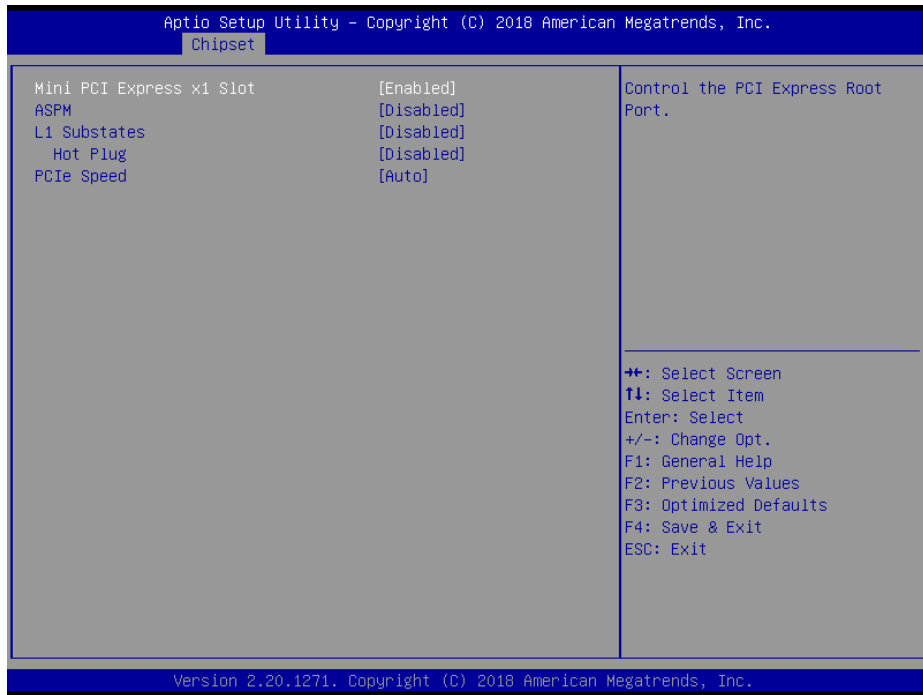
**PCI Express x4 Slot Screen**

BIOS Setting	Options	Description/Purpose
PCI Express x4 Slot	- Disabled - Enabled	Controls the PCI Express x4 slot settings.
ASPM	- Disabled - L0s - L1 - L0sL1 - Auto	Sets the ASPM (Active-State Power Management) Level. <ul style="list-style-type: none"> <li>• <b>Disabled:</b> Disables ASPM.</li> <li>• <b>L0s:</b> Forces all links to L0s state.</li> <li>• <b>L1:</b> Forces all links to L1 state.</li> <li>• <b>L0sL1:</b> Forces all links to L0sL1 state.</li> <li>• <b>Auto:</b> BIOS auto configure.</li> </ul>
L1 Substates	- Disabled - L1.1 - L1.1 & L1.2	PCI Express L1 Substates settings.
Hot Plug	- Disabled - Enabled	Enables or Disables PCI Express Hot Plug support.

BIOS Setting	Options	Description/Purpose
PCIe Speed	<ul style="list-style-type: none"> <li>- Auto</li> <li>- Gen1</li> <li>- Gen2</li> <li>- Gen3</li> </ul>	Selects PCI Express port speed.

## PCH-IO Configuration – PCI Express Configuration – Mini PCI Express x1 Slot (For C246/Q370 SKU Only)

Menu Path                      *Chipset > PCH-IO Configuration > PCI Express Configuration > Mini PCI Express x1 Slot*



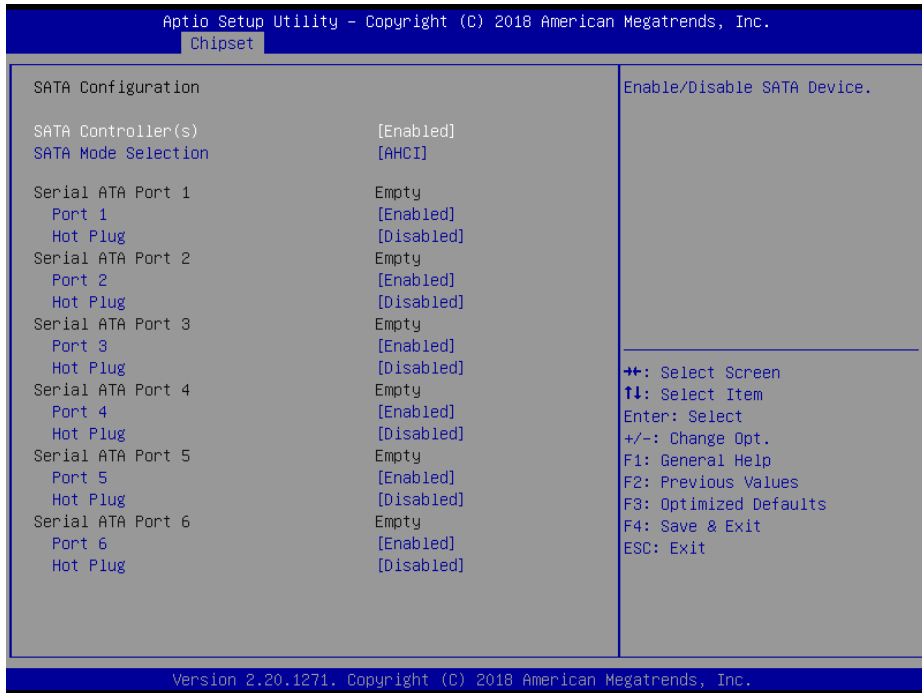
### Mini PCI Express x1 Slot Screen

BIOS Setting	Options	Description/Purpose
Mini PCI Express x1 Slot	<ul style="list-style-type: none"> <li>- Disabled</li> <li>- Enabled</li> </ul>	Enables or Disables the Min PCI Express x1 slot.
ASPM	<ul style="list-style-type: none"> <li>- Disabled</li> <li>- L0s</li> <li>- L1</li> <li>- L0sL1</li> <li>- Auto</li> </ul>	Sets the ASPM Level: <ul style="list-style-type: none"> <li>• <b>Disabled:</b> Disables ASPM.</li> <li>• <b>L0s:</b> Forces all links to L0s state.</li> <li>• <b>L1:</b> Forces all links to L1 state.</li> <li>• <b>L0sL1:</b> Forces all links to L0sL1 state.</li> <li>• <b>Auto:</b> BIOS auto configure.</li> </ul>

BIOS Setting	Options	Description/Purpose
L1 Substates	- Disabled - L1.1 - L1.1 & L1.2	PCI Express L1 Substates settings.
Hot Plug	- Disabled - Enabled	Enables or Disables PCI Express Hot Plug support.
PCIe Speed	- Auto - Gen1 - Gen2 - Gen3	Configures PCIe Speed.

## PCH-IO Configuration – PCI Express Configuration – SATA Configuration (For C246/Q370 SKU Only)

Menu Path *Chipset > PCH-IO Configuration > SATA Configuration*



**SATA Configuration Screen**

<b>BIOS Setting</b>	<b>Options</b>	<b>Description/Purpose</b>
SATA Controller(s)	- Disabled - Enabled	Enables or Disables SATA Device.
SATA Mode	- AHCI - RAID	Determines how SATA controller(s) operate.
Serial ATA Port 1 – 6,	No changeable options	Displays the SATA device's name.
Port 1 - 6	- Disabled - Enabled	Enables or Disables SATA Port Device.
HotPlug	- Disabled - Enabled	Enables or Disables SATA Port Device HotPlug function.

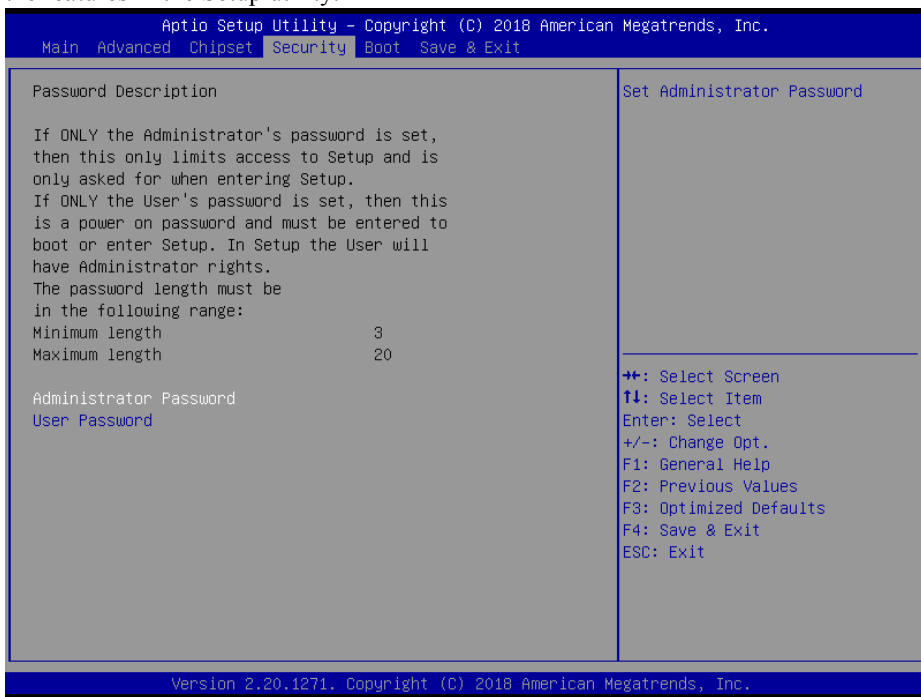


## 5.6 Security

Menu Path                      *Security*

From the **Security** menu, you are allowed to create, change or clear the administrator password. You will be asked to enter the configured administrator password before you can access the Setup Utility.

By setting an administrator password, you will prevent other users from changing your BIOS settings. You can configure an Administrator password and then configure a user password. An administrator has much more privileges over the settings in the Setup utility than a user. Heed that a user password does not provide access to most of the features in the Setup utility.



### Security Screen

BIOS Setting	Options	Description/Purpose
Administrator Password	Password can be 3-20 alphanumeric characters.	Specifies the administrator password.
User Password	Password can be 3-20 alphanumeric characters.	Specifies the user password.

**Create an Administrator or User Password**

1. Select the **Administrator Password / User Password** option from the Security menu and press <Enter>, and the password dialog entry box appears.
2. Enter the password you want to create. A password can be 3-20 alphanumeric characters. After you have configured the password, press <Enter> to confirm.
3. Type the new password again and press <Enter>.

**Change an Administrator or User Password**

1. Select the **Administrator Password / User Password** option from the Security menu and press <Enter>, and the password dialog entry box appears.
2. Select the Administrator Password or User Password that you want to change. A password can be 3-20 alphanumeric characters. After you have changed the password, press <Enter> to confirm.
3. Type the changed password again and press <Enter>.

**Remove an Administrator or User Password**

1. Select the **Administrator Password / User Password** option from the Security menu and press <Enter>, and the password dialog entry box appears.
2. Select the configured Administrator Password or User Password that you want to delete. Leave the dialog box blank and press <Enter>.
3. Press <Enter> again when the password confirmation box appears.

## 5.7 Boot

Menu Path                      *Boot*

This menu provides control items for setting system boot configuration and boot priorities.



**Boot Screen**

BIOS Setting	Options	Description/Purpose
Setup Prompt Timeout	Numeric (from 1 to 65535)	Number of seconds to wait for setup activation key.
Bootup NumLock State	- On - Off	Specifies the power-on state of the NumLock Key.
Quiet Boot	- Disabled - Enabled	Enables or Disables Quiet Boot option.
Boot Option #1~#n	- [Drive(s)] - Disabled	Sets the system boot order.

Menu Path	<i>Save &amp; Exit</i>
-----------	------------------------

<b>BIOS Setting</b>	<b>Options</b>	<b>Description/Purpose</b>
Save Changes and Exit	No changeable options	Exits and saves the changes in NVRAM.
Discard Changes and Exit	No changeable options	Exits without saving any changes made in BIOS settings.
Save Changes and Reset	No changeable options	Saves the changes in NVRAM and resets.
Discard Changes and Reset	No changeable options	Resets without saving any changes made in BIOS settings.
Save Changes	No changeable options	Saves Changes done so far to any of the setup options.
Discard Changes	No changeable options	Discards Changes done so far to any of the setup options.
Restore Defaults	No changeable options	Loads the optimized defaults for BIOS settings.
Save as User Defaults	No changeable options	Saves the changes done so far as User Defaults.
Restore User Defaults	No changeable options	Restores the User Defaults to all the setup options.
Boot Override	- [Drive(s)]	Forces to boot from selected [drive(s)].

# **Appendix A    Technical Summary**

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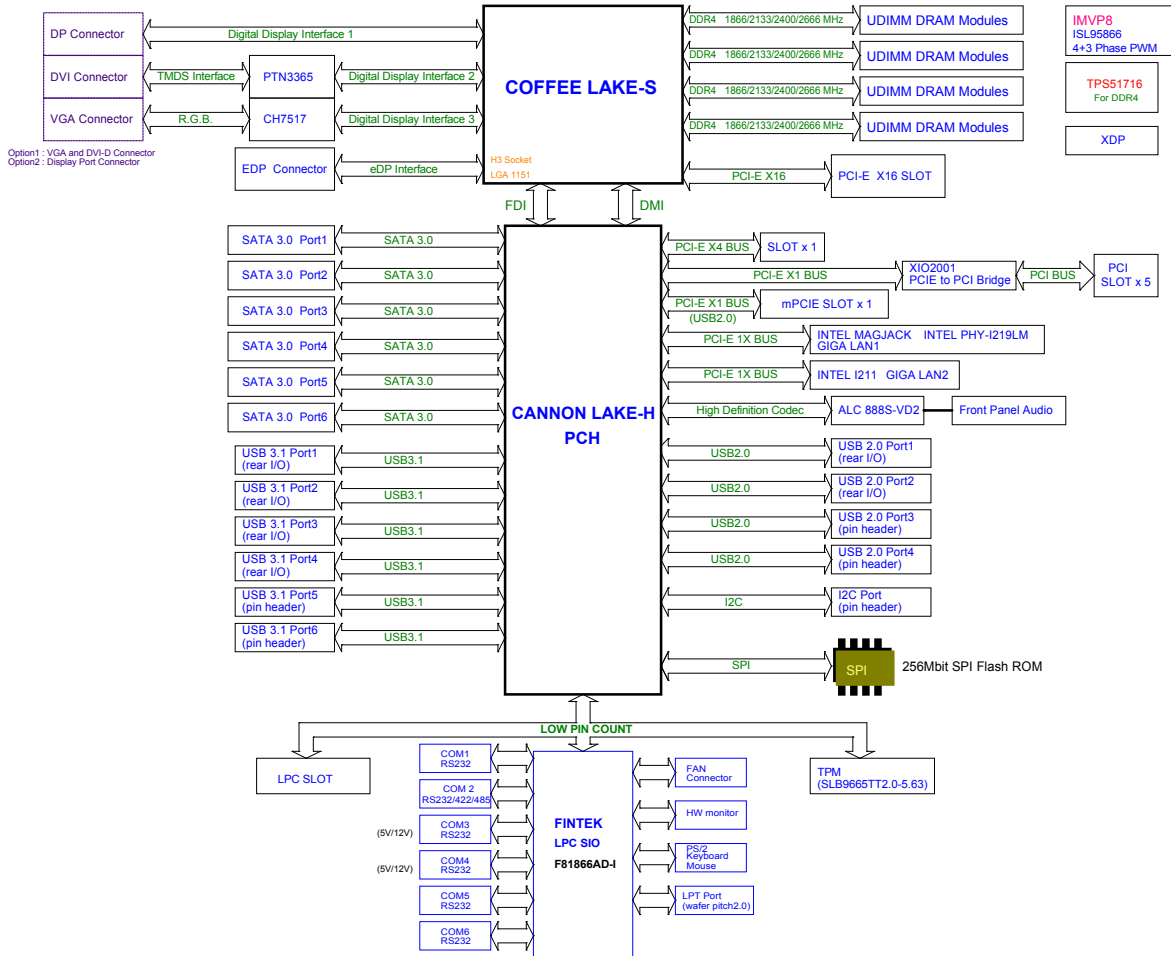
This appendix will give you a brief introduction of the allocation maps for BA-2601 resources.

The following topics are included:

- BA-2601 Block Diagram
- Interrupt Map
- I/O Map
- Memory Map
- Configuring WatchDog Timer
- Flash BIOS Update

# BA-2601 Block Diagram

## ATX Mother Board



**Interrupt Map**

<b>IRQ</b>	<b>ASSIGNMENT</b>
IRQ 0	System timer
IRQ 1	Standard PS/2 Keyboard
IRQ 8	System CMOS/real time clock
IRQ 4	Communications Port (COM1)
IRQ 3	Communications Port (COM2)
IRQ 7	Communications Port (COM3)
IRQ 6	Communications Port (COM4)
IRQ 10	Communications Port (COM5)
IRQ 11	Communications Port (COM6)
IRQ 12	PS/2 Port Compatible Pointing Device
IRQ 13	Numeric data processor
IRQ 14	Intel(R) Serial IO GPIO Host Controller - INT3450
IRQ 16	Intel(R) Serial IO I2C Host Controller - A368
IRQ 16	High Definition Audio Controller
IRQ 19	Intel(R) Active Management Technology - SOL (COM7)
IRQ 54	Microsoft ACPI-Compliant System
IRQ 55	Microsoft ACPI-Compliant System
IRQ 56	Microsoft ACPI-Compliant System
IRQ 57	Microsoft ACPI-Compliant System
IRQ 58	Microsoft ACPI-Compliant System
IRQ 59	Microsoft ACPI-Compliant System
IRQ 60	Microsoft ACPI-Compliant System
IRQ 61	Microsoft ACPI-Compliant System
IRQ 62	Microsoft ACPI-Compliant System
IRQ 63	Microsoft ACPI-Compliant System
IRQ 64	Microsoft ACPI-Compliant System
IRQ 65	Microsoft ACPI-Compliant System
IRQ 66	Microsoft ACPI-Compliant System
IRQ 67	Microsoft ACPI-Compliant System
IRQ 68	Microsoft ACPI-Compliant System
IRQ 69	Microsoft ACPI-Compliant System
IRQ 70	Microsoft ACPI-Compliant System



<b>IRQ</b>	<b>ASSIGNMENT</b>
IRQ 71	Microsoft ACPI-Compliant System
IRQ 72	Microsoft ACPI-Compliant System
IRQ 73	Microsoft ACPI-Compliant System
IRQ 74	Microsoft ACPI-Compliant System
IRQ 75	Microsoft ACPI-Compliant System
IRQ 76	Microsoft ACPI-Compliant System
IRQ 77	Microsoft ACPI-Compliant System
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IRQ 79	Microsoft ACPI-Compliant System
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IRQ 82	Microsoft ACPI-Compliant System
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IRQ 84	Microsoft ACPI-Compliant System
IRQ 85	Microsoft ACPI-Compliant System
IRQ 86	Microsoft ACPI-Compliant System
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<b>IRQ</b>	<b>ASSIGNMENT</b>
IRQ 104	Microsoft ACPI-Compliant System
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IRQ 137	Microsoft ACPI-Compliant System
IRQ 138	Microsoft ACPI-Compliant System

<b>IRQ</b>	<b>ASSIGNMENT</b>
IRQ 139	Microsoft ACPI-Compliant System
IRQ 140	Microsoft ACPI-Compliant System
IRQ 141	Microsoft ACPI-Compliant System
IRQ 142	Microsoft ACPI-Compliant System
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<b>IRQ</b>	<b>ASSIGNMENT</b>
IRQ 172	Microsoft ACPI-Compliant System
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<b>IRQ</b>	<b>ASSIGNMENT</b>
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<b>IRQ</b>	<b>ASSIGNMENT</b>
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<b>IRQ</b>	<b>ASSIGNMENT</b>
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<b>IRQ</b>	<b>ASSIGNMENT</b>
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<b>IRQ</b>	<b>ASSIGNMENT</b>
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<b>IRQ</b>	<b>ASSIGNMENT</b>
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<b>IRQ</b>	<b>ASSIGNMENT</b>
IRQ 462	Microsoft ACPI-Compliant System
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<b>IRQ</b>	<b>ASSIGNMENT</b>
IRQ 495	Microsoft ACPI-Compliant System
IRQ 496	Microsoft ACPI-Compliant System
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IRQ 502	Microsoft ACPI-Compliant System
IRQ 503	Microsoft ACPI-Compliant System
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IRQ 508	Microsoft ACPI-Compliant System
IRQ 509	Microsoft ACPI-Compliant System
IRQ 510	Microsoft ACPI-Compliant System
IRQ 511	Microsoft ACPI-Compliant System
IRQ 4294967282	Intel(R) Management Engine Interface
IRQ 4294967283	Intel(R) Ethernet Connection (7) I219-LM
IRQ 4294967284	Intel(R) I211 Gigabit Network Connection
IRQ 4294967285	Intel(R) I211 Gigabit Network Connection
IRQ 4294967286	Intel(R) I211 Gigabit Network Connection
IRQ 4294967287	Intel(R) I211 Gigabit Network Connection
IRQ 4294967288	Intel(R) I211 Gigabit Network Connection
IRQ 4294967289	Intel(R) I211 Gigabit Network Connection
IRQ 4294967290	Intel(R) I211 Gigabit Network Connection
IRQ 4294967291	Intel(R) I211 Gigabit Network Connection
IRQ 4294967292	Intel(R) USB 3.1 eXtensible Host Controller - 1.10 (Microsoft)
IRQ 4294967293	Intel(R) UHD Graphics P630
IRQ 4294967294	Standard SATA AHCI Controller

## I/O MAP

I/O	ASSIGNMENT
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A20-0x00000A2F	Motherboard resources
0x0000002E-0x0000002F	Motherboard resources
0x0000004E-0x0000004F	Motherboard resources
0x00000061-0x00000061	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000070-0x00000070	Motherboard resources
0x00000070-0x00000070	System CMOS/real time clock
0x00000080-0x00000080	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x000000B2-0x000000B3	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x0000164E-0x0000164F	Motherboard resources
0x00000378-0x0000037F	Printer Port (LPT1)
0x00003000-0x00003FFF	Intel(R) PCI Express Root Port #11 - A332
0x00004000-0x0000403F	Intel(R) UHD Graphics P630
0x000003F8-0x000003FF	Communications Port (COM1)
0x000002F8-0x000002FF	Communications Port (COM2)
0x000003E8-0x000003EF	Communications Port (COM3)
0x000002E8-0x000002EF	Communications Port (COM4)
0x000002F0-0x000002F7	Communications Port (COM5)
0x000002E0-0x000002E7	Communications Port (COM6)
0x00001800-0x000018FE	Motherboard resources
0x00000060-0x00000060	Standard PS/2 Keyboard
0x00000064-0x00000064	Standard PS/2 Keyboard
0x00000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller

<b>I/O</b>	<b>ASSIGNMENT</b>
0x0000002C-0x0000002D	Programmable interrupt controller
0x00000030-0x00000031	Programmable interrupt controller
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000004D0-0x000004D1	Programmable interrupt controller
0x00000000-0x000000CF7	PCI Express Root Complex
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x00004090-0x00004097	Standard SATA AHCI Controller
0x00004080-0x00004083	Standard SATA AHCI Controller
0x00004060-0x0000407F	Standard SATA AHCI Controller
0x0000FFF8-0x0000FFFF	Intel(R) Active Management Technology - SOL (COM7)
0x000000F0-0x000000F0	Numeric data processor
0x00002000-0x000020FE	Motherboard resources
0x00000040-0x00000043	System timer
0x00000050-0x00000053	System timer
0x00001854-0x00001857	Motherboard resources
0x0000EFA0-0x0000EFBF	Intel(R) SMBus - A323

## Memory Map

MEMORY MAP	ASSIGNMENT
0xFED10000-0xFED17FFF	Motherboard resources
0xFED18000-0xFED18FFF	Motherboard resources
0xFED19000-0xFED19FFF	Motherboard resources
0xE0000000-0xEFFFFFFF	Motherboard resources
0xFED20000-0xFED3FFFF	Motherboard resources
0xFED90000-0xFED93FFF	Motherboard resources
0xFED45000-0xFED8FFFF	Motherboard resources
0xFEE00000-0xFEEFFFFFFF	Motherboard resources
0xA1100000-0xA111FFFF	Intel(R) I211 Gigabit Network Connection
0xA1100000-0xA111FFFF	Intel(R) PCI Express Root Port #11 - A332
0xA1120000-0xA1123FFF	Intel(R) I211 Gigabit Network Connection
0xFED00000-0xFED003FF	High precision event timer
0xA0000000-0xA0FFFFFFF	Intel(R) UHD Graphics P630
0x90000000-0x9FFFFFFF	Intel(R) UHD Graphics P630
0x90000000-0x9FFFFFFF	PCI Express Root Complex
0xA1220000-0xA122FFFF	Intel(R) USB 3.1 eXtensible Host Controller - 1.10 (Microsoft)
0xFD000000-0xFD69FFFF	Motherboard resources
0xFD6C0000-0xFD6CFFFF	Motherboard resources
0xFD6F0000-0xFDFFFFFFF	Motherboard resources
0xFE000000-0xFE01FFFF	Motherboard resources
0xFE200000-0xFE7FFFFF	Motherboard resources
0xFF000000-0xFFFFFFFF	Motherboard resources
0xA0000-0xBFFFF	PCI Express Root Complex
0xE0000-0xE3FFF	PCI Express Root Complex
0xE4000-0xE7FFF	PCI Express Root Complex
0xE8000-0xEBFFF	PCI Express Root Complex
0xEC000-0xEFFFF	PCI Express Root Complex
0xF0000-0xFFFFF	PCI Express Root Complex
0xFC800000-0xFE7FFFFF	PCI Express Root Complex
0xA1234000-0xA1235FFF	Standard SATA AHCI Controller

<b>MEMORY MAP</b>	<b>ASSIGNMENT</b>
0xA123A000-0xA123A0FF	Standard SATA AHCI Controller
0xA1239000-0xA12397FF	Standard SATA AHCI Controller
0xFE010000-0xFE010FFF	Intel(R) SPI (flash) Controller - A324
0xFE1DF000-0xFE1DFFFF	Intel(R) Active Management Technology - SOL (COM7)
0xFE1DE000-0xFE1DEFFF	Intel(R) Management Engine Interface
0xFE1DD000-0xFE1DDFFF	Intel(R) Serial IO I2C Host Controller - A368
0xA123F000-0xA123FFFF	Intel(R) Thermal Subsystem - A379
0xFE1E0000-0xFE1FFFFFF	Intel(R) Ethernet Connection (7) I219-LM
0xFD6E0000-0xFD6EFFFF	Intel(R) Serial IO GPIO Host Controller - INT3450
0xFD6D0000-0xFD6DFFFF	Intel(R) Serial IO GPIO Host Controller - INT3450
0xFD6B0000-0xFD6BFFFF	Intel(R) Serial IO GPIO Host Controller - INT3450
0xFD6A0000-0xFD6AFFFF	Intel(R) Serial IO GPIO Host Controller - INT3450
0xFE1D8000-0xFE1DBFFF	High Definition Audio Controller
0xFCF00000-0xFCFFFFFF	High Definition Audio Controller
0xA1238000-0xA12380FF	Intel(R) SMBus - A323



## **Configuring WatchDog Timer**

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. User must first assign the address of register by writing address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

### **Configuration Sequence**

To program F81866 configuration registers, the following configuration sequence must be followed:

#### **(1) Enter the extended function mode**

To place the chip into the Extended Function Mode, two successive writes of 0x87 must be applied to Extended Function Enable Registers (EFERs, i.e. 2Eh or 4Eh).

#### **(2) Configure the configuration registers**

The chip selects the Logical Device and activates the desired Logical Devices through Extended Function Index Register (EFIR) and Extended Function Data Register (EFDR). The EFIR is located at the same address as the EFER, and the EFDR is located at address (EFIR+1). First, write the Logical Device Number (i.e. 0x07) to the EFIR and then write the number of the desired Logical Device to the EFDR. If accessing the Chip (Global) Control Registers, this step is not required. Secondly, write the address of the desired configuration register within the Logical Device to the EFIR and then write (or read) the desired configuration register through the EFDR.

#### **(3) Exit the extended function mode**

To exit the Extended Function Mode, writing 0xAA to the EFER is required. Once the chip exits the Extended Function Mode, it is in the normal running mode and is ready to enter the configuration mode.

**Code example for watch dog timer**

Enable watchdog timer and set timeout interval to 30 seconds.

```

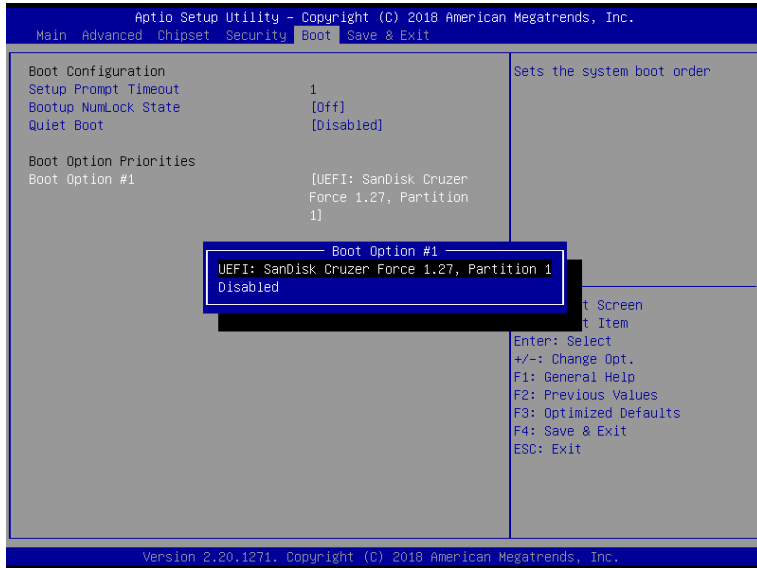
;----- Enter to extended function mode -----
mov     dx, 2eh
mov     al, 87h
out     dx, al
out     dx, al
;----- Select Logical Device 7 of watchdog timer -----
mov     al, 07h
out     dx, al
inc     dx
mov     al, 07h
out     dx, al
;----- Enable Watch dog feature -----
mov     al, 030h
out     dx, al
inc     dx
mov     al, 01h
out     dx, al
;----- Enable Watch PME-----
dec     dx
mov     al, 0FAh
out     dx, al
inc     dx
in      al, dx
and     al, 51h
out     dx, al
;----- Set timeout interval to 30 -----
dec     dx
mov     al, 0F6h
out     dx, al
inc     dx
mov     al, 1Eh
out     dx, al
;----- Set second as counting unit and start counting -----
dec     dx
mov     al, 0F5h
out     dx, al
inc     dx
in      al, dx
and     al, 30h
out     dx, al
;----- Exit the extended function mode -----
dec     dx
mov     al, 0AAh
out     dx, al

```

## **Flash BIOS Update**

### **I. Prerequisites**

- 1** Prepare a USB storage device which can save the required files for BIOS update.
- 2** Download and save the BIOS file (e.g. 26010PW1.bin) to the storage device.
- 3** Copy AMI flash utility –AFUEFIx64.exe (v5.10.01) into the storage device. The utility and BIOS file should be saved to the same path.
- 4** Copy UEFI Shell into the storage device under specific directory path. (/efi/boot/bootx64.efi).
  - (1) Connect the USB storage device.
  - (2) Turn on the computer and press <ESC> or <DEL> key during boot to enter BIOS Setup.
  - (3) The system will go into the BIOS setup menu.
  - (4) Select [**Boot**] menu and set the USB storage device as the 1<sup>st</sup> boot device.
  - (5) Press <F4> key to save the configuration and restart the system to boot into EFI Shell environment.



## II. AFUEFIx64 Command for System BIOS Update

AFUEFIx64.efi is the AMI firmware update utility; the command line is shown as below:

**AFUEFIx64 <ROM File Name> [option1] [option2]....**

Users can type “AFUEFIx64 /?” to view the definition of each control option. The recommended options for BIOS ROM update include the following parameters:

- /P:** Program main BIOS image.
- /B:** Program Boot Block.
- /N:** Program NVRAM.
- /X:** Don't check ROM ID.

### III. BIOS Update Procedure

- 1 Boot into EFI Shell and change to the path where you put BIOS image and AFUEFIx64.

```
Shell> fs0:  
fs0:\> cd afuefix64
```

- 2 "AFUEFIx64 2601xxxx.bin /p /b /n /x" and press <Enter> to start the flash procedure. (xx means the BIOS revision part, e.g. 0PW1...)
- 3 During the update procedure, you will see the BIOS update process status and its execution percentage. Beware! Do not turn off the system power or reset your computer if the whole procedure are not complete yet, or it may crash the BIOS ROM and the system will be unable to boot up next time.
- 4 After the BIOS update procedure is completed, the following messages will display:

```
fs0:\afuefix64> AfuEfix64 26010PW1.bin /p /b /n /x  
  
+-----+  
|          AMI Firmware Update Utility  v5.10.01.1670          |  
| Copyright (C) 2018 American Megatrends Inc. All Rights Reserved. |  
+-----+  
Reading flash ..... done  
- ME Data Size Checking . ok  
- FFS checksums ..... ok  
- Check RomLayout ..... Ok.  
Erasing Boot Block ..... done  
Updating Boot Block ..... done  
Verifying Boot Block ..... done  
Erasing Main Block ..... done  
Updating Main Block ..... done  
Verifying Main Block ..... done  
Erasing NVRAM Block ..... done  
Updating NVRAM Block ..... done  
Verifying NVRAM Block ..... done  
  
Process completed.  
  
fs0:\afuefix64> _
```

- 5** Restart the system and boot up with the new BIOS configurations.
- 6** The BIOS Update is completed after the system is restarted.
- 7** Reboot the system and verify if the BIOS version shown on the initialization screen has been updated.



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BIOS Date: 05/23/2018 17:17:00 Ver: 26010PW1  
Press <DEL> or <ESC> to enter setup.