SLP-SKL/SKLB

6th Gen Intel®Core™ Processor Core™ i7/i5/i3 Fanless Expendable Controller with PCI/PCI-e expansion slots

Quick Reference Guide

2nd Ed –08 September 2017

Part No. E20178209A2R

FCC Statement

THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.

(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTATLLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

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

A Message to the Customer

Avalue Customer Services

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

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

Technical Support

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

To receive the latest version of the user's manual; please visit our Web site at:

http://www.avalue.com.tw/

Content

1. Getting Started

1.1 Safety Precautions

Warning!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

1.2 Packing List

- 1 x SLP-SKL/SKLB controller
- Accessory Box
- Screw pack for wall-mounting and HDD fixing
- 1 x 24V Adapter

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

1.3 System Specifications

Component	
Mother Board	Customized board for slot PC 128-Mbit SPI Flash ROM (AMI Aptio V uEFI BIOS used)
Backplane	1 customized backplane with 1 x PCI-e x16, 3 x PCI **(SLP-SKL)** 1 x PCI-e x 8, 2 x PCI-e x 4, 1 x PCI **(SLP-SKLB)**
CPU	6th Gen Intel® Core™ i7-6700TE, 4-Core, 2.4GHz processor 6th Gen Intel® Core™ i5-6500TE, 4-Core, 2.3GHz processor 6th Gen Intel® Core™ i3-6100TE, 2-Core, 2.7GHz processor
CPU Cooler (Type)	Fanless
Memory	2 x 260-pin DDR4-2133MHz (Up to 32GB Max)
Adapter	Input: 100 ~ 240Vac/ 50 ~ 60Hz，Output: 180W Adapter (24V @ 7.5A)
System Fan	Optional Fan module
Operating System	Win7 32/64bit，Win8.1 & Win10 64bit
Other Component	Support TPM 1.2/2.0, by BOM option (Infineon 9665/9655)TPM2.0 works in EFI O.S.
Storage	
Hard Disk Drive	2 x 2.5” HDD/SSD, support SATA RAID 0, 1 & SATA 6 Gb/s
Solid State Drive	Supported
Other Storage Device	1 x CFast socket
External I/O	
PS/2 KB & Mouse	YES
Serial Port	2 x RS232(Pin 9 with 5V, 12V or Ring, By Jump setting) 2 x RS232(Pin 9 with 5V, 12V or Ring, By Jump setting) /422/485, By BIOS setting
USB Port	6 x USB 3.0 1 x USB 2.0 (internal) Type-A
DIO Port	DIO connector MCR 68P 90D(F) 1.27 BLK DIP Wing-Tech MCR68FL33 (RoHS)
Display output	1 x DP, 1 x DVI-I
Audio Port	1 x Line-in, 1 x Line-out, 1 x Mic-in
LAN Port	2 x RJ45 with Intel I219-LM and I210-AT 10/100/1000 Ethernet controller
Wireless LAN Antenna	Optional knock-up antenna hole x 2
Switch	1 x Power button (LED Blue)
Indicator Light	2 x LED Green : HD drive

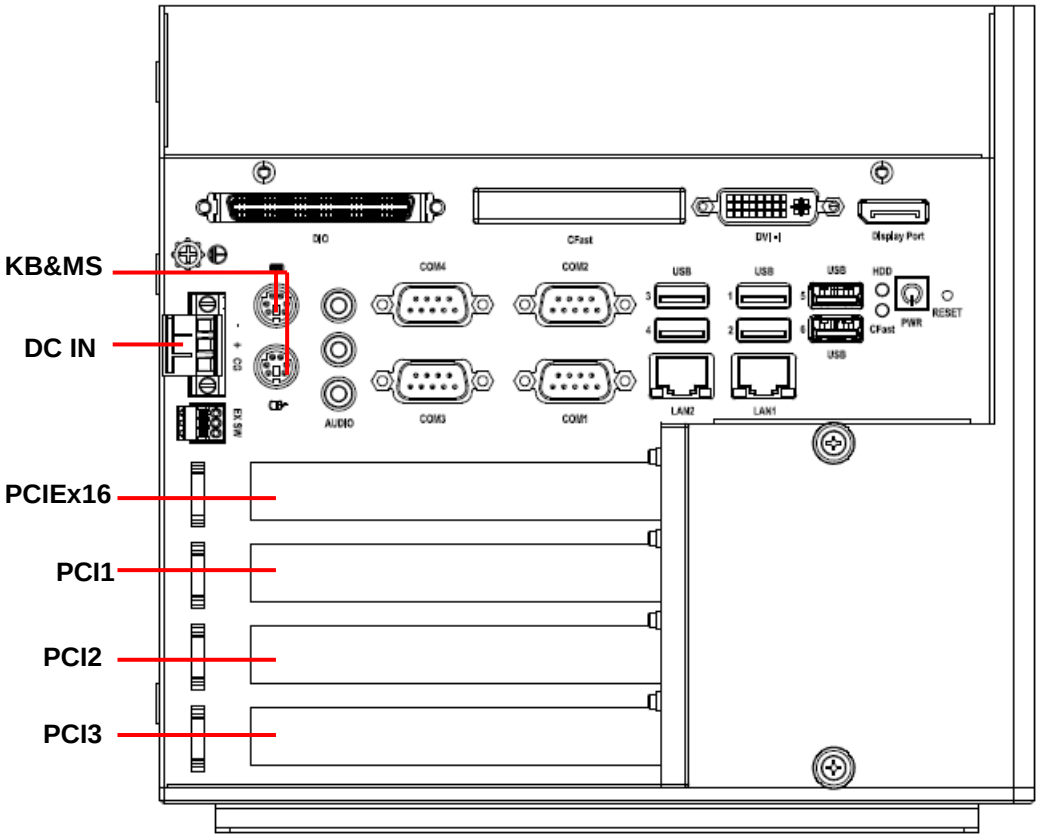
	When the SATA hard drive is active, the LED indicator flashes. Yellow : CFast When CFast card is active, the LED indicator remains lit.
Expansion Slots	80-pin Avalue IET module 1 x Mini PCIe (supported mSATA) 1 x PCI-e x16, 3 x PCI **(SLP-SKL)** 1 x PCI-e x 8, 2 x PCI-e x 4, 1 x PCI **(SLP-SKLB)**
Others	1 x Reset button
Mechanical	
Power Type	Built-in 9-36 VDC wide-range DC input Supports maximum : 135W power with 9VDC/15A input 180W power with 12VDC/5A input 180W power with 19VDC/9.4A input 180W power with 24VDC/7.5A input 180W power with 36VDC/5A input
Power Connector Type	Phoenix Connector
Dimension	200 x 225 x 218 mm
Weight	4.5 kg
Color	Black
Fanless	YES, Optional Fan module
Reliability	
EMI Test	CE/FCC : Class A
Safety	Avalue Standard
Dust and Rain Test	Avalue Standard
Vibration Test	With CFast /SSD: 1.5Grms, IEC 60068-2-64, Random, 5 ~ 500Hz, 30min/axis
Mechanical Bump Test	With CFast /SSD: 10G, IEC 60068-2-27, Half Sine,11ms
Drop Test	1. One corner , three edges, six faces 2. ISTA 2A, IEC-60068-2-32 Test:Ed
Operating Temperature	(w/HDD), ambient w/ air flow 0°C ~ 40°C (32°F ~ 104°F) Extended temperature option: (w/industrial SSD, CFast),ambient w/ air flow 0°C to 50°C (32˚F to 122˚F)
Operating Humidity	0% ~ 90% Relative Humidity, Non-condensing
Storage Temperature	-40 ~ 75°C (-40 ~ 167°F)
Others	
Main Board	CFast Socket, DVI-I, Digital I/O, Display Port, Mini PCI-e (Full Size), IET 80-pin interface

I/O Board	4 x COM, 6 x USB 3.0 1 x Line-in, 1 x Line-out, 1 x Mic-in, PS/2 KB & Mouse 1 x Power button (LED Blue), 1 x Reset button 2 x LED (Orange, Green) 2 x Gigabit Ethernet
Backplane	DC IN, Extend Power Switch, 2 x SATA, internal USB2.0 (Type-A), Internal Reserved +5V and +12V Connector 1 x PCI-e x16, 3 x PCI **(SLP-SKL)** 1 x PCI-e x 8, 2 x PCI-e x 4, 1 x PCI **(SLP-SKLB)** Supports maximum 55W power for expansion Supports maximum dimension of 116 mm (H) x 175mm (L) for expansion PC board

Note: Specifications are subject to change without notice.

1.4 System Overview

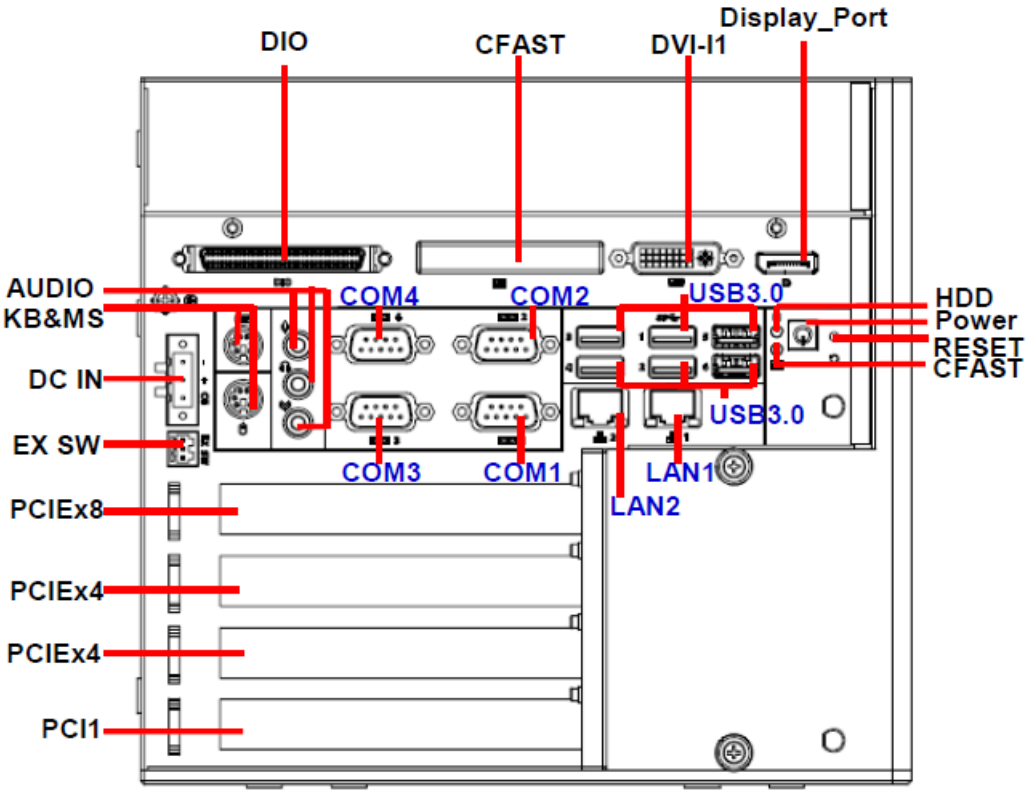
1.4.1 SLP-SKL Rear View



Connectors		
Label	**Function**	**Note**
Display Port	Display Port	
Power	Power on button	
Reset	Reset button	
DVI-I	DVI Port	
CFAST	CFast socket	
DIO	DI/DO Isolator	MCR 68P 90D(F) 1.27 BLK DIP Wing-Tech MCR68FL33 (RoHS)
USB3.0	6 x USB3.0 connector	
LAN1/2	RJ-45 Ethernet 1/2	
COM1/2	Serial port connector 1/2	D-sub 9-pin, male **Note**：COM1/2 support RS422/485 by BIOS setting
COM3/4	Serial port connector 3/4	DB-9 male connector
AUDIO	Audio Line in/Line out/Mic in	

KB&MS	PS/2 keyboard & mouse connector	
PCI1/2/3	PCI slot 1/2/3	
PCIEx16	PCIex16 slot	
HDD	HDD indicator	
EX SW	Power Button connector	TERMINAL 3P 90D(F) 2.5 GRN DIP DINKLEECH250R-03P (RoHS)
DC IN	DC Input connector	TERMINAL 3P 90D(M) 5.08 w/NUT GRN DIPDINKLE 2EHDRM-03P (HF)

1.4.2 SLP-SKLB Rear View



Connectors

Label	Function	Note
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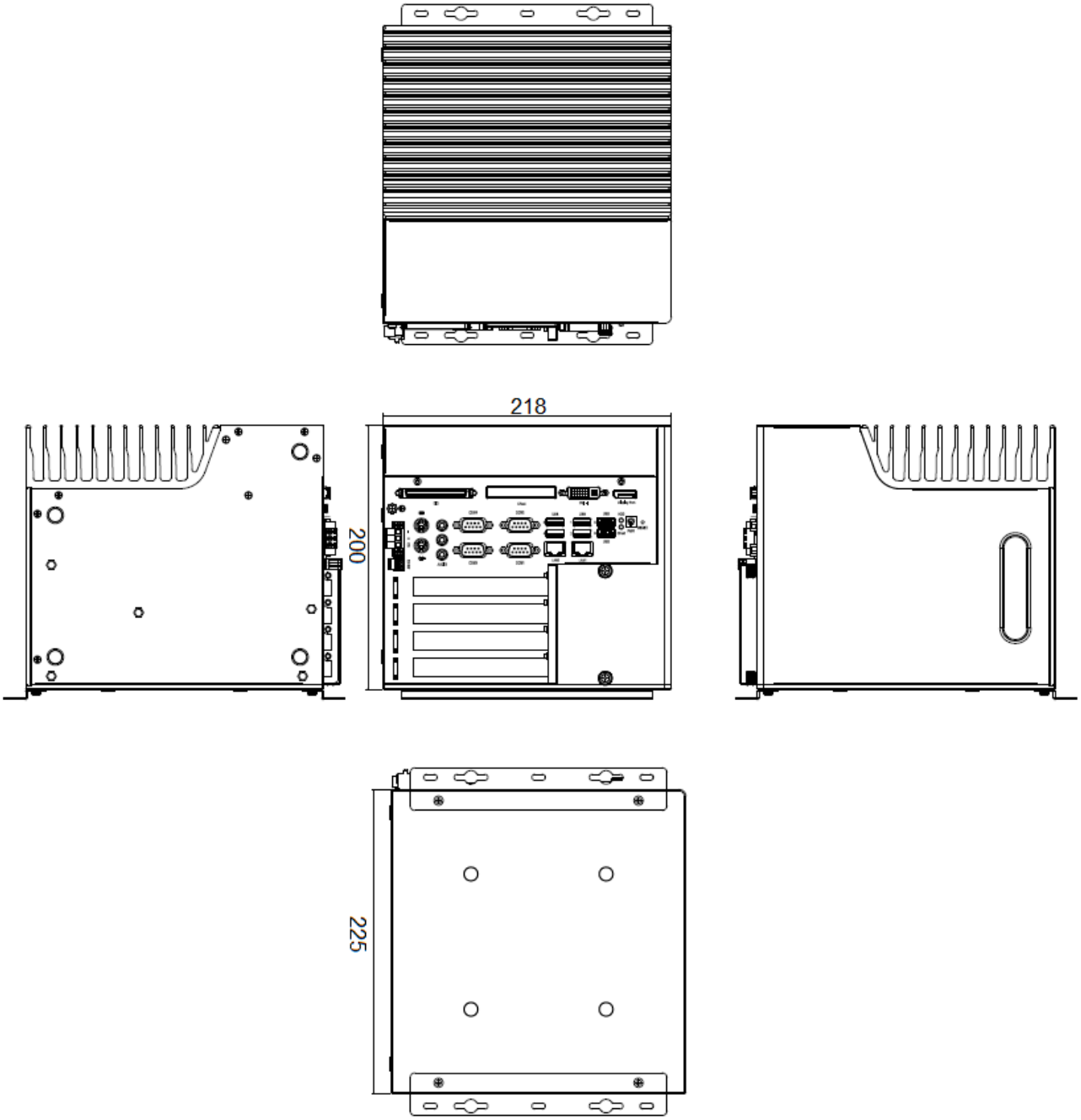
USB3.0	6 x USB3.0 connector	
LAN1/2	RJ-45 Ethernet 1/2	
COM1/2	Serial port connector 1/2	D-sub 9-pin, male **Note**：COM1/2 support RS422/485 by BIOS setting
COM3/4	Serial port connector 3/4	DB-9 male connector
AUDIO	Audio Line in/Line out/Mic in	
KB&MS	PS/2 keyboard & mouse connector	
PCI1	PCI slot	
PCIEx4	2 x PCIex4 slot	
PCIEx8	PCIex8 slot	
HDD	HDD indicator	
EX SW	Power Button connector	TERMINAL 3P 90D(F) 2.5 GRN DIP DINKLEECH250R-03P (RoHS)
DC IN	DC Input connector	TERMINAL 3P 90D(M) 5.08 w/NUT GRN DIPDINKLE 2EHDRM-03P (HF)

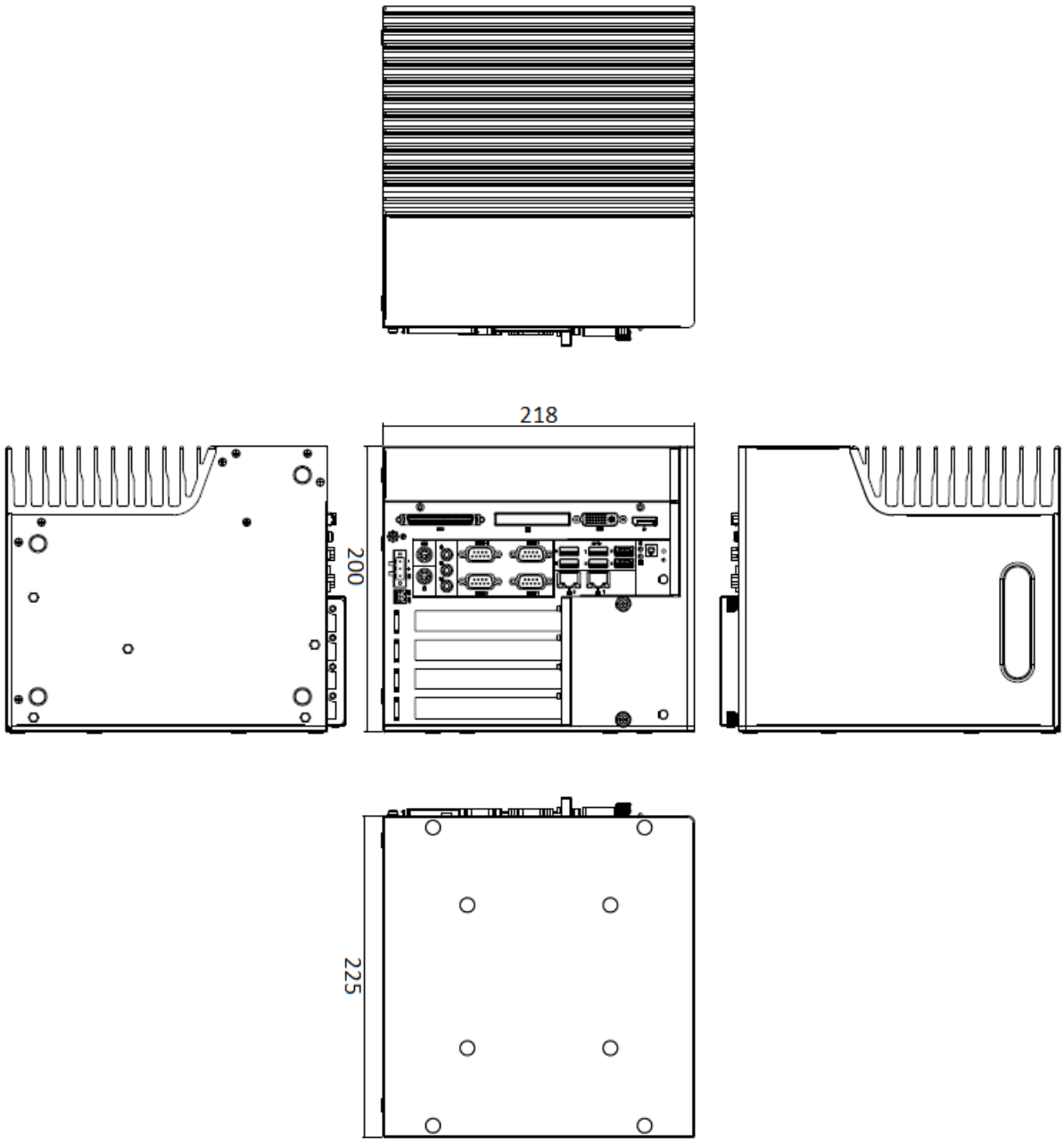
1.5 System Dimensions

1.5.1 SLP-SKL Front & Top view



(Unit: mm)

1.5.2 SLP-SKLB Front & Top view



(Unit: mm)

2. Hardware Configuration

Jumper and Connector Setting

For advanced information, please refer to:

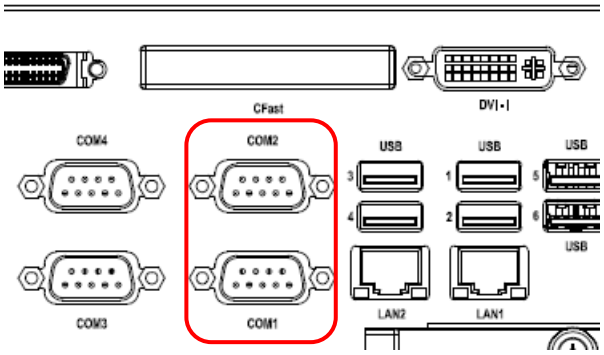
1- SLP-SKL, SLP-SKL DB-A and SLP-SKL/SKLB DB-B included in this manual.

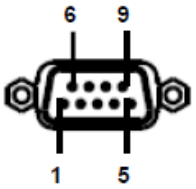
Note: If you need more information, please visit our website:

http://www.avalue.com.tw

2.1 SLP-SKL connector mapping

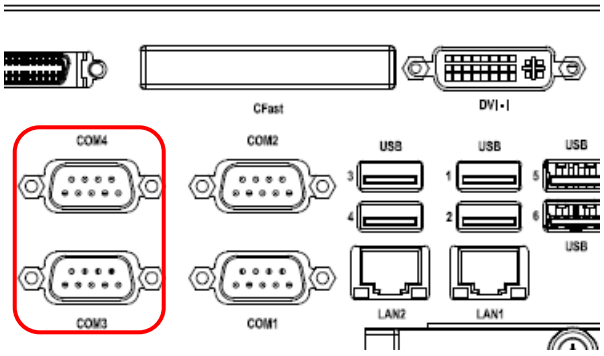
2.1.1 Serial Port 1/2 connector (COM1/2)

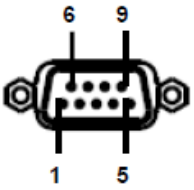




Pin	RS-232	RS-422	RS-485
1	DCD#	TXD422-	485DATA-
2	RXD	TXD422+	485DATA+
3	TXD	RXD422+	
4	DTR#	RXD422-	
5	GND		
6	DSR#		
7	RTS#		
8	CTS#		
9	RI#		

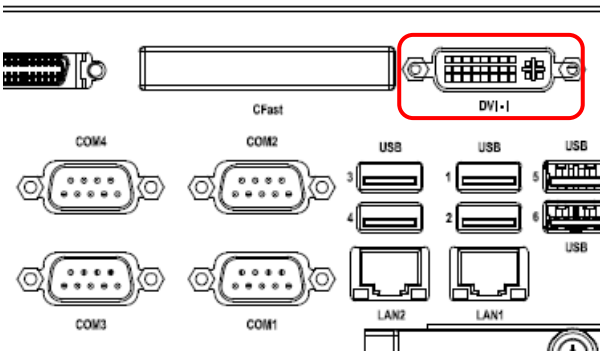
2.1.2 Serial Port 3/4 connector (COM3/4)

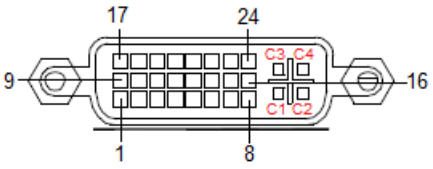




Signal	PIN	PIN	Signal
NDCD#	1	2	NRXD
NTXD	3	4	NDTR#
GND	5	6	NDSR#
NRTS#	7	8	NCTS#
NRI#	9		

2.1.3 DVI Port (DVI-I1)

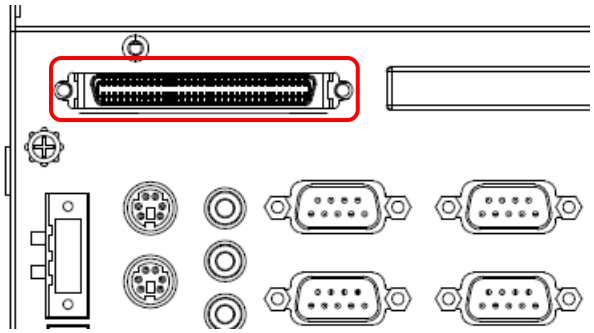




Pin	Signal	Pin	Signal	Pin	Signal
1	TMDS2-	9	TMDS1-	17	TMDS0-
2	TMDS2+	10	TMDS1+	18	TMDS0+
3	TS24SD	11	TS13SD	19	TS05SD
4	NC	12	NC	20	NC
5	NC	13	NC	21	NC
6	DDCCLK	14	VCC	22	CLKSD
7	DDCDAT	15	GND	23	TMDSCLK+
8	VSYNC	16	DETECT	24	TMDSCLK-

Signal	PIN	PIN	Signal
VGA_BLUE	C3	C4	VGA_HSYNC_R
VGA_RD	C1	C2	VGA_GREEN

2.1.4 DI/DO Isolator (DIO)

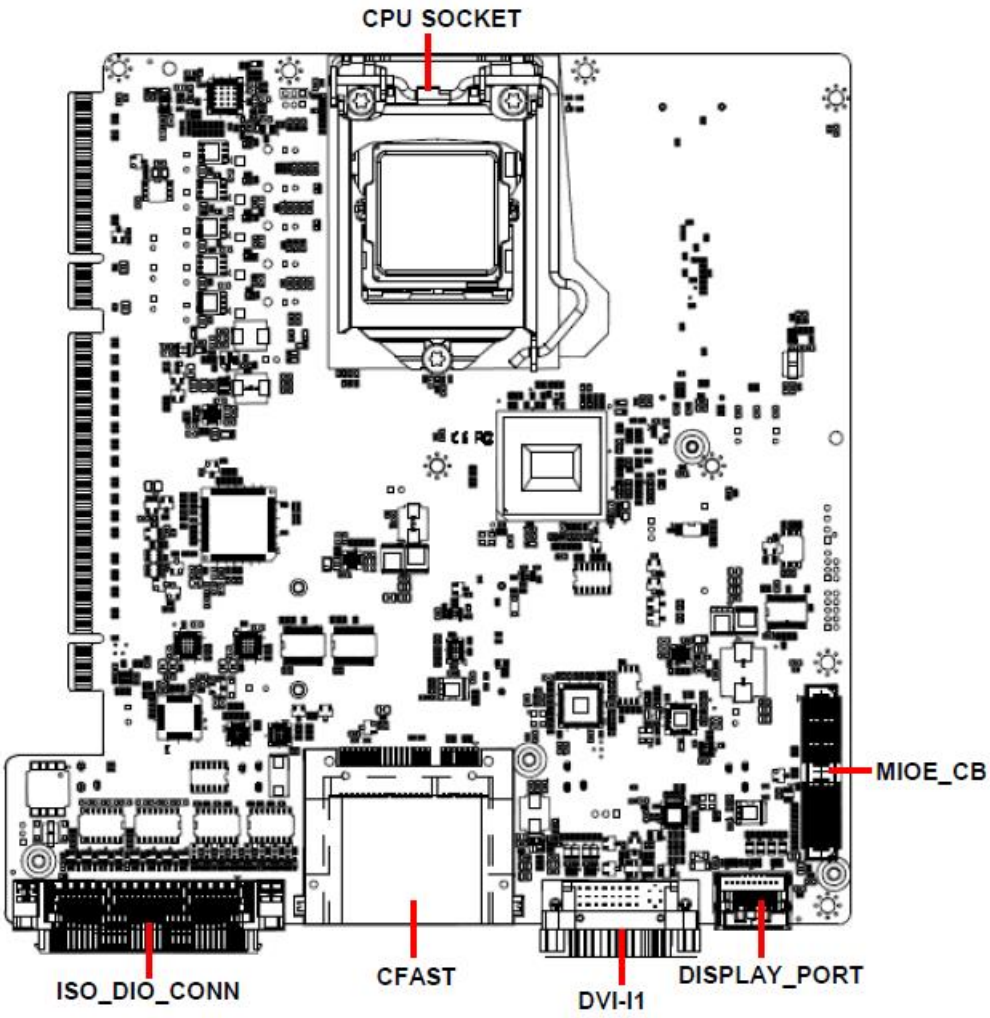


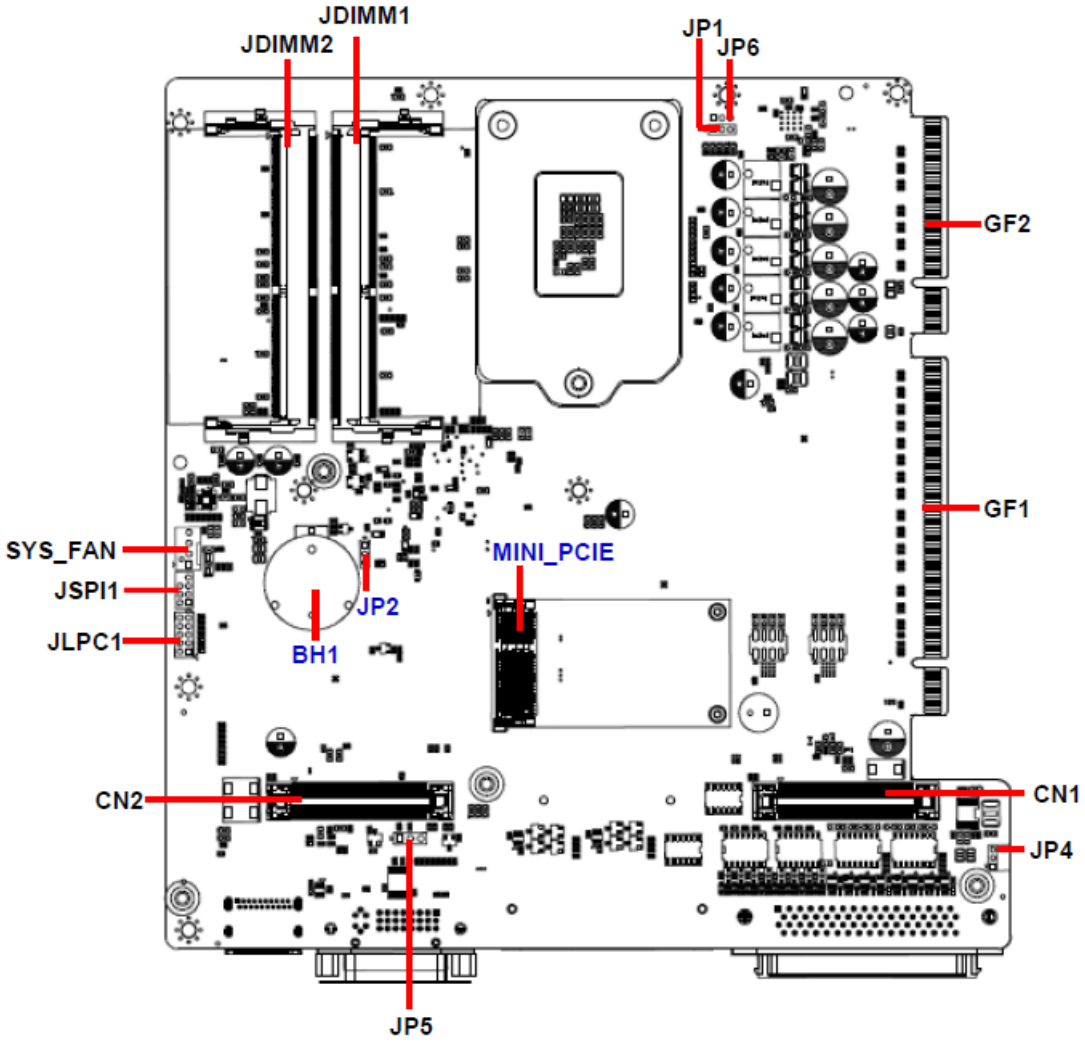
Signal	PIN	PIN	Signal
Din1	1	35	Din16
DIGND	2	36	DIGND
Din2	3	37	Din15
DIGND	4	38	DIGND
Din3	5	39	Din14
DIGND	6	40	DIGND
Din4	7	41	Din13
DIGND	8	42	DIGND
Din5	9	43	Din12
DIGND	10	44	DIGND
Din6	11	45	Din11
DIGND	12	46	DIGND
Din7	13	47	Din10
DIGND	14	48	DIGND
Din8	15	49	Din9

Signal	PIN	PIN	Signal
DIGND	16	50	DIGND
NC	17	51	NC
O_DIO_GPO1	18	52	O_DIO_GPO16
DOGND	19	53	DOGND
O_DIO_GPO2	20	54	O_DIO_GPO15
DOGND	21	55	DOGND
O_DIO_GPO3	22	56	O_DIO_GPO14
DOGND	23	57	DOGND
O_DIO_GPO4	24	58	O_DIO_GPO13
DOGND	25	59	DOGND
O_DIO_GPO5	26	60	O_DIO_GPO12
DOGND	27	61	DOGND
O_DIO_GPO6	28	62	O_DIO_GPO11
DOGND	29	63	DOGND
O_DIO_GPO7	30	64	O_DIO_GPO10
DOGND	31	65	DOGND
O_DIO_GPO8	32	66	O_DIO_GPO9
O_ISO_+V5S_R	33	67	O_ISO_+V5S_R
OUT_PWR	34	68	OUT_PWR

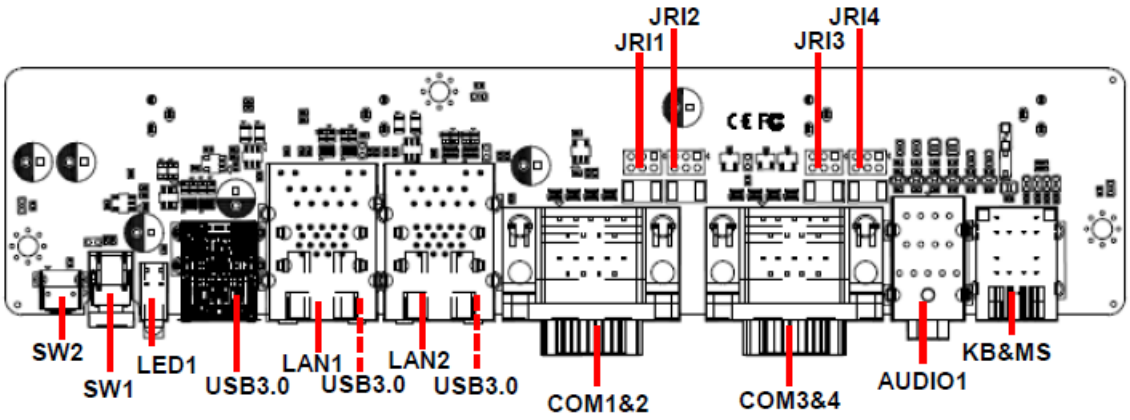
2.2 SLP-SKL, SLP-SKL DB-A and SLP-SKL/SKLB DB-B Overviews

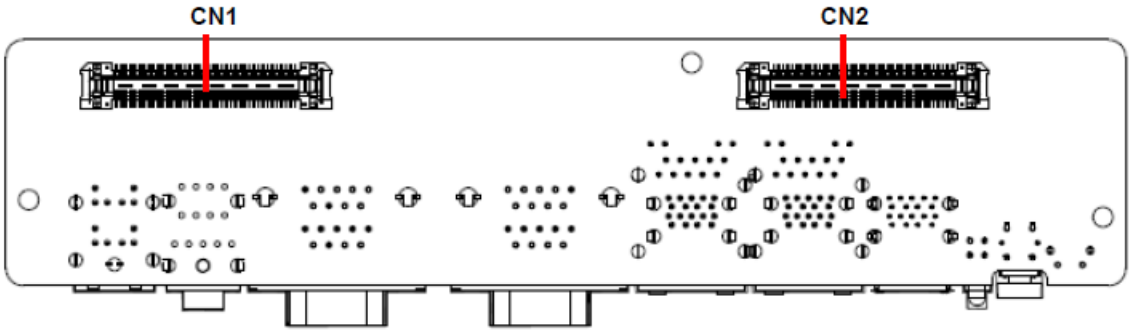
2.2.1 SLP-SKL



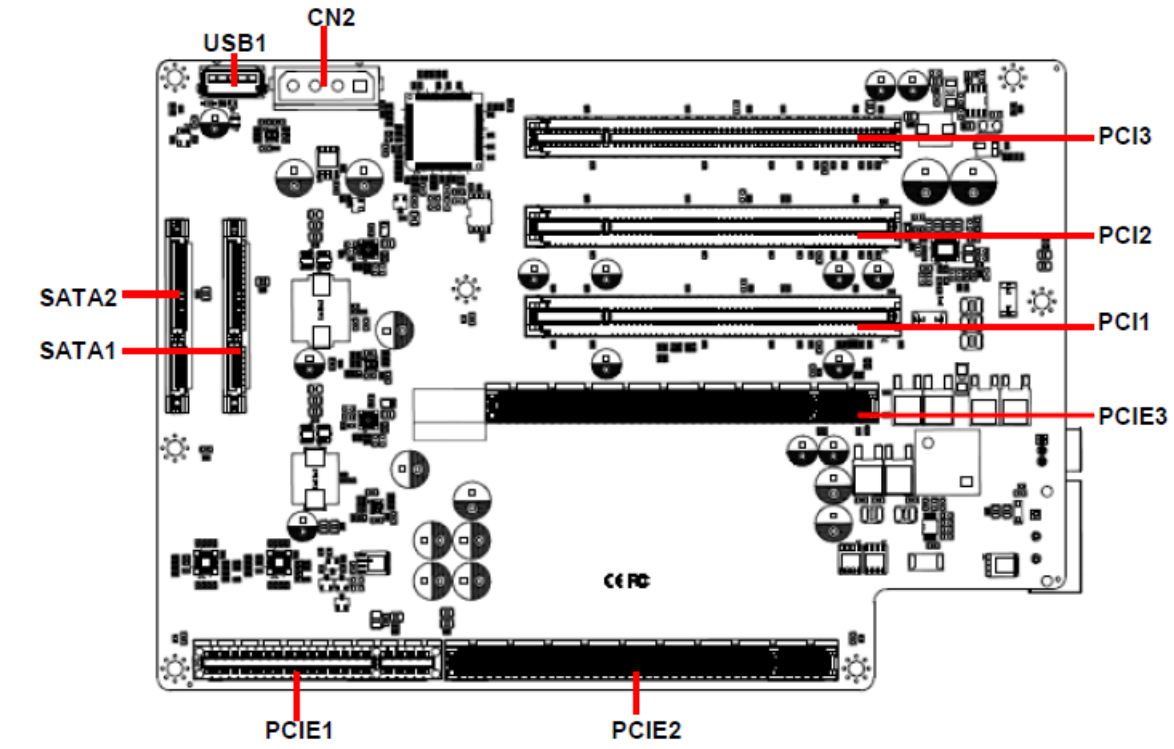

JDIMM1
JDIMM2
JP1
JP6
GF2
GF1
SYS_FAN
JSPI1
JLPC1
JP2
BH1
MINI_PCIE
CN2
CN1
JP4
JP5

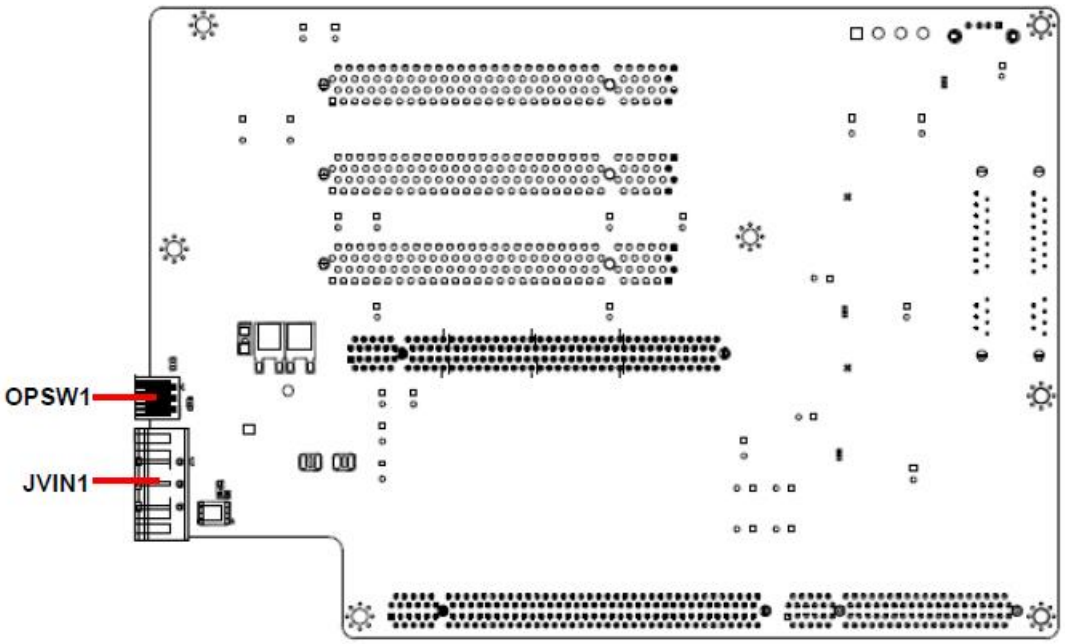
2.2.2 SLP-SKL DB-A



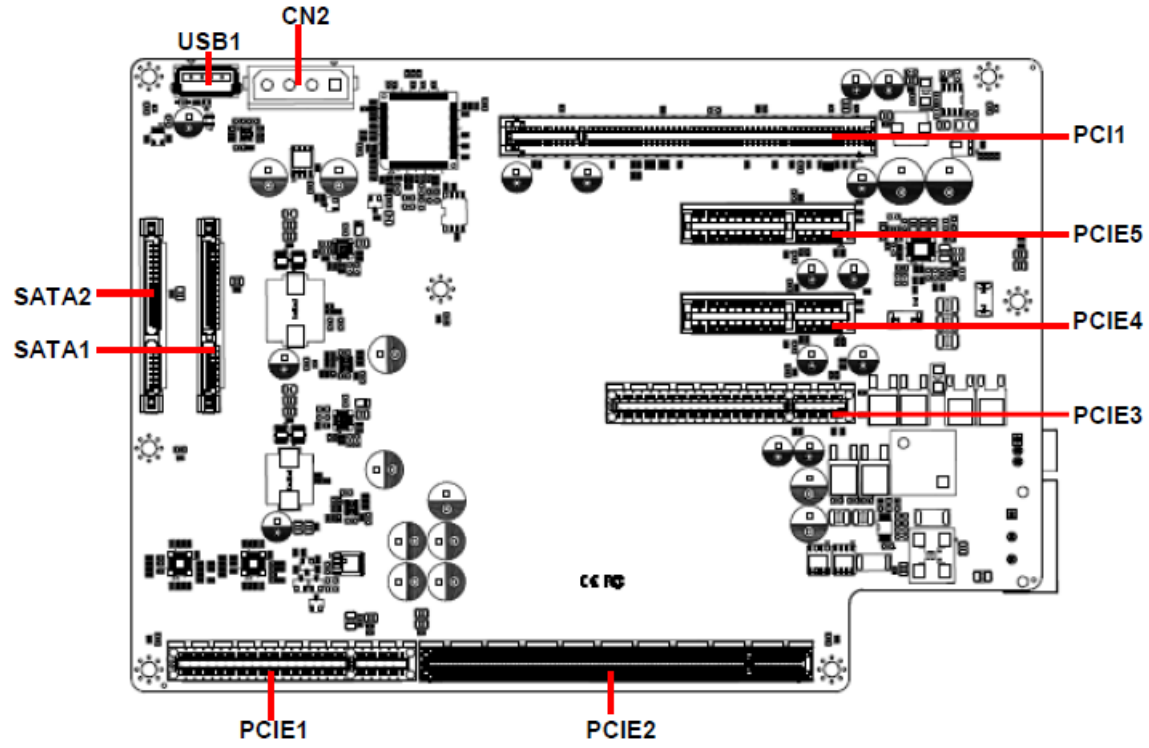


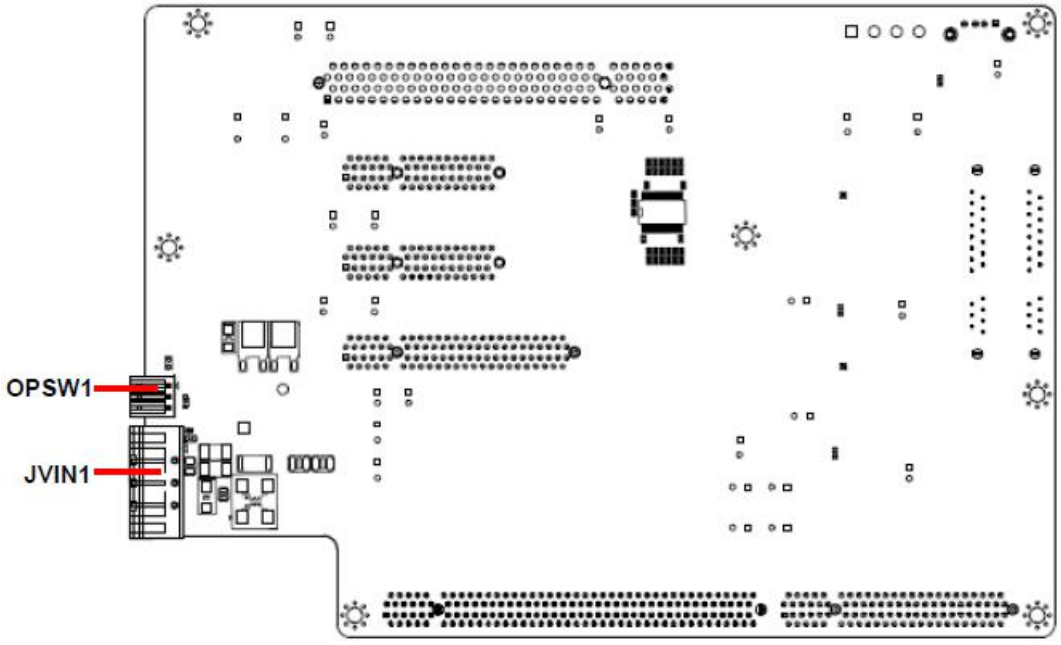
2.2.3 SLP-SKL DB-B





2.2.4 SLP-SKLB DB-C





2.3 SLP-SKL Jumper & Connector list

Jumpers

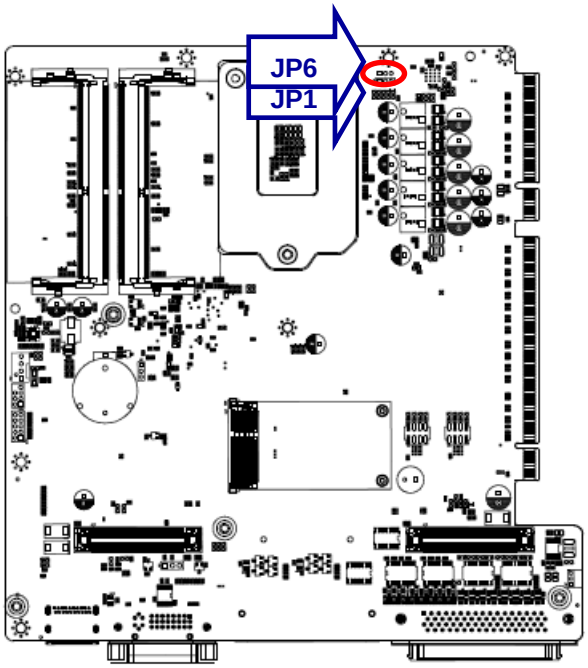
Label	Function	Note
JP1	PCIe selector	3 x 1 header, pitch 2.00mm
JP2	Clear CMOS	3 x 1 header, pitch 2.00 mm
JP4	Isolation output voltage source select	3 x 1 header, pitch 2.00 mm
JP6	PCIe x4 & x8 & x16 selection	3 x 1 header, pitch 2.00 mm

Connectors

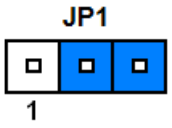
Label	Function	Note
CPU SOCKET	CPU Socket	
MIOE_CB	IET Expansion slot	
DISPLAY_PORT	Display Port	
DVI-I1	DVI Port	
CFAST	CFast socket	
ISO_DIO_CONN	DI/DO Isolator	
SYS_FAN	System Fan connector	4 x 1 wafer, pitch 2.54 mm
GF1	PCIe x16 slot	
GF2	PCIe x8 slot	
CN1	I/O Board connector 1	40 x 2 wafer, pitch 0.80 mm
CN2	I/O Board connector 2	40 x 2 wafer, pitch 0.80 mm
JP5	Reserved connector	3 x 1 header, pitch 2.54 mm
MINI_PCIE	Mini PCI Express connector	
BH1	Battery	
JSPI1	SPI connector	4 x 2 header, pitch 2.00 mm
JLPC1	LPC port connector	5 x 2 header, pitch 2.00 mm
JDIMM1/2	DDR4 SODIMM connector	

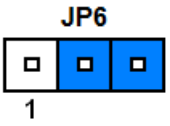
2.4 SLP-SKL Jumpers & Connector settings

2.4.1 PCIe selector/ PCIe x4 & x8 & x16 selection (JP1/JP6)

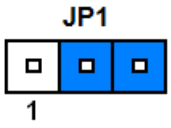


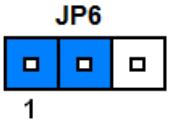
1x8, 2x4 PCI Express



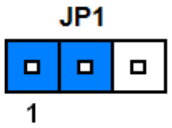


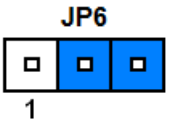
2x8 PCI Express



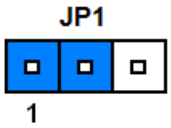


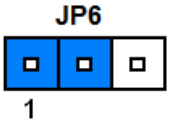
Reserved



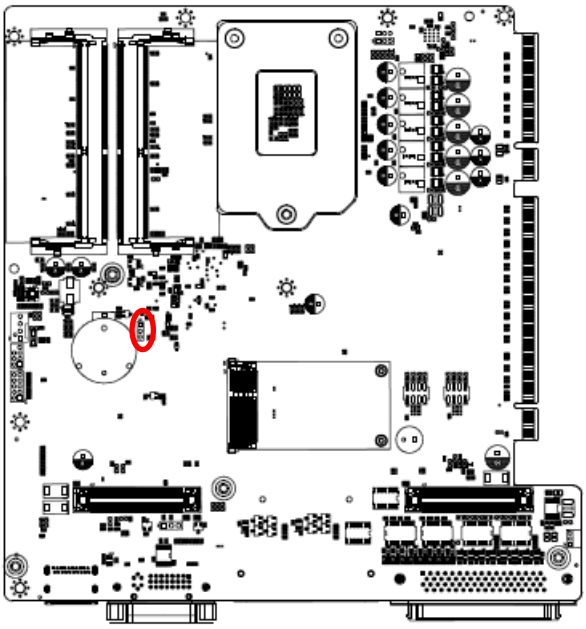


1x16 PCI Express

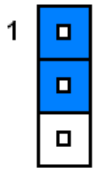




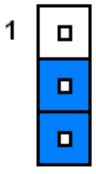
2.4.2 Clear CMOS (JP2)



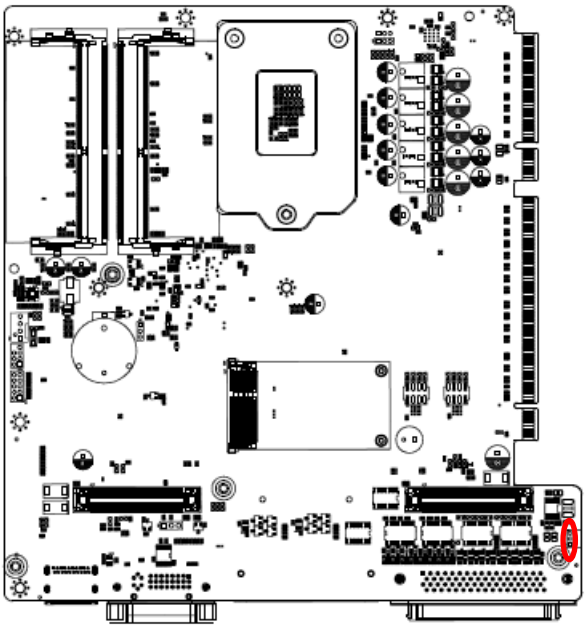
Normal



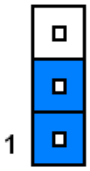
Clear CMOS



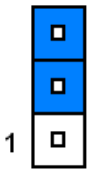
2.4.3 Isolation output voltage source select (JP4)



Internal 5V supply*

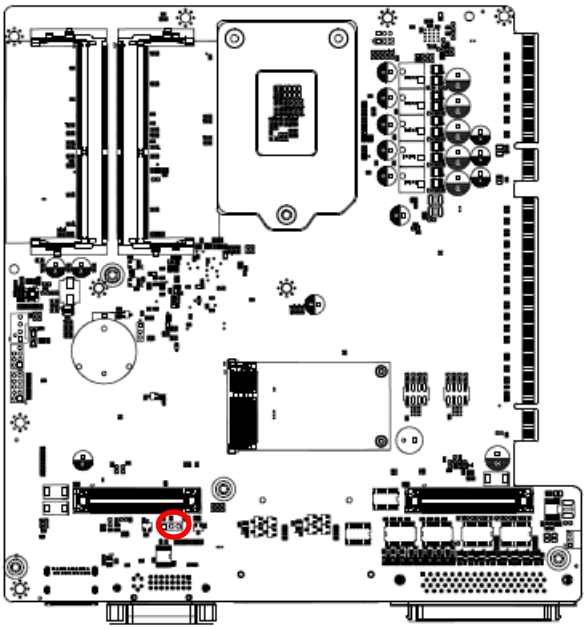


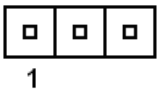
Output voltage source 5~35V



*** Default**

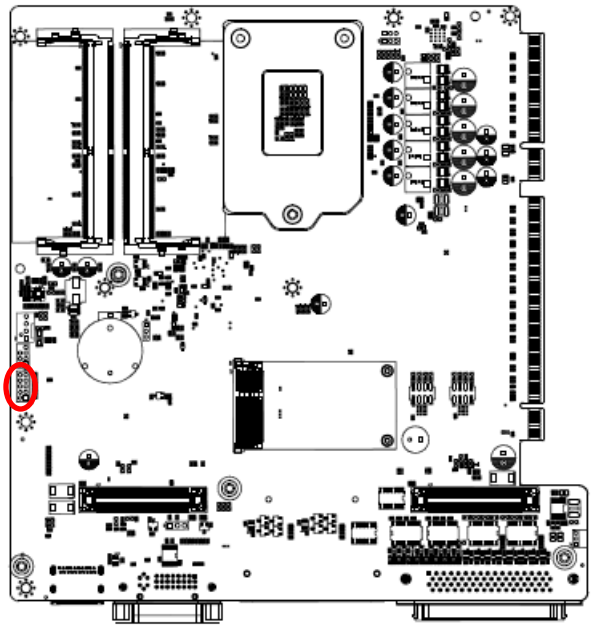
2.4.4 Reserved connector (JP5)

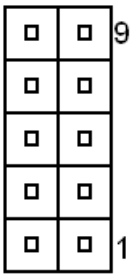




Signal	PIN
7517_SPC	1
7517_SPD	2
GND	3

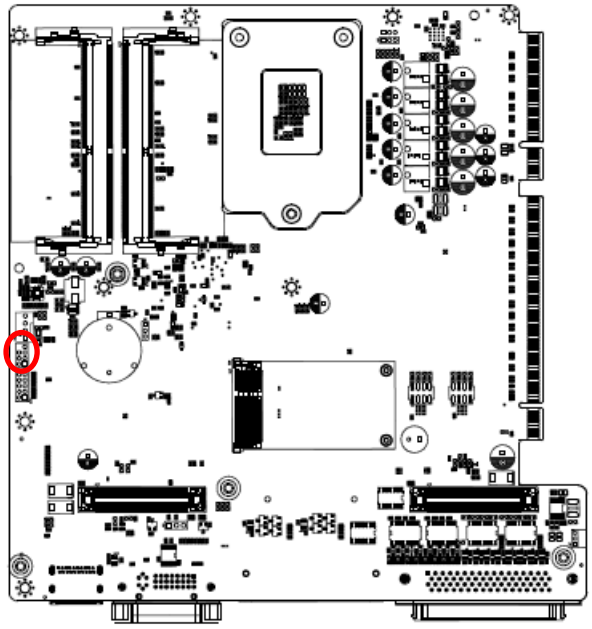
2.4.5 LPC port connector (JLPC1)

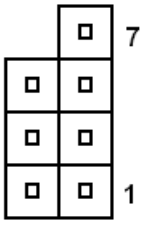




Signal	PIN	PIN	Signal
GND	10	9	LPC_SERIRQ_R
LPC_CLK_PH	8	7	LPC_AD3_R
LPC_FRAME#_R	6	5	LPC_AD2_R
BUF_PLT_RST#	4	3	LPC_AD1_R
+3.3V	2	1	LPC_AD0_R

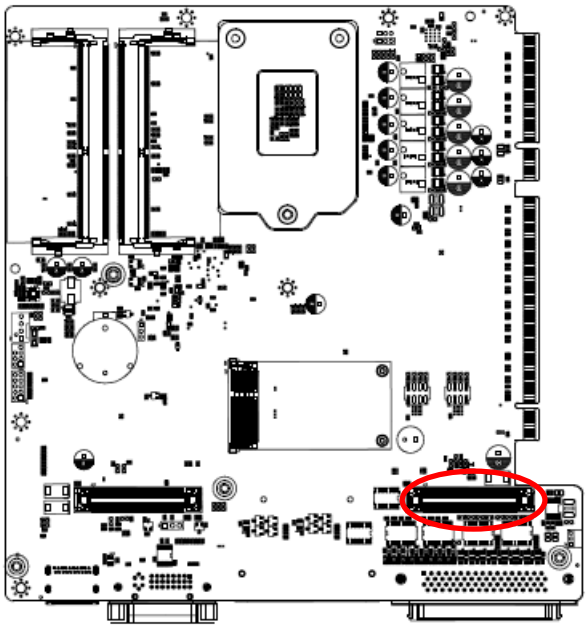
2.4.6 SPI connector (JSPI1)





Signal	PIN	PIN	Signal
		7	SSPI_HOLD#0
SSPI_SI_R	6	5	SSPI_SO_R
SSPI_SCLK_R	4	3	SSPI_CS0#
GND	2	1	+3.3V

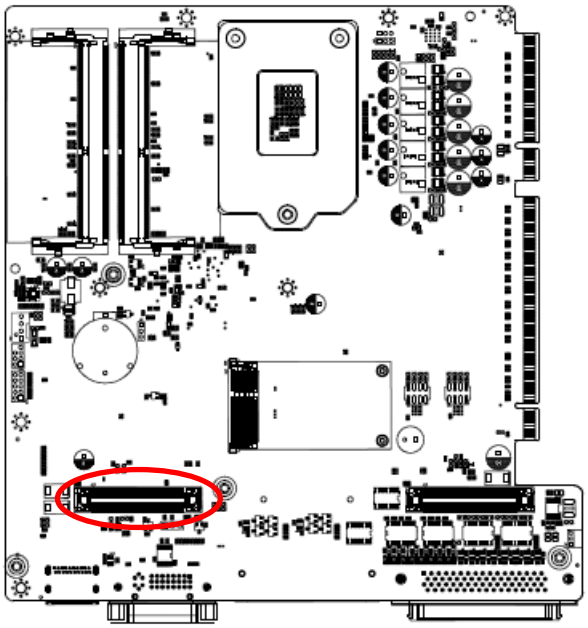
2.4.7 I/O Board connector 1 (CN1)



Signal	PIN	PIN	Signal
USB3_RXN4	1	41	NCTSE#
USB3_RXP4	2	42	NRIE#
GND	3	43	NRXDE
USB3_TXN4	4	44	NDSRE#
USB3_TXP4	5	45	NDCDE#
GND	6	46	NDTRE#
USB3_RXN3	7	47	NTXDE
USB3_RXP3	8	48	NRTSE#
GND	9	49	GND
USB3_TXN3	10	50	NCTSD#
USB3_TXP3	11	51	NRID#
GND	12	52	NRXDD
NCTSC#	13	53	NDSRD#
NRIC#	14	54	NDCDD#
NRXDC	15	55	NDTRD#
NDSRC#	16	56	NTXDD
NDCDC#	17	57	NRTSD#

Signal	PIN	PIN	Signal
NDTRC#	18	58	GND
NTXDC	19	59	GND
NRTSC#	20	60	GND
GND	21	61	GND
NCTSA#	22	62	GND
NRIA#	23	63	MIC1_JD
NRXDA	24	64	FRONT_JD
NDSRA#	25	65	LINE_IN_JD
NDCDA#	26	66	GND
NDTRA#	27	67	MIC1-L
NTXDA	28	68	GND
NRTSA#	29	69	MIC1-R
GND	30	70	GND
EXT_COM_RI#	31	71	MIC1-VREFO-R
GND	32	72	MIC1-VREFO-R
GND	33	73	GND
GND	34	74	FRONT-L
GND	35	75	GND
KDAT	36	76	FRONT-R
KCLK	37	77	GND
GND	38	78	LINE1-L
MDAT	39	79	GND
MCLK	40	80	LINE1-R

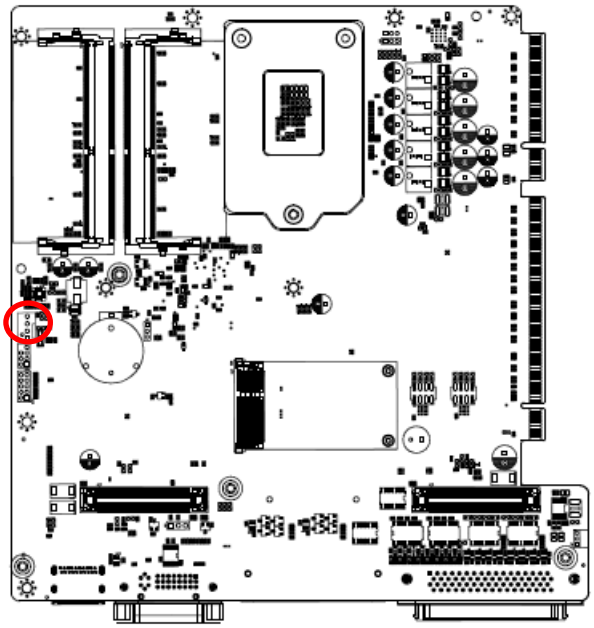
2.4.8 I/O Board connector 2 (CN2)

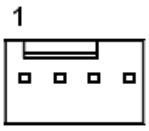


Signal	PIN	PIN	Signal
GND	1	41	USB3_TXN5
USB_PN6	2	42	USB3_TXP5
USB_PP6	3	43	GND
GND	4	44	USB3_RXN5
USB_PN5	5	45	USB3_RXP5
USB_PP5	6	46	GND
GND	7	47	USB3_RXN6
USB_OC#_56	8	48	USB3_RXP6
CFAST_LED#	9	49	GND
SATA_LED	10	50	USB3_TXN6
IO_RESET#	11	51	USB3_TXP6
PWR_BTN_SW#	12	52	GND
GND	13	53	USB_OC#_12
USB3_TXN1	14	54	GND
USB3_TXP1	15	55	LAN1_MDIN3
GND	16	56	LAN1_MDIP3
USB3_RXN1	17	57	GND

Signal	PIN	PIN	Signal
USB3_RXP1	18	58	LAN1_MDIN2
GND	19	59	LAN1_MDIP2
USB_PN1	20	60	GND
USB_PP1	21	61	LAN1_MDIN1
GND	22	62	LAN1_MDIP1
USB_PN2	23	63	GND
USB_PP2	24	64	LAN1_MDIN0
GND	25	65	LAN1_MDIP0
USB3_TXN2	26	66	GND
USB3_TXP2	27	67	LAN1_ACT-
GND	28	68	LAN1_LINK100
USB3_RXN2	29	69	LAN1_LINK1000
USB3_RXP2	30	70	LAN2_MDIN3
LAN2_LINK100	31	71	LAN2_MDIP3
LAN2_LINK1000	32	72	GND
LAN2_ACT-	33	73	LAN2_MDIN2
GND	34	74	LAN2_MDIP2
USB_PN4	35	75	GND
USB_PP4	36	76	LAN2_MDIN1
GND	37	77	LAN2_MDIP1
USB_PN3	38	78	GND
USB_PP3	39	79	LAN2_MDIN0
USB_OC#	40	80	LAN2_MDIP0

2.4.9 System Fan connector (SYS_FAN)





Signal	PIN
GND	1
+12V	2
SYSFANIN	3
+5V	4

2.5 SLP-SKL DB-A and SLP-SKL/SKLB DB-B Jumper & Connector list

2.5.1 SLP-SKL DB-A

Jumpers

Label	Function	Note
JRI1/2/3/4	COM 1/2/3/4 pin 9 signal select	3 x 2 header, pitch 2.00mm

Connectors

Label	Function	Note
USB3.0	6 x USB3.0 connector	
LAN1/2	RJ-45 Ethernet 1/2	
COM1&2	Serial port connector 1/2	
COM3&4	Serial port connector 3/4	
AUDIO1	Audio Line in/Line out/Mic in	
SW1	Power button	
SW2	Reset button	
LED1	Power LED indicator	
KB&MS	PS/2 keyboard & mouse connector	
CN1	I/O Board connector 1	
CN2	I/O Board connector 2	

2.5.2 SLP-SKL DB-B

Connectors

Label	Function	Note
USB1	USB connector	
CN2	Internal Reserved +5V and +12V connector	4 x 1 wafer, pitch 5.08mm
PCI1/2/3	PCI slot 1/2/3	
PCIE1/2/3	PCIe slot 1/2/3	
SATA1/2	Serial ATA connector 1/2	
OPSW1	Power Button connector	3 x 1 wafer, pitch 2.50mm
JVIN1	DC Input connector	3 x 1 wafer, pitch 5.08mm

2.5.3 SLP-SKLB DB-C

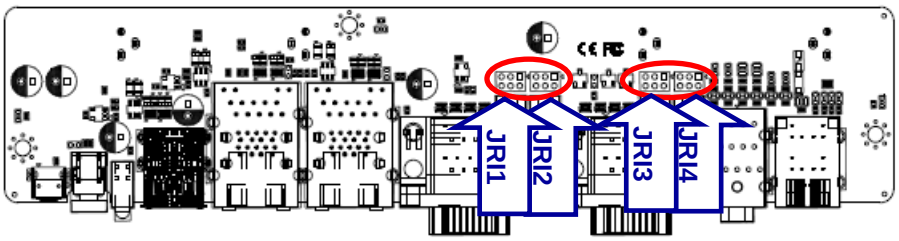
Connectors

Label	Function	Note
USB1	USB connector	

CN2	Internal Reserved +5V and +12V connector	4 x 1 wafer, pitch 5.08mm
PCI1	PCI slot	
PCIE1/2/3/4/5	PCIe slot 1/2/3/4/5	
SATA1/2	Serial ATA connector 1/2	
OPSW1	Power Button connector	3 x 1 wafer, pitch 2.50mm
JVIN1	DC Input connector	3 x 1 wafer, pitch 5.08mm

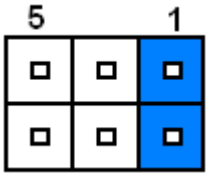
2.6 SLP-SKL DB-A Jumper settings

2.6.1 COM 1/2/3/4 pin 9 signal select (JRI1/2/3/4)

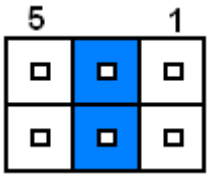


*** Default**

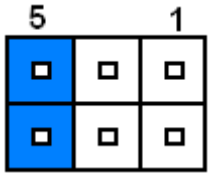
Ring*



+5V

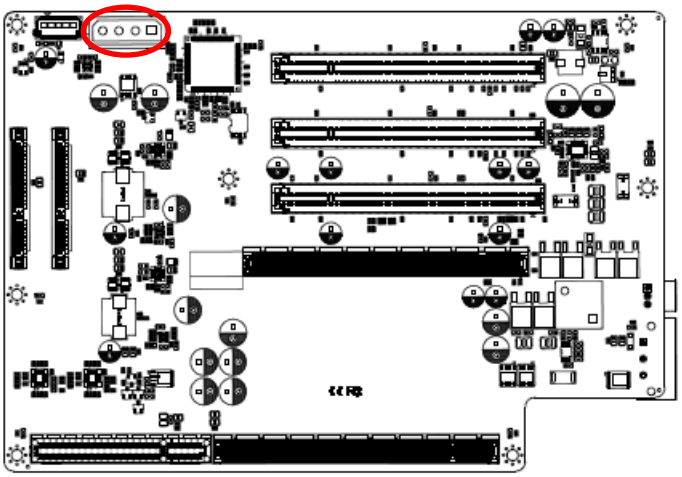


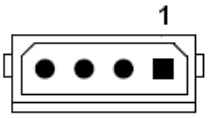
+12V



2.7 SLP-SKL DB-B Connectors settings

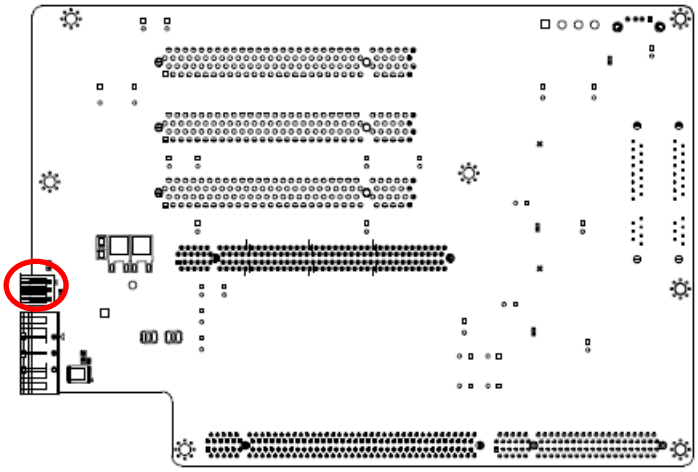
2.7.1 Internal Reserved +5V and +12V connector (CN2)

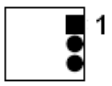




Signal	PIN
+12V	1
GND	2
GND	3
+5V	4

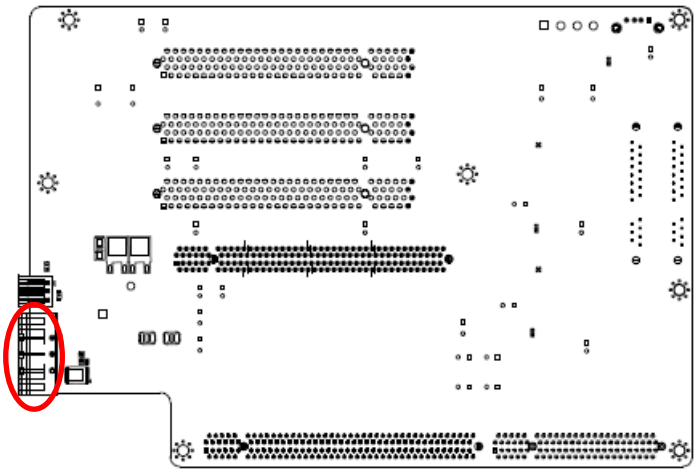
2.7.2 Power Button connector (OPSW1)

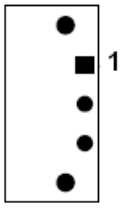




Signal	PIN
+5V	1
PWR_BTN_SW#	2
GND	3

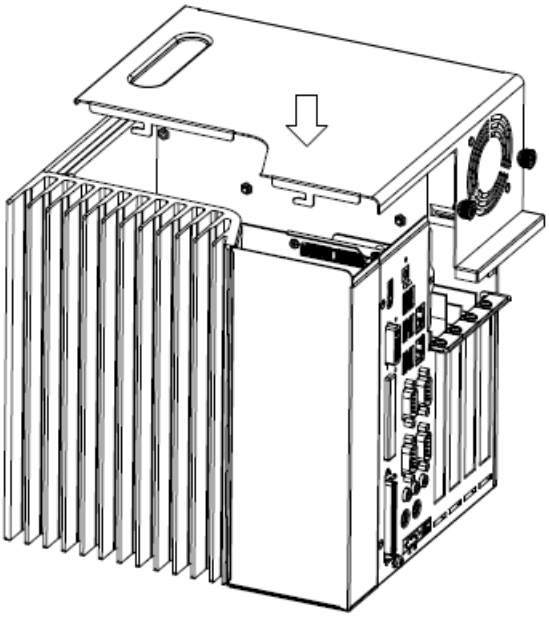
2.7.3 DC Input connector (JVIN1)

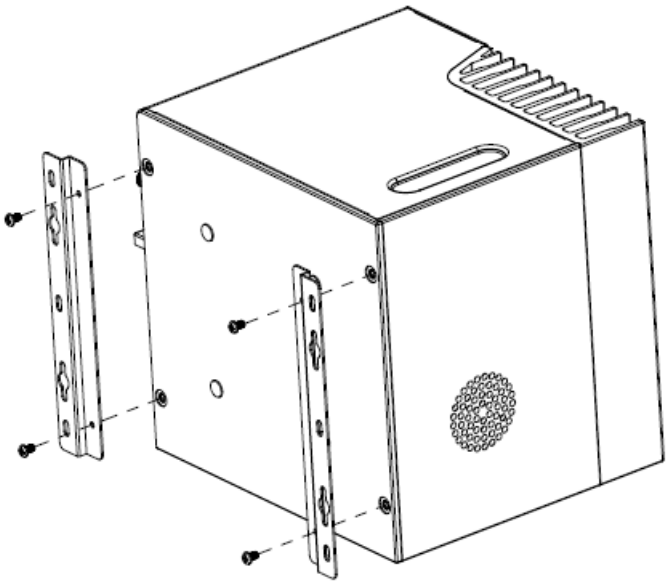




Signal	PIN
EARTH	1
+VIN	2
GND	3

2.8 Installing Mounting Brackets

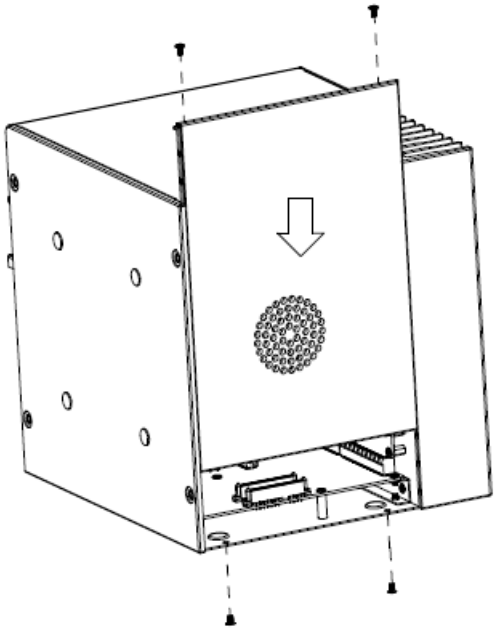


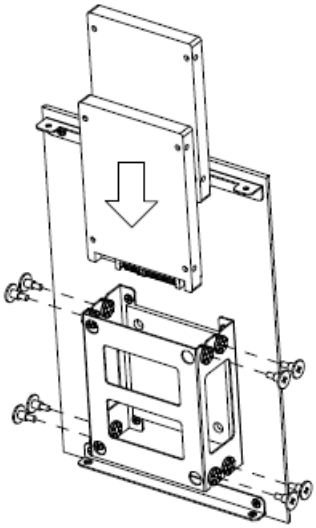


Step1. Position brackets on both sides, matching the holes on the system.

Step2. Insert and fasten screw on each side of the system to secure Mounting brackets.

2.9 Installing Hard Disk





Step1. Remove 4 screws to release the cover.

Step2. Slide HDD into its bracket until properly seated.

Step3. Secure HDD by means of 8 screws.

3.BIOS Setup

3.1 Introduction

The BIOS setup program allows users to modify the basic system configuration. In this following chapter will describe how to access the BIOS setup program and the configuration options that may be changed.

3.2 Starting Setup

The AMI BIOS™ is immediately activated when you first power on the computer. The BIOS reads the system information contained in the NVRAM and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:
By pressing <Del> or <F2> immediately after switching the system on, or
By pressing the <Del> or <F2> key when the following message appears briefly at the left-top of the screen during the POST (Power On Self Test).

Press <Del> or <F2> to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to.

Press F1 to Continue, DEL to enter SETUP

3.3 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Button	Description
↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into NVRAM Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Previous Values.
F3 key	Optimized defaults
F4 key	Save & Exit Setup

- **Navigating Through The Menu Bar**
  Use the left and right arrow keys to choose the menu you want to be in.

Note: Some of the navigation keys differ from one screen to another.

- **To Display a Sub Menu**
  Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A "➢" pointer marks all sub menus.

3.4 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

3.5 In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AMI BIOS supports an override to the NVRAM settings which resets your system to its defaults.

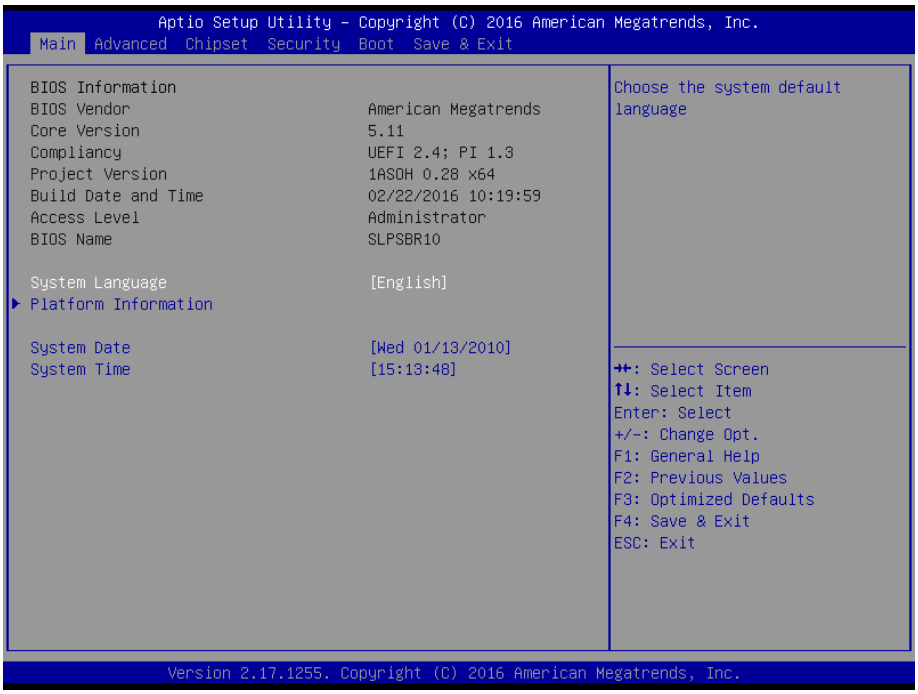
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

3.6 BIOS setup

Once you enter the Aptio Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

3.6.1 Main Menu

This section allows you to record some basic hardware configurations in your computer and set the system clock.



3.6.1.1 System Language

This option allows choosing the system default language.

3.6.1.2 System Date

Use the system date option to set the system date. Manually enter the day, month and year.

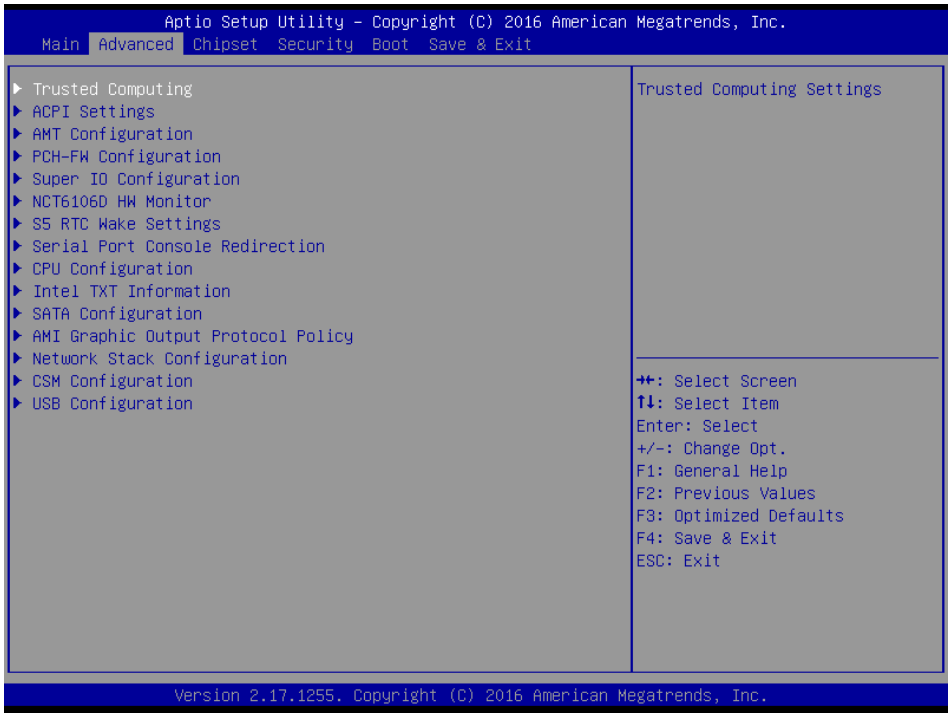
3.6.1.3 System Time

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

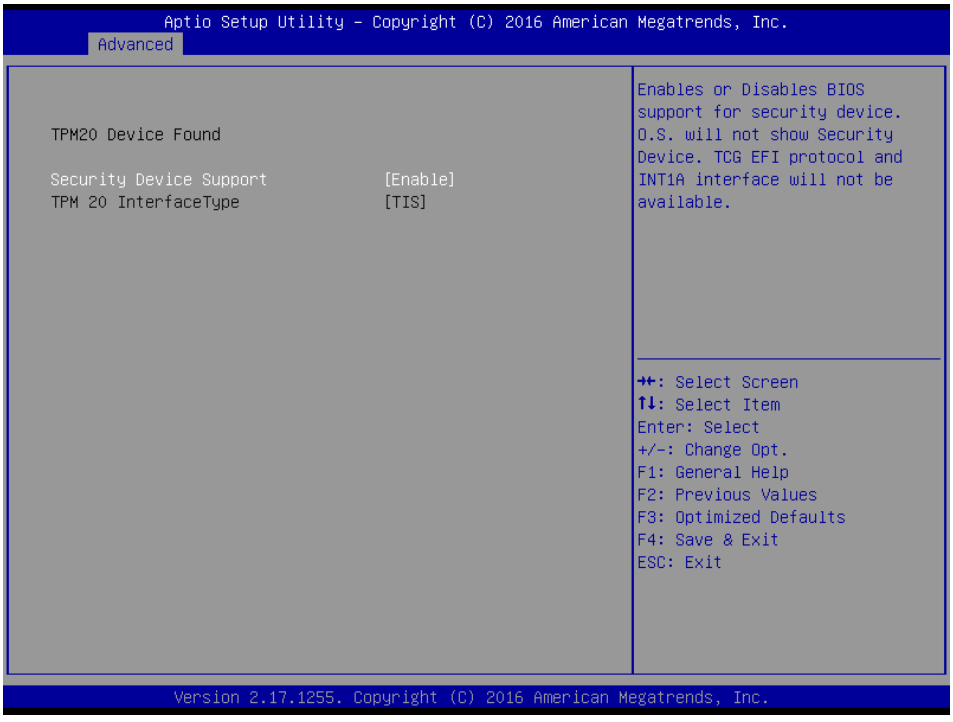
Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.
Visit the Avalue website (www.avalue.com.tw) to download the latest product and BIOS information.

3.6.2 Advanced Menu

This section allows you to configure your CPU and other system devices for basic operation through the following sub-menus.

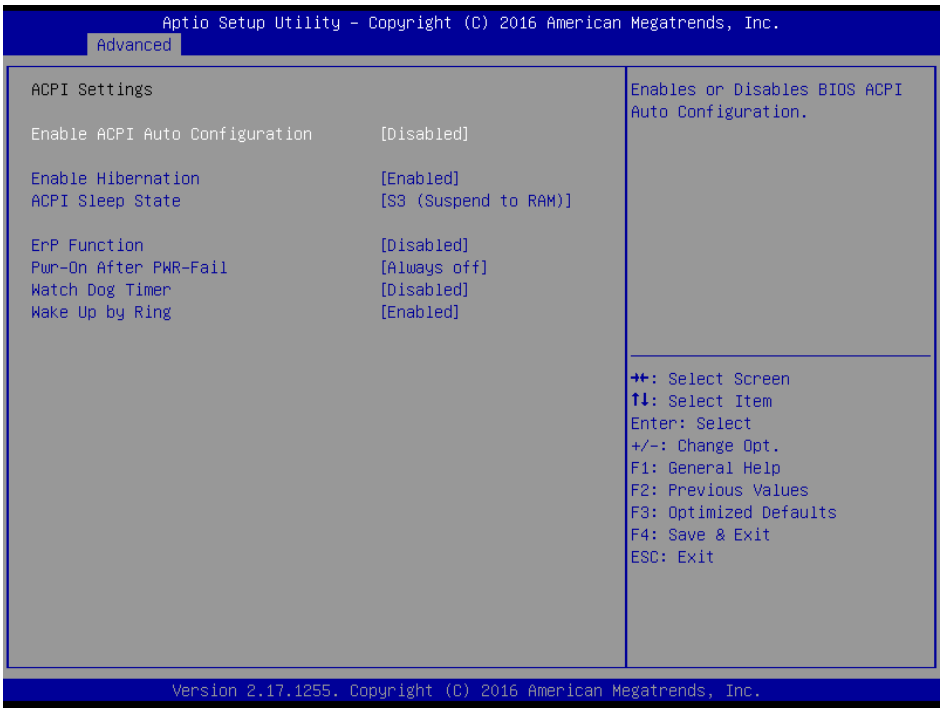


3.6.2.1 Trusted Computing



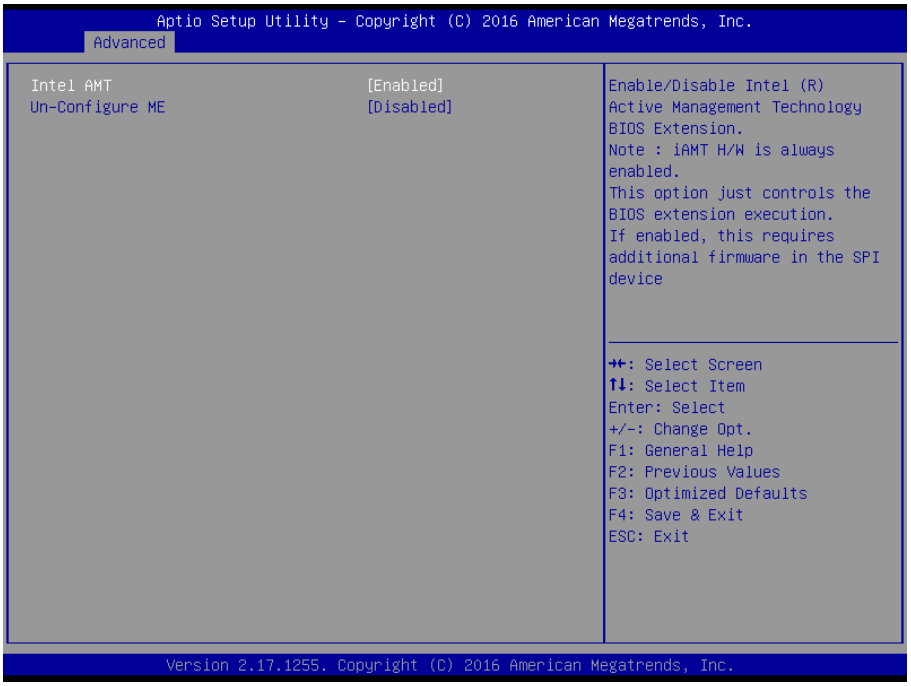
Item	Options	Description
Security Device Support	Disable, Enable**[Default]**	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1Ainterface will not be available.

3.6.2.2 APCI Settings



Item	Options	Description
Enable ACPI Auto Configuration	Disabled**[Default]**, Enabled	Enables or Disables BIOS ACPI Auto Configuration.
Enable Hibernation	Disabled Enabled**[Default]**,	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)**[Default]**	Select the highest ACPI sleep state the system will enter when the SUSPEDN button is pressed.
ErP Function	Disabled**[Default]**, Enabled	ErP Function (Deep S5).
Pwr-On After PWR-Fail	Always Off**[Default]** Always On Keep Last state	Specify what state to go to when power is re-applied after a power failure (G3 state).
Watch Dog Timer	Disabled**[Default]**, 30 sec 40 sec 50 sec 1 min 2 min 10 min 30 min	Select Watch Dog Timer (WDT) Mode.
Wake Up by Ring	Disabled Enabled**[Default]**,	Enable/Disable system waked up by Ring signal from standby states (S3~S5).

3.6.2.3 AMT Configuration

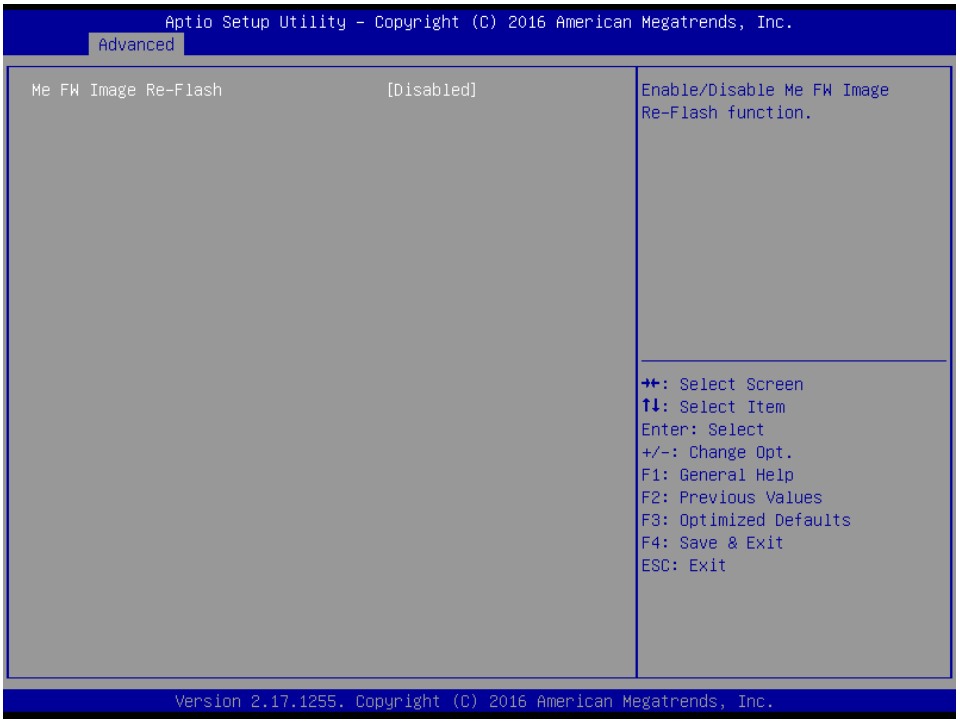


Item	Options	Description
Intel AMT	Disabled Enabled**[Default]**,	Enable/Disable Intel® Active Management Technology BIOS Extension. Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.
Un-Configure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

3.6.2.4 PCH-FW Configuration

Item	Options	Description
TPM Device Selection	dTPM Chip**[Default]**, PTT	Selects TPM device: dTPM – The discrete TPM chip. PTT – Intel Platform Trust Technology. Warning! If PTT/dTPM was disabled, All data saved on it will be lost.

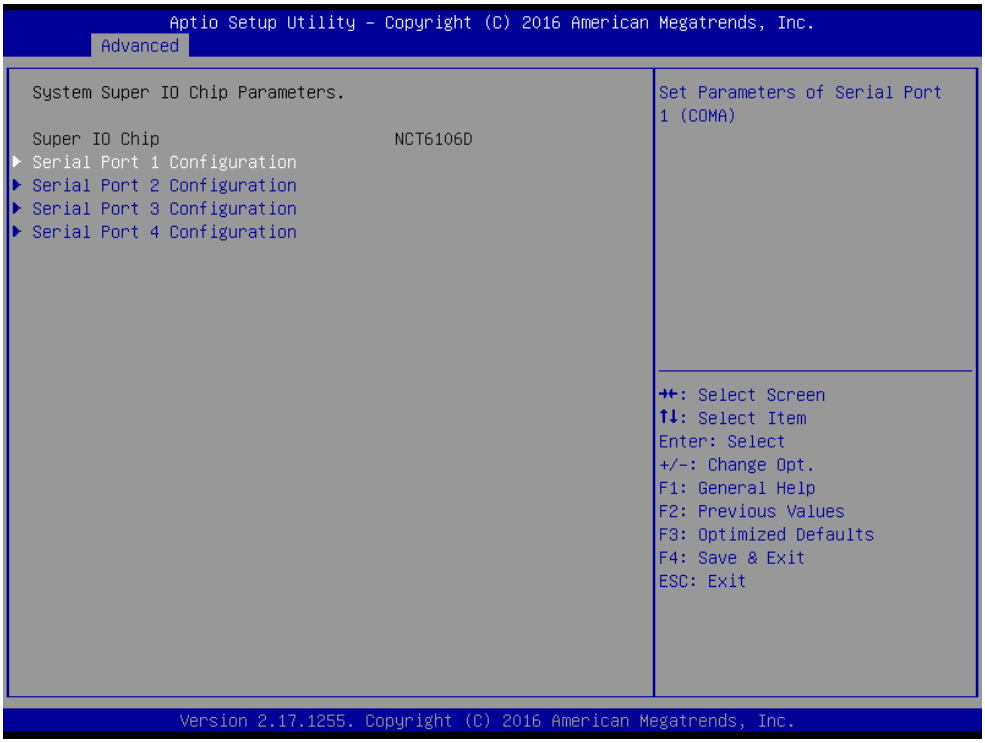
3.6.2.4.1 Firmware Update Configuration



Item	Option	Description
ME FW Image Re-Flash	Disabled**[Default]**, Enabled	Enable/Disable Me FW Image Re-Flash function.

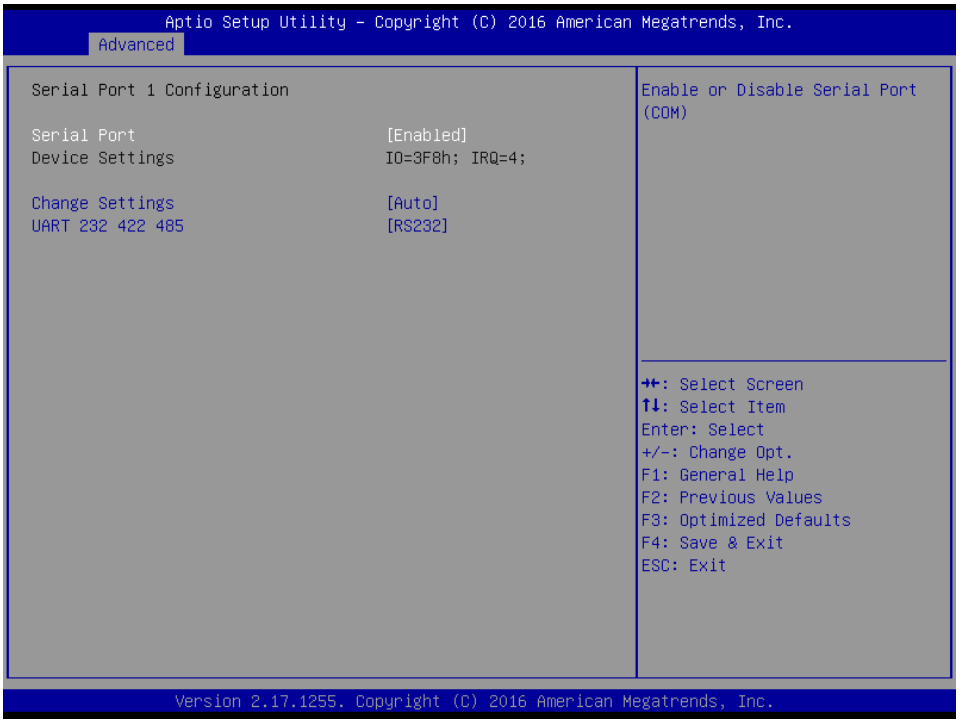
3.6.2.5 Super IO Configuration

You can use this item to set up or change the Super IO configuration for serial ports. Please refer to 3.6.2.5.1~ 3.6.2.5.4 for more information.



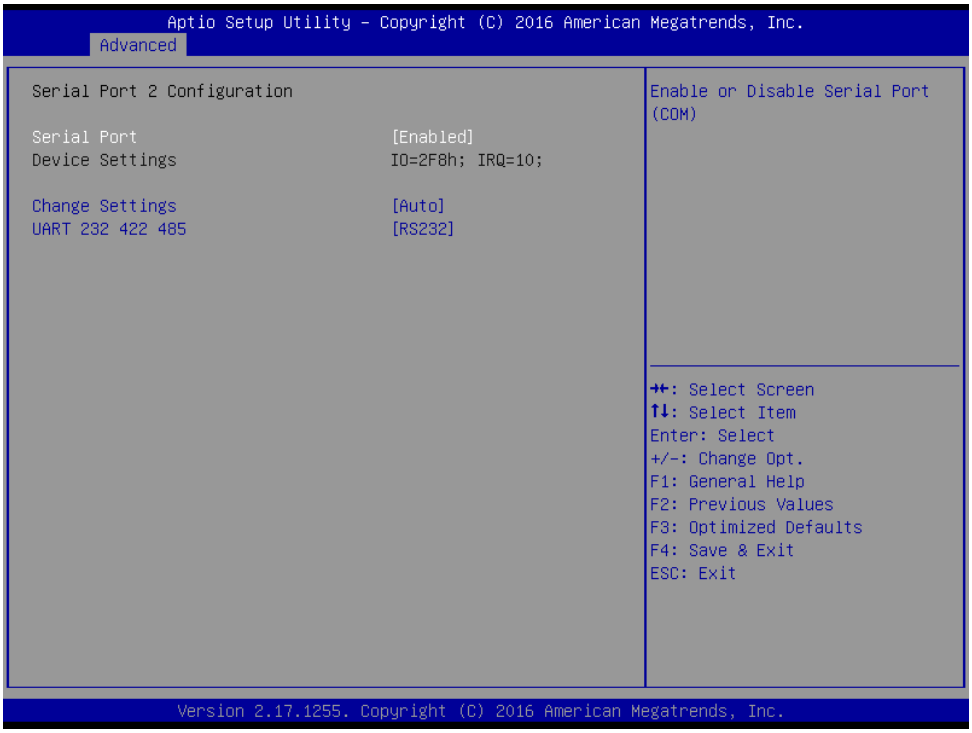
Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).

3.6.2.5.1 Serial Port 1 Configuration



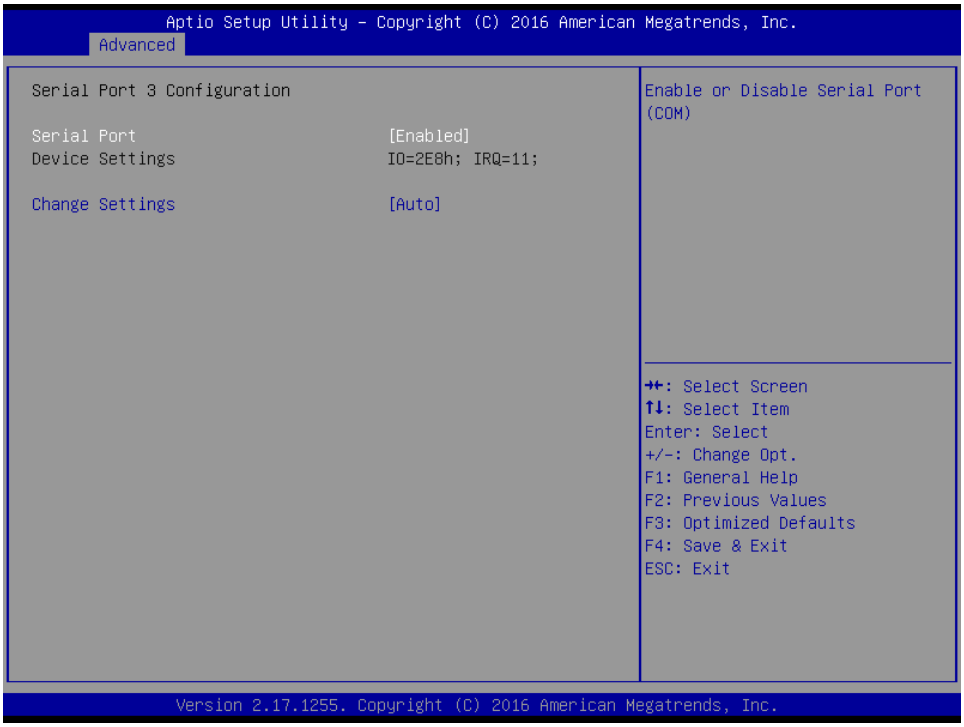
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**	Select an optimal setting for Super IO Device.
UART 232 422 485	RS232**[Default]** RS422 RS485	Set COM Port as RS232, RS422 or RS485 mode.

3.6.2.5.2 Serial Port 2 Configuration



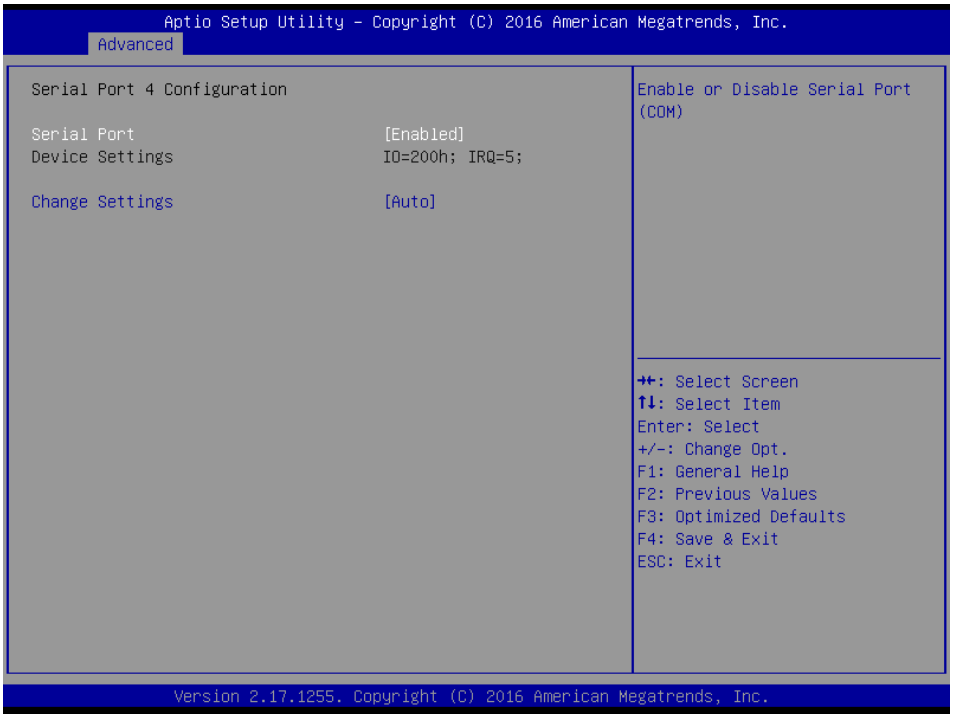
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**	Select an optimal setting for super IO Device.
UART 232 422 485	RS232**[Default]** RS422 RS485	Set COM Port as RS232, RS422 or RS485 mode.

3.6.2.5.3 Serial Port 3 Configuration



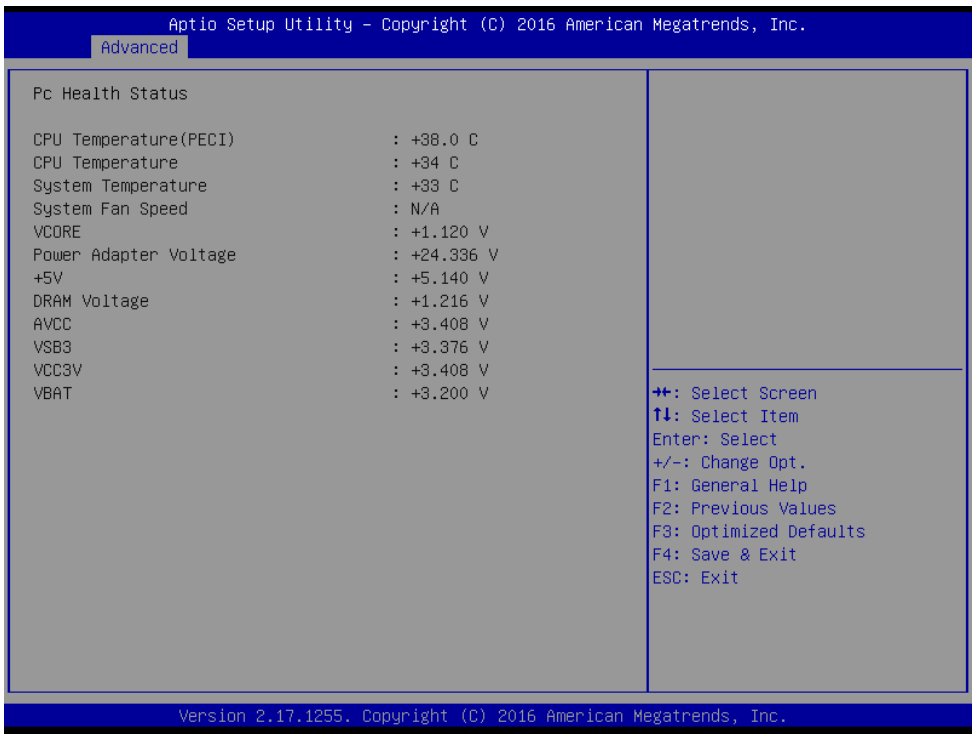
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**	Select an optimal setting for super IO Device.

3.6.2.5.4 Serial Port 4 Configuration

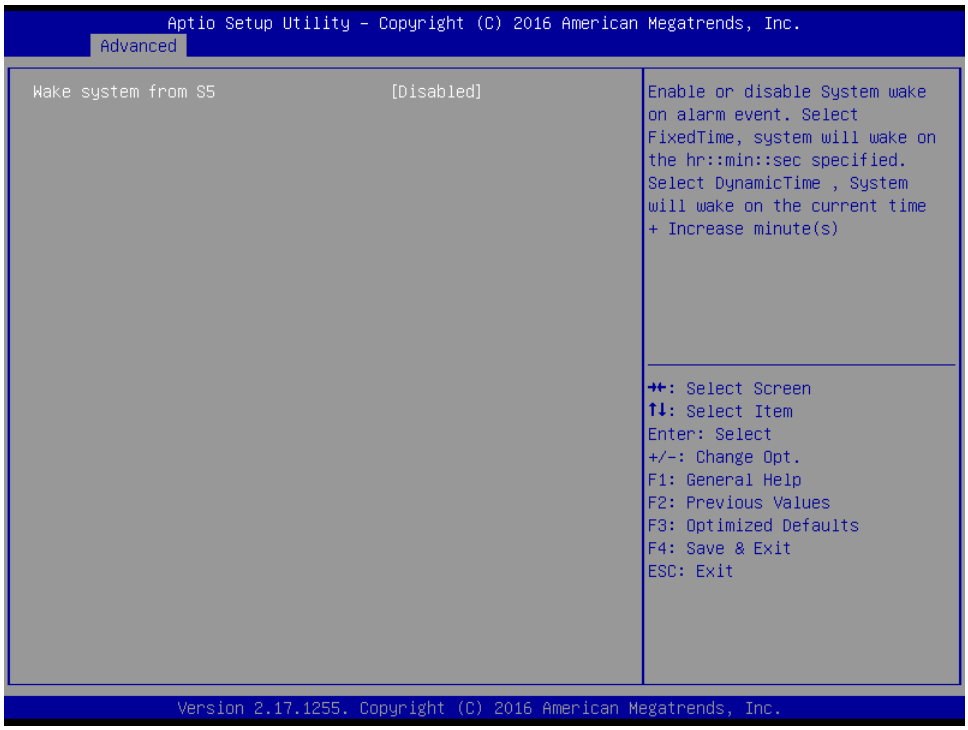


Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**	Select an optimal setting for super IO Device.

3.6.2.6 NCT6106D H/W Monitor

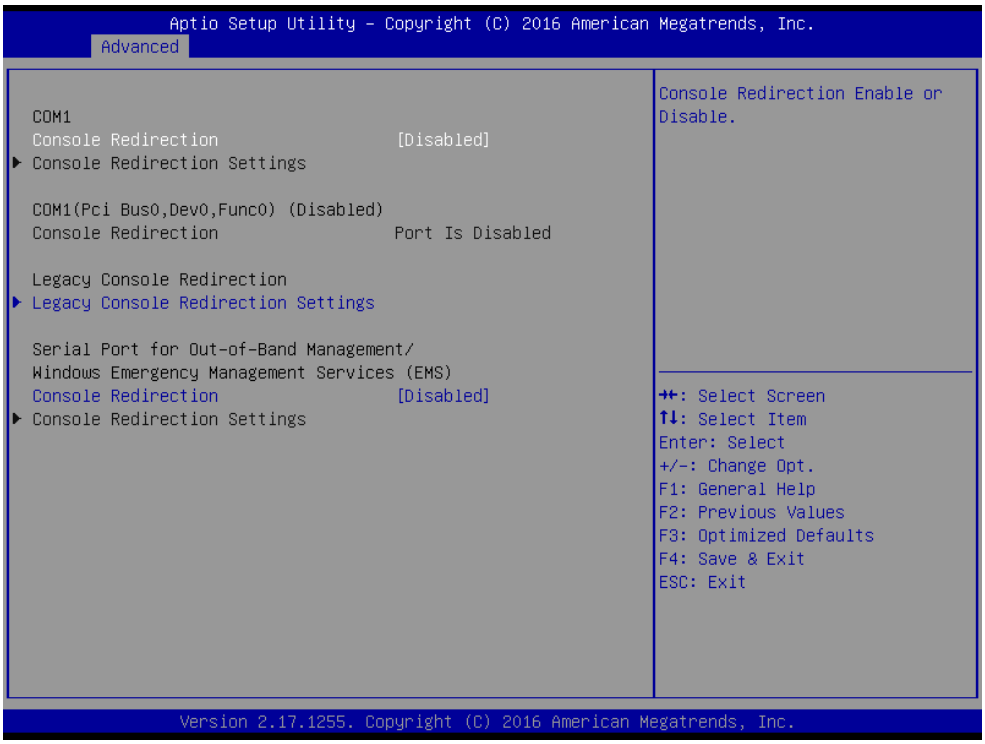


3.6.2.7 S5 RTC Wake Settings



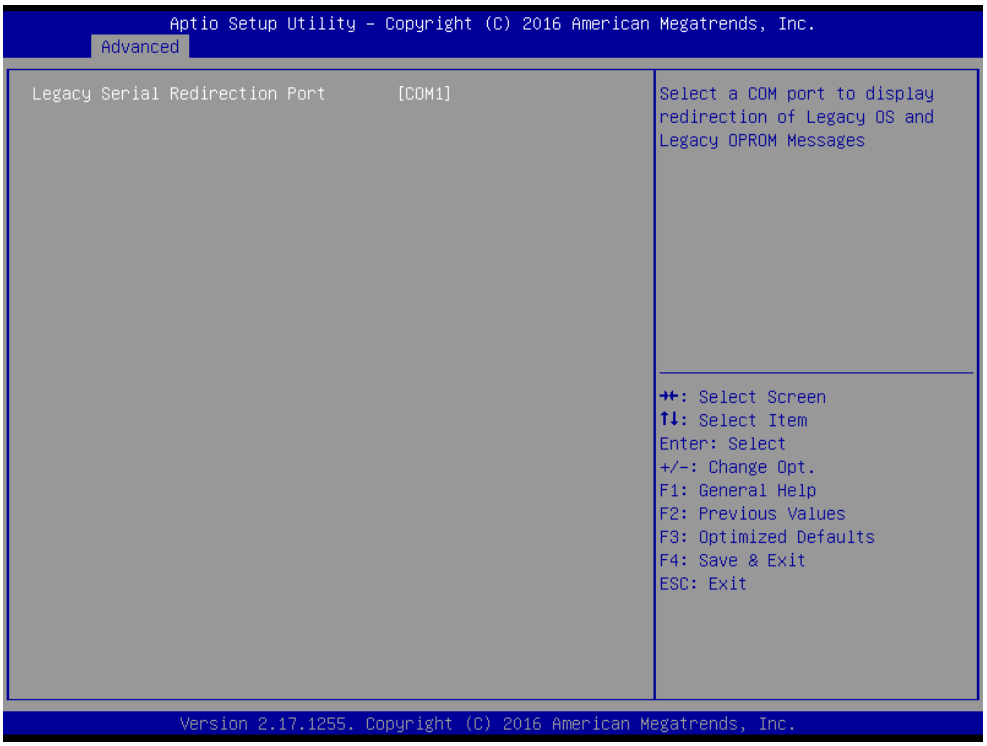
Item	Options	Description
Wake system from S5	Disabled**[Default]**, Fixed Time Dynamic Time	Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s).

3.6.2.8 Serial Port Console Redirection



Item	Options	Description
Console Redirection	Disabled**[Default]**, Enabled	Console Redirection Enable or Disable.

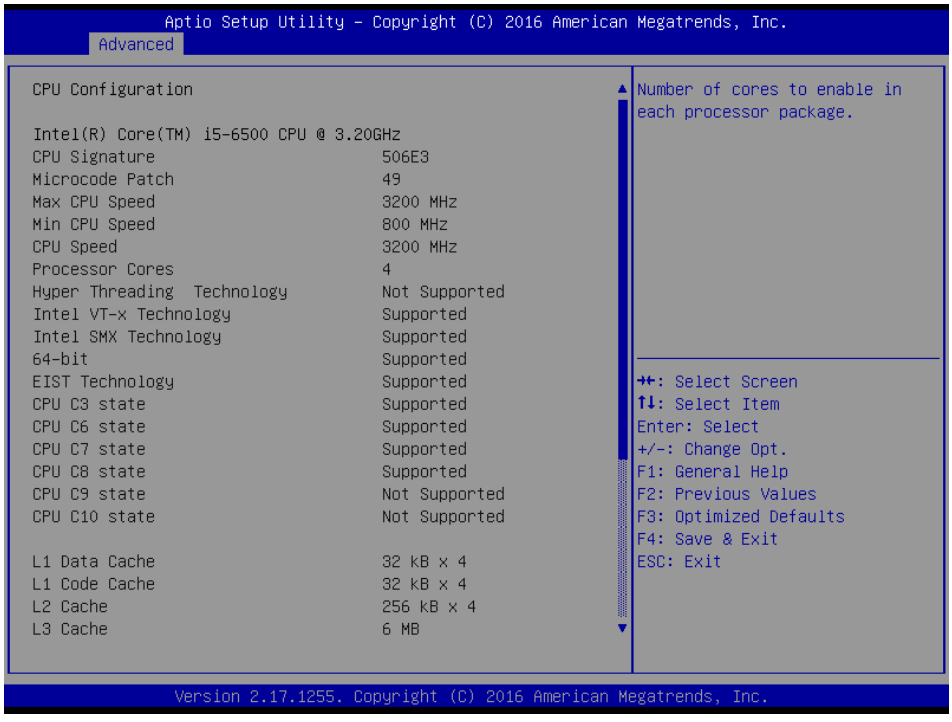
3.6.2.8.1 Legacy Console Redirection Settings



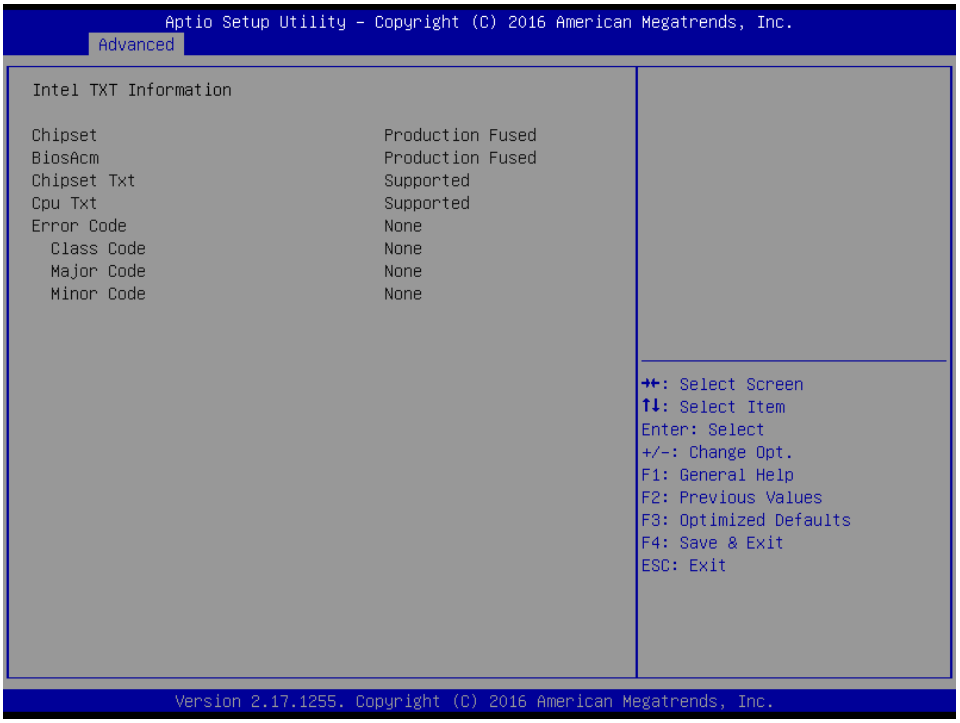
Item	Option	Description
Legacy Serial Redirection Port	COM1l**[Default]**,	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.

3.6.2.9 CPU Configuration

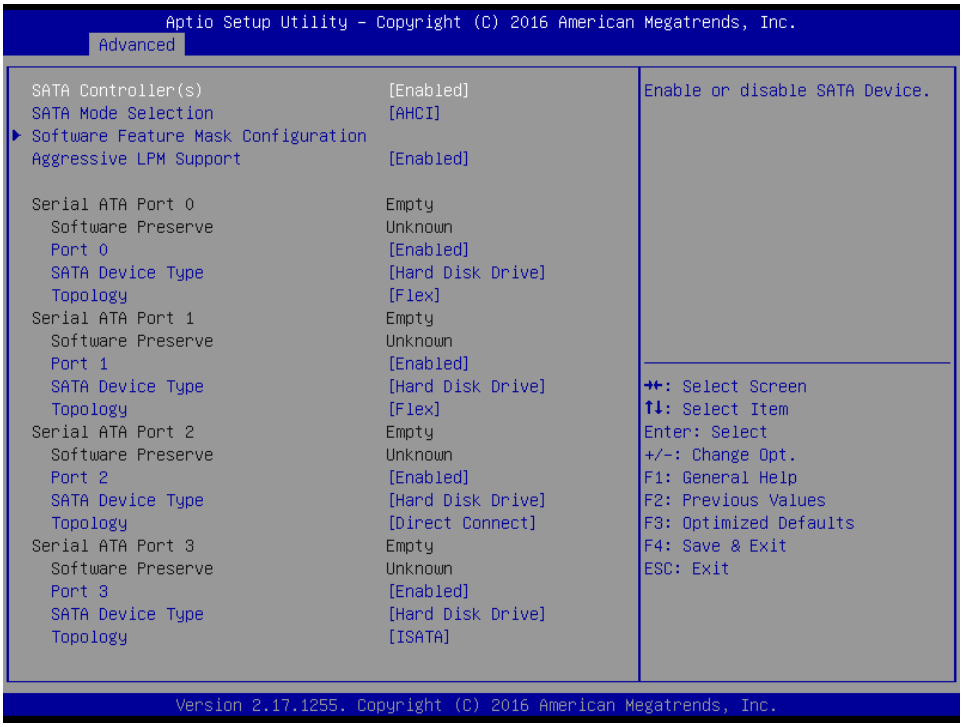
Use the CPU configuration menu to view detailed CPU specification and configure the CPU.



3.6.2.10 Intel TXT Configuration



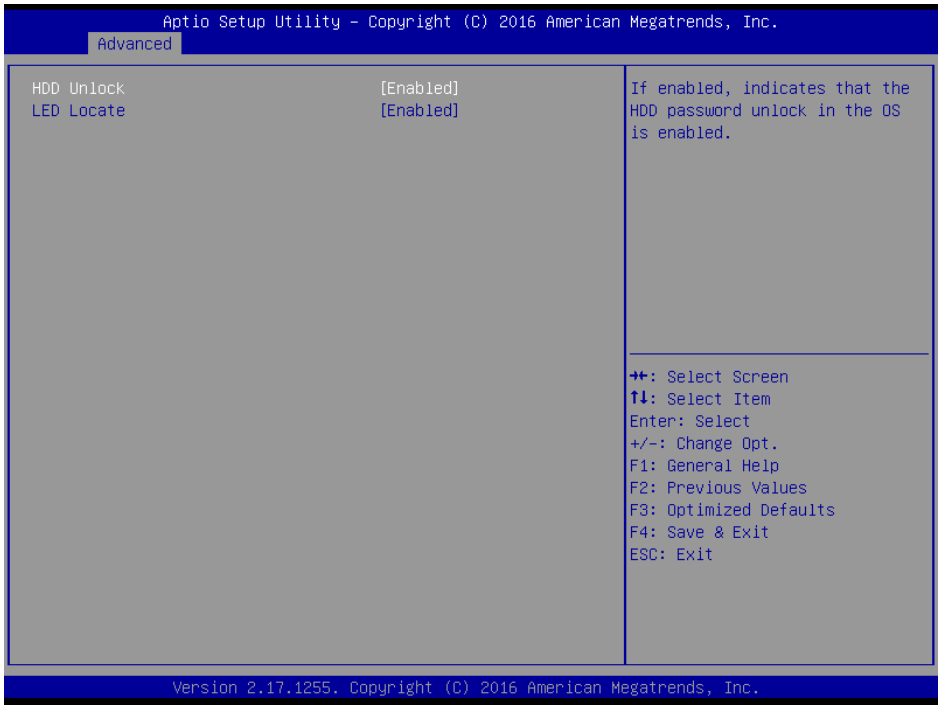
3.6.2.11 SATA Configuration



Item	Options	Description
SATA Controller(s)	Disabled, Enabled**[Default]**	Enable or disable SATA Device.
SATA Mode Selection	AHCI**[Default]** RAID	Determines how SATA controller(s) operate.

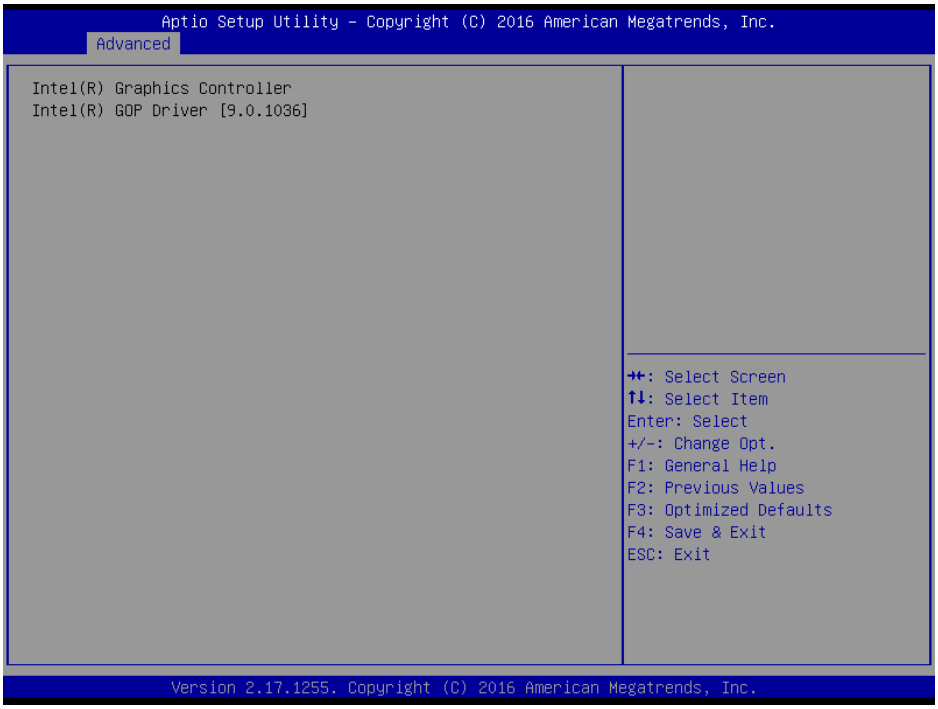
Aggressive LPM Support	Disabled, Enabled**[Default]**	Enable PCH to aggressively enter link power state.
Port 0	Disabled, Enabled**[Default]**	Enable or Disable SATA Port.
SATA Device Type	Hard Disk Drive**[Default]** Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
Topology	Unknown ISATA Direct Connect Flex**[Default]** M2	Identify the SATA Topology if it is Default or ISATA of Flex of DirectConnect or M2.
Port 1	Disabled, Enabled**[Default]**	Enable or Disable SATA Port.
SATA Device Type	Hard Disk Drive**[Default]** Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
Topology	Unknown ISATA Direct Connect Flex**[Default]** M2	Identify the SATA Topology if it is Default or ISATA of Flex of DirectConnect or M2.
Port 2	Disabled, Enabled**[Default]**	Enable or Disable SATA Port.
SATA Device Type	Hard Disk Drive**[Default]** Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
Topology	Unknown ISATA Direct Connect**[Default]** Flex M2	Identify the SATA Topology if it is Default or ISATA of Flex of DirectConnect or M2.
Port 3	Disabled, Enabled**[Default]**	Enable or Disable SATA Port.
SATA Device Type	Hard Disk Drive**[Default]** Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
Topology	Unknown ISATA**[Default]** Direct Connect Flex M2	Identify the SATA Topology if it is Default or ISATA of Flex of DirectConnect or M2.

3.6.2.11.1 Software Feature Mask Configuration



Item	Option	Description
HDD Unlock	Disabled Enabled**[Default]**,	If enabled, indicates that the HDD password unlock in the OS is enabled.
LED Locate	Disabled Enabled**[Default]**,	If enabled, indicates that the LED/SGPIO hardware is attached and ping to locate feature is enabled on the OS.

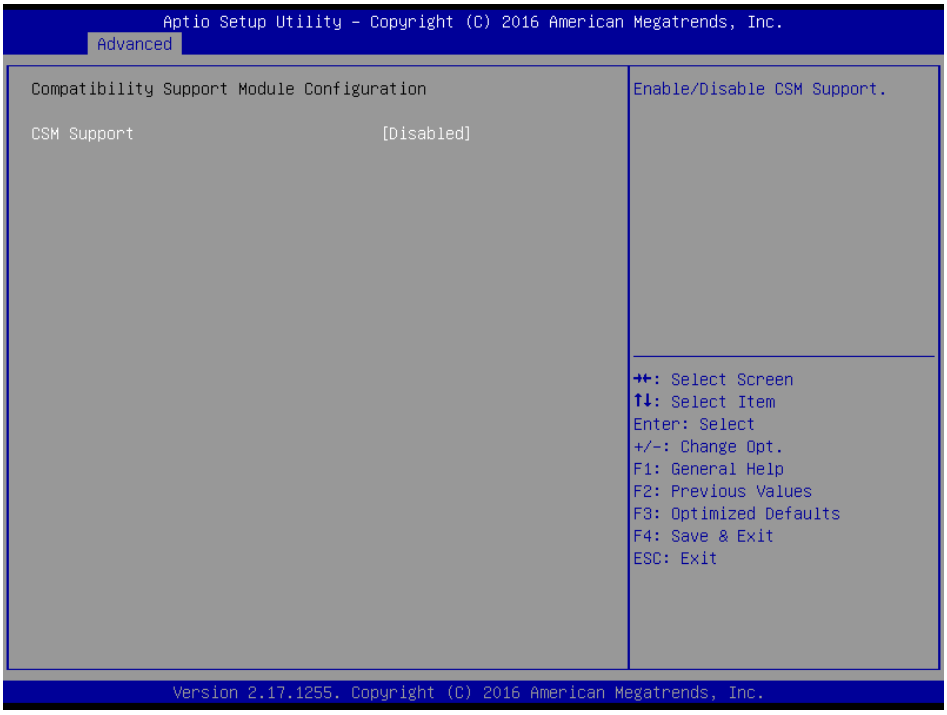
3.6.2.12 AMI Graphic Output Protocol Policy



3.6.2.13 Network Stack Configuration

Item	Options	Description
Network Stack	Enabled Disabled**[Default]**	Enable/Disable UEFI Network Stack.

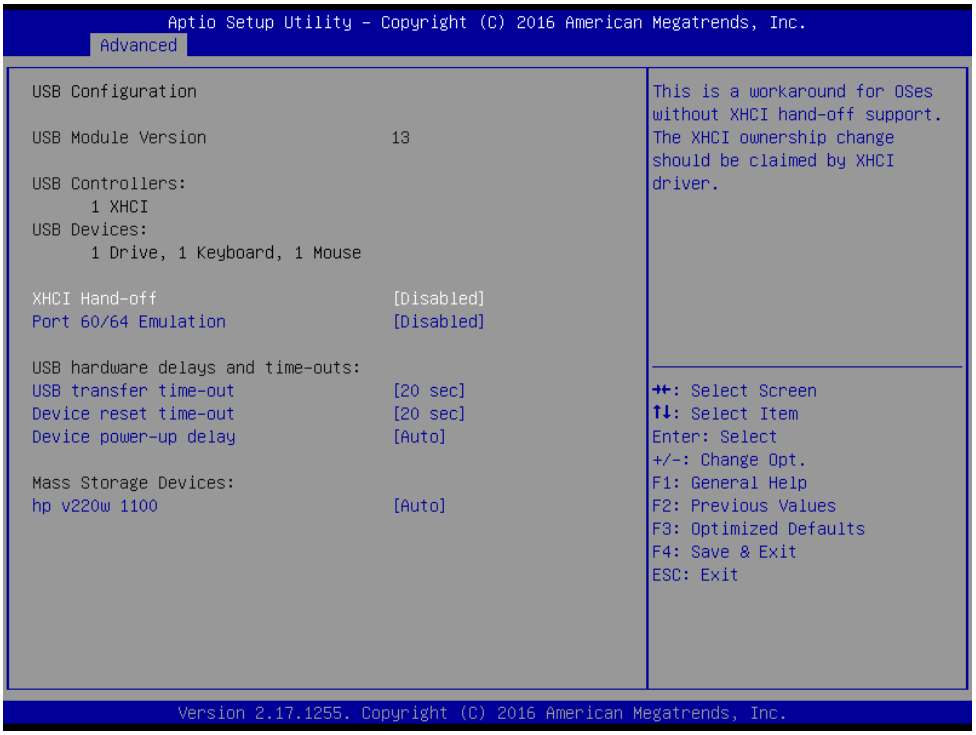
3.6.2.14 CSM Configuration



Item	Options	Description
CSM Support	Enabled Disabled**[Default]**	Enable/Disable CSM Support.

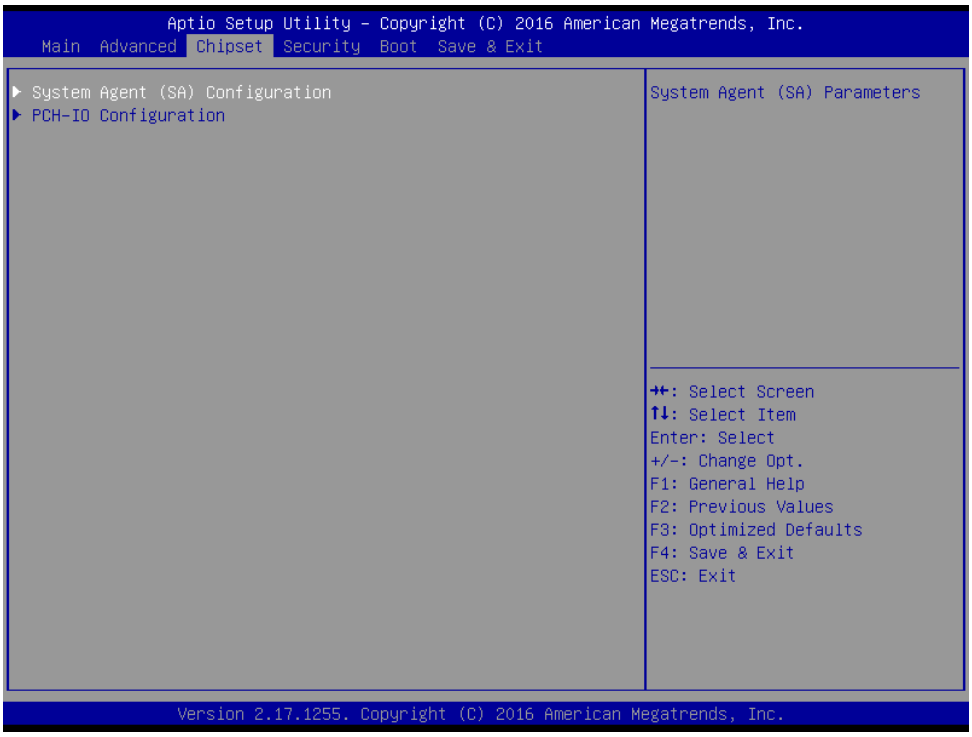
3.6.2.15 USB Configuration

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

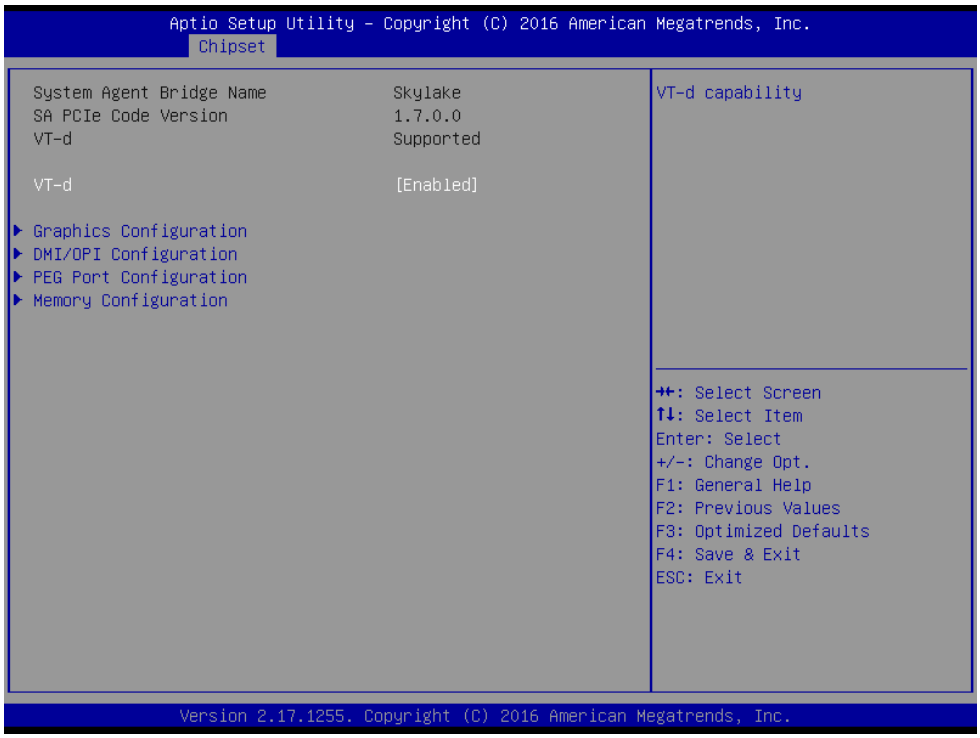


Item	Options	Description
XHCI Hand-off	Enabled Disabled**[Default]**	This is a workaround for OSew without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
Port 60/64 Emulation	Enabled Disabled**[Default]**	Enables I/O port 60h/64h emulation support.
USB transfer time-out	1 sec 5 sec 10 sec 20 sec**[Default]**	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 sec 20 sec**[Default]** 30 sec 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto**[Default]** Manual	Maximum time the device will take before it properly reports itself to the Host Controller. ‘Auto’ uses default value: for a Root port it is 100ms, for a Hub port the delay is taken form Hub descriptor.
Mass Storage Devices	Auto**[Default]** Floppy Forced FDD Hard Disk CD-ROM	Mass storage device emulation type. ‘AUTO’ enumerates devices according to their media format. Optical drives are emulated as ‘CDROM’, drives with no media will be emulated according to a drive type.

3.6.3 Chipset

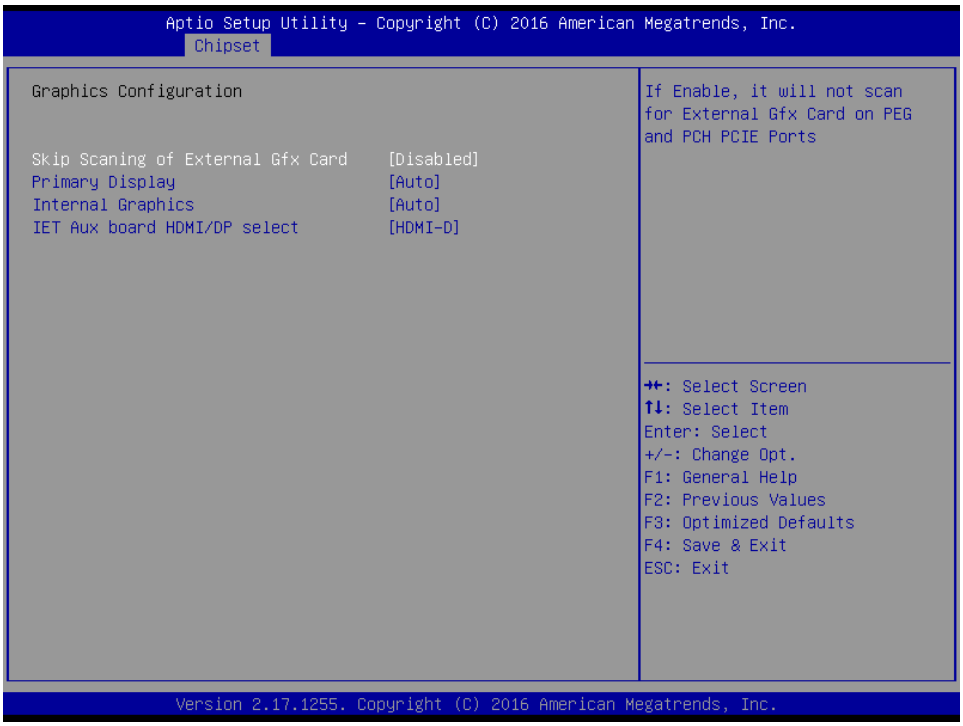


3.6.3.1 System Agent (SA) Configuration



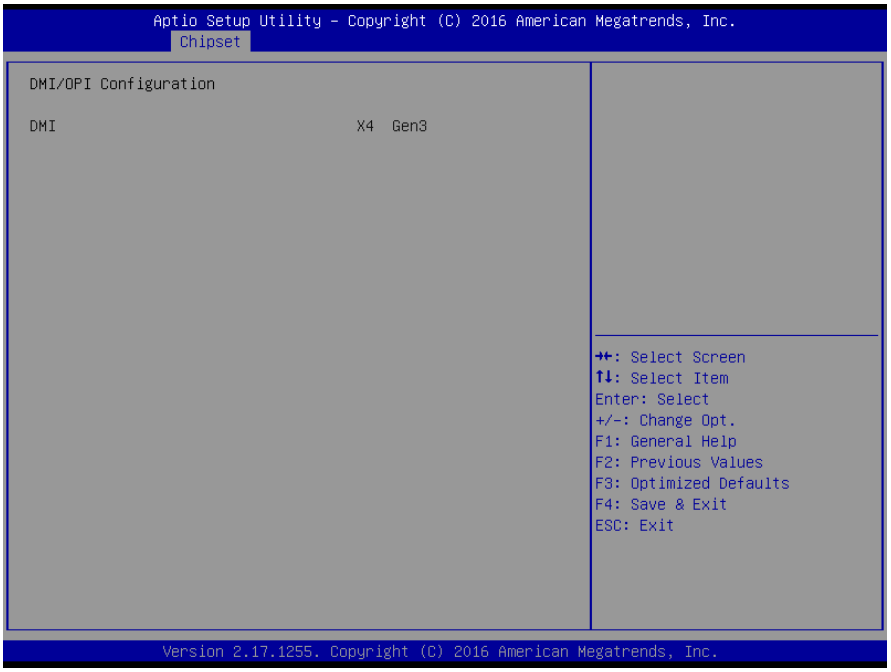
Item	Option	Description
VT-d	Enabled**[Default]** Disabled	VT-d capability.

3.6.3.1.1 Graphics Configuration



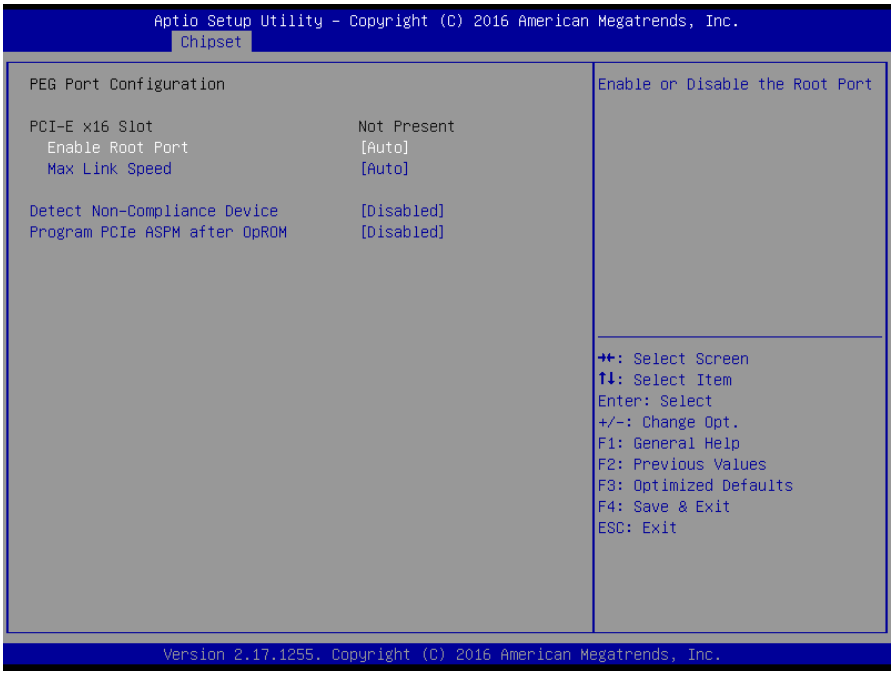
Item	Option	Description
Skip Scaning of External Gfx Card	Disabled**[Default]** Enabled	If Enable, it will not scan for External Gfx Card on PEG and PCH PCIE Ports.
Primary Display	Auto**[Default]** IGFX PEG	Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
Internal Graphics	Auto **[Default]** Disabled Enabled	Keep IGFX enabled based on the setup options.
IET Aux board HDMI/DP select	HDMI-D**[Default]** DisplayPort-D	Device-3 (EFP3).

3.6.3.1.2 DMI/OPI Configuration



3.6.3.1.3 PEG Port Configuration

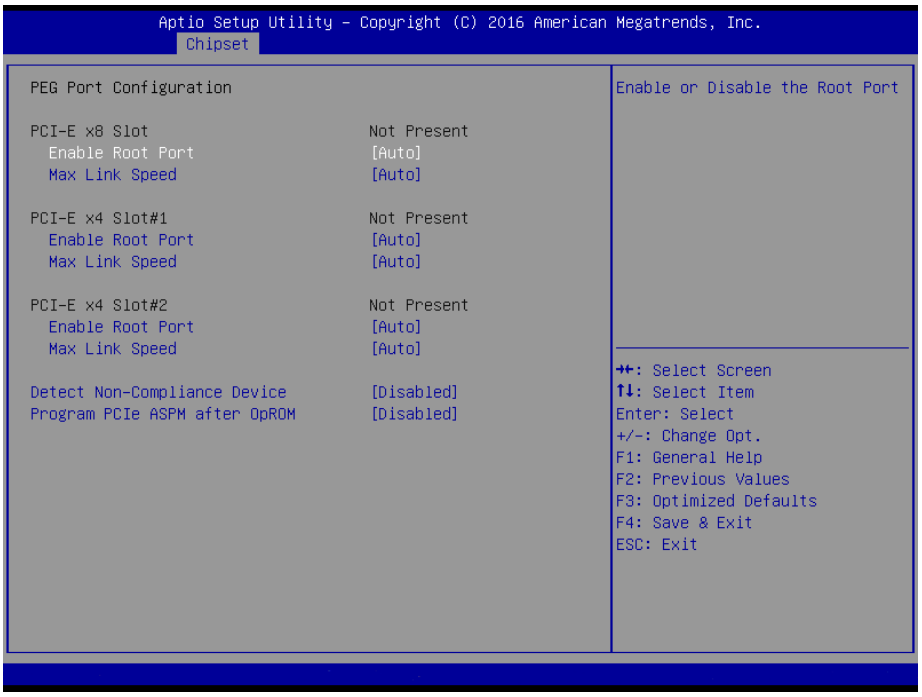
SLP-SKL



Item	Option	Description
Enable Root Port	Disabled Enabled Auto**[Default]**	Enable or Disable the Root Port.
Max Link Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PEG 0:1:0 Max Speed.

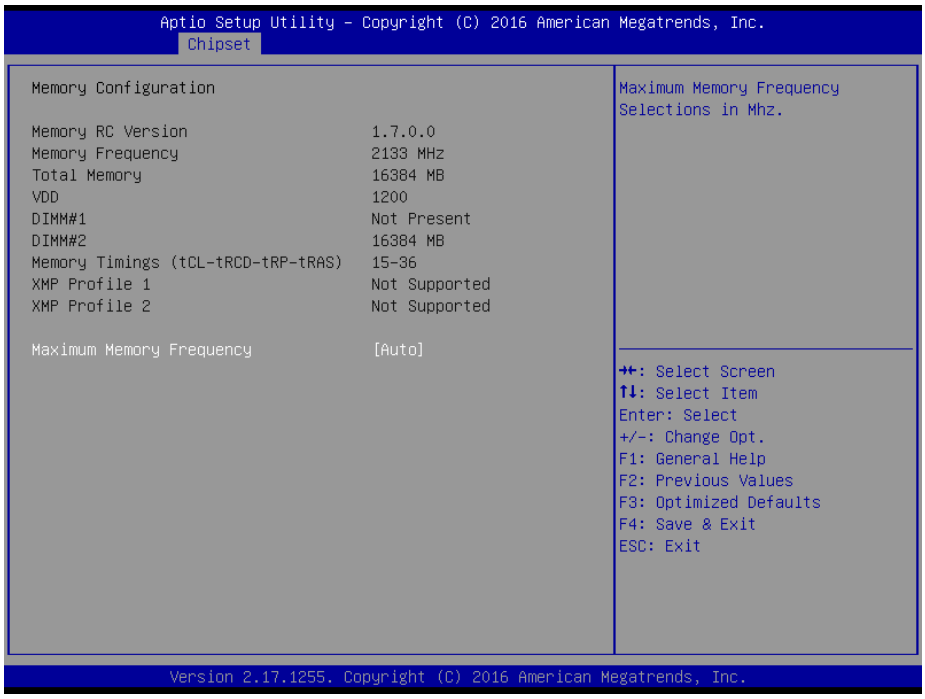
Detect Non-Compliance Device	Disabled**[Default]** Enabled	Detect Non-Compliance PCI Express Device in PEG.
Program PCIe ASPM after OpROM	Disabled**[Default]** Enabled	Enabled: PCIe ASPM will be programmed after OpROM. Disabled: PCIe ASPM will be programmed before OpROM.

SLP-SKLB



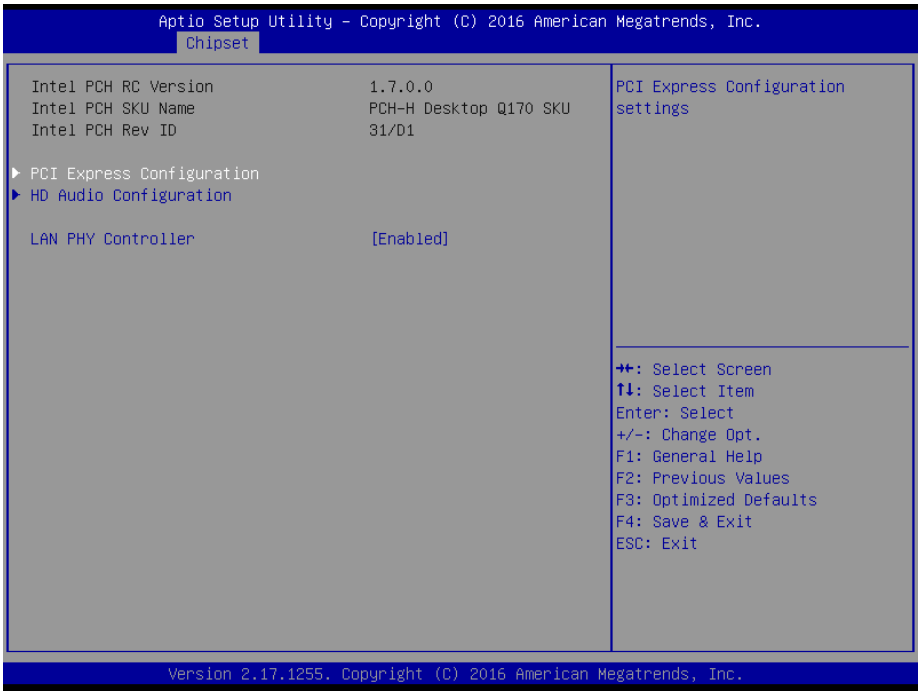
Item	Option	Description
Enable Root Port	Disabled Enabled Auto**[Default]**	Enable or Disable the Root Port.
Max Link Speed	Auto**[Default]** Gen1 Gen2 Gen3	Configure PEG 0:1:0 Max Speed.
Detect Non-Compliance Device	Disabled**[Default]** Enabled	Detect Non-Compliance PCI Express Device in PEG.
Program PCIe ASPM after OpROM	Disabled**[Default]** Enabled	Enabled: PCIe ASPM will be programmed after OpROM. Disabled: PCIe ASPM will be programmed before OpROM.

3.6.3.1.4 Memory Configuration



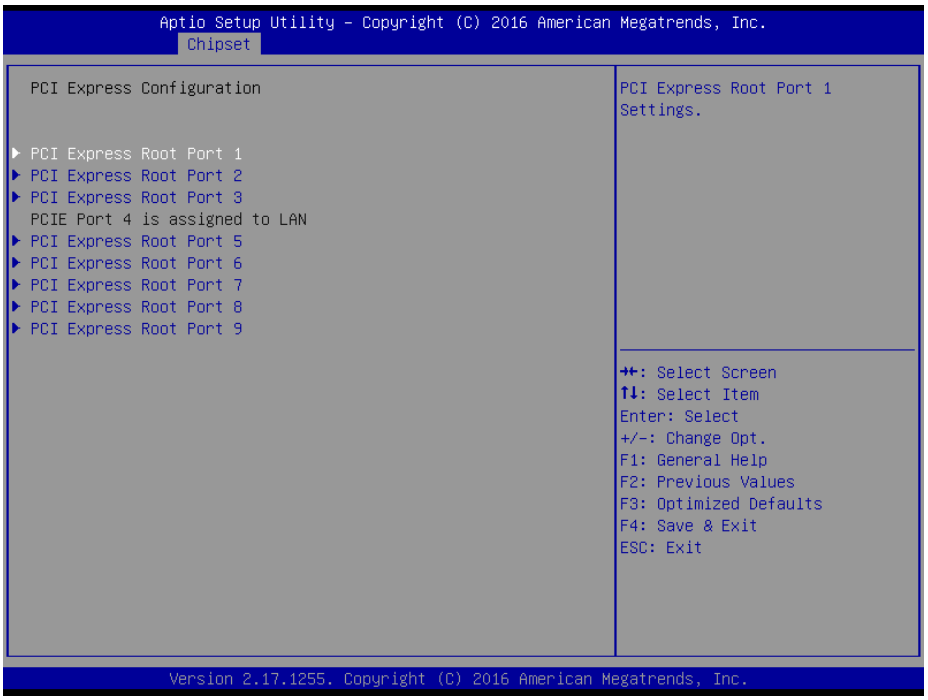
Item	Option	Description
Maximum Memory Frequency	Auto**[Default]** 1067/1200/1333/1400/1600/1800/1867/2000/2133/2200/2400/2600/2667/2800/2933/3000/3200	Maximum Memory Frequency Selections in Mhz.

3.6.3.2 PCH-IO Configuration

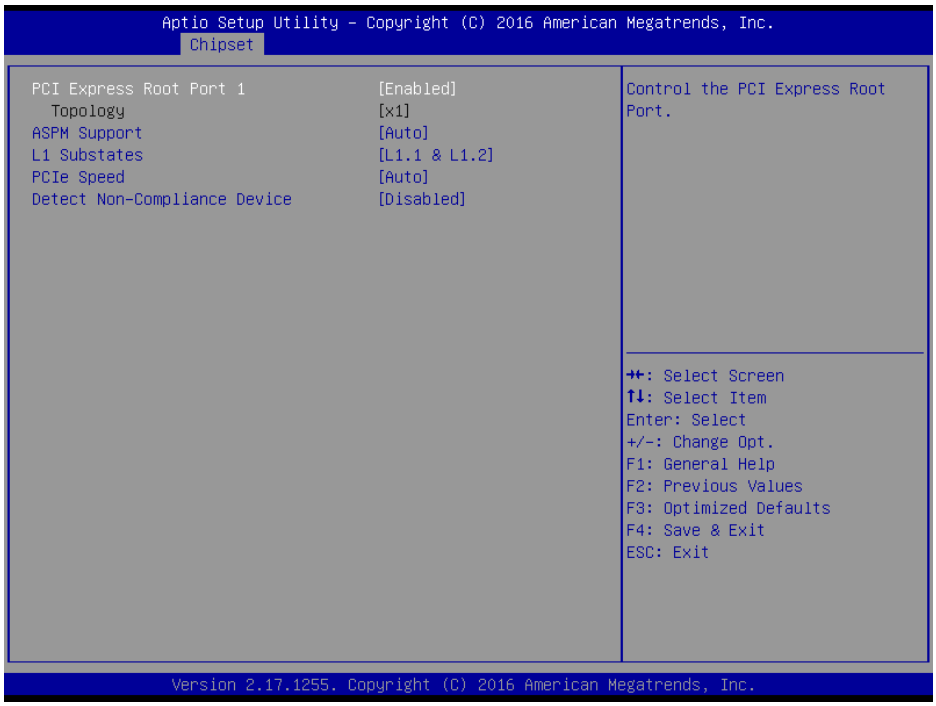


Item	Option	Description
LAN PHY Controller	Disabled Enabled**[Default]**	Enable or disable OnBoard PCH LAN PHY Controller.

3.6.3.2.1 PCI Express Configuration

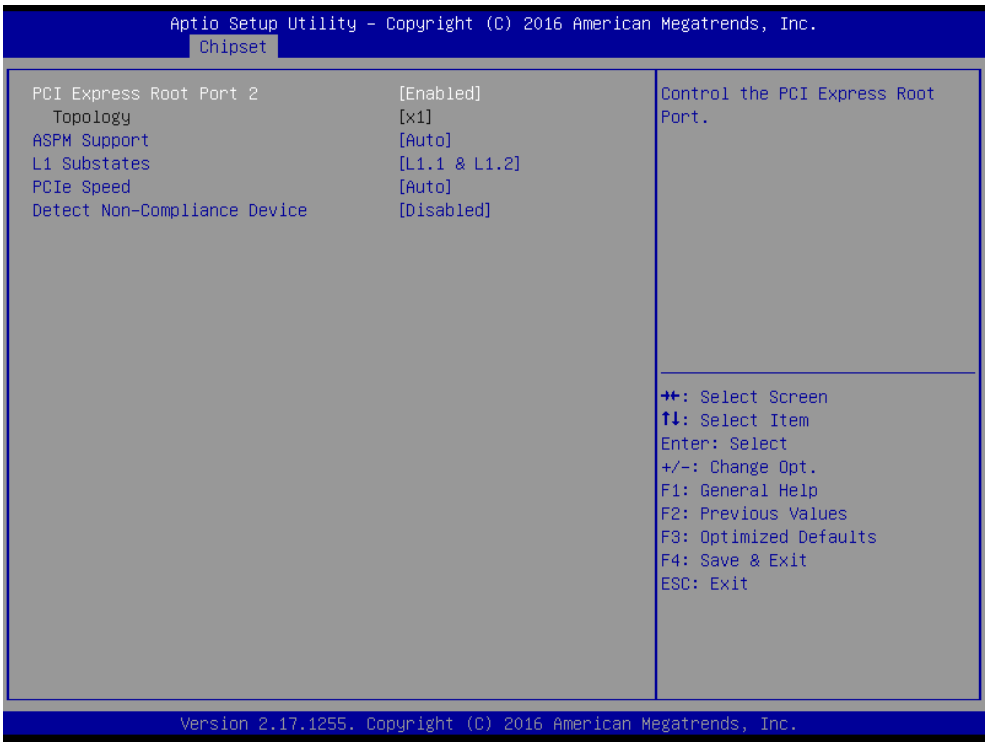


3.6.3.2.1.1 PCI Express Root Port 1



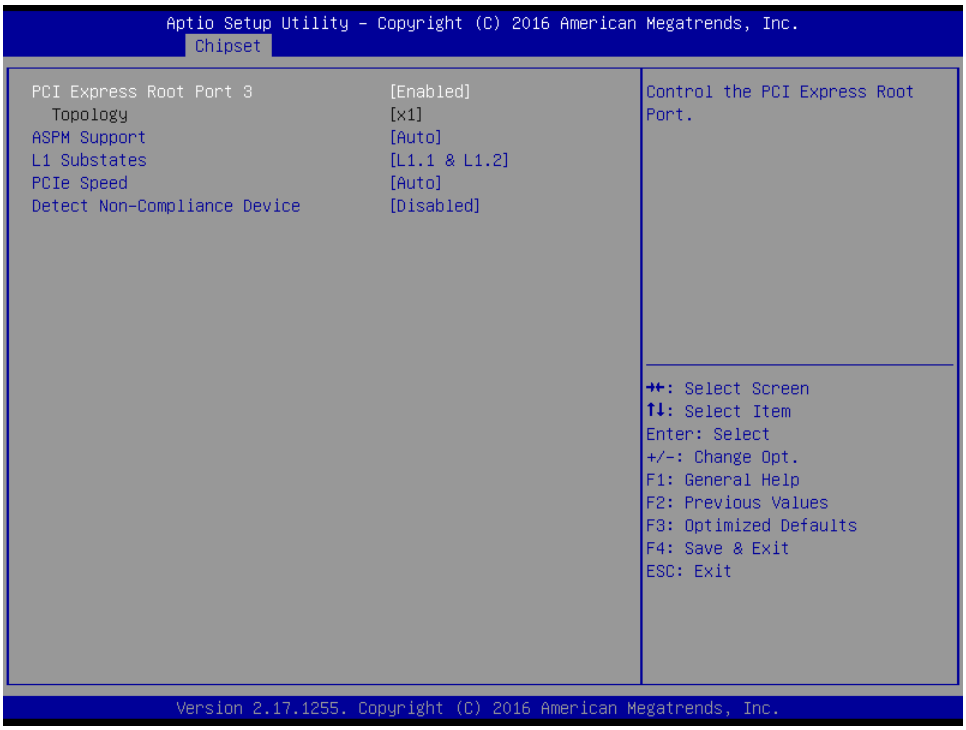
Item	Option	Description
PCI Express Root Port 1	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled L0s L1 L0sL1 Auto**[Default]**	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.2 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCI Express port speed.
Detect Non-Compliance Device	Enabled Disabled**[Default]**,	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

3.6.3.2.1.2 PCI Express Root Port 2



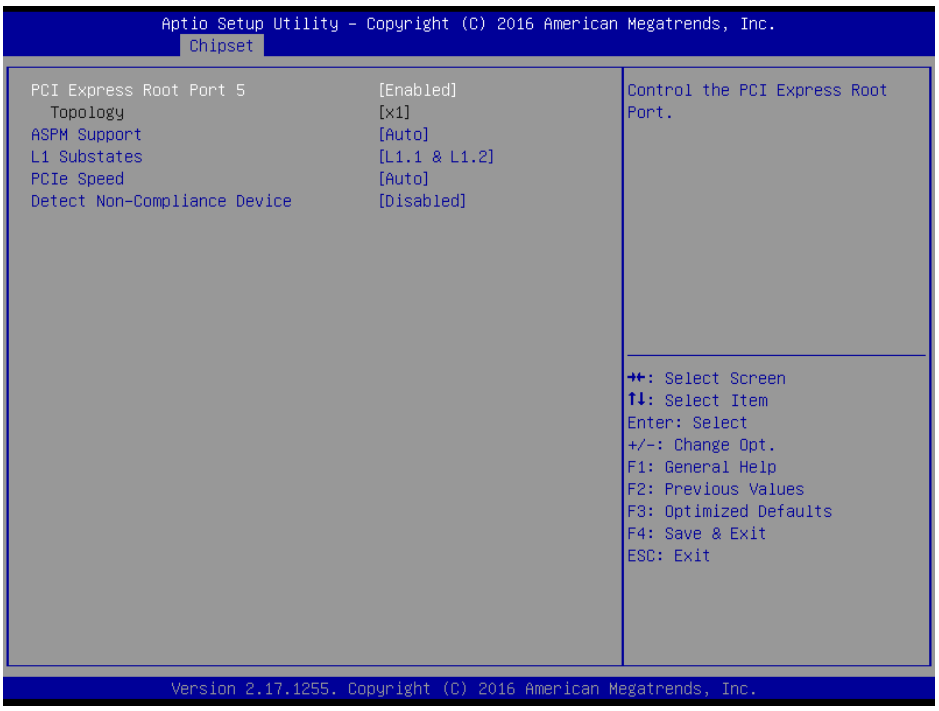
Item	Option	Description
PCI Express Root Port 2	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled L0s L1 L0sL1 Auto**[Default]**	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.2 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCI Express port speed.
Detect Non-Compliance Device	Enabled Disabled**[Default]**,	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

3.6.3.2.1.3 PCI Express Root Port 3



Item	Option	Description
PCI Express Root Port 3	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled L0s L1 L0sL1 Auto**[Default]**	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.2 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCI Express port speed.
Detect Non-Compliance Device	Enabled Disabled**[Default]**,	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

3.6.3.2.1.4 PCI Express Root Port 5

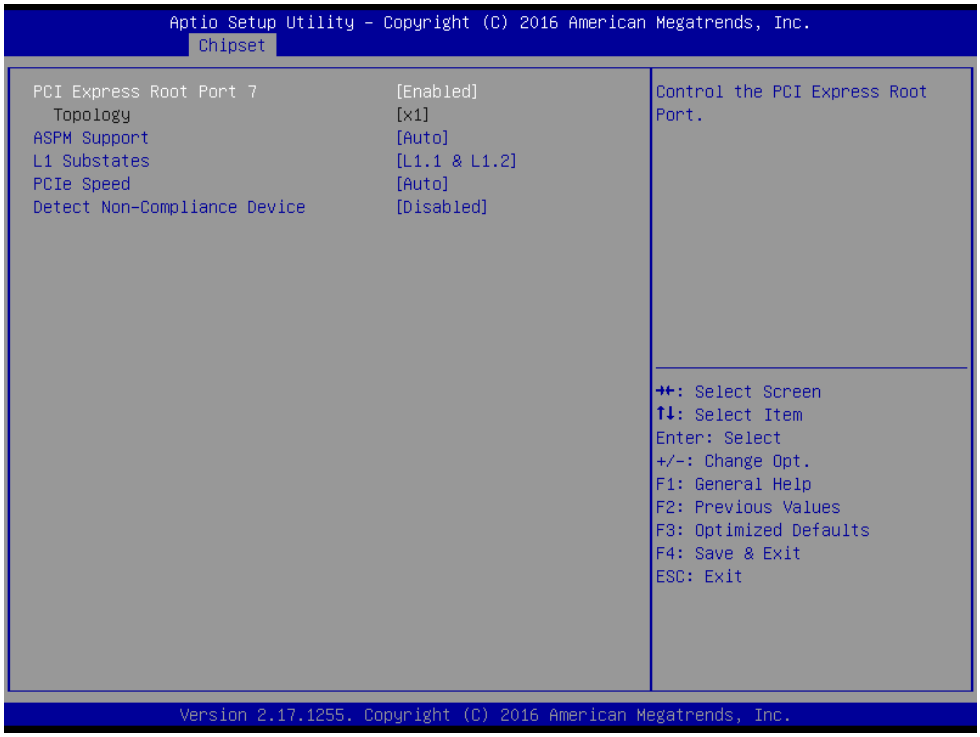


Item	Option	Description
PCI Express Root Port 5	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled L0s L1 L0sL1 Auto**[Default]**	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.2 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCI Express port speed.
Detect Non-Compliance Device	Enabled Disabled**[Default]**,	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

3.6.3.2.1.5 PCI Express Root Port 6

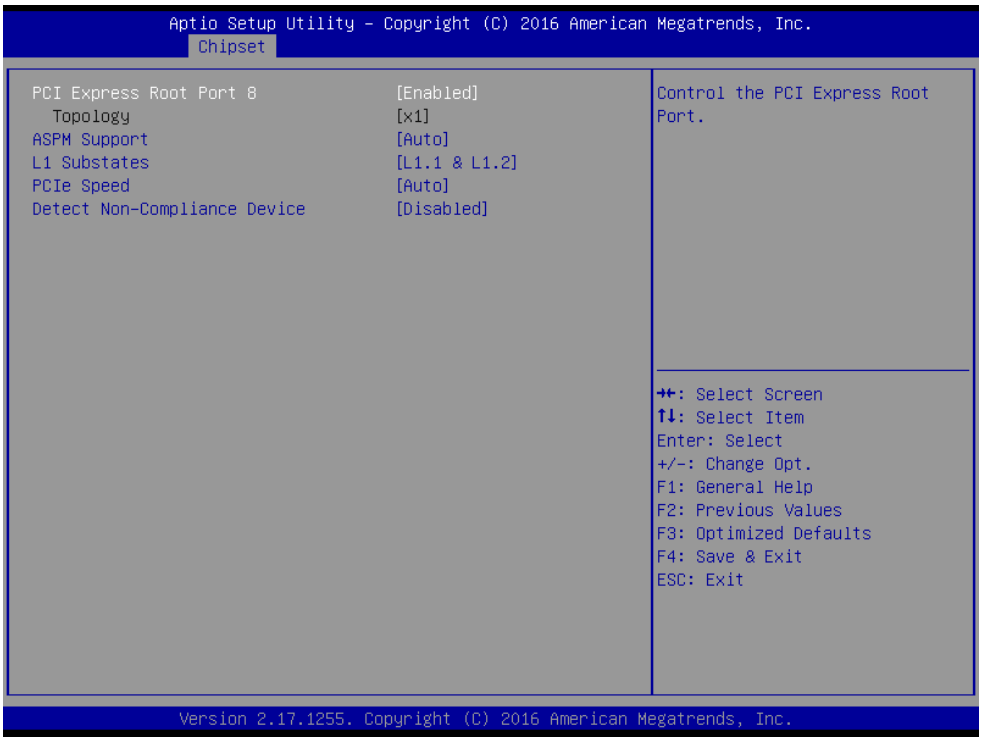
Item	Option	Description
PCI Express Root Port 6	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled L0s L1 L0sL1 Auto**[Default]**	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.2 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCI Express port speed.
Detect Non-Compliance Device	Enabled Disabled**[Default]**,	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

3.6.3.2.1.6 PCI Express Root Port 7



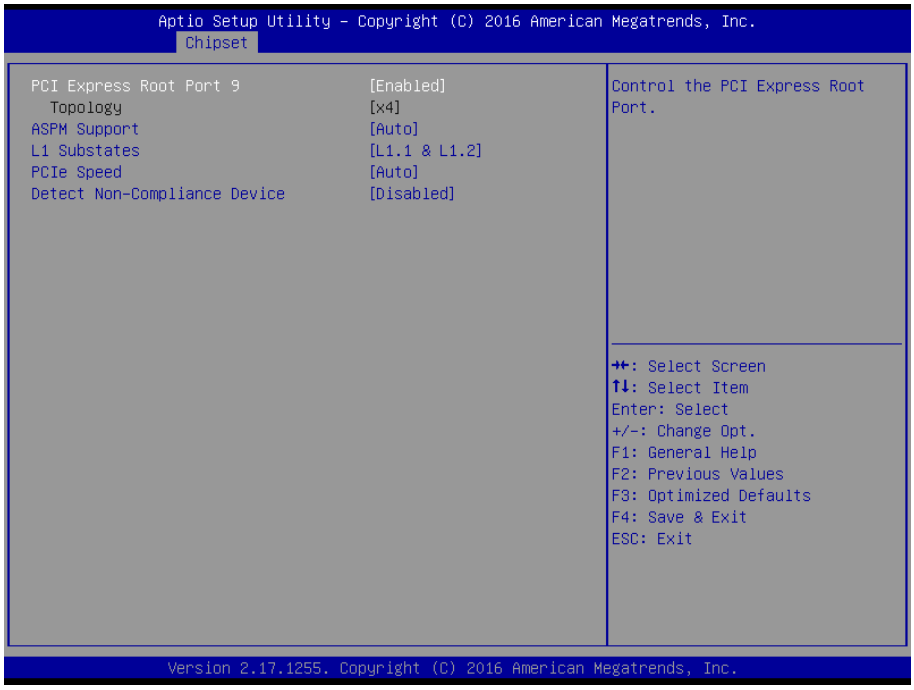
Item	Option	Description
PCI Express Root Port 7	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled L0s L1 L0sL1 Auto**[Default]**	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.2 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCI Express port speed.
Detect Non-Compliance Device	Enabled Disabled**[Default]**,	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

3.6.3.2.1.7 PCI Express Root Port 8



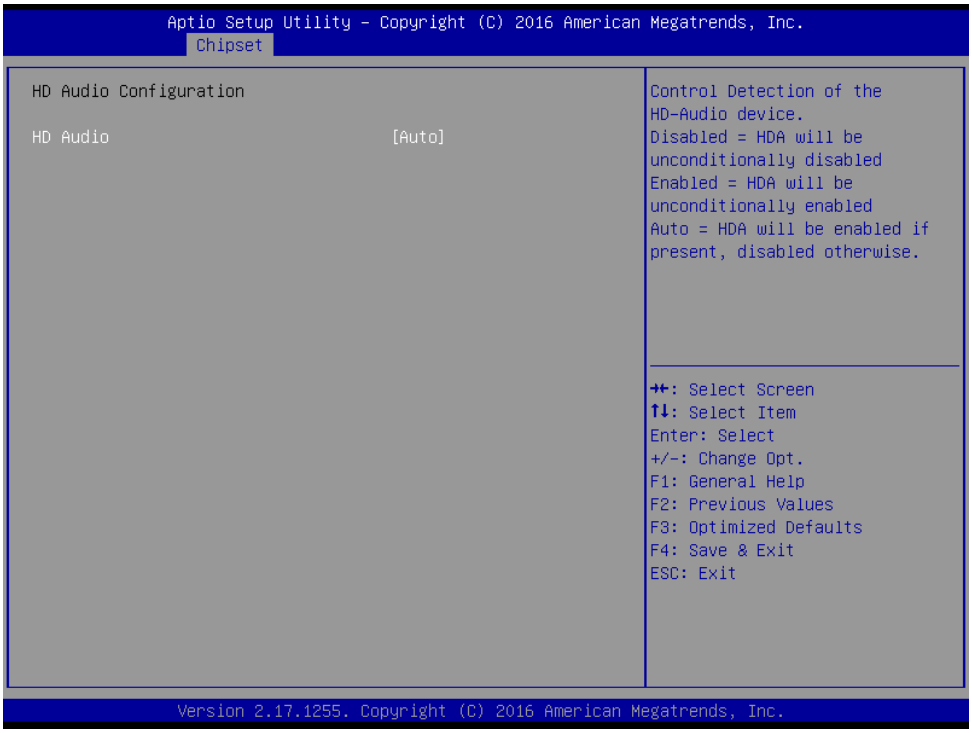
Item	Option	Description
PCI Express Root Port 8	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled L0s L1 L0sL1 Auto**[Default]**	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.2 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCI Express port speed.
Detect Non-Compliance Device	Enabled Disabled**[Default]**,	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

3.6.3.2.1.8 PCI Express Root Port 9



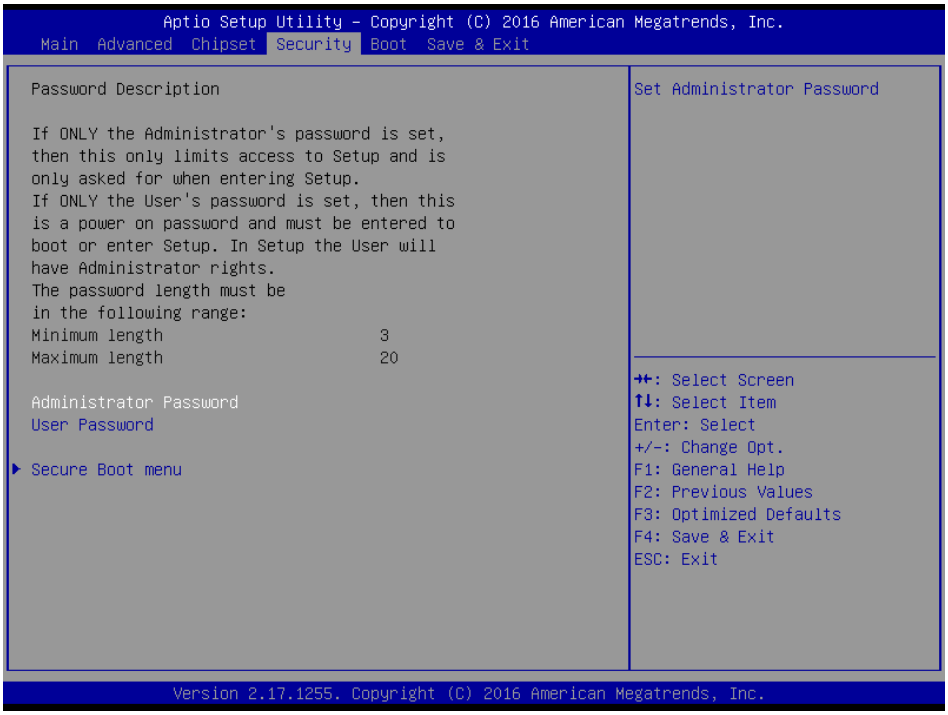
Item	Option	Description
PCI Express Root Port 9	Enabled**[Default]**, Disabled	Control the PCI Express Root Port.
ASPM Support	Disabled L0s L1 L0sL1 Auto**[Default]**	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
L1 Substates	Disabled L1.1 L1.2 L1.1 & L1.2**[Default]**	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]** Gen1 Gen2 Gen3	Select PCI Express port speed.
Detect Non-Compliance Device	Enabled Disabled**[Default]**,	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.

3.6.3.2.2 HD Audio Configuration



Item	Option	Description
HD Audio	Disabled Enabled Auto**[Default]**,	Control Detection of the HD-Audio device. Disable = HAD will be unconditionally disabled Enabled = HAD will be unconditionally enabled Auto = HAD will be enabled if present, disabled otherwise.

3.6.4 Security



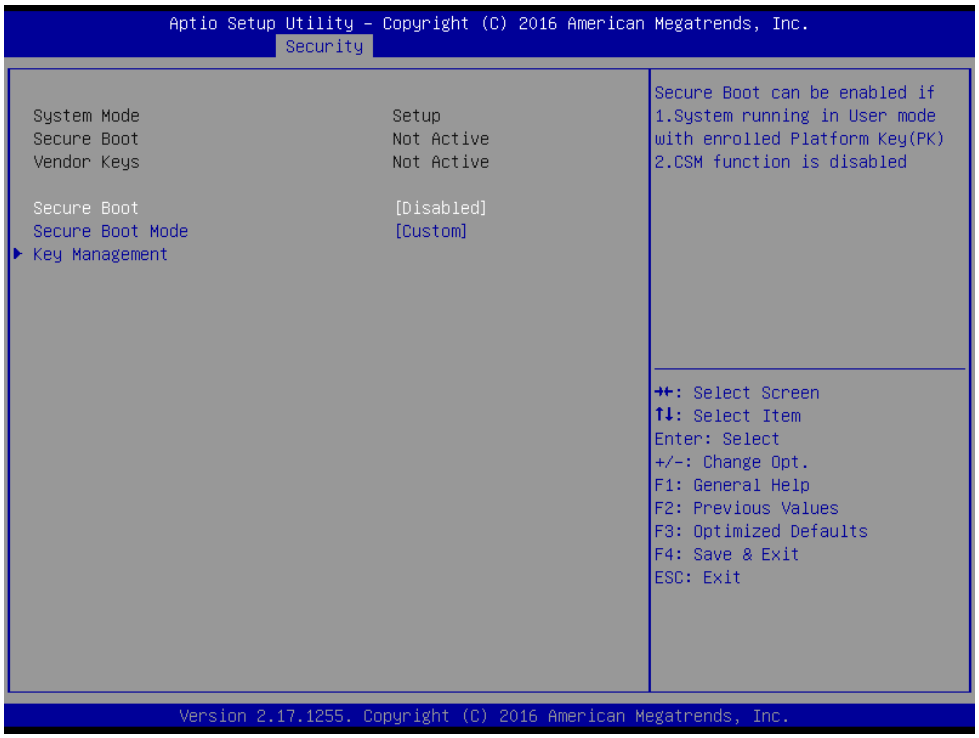
- **Administrator Password**

Set setup Administrator Password

- **User Password**

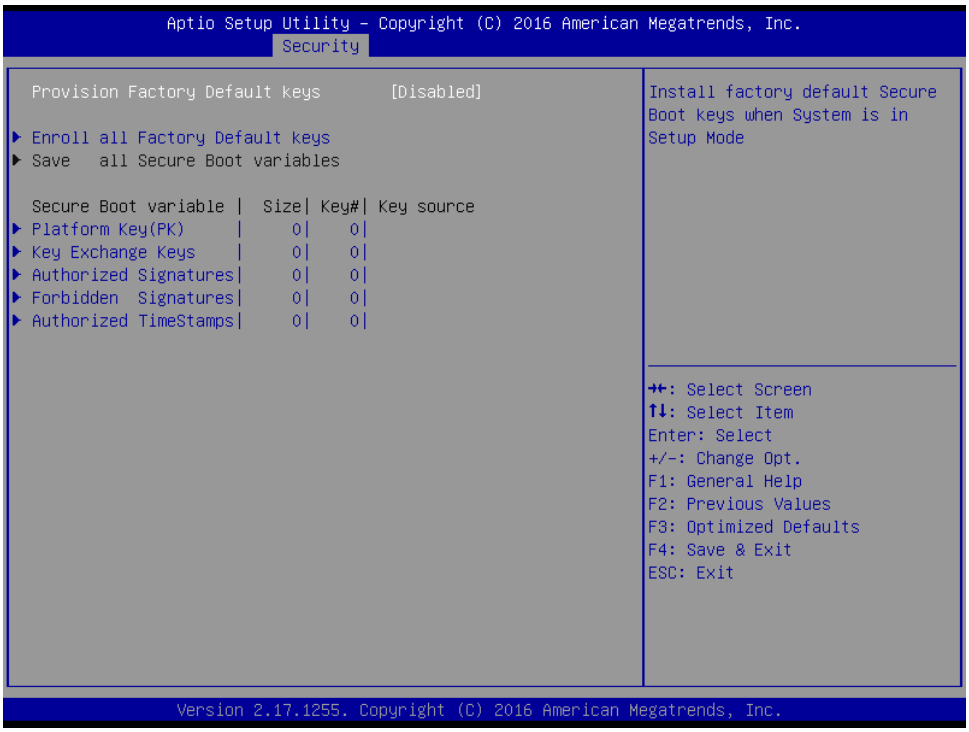
Set User Password

3.6.4.1 Secure Boot menu



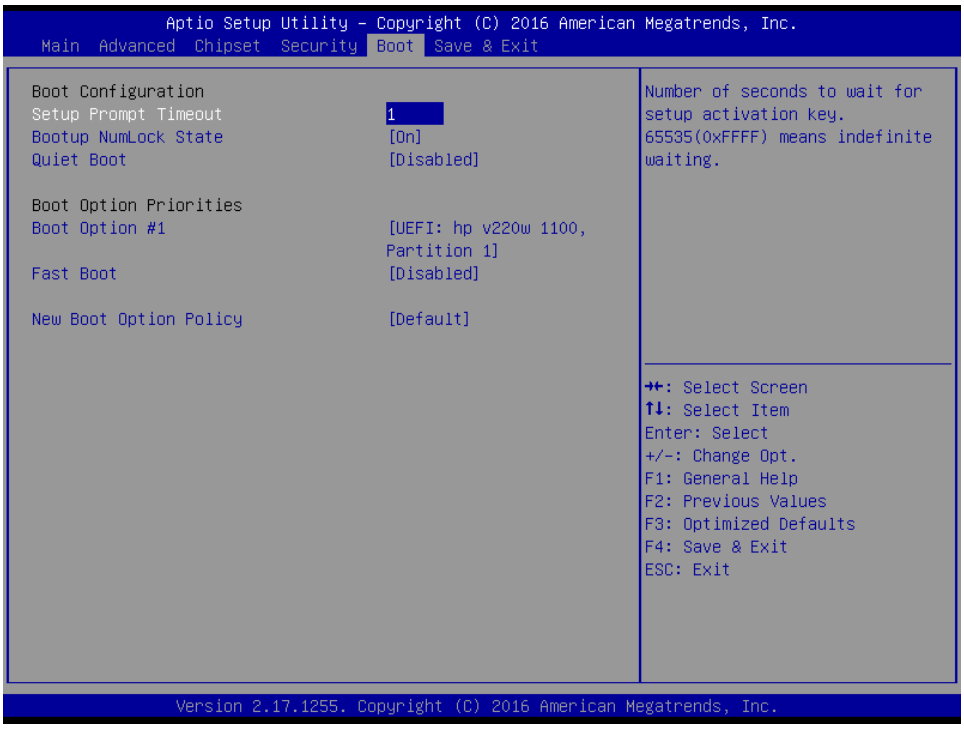
Item	Option	Description
Secure Boot	Disabled**[Default]** Enabled	Secure Boot can be enabled if 1.System running in User mode with enrolled Platform Key(PK) 2.CSM function is disabled.
Secure Boot Mode	Standard Custom**[Default]**	Secure Boot mode selector. 'Custom' Mode enables users to change Image Execution policy and manage Secure Boot Keys.

3.6.4.1.1 Key Management



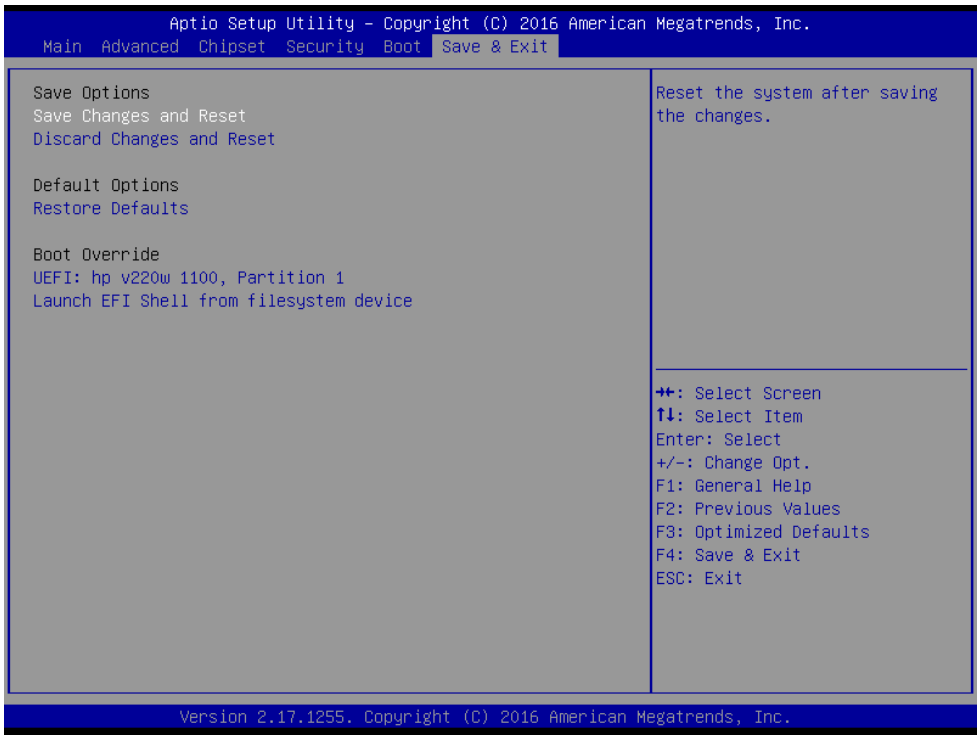
Item	Option	Description
Provision Factory Default Keys	Enabled, Disabled**[Default]**	Install Factory default Secure Boot Keys when System is in Setup Mode.

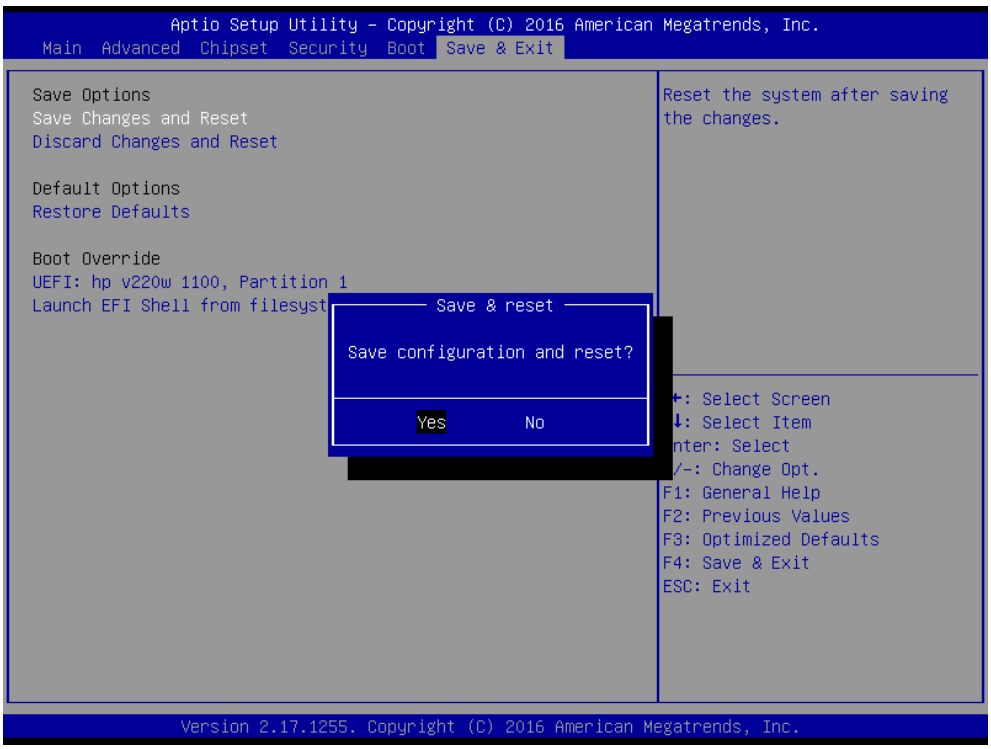
3.6.5 Boot



Item	Option	Description
Setup Prompt Timeout	1~ 65535	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	On**[Default]** Off	Select the Keyboard NumLock state
Fast Boot	Disabled**[Default]** Enabled	Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.
New Boot Option Policy	Default**[Default]** Place First Place Last	Controls the placement of newly detected UEFI boot options.
Boot Option #1	Set the system boot order.	

3.6.6 Save and exit





3.6.6.1 Save Changes and Reset

Reset the system after saving the changes.

3.6.6.2 Discard Changes and Reset

Any changes made to BIOS settings during this session of the BIOS setup program are discarded. The setup program then exits and reboots the controller.

3.6.6.3 Restore Defaults

This option restores all BIOS settings to the factory default. This option is useful if the controller exhibits unpredictable behavior due to an incorrect or inappropriate BIOS setting.

3.6.6.4 Launch EFI Shell from filesystem device

Attempts to Launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.

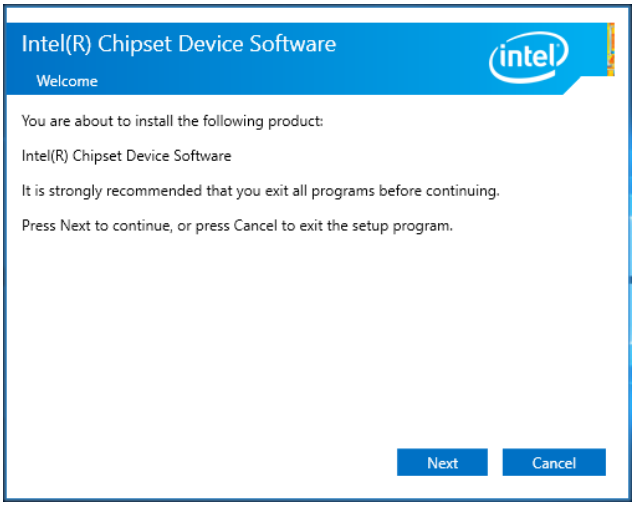
4. Drivers Installation

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

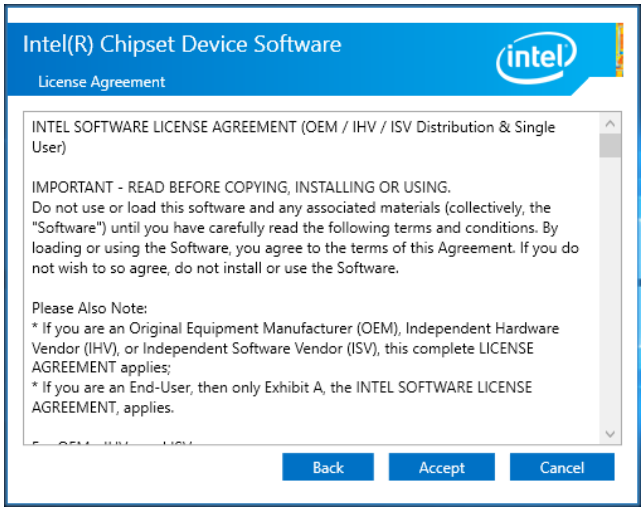
4.1 Install Chipset Driver

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.

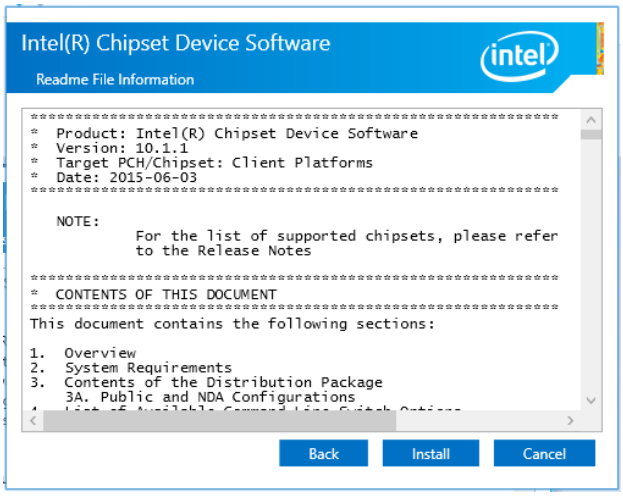
Note: The installation procedures and screen shots in this section are based on Windows 8.1 operation system. If the warning message appears while the installation process, click Continue to go on.



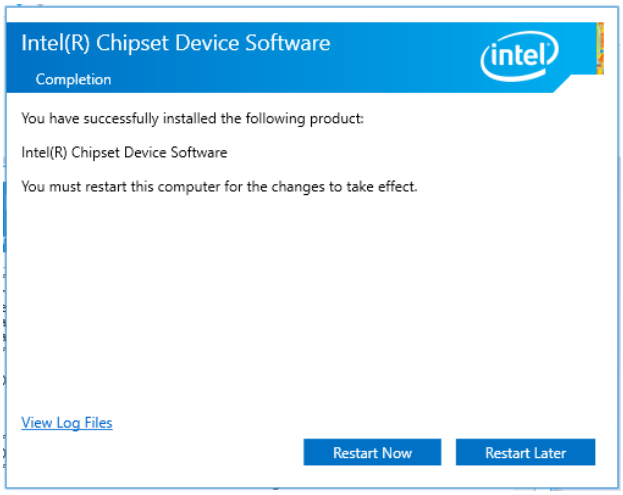
Step1. Click **Next**.



Step 2. Click **Accept**.



Step 3. Click **Install**.

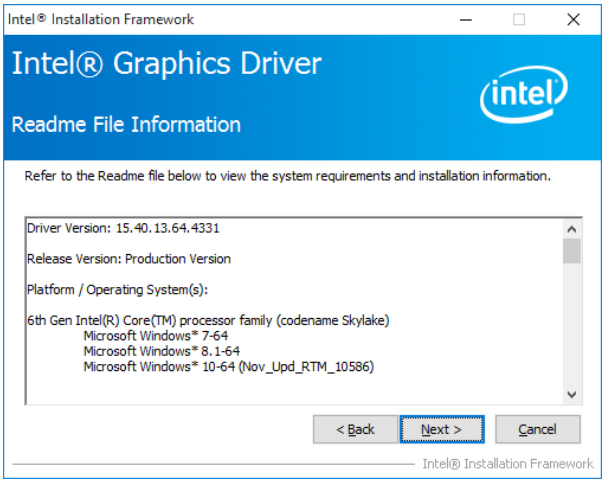


Step 4. Complete setup.

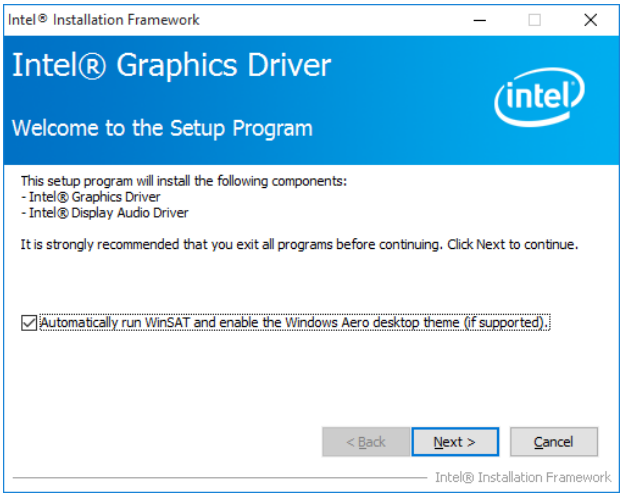
4.2 Install VGA Driver

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.

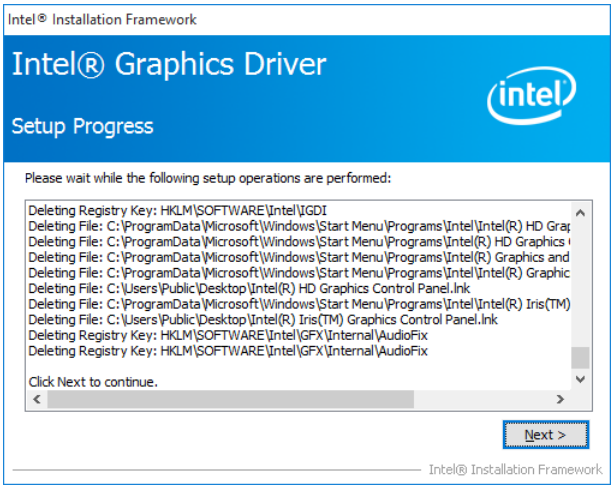
Note: The installation procedures and screen shots in this section are based on Windows 8.1 operation system.



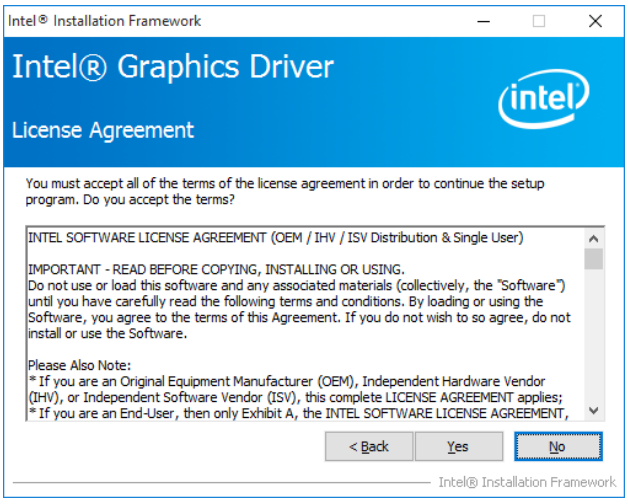
Step 3. Click **Next.**



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

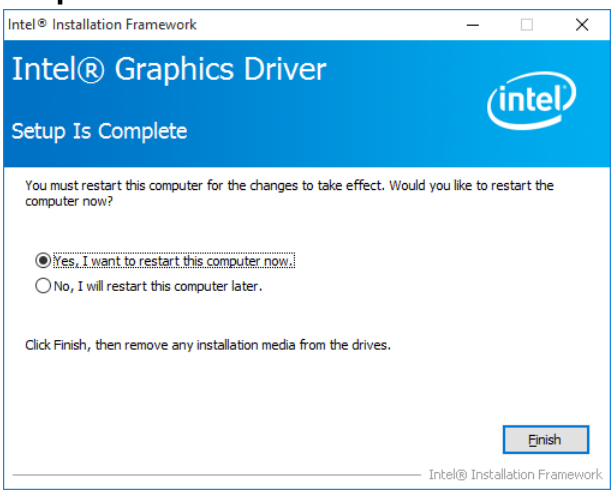


Step 4. Click **Next**.



Step 2.

Click **Yes** to accept license agreement.

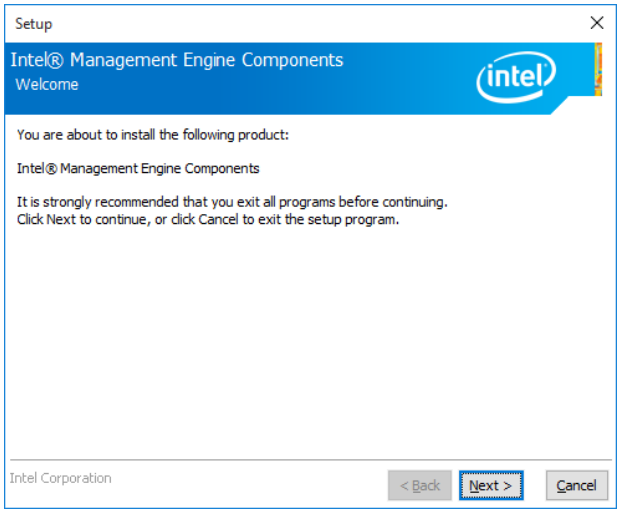


Step 5. Click **Finish** to complete setup.

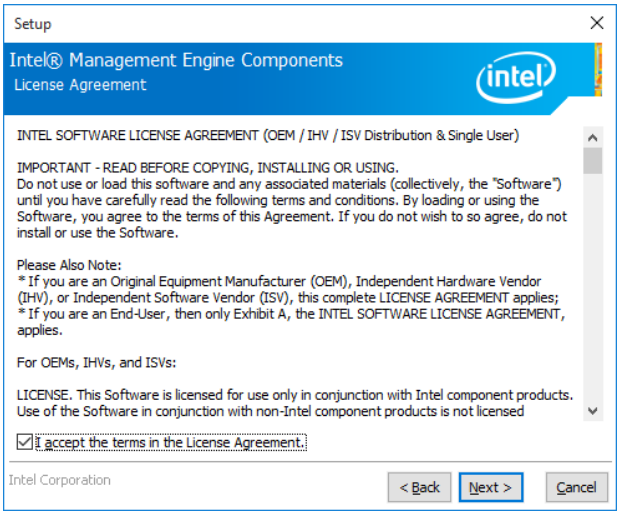
4.3 Install ME Driver

Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.

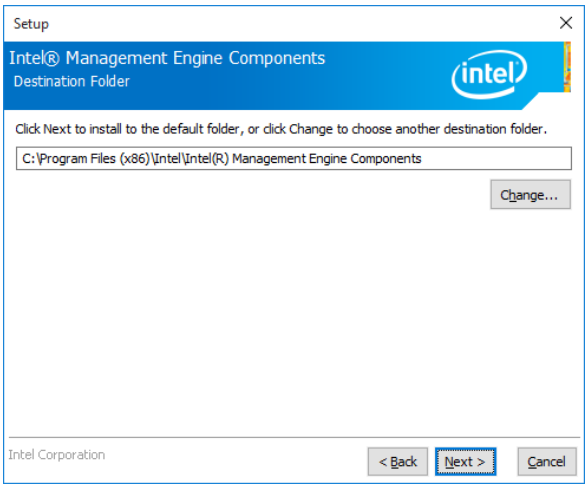
Note: The installation procedures and screen shots in this section are based on Windows 8.1 operation system.



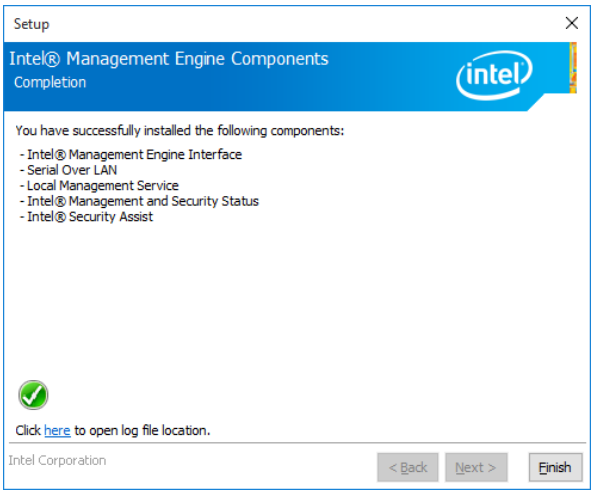
Step 1. Click **Next** to continue setup.



Step 2. Click **Next**.



Step 3. Click **Next**

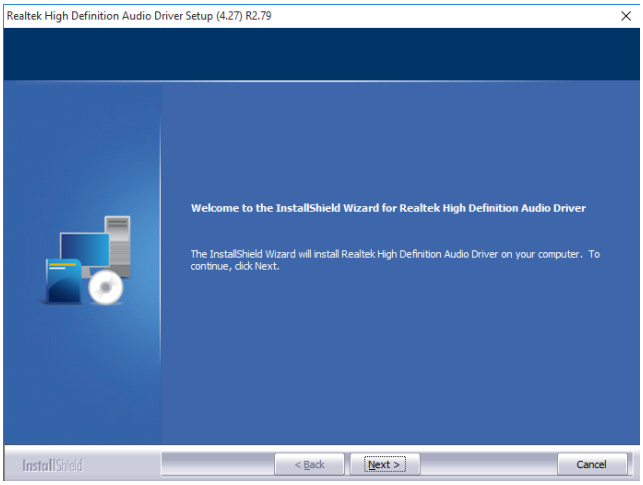


Step 4. Click **Finish** to complete the setup

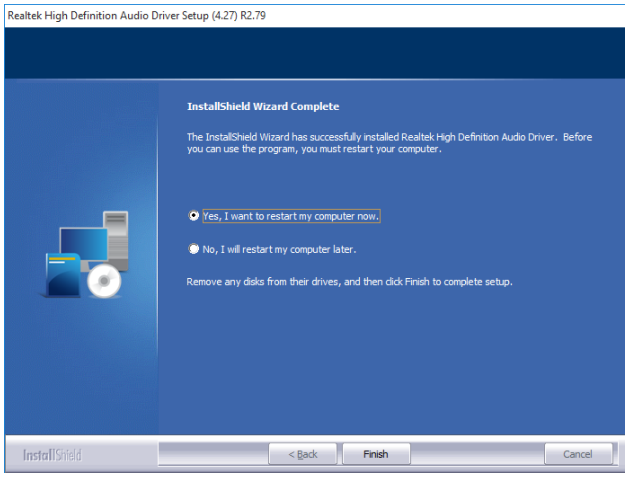
4.4 Install Audio Driver (For Realtek ALC892 HD Audio)

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.

Note: The installation procedures and screen shots in this section are based on Windows 8.1 operation system. If the warning message appears while the installation process, click Continue to go on.



Step1. Click **Next** to Install.

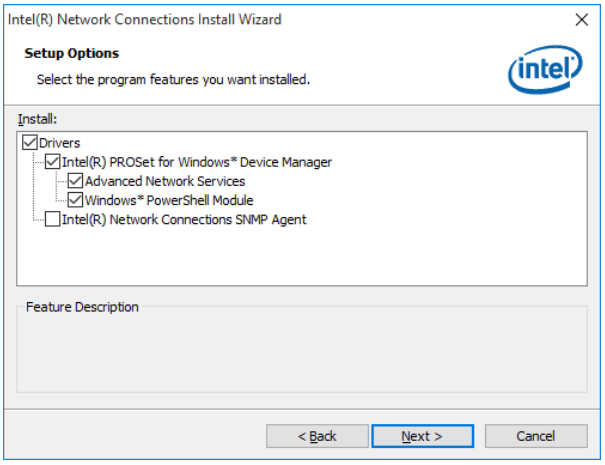


Step 2. Select **Finish** to complete Installation.

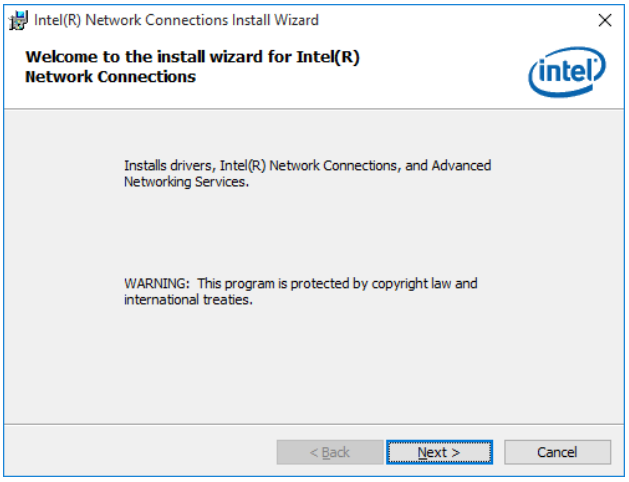
4.5 Install LAN Driver

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.

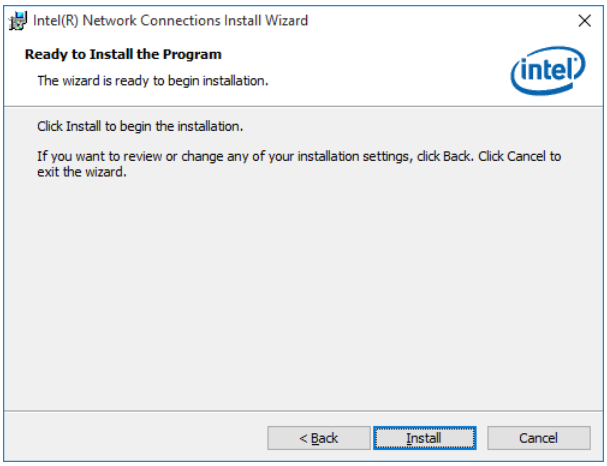
Note: The installation procedures and screen shots in this section are based on Windows 8.1 operation system.



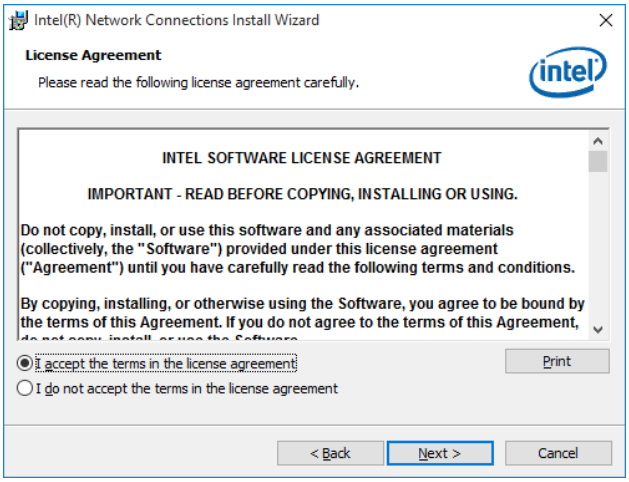
Step 3. Click **Next**.



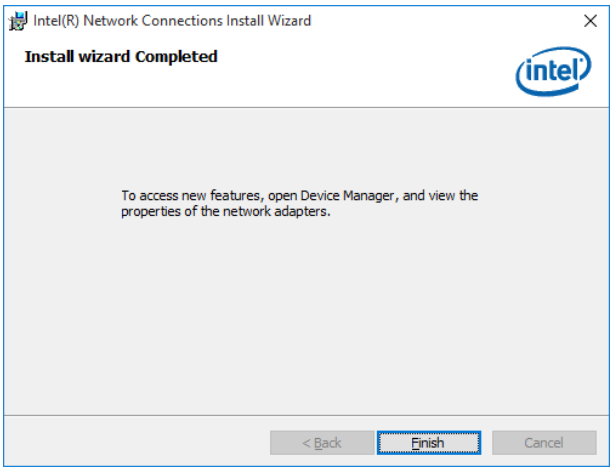
Step 1. Click **Next** to continue installation.



Step 4. Click **Install**.



Step 2. Click **Next**.

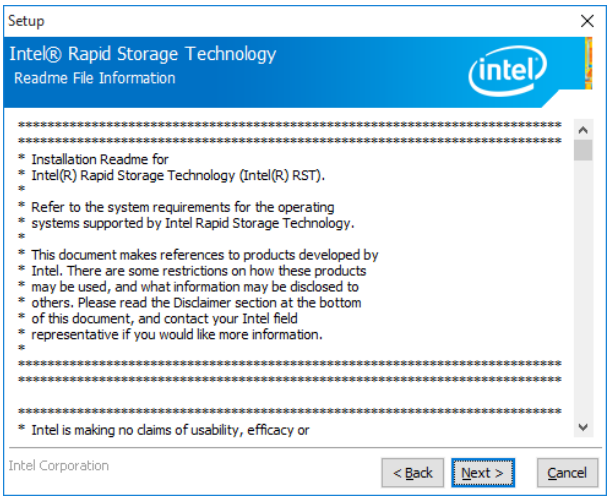


Step 5. Click **Finish** to complete setup.

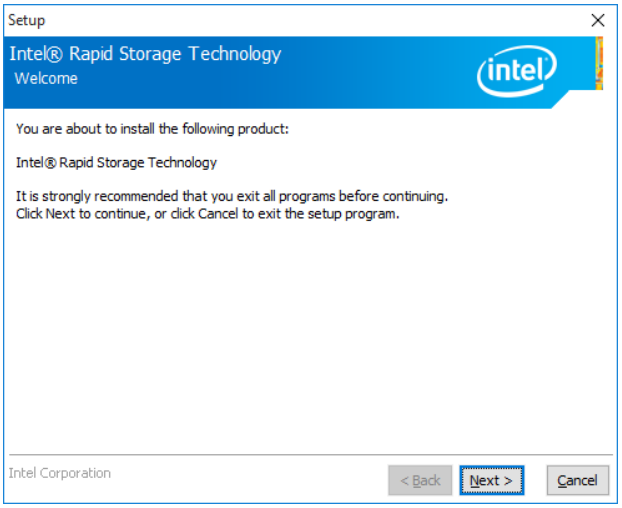
4.6 Install RST Driver

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left.

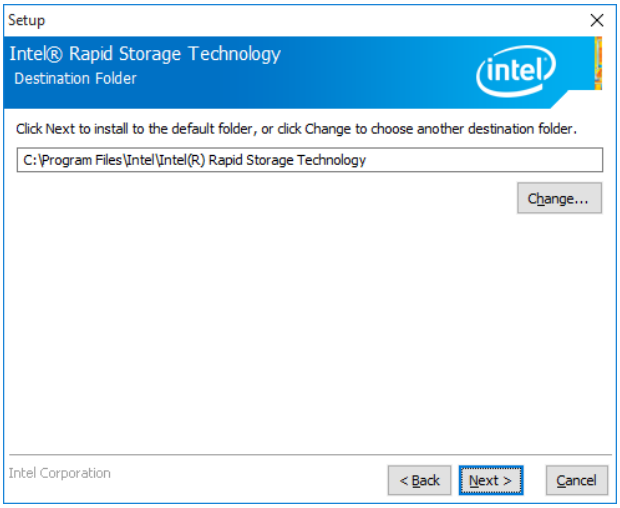
Note: The installation procedures and screen shots in this section are based on Windows 8.1 operation system.



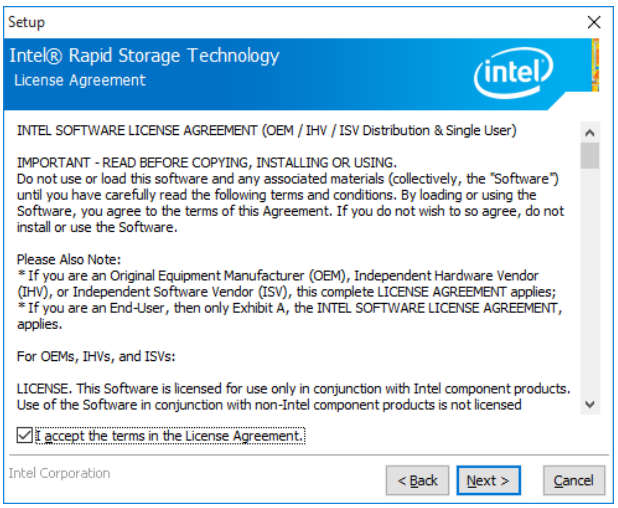
Step 3. Click **Next.**



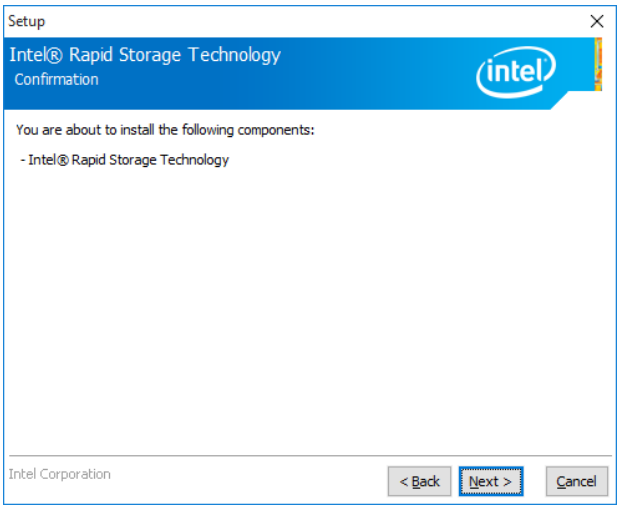
Step 1. Click **Next** to continue installation.



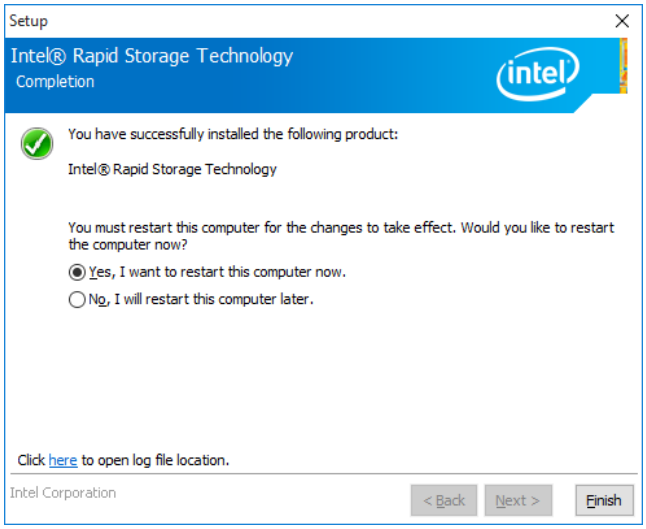
Step 4. Click **Next**.



Step 2. Click **Next**.



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



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