EBM-BDW

5th Gen Intel® Core™ SoC Processor i7/i5/i3
5.25" Mini Module

User's Manual

1st Ed – 21 July 2015

Part No. E2047582400R

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 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.

Notice

This guide is designed for experienced users to setup the system within the shortest time. For detailed information, please always refer to the electronic user's manual.

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1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into body, or (b) support or sustain life and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

A Message to the Customer

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Product Warranty

Avalue warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Avalue, or which have been subject to misuse, abuse, accident or improper installation. Avalue assumes no liability under the terms of this warranty as a consequence of such events. Because of Avalue's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If any of Avalue's products is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details. If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU type and speed, Avalue's products model name, hardware & BIOS revision number, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your good return more quickly.
4. Carefully pack the defective product, a complete Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

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

Before you begin installing your single board, please make sure that the following materials have been shipped:

- 1 x EBM-BDW 5th Generation intel Core Processor 5.25" Mini Module
- 1 x Driver/Utility DVD-ROM

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

1.3 Document Amendment History

Revision	Date	By	Comment
1st	July 2015	Avalue	Initial Release

1.4 Manual Objectives

This manual describes in details Avalue Technology EBM-BDW Single Board.

We have tried to include as much information as possible but we have not duplicated information that is provided in the standard IBM Technical References, unless it proved to be necessary to aid in the understanding of this board.

We strongly recommend that you study this manual carefully before attempting to set up EBM-BDW or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors regarding this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

1.5 System Specifications

System	
CPU	Intel® Boardwell ULT 2 Cores BGA w/ integrated Boardwell PCH-LP (MCP) (Co-layout w/ Core i7/ i5/ i3)
BIOS	AMI uEFI BIOS(*1), 128 Mbit SPI Flash ROM(*2) iAMT 10 supported
System Chipset	Intel Boardwell PCH-LP (MCP; Integrated in Processor)
I/O Chip	EC(IT8528E) Fintek F81216AD for 4 COMs
System Memory	2 x 204-pin DDR3L SO-DIMM (up to 2 DIMMs), 8GB per DIMM, total 16GB
SSD	1 x CF (via JMB368) 3 x SATA ports, 1 x mSATA (mPCIe connector), 1 x 15+7 pin SATA connector, 1 x 7 pin SATA(7th Pin) (cowork w/ 2-pin 5V power)
Watchdog Timer	H/W Reset, 1sec. – 65535sec. and 1sec./step
H/W Status Monitor	CPU & system temperature monitoring Voltages monitoring
Expansion	1 x mPCIe w/ SIM slot 1 x mPCIe supports mSATA only
I/O	
MIO	1 x HDMI, 1 x CF (via JMB368) 1 x Lockable DC Jack 2 x LAN 2 x USB 3.0 (compatible with USB 2.0) 1 x COM D-Sub 9-pin (RS232/422/485 selected by BIOS), 1 x box wafer behind external I/O and 4 x box wafer (90-degree box wafer same as EBM-CDV) 1 x dual deck LED(green color for power-on indication/ Yellow color for HDD active indication) Audio jack (output)
USB	2 x USB 3.0 Type A (including 2 x USB 2.0) 2 x USB 2.0 10-pin box wafer 1 x USB 2.0 for Touch controller 1 x USB through mPCIe port
GPIO	16-bit General Purpose I/O for DI (8bit) and DO(8bit) IC: PCA9555
Touch Interface	1 x USB 2.0 (EETI ETP-CP-MER4485XRU support 5 wire)
Display	

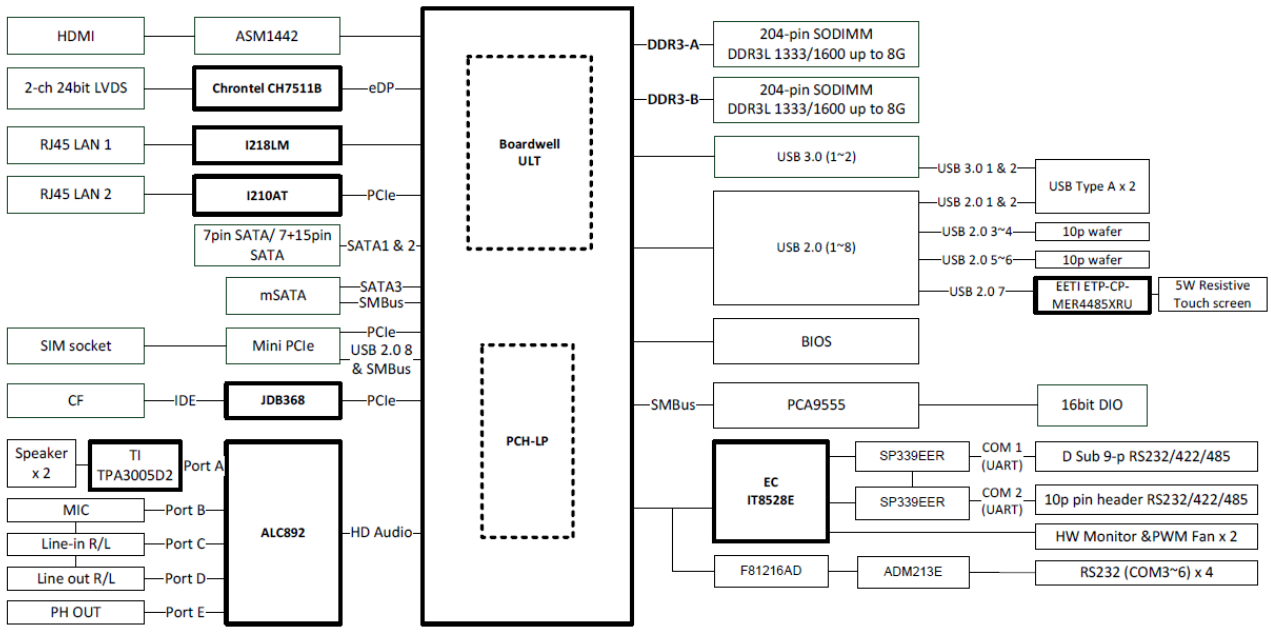
Chipset	Intel Boardwell GT2 integrated w/ CPU
Resolution	HDMI: 4000 x 2000@24Hz (single display) LVDS via CH7511: 1920 x 1200@60Hz
Multiple Display	Dual-display supported: HDMI+LVDS
HDMI	1 x HDMI
LCD Interface	1 x eDP via CH7511 supports 24bit Dual Channel LVDS
Audio	
AC97 Codec	Realtek ALC892 supports 5.1 CH Audio
Audio Amp	TI TPA3005D2
Ethernet	
LAN Chip	1 x Intel I210AT GbE controller 1 x Intel I218LM GbE PHY
Ethernet Interface	10/100/1000 Base-Tx compatible
Touch	
Chipset	EETI ETP-CP-MER4485XRU support 5 wire
Touch Interface	1 x 5-pin 2.0mm pin header
Internal I/O Connectors	
Fan	Fanless (System fan and CPU fan reserved)
CMOS Battery	Cable type battery CR-2032
Audio	1 x Audio output (external I/O) 2 x 2-pin Speak out connector Jaudio 2 x 6 header (Line in, Line out & Mic in)
Rear I/O Connectors	
USB	2 x USB 3.0 Type A (including 2 x USB 2.0)
LAN	2 x RJ-45 LAN
HDMI	1 x HDMI
LED	1 x dual deck LED(green color for power-on indication/ Yellow color for HDD active indication)
Power	1 x Lockable DC Jack
Audio	1 x Headphone Audio Jack
COM	1 x COM1
Mechanical & Environmental	
Power Requirement	+12 ~ +26V, ErP

Power Type	AT or ATX mode
Operating Temp.	0°C ~ 60°C (32°F ~ 140°F)
Operating Humidity	0% ~ 90% relative humidity, non-condensing
Size (L x W)	8" x 5.75" (203mm x 146mm x 19mm)
Weight	TBD
Safety	CE FCC Class B
Others	4 screw holes for fixing heatsink without covering RAM
Certifications	
Certification Information	CE FCC Class B
Software Support	
OS Information	Win8, Win7, Linux

Note: Specifications are subject to change without notice.

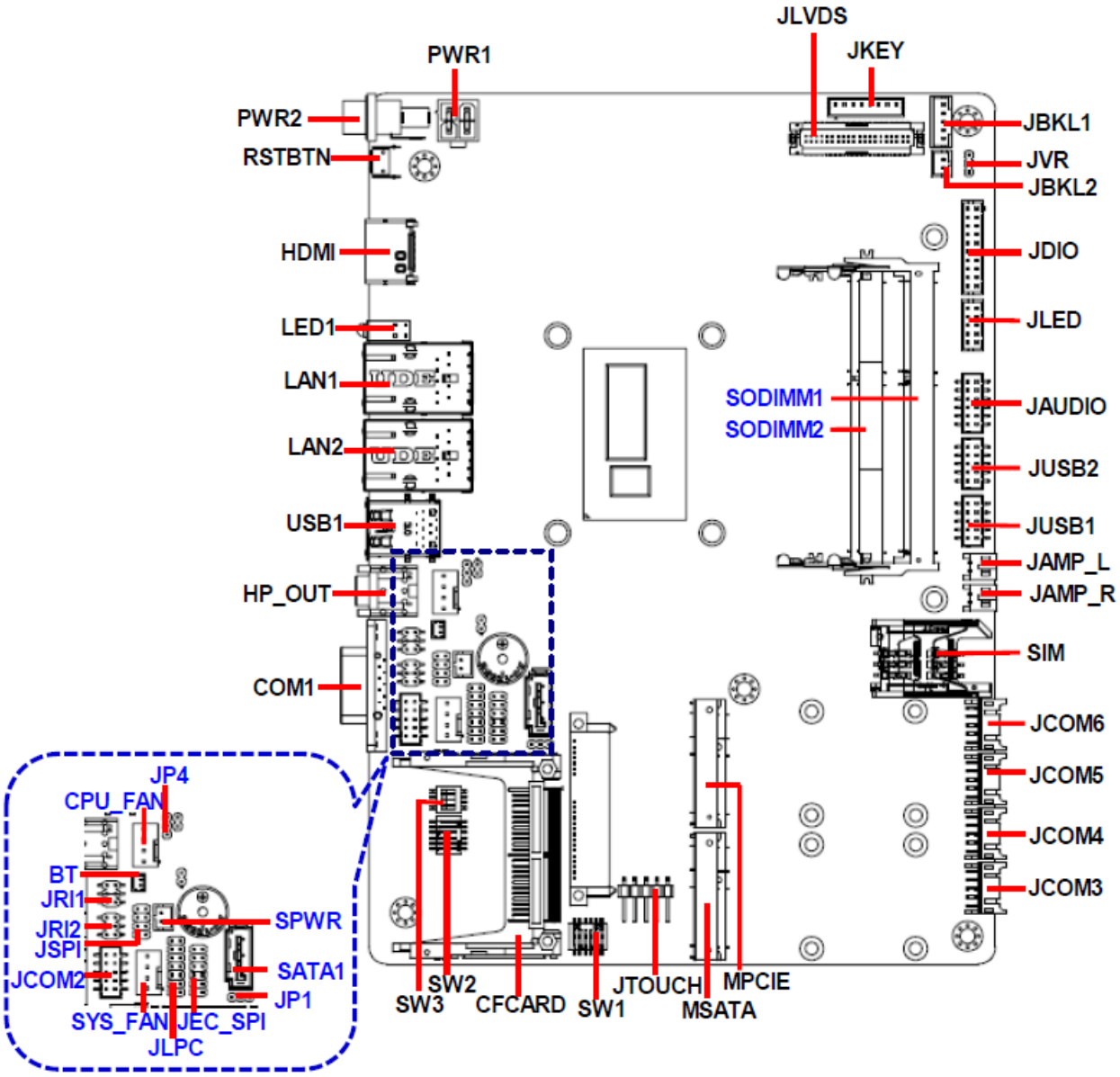
1.6 Architecture Overview—Block Diagram

The following block diagram shows the architecture and main components of EBM-BDW.



2. Hardware Configuration

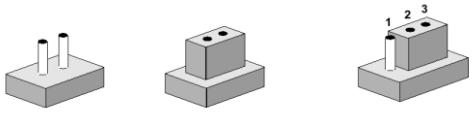
2.1 Product Overview



2.2 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper you connect the pins with the clip. To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



Open Closed Closed 2-3

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

Open Closed Closed 2-3

A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

The following tables list the function of each of the board's jumpers and connectors.

Jumpers

Label	Function	Note
JRI1	Serial port 1/2 pin9 signal select	3 x 2 header, pitch 2.00mm
JVR	LCD backlight brightness adjustment	3 x 1 header, pitch 2.00mm
SW1	Multi-function select	DIP switch 6pin
SW2	Serial port 1/2 - RS-485 mode selector	DIP switch 6pin
SW3	Serial port 1/2 - RS-422 mode selector	DIP switch 4pin
JP1	SATA Power select (SATA1- Serial ATA connector)	3 x 1 header, pitch 2.00mm
JP4	SATA 2 Pin 7 Power Mode selector	3 x 1 header, pitch 2.00mm

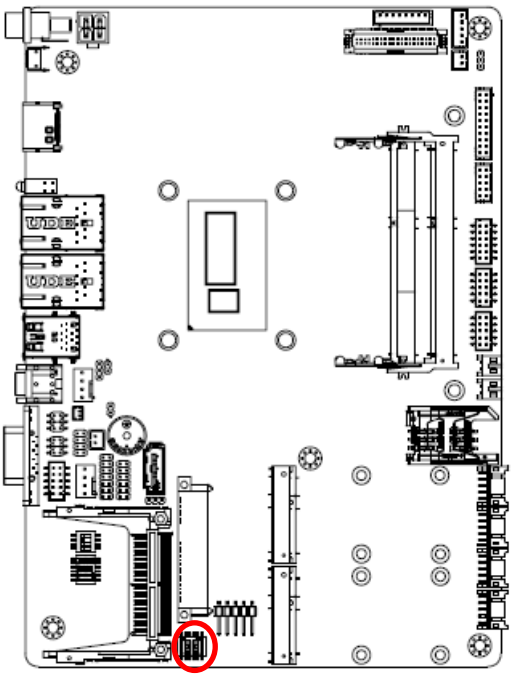
Connectors

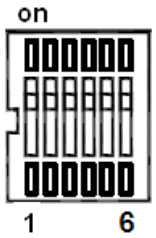
Label	Function	Note
CPU_FAN	CPU fan connector	4 x 1 wafer, pitch 2.54mm

SYS_FAN	System fan connector	4 x 1 wafer, pitch 2.54mm
JBKL1	LCD Inverter connector 1	5 x 1 wafer, pitch 2.00mm
JBKL2	LCD Inverter connector 2	2 x 1 wafer, pitch 2.00mm
COM1	Serial Port 1 connector	D-sub 9 pin, male
JCOM2	Serial Port 2 connector	5 x 2 wafer, pitch 2.00mm
JCOM3/4/5/6	Serial Port 3/4/5/6 connector	5 x 2 wafer, pitch 2.00mm
JDIO	General purpose I/O connector	10 x 2 wafer, pitch 2.00mm
JLED	LED indicator connector	5 x 2 wafer, pitch 2.00mm
LED1	HDD/Power LED indicator	
JLVDS	LVDS Connector	DIN 40-pin wafer, pitch 1.25mm
JTOUCH	Touch panel connector	5 x 1 header, pitch 2.54mm
USB1	2 x USB3.0 connector	
JUSB1	USB connector 1	5 x 2 wafer, pitch 2.00mm
JUSB2	USB connector 2	5 x 2 wafer, pitch 2.00mm
JAUDIO	Audio connector	6 x 2 wafer, pitch 2.00mm
LAN1/2	RJ-45 Ethernet 1/2	
BT	Battery connector	2 x 1 wafer, pitch 1.25mm
JKEY	OSD for front panel key	8 x 1 wafer, pitch 2.00mm
SODIMM1/2	DDR3 SODIMM socket	
JAMP_R	AMPLIFIER_R	2 x 1 wafer, pitch 2.00mm
JAMP_L	AMPLIFIER_L	2 x 1 wafer, pitch 2.00mm
MPCIE	Mini-PCIe connector	
MSATA	SMBUS & SATA connector	
JLPC	LPC connector	5 x 2 header, pitch 2.00mm
PWR1	Power connector	2 x 2 wafer, pitch 4.20mm
PWR2	Power connector	
RSTBTN	Reset button	
JSPI	SPI connector	4 x 2 header, pitch 2.00mm
JEC_SPI	EC_Program	4 x 2 header, pitch 2.00 mm
SPWR	SATA Power connector	2 x 1 wafer, pitch 2.00mm
SATA1	Serial ATA connector 1	
SIM	SIM card slot	
HDMI	HDMI connector	
HP_OUT	Audio line-out connector	
CFCARD	Compact Flash card slot	

2.3 Setting Jumpers & Connectors

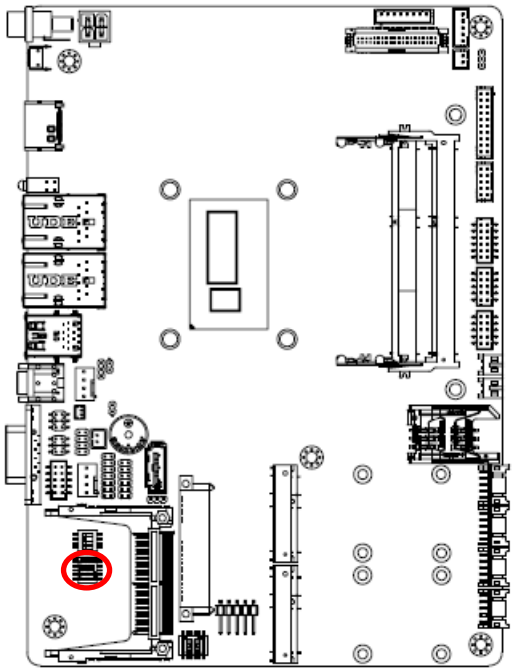
2.3.1 Multi-function select (SW1)

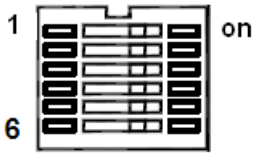




	ON	OFF
1	AT SEL	ATX SEL
2	CF Slave	CF Master
3	Touch off	Touch on
4	Touch: 5W	Touch: 5W
5	BKLT: Negative	BKLT: Positive
6	GPIO: Low	GPIO: High

2.3.2 Serial port 1/2 - RS-485 mode selector (SW2)





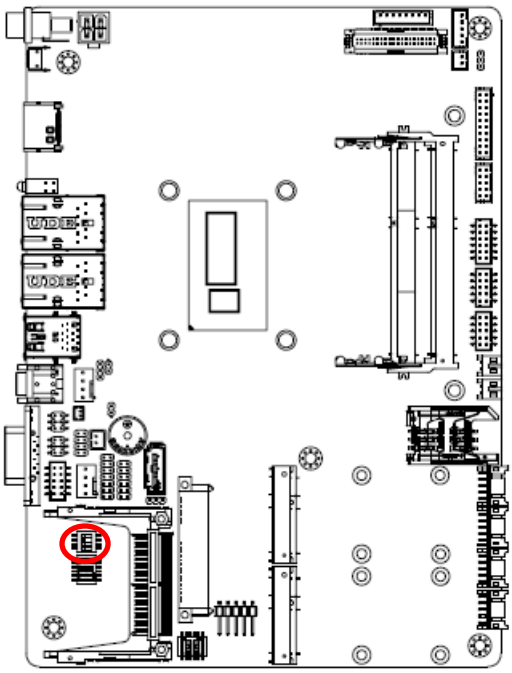
In Serial Port 1 mode

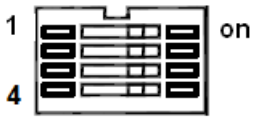
	ON	OFF
1	Auto Direction	RTS# Control
2	External biasing resistor	OPEN
3	External biasing resistor	OPEN

In Serial Port 2 mode

	ON	OFF
1	Auto Direction	RTS# Control
2	External biasing resistor	OPEN
3	External biasing resistor	OPEN

2.3.3 Serial port 1/ 2 - RS-422 mode selector (SW3)





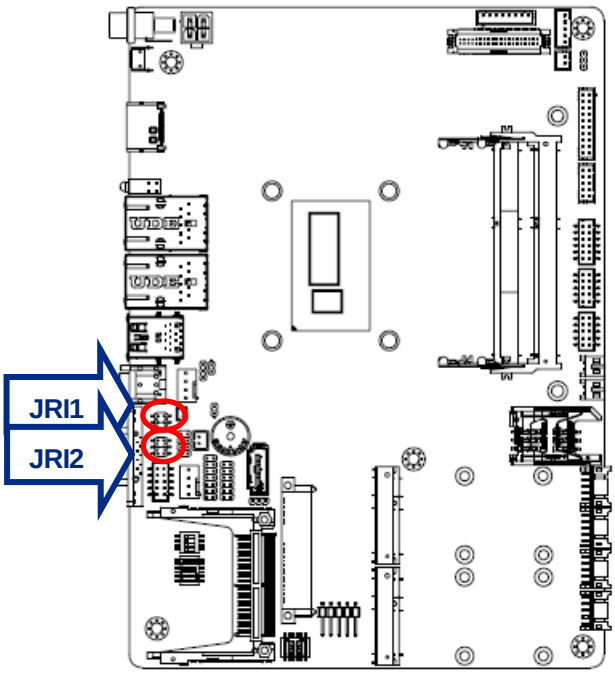
In Serial Port 1 mode

	ON	OFF
1	External biasing resistor	OPEN
2	External biasing resistor	OPEN

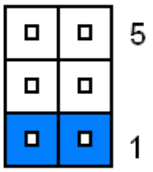
In Serial Port 2 mode

	ON	OFF
1	External biasing resistor	OPEN
2	External biasing resistor	OPEN

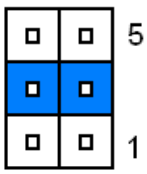
2.3.4 Serial port 1/ 2 pin9 signal select (JRI1/ JRI2)



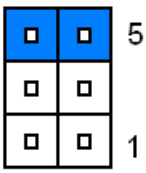
Ring*



+5V

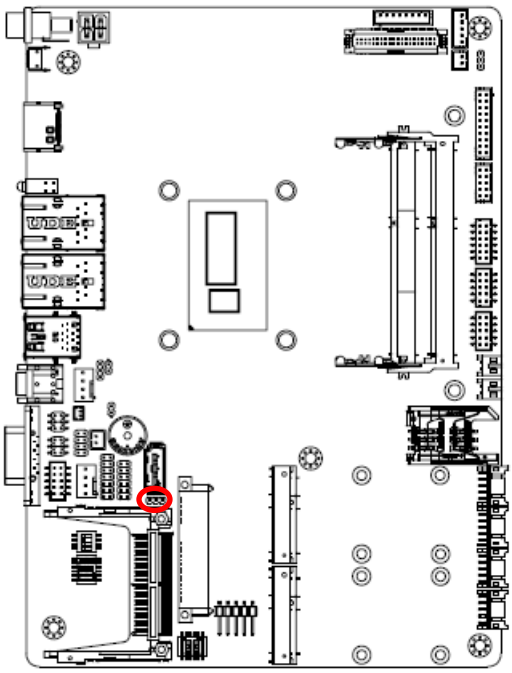


+12V



*** Default**

2.3.5 SATA Power select (JP1)

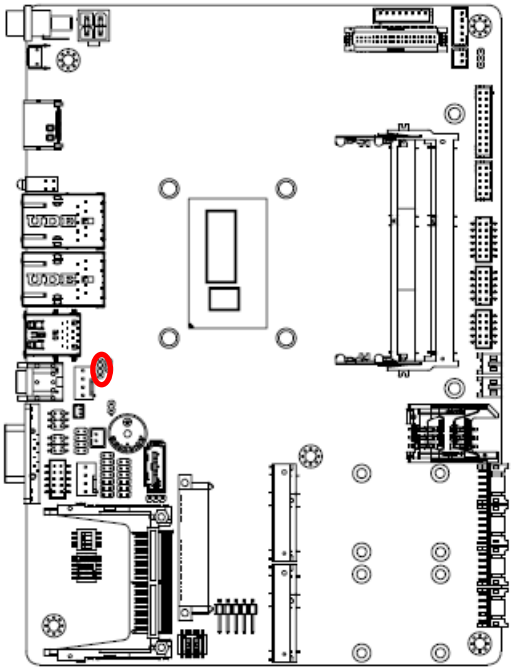


*** Default**

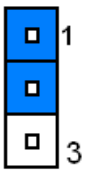
Signal	PIN
SATA_PWR1	1
SATA1_P7	2
GND	3

*** Default**

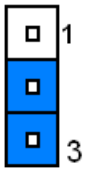
2.3.6 Clear CMOS (JP4)



Protect*

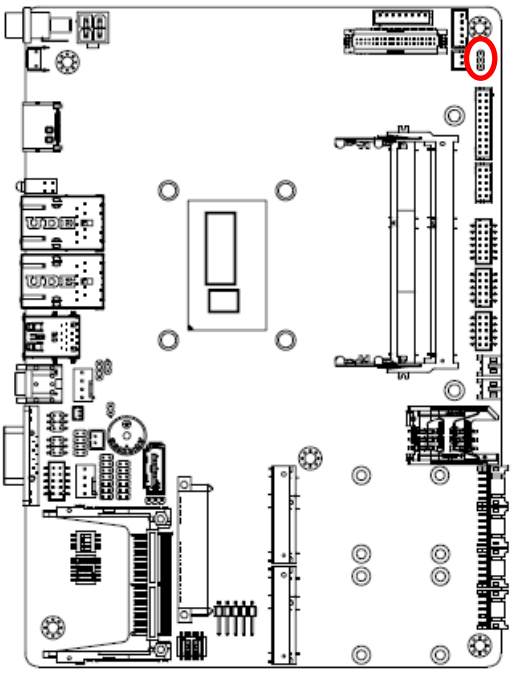


Clear CMOS

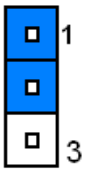


*** Default**

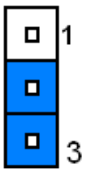
2.3.7 LCD backlight brightness adjustment (JVR)



PWM Mode*

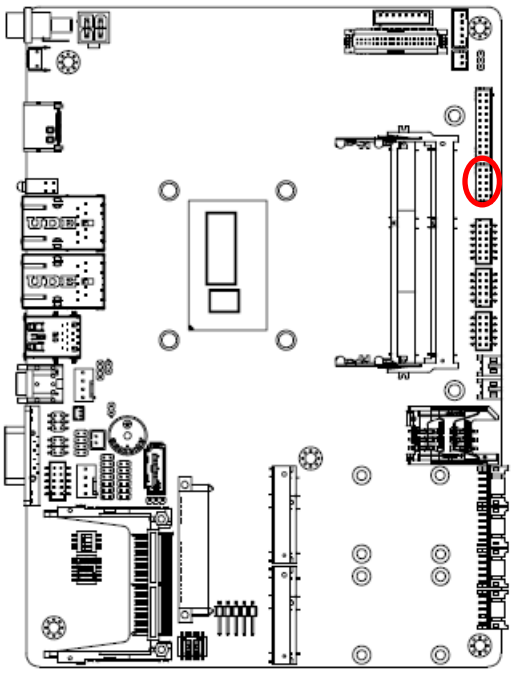


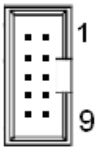
DC Mode



*** Default**

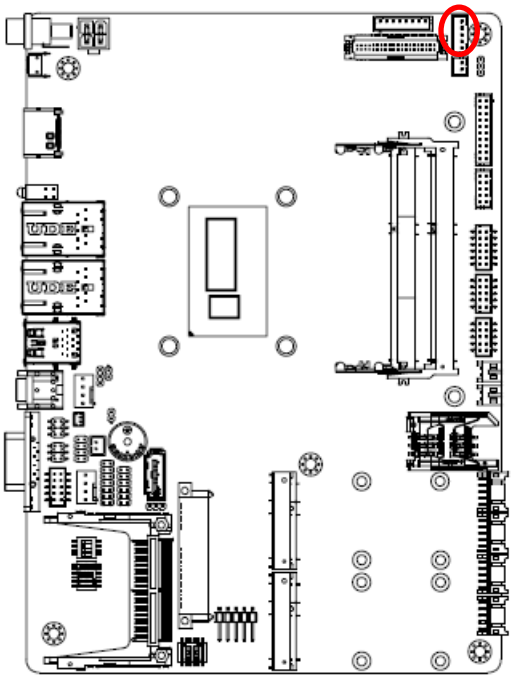
2.3.8 LED indicator connector (JLED)





Signal	PIN	PIN	Signal
PWR_LED_FP#	2	1	+5VSB
HDD_LED#	4	3	+5V
LAN1_ACT#	6	5	+V3P3M
LAN2_ACT#	8	7	+V3P3A
PWR_BTN_IN_EC#	10	9	GND

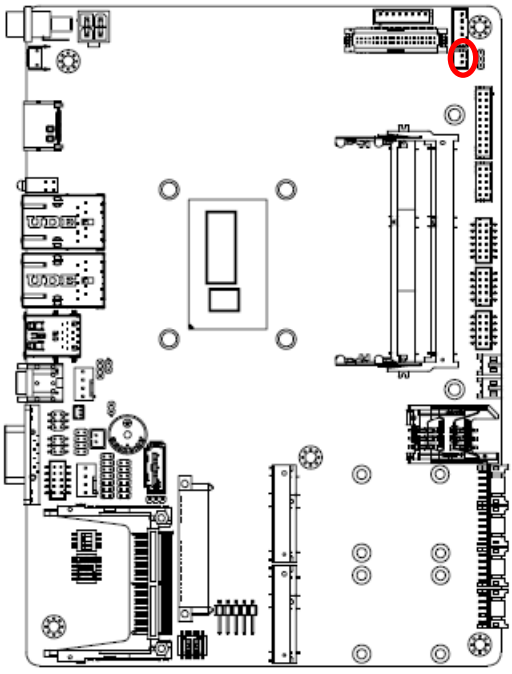
2.3.9 LCD Inverter connector 1 (JBKL1)



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

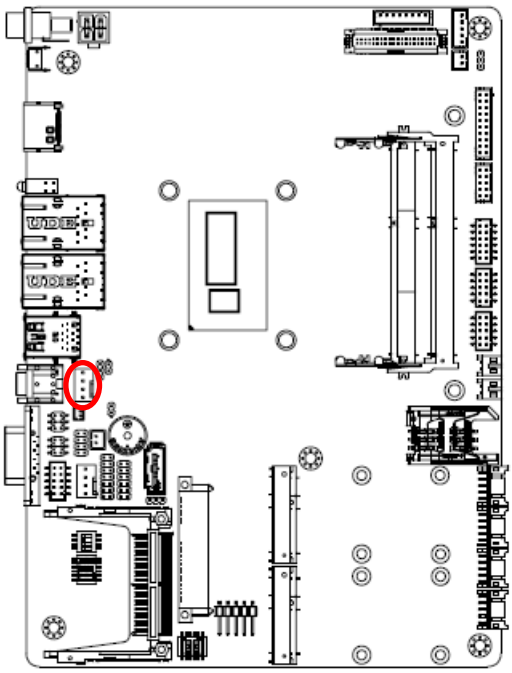
Note:
For inverters with adjustable Backlight function, it is possible to control the LCD brightness through the VR signal controlled by **JVR**. Please see the **JVR** section for detailed circuitry information.

2.3.10 LCD Inverter connector 2 (JBKL2)



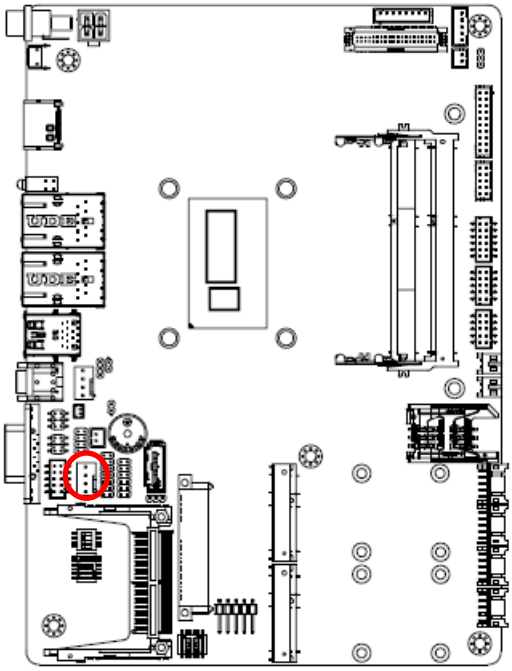
Signal	PIN
+12V	1
GND	2

2.3.11 CPU fan connector (CPU_FAN)



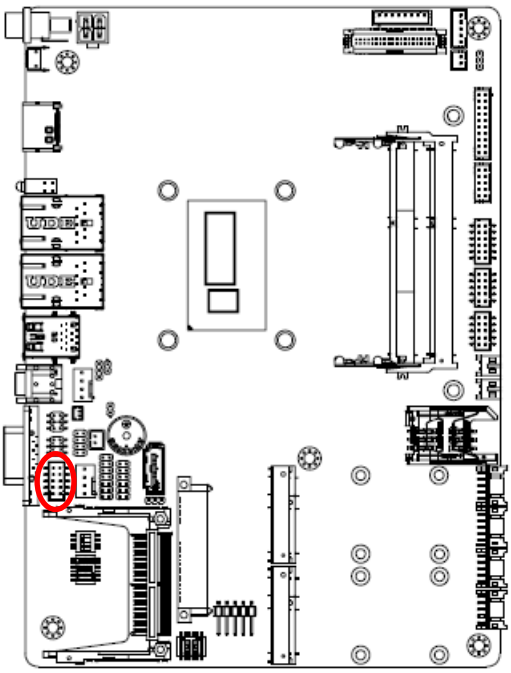
Signal	PIN
FAN_PWM0	4
EC_TACH0	3
+12V	2
GND	1

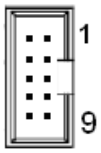
2.3.12 System fan connector (SYS_FAN)



Signal	PIN
FAN_PWM1	4
EC_TACH1	3
+12V	2
GND	1

2.3.13 Serial port 2 connector (JCOM2)





RS-232 Mode

Signal	PIN	PIN	Signal
NRXDB#	2	1	NDCDB
NDTRB#	4	3	NTXDB
NDSRB#	6	5	GND
NCTSB#	8	7	NRTSB#
NC	10	9	NRIB#

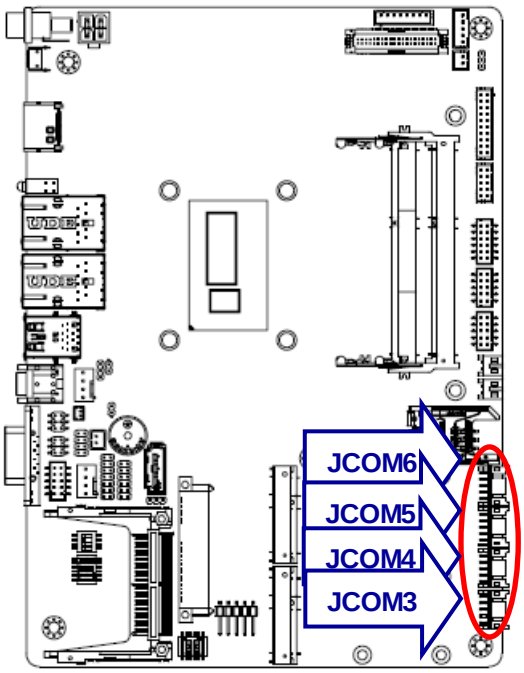
RS-422 Mode

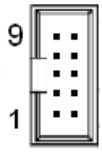
Signal	PIN	PIN	Signal
485TXP	2	1	485TXN
485RXN	4	3	485RXP
NC	6	5	GND
NC	8	7	NC
NC	10	9	NC

RS-485 Mode

Signal	PIN	PIN	Signal
485TXP	2	1	485TXN
NC	4	3	NC
NC	6	5	GND
NC	8	7	NC
NC	10	9	NC

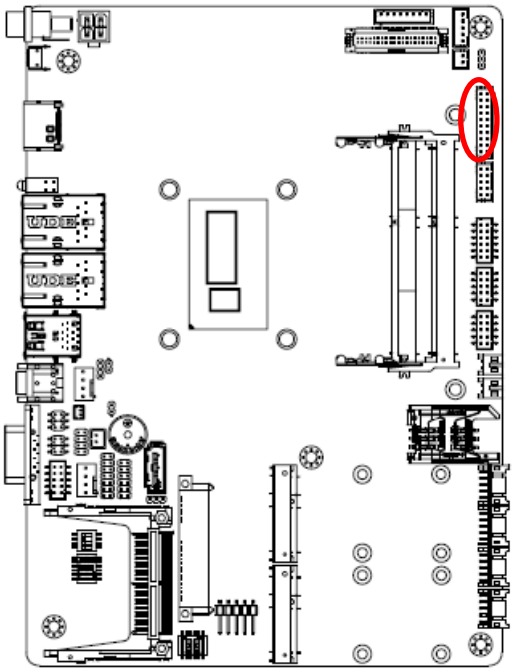
2.3.14 Serial port 3/4/5/6 connector (JCOM3/JCOM4/JCOM5/JCOM6)

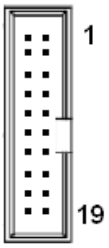




Signal	PIN	PIN	Signal
COM_RI#	9	10	NC
COM_RTS#	7	8	COM_CTS#
GND	5	6	COM_DSR#
COM_TXD	3	4	COM_DTR#
COM_DCD#	1	2	COM_RXD#

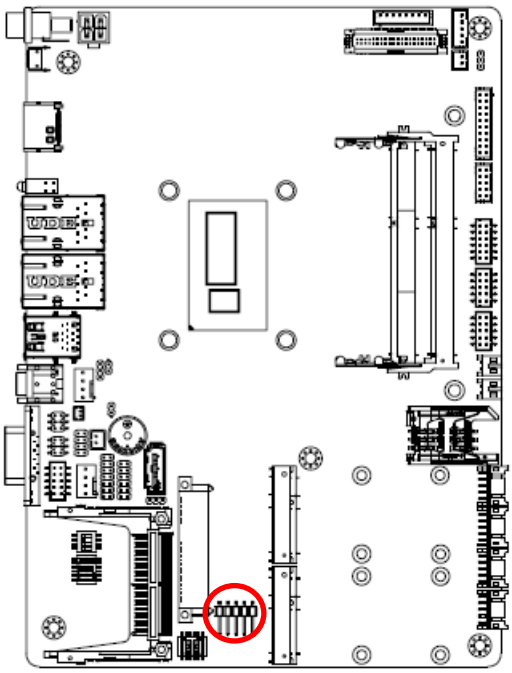
2.3.15 General purpose I/O connector (JDIO)

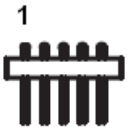




Signal	PIN	PIN	Signal
DI0	2	1	DO0
DI1	4	3	DO1
DI2	6	5	DO2
DI3	8	7	DO3
DI4	10	9	DO4
DI5	12	11	DO5
DI6	14	13	DO6
DI7	16	15	DO7
I2C-SMB_CLK_VCC	18	17	I2C-SMB_DATA_VCC
GND	20	19	+5V

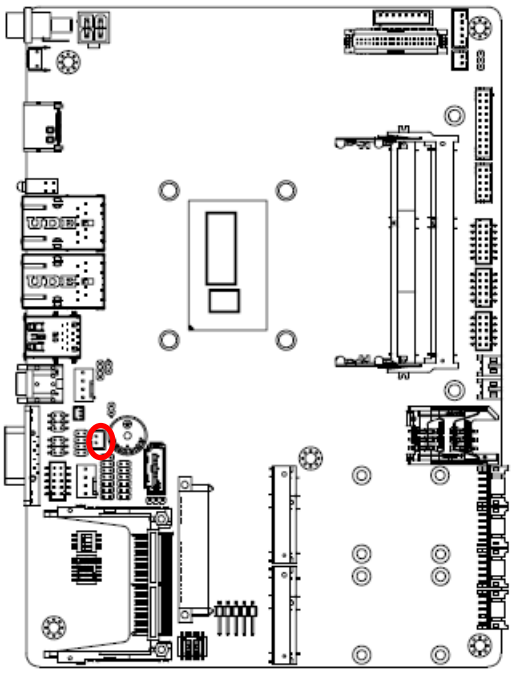
2.3.16 Touch panel connector (JTOUCH)





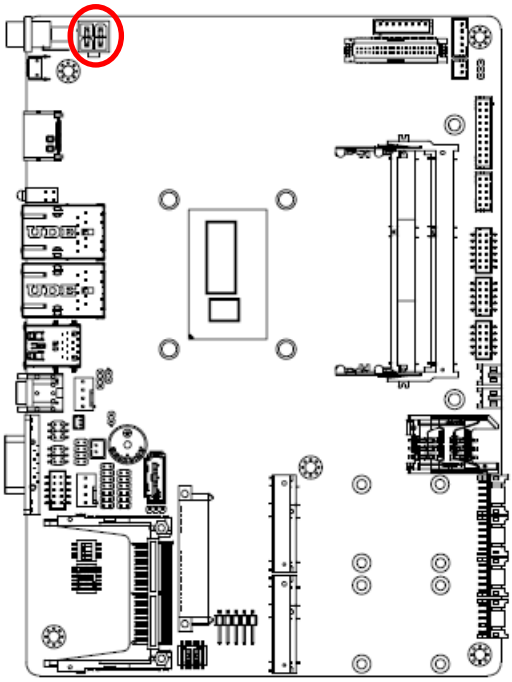
Signal	PIN
THX-	1
THX+	2
THPROBE_R	3
THY+	4
THY-	5

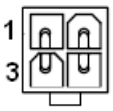
2.3.17 SATA Power connector (SPWR)



Signal	PIN
+5V	2
GND	1

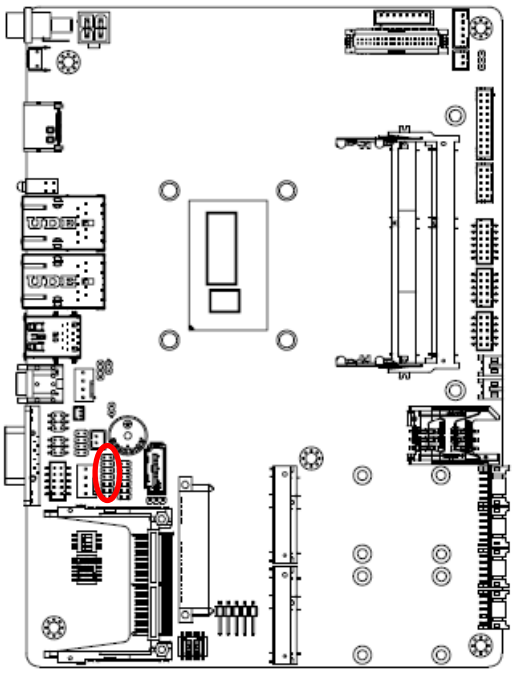
2.3.18 Power connector (PWR1)

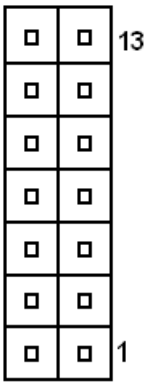




Signal	PIN	PIN	Signal
GND	1	2	GND
+V_DCIN	3	4	+V_DCIN

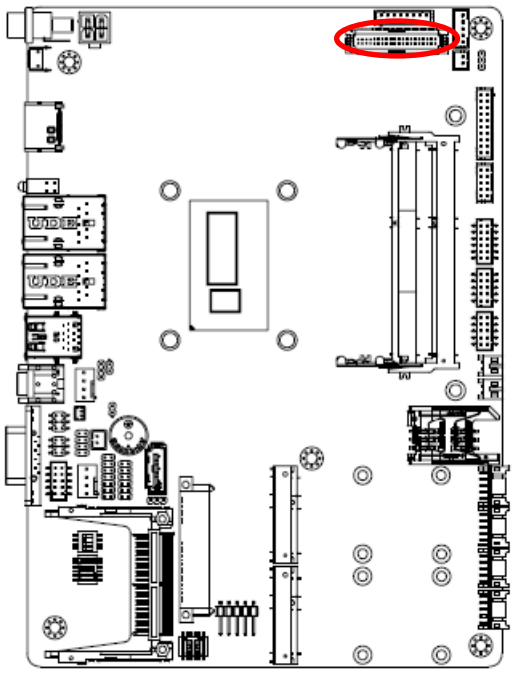
2.3.19 LPC connector (JLPC)

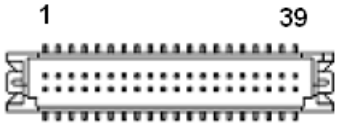




Signal	PIN	PIN	Signal
GND	14	13	+5VSB
GND	12	11	+5V
GND	10	9	SERIRQ
CLK_PCI_JLPC	8	7	LPC_AD3
LPC_LFRAME#	6	5	LPC_AD2
PLTRST#	4	3	LPC_AD1
+3V	2	1	LPC_AD0

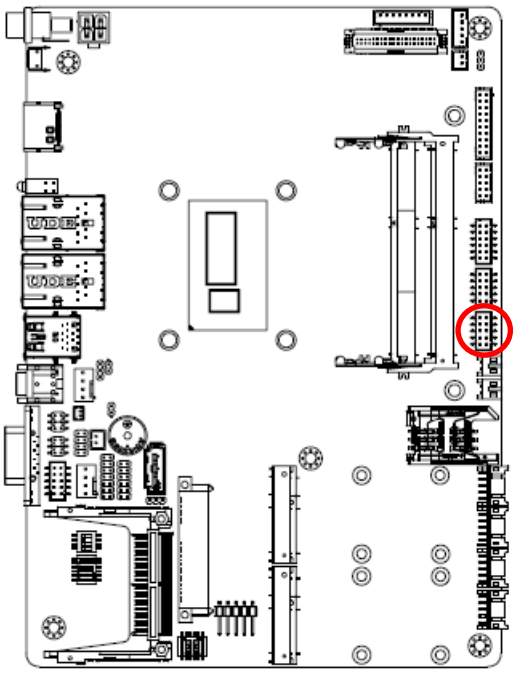
2.3.20 LVDS connector (JLVDS)

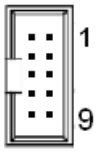




Signal	PIN	PIN	Signal
+3V	1	2	+5V
+3V	3	4	+5V
LVDS_DDC_CLK	5	6	LVDS_DDC_DATA
GND	7	8	GND
LVDS_DATA1_P	9	10	LVDS_DATA0_P
LVDS_DATA1_N	11	12	LVDS_DATA0_N
GND	13	14	GND
LVDS_DATA3_P	15	16	LVDS_DATA2_P
LVDS_DATA3_N	17	18	LVDS_DATA2_N
GND	19	20	GND
LVDS_DATA5_P	21	22	LVDS_DATA4_P
LVDS_DATA5_N	23	24	LVDS_DATA4_N
GND	25	26	GND
LVDS_DATA7_P	27	28	LVDS_DATA6_P
LVDS_DATA7_N	29	30	LVDS_DATA6_N
GND	31	32	GND
LVDS_CLK2_P	33	34	LVDS_CLK1_P
LVDS_ CLK2_N	35	36	LVDS_ CLK1_N
GND	37	38	GND
+12V	39	40	+12V

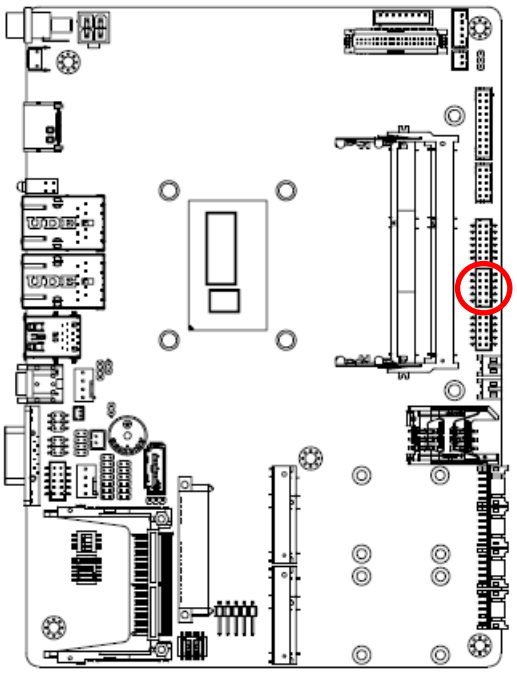
2.3.21 USB connector 1 (JUSB1)

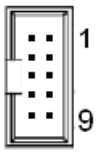




Signal	PIN	PIN	Signal
+VCC_USB23	2	1	+VCC_USB23
USB_DN2	4	3	USB_DN3
USB_DP2	6	5	USB_DP3
GND	8	7	GND
GND	10	9	GND

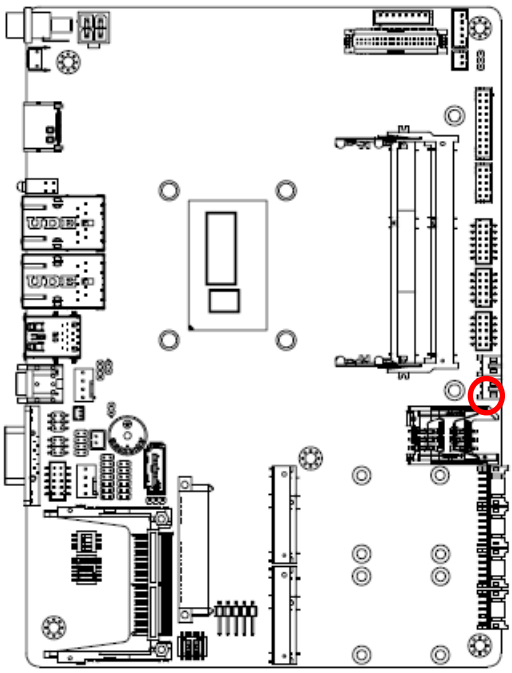
2.3.22 USB connector 2 (JUSB2)





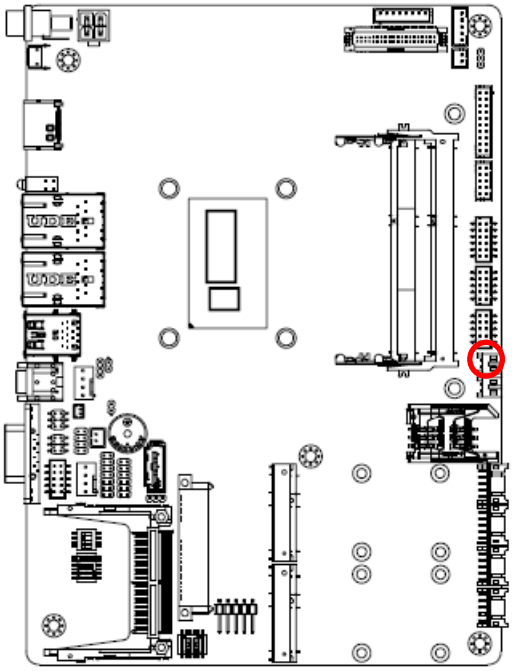
Signal	PIN	PIN	Signal
+VCC_USB45	2	1	+VCC_USB45
USB_DN4	4	3	USB_DN5
USB_DP4	6	5	USB_DP5
GND	8	7	GND
GND	10	9	GND

2.3.23 AMPLIFIER_R (JAMP_R)



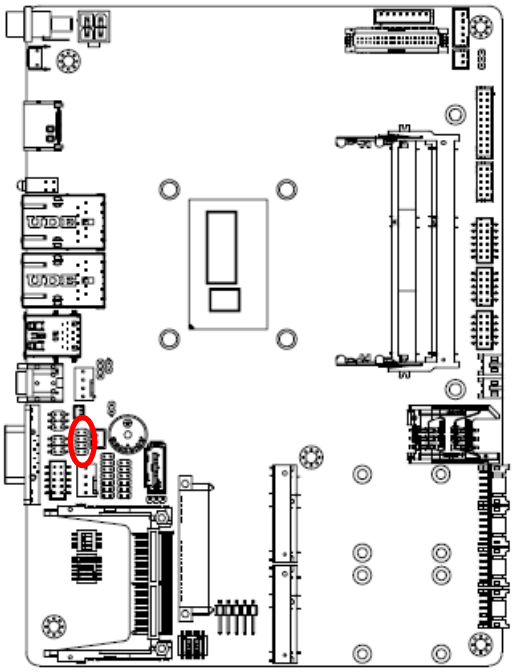
Signal	PIN
AMP_ROUT-	2
AMP_ROUT+	1

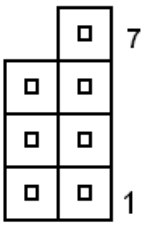
2.3.24 AMPLIFIER_L (AMP_L)



Signal	PIN
AMP_LOUT-	2
AMP_LOUT+	1

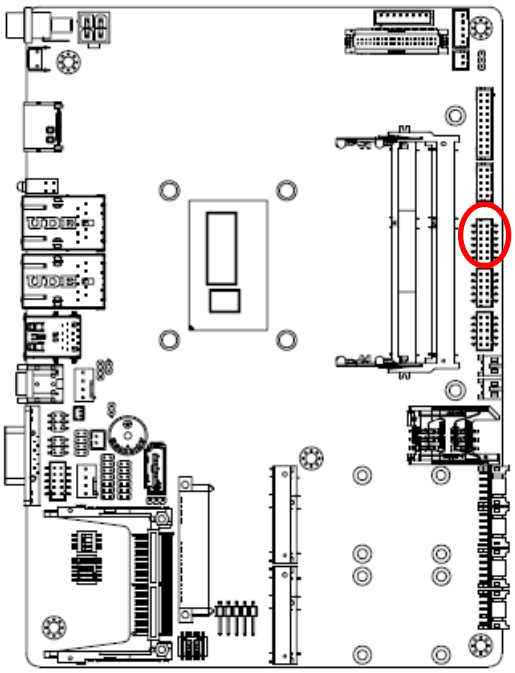
2.3.25 SPI connector (JSPI)

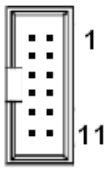




Signal	PIN	PIN	Signal
		7	HOLD#
SPI_SI	6	5	SPI_SO
SPI_CLK	4	3	SPI_CS0#
GND	2	1	+V3P3A_SPI

2.3.26 Audio connector (JAUDIO)



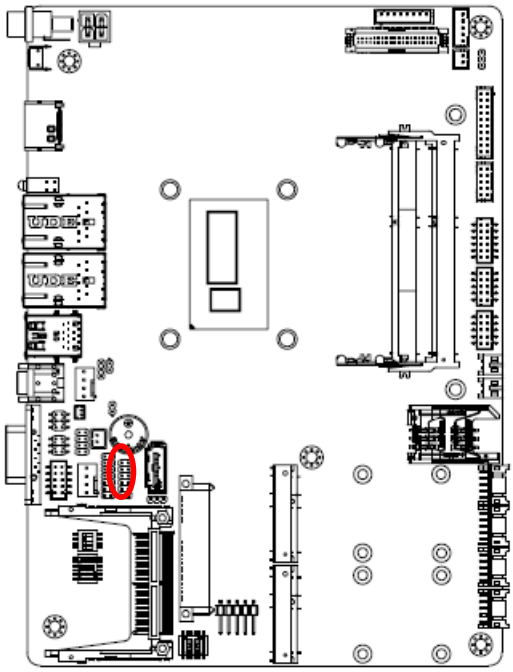


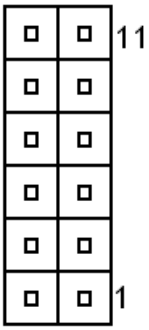
Signal	PIN	PIN	Signal
LINEOUT_R	2	1	LINEOUT_L
GND	4	3	GND
LINE1_RIN	6	5	LINE1_LIN
MIC_RIN	8	7	MIC_LIN
FRONT_JD	10	9	LINE1_JD
MIC1_JD	12	11	GND

2.3.26.1 Signal Description – Audio connector (JAUDIO)

Signal	Signal Description
LINE1_JD	AUDIO IN (LINE_RIN/LIN)sense pin
FRONT_JD	AUDIO Out(ROUT/LOUT) sense pin
MIC1_JD	MIC IN (MIC_RIN/LIN) sense pin

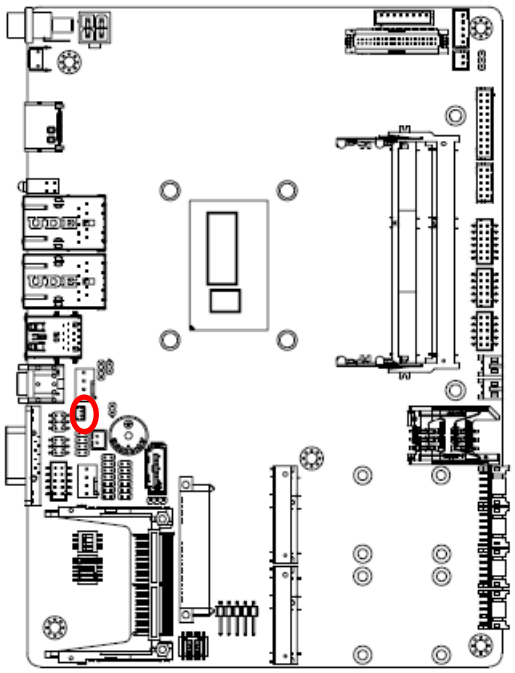
2.3.27 EC_Program (JEC_SPI)





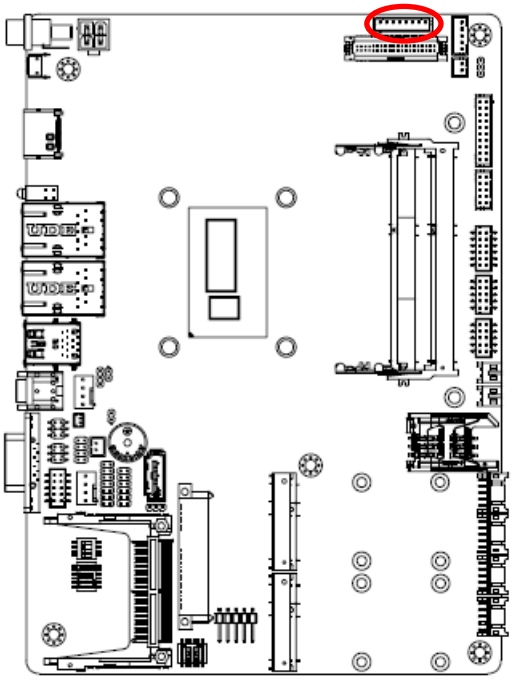
Signal	PIN	PIN	Signal
EC_SMDAT	12	11	EC_SMCLK
EC_SMDAT_DEBUG	10	9	EC_SMCLK_DEBUG
NC	8	7	EC_HOLD#
EC_FMOSI	6	5	EC_FMISO
EC_FSCK	4	3	EC_FSCE#
GND	2	1	+VSPI_EC

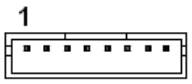
2.3.28 Battery connector (BT)



Signal	PIN
GND	2
+VBAT	1

2.3.29 OSD for front panel key (JKEY)





Signal	PIN
GND	1
+V3P3EC	2
EC_PWM	3
EC_GPIOJ1	4
EC_GPIOJ2	5
EC_GPIOJ3	6
EC_GPIOJ4	7
EC_DC	8

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 bottom 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 or restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

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
PGUP/HOME key	Go to Top of Screen
PGDN/END key	Go to Bottom of Screen
+ 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 Windows press <Esc> or <Enter> key.

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.

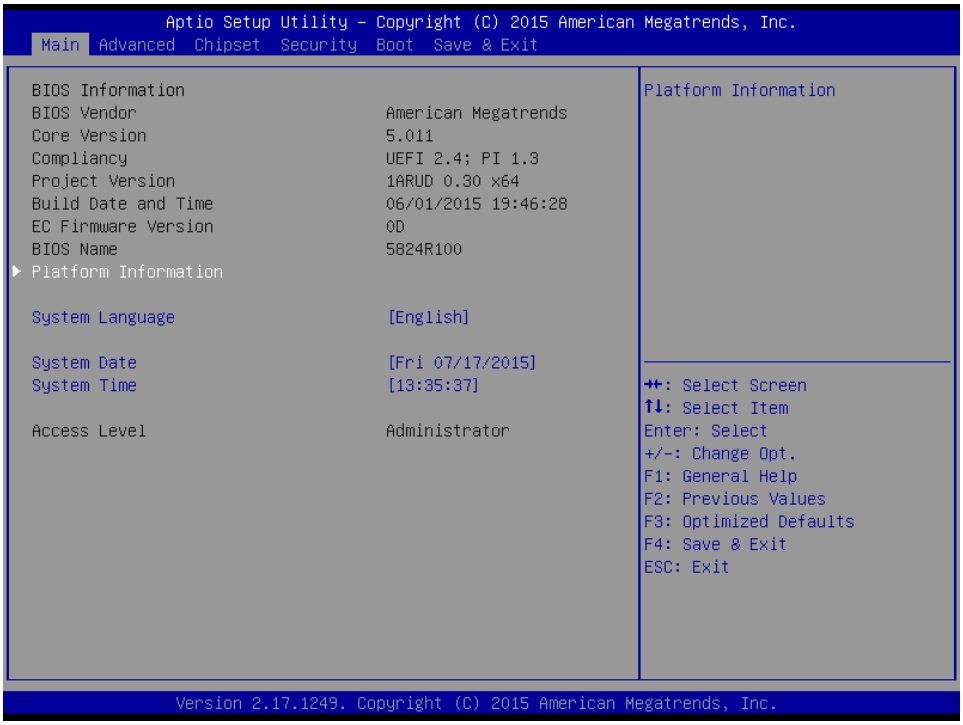
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance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

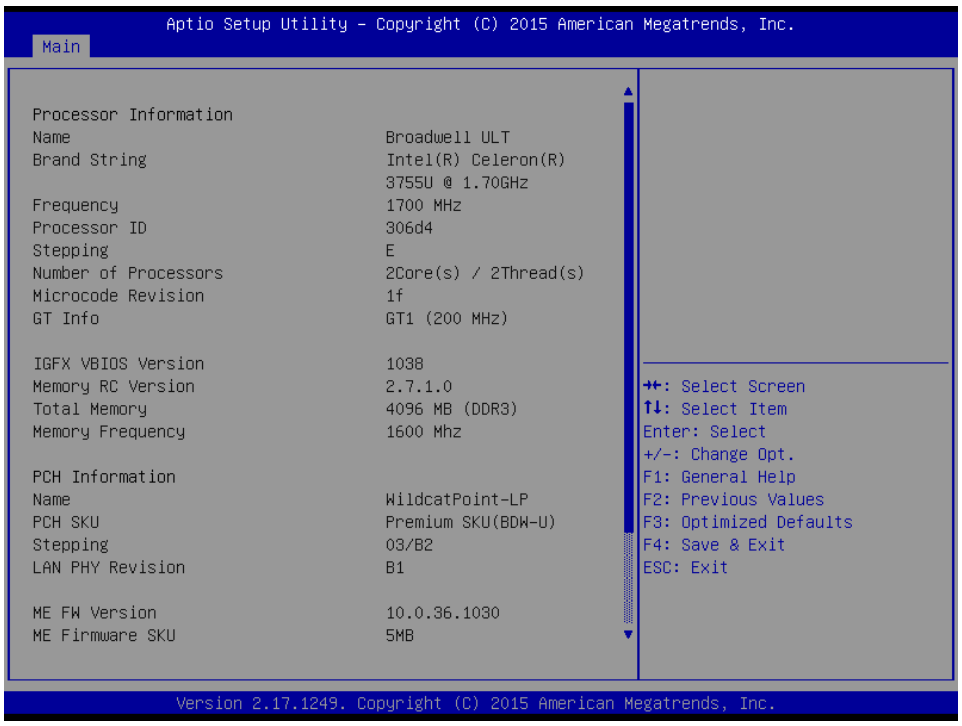
3.6 BIOS setup

Once you enter the 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.

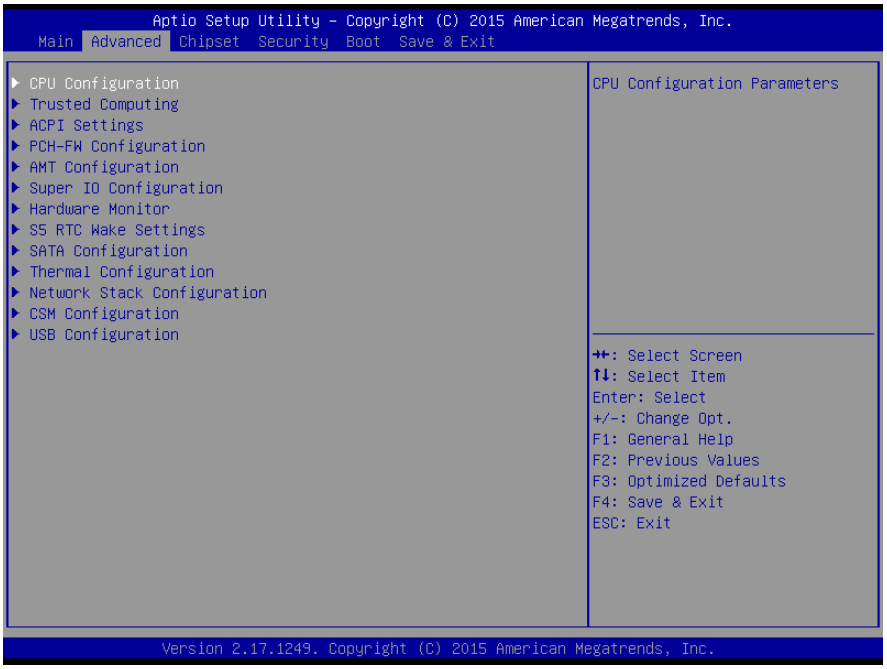
3.6.1.3 System Time

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.

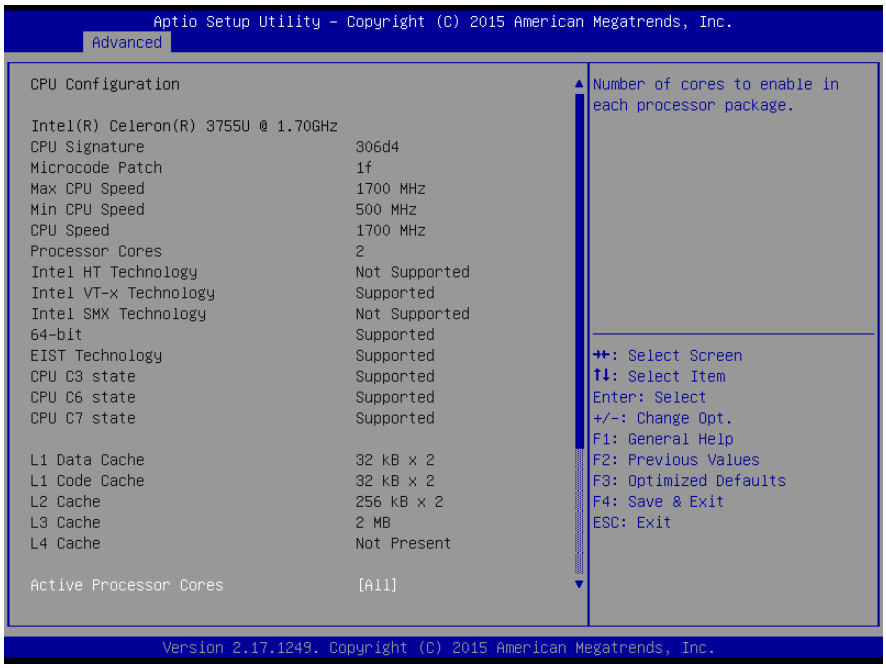
3.6.2 Advanced Menu

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



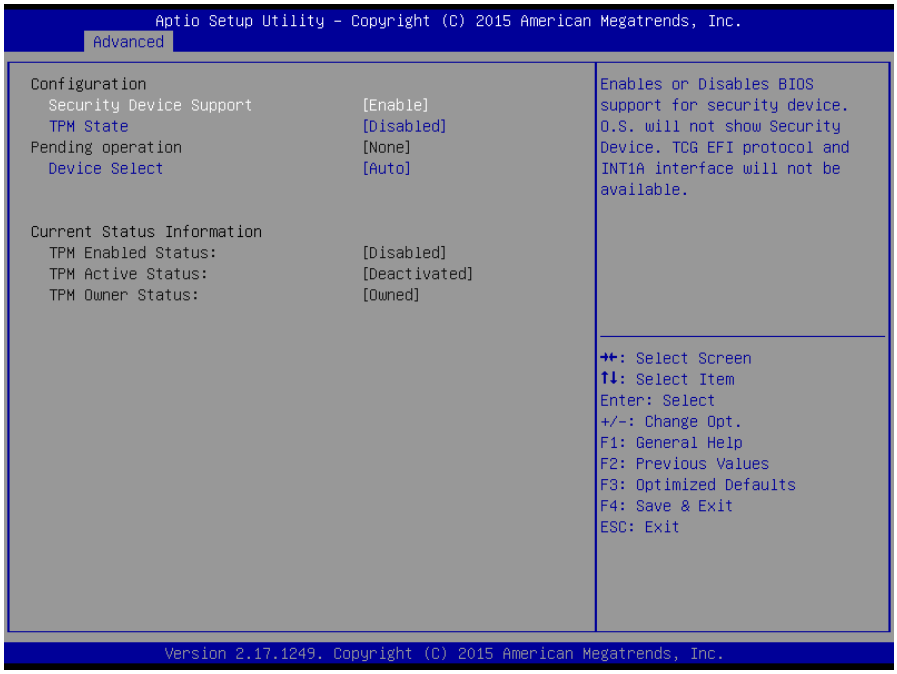
3.6.2.1 CPU Configuration

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



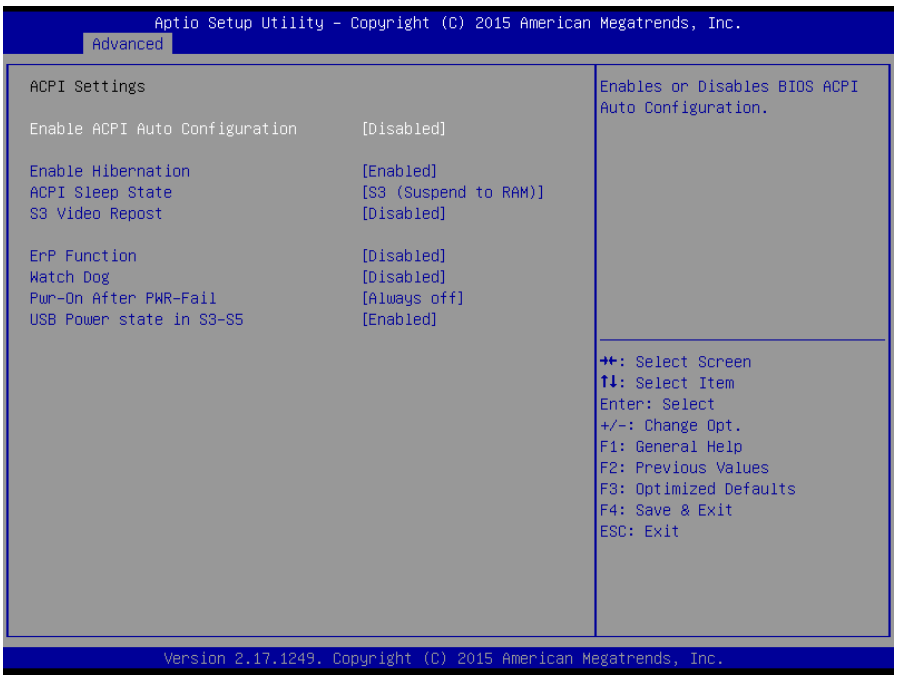
Item	Options	Description
Active Processor Cores	All**[Default]**, 1 2 3	Number of cores to enable in each processor package.

3.6.2.2 Trusted Computing



Item	Options	Description
Security Device Support	Disabled Enabled**[Default]**	Enable or Disable BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
TPM State	Disabled**[Default]** Enabled	Enable/Disable Security Device. NOTE: Your Computer will reboot during restart in order to change State of the Device.
Device Select	TPM 1.2 TPM 2.0 Auto**[Default]**	TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 device, Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated. **Note:** TPM 2.0 is not backward compatible with TPM 1.2 and only fully functional under pure UEFI OSes. H/W TPM 2.0 is an optional function. If H/W TPM 2.0 function is required, please contact your distributer or our contact window.

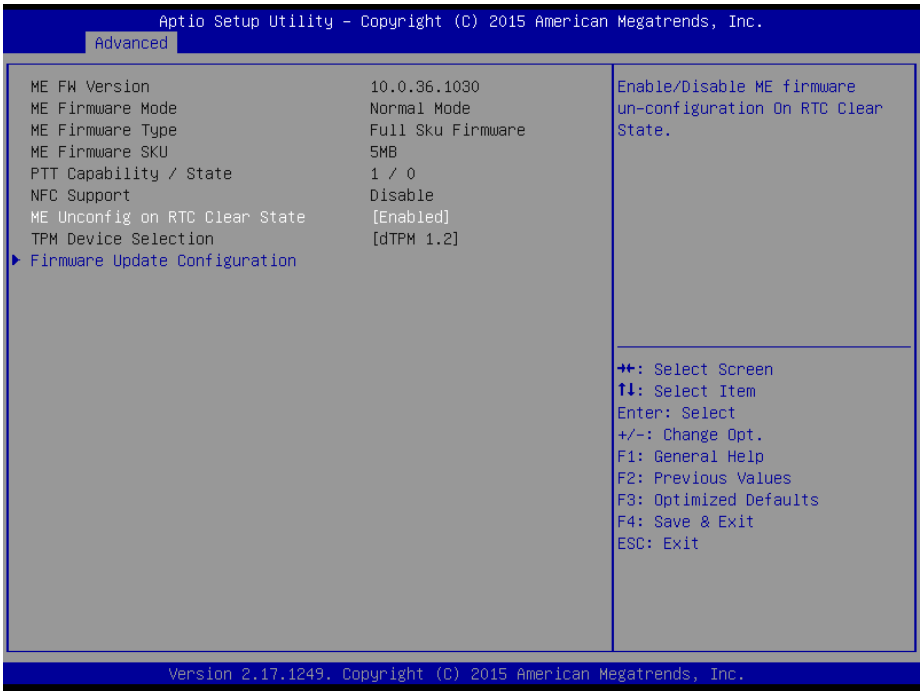
3.6.2.3 APCI Settings



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.
APCI Sleep State	Suspend Disabled S3 (Suspend to RAM)**[Default]**	Select ACPI sleep state the system will enter when the SUSPEND button is pressed.
S3 Video Repost	Disabled**[Default]** Enabled	Enable or Disable S3 Video Repost.
ErP Function	Disabled**[Default]** Enabled	ErP Function (Deep S5).

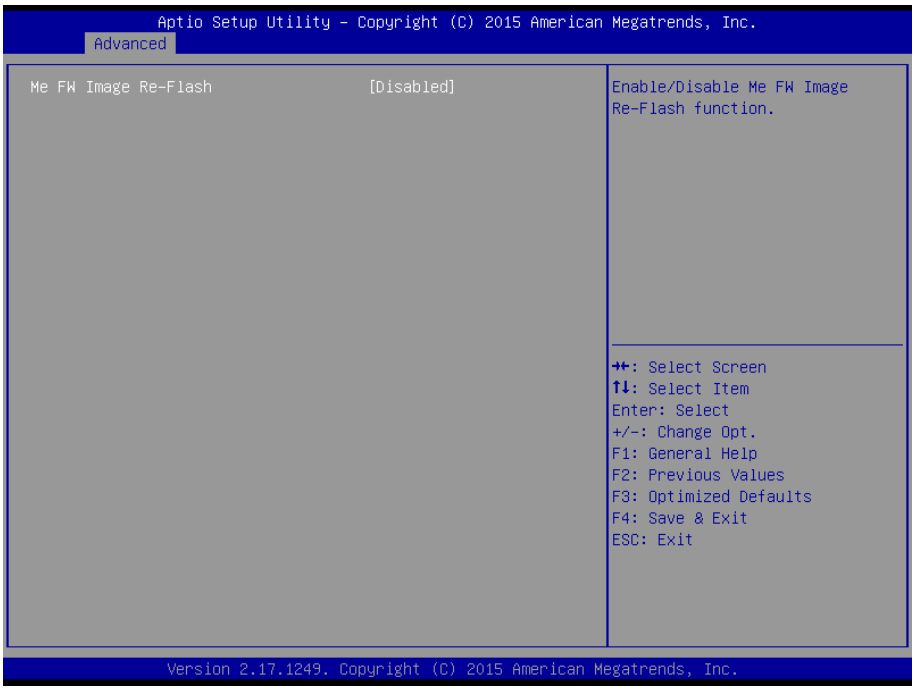
Watch Dog	Disabled**[Default]** 30 sec 40 sec 50 sec 1 min 2 min 10 min 30 min	Select Watch Dog Timer(WDT) Mode.
PWR-On After PWR-Fail	Always Off**[Default]** Always On Last state	Select AC power state when power is re-applied after a power failure.
USB Power state in S3-S5	Disabled Enabled**[Default]**	Enable/Disable USB Power delivery in S3(Sleep), S4(Hibernate), S5(Shut down) Modes.

3.6.2.4 PCH-FW Configuration



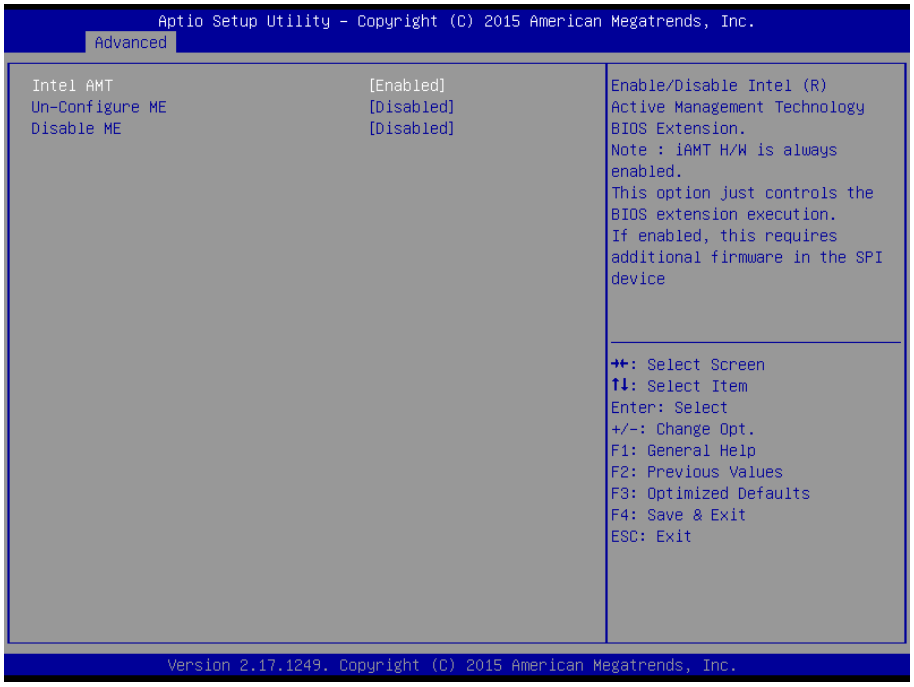
Item	Options	Description
ME Unconfig on RTC Clear State	Disabled Enabled**[Default]**	Enable/Disable ME firmware un-configuration On RTC Clear State.

3.6.2.4.1 Firmware Update Configuration



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

3.6.2.5 AMT Configuration

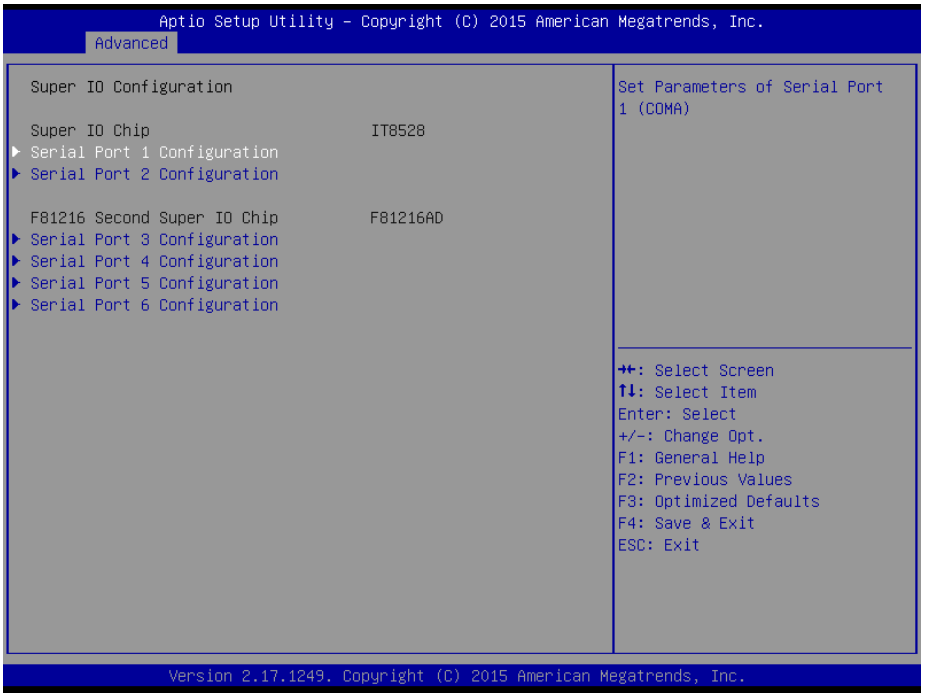


Item	Options	Description
Intel AMT	Disabled Enabled**[Default]**,	Enable/Disable Intel® Active Management Technology BIOS Extension. Note: iAMT H/W is always enabled. This option just controls the

		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.
Disable ME	Disabled**[Default]**, Enabled	Set ME to Soft Temporary Disabled.

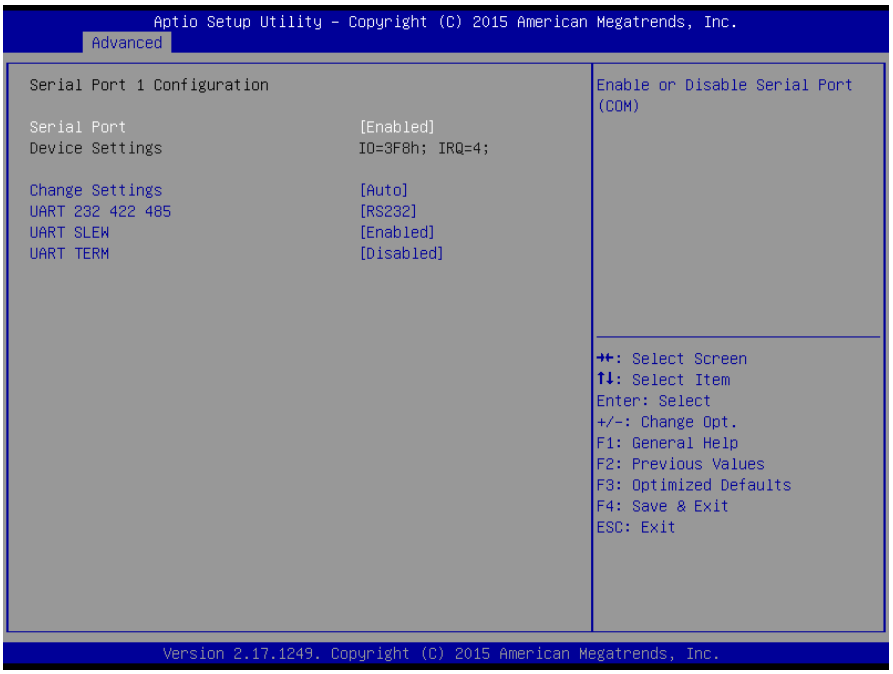
3.6.2.6 Super IO Configuration

You can use this item to set up or change the Super IO configuration for serial ports. Please refer to 3.6.2.6.1~6 for more information.



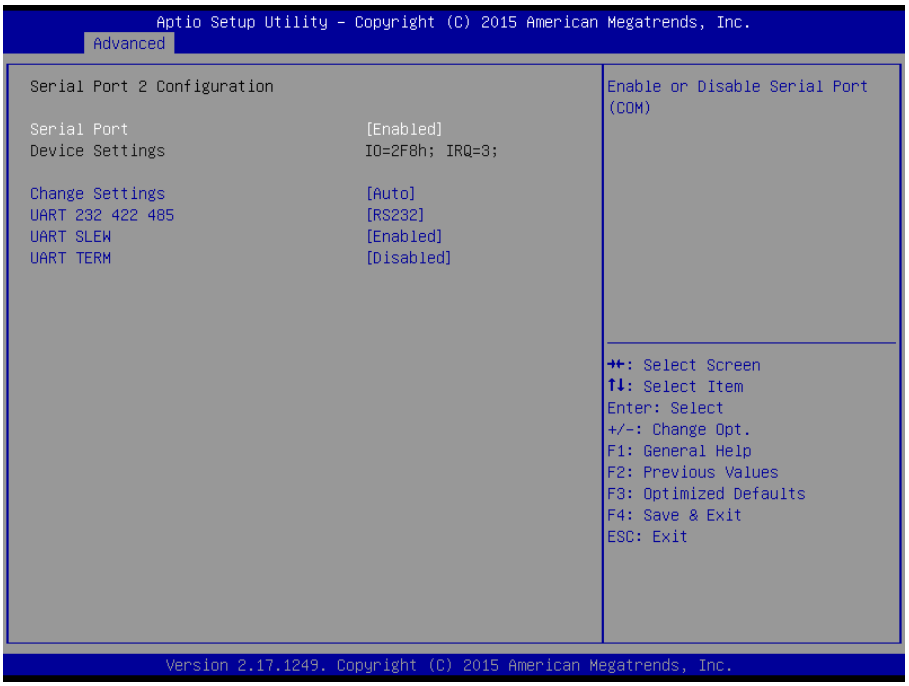
Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).
Serial Port 5 Configuration	Set Parameters of Serial Port 3 (COME).
Serial Port 6 Configuration	Set Parameters of Serial Port 4 (COMF).

3.6.2.6.1 Serial Port 1 Configuration



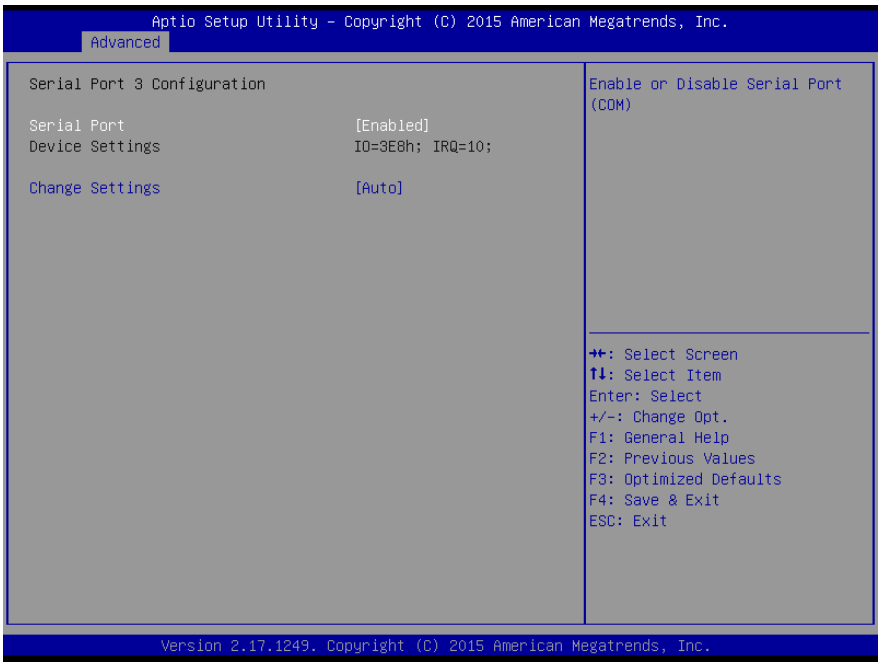
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]** IO=3F8h; IRQ=4; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Select an optimal setting for Super IO Device.
UART 232 422 485	RS232**[Default]**, RS485 RS422	Change the Serial Port mode.
UART SLEW	Enabled**[Default]**, Disabled	Enable or Disable 250kbps slew limiting.
UART THRM	Enabled Disabled**[Default]**,	Enable or Disable RS-485/422 receiver termination.

3.6.2.6.2 Serial Port 2 Configuration



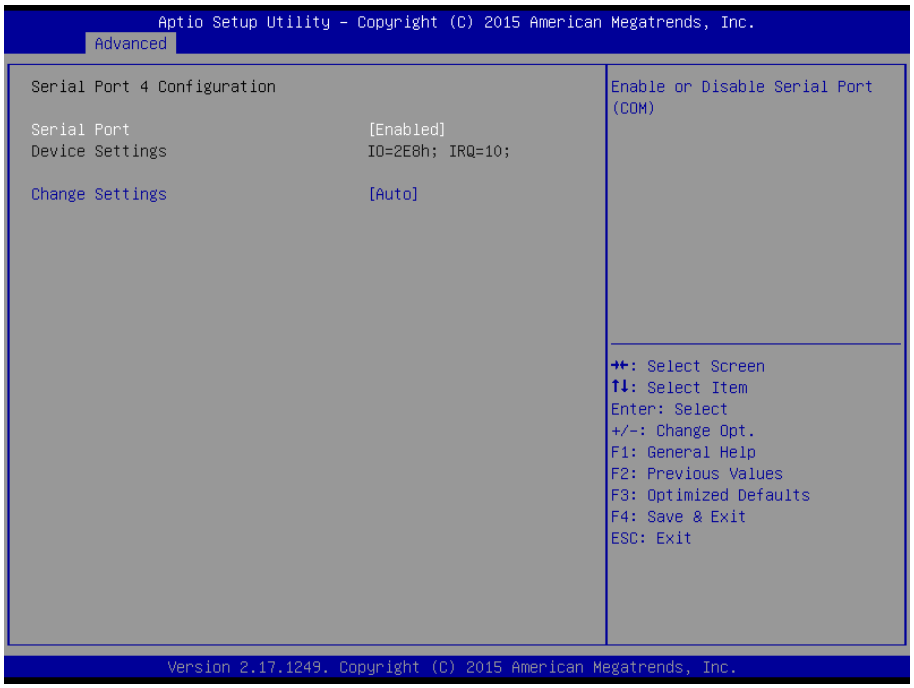
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]** IO=2F8h; IRQ=3; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Select an optimal setting for Super IO Device.
UART 232 422 485	RS232**[Default]**, RS485 RS422	Change the Serial Port mode.
UART SLEW	Enabled**[Default]**, Disabled	Enable or Disable 250kbps slew limiting.
UART THRM	Enabled Disabled**[Default]**,	Enable or Disable RS-485/422 receiver termination.

3.6.2.6.3 Serial Port 3 Configuration



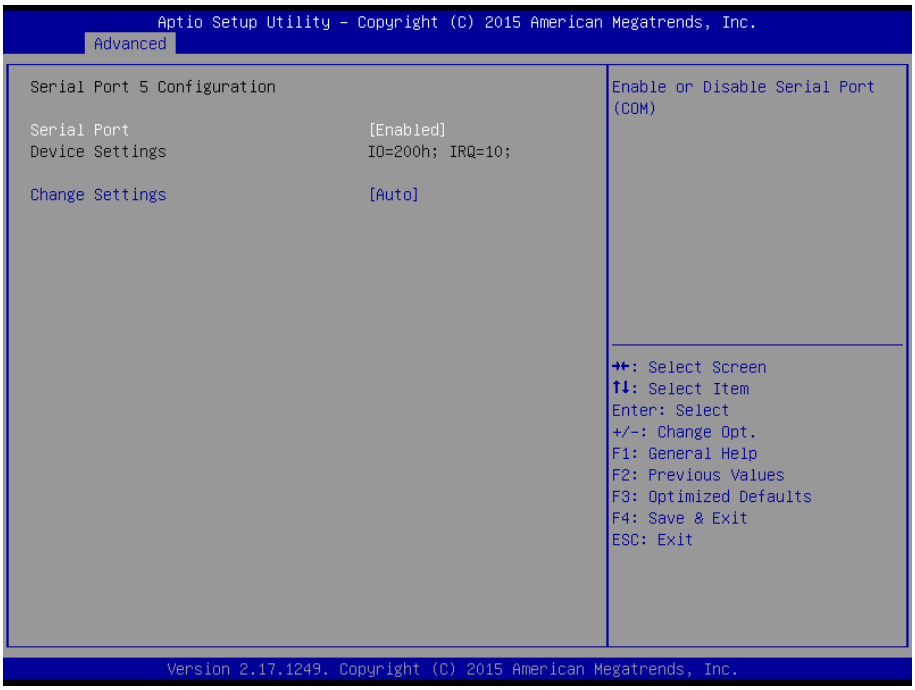
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]** IO=3E8h; IRQ=10; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=200h; IRQ=3,4,5,6,7,9,10,11,12; IO=208h; IRQ=3,4,5,6,7,9,10,11,12;	Select an optimal setting for Super IO Device.

3.6.2.6.4 Serial Port 4 Configuration



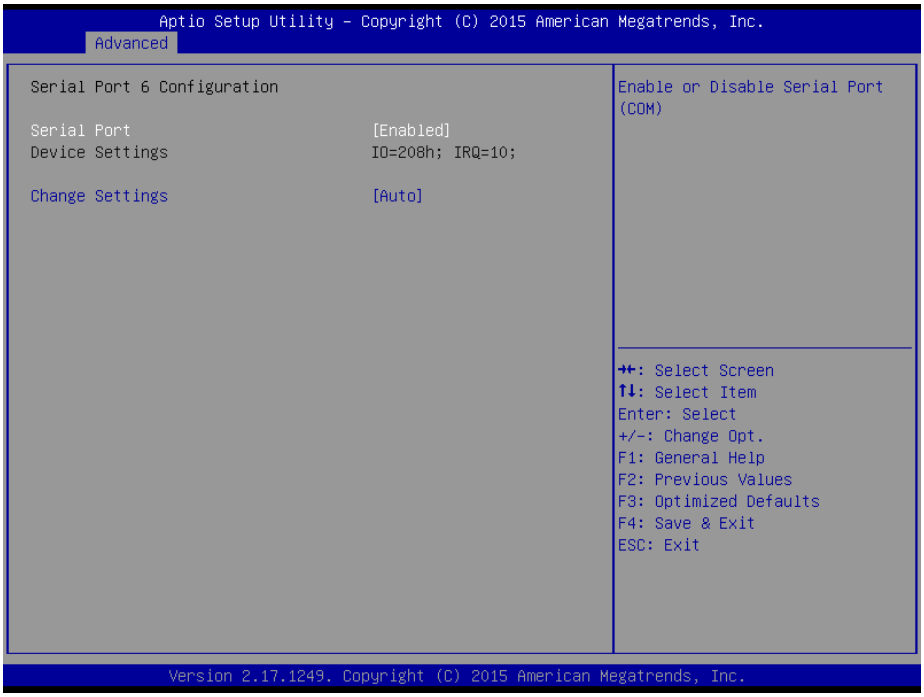
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]** IO=2E8h; IRQ=11; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=200h; IRQ=3,4,5,6,7,9,10,11,12; IO=208h; IRQ=3,4,5,6,7,9,10,11,12;	Select an optimal setting for Super IO Device.

3.6.2.6.5 Serial Port 5 Configuration



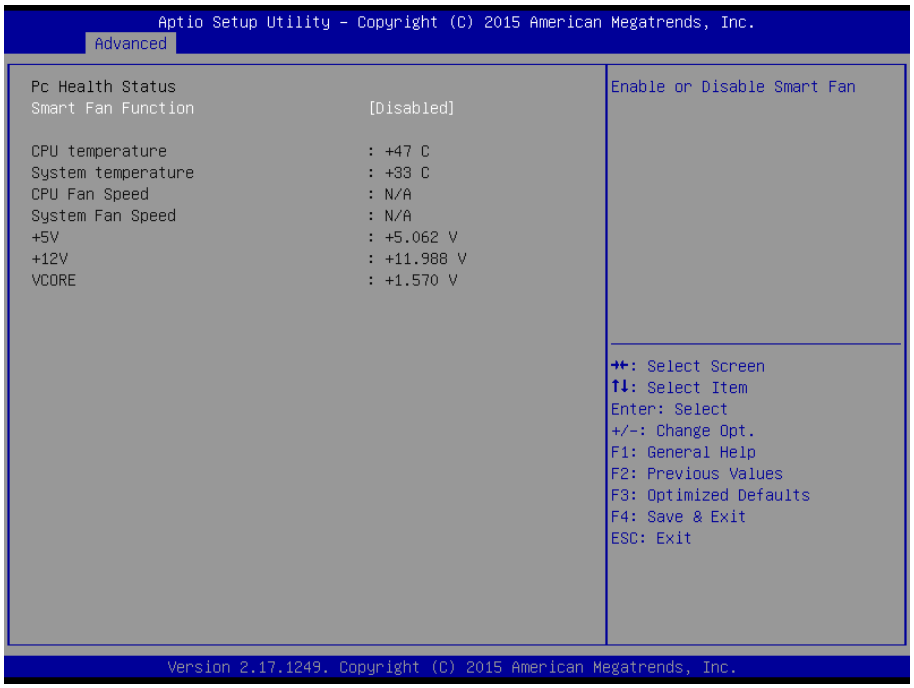
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]** IO=200h; IRQ=10; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=200h; IRQ=3,4,5,6,7,9,10,11,12; IO=208h; IRQ=3,4,5,6,7,9,10,11,12;	Select an optimal setting for Super IO Device.

3.6.2.6.6 Serial Port 6 Configuration



Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]** IO=208h; IRQ=11; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=200h; IRQ=3,4,5,6,7,9,10,11,12; IO=208h; IRQ=3,4,5,6,7,9,10,11,12;	Select an optimal setting for Super IO Device.

3.6.2.7 H/W Monitor

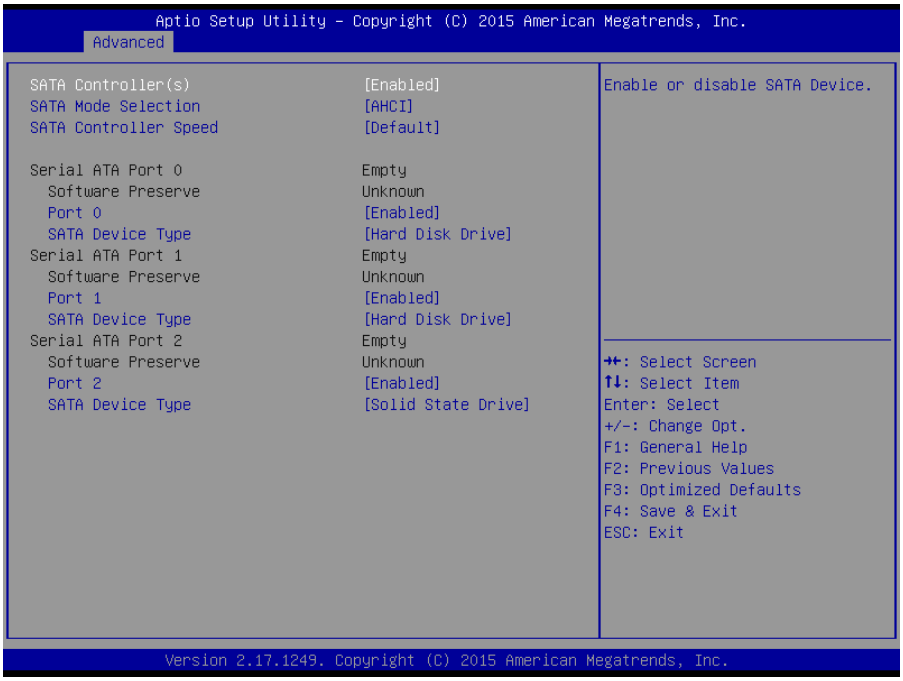


Item	Options	Description
Smart Fan Function	Disabled**[Default]** Enabled,	Enable or Disable Smart Fan.

3.6.2.8 S5 RTC Wake Settings

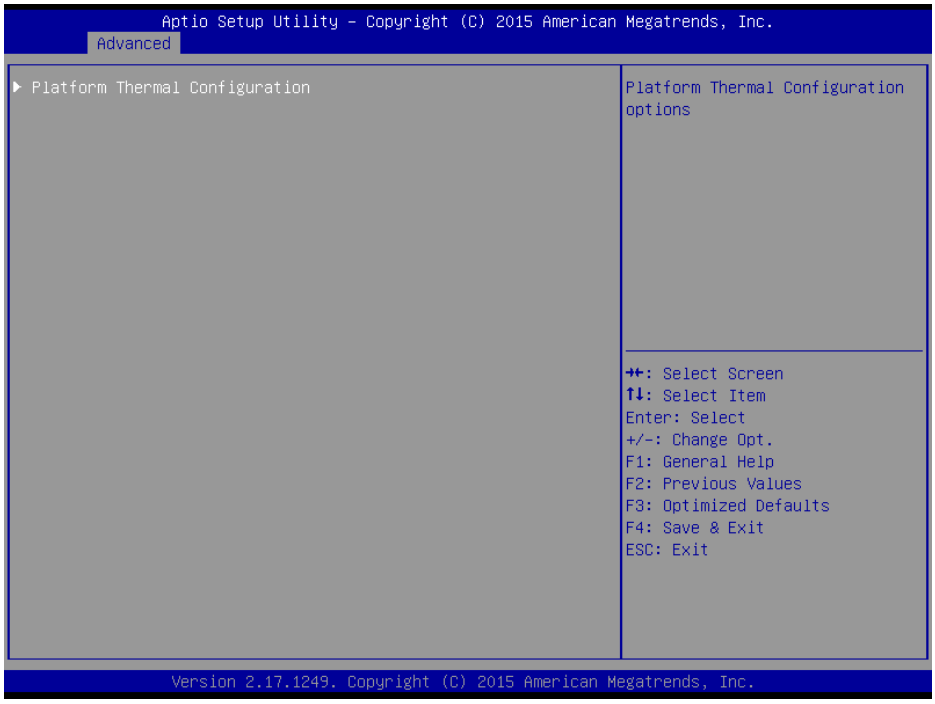
Item	Options	Description
Wake system from S5	Disabled**[Default]**, Fixed Time Dynamic Time	Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s).

3.6.2.9 SATA Configuration

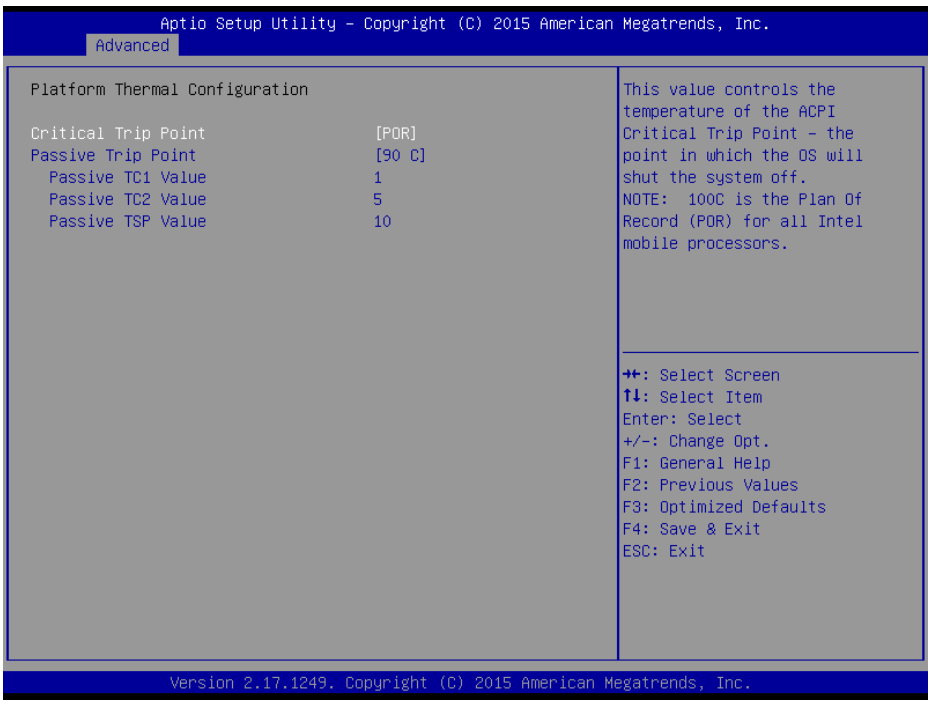


Item	Options	Description
SATA Controller(s)	Disabled Enabled**[Default]**	Enable or disable SATA Device.
SATA Mode Selection	IDE AHCI**[Default]** RAID	Determines how SATA controller(s) operate.
SATA Controller Speed	Default**[Default]** Gen1 Gen2 Gen3	Indicates the maximum speed the SATA controller can support.
Port 0/1/2	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.

3.6.2.10 Thermal Configuration



3.6.2.10.1 Platform Thermal Configuration



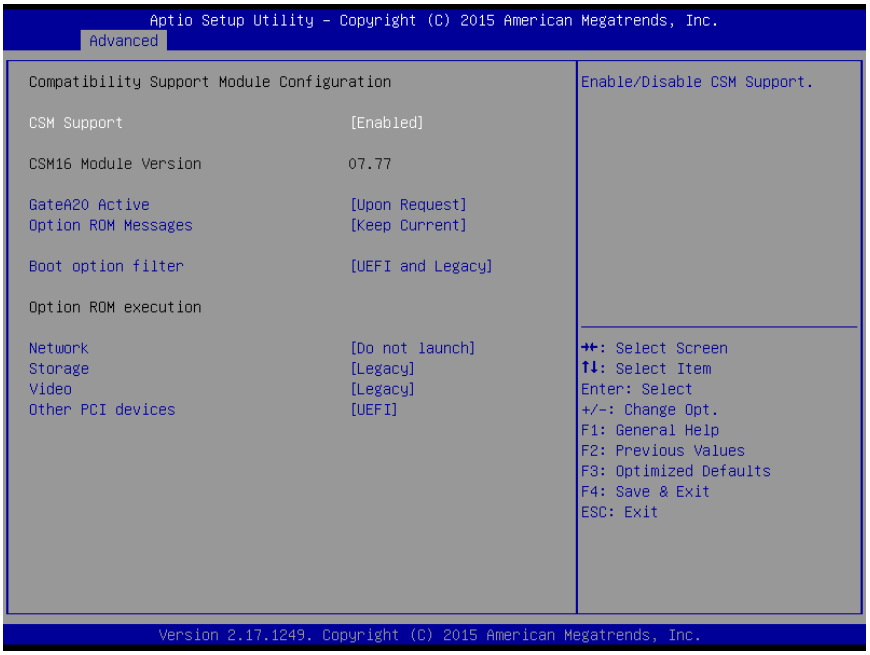
Item	Options	Description
Critical Trip Point	POR**[Default]** 80C 90C 100C 110C	This value controls the temperature of the ACPI Critical Trip Point – the point in which the OS will shut the system off. NOTE:100C is the Plan Of Record (POR) for all Intel mobile processors.
Passive Trip Point	Disabled,	This value controls the temperature of the

	80C 90C**[Default]** 100C 110C	ACPI Passive Trip Point – the point in which the OS will begin throttling the processor.
Passive TC1 Value	1-16 1**[Default]**	This value sets the TC1 value for the ACPI Passive Cooling Formula. Range 1 – 16.
Passive TC2 Value	1-16 5**[Default]**	This value sets the TC2 value for the ACPI Passive Cooling Formula. Range 1 – 16.
Passive TSP Value	2 – 32 10**[Default]**,	This item sets the TSP value for the ACPI Passive Cooling Formula. It represents in tenths of a second how often the OS will read the temperature when passive cooling is enabled. Range 2 – 32.

3.6.2.11 Network Stack Configuration

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

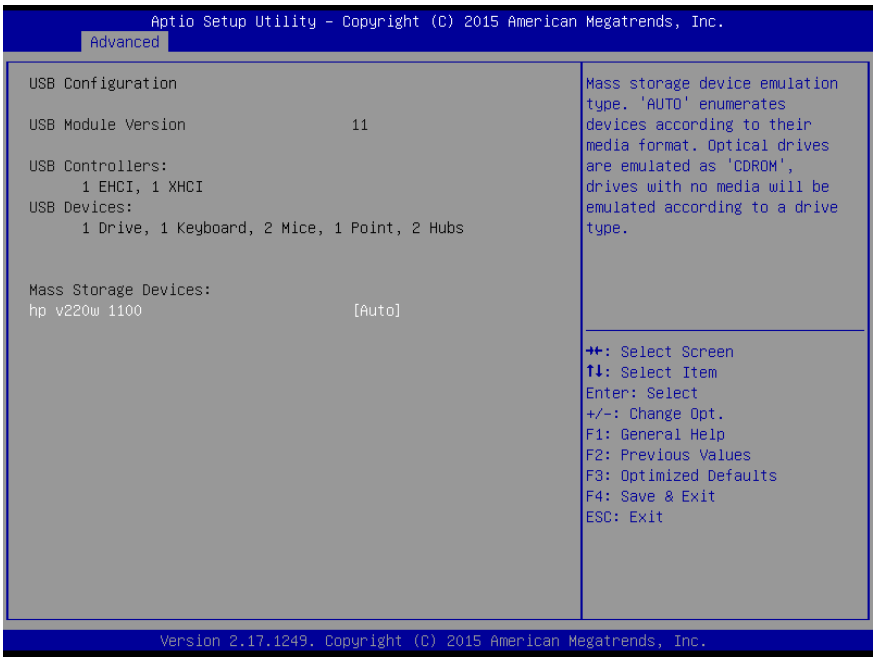
3.6.2.12 CSM Configuration



Item	Options	Description
CSM Support	Disabled, Enabled**[Default]**	Enable/Disable CSM Support.
GateA20 Active	Upon Request**[Default]** Always	UPON REQUEST – GA20 can be disabled using BIOS services. ALWAYS – go not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
Option ROM Messages	Force BIOS Keep Current**[Default]**	Set display mode for Option ROM.
Boot option filter	UEFI and Legacy**[Default]** Legacy only UEFI only	This option controls Legacy/UEFI ROMs priority.
Network	Do not launch**[Default]** UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM.
Storage	Do not launch UEFI Legacy**[Default]**	Controls the execution of UEFI and Legacy Storage OpROM.
Video	Do not launch UEFI Legacy**[Default]**	Controls the execution of UEFI and Legacy Video OpROM.
Other PCI devices	Do not launch UEFI**[Default]** Legacy	Determines OpROM execution policy for devices other than Network, Storage, or Video.

3.6.2.13 USB Configuration

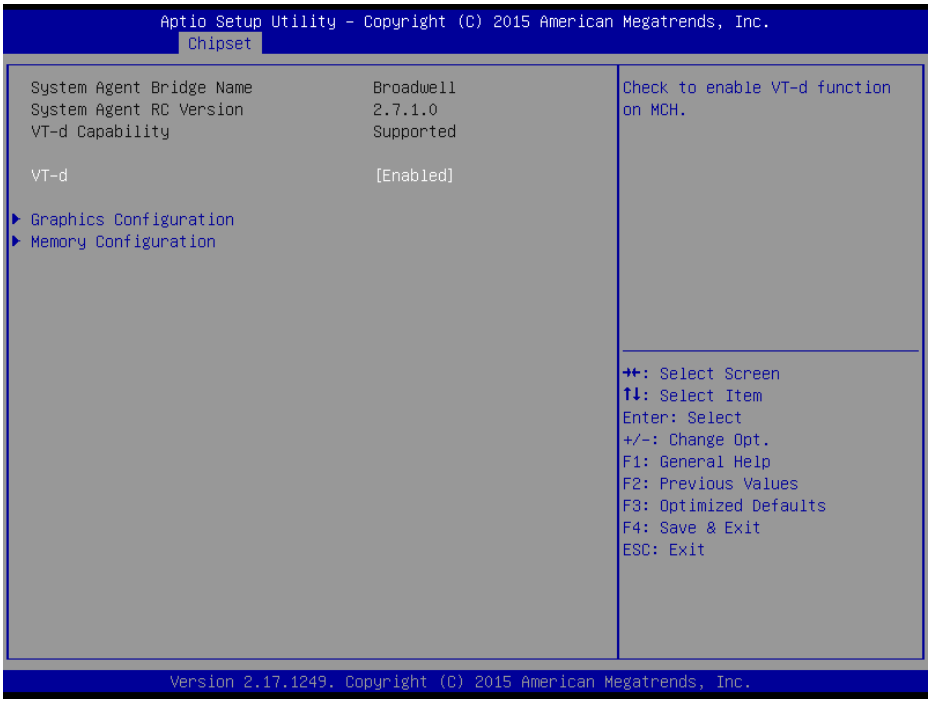
The USB Configuration menu helps read USB information and configures USB settings.



Item	Options	Description
Hp v220w 1100	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.

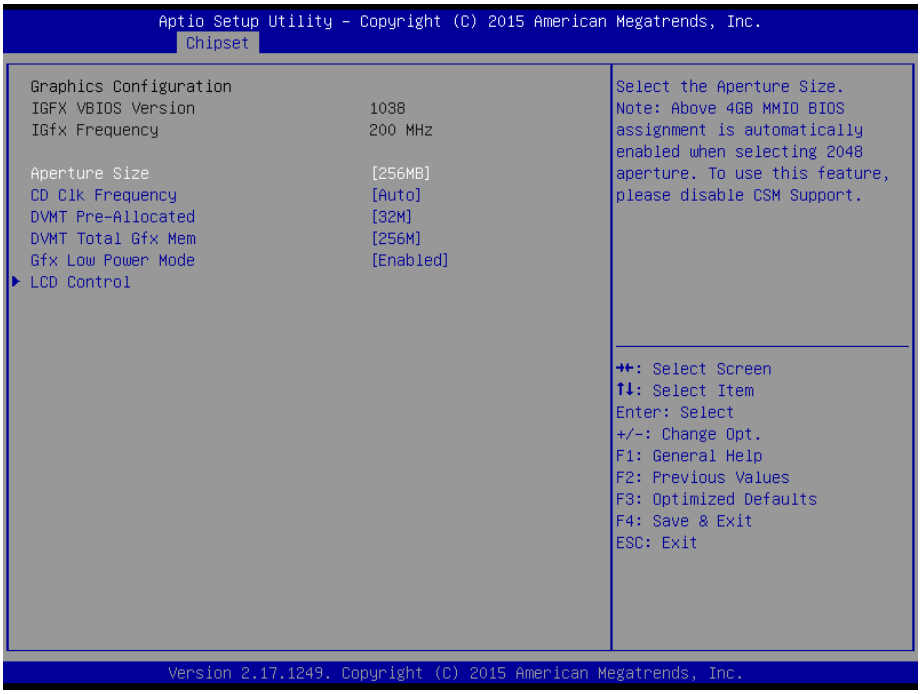
3.6.3 Chipset

3.6.3.1 System Agent (SA) Configuration



Item	Option	Description
VT-d	Disabled Enabled**[Default]**	Check to enable VT-d function on MCH.

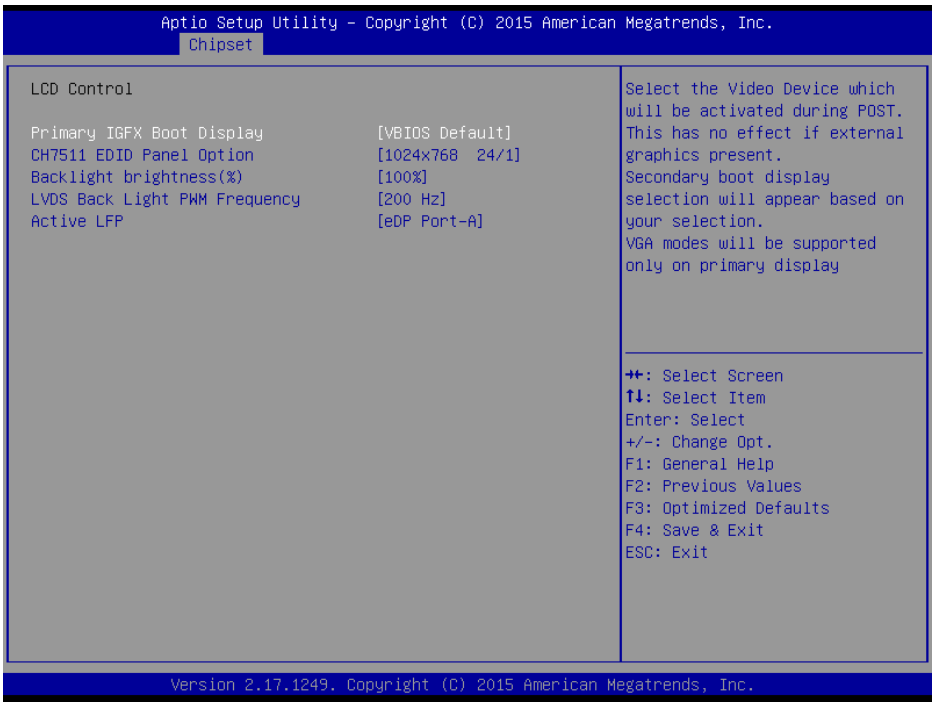
3.6.3.1.1 Graphics Configuration



Item	Option	Description
Aperture Size	128MB 256MB**[Default]**	Select the Aperture Size. Note: Above 4GB MMIO BIOS assignment

	512MB 1024MB 2048MB 4096MB	is automatically enabled when selecting 2048 aperture. To use this feature, please disable CSM Support.
CD C1k Frequency	337.5Mhz 450Mhz 540Mhz 675Mhz Auto**[Default]**	Select CD C1k Frequency.
DVMT Pre-Allocated	32M**[Default]**/64M/96M128M/160M/ 192M/224M/256M/288M/320M/352M/ 384M/416M/448M/480M/512M/ 1024M/2016M	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
DVMT Total Gfx Mem	128M 256M**[Default]** Max	Select DVMT 5.0 Total Graphics Memory size used by the Internal Graphics Device.
GFx Low Power Mode	Disabled Enabled**[Default]**	This option is applicable for SFF only.

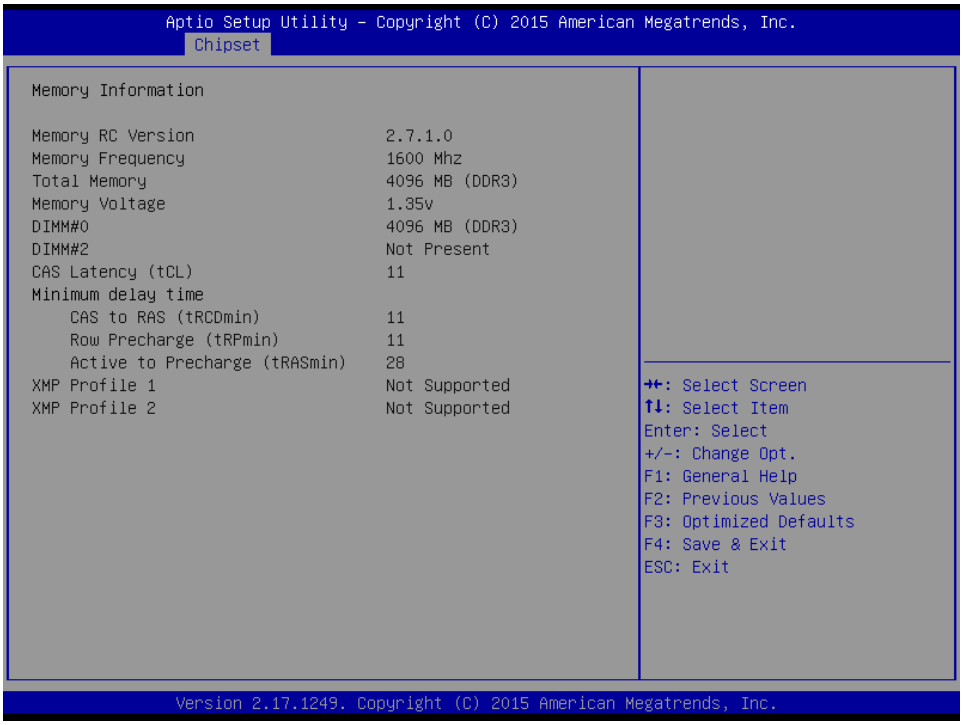
3.6.3.1.1.1 LCD Control



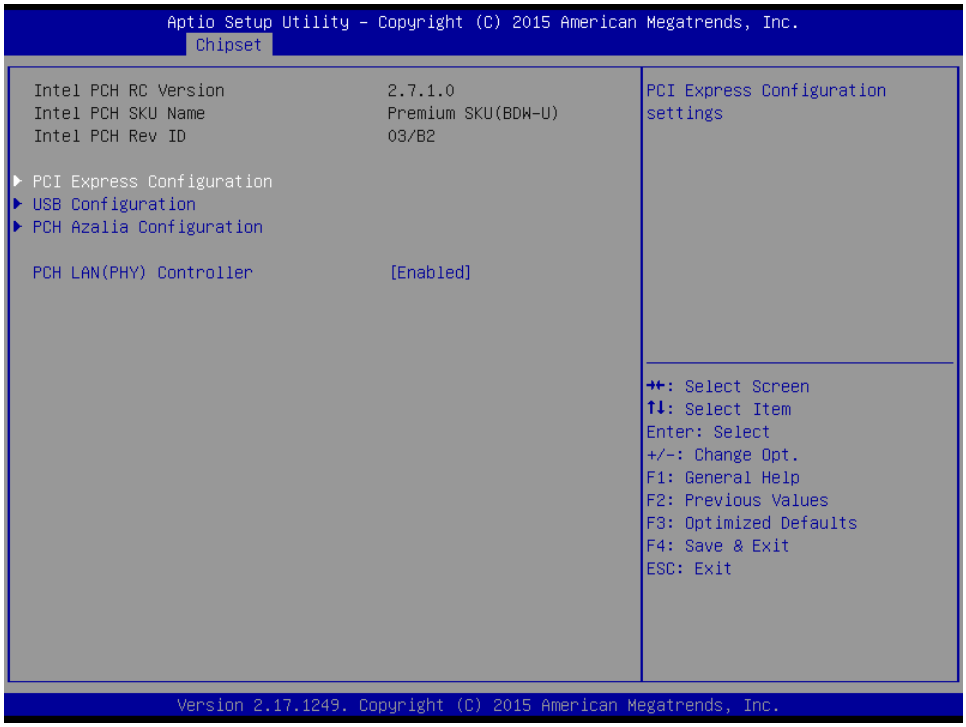
Item	Option	Description
Primary IGFX Boot Display	VBIOS Default**[Default]** HDMI LVDS	Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.
CH7511 EDID Panel Option	1024x768 24/1**[Default]** 800x600 18/1	Port1-EDP to LVDS (Chrotel 7511) Panel EDID Option.

	1024x768 18/1 1366x768 18/1 1024x600 18/1 1280x800 18/1 1920x1200 24/2 640x480 18/1 800x480 18/1 1920x1080 18/2 1280x1024 24/2 1440x900 18/2 1600x1200 24/2 1366x768 24/1 1920x1080 24/2 1680x1050 24/2	
Backlight brightness (%)	00% 25% 50% 75% 100%**[Default]**	Select LVDS back light PWM duty.
LVDS Back Light PWM Frequency	200Hz**[Default]** 300Hz 400Hz 500Hz 700 Hz 1kHz 2kHz 3kHz 5kHz	Select LVDS back light PWM Frequency.
Active LFP	No LVDS eDP Port-A**[Default]**	Select the Active LFP Configuration. No LVDS: VBIOS does not enable LVDS. eDP Port-A:LFP Driven by Int-DisplayPort encoder from Port-A. (through PCH).

3.6.3.1.2 Memory Configuration

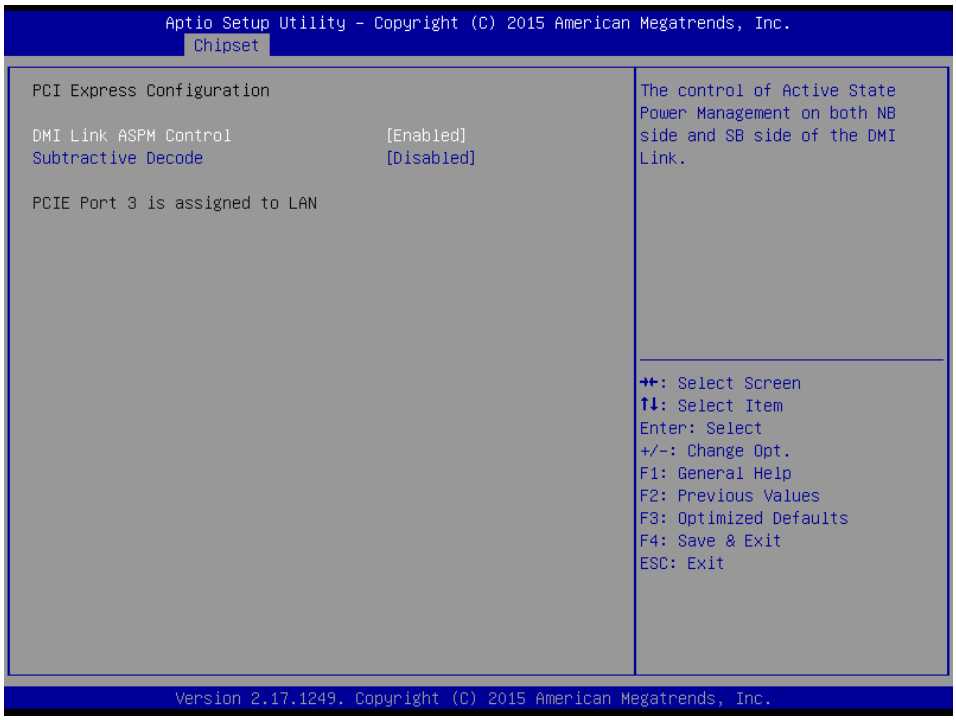


3.6.3.2 PCH-IO Configuration



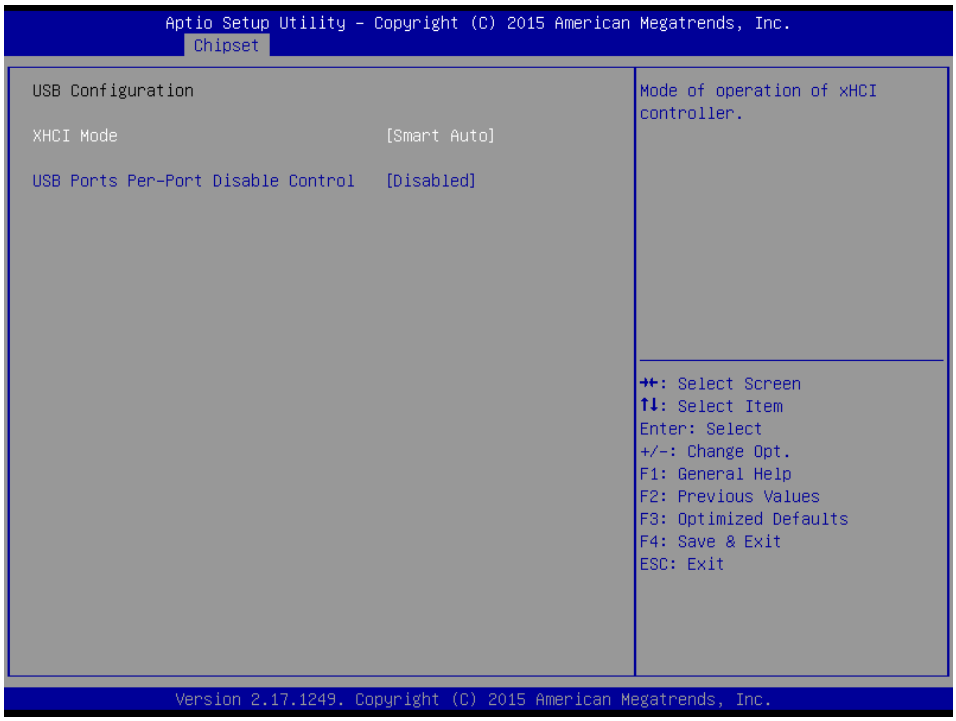
Item	Option	Description
PCH LAN(PHY) Controller	Disabled Enabled**[Default]**	Enable or disable LAN1 NIC.

3.6.3.2.1 PCI Express Configuration



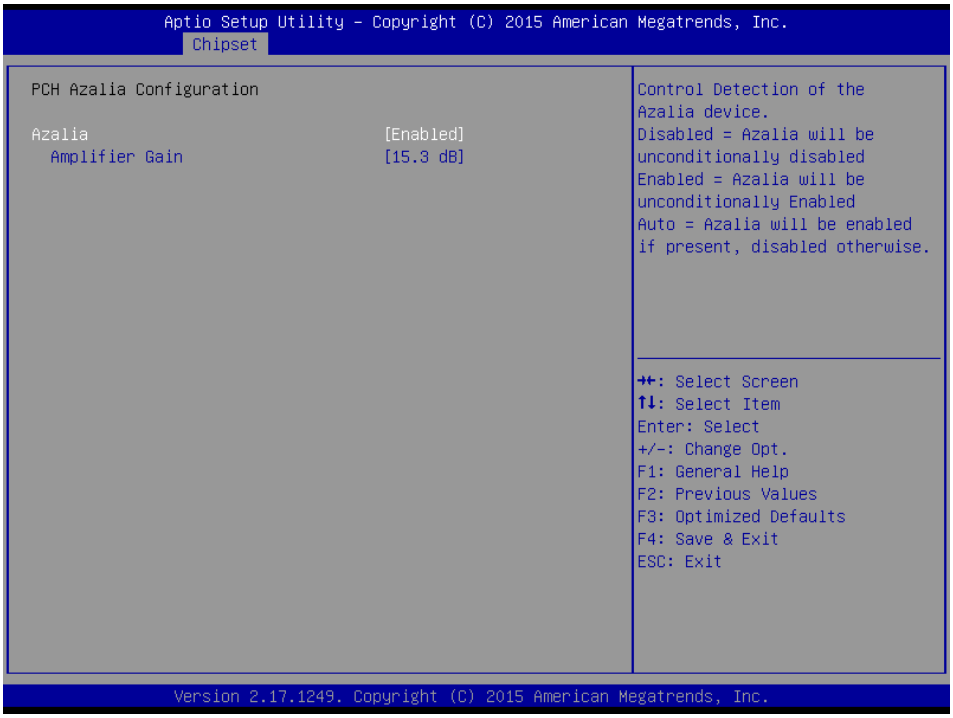
Item	Option	Description
DMI Link ASPM Control	Disabled Enabled**[Default]**	The control of Active State Power Management on both NB side and SB side of the DMI Link.
Subtractive Decode	Disabled**[Default]** Enabled	Enable or disable PCI Express Subtractive Decode.

3.6.3.2.2 USB Configuration



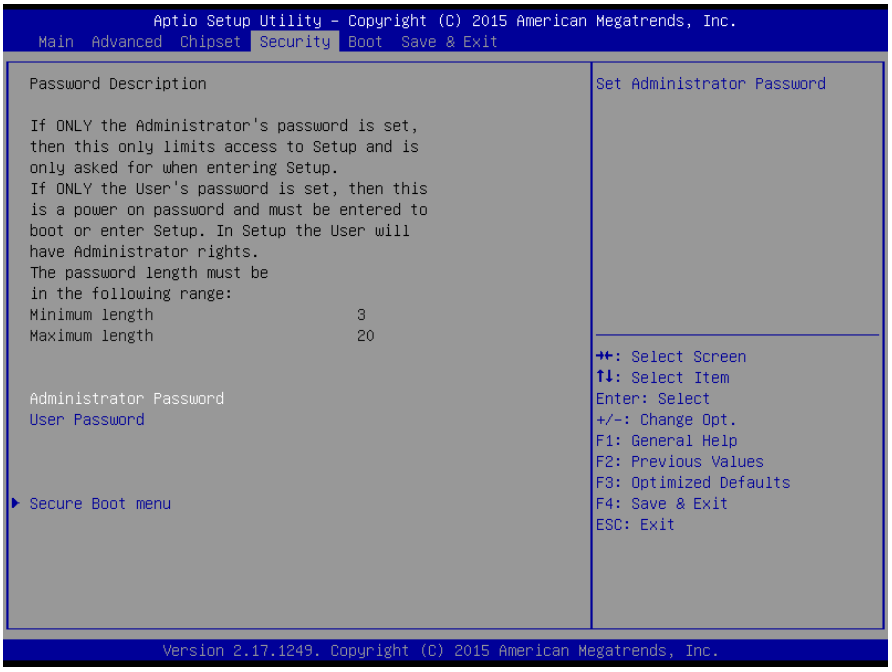
Item	Option	Description
XHCI Mode	Smart Auto**[Default]**, Auto Enabled Disabled	Mode of operation of xHCI controller.
USB Ports Per-Port Disable Control	Enabled, Disabled**[Default]**	Control each of the USB ports (0~13) disabling.

3.6.3.2.3 PCH Azalia Configuration



Item	Option	Description
Azalia	Disabled Enabled**[Default]** Auto	Control Detection of the Azalia device. Disabled = Azalia will be unconditionally disabled Enabled = Azalia will be unconditionally Enabled Auto = Azalia will be enabled if present, disabled otherwise.
Amplifier Gain	15.3 dB**[Default]**, 21.1 dB 27.2 dB 31.8 dB	Select Amplifier Gain (dB).

3.6.4 Security



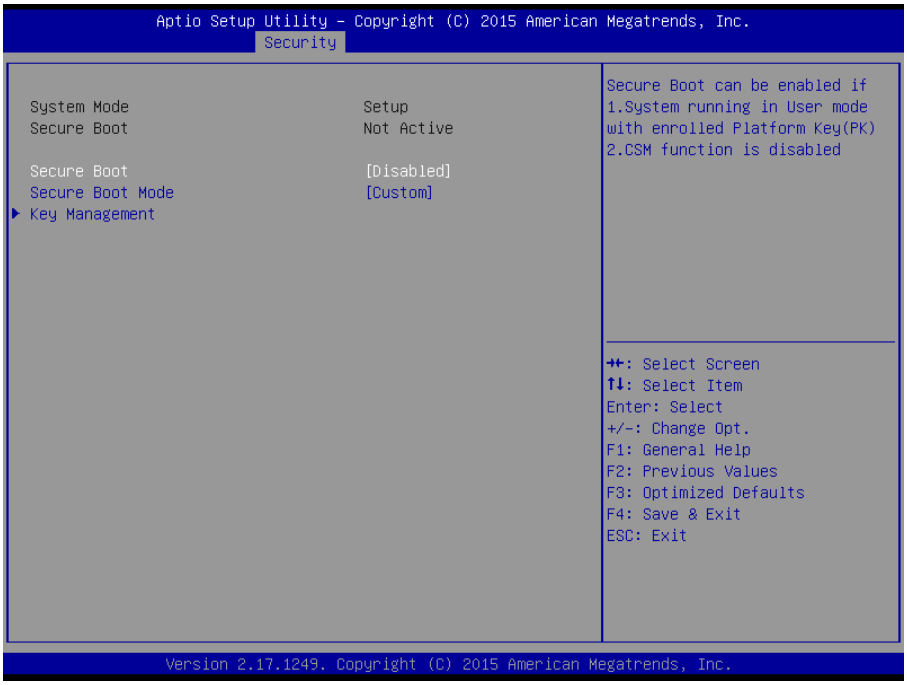
- **Administrator Password**

Set setup Administrator Password

- **User Password**

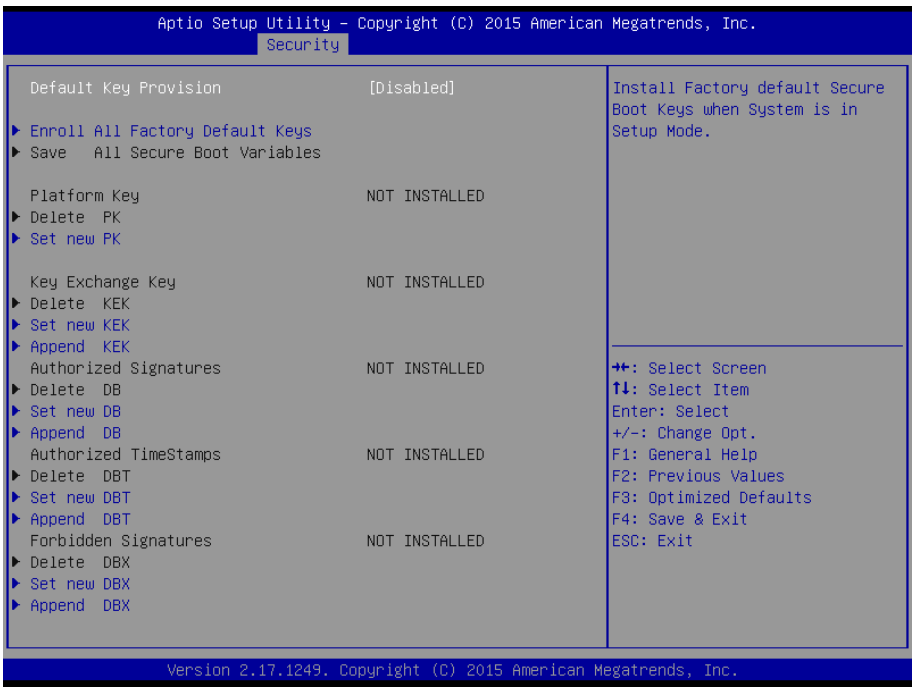
Set User Password

3.6.4.1 Secure Boot menu



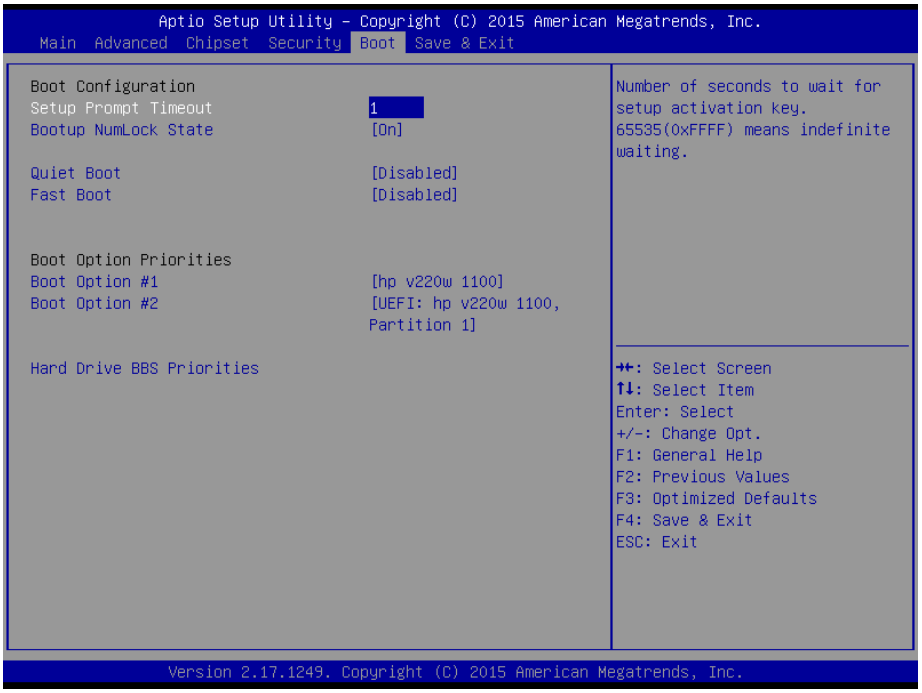
Item	Option	Description
Secure Boot	Disabled**[Default]** Enabled	Secure Boot can be enabled if 1.System running in User mode with enrolled Platform Key(PK) 2.CSM function is disabled.
Secure Boot Mode	Standard Custom**[Default]**	Secure Boot mode selector. 'Custom' Mode enables users to change Image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

3.6.4.1.1 Key Management



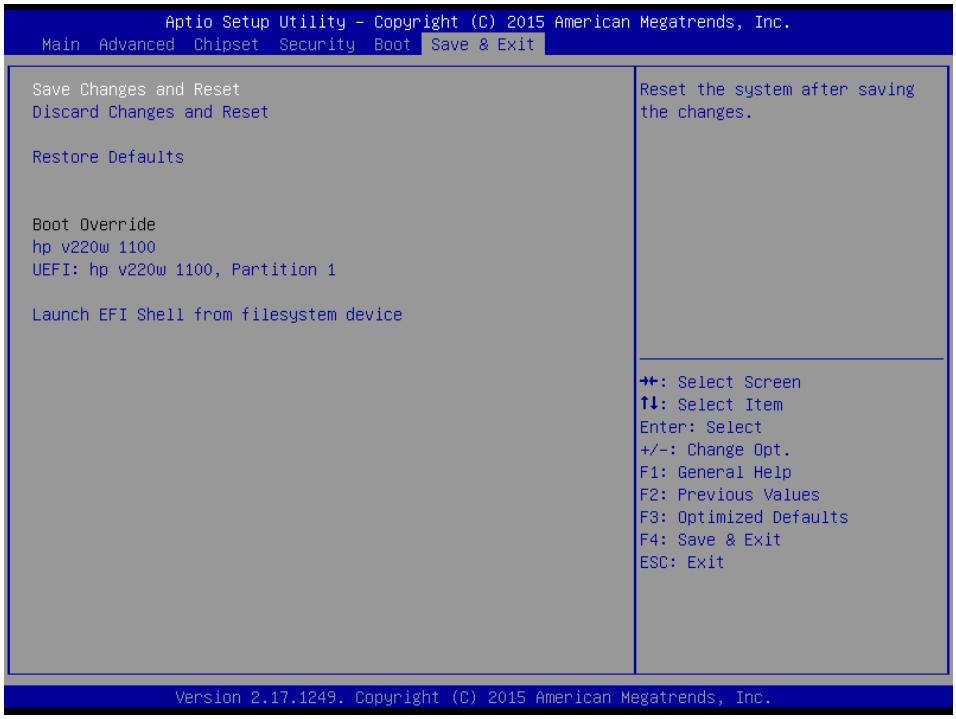
Item	Option	Description
Default Key Provision	Enabled, Disabled**[Default]**	Install Factory default Secure Boot Keys when System is in Setup Mode.

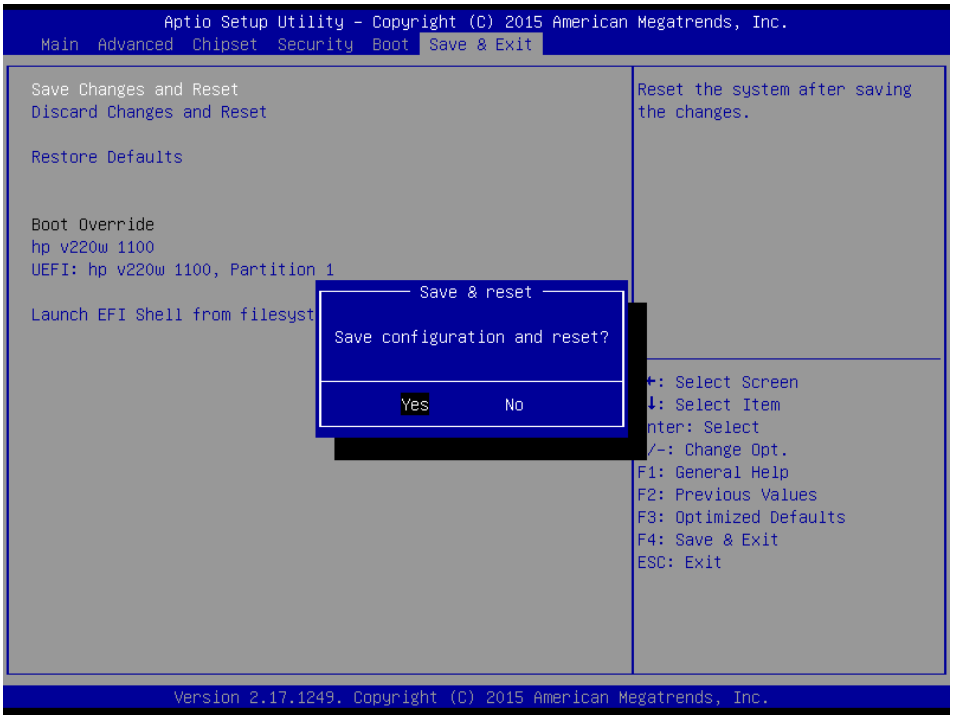
3.6.5 Boot



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
Quiet Boot	Disabled**[Default]** Enabled	Enables or disables Quiet Boot option
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.
Boot Option #1/2	Sets 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, or link to **\Driver_Chipset\Intel\EBM-BDW**.

Note: The installation procedures and screen shots in this section are based on Windows 8 operation system. If the warning message appears while the installation process, click Continue to go on.

Step1. Click **Next**.

Step 2. Click **Accept**.

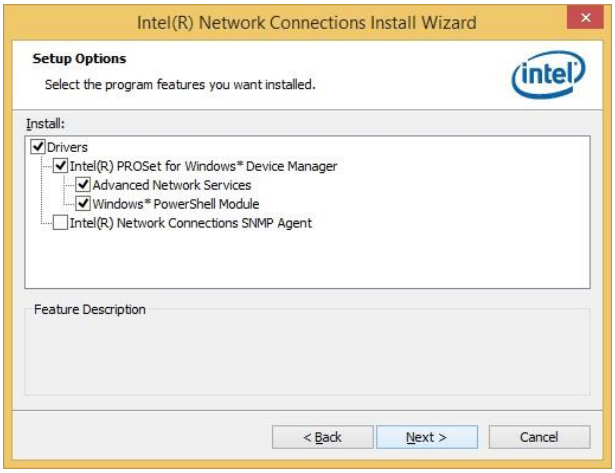
Step 3. Wait while installing.

Step 4. Click **Restart Now or Restart Later** to complete setup.

4.2 Install Ethernet Driver

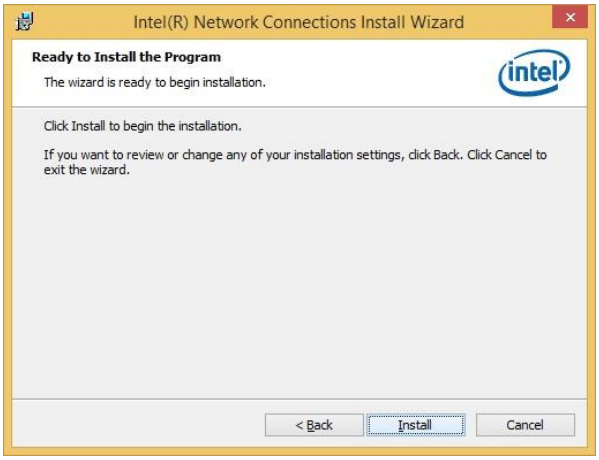
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **\Driver_Gigabit\Intel\I210AT_I218LM\EBM-BDW_LAN**.

Note: The installation procedures and screen shots in this section are based on Windows 8 operation system. If the warning message appears while the installation process, click Continue to go on.



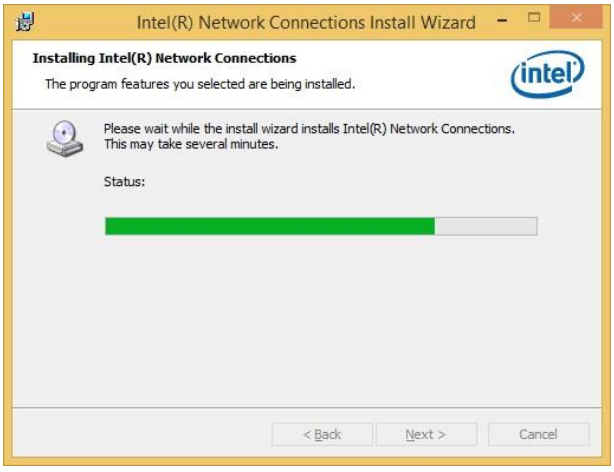
Step 3. Click **Next**.

Step1. Click **Next** to start installation.



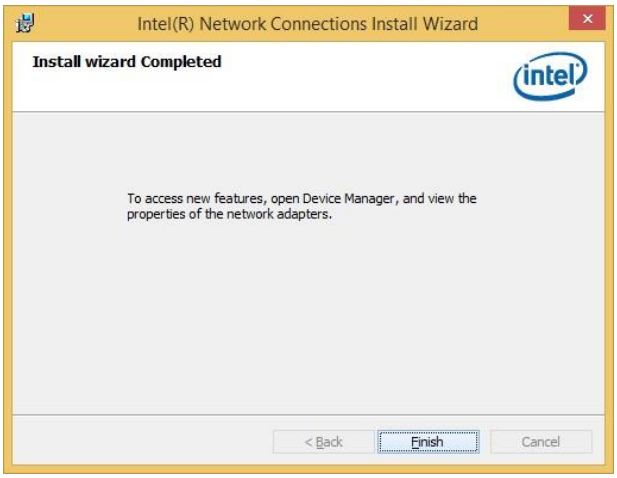
Step 4. Click **Install**.

Step 2. Click **Next** to proceed setup.



Step 5. Wait while installing.

Step 6. Wait while installing.

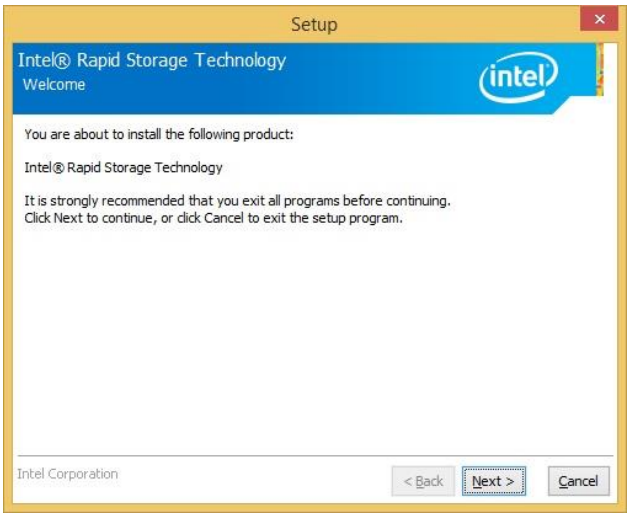


Step 7. Click **Finish** to complete setup.

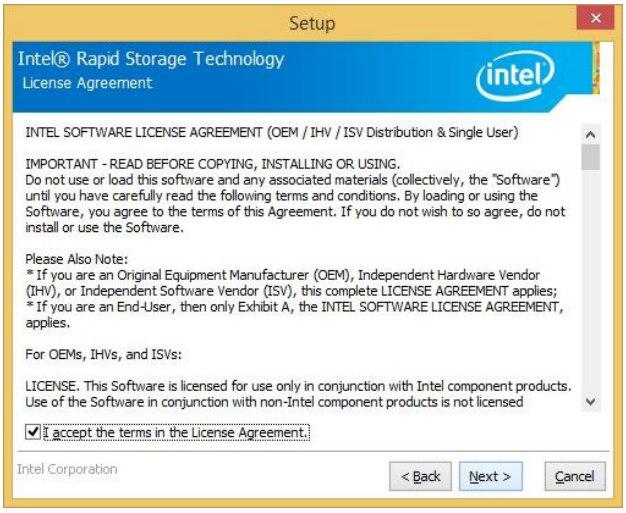
4.3 Install IRST Driver

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, or link to **\Utility\EBM-BDW_IRST**.

Note: The installation procedures and screen shots in this section are based on Windows 8 operation system. If the warning message appears while the installation process, click Continue to go on.

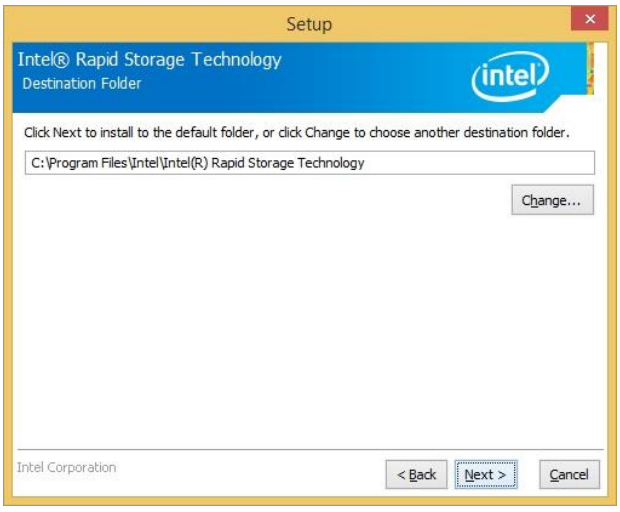


Step1. Click **Next** to start installation.

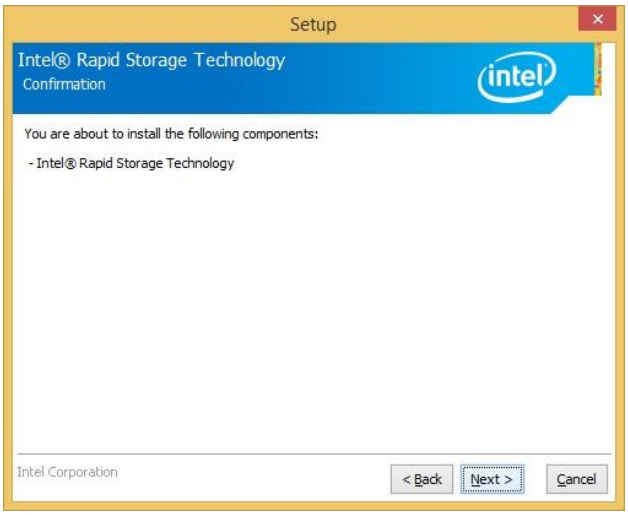


Step 2. Click **Next** to proceed setup.

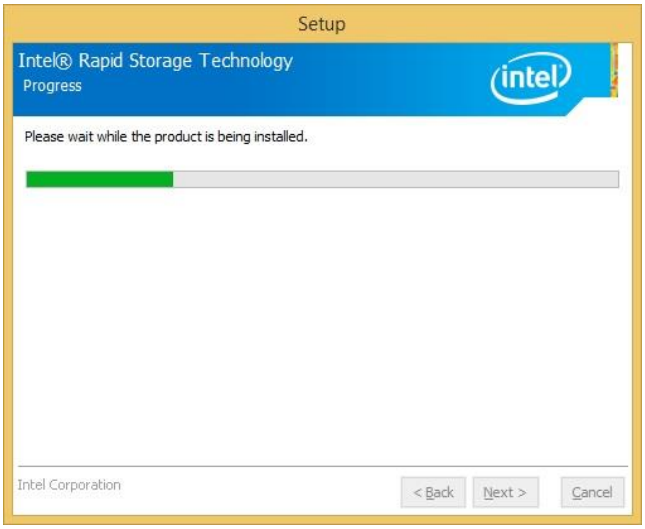
Step 3. Click **Next**.



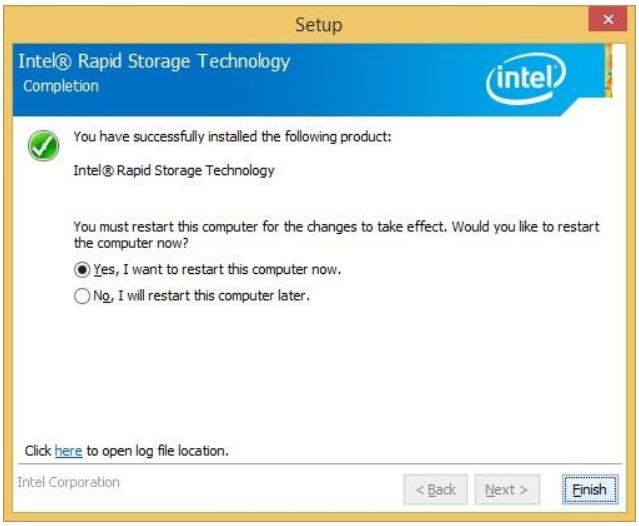
Step 4. Click **Next**.



Step 5. Click **Next**.



Step 6. Wait while installing.

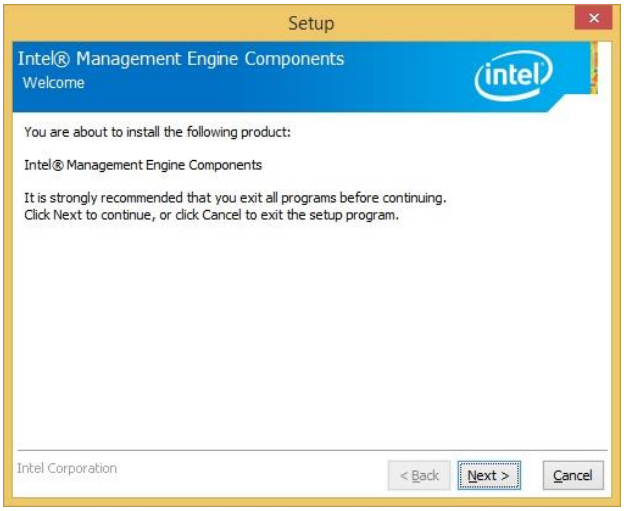


Step 7. Click **Finish** to complete setup.

4.4 Install ME Driver

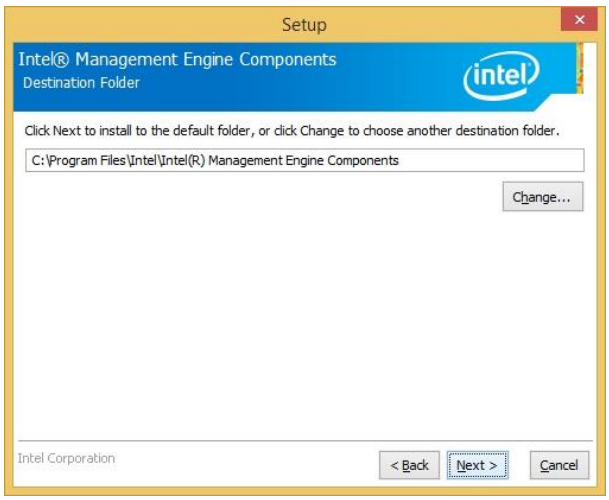
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **\Utility\EBM-BDW_ME**.

Note: The installation procedures and screen shots in this section are based on Windows 8 operation system. If the warning message appears while the installation process, click Continue to go on.

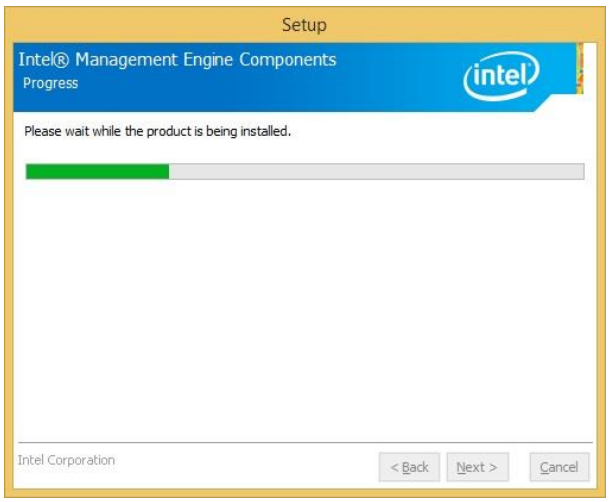


Step1. Click **Next** to start installation.

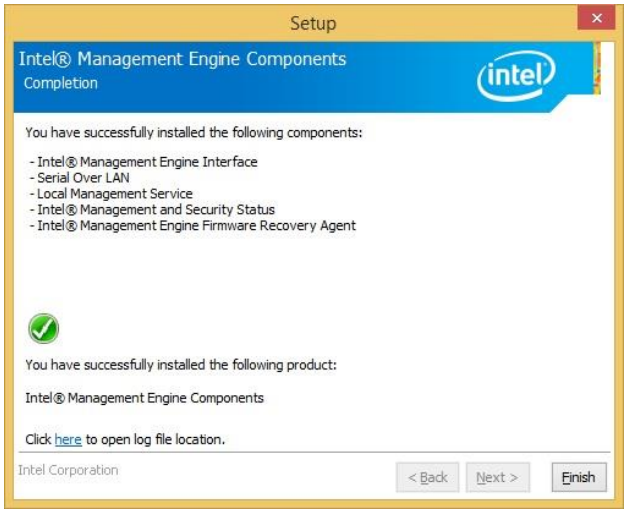
Step 2. Click **Next** to proceed setup.



Step 3. Click **Next**.



Step 4. Wait while installing.

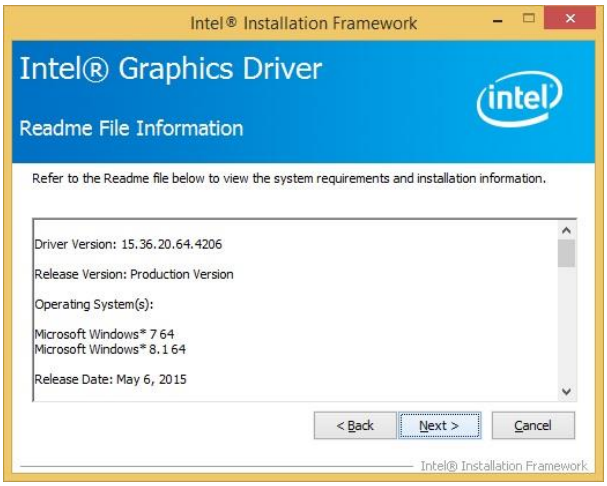


Step 5. Click **Finish** to complete setup.

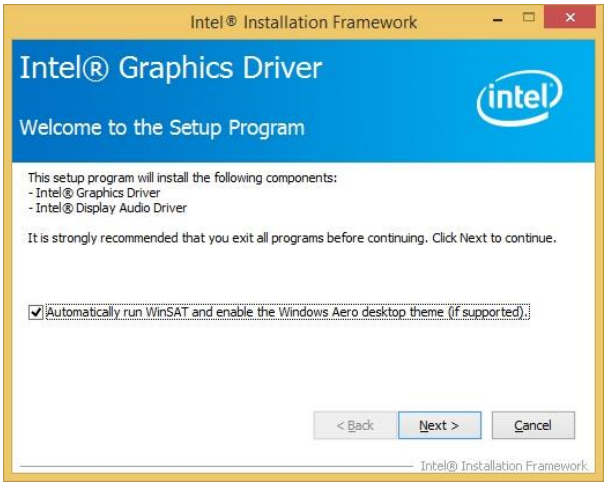
4.5 Install VGA Driver

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, or link to **\VGA\EBM-BDW**.

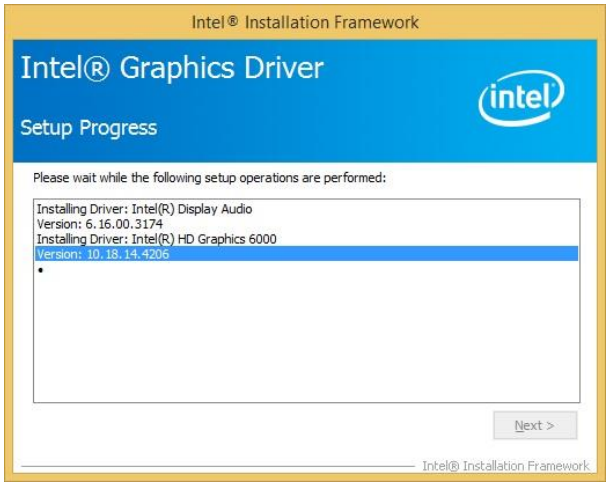
Note: The installation procedures and screen shots in this section are based on Windows 8.1 operation system.



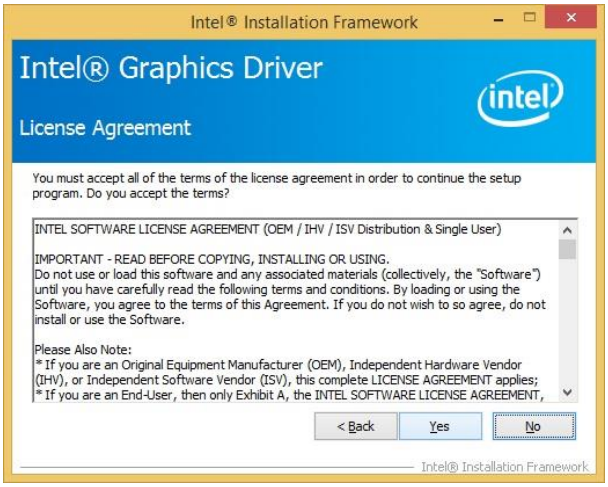
Step 3. Click **Next.**



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

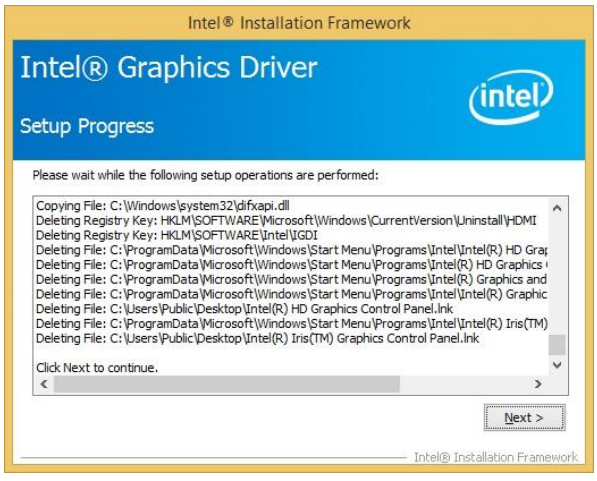


Step 4. Click **Next**.

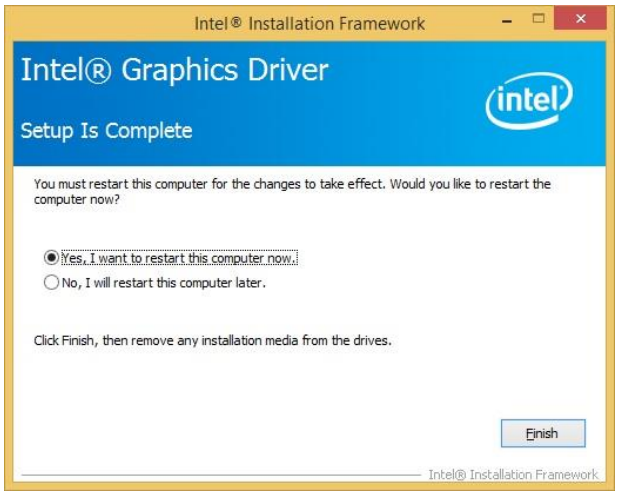


Step 2.

Click **Yes** to accept license agreement.



Step 5. Click **Next**.



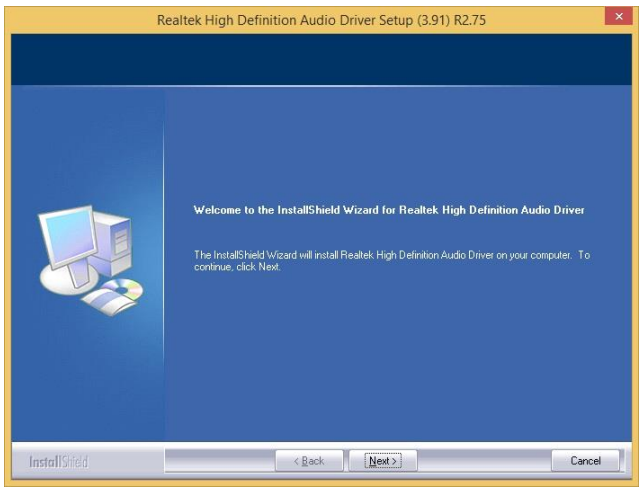
Step 6. Click **Finish** to complete setup.

4.6 Install Audio Driver (For Realtek ALC892)

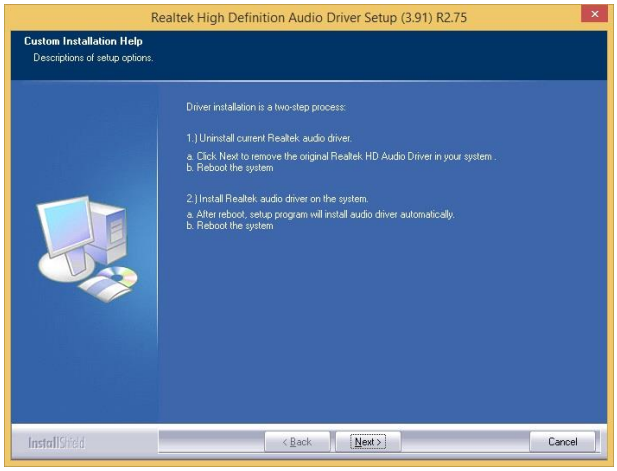
Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **\Driver_Audio\Realtek\ALC892\EBM-BDW_Audio**.

Note: The installation procedures and screen shots in this section are based on Windows 8 operation system.

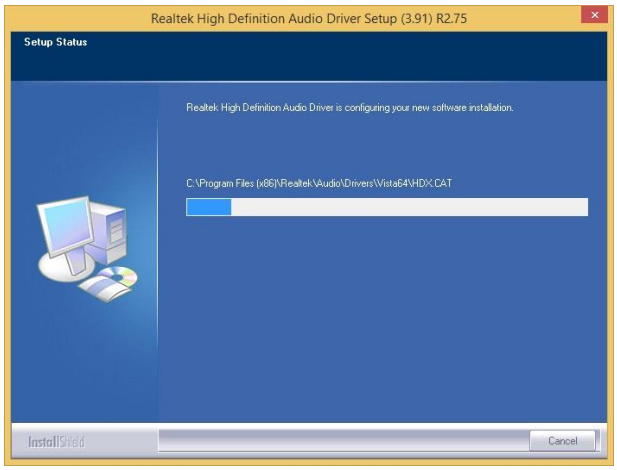
Step 1. Click **Next** to continue setup.



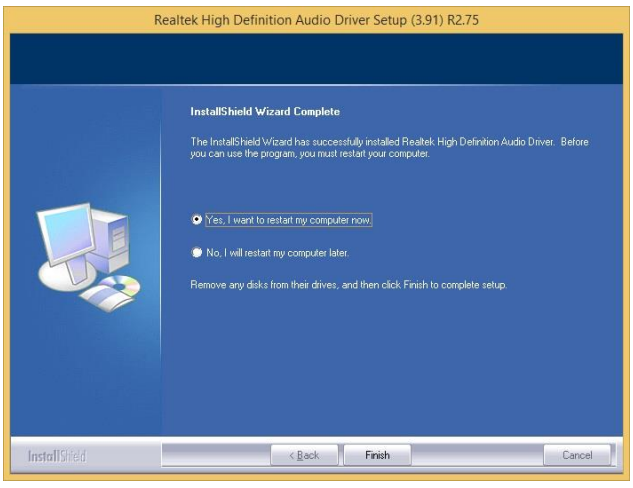
Step 2. Click **Next**.



Step 3. Click **Next** to continue setup.

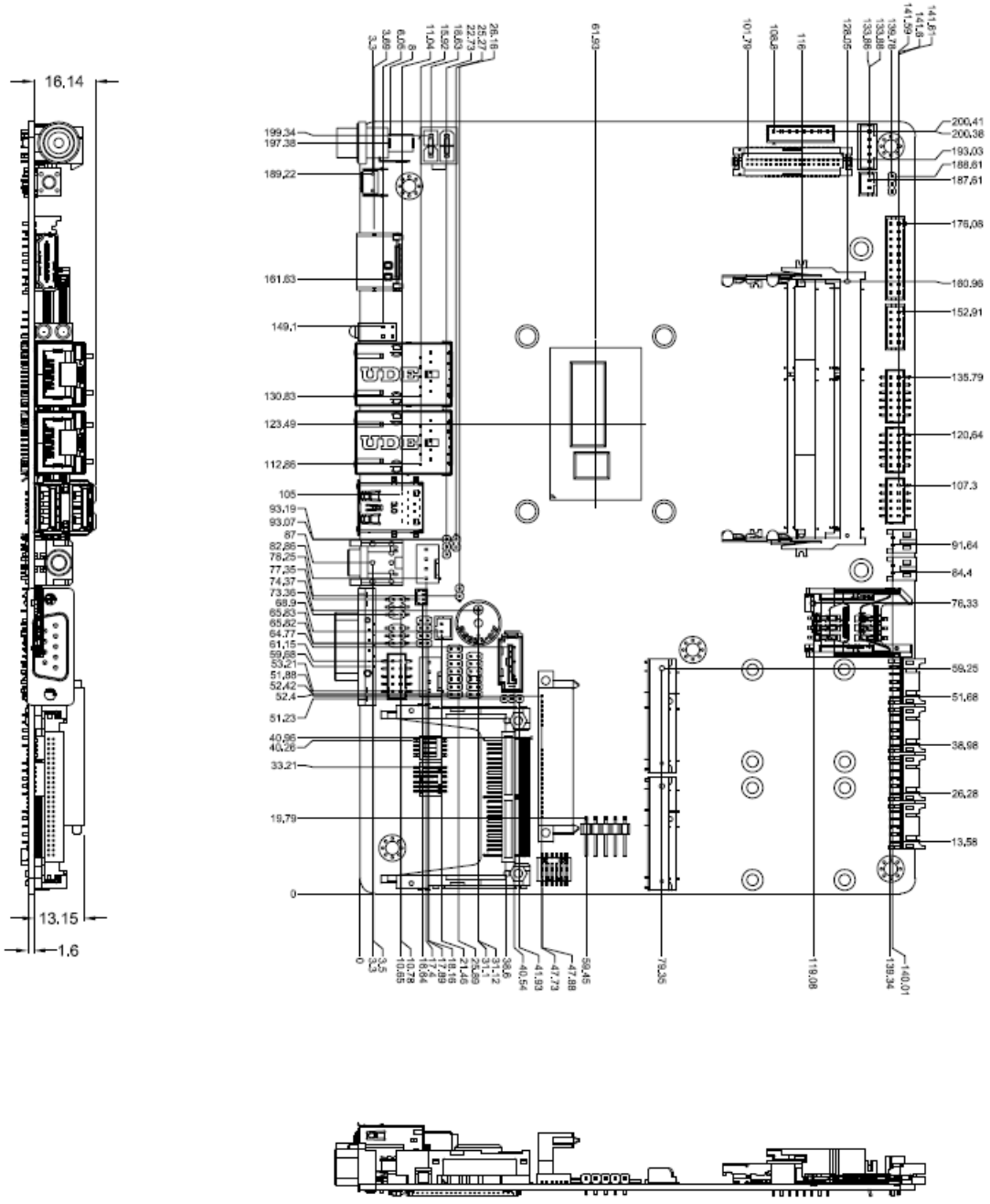


Step 4. Wait while installing.

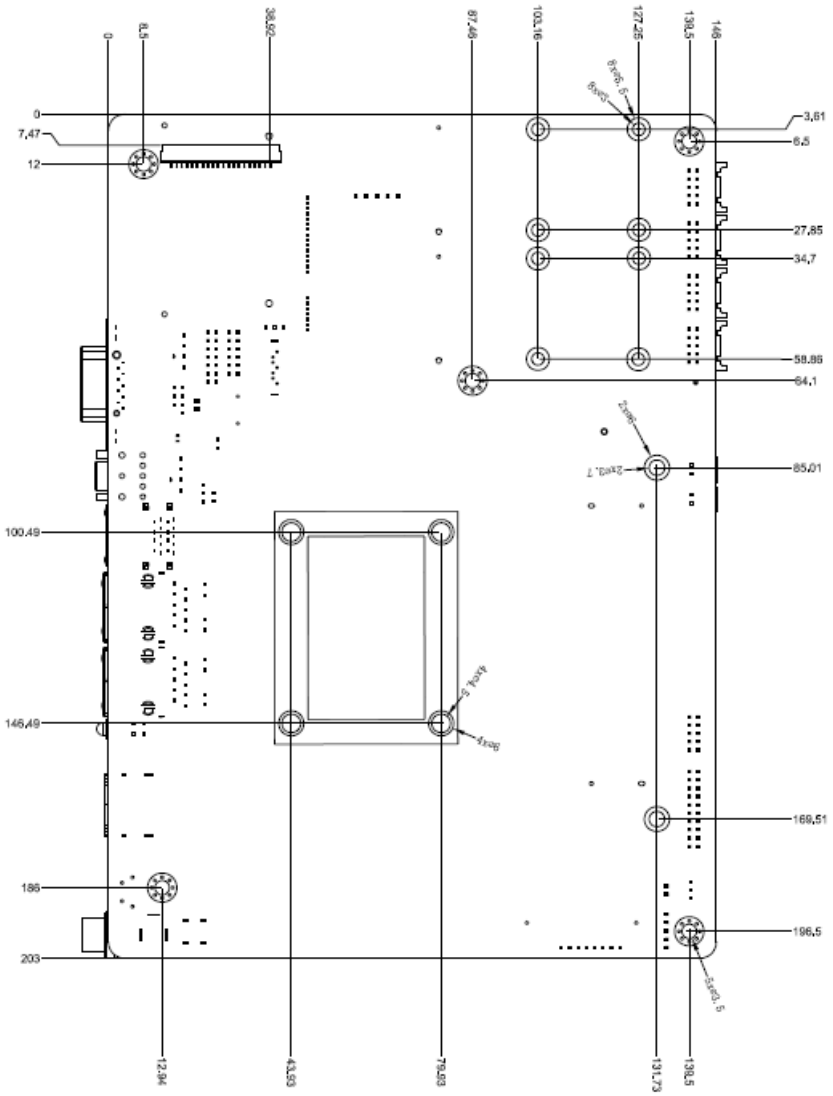


Step 5. Click **Finish** to complete the setup.

5. Mechanical Drawing



Unit: mm


0
8,5
38,92
87,48
103,16
127,25
139,5
146
0
7,47
12
3,81
6,5
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58,86
64,1
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186
196,5
203
12,94
43,53
79,03
131,73
138,5

Unit: mm