

EPI-BDW

Intel® 5th Generation Core™ i7 BGA Processor
EPIC Module with Intel® QM87 Chipset

User's manual

1st Ed – 14 September 2015

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- (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.
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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.

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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. 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 EPI-BDW EPIC Module
- 1 x CD-ROM or DVD-ROM contains the followings:
 - User's Manual (this manual in PDF file)
 - Ethernet driver and utilities
 - VGA drivers and utilities
 - Audio drivers and utilities
- 1 x Cable set contains the followings:
 - 1 x COM port cable (20-pin to 2 x DB9(M))
 - 1 x Serial ATA cable (7-pin, standard)
 - 1 x Serial ATA power cable



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

1.3 Document Amendment History

Revision	Date	Comment
1 st	September 2015	Initial Release

1.4 Manual Objectives

This manual describes in detail the Avalue Technology EPI-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 interface with EPI-BDW series 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 NVRAM that make booting impossible. If this should happen, clear the NVRAM settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors concerning 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	Onboard 5th generation Intel® mobile Core™ i7 BGA processors (47W CPU)
BIOS	AMI uEFI BIOS, 128 Mbit SPI Flash ROM iAMT9.0 supported
System Chipset	Intel QM87 PCH
I/O Chip	EC(IT8518E)
System Memory	1 x 204-pin 1.35V DDR3L SODIMM
SSD	1 x mSATA (from Mini PCIe slot)
Watchdog Timer	H/W Reset, 1sec. – 65535sec.
H/W Status Monitor	CPU & system temperature monitoring Voltages monitoring
Expansion	1 x mini-PCIe (mSATA supported)
Built-in Touch screen (optional)	chipset :PenMount 6000 Touch screen interface With 9-pin 2.0mm Box Header (can be selected to support 4/5/8 wire touch screen)
I/O	
MIO	2 x SATA III, 2 x RS232, 2 x RS232/422/485, LPC
USB	2 x USB3.0 , 2 x USB 2.0(Wafer), 4 x USB 3.0 (Edge connectors)
GPIO	4-bit GPI, 4-bit GPO
Display	
Chipset	Intel QM87
Resolution	DVI Mode:1920 x 1200@60Hz HDMI mode:4096 x 2304@24Hz, 1920 x 1200@60Hz LVDS mode:1920 x 1080@60Hz
Multiple Display	Triple independent display Dual HDMI+LVDS/ HDMI+LVDS+DVI or Dual HDMI+CRT/ HDMI+LVDS+CRT
HDMI	HDMI x 2
LCD Interface	Dual channel 18/24-bit LVDS
DVI	One DVI port co-lay with VGA
Audio	
AC97 Codec	Realtek ALC892 Supports 5.1-CH Audio
Ethernet	
LAN Chip	1 x Intel I210AT GbE controller 1 x Intel I217LMGbE PHY
Ethernet Interface	10/100/1000 Base-Tx compatible
Internal I/O	

EPI-BDW

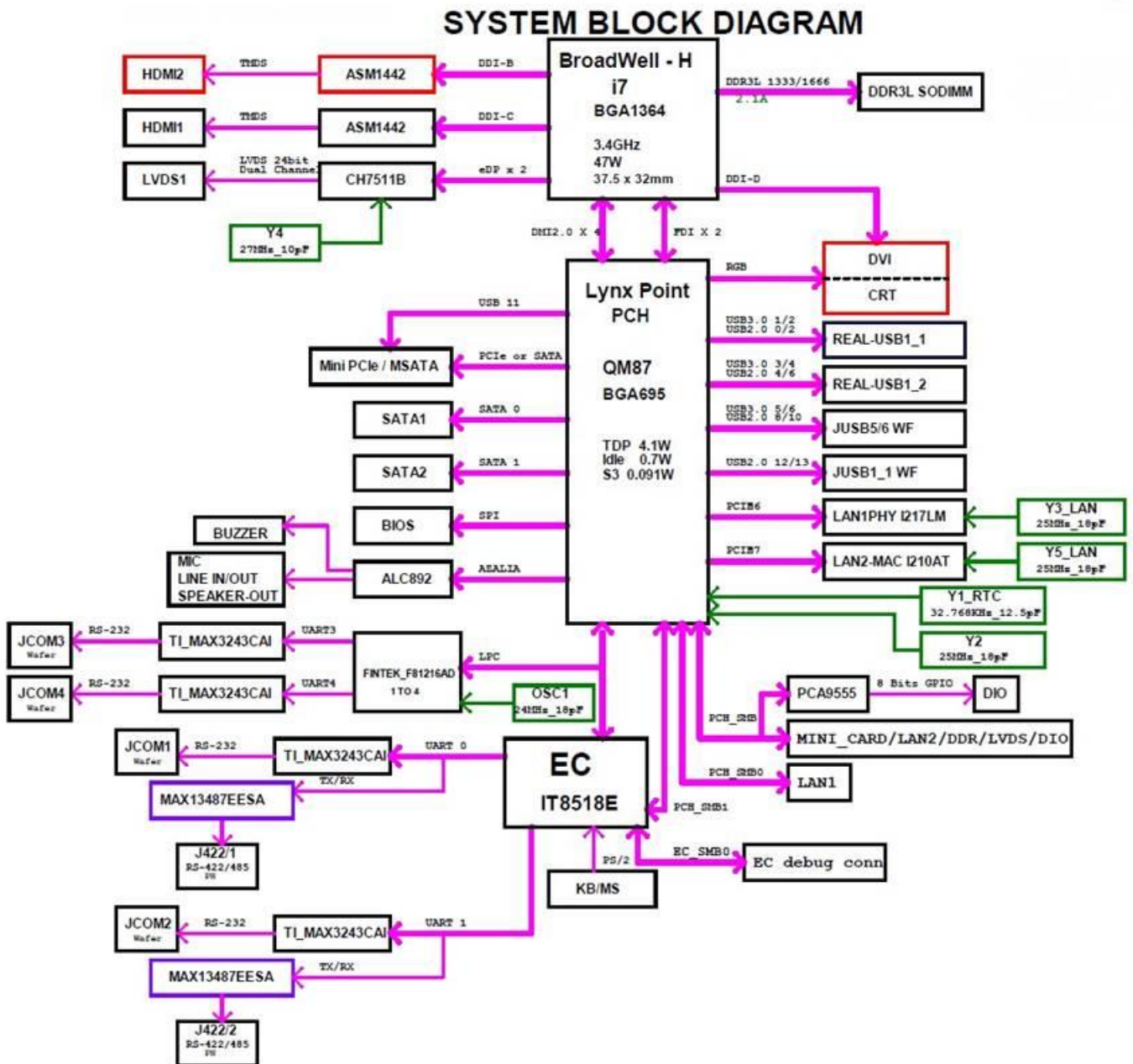
Connectors	
CMOS Battery	CR2032
COM	2 x RS232 2 x RS232/422/485
Rear I/O Connectors	
USB	4 x USB3.0
LAN	2 x Ethernet
HDMI	2 x HDMI
LED	Front Panel LED Connector (for system use)
DVI	1 x DVI-I
Mechanical & Environmental	
Power Requirement	+12V ~+19V
ACPI	Single power ATX Support S0, S3, S4, S5 ACPI 3.0 Compliant
Power Type	AT / ATX
Operating Temp.	0°C ~60°C
Storage Temp.	-40°C ~75°C
Operating Humidity	0%~90% relative humidity, non-condensing
Size (L x W)	4.5" x 6.5" (115mm x 165mm) (Please consult product engineers for the production feasibility if the size is larger than 410x360mm or smaller than 80x70mm)
Weight	0.41 lbs (0.18 Kg)



Note: Specifications are subject to change without notice.

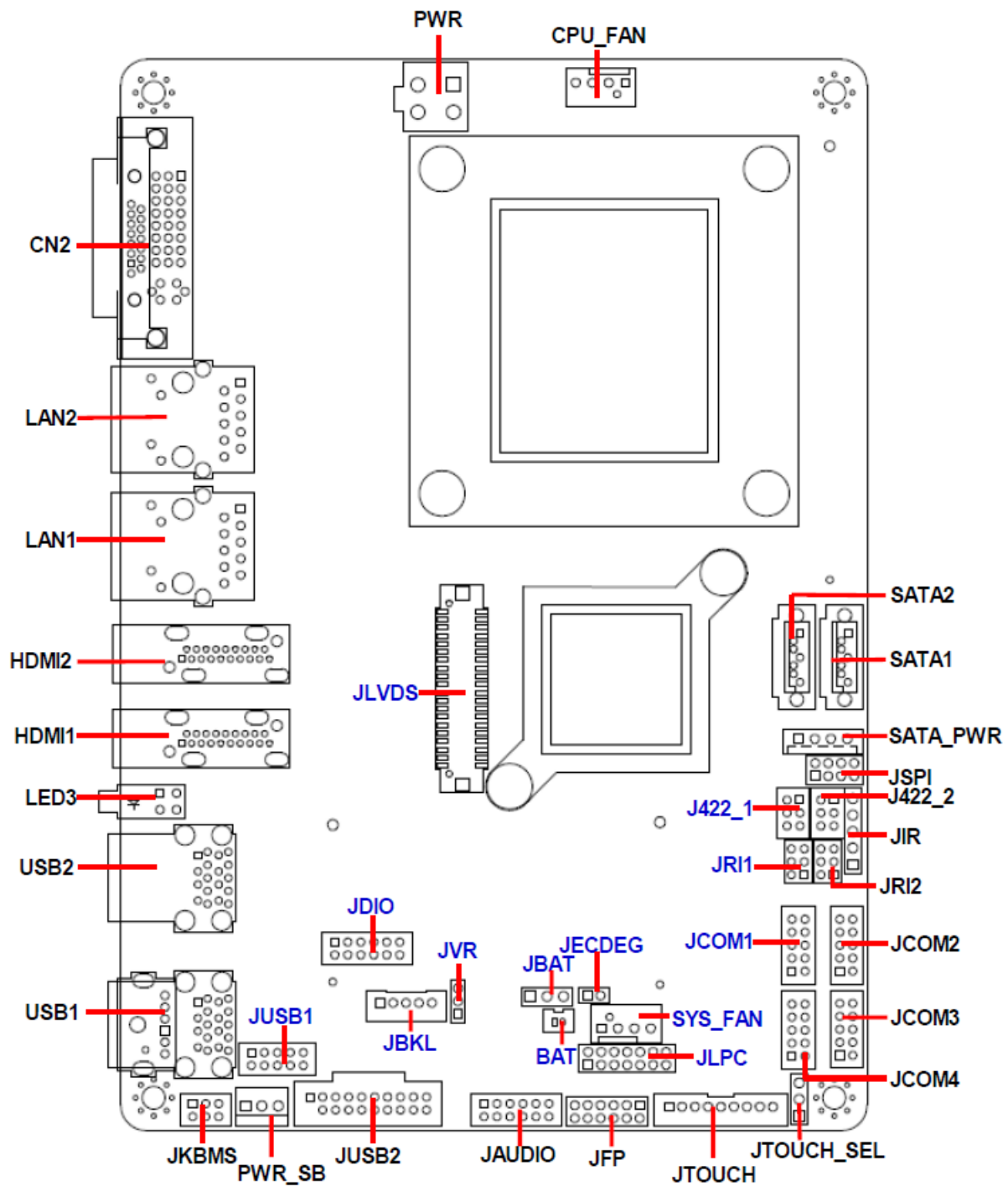
1.6 Architecture Overview – Block Diagram

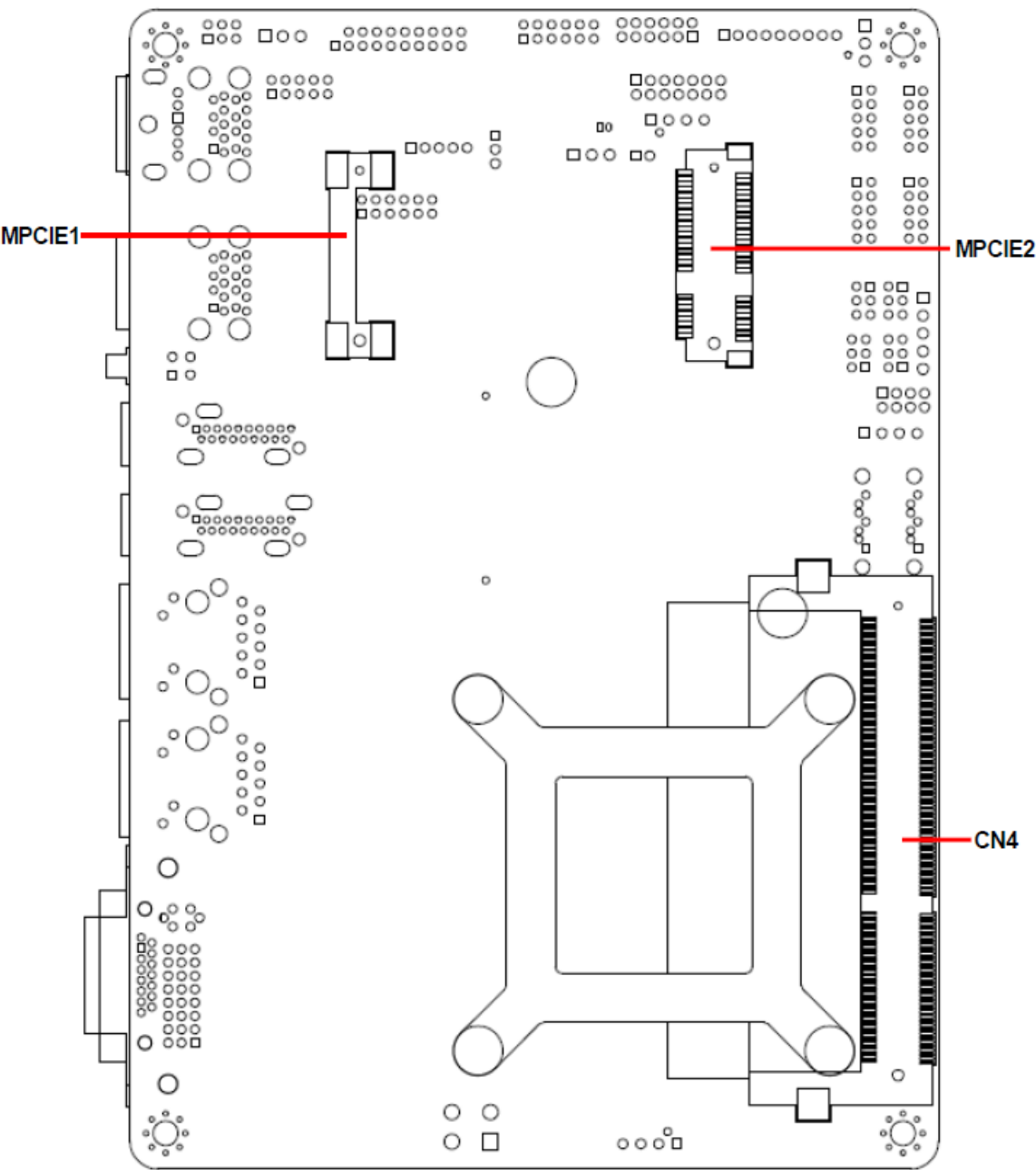
The following block diagram shows the architecture and main components of EPI-BDW.



2. Hardware Configuration

2.1 Product Overview





2.2 Installation Procedure

This chapter explains you the instructions of how to setup your system.

1. Turn off the power supply.
2. Insert the SODIMM module (be careful with the orientation).
3. Insert all external cables for hard disk, keyboard, mouse, USB etc. except for flat panel. A CRT monitor must be connected in order to change NVRAM settings to support flat panel.
4. Connect power supply to the board via the ATXPWR.
5. Turn on the power.
6. Enter the BIOS setup by pressing the delete key during boot up. Use the "Save & Exit \ Restore Defaults" feature.
7. If TFT panel display is to be utilized, make sure the panel voltage is correctly set before connecting the display cable and turning on the power.

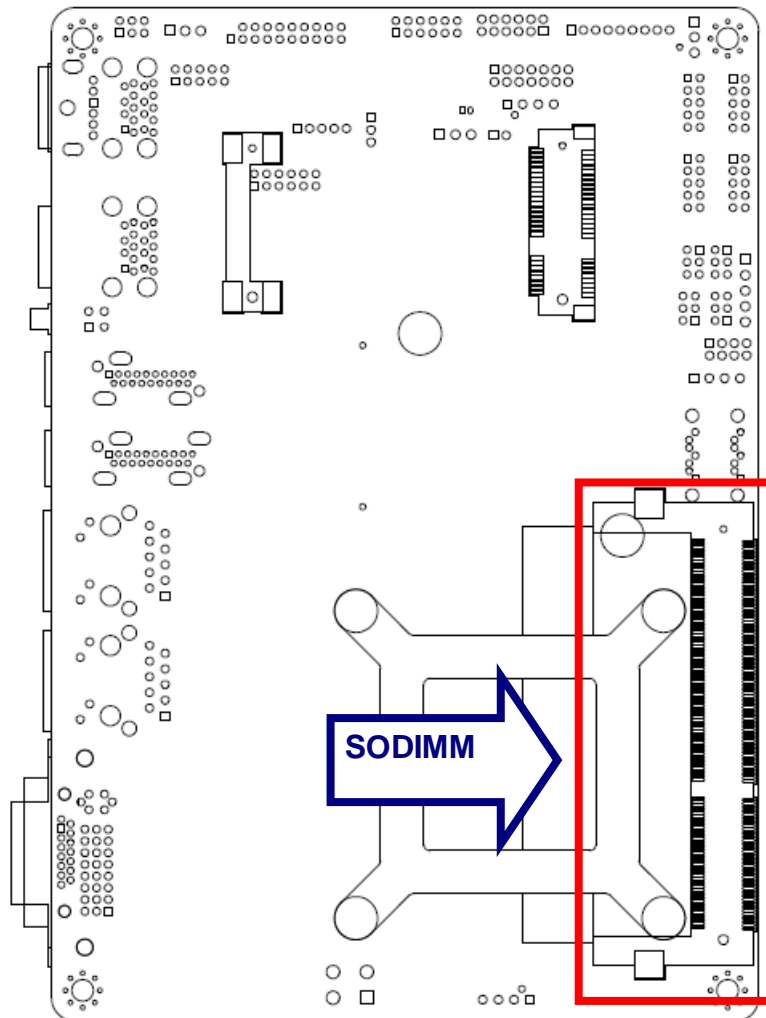


Note: Make sure the heat sink and the CPU top surface are in total contact to avoid CPU overheating problem that would cause the system to hang or unstable

EPI-BDW

2.2.1 Main Memory

EPI-BDW provides one 204-pin DDR3L SODIMM socket, supports up to 8GB 1.35V DDR3L 1333/1600 SDRAM.

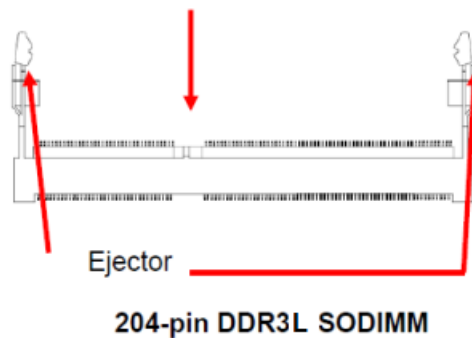
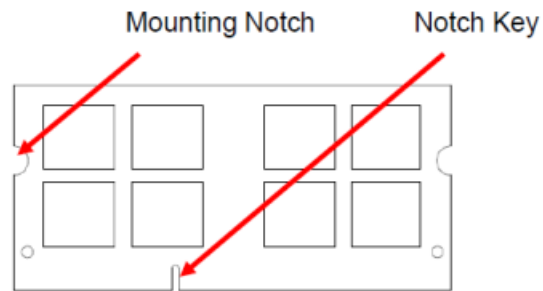


(Rear side)



Make sure to unplug the power supply before adding or removing SODIMMs or other system components. Failure to do so may cause severe damage to both the board and the components.

- Locate the SODIMM socket on the board.
- Hold two edges of the SODIMM module carefully. Keep away of touching its connectors.
- Align the notch key on the module with the rib on the slot.
- Firmly press the modules into the socket automatically snaps into the mounting notch. Do not force the SODIMM module in with extra force as the SODIMM module only fit in one direction.



- To remove the SODIMM modules, push the two ejector tabs on the slot outward simultaneously, and then pull out the SODIMM module.



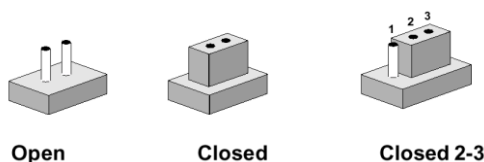
Note:

- (1) Please do not change any DDR3L SDRAM parameter in BIOS setup to increase your system's performance without acquiring technical information in advance.
- (2) Static electricity can damage the electronic components of the computer or optional boards. Before starting these procedures, ensure that you are discharged of static electricity by touching a grounded metal object briefly.

2.3 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.



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



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

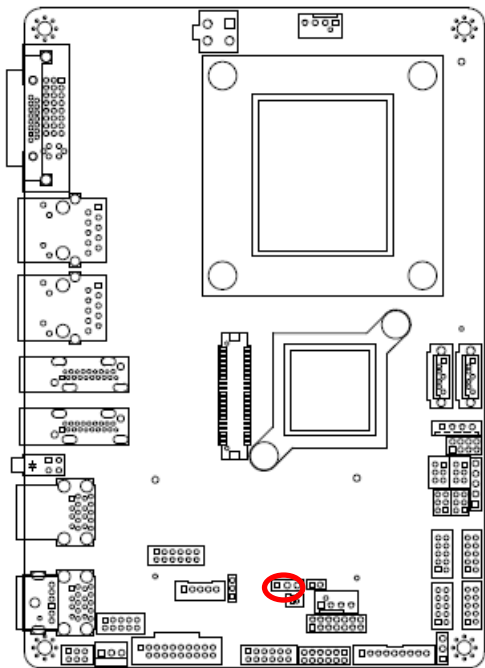
Label	Function	Note
JBAT	Clear CMOS	3 x 1 header, pitch 2.54mm
JFP	AT/ATX mode selector, Front panel & LED settings	6 x 2 header, pitch 2.00mm
JRI1/2	Serial port 1/2 - Ring, +5V, +12V power selector	3 x 2 header, pitch 2.00mm
JTOUCH_SEL	Touch panel connector	3 x 1 header, pitch 2.54mm
JVR	LCD Backlight brightness adjustment	3 x 1 header, pitch 2.00mm

Connectors

Label	Function	Note
BAT	Battery connector	2 x 1 wafer, pitch 1.25mm
CN2	DVI connector	
CN4	204-pin DDR3L SODIMM	
CPU_FAN	CPU Fan connector	4 x 1 wafer, pitch 2.54mm
HDMI1/2	HDMI connector	
SATA_PWR	SATA power connector	4 x 1 wafer, pitch 2.50mm
J422_1	Serial Port 1 422/485 Mode connector	3 x 2 wafer, pitch 2.00mm
J422_2	Serial Port 2 422/485 Mode connector	3 x 2 wafer, pitch 2.00mm
JAUDIO	Audio Connector	6 x 2 wafer, pitch 2.00mm
JBKL	LCD Inverter connector	5 x 1 wafer, pitch 2.00mm
JCOM1~4	Serial port 1~4 connector	5 x 2 wafer, pitch 2.00mm
JDIO	General purpose I/O connector	6 x 2 wafer, pitch 2.00mm
JIR	IrDA connector	5 x 1 header, pitch 2.54mm
JKBMS	PS/2 keyboard & mouse connector	3 x 2 wafer, pitch 2.00mm
JLPC	(Reversed for BIOS programming)	7 x 2 header, pitch 2.00mm
JLVDS	LVDS connector	DIN 40-pin wafer, pitch 1.25mm
JSPI	SPI connector	4 x 2 header, pitch 2.00mm
JTOUCH	Touch panel connector	9 x 1 wafer, pitch 2.00mm
JUSB1	USB 2.0 connector	5 x 2 wafer, pitch 2.00mm
JUSB2	USB 3.0 connector	10 x 2 wafer, pitch 2.00mm
LAN1	RJ-45 Ethernet connector 1	
LAN2	RJ-45 Ethernet connector 2	
LED3	Power & HDD indicator	
MPCIE1/2	Mini PCIEXPRESS connector	
PWR_SB	5VSB connector in ATX	3 x 1 wafer, pitch 2.54mm
PWR	Power connector	2 x 2 wafer, pitch 4.2mm
SATA1	Serial ATA connector 1	
SATA2	Serial ATA connector 2	
SYS_FAN	System Fan connector	4 x 1 wafer, pitch 2.54mm
USB1	USB 3.0 connector 0 & 1	
USB2	USB 3.0 connector 2 & 3	
JECDEG	EC SMB Reserve connector	2 x 1 header, pitch 2.00mm

2.4 Setting Jumpers & Connectors

2.4.1 Clear CMOS (JBAT)



RTC Working*

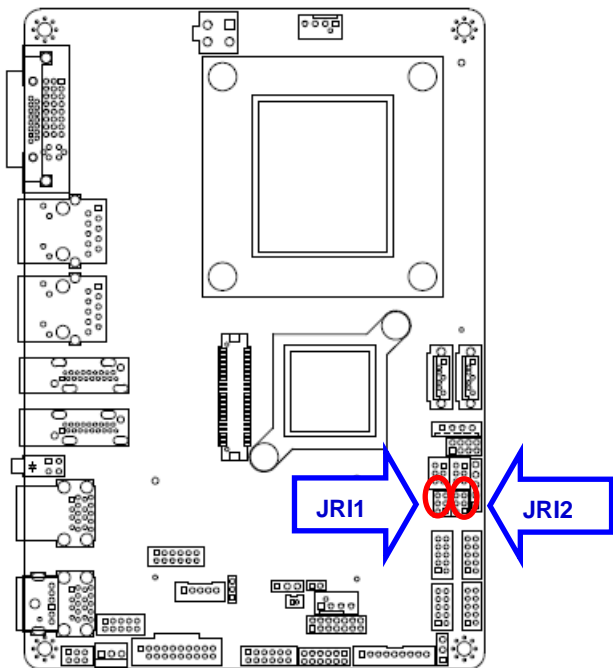


RTC Reset

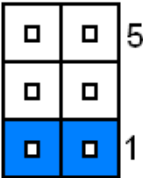


*Default

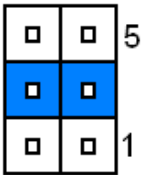
2.4.2 Serial port 1/2 - Ring, +5V, +12V power selector (JR11/2)



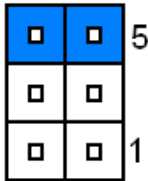
Ring*



+5V

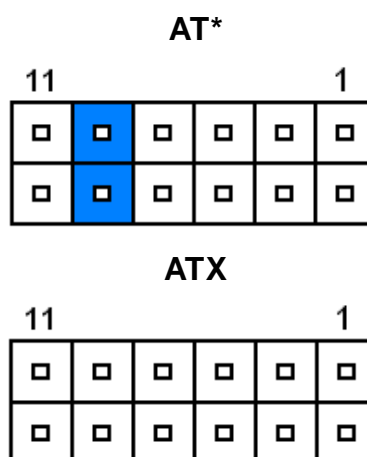
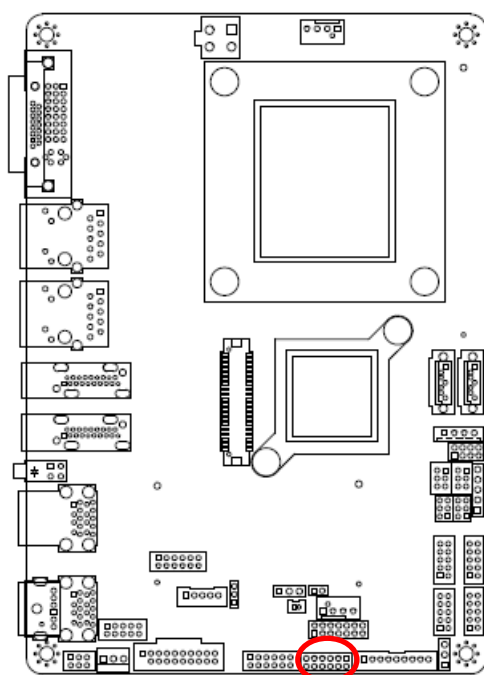


+12V



* Default

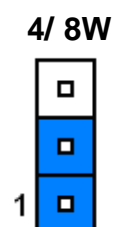
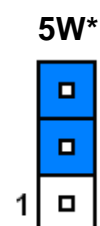
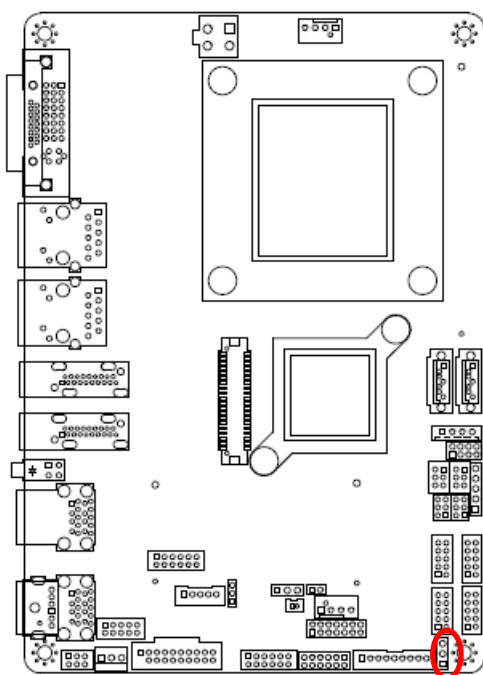
2.4.3 AT/ATX mode selector, Front panel & LED settings (JFP)



Signal	PIN
PWBT	1
	2
RST#	3
	4
PWR-LED+	5
PWR-LED-	6
HDD-LED-	7
HDD-LED+	8
Power On Mode	9
	10
CASE_OPEN#	11
	12

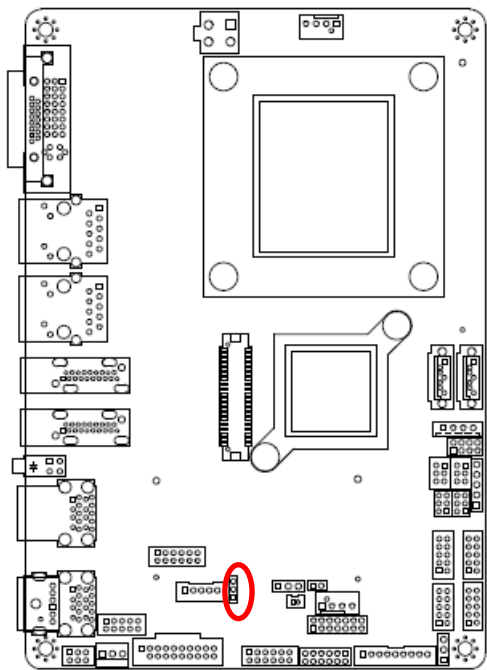
*Default

2.4.4 Touch panel connector (JTOUCH_SEL)

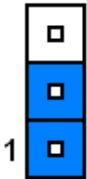


* Default

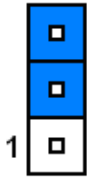
2.4.5 LCD Backlight brightness adjustment (JVR)



PWM mode*

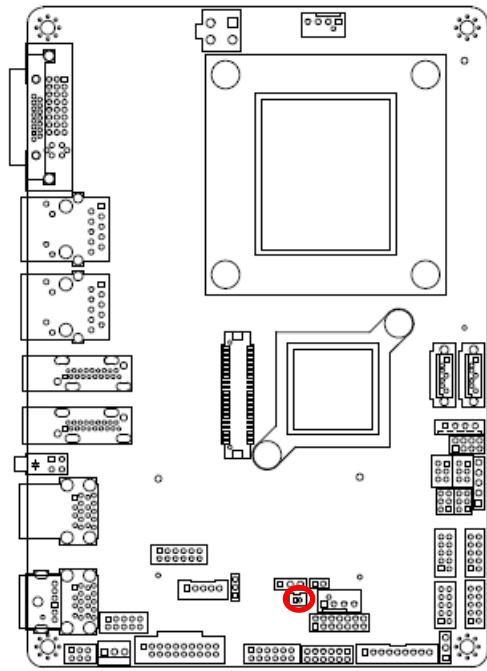


DC Mode



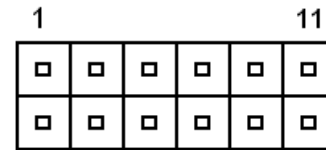
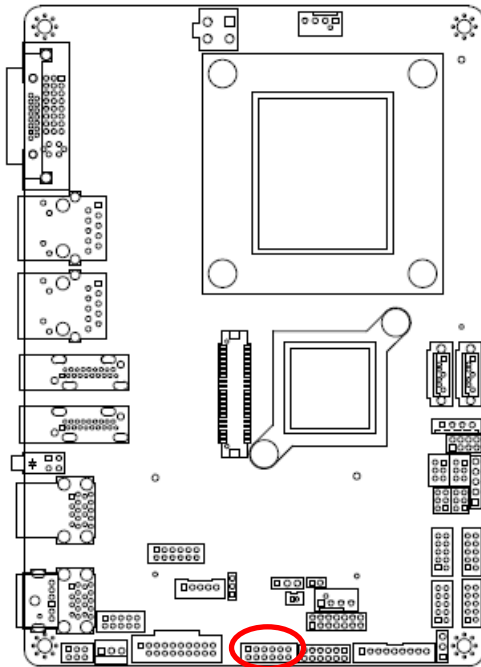
* Default

2.4.6 Battery connector (BAT)



Signal	PIN
+3.3V	1
GND	2

2.4.7 Audio connector (JAUDIO)

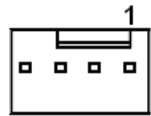
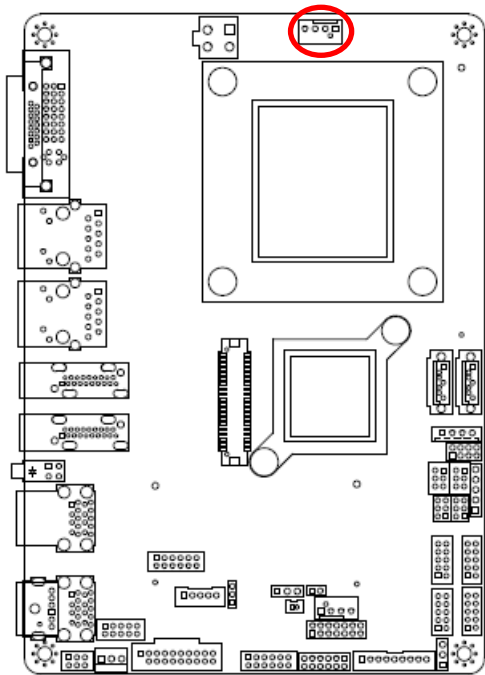


Signal	PIN	PIN	Signal
FRONT-R-OUT	2	1	FRONT-L-OUT
GND	4	3	GND
LINE1-R-IN	6	5	LINE1-L-IN
MIC1-R-IN	8	7	MIC1-L-IN
FRONT_JD	10	9	LINE1_JD
MIC1_JD	12	11	GND

2.4.7.1 Signal Description – Audio connector (JAUDIO)

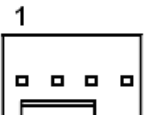
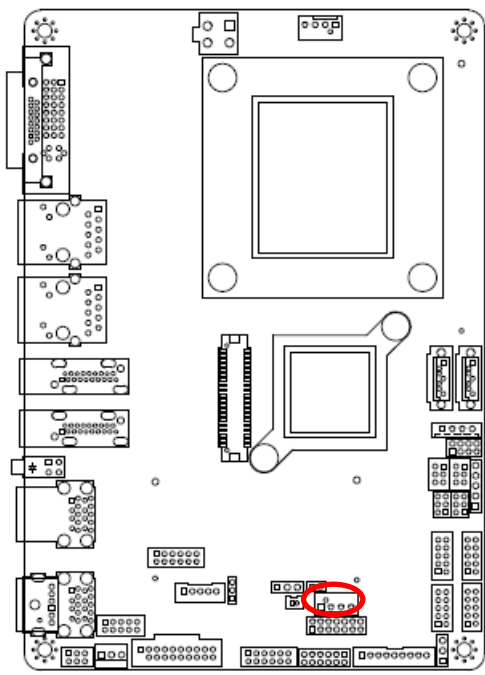
Signal	Signal Description
LINE1_JD	AUDIO IN (LINE_RIN/LIN)sense pin
FRONT_JD	AUDIO Out(ROUT/LOUT) sense pin
MIC1_JD	MIC IN (MIC_RIN/LIN) sense pin

2.4.8 CPU fan connector (CPU_FAN)



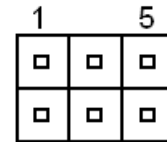
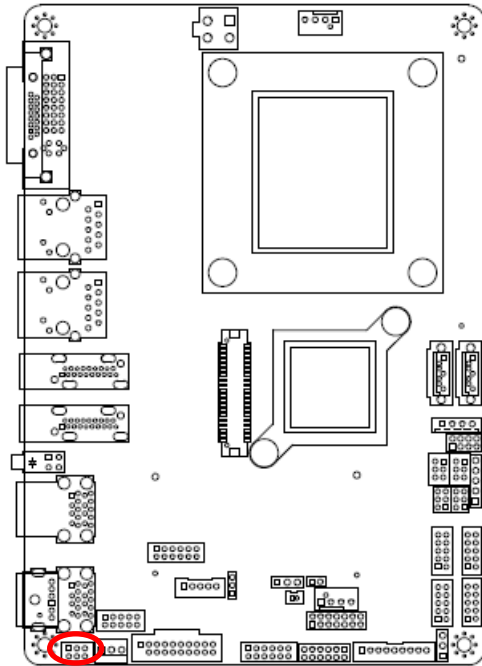
Signal	PIN
GND	1
+12V	2
EC_TACH0	3
FAN_PWM0	4

2.4.9 System fan connector (SYS_FAN)



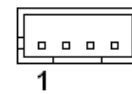
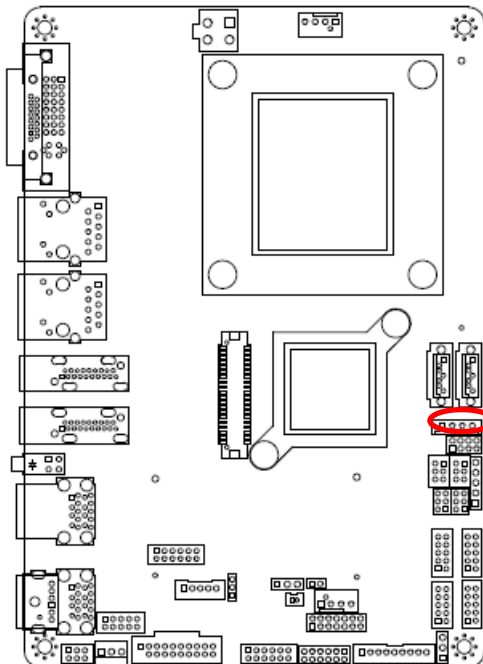
Signal	PIN
GND	1
+12V	2
EC_TACH1	3
FAN_PWM1	4

2.4.10 PS/2 keyboard & mouse connector (JKBMS)



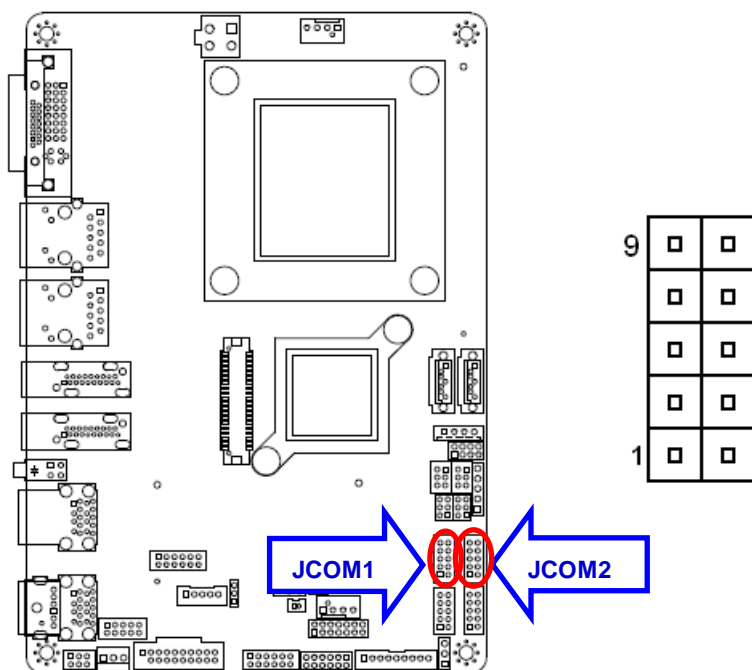
Signal	PIN	PIN	Signal
KBDT	2	1	KBCK
GND	4	3	KBVCC
MSDT	6	5	MSCK

2.4.11 SATA power connector (SATA_PWR)



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

2.4.12 Serial port 1/ 2 connector (JCOM1/ JCOM2)



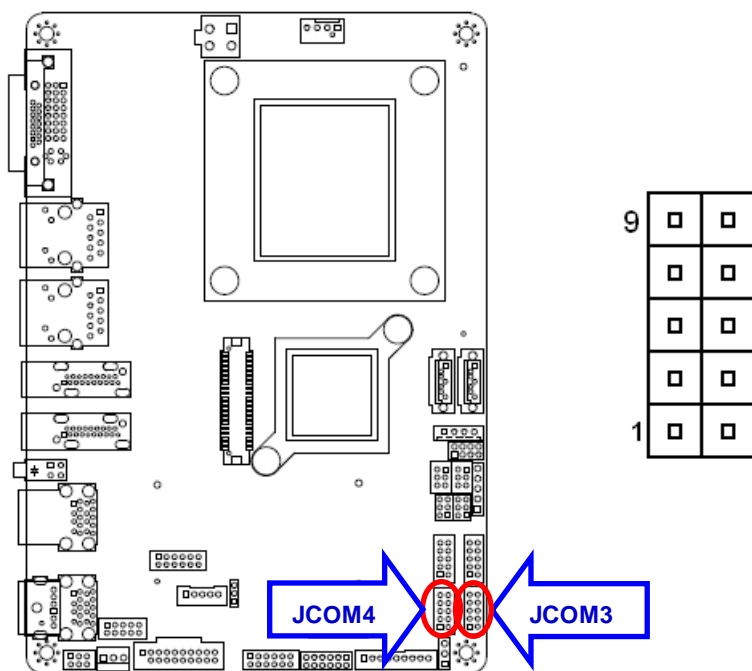
JCOM1

Signal	PIN	IN	Signal
RI#_1	9	10	NC
RTS#1	7	8	CTS#_1
GND	5	6	DSR#_1
TXD_1	3	4	DTR#_1
DCD#_1	1	2	RXD_1

JCOM2

Signal	PIN	IN	Signal
RI#_2	9	10	NC
RTS#2	7	8	CTS#_2
GND	5	6	DSR#_2
TXD_2	3	4	DTR#_2
DCD#_2	1	2	RXD_2

2.4.13 Serial port 3/ 4 connector (JCOM3/ JCOM4)



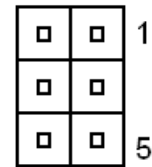
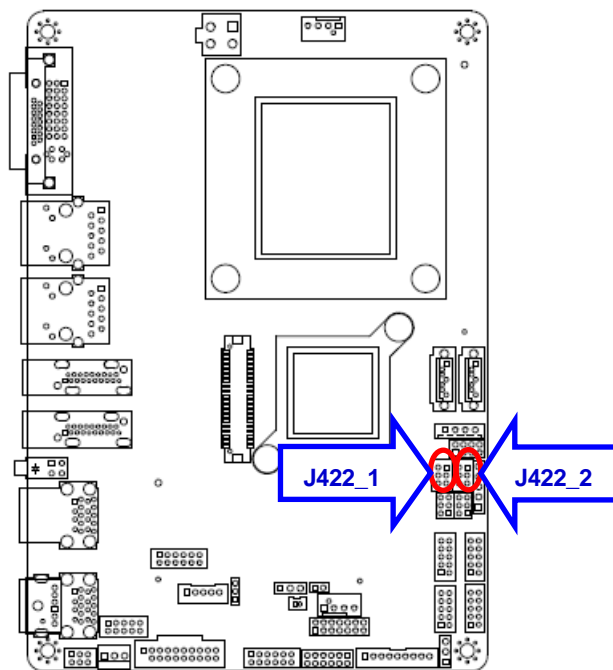
JCOM3

Signal	PIN	IN	Signal
NRIC#	9	10	NC
NRTSC#	7	8	NCTSC#
GND	5	6	NDSRC#
NTXDC	3	4	NDTRC#
NDCDC#	1	2	NRXDC

JCOM4

Signal	PIN	IN	Signal
NRID#	9	10	NC
NRTSD#	7	8	NCTSD#
GND	5	6	NDSRD#
NTXDD	3	4	NDTRD#
NDCDD#	1	2	NRXDD

2.4.14 Serial Port 1/2 422/485 Mode connector (J422_1 / J422_2)

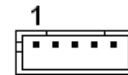
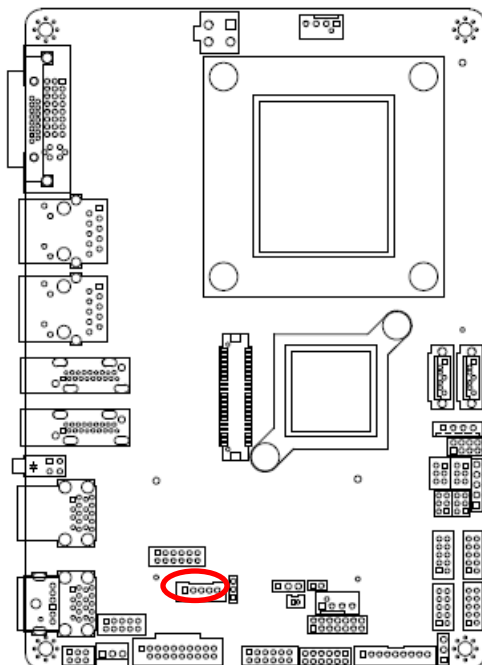


Signal	PIN	PIN	Signal
485_422TX1-	2	1	422RX1-
485_422TX1+	4	3	422RX1+
+5V	6	5	GND

Note:

J422_1/J422_2 is available after modify the mode of COM1/2 in BIOS setting

2.4.15 LCD Inverter Connector (JBKL)

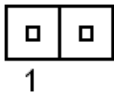
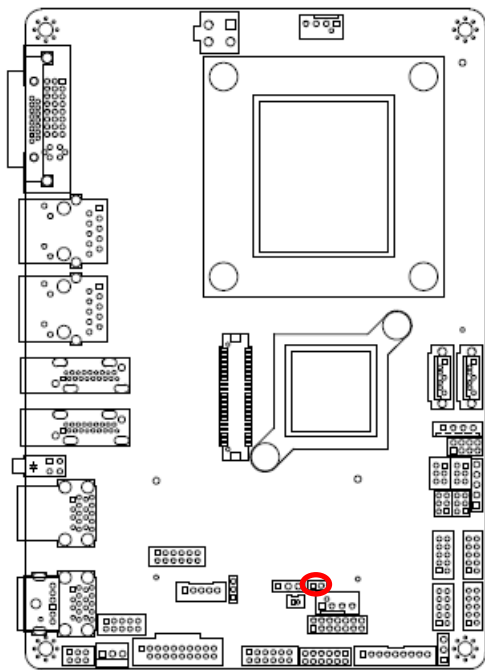


Signal	PIN
+12V	1
GND	2
BKLEN	3
VBRIGHT	4
+5V	5

2.4.15.1 Signal Description – LCD Inverter Connector (JBKL)

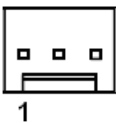
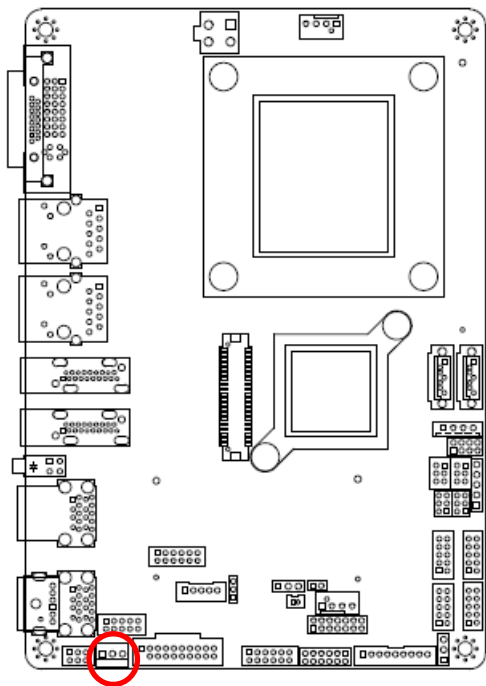
Signal	Signal Description
VBRIGHT	LCD Brightness control: PWM or DC Mode
BKLEN	LCD backlight ON/OFF control signal

2.4.16 EC SMB Reserve connector (JECDEG)



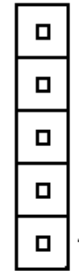
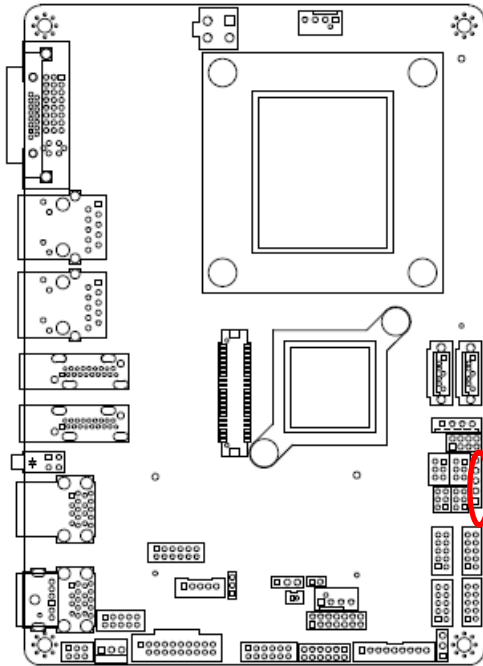
Signal	PIN
EC_SMCLK_DEBUG	1
EC_SMDAT_DEBUG	2

2.4.17 5VSB connector in ATX (PWR_SB)



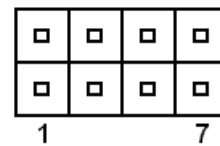
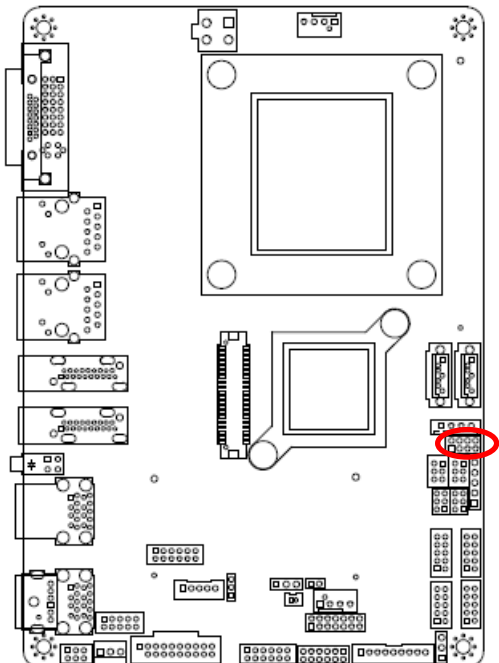
Signal	PIN
PSON_ATX#	1
GND	2
+ATX5VSB	3

2.4.18 IrDA connector (JIR)



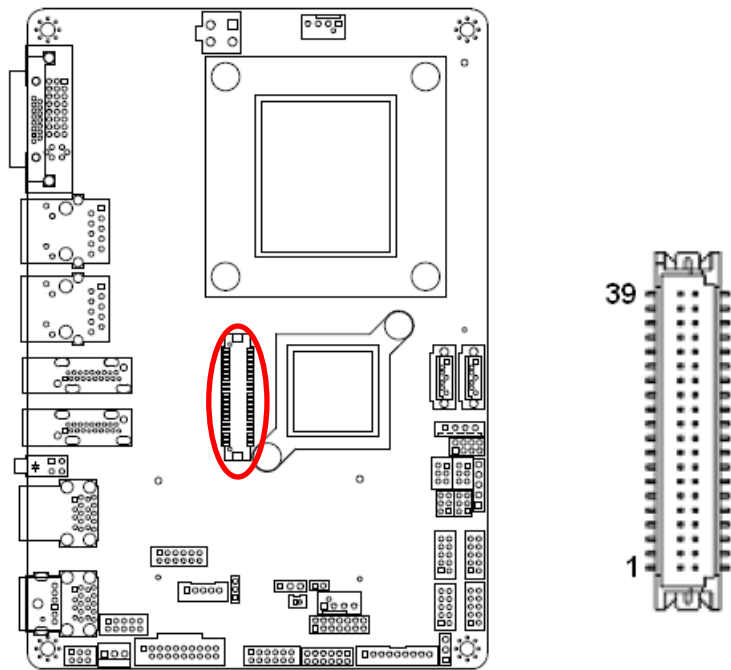
Signal	PIN
IR_TX	5
GND	4
IR_RX	3
NC	2
+5V	1

2.4.19 SPI connector (JSPI)



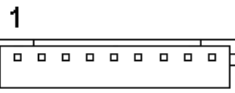
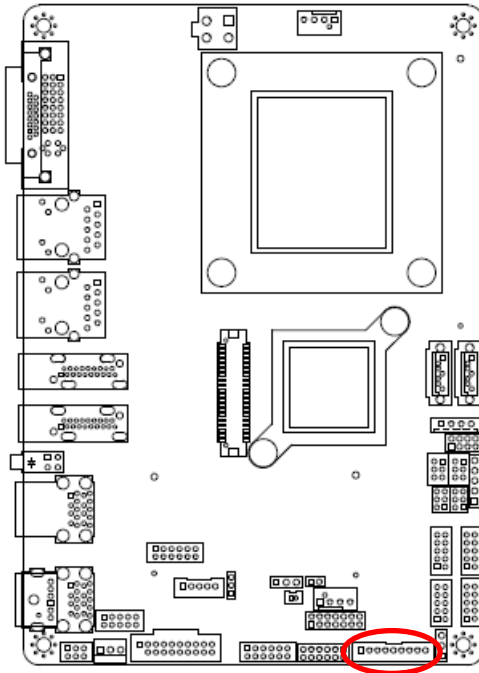
Signal	PIN	PIN	Signal
+3.3V	1	2	GND
SPI_CS0#	3	4	SPI_CLK
SPI_SO	5	6	SPI-SI
HOLD#	7	8	SPI_WP#

2.4.20 LVDS connector (JLVDS)



Signal	PIN	PIN	Signal
+12V	39	40	+12V
GND	37	38	GND
LVDS_CLK2_N	35	36	LVDS_CLK1_N
LVDS_CLK2_P	33	34	LVDS_CLK1_P
GND	31	32	GND
LVDS_DATA7_N	29	30	LVDS_DATA6_N
LVDS_DATA7_P	27	28	LVDS_DATA6_P
GND	25	26	GND
LVDS_DATA5_N	23	24	LVDS_DATA4_N
LVDS_DATA5_P	21	22	LVDS_DATA4_P
GND	19	20	GND
LVDS_DATA3_N	17	18	LVDS_DATA2_N
LVDS_DATA3_P	15	16	LVDS_DATA2_P
GND	13	14	GND
LVDS_DATA1_N	11	12	LVDS_DATA0_N
LVDS_DATA1_P	9	10	LVDS_DATA0_P
GND	7	8	GND
NC	5	6	NC
+3.3V	3	4	+5V
+3.3V	1	2	+5V

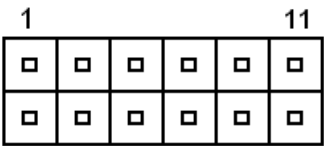
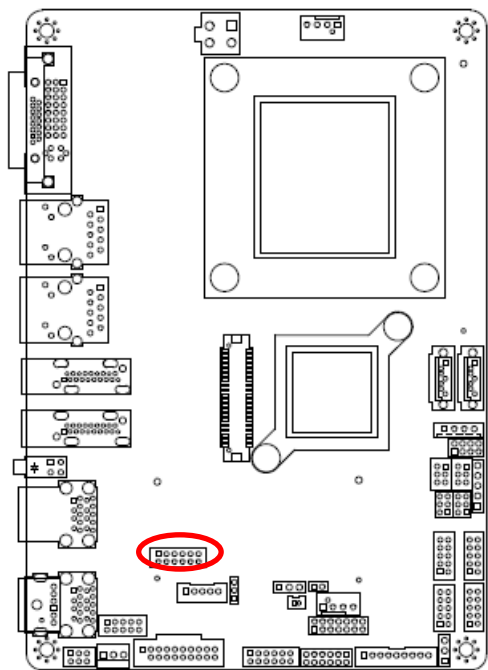
2.4.21 Touch panel connector (JTOUCH)



Signal	PIN
X+	1
X-	2
Y+	3
SENSE	4
X+	5
X-	6
Y+	7
Y-	8
TOUCH_GND	9

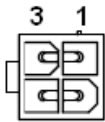
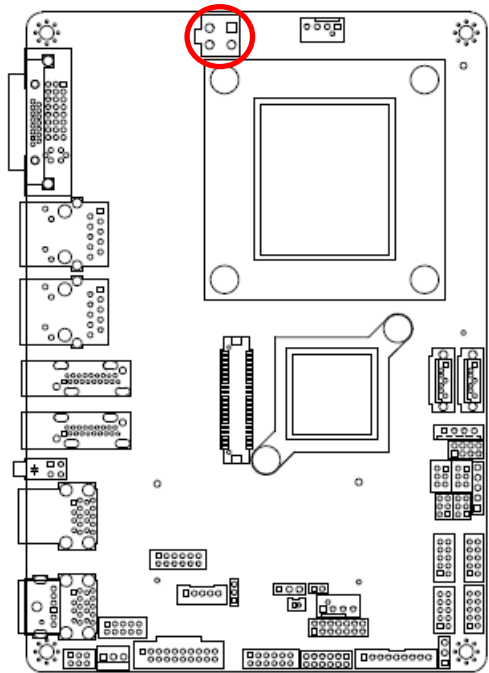
PIN	4-WIRE	5-WIRE	8-WIRE
1	N/A	N/A	Right Sense
2	N/A	N/A	Left Sense
3	N/A	N/A	Bottom Sense
4	N/A	Sense	Top Sense
5	Right	LR	Right Excite
6	Left	LL	Left Excite
7	Bottom	UR	Bottom Excite
8	Top	UL	Top Excite
9	GND	GND	GND

2.4.22 General purpose I/O connector (JDIO)



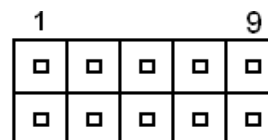
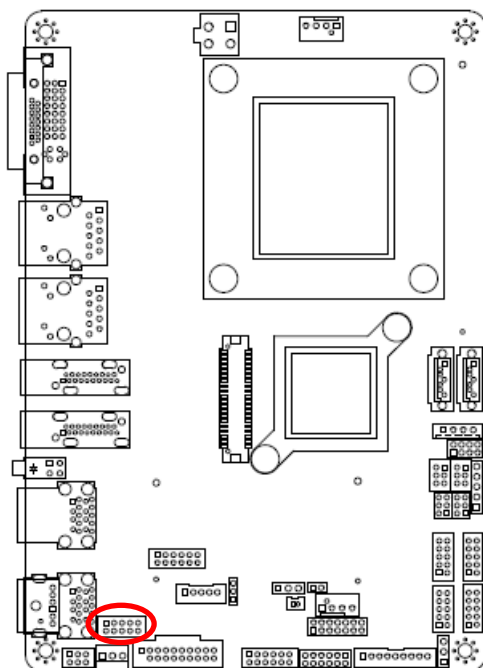
Signal	PIN	PIN	Signal
DIO_GP20	2	1	DIO_GP10
DIO_GP21	4	3	DIO_GP11
DIO_GP22	6	5	DIO_GP12
DIO_GP23	8	7	DIO_GP13
SMB_CLK_9555	10	9	SMB_DATA_9555
GND	12	11	+5V

2.4.23 Power connector (PWR)



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

2.4.24 USB 2.0 connector (JUSB1)

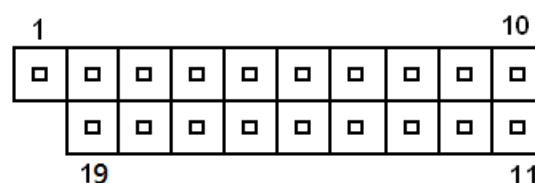
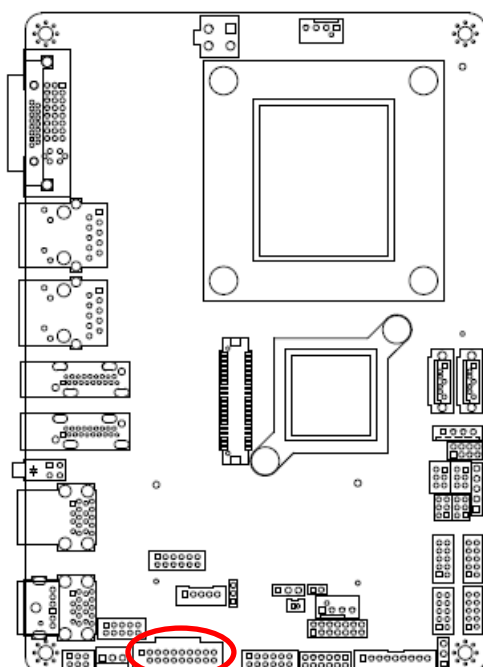


Signal	PIN	PIN	Signal
USBVCC6	2	1	USBVCC6
USB_PN_Z_13	4	3	USB_PN_Z_12
USB_PP_Z_13	6	5	USB_PP_Z_12
GND	8	7	GND
GND	10	9	GND



Note: Wrong USB cable configuration with USB devices might damage USB devices.

2.4.25 USB 3.0 connector (JUSB2)



Signal	PIN	PIN	Signal
		1	USBVCC4
USBVCC5	19	2	USB3_RXN5_L
USB3_RXN6_L	18	3	USB3_RXP5_L
USB3_RXP6_L	17	4	GND
GND	16	5	USB3_TXN5_L
USB3_TXN6_L	15	6	USB3_TXP5_L
USB3_TXP6_L	14	7	GND
GND	13	8	USB_PN_Z_8
USB_PN_Z_10	12	9	USB_PP_Z_8
USB_PP_Z_10	11	10	NC

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 or <F2> immediately after switching the system on, or

By pressing the or <F2> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self Test).

Press 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. Remove all storage can also enter the BIOS Setup Utility.

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 Window 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.

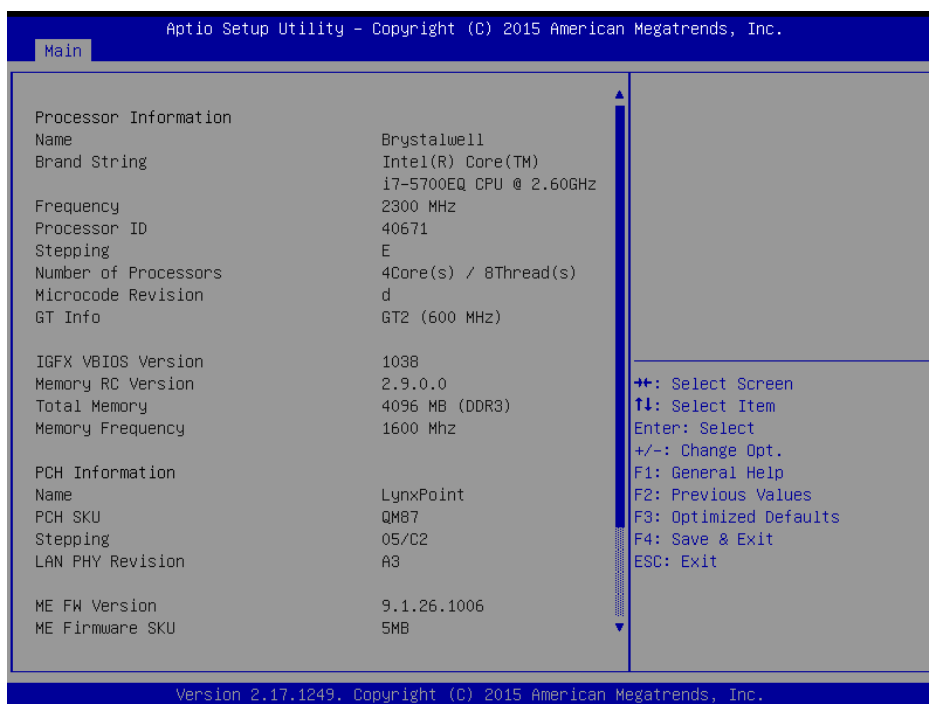
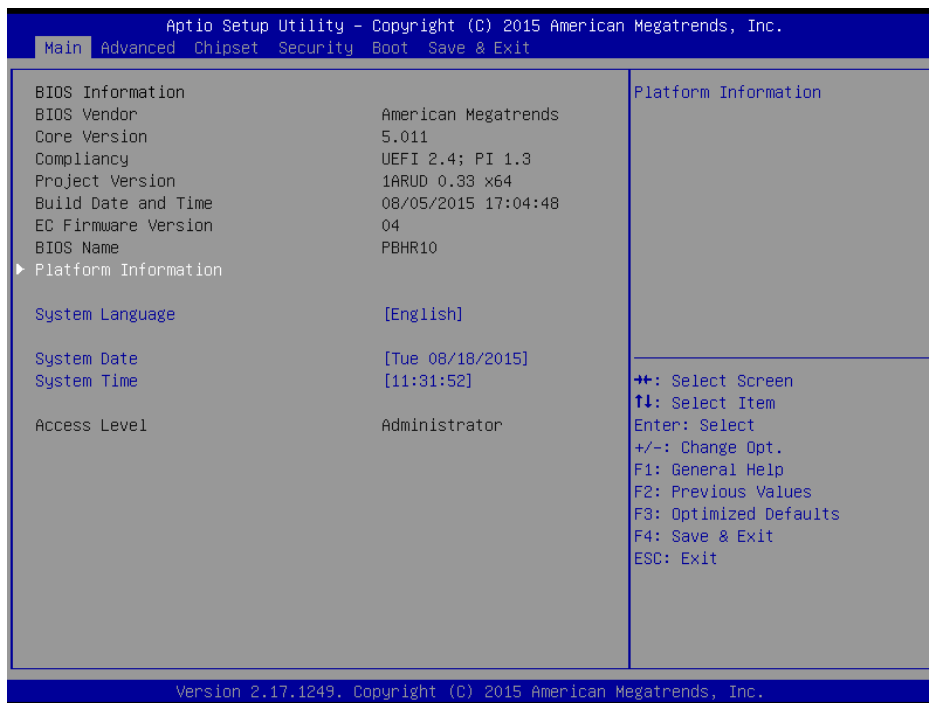
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance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

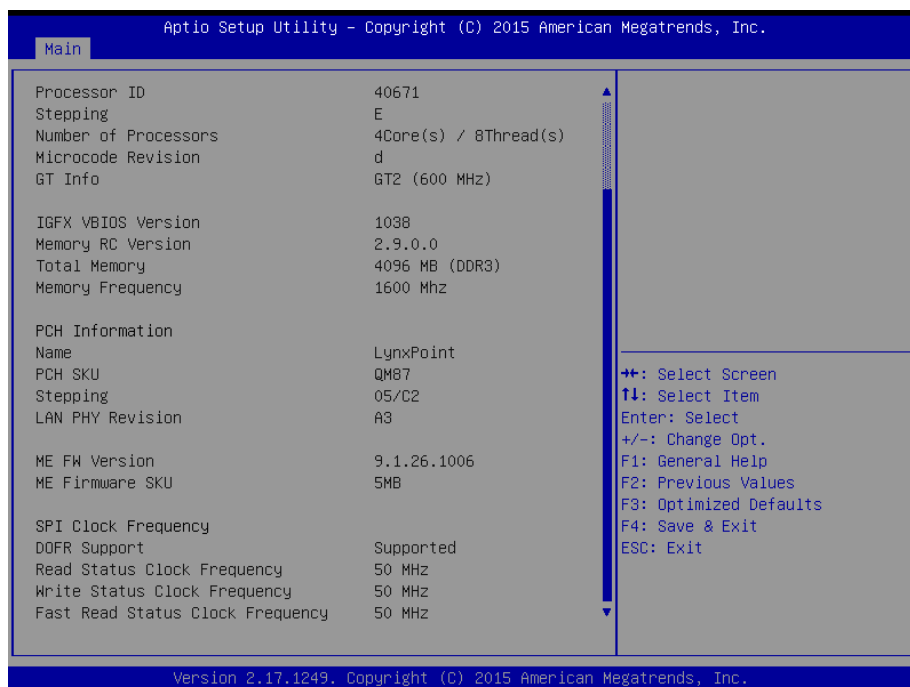
3.6 BIOS setup

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

3.6.1.3 System Time

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

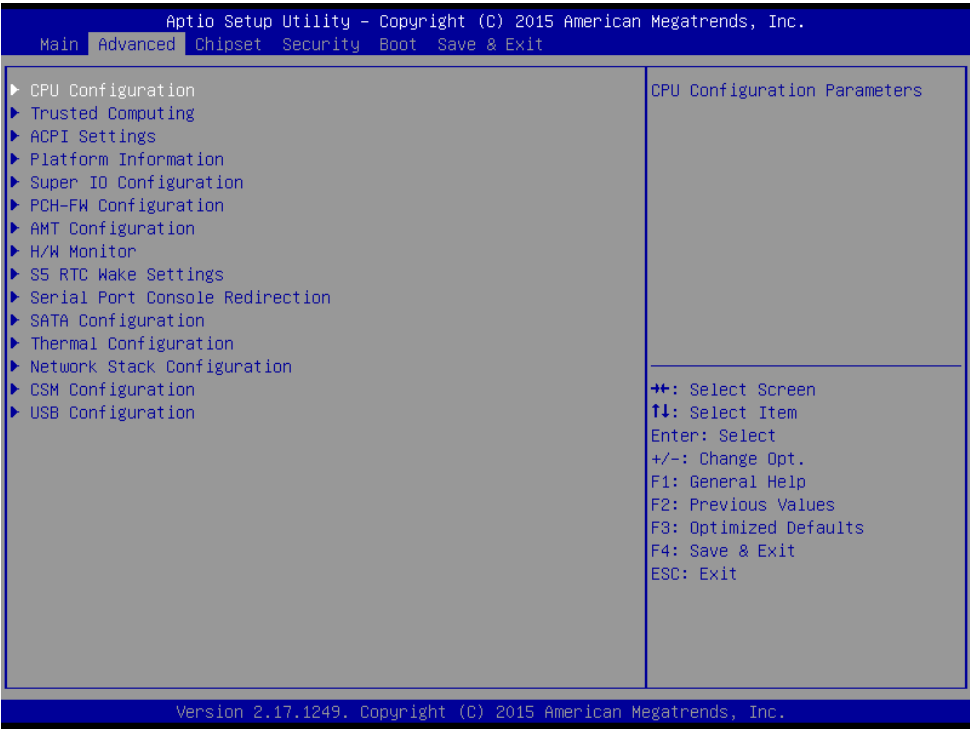


Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.

Visit the Avalue website (www.avalue.com.tw) to download the latest product and BIOS information.

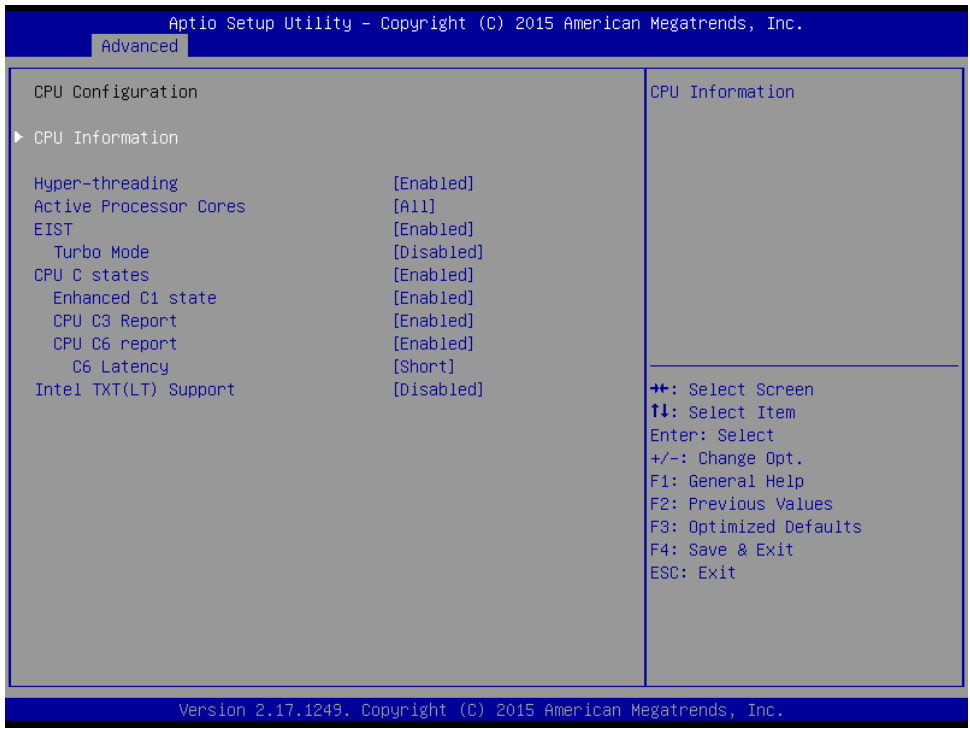
3.6.2 Advanced Menu

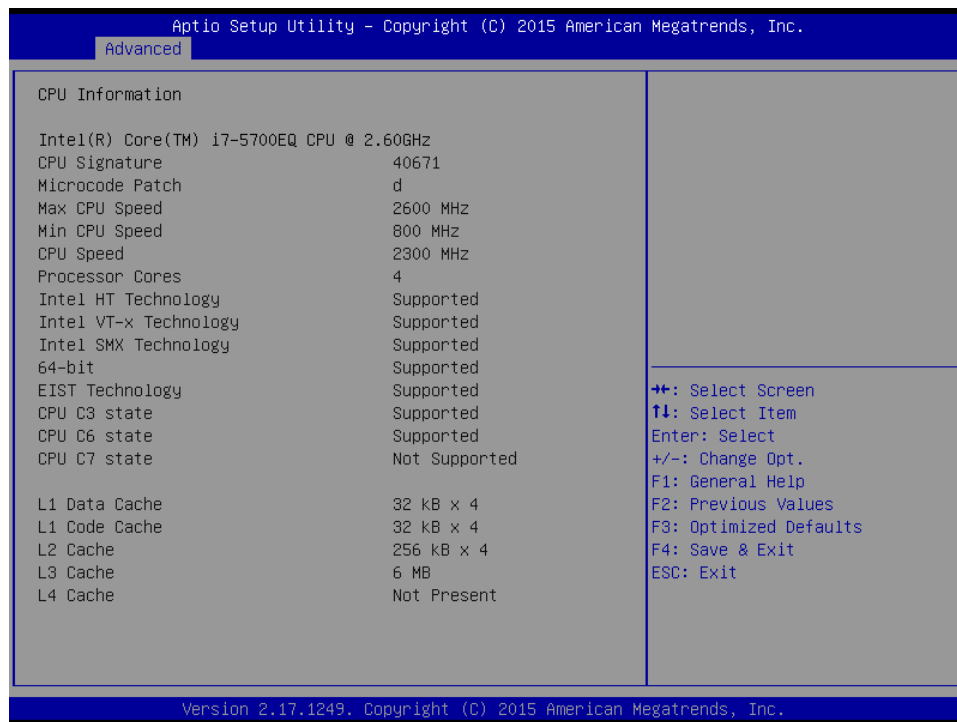
This section allows you to configure your CPU and other system devices for basic operation through the following sub-menus.



3.6.2.1 CPU Configuration

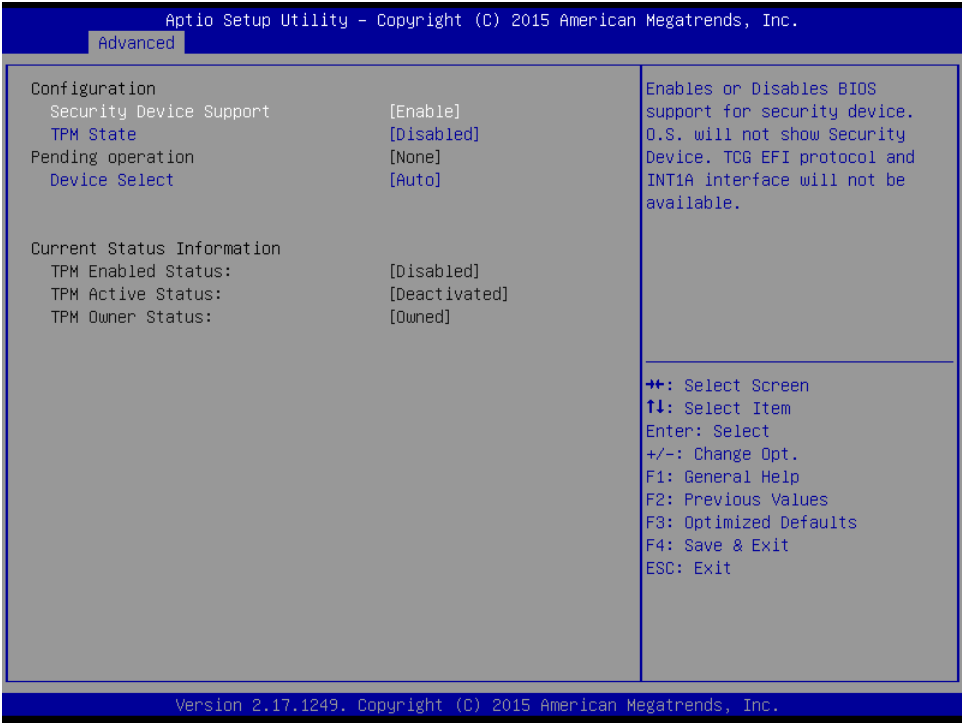
Use the CPU configuration menu to view detailed CPU specification and configure the CPU.





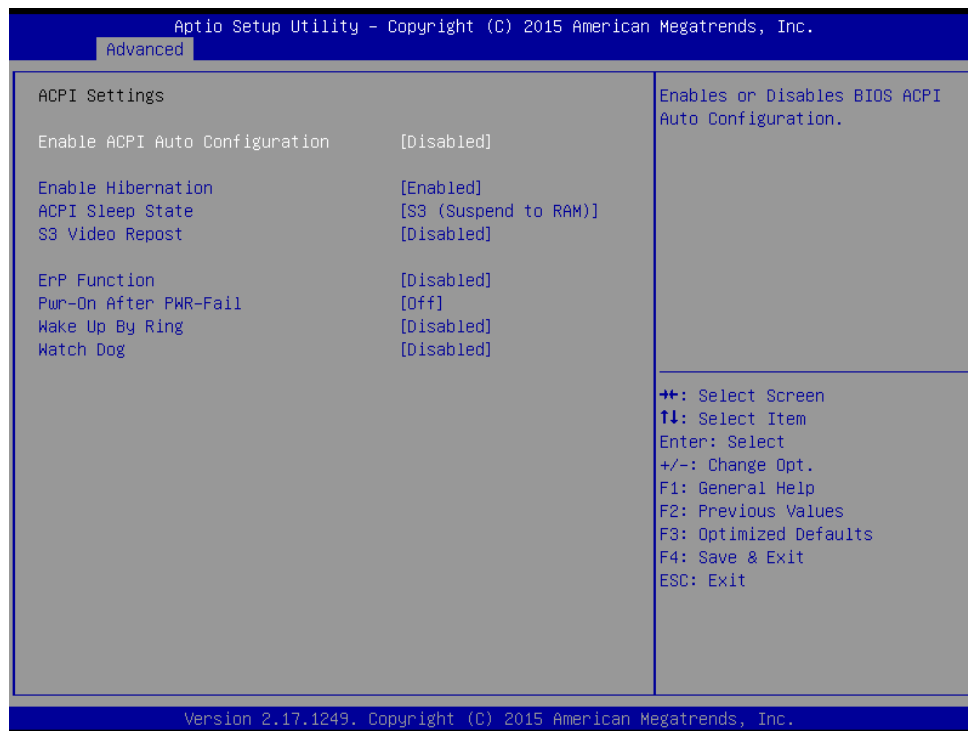
Item	Options	Description
Hyper-threading	Disabled Enabled[Default]	Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.
Active Processor Cores	All[Default] 1/2/3	Number of cores to enable in each processor package
EIST	Disabled Enabled[Default]	Enable/Disable Intel SpeedStep.
Turbo Mode	Disabled[Default] Enabled	Turbo Mode. To Enabled Turbo Mode, please make sure your thermal solution is good enough. Note: In order to maximize the effectiveness of the turbo boost, the system need to have the corresponding thermal design.
CPU C states	Disabled Enabled[Default]	Enable or disable CPU C states.
Enhanced C1 state	Disabled Enabled[Default]	Enhanced C1 state.
CPU C3/6 Report	Disabled Enabled[Default]	Enable/Disable CPU C3/6 report to OS.
C6 Latency	Short[Default] Long	Configure Short/Long latency for C6.
Intel TXT(LT) Support	Disabled[Default] Enabled	Enables or Disables Intel® TXT(LT) support.

3.6.2.2 Trusted Computing



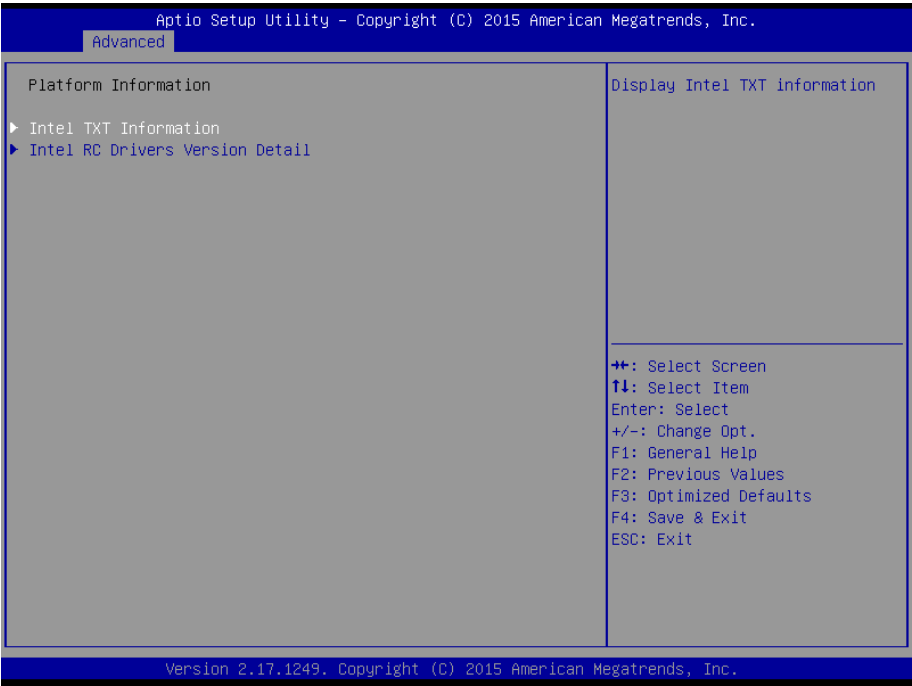
Item	Options	Description
Security Device Support	Disable, Enable[Default]	Enables or Disables BIOS support for security device. O.S will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
TPM State	Disabled[Default] Enabled	Enable/Disable Security Device. NOTE: Your Computer will reboot during restart in order to change State of the Device.
Device Select	Auto[Default]	

3.6.2.3 APCI Settings

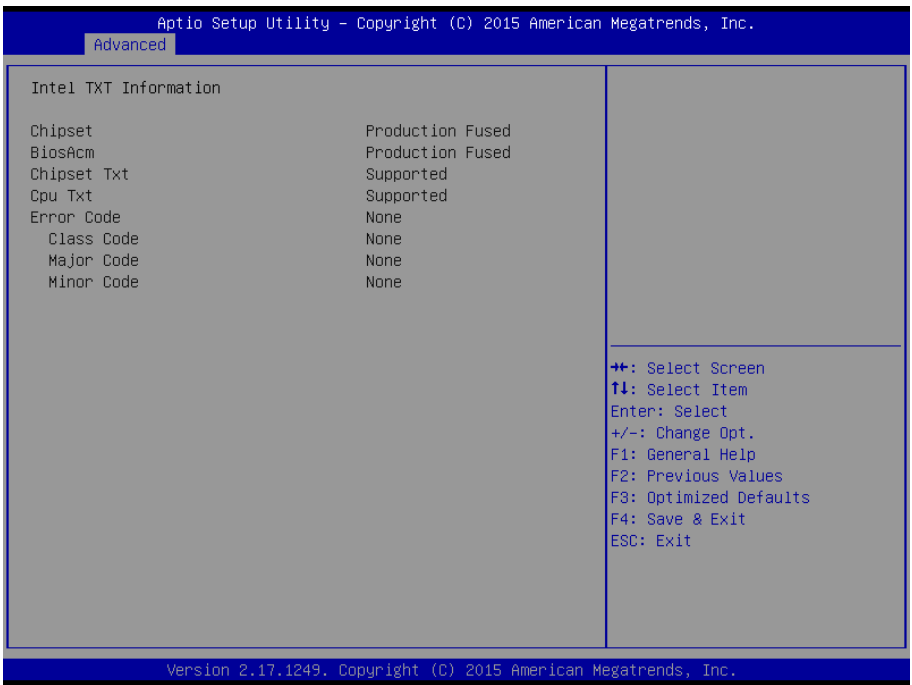


Item	Options	Description
Enable ACPI Auto Configuration	Disabled[Default] Enabled	Enable or Disable BIOS ACPI Auto Configuration.
Enable Hibernation	Disabled Enabled[Default]	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	Suspend Disabled S3 (Suspend to RAM)[Default]	Select 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).
Pwr-On After PWR-Fail	Off[Default] On Last State	Select the power station after power failure.
Wake Up by Ring	Disabled[Default] Enabled	System wake up by ring (from S3~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.

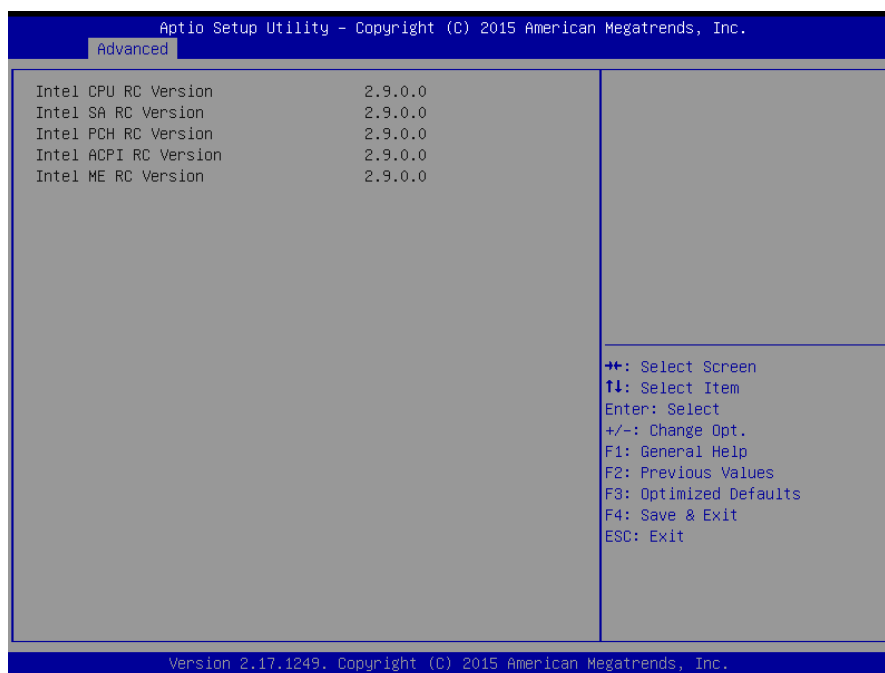
3.6.2.4 Platform Information



3.6.2.4.1 Intel TXT Information



3.6.2.4.2 Intel RC Drivers Version Detail

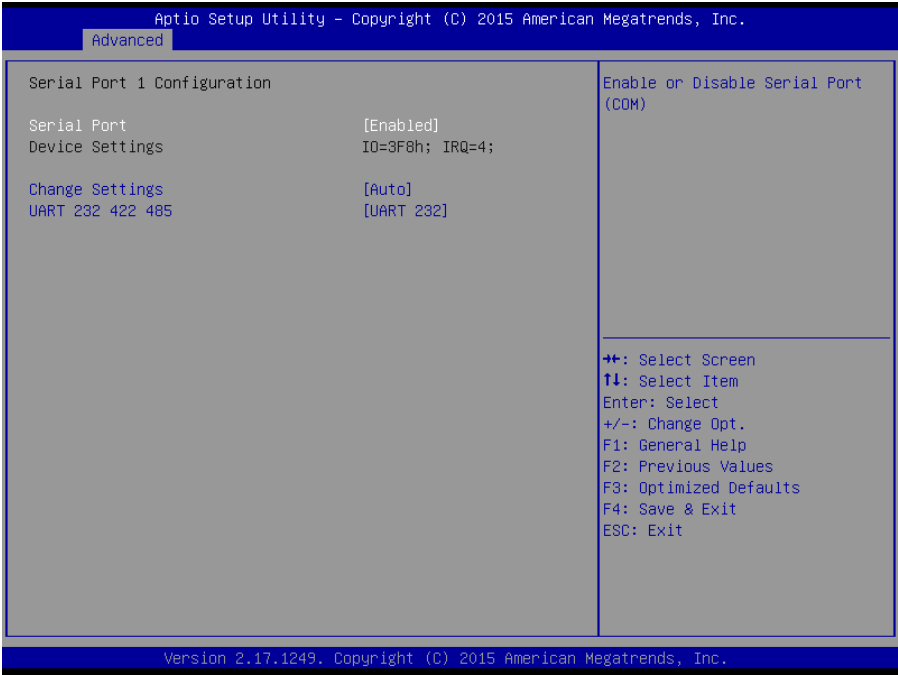


3.6.2.5 Super IO Configuration

You can use this item to set up or change the IT8518/F81216SEC Super IO configuration. Please refer to 3.6.2.5.1~4 for more information.

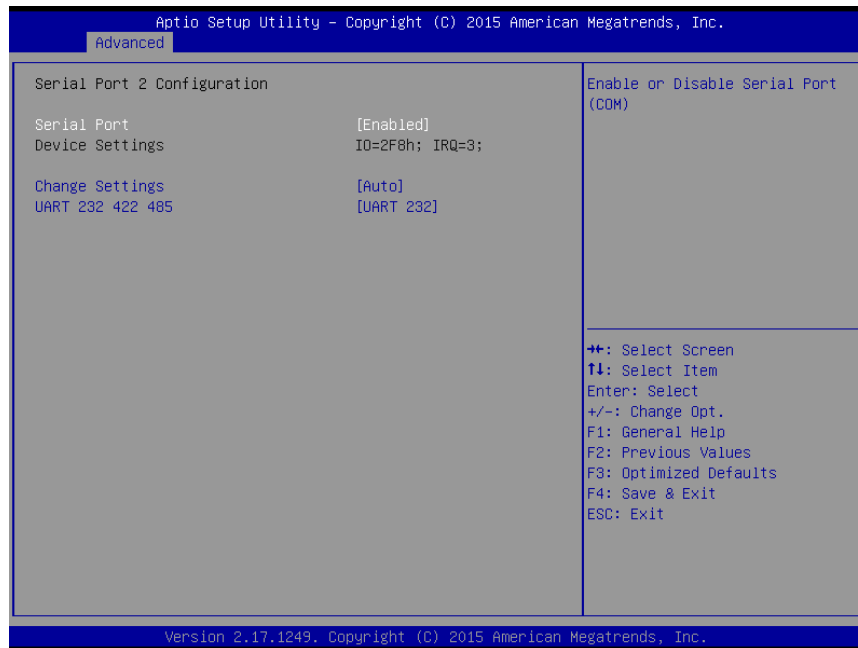


3.6.2.5.1 Serial Port 1 Configuration



Item	Option	Description
Serial Port	Enabled[Default], Disabled	Enable or Disable Serial Port (COM)
Change Settings	Auto[Default] 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	UART 232[Default], UART 422, UART485	Change the Serial Port as RS232/422/485.

3.6.2.5.2 Serial Port 2 Configuration



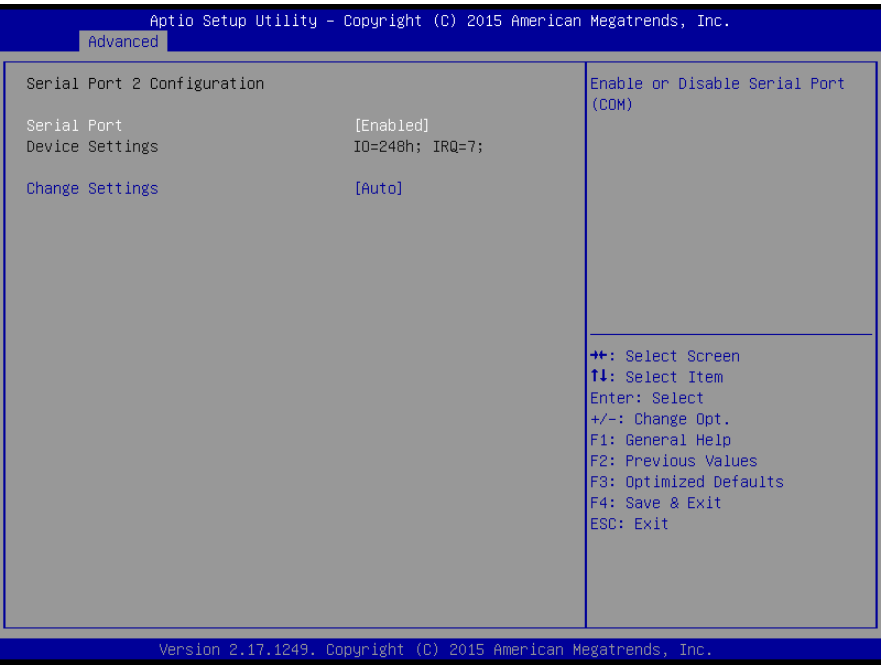
Item	Option	Description
Serial Port	Enabled[Default] Disabled	Enable or Disable Serial Port (COM)
Change Settings	Auto[Default] IO=2F8h; IRQ=3; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Select an optimal setting for super IO Device.
UART 232 422 485	UART 232[Default], UART 422, UART485	Change the Serial Port as RS232/422/485.

3.6.2.5.3 Serial Port 1 Configuration



Item	Option	Description
Serial Port	Enabled[Default], Disabled	Enable or Disable Serial Port (COM)
Change Settings	Auto[Default] IO=240h; IRQ=7;; IO=240h; IRQ=3,4,5,6,7,10,11,12; IO=248h; IRQ=3,4,5,6,7,10,11,12; IO=250h; IRQ=3,4,5,6,7,10,11,12; IO=258h; IRQ=3,4,5,6,7,10,11,12;	Select an optimal setting for Super IO Device.

3.6.2.5.4 Serial Port 2 Configuration



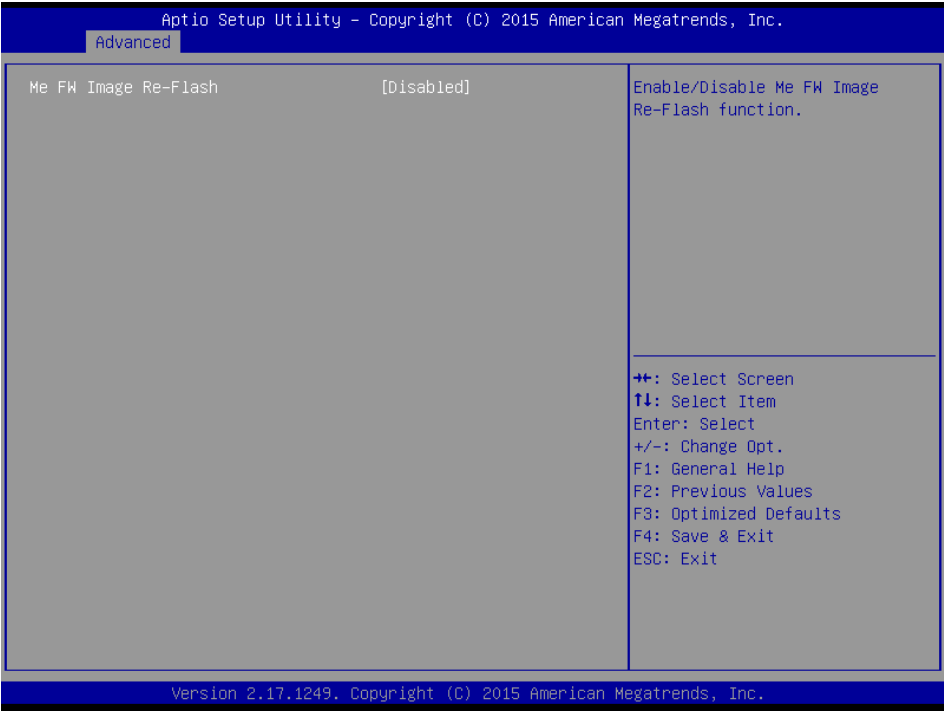
Item	Option	Description
Serial Port	Enabled[Default] Disabled	Enable or Disable Serial Port (COM)
Change Settings	Auto[Default] IO=248h; IRQ=7;, IO=240h; IRQ=3,4,5,6,7,10,11,12; IO=248h; IRQ=3,4,5,6,7,10,11,12; IO=250h; IRQ=3,4,5,6,7,10,11,12; IO=258h; IRQ=3,4,5,6,7,10,11,12;	Select an optimal setting for Super IO Device.

3.6.2.6 PCH-FW Configuration



Item	Description
Firmware Update Configuration	Configure Management Engine Technology Parameters.

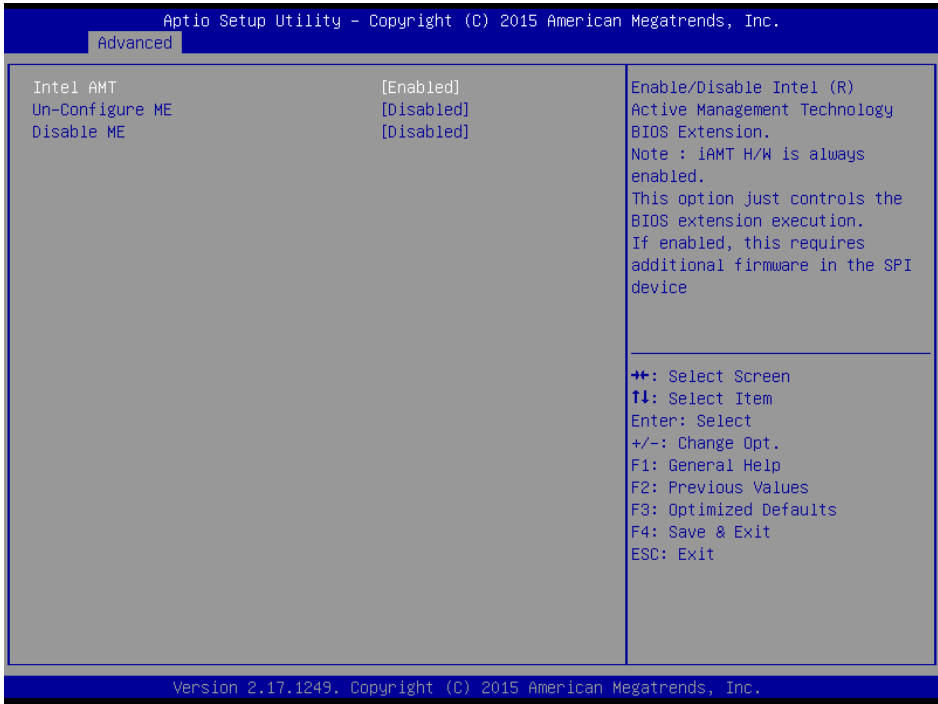
3.6.2.6.1 Firmware Update Configuration



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

3.6.2.7 AMT Configuration

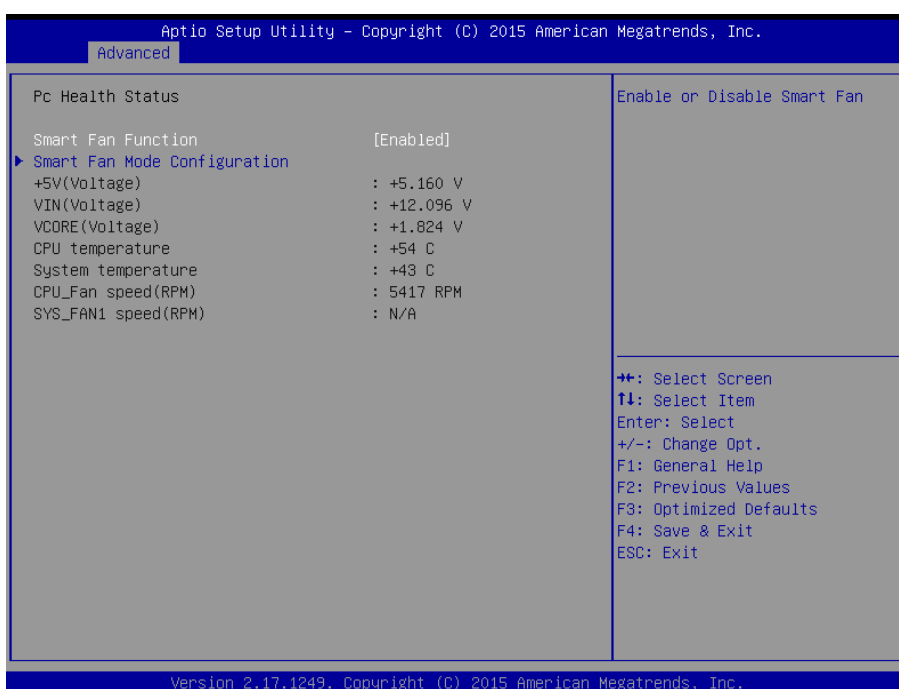
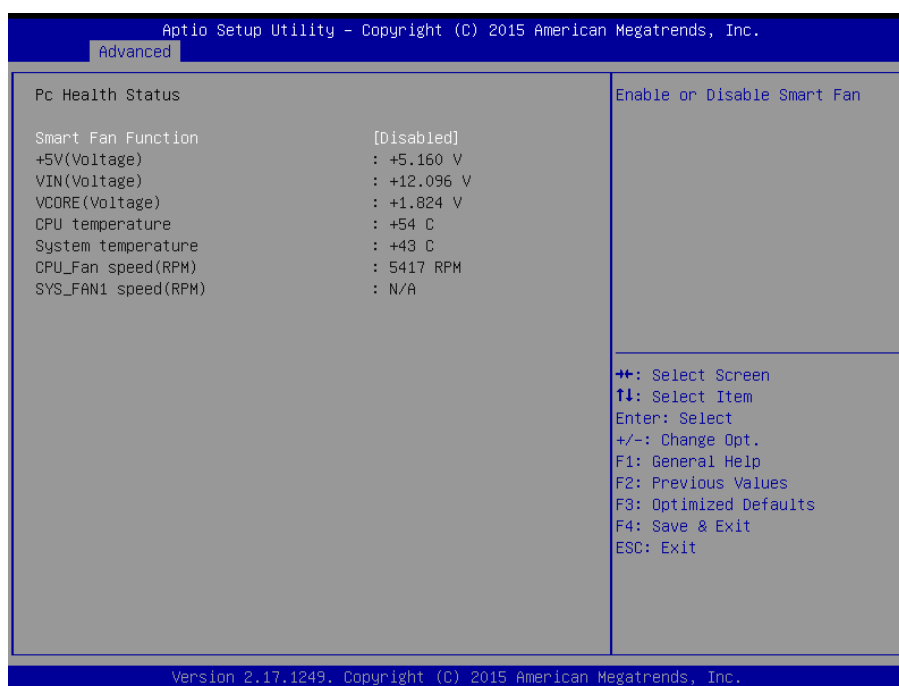
Intel AMT allows hardware-based remote management, security, power-management, and remote-configuration features.



Item	Options	Description
Intel AMT	Enabled[Default] Disabled	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.

3.6.2.8 H/W Monitor

Displays system health status



EPI-BDW

Item	Description
Smart Fan Function	Enable or Disable Smart Fan.

The following system temperature, fan speed and voltage are monitored.

Temperature:

- System Temperature
- CPU Thermistor Temperature

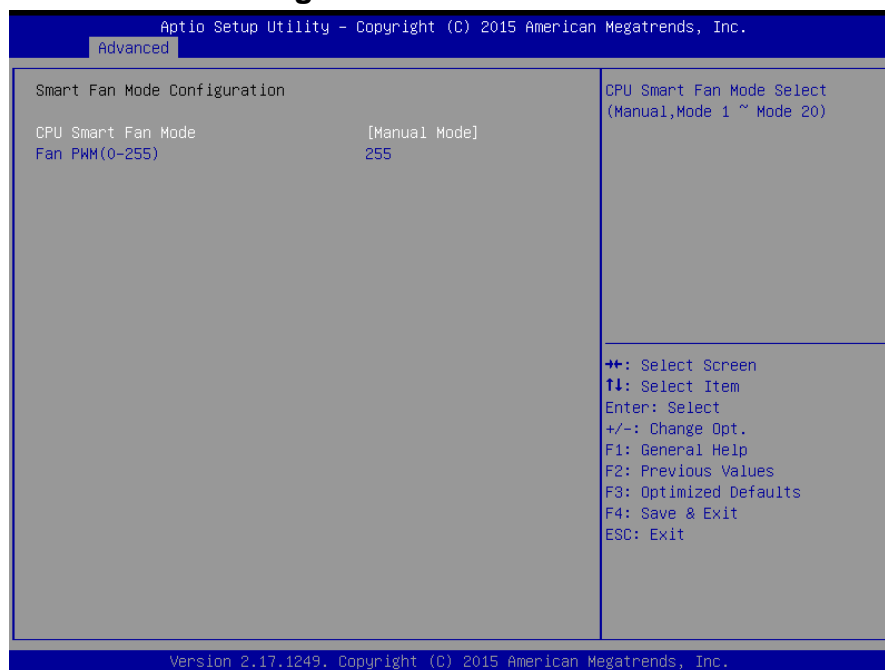
Fan Speed:

- System Fan Speed
- CPU Fan speed

Voltage:

- VCORE
- +12V
- +5V
- +5VSB
- AVCC
- 3VCC
- VSB3
- VBAT

3.6.2.8.1 Smart Fan Mode Configuration



Item	Options	Description
CPU Smart Fan Mode	Manual Mode[Default] Mode 01/Mode 02/Mode 03/ Mode 04/Mode 05/Mode 06/ Mode 07/Mode 08/Mode 09/ Mode 10/Mode 11/Mode 10/	CPU Smart Fan Mode Select (Manual, Mode 1~ Mode 20).

	Mode 12/Mode 13/Mode 14/ Mode 15/Mode 16/Mode 17/ Mode 18/Mode 19/Mode 20	
Fan PWM (0-255)	0-255[Default]	Fan PWM duty (0-255).

3.6.2.9 S5 RTC Wake Settings

Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.

Advanced

Wake system from S5	[Disabled]	Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select DynamicTime, System will wake on the current time + Increase minute(s)
System Date	[Tue 08/18/2015]	
System Time	[11:32:52]	

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

Version 2.17.1249. Copyright (C) 2015 American Megatrends, Inc.

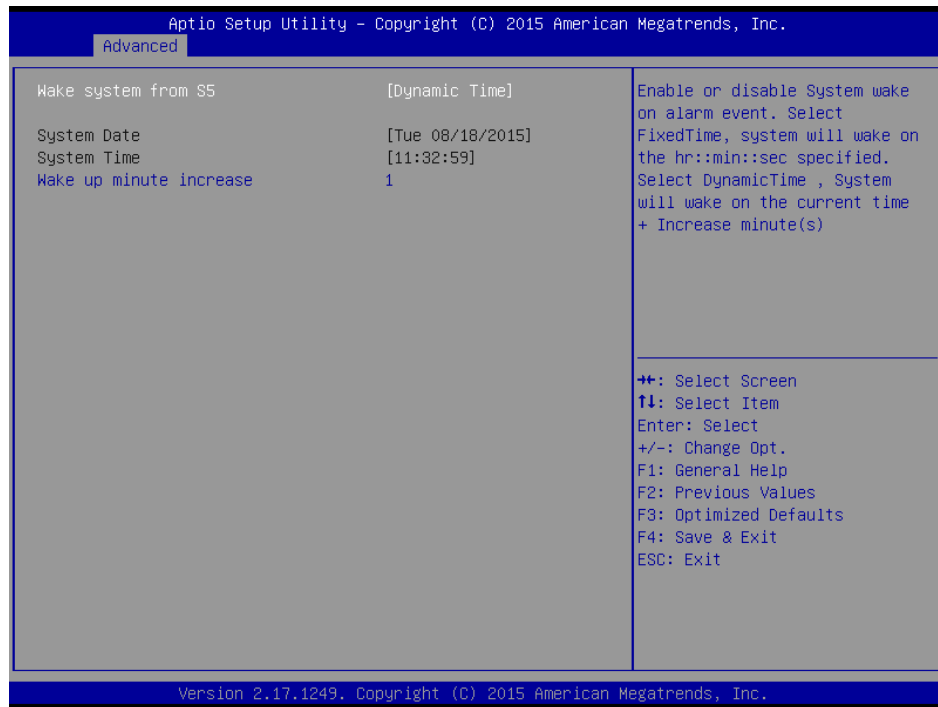
Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.

Advanced

Wake system from S5	[Fixed Time]	Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select DynamicTime, System will wake on the current time + Increase minute(s)
Wake up day of week	[Disabled]	
System Date	[Tue 08/18/2015]	
System Time	[11:32:54]	
Wake up hour	0	
Wake up minute	0	
Wake up second	0	

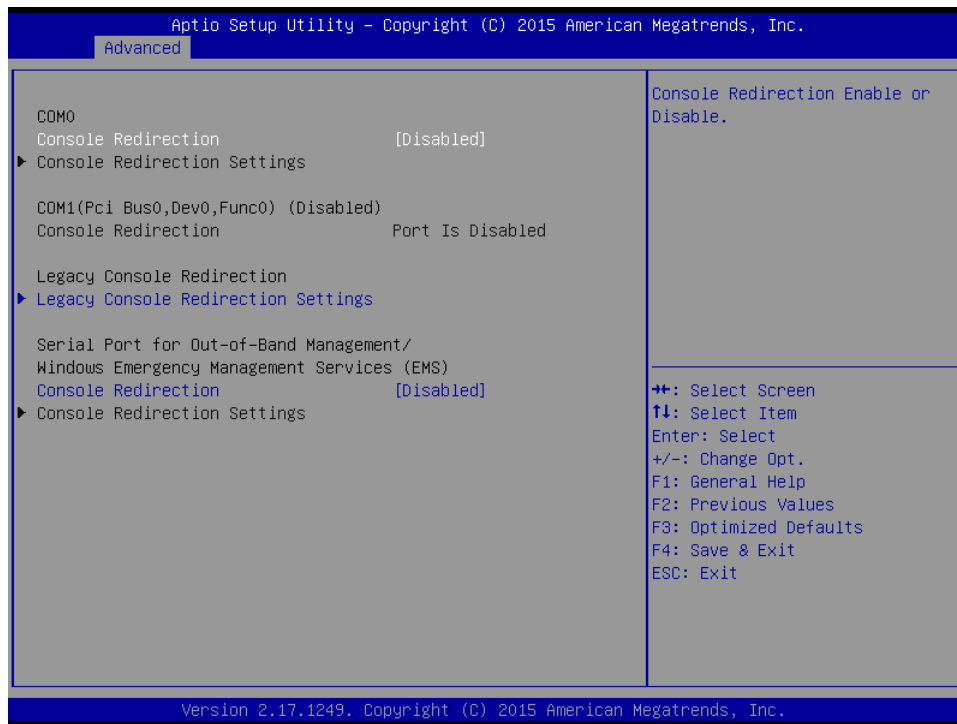
++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 ESC: Exit

Version 2.17.1249. Copyright (C) 2015 American Megatrends, Inc.



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 Times, System will wake on the current time + Increase minute(s).
Wake up day of week	Disabled [Default] , Monday-Friday Monday-Saturday	Wake up day of week. (Monday-Friday) or (Monday-Saturday).
Wake up hour	0-23	Select 0-23 For example enter 3 for 3am and 15 for 3pm.
Wake up minute	0-23	Select 0-23 For example enter 3 for 3am and 15 for 3pm.
Wake up second	0-23	Select 0-23 For example enter 3 for 3am and 15 for 3pm.
Wake up minute increase	1-5	1-5.

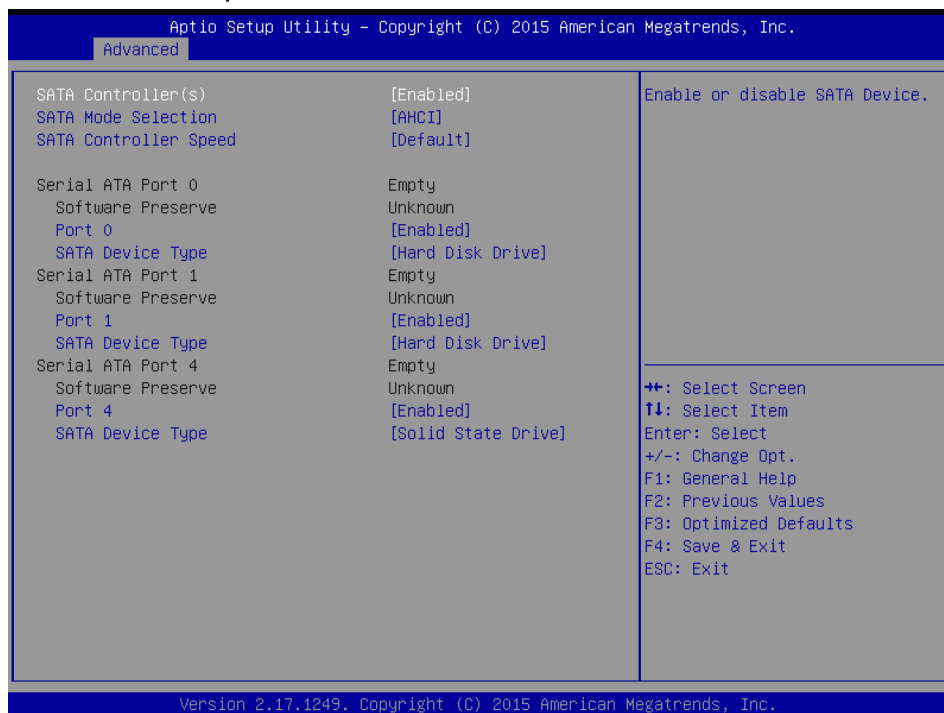
3.6.2.10 Serial Port Console Redirection



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

3.6.2.11 SATA Configuration

It allows you to select the operation mode for SATA controller.



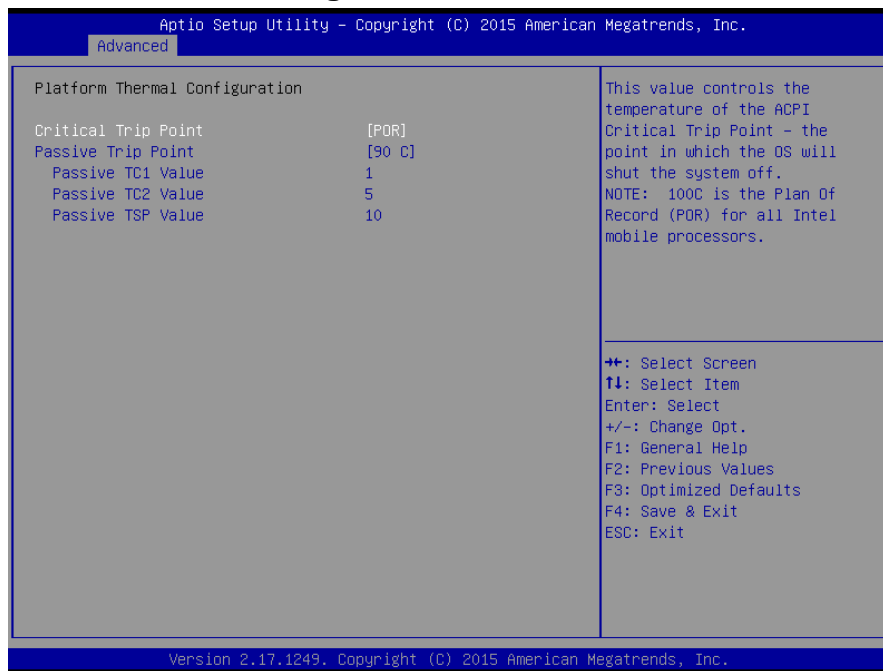
EPI-BDW

Item	Options	Description
SATA Controller(s)	Enabled[Default] Disabled	Enable or disable SATA Device.
SATA Mode Selection	IDE AHCI[Default]	Determines how SATA controller(s) operate.
SATA Controller Speed	Default[Default] Gen1 Gen2 Gen3	Indicates the maximum speed the SATA controller can support.
Port 0/1/4	Enabled[Default] Disabled	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.

3.6.2.12 Thermal Configuration



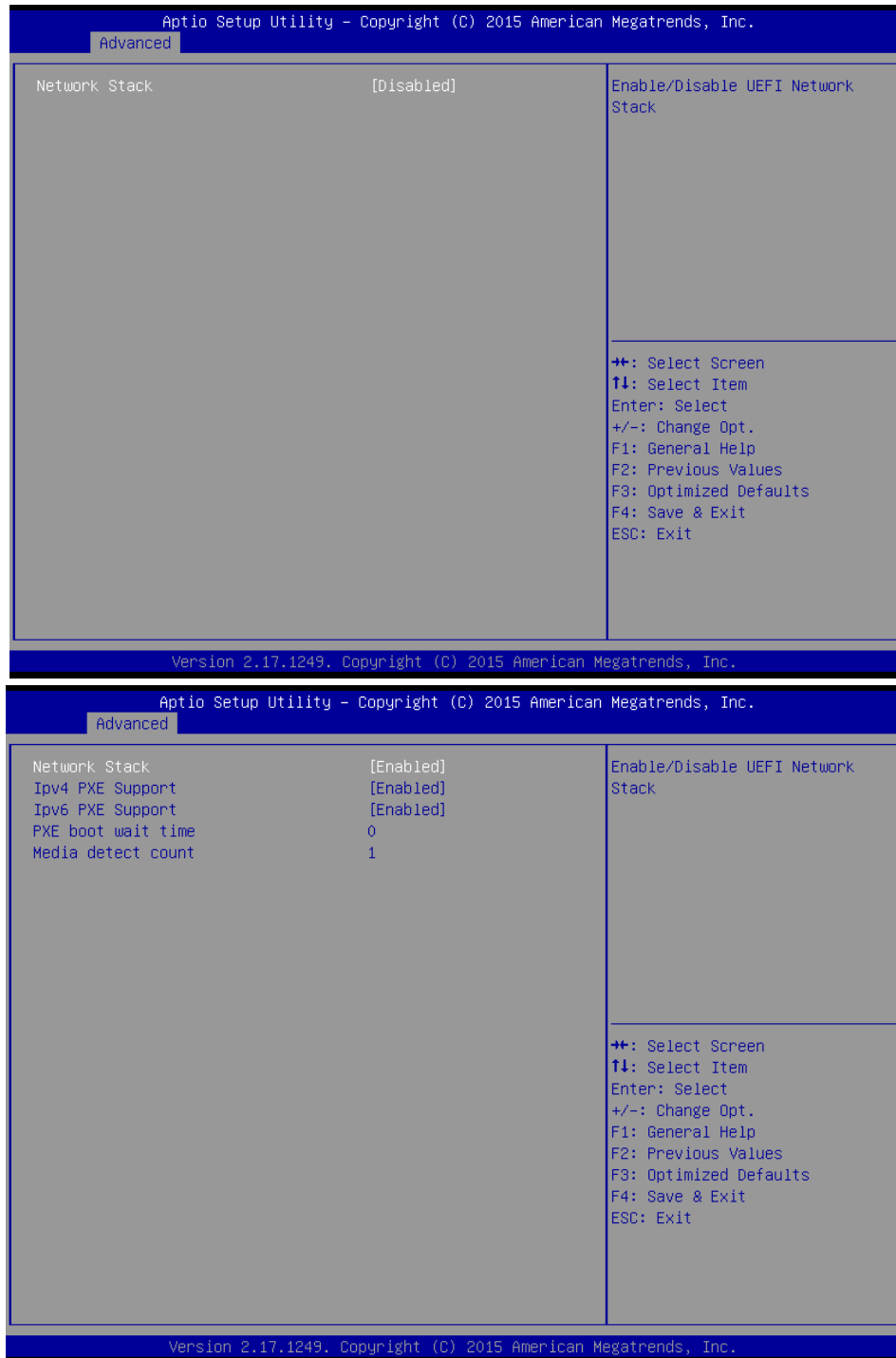
3.6.2.12.1 Platform Thermal Configuration



Item	Option	Description
Critical Trip Point	POR[Default] 80 C 90 C 100 C 110 C	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 80 C 90 C[Default] 100 C 110 C	This value controls the temperature of the 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 TC1 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.

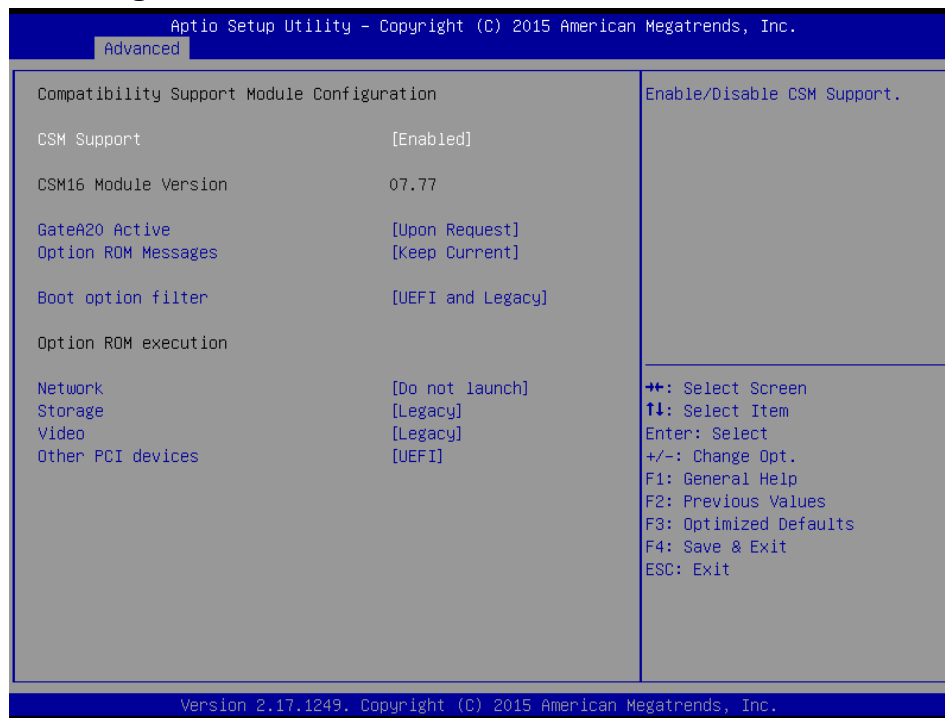
EPI-BDW

3.6.2.13 Network Stack



Item	Option	Description
Network stack	Enabled Disabled [Default]	Enable/Disable UEFI Network Stack.
Ipv4/6 PXE Support	Enabled [Default] Disabled	Enable Ipv4/6 PXE Boot Support. If disabled IPV4/6 PXE boot option will not be created.
PXE boot wait time	0	Wait time to press ESC key to abort the PXE boot.
Media detect count	1	Number of times presence of media will be checked.

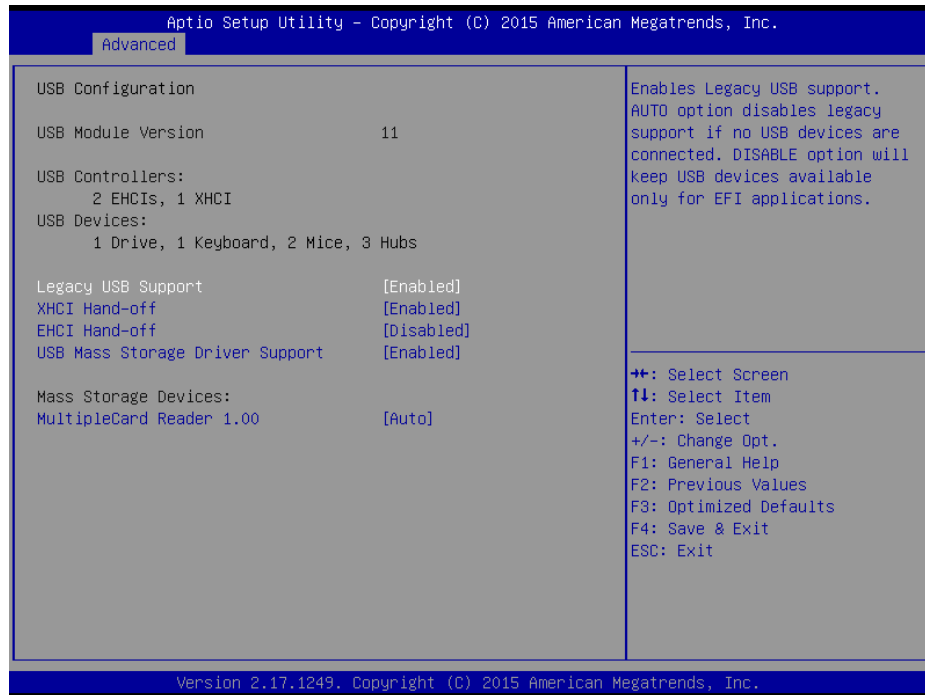
3.6.2.14 CSM Configuration



Item	Option	Description
CSM Support	Enabled[Default] Disabled	Enable/Disable CSM Support.
GateA20 Active	Upon Request[Default] Always	UPON REQUEST – GA20 can be disabled using BIOS services. ALWAYS – do 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.

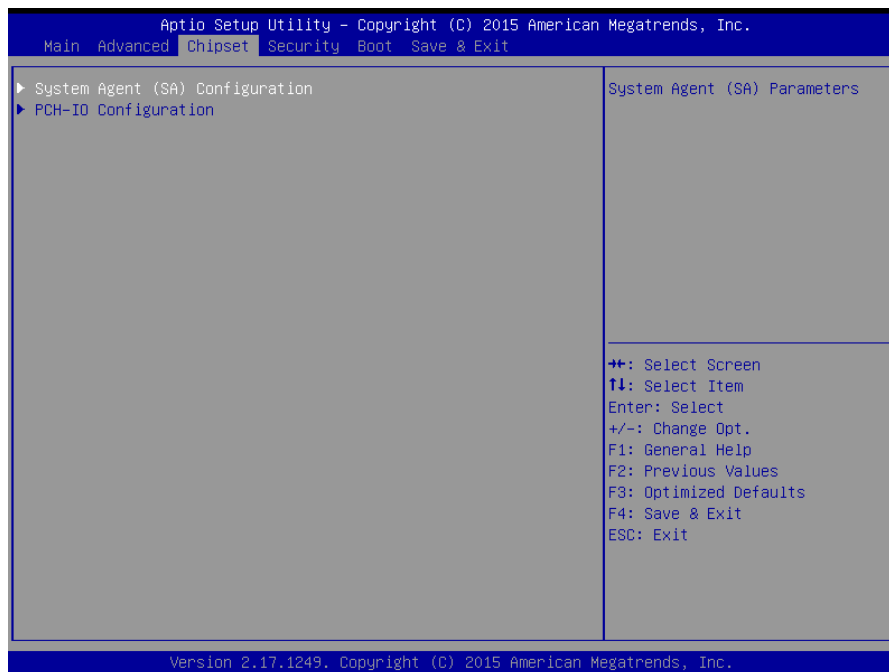
3.6.2.15 USB Configuration

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

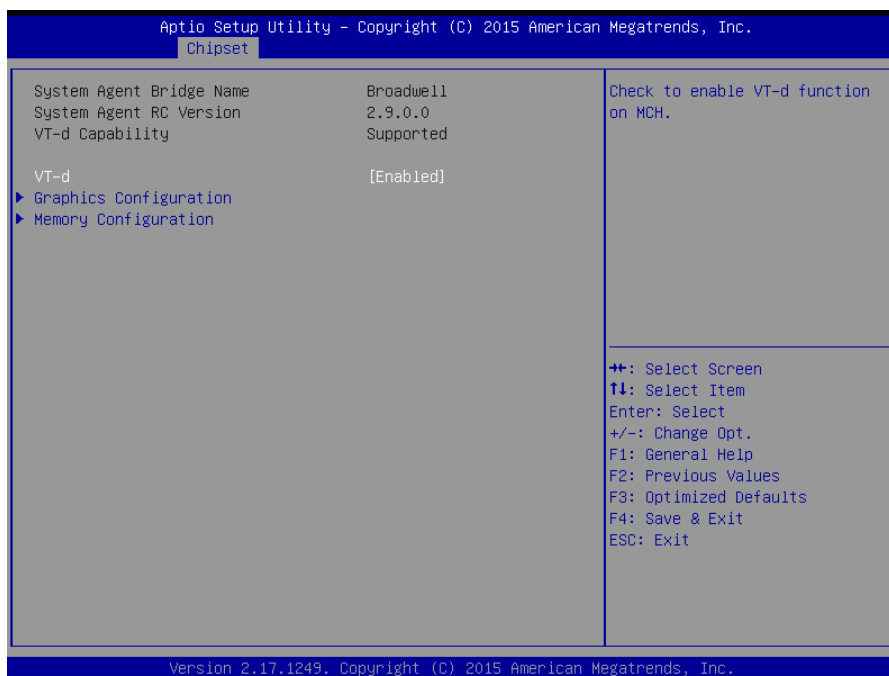


Item	Options	Description
Legacy USB Support	Enabled[Default] Disabled Auto	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
XHCI Hand-off	Enabled[Default] Disabled	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
EHCI Hand-off	Enabled Disabled[Default]	This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.
USB Mass Storage Driver Support	Enabled[Default] Disabled	Enable/Disable USB Mass Storage Driver Support.
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



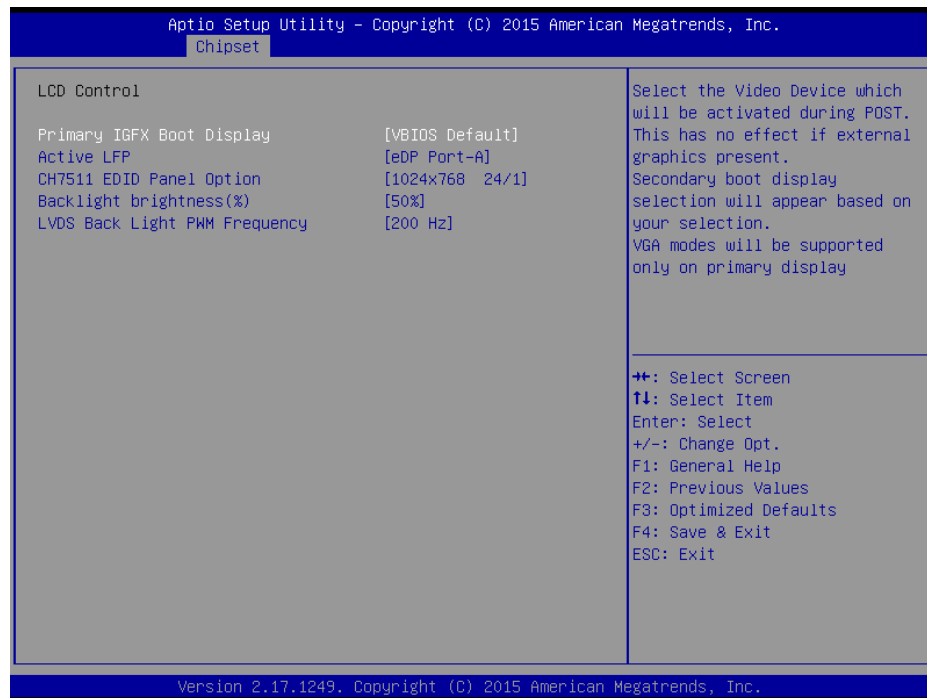
Item	Options	Description
VT-d	Enabled[Default] Disabled	Check to enable VT-d function on MCH.

3.6.3.1.1 Graphics Configuration



Item	Options	Description
Aperture Size	[128MB] [256MB] [Default] [512MB] [1024MB]	Select the Aperture Size. Note: Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048 aperture. To use this feature, please disable CSM Support.
DVMT Pre-Allocated	[32M] [Default] [64M] [96M] [128M] [160M] [192M] [224M] [256M] [288M] [320M] [352M] [384M] [416M] [448M] [480M] [512M] [1024M]	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 DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.
Gfx Low Power Mode	Enabled [Default] Disabled	This option is applicable for SFF only.

3.6.3.1.1.1 LCD Control

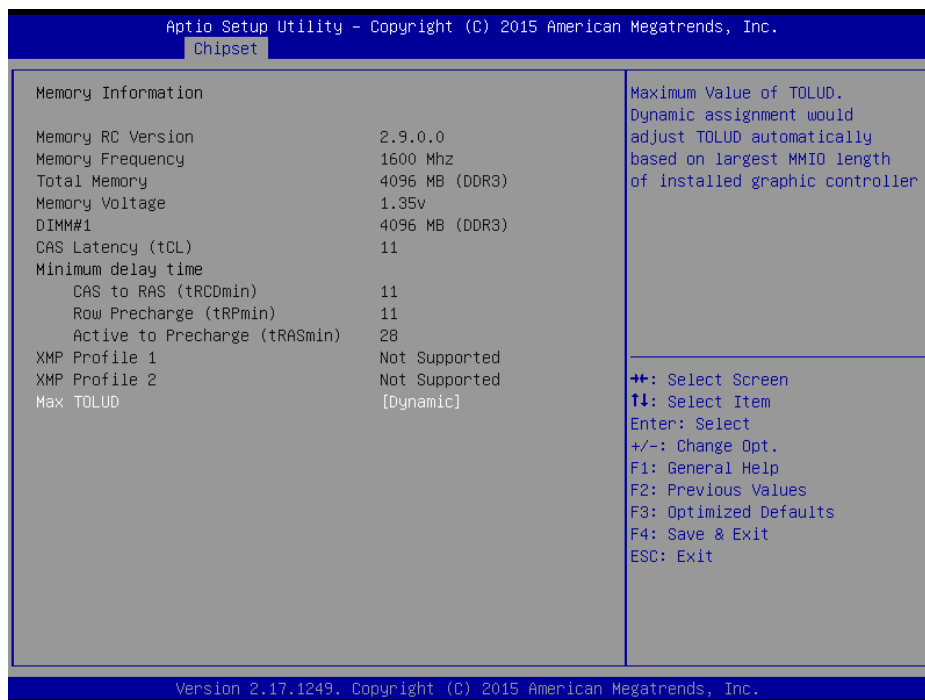


Item	Option	Description
Primary IGFX Boot Display	VBIOS Default[Default] CRT HDMI-1 LVDS DVI HDMI-2	Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.
Active LFP	No LVDS eDP Port-A[Default]	Select the Active LFP Configuration. No LVDS:VBIOS does not enable LVDS. Int-LVDS. Int-LVDS:BIOS enables LVDS driver by Integrated encoder. SDVO LVDS:VBIOS enables LVDS driver by SDVO encoder. eDP Port-A:LFP Driven by Int-DisplayPort encoder from Port-A. eDP Port-D:LFP Driven by Int-DisplayPort encoder from Port-D9through PCH).
CH7511 EDID Panel Option	1024x768 24/1[Default] 800x600 18/1 1024x768 18/1 1366x768 18/1 1024x600 18/1 1280x800 18/1 1920x1200 24/2 640x480 18/1 800x480 18/1 1920x1080 18/2	Port-EDP to LVDS (Chrotel7511) Panel EDID Option.

EPI-BDW

	1280x1024 24/2 1440x900 18/2 1600x1200 24/2 1366x768 24/1 1920x1080 24/2 1680x1050 24/2	
Backlight brightness (%)	0% 25% 50% [Default] 75% 100%	Select LVDS back light PWM duty.
LVDS Back Light PWM Frequency	200 Hz [Default] 300 Hz 400 Hz 500 Hz 700 Hz 1 kHz 2 kHz 3 kHz 5 kHz 10 kHz 20 kHz	Select LVDS back light PWM Frequency.

3.6.3.1.2 Memory Configuration



Item	Options	Description
Max TOLUD	Dynamic[Default] 1 GB 1.25 GB 1.5 GB 1.75 GB 2 GB 2.25 GB 2.5 GB 2.75 GB 3 GB 3.25 GB	Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.

3.6.4 Security



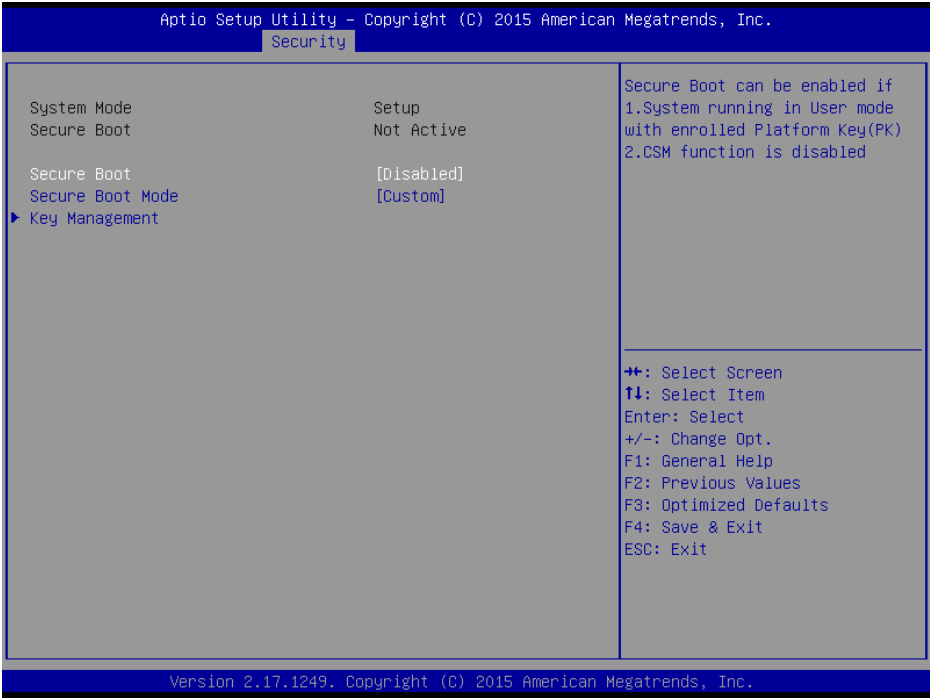
- **Administrator Password**

Set setup Administrator Password

- **User Password**

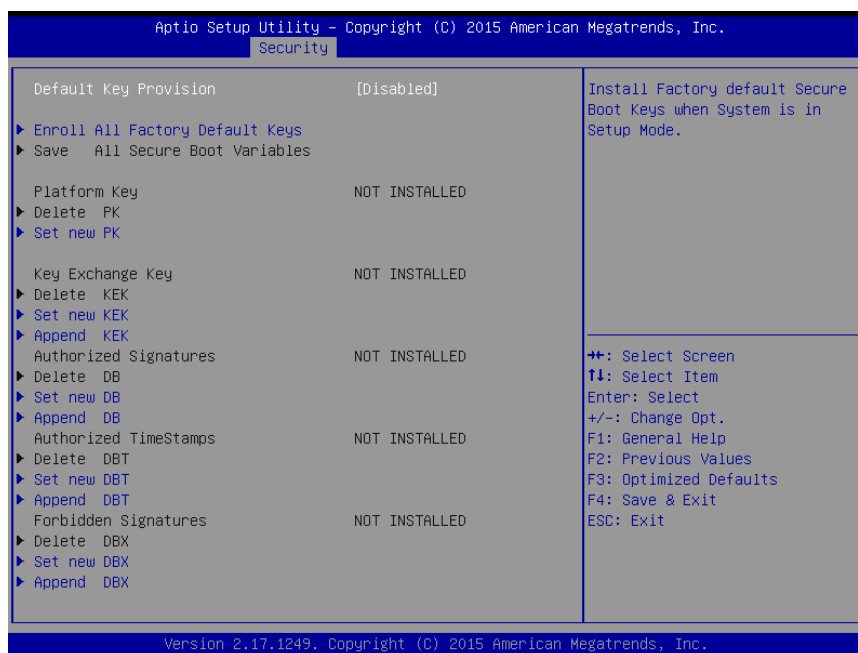
Set User Password

3.6.4.1 Secure Boot menu



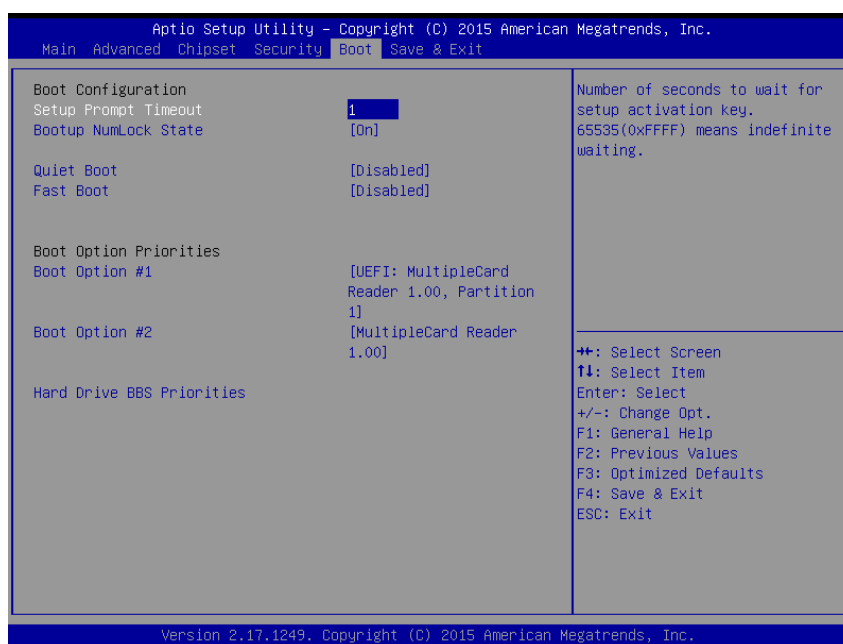
Item	Options	Description
Secure Boot	Enabled Disabled [Default]	Secure Boot can be enabled if 1.System running in User mode with enrolled Platform Key (PK) 2.CSm function is disabled.
Secure Boot Mode	Standard Custom [Default]	Secure Boot mode selector. 'Custom' Mode enables users to change Image Execution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

3.6.4.1.1 Key Management



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

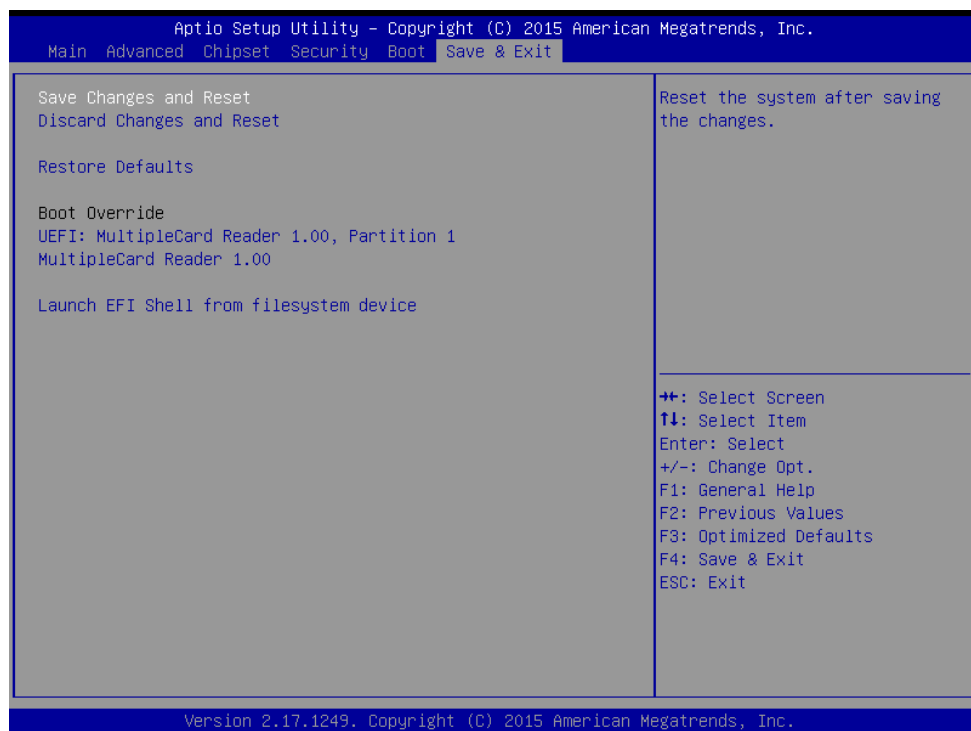
3.6.4 Boot



EPI-BDW

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.

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\\EPI-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.



Step 3. Click Install.



Step1. Click Next.



Step 4. Click Finish to complete setup.



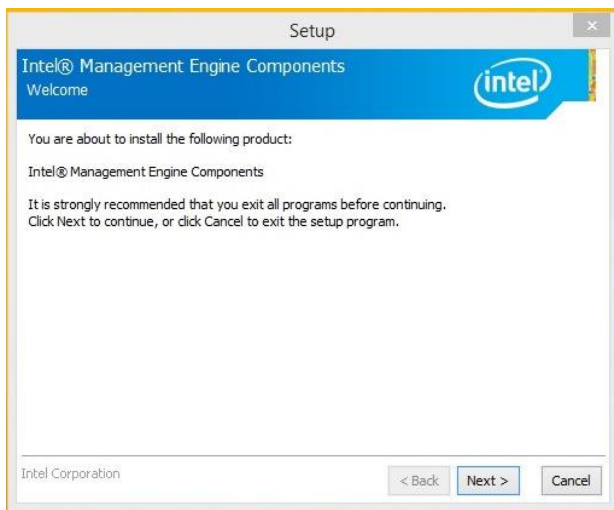
Step 2. Click Accept.

4.2 Install ME Driver

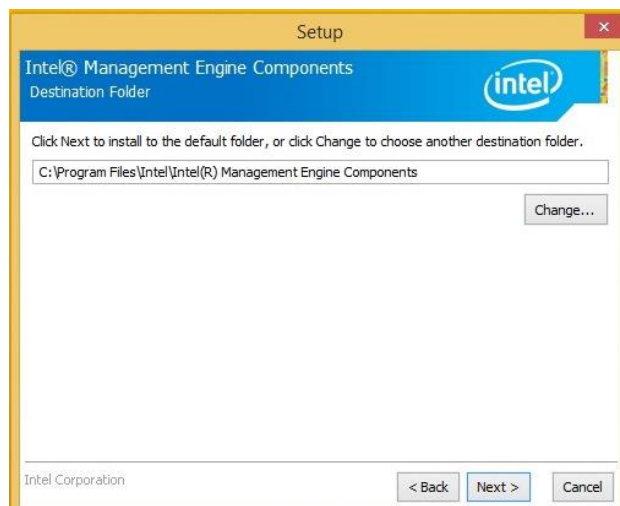
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to \Utility\EPI-BDW_ME.



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 3. Click **Next** to proceed setup.



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



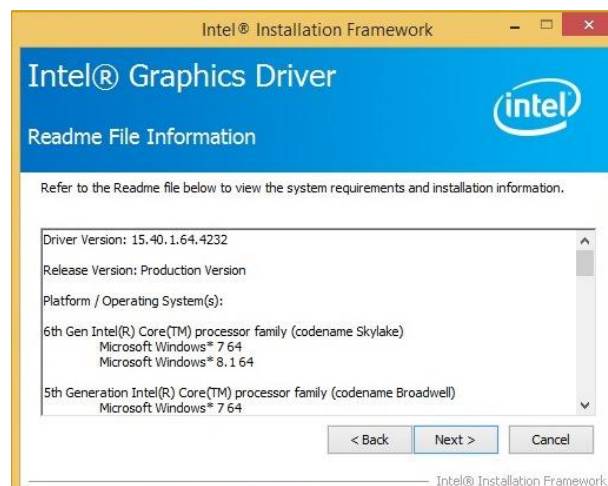
Step 2. Click **Next**.

4.3 Install Display Driver

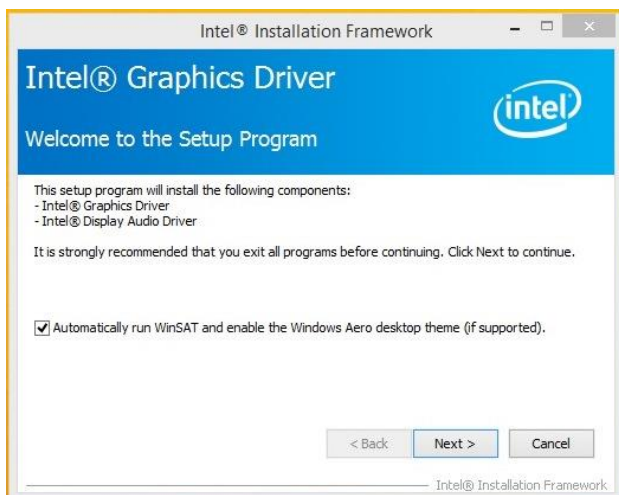
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **VGA/EPI-BDW**.



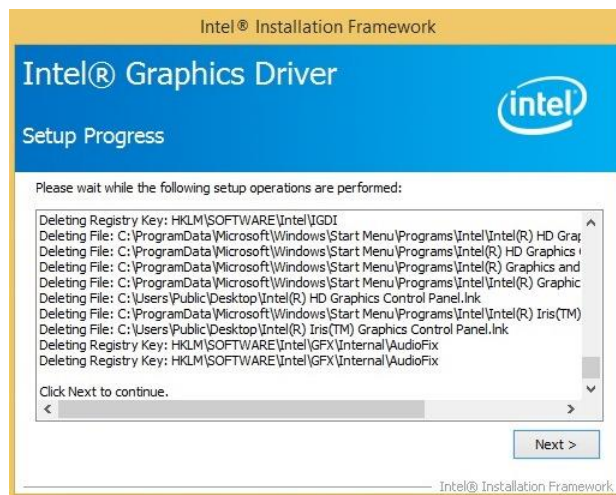
Note: The installation procedures and screen shots in this section are based on Windows 8 operation system.



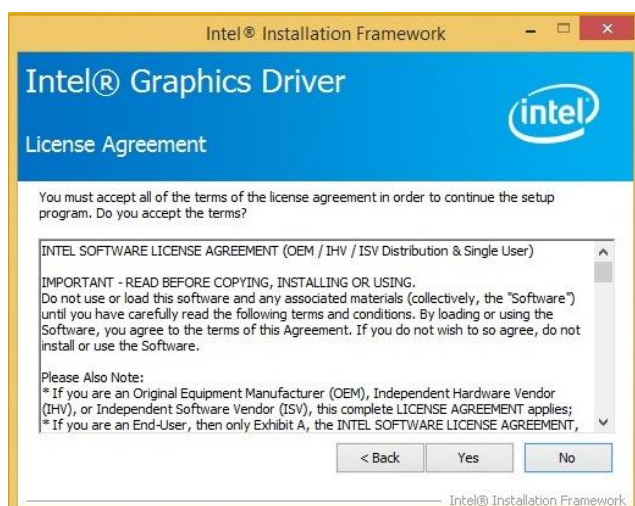
Step 3. Click Next.



Step 1. Click Next to continue installation.

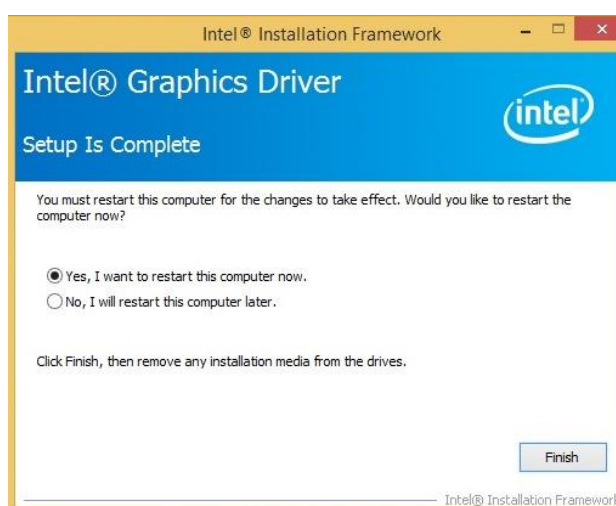


Step 4. Click Next.



Step 2.

Click **Yes** to accept license agreement.



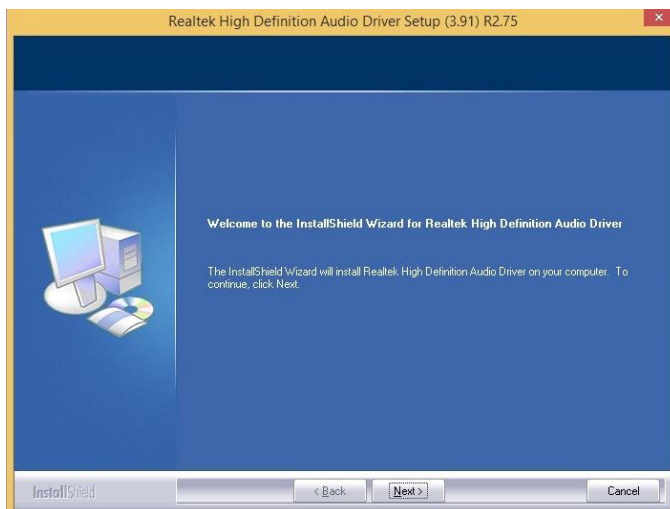
Step 5. Click Finish to complete setup.

4.4 Install Audio Driver (For Realtek ALC892)

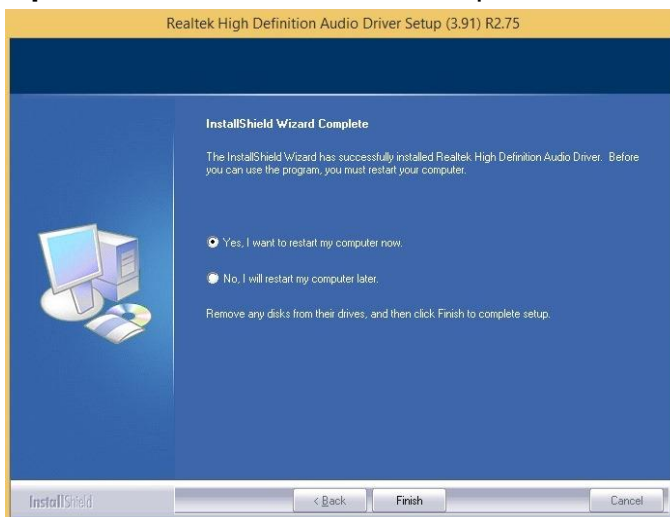
Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **\\Driver_Audio\\Realtek\\ALC892\\EPI-BDW_Audio**.



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 **Finish** to complete the setup.

4.5 Install Ethernet Driver (For Intel I210AT and I217LM)

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_I217LM\\EPI-BDW_LAN.



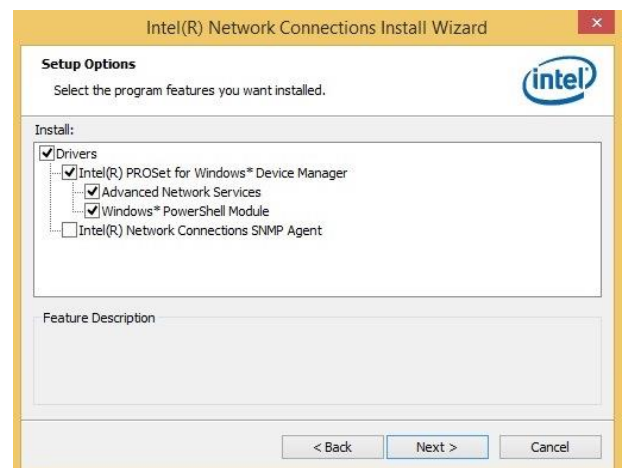
Note: The installation procedures and screen shots in this section are based on Windows 8 operation system.



Step 3. Click Next.



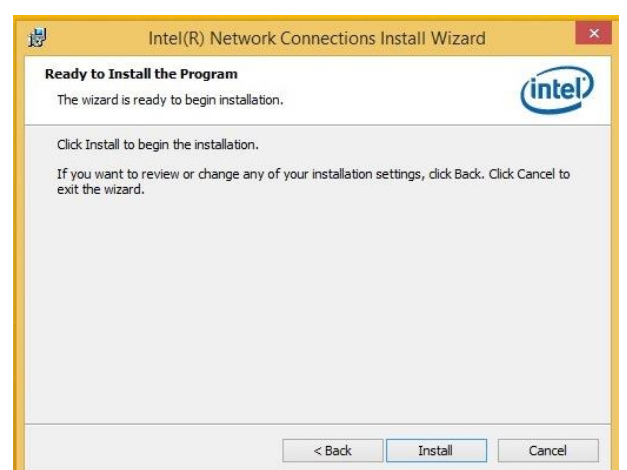
Step 1. Click Yes to accept license agreement.



Step 4. Click Next.

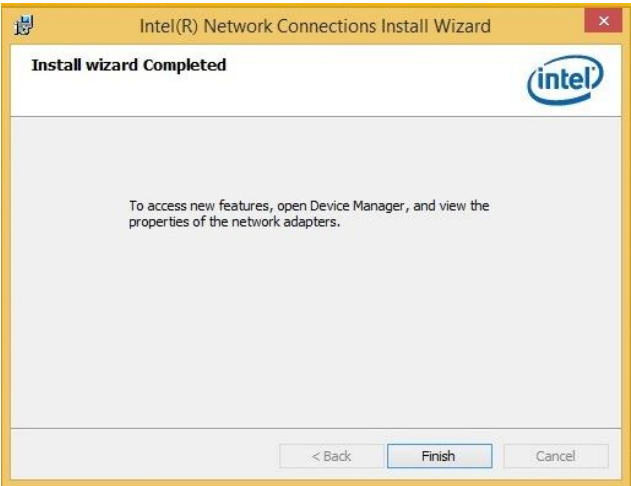


Step 2. Click Next.



Step 5. Click Install.

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

4.6 Install Rapid Storage Technology 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\EPI-BDW_RST.



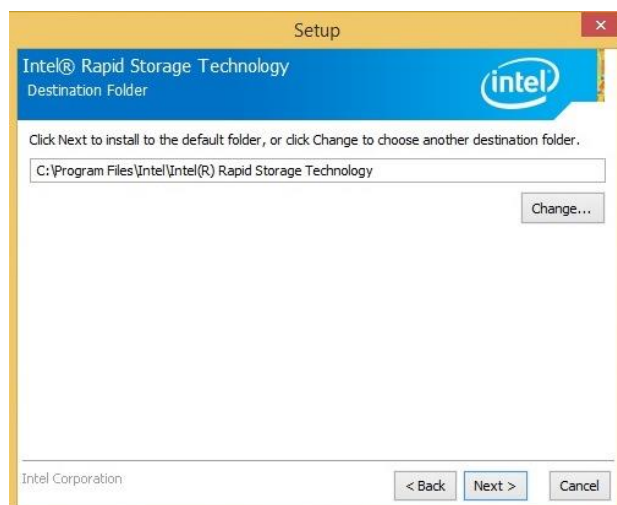
Note: The installation procedures and screen shots in this section are based on Windows 8 operation system.



Step 3. Click Next.



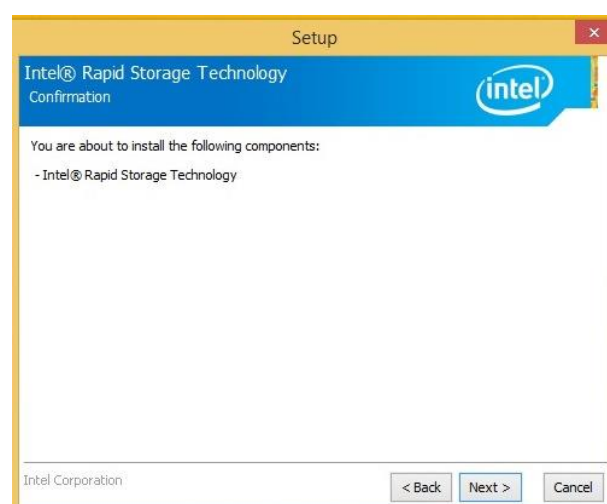
Step 1. Click Next to continue installation.



Step 4. Click Next.

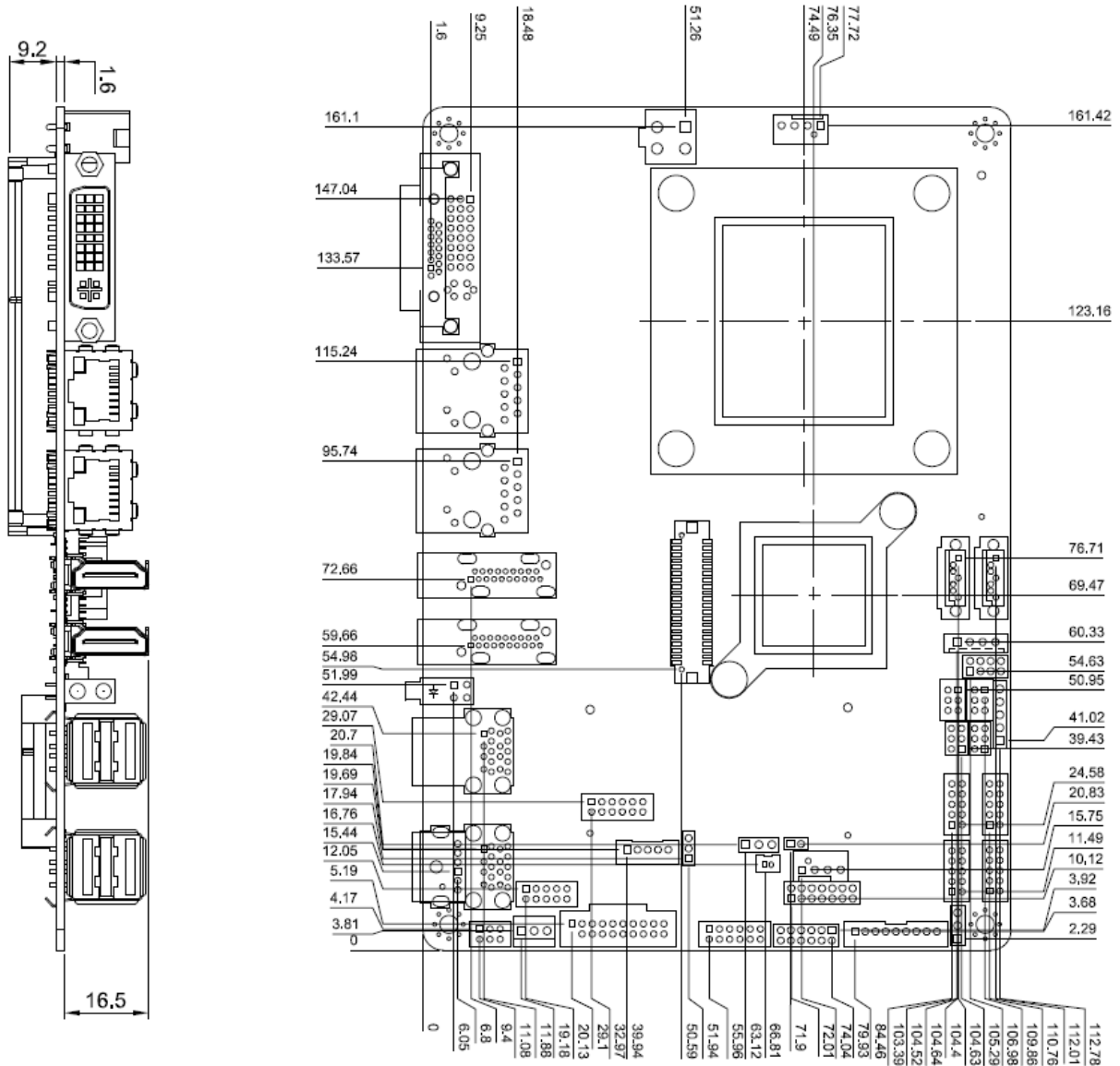


Step 2. Click Next.

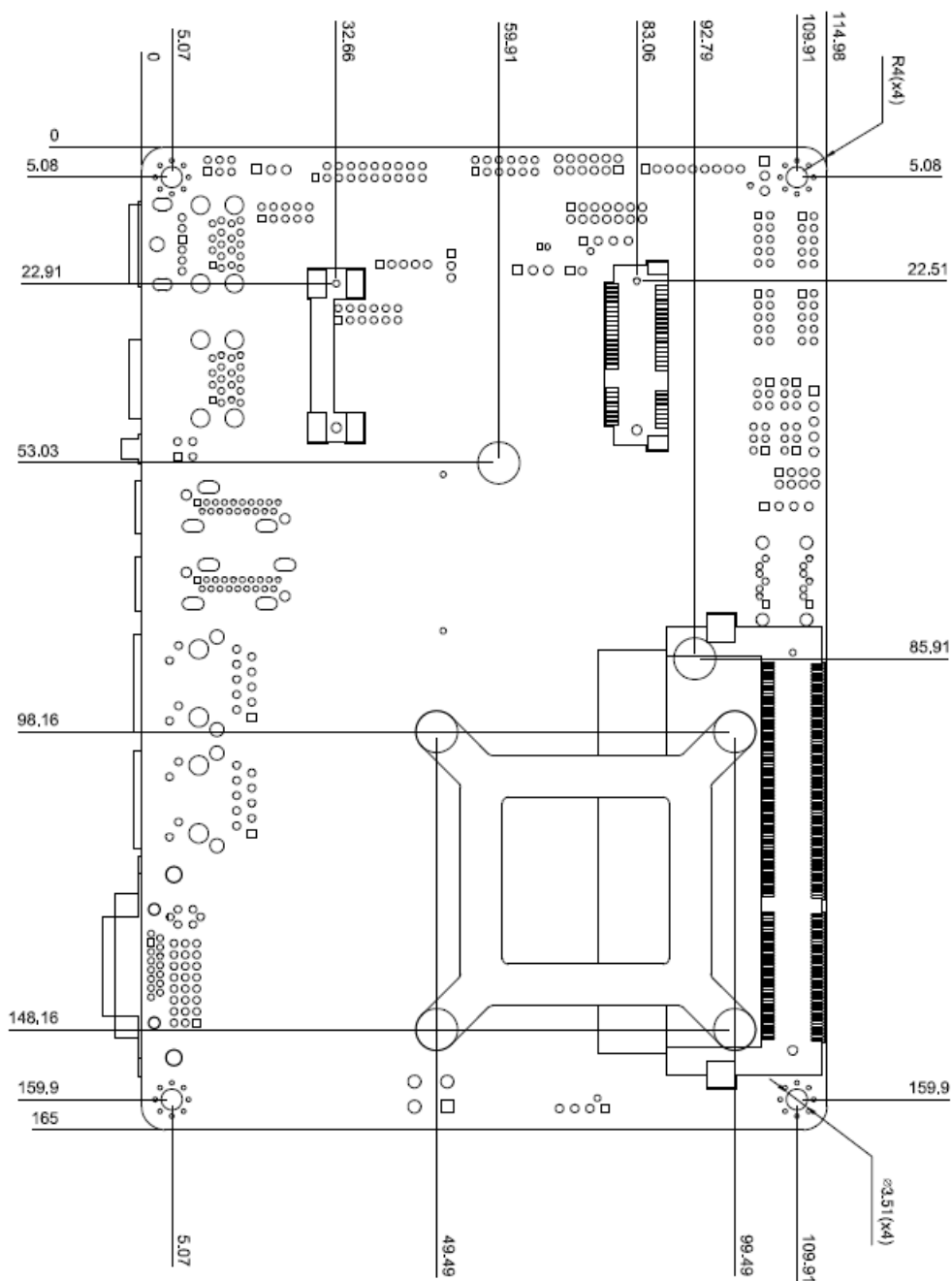


Step 5. Click Next to complete setup.

5. Mechanical Drawing



Unit: mm



Unit: mm

