ESM-CDV

COM Express Type 2 CPU Module

User's Manual

1st Ed – 18 December 2012

Part No. E2047286400R

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.

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To receive the latest version of the user's manual; please visit our Web site at:
http://www.avalue.com.tw/

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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 that have been repaired or altered by people other than repair personnel authorized by Avalue, or that have been subject of 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.

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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.

Always note that improper disassembling action could cause damage to the motherboard. We suggest not removing the heatsink without correct instructions in any circumstance. If you really have to do this, please contact us for further support.

1.2 Packing List

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

- 1 x ESM-CDV COM Express Module
- 1 x Quick Installation Guide
- 1 x DVD-ROM contains the followings:
  - User's Manual (this manual in PDF file)
  - Chipset and Ethernet driver

1.3 Document Amendment History

Revision	Date	By	Comment
1st	December 2012	Avalue	Initial Release

1.4 Manual Objectives

This manual describes in details Avalue Technology ESM-CDV 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 ESM-CDV 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 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.

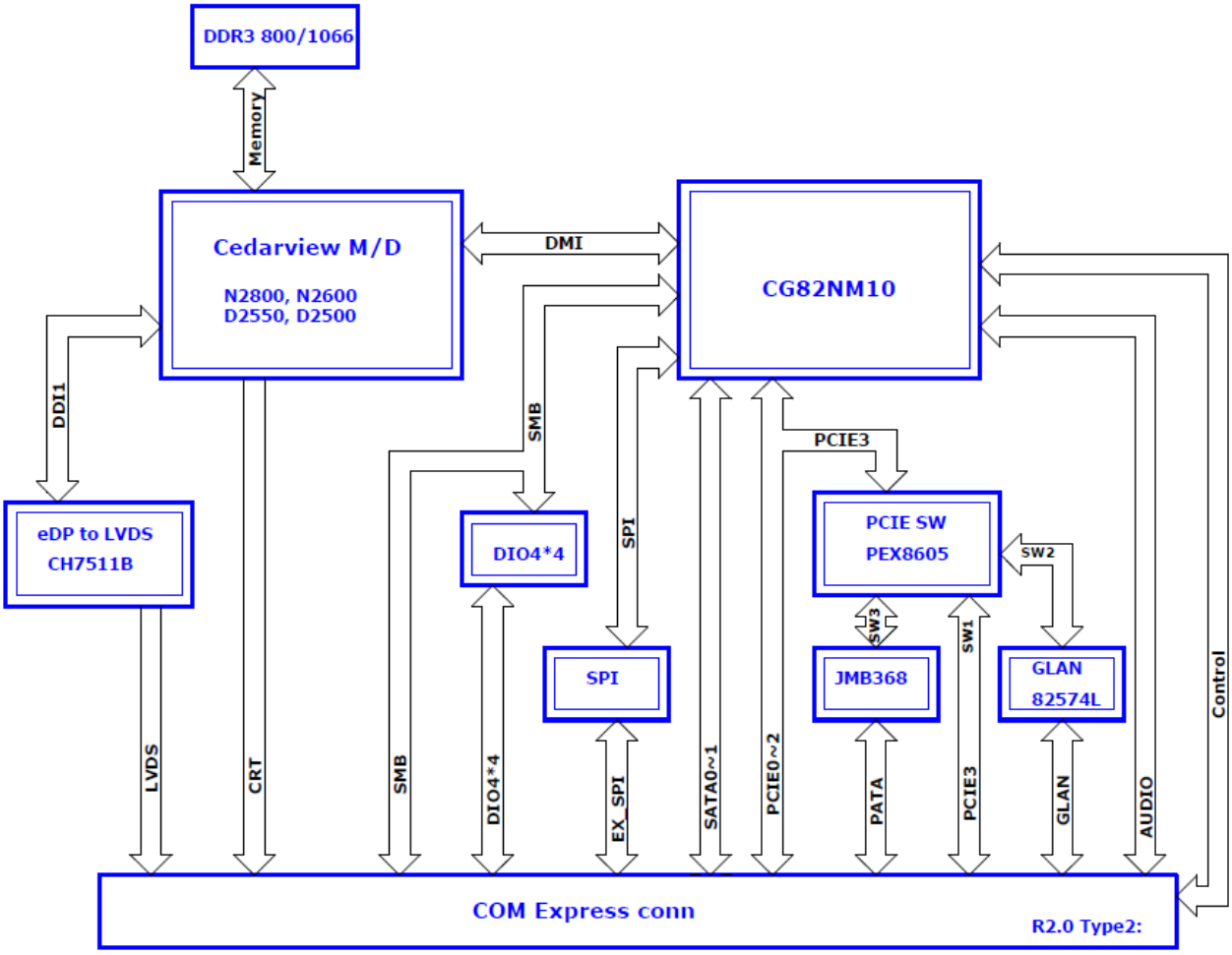
1.5 System Specifications

System	
CPU	Intel Atom Processor D2550 (N2800 and N2600 for optional)
BIOS	AMI uEFI BIOS, 16Mbit SPI Flash ROM
System Chipset	Intel NM10
System Memory	One DDR3 SO-DIMM socket, data transfer rate supports 800MT/s and 1066MT/s, up to 4GB
H/W monitor	Nuvoton NCT7904D H/W monitor IC onboard
Watchdog Timer	Nuvoton NCT7904D integrated - H/W Reset asserted - 1us – 10min.
Display	
Chipset	D2550/N2800/N2600 integrated graphics One CH-7511B onboard
Interface	2-ch 24-bit LVDS, resolution up to 1920x1080 VGA supported, resolution up to 1920x1200
Ethernet	
Chipset	Intel 82574L GbE controller
Interface	10/100/1000base-Tx
Audio	
Chipset	Intel NM10 integrated
Interface	HD audio codec interface
Storage	
Interface	2 x SATA port 1 x PATA port
Digital Input/output	
Chipset	TI PCA9555PWR
Interface	4 bits for input and 4 bits for output
I/O	
COM Express Type-2 Connector	2 x PCI master 4 x PCIex1 1 x LPC interface 2 x SATA ports 1 x PATA port

	1 x GbE port 8 x USB2.0 ports 1 x HD audio codec interface 1 x 2-ch 24-bit LVDS port 1 x VGA port 1 x SMBus 8-bit GPIO - 4-bits for input - 4-bits for output
Mechanical & Environmental	
Power Requirement	5VSB & VIN or VIN only. - 5VSB +-5% - VIN range from +9V(min) ~ +19V(max)
Power Type	AT / ATX
ACPI	Single power ATX Support S0, S3, S4, S5 ACPI 3.0 Compliant
Operating Temp.	0°C ~60°C
Storage Temp.	-40°C ~75°C
Operating Humidity	0%~90% relative humidity, non-condensing
Size (L x W)	5" x 3.7" (125mm x 95mm)
Weight	0.44 lbs (0.2 Kg)

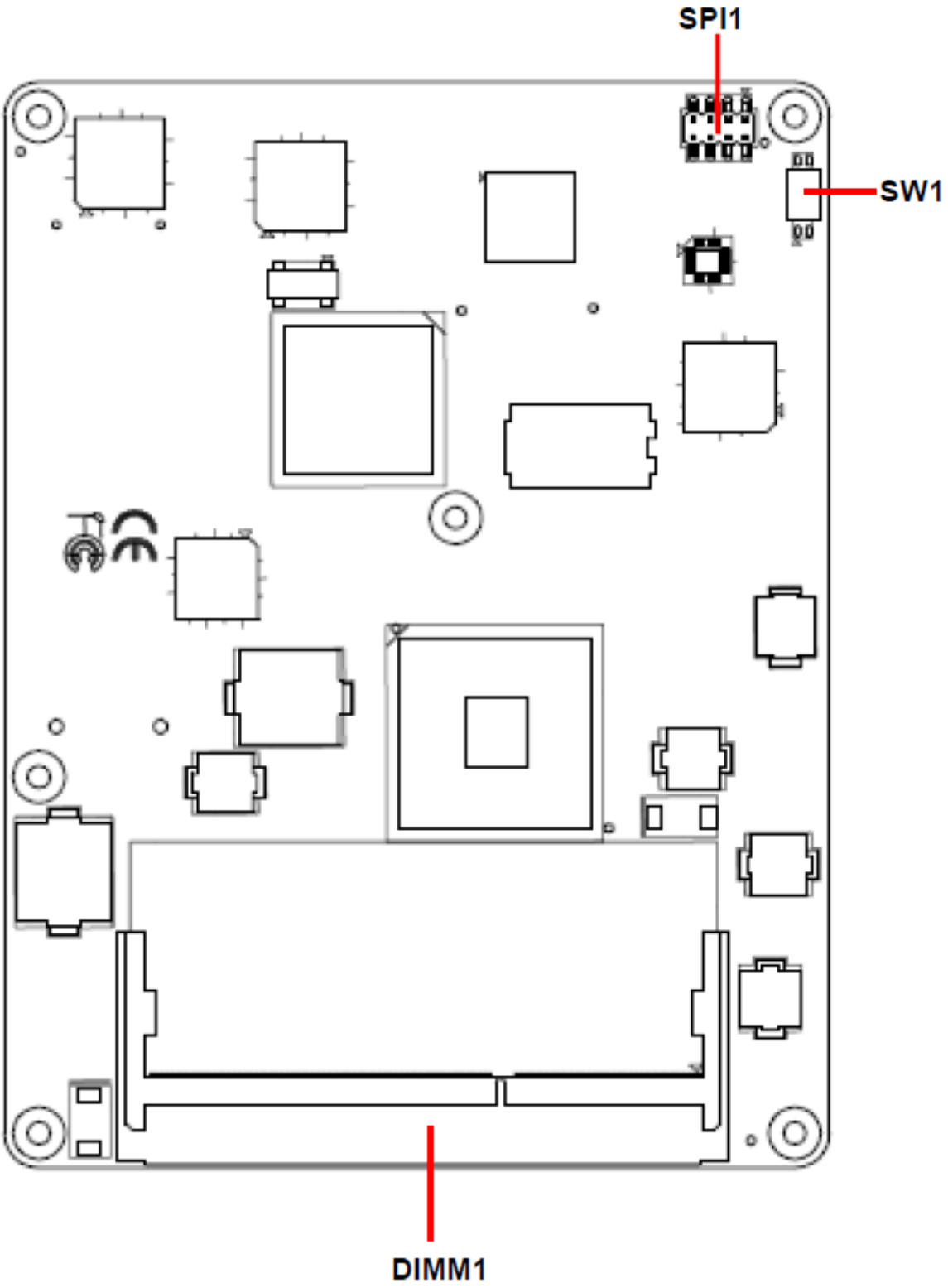
1.6 Architecture Overview—Block Diagram

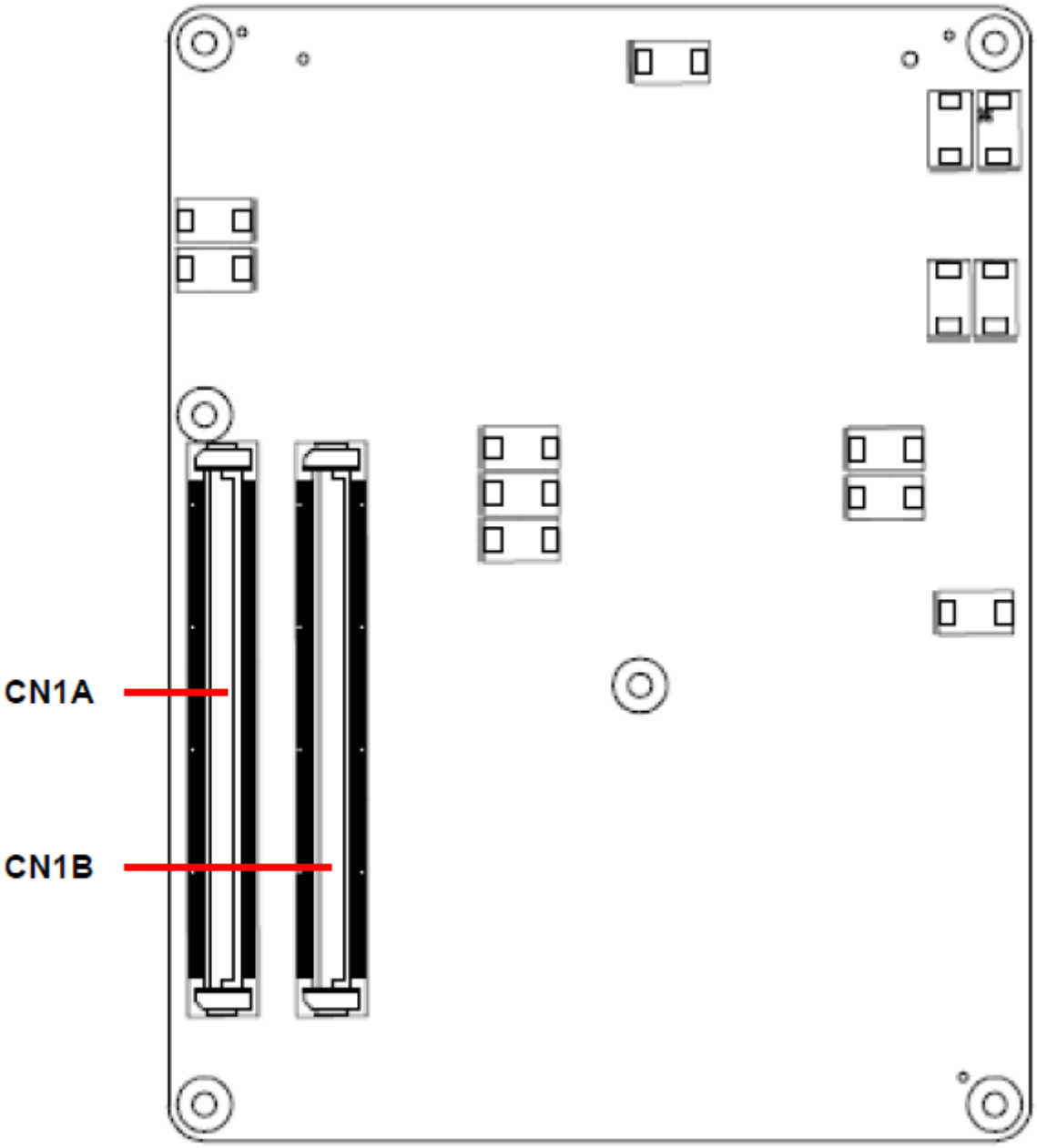
The following block diagram shows the architecture and main components of ESM-CDV.



2. Hardware Configuration

2.1 Product Overview




CN1A
CN1B

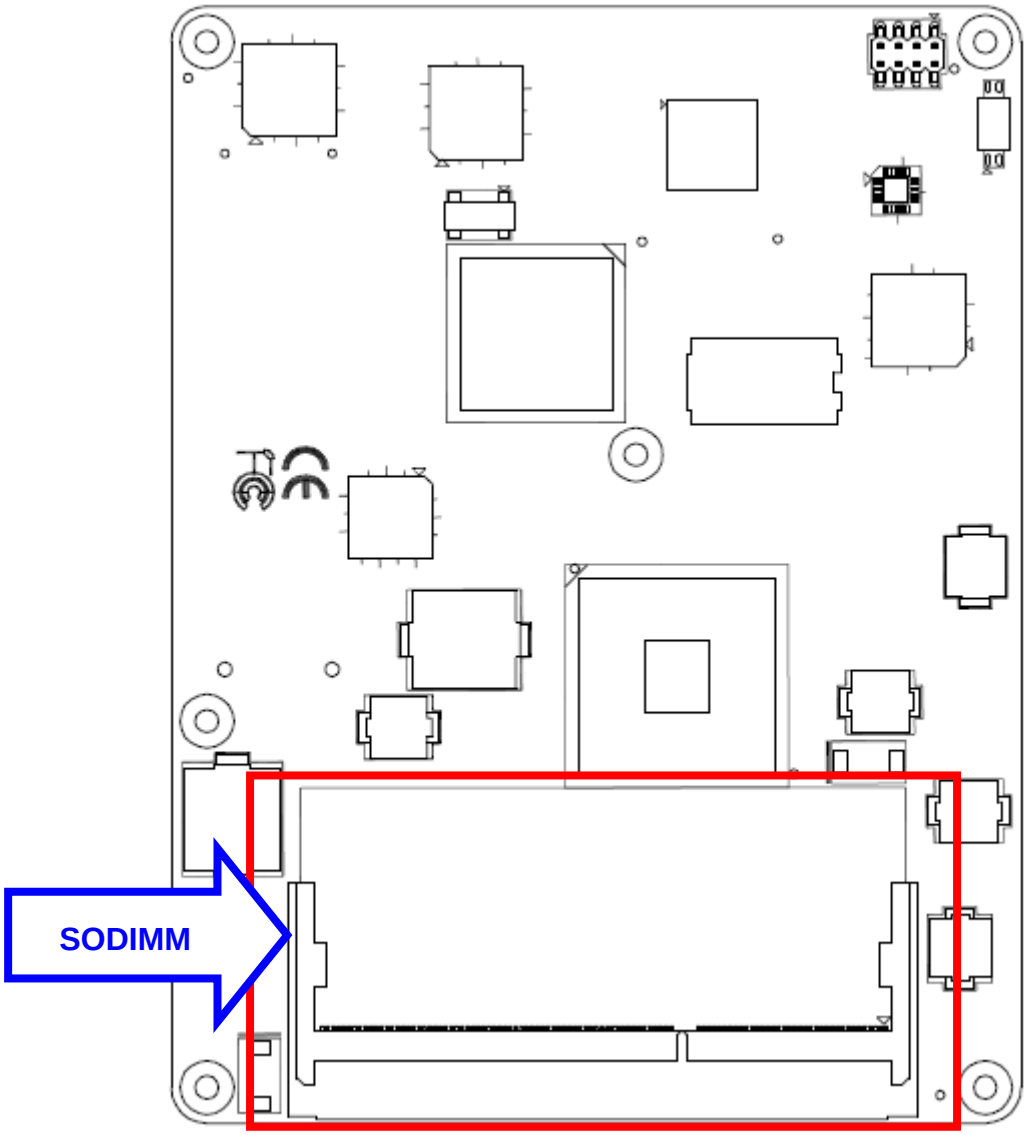
2.2 Installation Procedure

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

1. Turn off the power supply.
2. Insert the DIMM module (be careful with the orientation).
3. Insert all external cables for hard disk, floppy, keyboard, mouse, USB etc. except for flat panel. A CRT monitor must be connected in order to change CMOS 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.

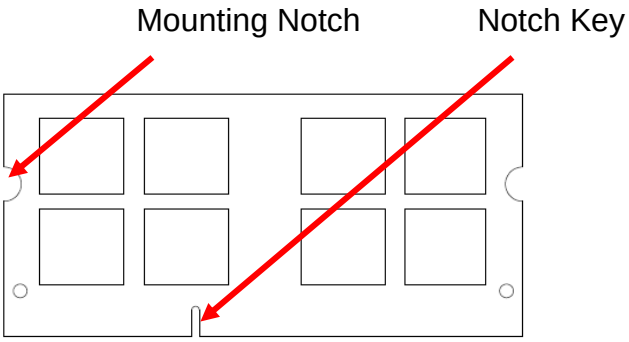
2.2.1 Main Memory

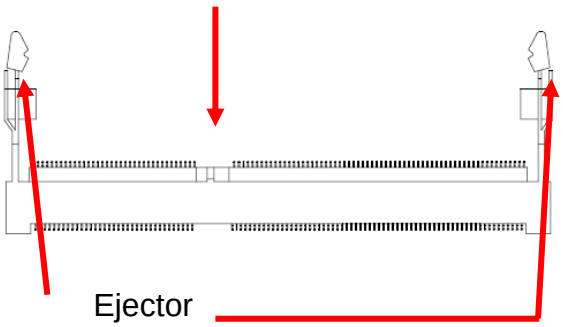
ESM-CDV provides one 204-pin DDR3 SODIMM socket, supports up to 4GB DDR3 800/1066 SDRAM



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

- Locate the SODIMM socket on the board.
- Carefully hold two edges of the SODIMM module. avoid touching its connectors.
- Align the notch key on the module with the rib on the slot.
- Firmly press the modules into the socket which automatically snaps into the mounting notch. Do not force the SODIMM module in with extra force as the SODIMM module only fits in one direction.





204-pin DDR3 SODIMM

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

Note:

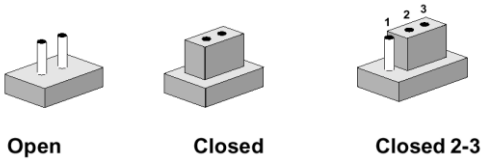
(1) Please do not change any DDR3 SDRAM parameter in BIOS setup to increase your system's performance without acquiring technical information in advance.

(2) Static electricity can damage the electronic components of the computer or optional boards. Before proceeding, ensure that you are discharged of static electricity by briefly touching a grounded metal object.

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.

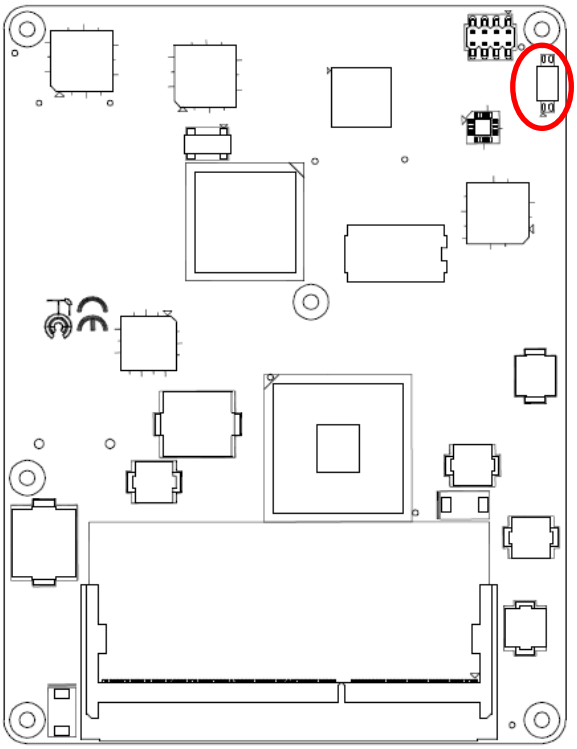
The following tables list the function of each of the board's jumpers and connectors.

Connectors

Label	Function	Note
SPI1	(Reserved for BIOS programming)	4 x 2 header, pitch 2.0mm
CN1A	COM Express connector 1	
CN1B	COM Express connector 2	
DIMM1	204-pin DDR3 SDRAM DIMM socket	
SW1	AT/ATX mode selector	

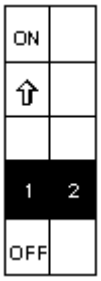
2.4 Setting Jumpers & Connectors

2.4.1 AT/ATX mode selector (SW1)

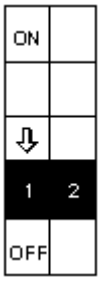


AT/ATX mode

AT mode



ATX mode*

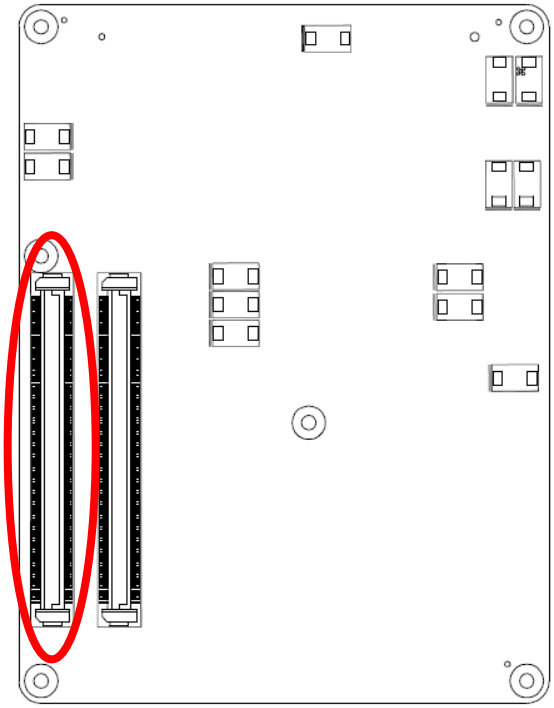


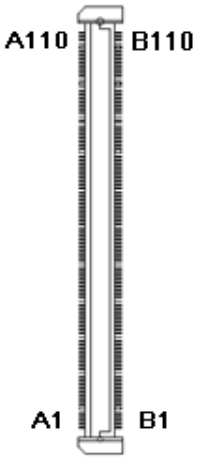
***Default**

2.4.1.1 Signal Description –AT/ATX mode selection

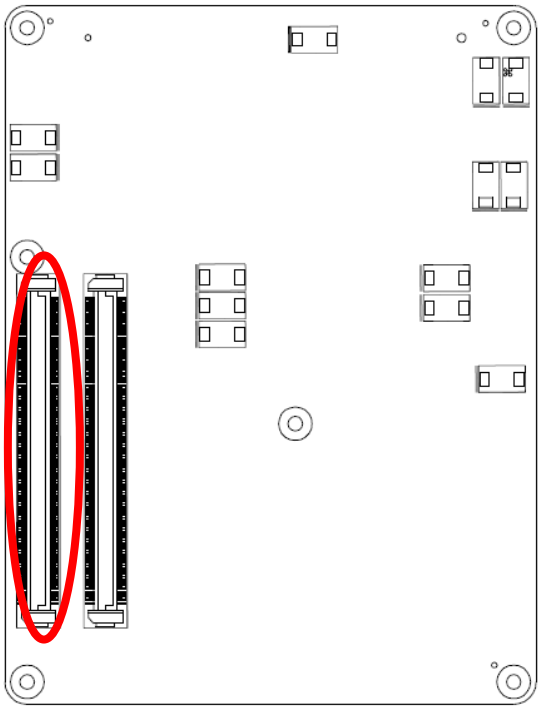
AT/ATX mode	Description
AT mode 	This Mode supports AT power supply, no need to press Power button to enable power on/off
ATX mode 	This Mode supports ATX power supply. Press the ATX power button to enable power on/off

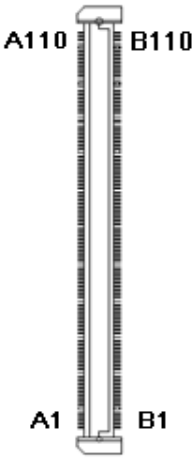
2.4.2 COM Express Connector 1 (CN1A)



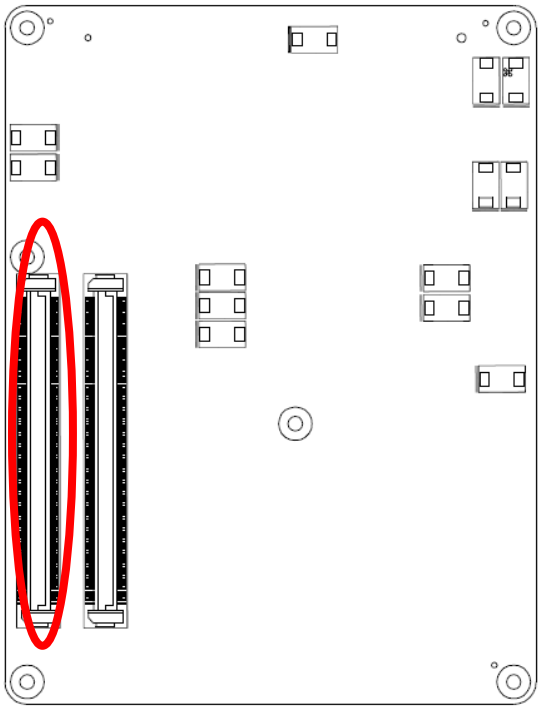


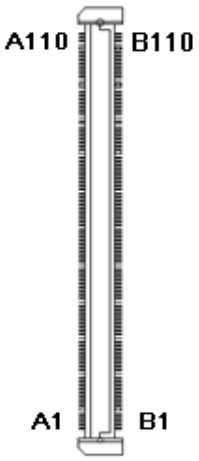
Signal	PIN	PIN	Signal
GND	A1	B1	GND
GBE0_MDI3-	A2	B2	GBE0_ACT#
GBE0_MDI3+	A3	B3	LPC_FRAME#
GBE0_LINK100#	A4	B4	LPC_AD0
GBE0_LINK1000#	A5	B5	LPC_AD1
GBE0_MDI2-	A6	B6	LPC_AD2
GBE0_MDI2+	A7	B7	LPC_AD3
GBE0_LINK#	A8	B8	LPC_DRQ0#
GBE0_MDI1-	A9	B9	LPC_DRQ1#
GBE0_MDI1+	A10	B10	LPC_CLK
GND	A11	B11	GND
GBE0_MDI0-	A12	B12	PWRBTN#
GBE0_MDI0+	A13	B13	SMB_CK
GBE0_CTREF	A14	B14	SMB_DAT
SUS_S3#	A15	B15	SMB_ALERT#
SATA0_TX+	A16	B16	SATA1_TX+
SATA0_TX-	A17	B17	SATA1_TX-
SUS_S4#	A18	B18	SUS_STAT#
SATA0_RX+	A19	B19	SATA1_RX+
SATA0_RX-	A20	B20	SATA1_RX-
GND	A21	B21	GND
NC	A22	B22	NC
NC	A23	B23	NC
SUS_S5#	A24	B24	PWR_OK
NC	A25	B25	NC
NC	A26	B26	NC
BATLOW#	A27	B27	WDT
ATA_ACT#	A28	B28	AC_SDIN2
AC_SYNC	A29	B29	AC_SDIN1
AC_RST#	A30	B30	AC_SDIN0



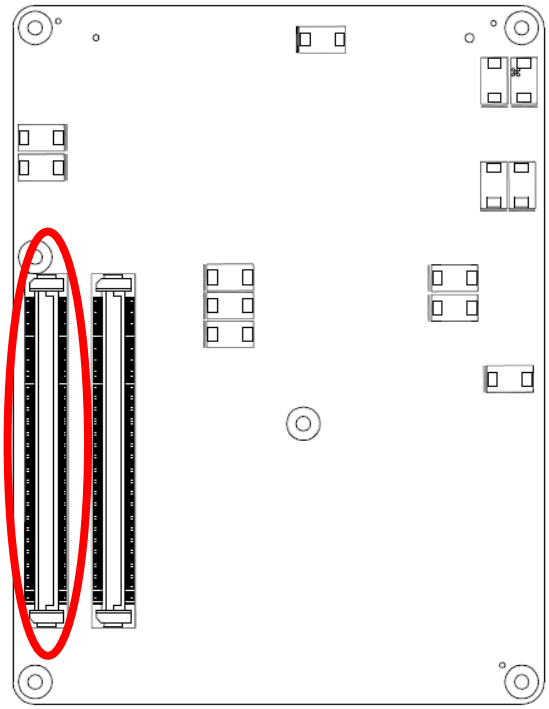


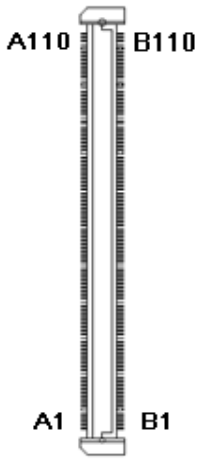
Signal	PIN	PIN	Signal
GND	A31	B31	GND
AC_BITCLK	A32	B32	SPKR
AC_SDOUT	A33	B33	I2C_CK
BIOS_DISABLE#	A34	B34	I2C_DAT
THRMTRIP#	A35	B35	THRM#
USB6-	A36	B36	USB7-
USB6+	A37	B37	USB7+
USB_6_7_OC#	A38	B38	USB_4_5_OC#
USB4-	A39	B39	USB5-
USB4+	A40	B40	USB5+
GND	A41	B41	GND
USB2-	A42	B42	USB3-
USB2+	A43	B43	USB3+
USB_2_3_OC#	A44	B44	USB_0_1_OC#
USB0-	A45	B45	USB1-
USB0+	A46	B46	USB1+
VCC_RTC	A47	B47	EXCD1_PERST#
EXCD0_PERST#	A48	B48	EXCD1_CPPE#
EXCD0_CPPE#	A49	B49	SYS_RESET#
LPC_SERIRQ	A50	B50	CB_RESET#
GND	A51	B51	GND
NC	A52	B52	NC
NC	A53	B53	NC
GPI0	A54	B54	GPO1
NC	A55	B55	NC
NC	A56	B56	NC
GND	A57	B57	GPO2
PCIE_TX3+	A58	B58	PCIE_RX3+
PCIE_TX3-	A59	B59	PCIE_RX3-
GND	A60	B60	GND





Signal	PIN	PIN	Signal
PCIE_TX2+	A61	B61	PCIE_RX2+
PCIE_TX2-	A62	B62	PCIE_RX2-
GPI1	A63	B63	GPO3
PCIE_TX1+	A64	B64	PCIE_RX1+
PCIE_TX1-	A65	B65	PCIE_RX1-
GND	A66	B66	WAKE0#
GPI2	A67	B67	WAKE1#
PCIE_TX0+	A68	B68	PCIE_RX0+
PCIE_TX0-	A69	B69	PCIE_RX0-
GND	A70	B70	GND
LVDS_A0+	A71	B71	LVDS_B0+
LVDS_A0-	A72	B72	LVDS_B0-
LVDS_A1+	A73	B73	LVDS_B1+
LVDS_A1-	A74	B74	LVDS_B1-
LVDS_A2+	A75	B75	LVDS_B2+
LVDS_A2-	A76	B76	LVDS_B2-
LVDS_VDD_EN	A77	B77	LVDS_B3+
LVDS_A3+	A78	B78	LVDS_B3-
LVDS_A3-	A79	B79	LVDS_BKLT_EN
GND	A80	B80	GND
LVDS_A_CK+	A81	B81	LVDS_B_CK+
LVDS_A_CK-	A82	B82	LVDS_B_CK-
LVDS_I2C_CK	A83	B83	LVDS_BKLT_CTRL
LVDS_I2C_DAT	A84	B84	VCC_5V_SBY_1
GPI3	A85	B85	VCC_5V_SBY_2
KBD_RST#	A86	B86	VCC_5V_SBY_3
KBD_A20GATE	A87	B87	VCC_5V_SBY_4
PCIE_CK_REF0+	A88	B88	RSVD5
PCIE_CK_REF0--	A89	B89	VGA_RED
GND	A90	B90	GND





Signal	PIN	PIN	Signal
RSVD1	A91	B91	VGA_GRN
RSVD2	A92	B92	VGA_BLU
GPO0	A93	B93	VGA_HSYNC
RSVD3	A94	B94	VGA_VSYNC
RSVD4	A95	B95	VGA_I2C_CK
GND	A96	B96	VGA_I2C_DAT
NC	A97	B97	SPI CS#
NC	A98	B98	NC
NC	A99	B99	NC
GND	A100	B100	GND
NC	A101	B101	NC
NC	A102	B102	NC
NC	A103	B103	NC
VCC_12V	A104	B104	VCC_12V
VCC_12V	A105	B105	VCC_12V
VCC_12V	A106	B106	VCC_12V
VCC_12V	A107	B107	VCC_12V
VCC_12V	A108	B108	VCC_12V
VCC_12V	A109	B109	VCC_12V
GND	A110	B110	GND

2.4.2.1 Signal Description – COM Express Connector 1 (CN1A)

2.4.2.1.1 Audio Signals

Signal	Signal Description
AC_SYNC	HD Audio Sync
AC_RST#	HD Audio Reset
AC_SDIN[0:2]	Audio CODEC Serial Data
AC_BITCLK	HD Audio Clock
AC_SDOUT	HD Audio Data

2.4.2.1.2 Gigabit Ethernet Signals

<table>
<tr><th>Signal</th><th>Signal Description</th></tr>
<tr><td>GBE0_MD[0:3] +/-</td><td>Gigabit Ethernet Controller 0: Media Dependent Interface Differential Pairs 0,1,2,3. The MDI can operate in 1000, 100 and 10 Mbit / sec modes. Some pairs are unused in some modes, per the following:
<table>
<tr><th></th><th>1000B-T</th><th>100B-T</th><th>10B-T</th></tr>
<tr><td>MDI[0]+/-</td><td>B1_DA+/</td><td>TX+/-</td><td>TX+/-</td></tr>
<tr><td>MDI[1]+/</td><td>B1_DB+/</td><td>RX+/-</td><td>RX+/-</td></tr>
<tr><td>MDI[2]+/</td><td>B1_DC+/</td><td>X</td><td>X</td></tr>
<tr><td>MDI[3]+/</td><td>B1_DD+/</td><td>X</td><td>X</td></tr>
</table></td></tr>
<tr><td>GBE0_ACT#</td><td>Gigabit Ethernet Controller 0 activity indicator, active low.</td></tr>
<tr><td>GBE0_Link#</td><td>Gigabit Ethernet Controller 0 link indicator, active low.</td></tr>
<tr><td>GBE0_Link100#</td><td>Gigabit Ethernet Controller 0 100 Mbit / sec link indicator, active low.</td></tr>
<tr><td>GBE0_Lin1000#</td><td>Gigabit Ethernet Controller 0 1000 Mbit / sec link indicator, active low.</td></tr>
</table>

2.4.2.1.3 GPIO Signals

Signal	Signal Description
GPI[0:4]	General purpose input pins.
GPO[0:4]	General purpose output pins.

2.4.2.1.4 Flat Panel LVDS Signals

Signal	Signal Description
BIASON	Controls panel contrast voltage.
DIGON	Controls panel digital power.
ENBKL#	Controls backlight power enable.
I^2C_DAT, I^2C_CLK	I^2C interface for panel parameter EEPROM. This EERPOM is mounted on the LVDS receiver. The data in the EEPROM allows the EXT module to automatically set the proper timing parameters for a specific LCD panel.

2.4.2.1.5 LPC Signals

Signal	Signal Description
LPC_FRAME#	LPC frame indicates the start of an LPC cycle
LPC_AD[0:3]	LPC multiplexed address, command and data bus
LPC_DRQ[0:1]#	LPC serial DMA request
LPC_CLK	LPC clock output - 33MHz nominal
LPC_SERIRQ	LPC serial interrupt

2.4.2.1.6 Miscellaneous Signals

<table>
<tr><th>Signal</th><th>Signal Description</th></tr>
<tr><td>I^2C_CK</td><td>General purpose I^2C port clock output</td></tr>
<tr><td>I^2C_DAT</td><td>General purpose I^2C port data I/O line</td></tr>
<tr><td>SPKR</td><td>Output for audio enunciator - the "speaker" in PC-AT systems</td></tr>
<tr><td>KBD_RST#</td><td>Input to Module from (optional) external keyboard controller that can force a reset.</td></tr>
<tr><td>KBD_A20GATE</td><td>Input to Module from (optional) external keyboard controller that can be used to control the CPU A20 gate line.</td></tr>
<tr><td>BIOS_DIS0#
BIOS_DIS1#</td><td>Selection straps to determine the BIOS boot device
<table>
<tr><th>BIOS_DIS1#</th><th>BIOS_DIS0#</th><th>Chipset SPI CS1# Destination</th><th>Chipset SPI CS0# Destination</th><th>Carrier SPI_CS#</th><th>SPI Descriptor</th><th>Bios Entry</th><th>Ref Line</th></tr>
<tr><td>1</td><td>1</td><td>Module</td><td>Module</td><td>High</td><td>Module</td><td>SPI0/SPI1</td><td>0</td></tr>
<tr><td>1</td><td>0</td><td>Module</td><td>Module</td><td>High</td><td>Module</td><td>Carrier FWH</td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>Module</td><td>Carrier</td><td>SPI0</td><td>Carrier</td><td>SPI0/SPI1</td><td>2</td></tr>
<tr><td>0</td><td>0</td><td>Carrier</td><td>Module</td><td>SPI1</td><td>Module</td><td>SPI0/SPI1</td><td>3</td></tr>
</table></td></tr>
<tr><td>KB_RST#</td><td>Input to module from (optional) external keyboard controller that can force a reset.</td></tr>
<tr><td>KB_A20GATE</td><td>Input to module from (optional) external keyboard controller that can be used to control the CPU A20 gate line.</td></tr>
</table>

2.4.2.1.7 PCI Express Signals

Signal	Signal Description
PCIE_TX[0:3] +/-	PCI Express Differential Transmit Pair 0-3
PCIE_RX[0:3] +/-	PCI Express Differential Receive Pair 0-3
PCIE0_CK_REF+/-	Reference clock output for PCI Express lanes 0-7 and for PCI Express Graphics lanes 0-15

2.4.2.1.8 Power Signals

Signal	Signal Description
VCC_5V_SBY	Standby power input: +5.0V nominal. See Electrical Specifications for allowable input range. If VCC5_SBY is used, all available VCC_5V_SBY pins on the connector(s) must be used. Only used for standby and suspend functions. May be left unconnected if these functions are not used in the system design.
VCC_RTC	Real-time clock circuit-power input. Nominally +3.0V.

2.4.2.1.9 Power & System Management Signals

Signal	Signal Description
SUS_S3#	Indicates system is in Suspend to RAM state. Active low output.
SUS_S4#	Indicates system is in Suspend to Disk state. Active low output.
SUS_S5#	Indicates system is in Soft Off state.
BATLOW#	Indicates that external battery is low
PWRBTN#	Power button to bring system out of S5 (soft off), active on rising edge.
SMB_CK	System Management Bus bidirectional clock line.
SMB_DTA	System Management Bus bidirectional data line.
SMB_ALERT#	System Management Bus Alert - input can be used to generate an SMI# (System Management Interrupt) or to wake the system.
SUS_STAT#	Indicates imminent suspend operation.
PWR_OK	Power OK from main power supply
THRMTRIP#	Active low output indicating that the CPU has entered thermal shutdown.
THRM#	Input from off-module temp sensor indicating and over-temp situation.
SYS_RESET#	Reset button input. Active low input.
WAKE0#	PCI Express wake up signal.
WAKE1#	General purpose wake up signal.

2.4.2.1.10 SATA Signals

Signal	Signal Description
SATA[0:1]_TX +/-	Serial ATA Channel 0-1 transmit differential pair.
SATA[0:1]_RX +/-	Serial ATA Channel 0-1 receive differential pair.
ATA_ACT#	ATA (parallel and serial) activity indicator, active low.

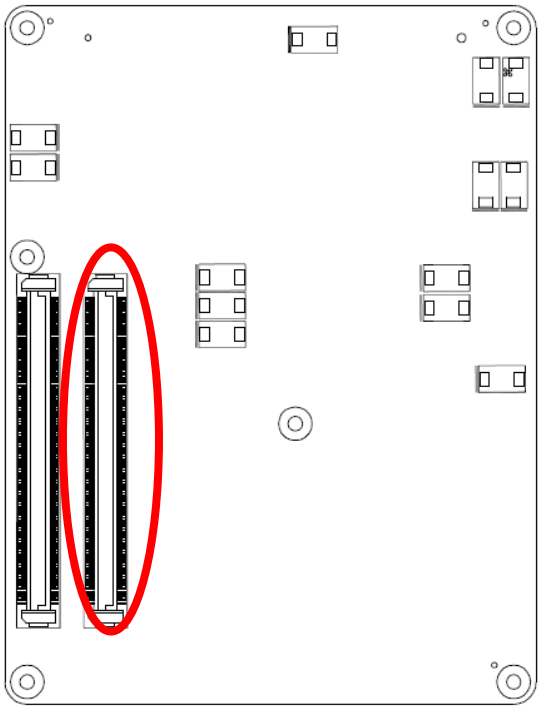
2.4.2.1.11 VGA Signals

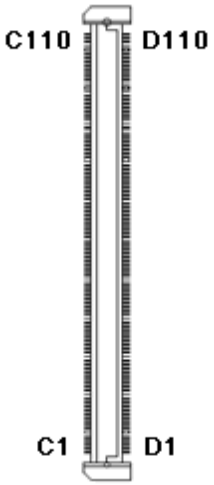
Signal	Signal Description
VGA_RED	Red for monitor. Analog DAC output.
VGA_GRN	Green for monitor. Analog DAC output.
VGA_BLU	Blue for monitor. Analog DAC output.
VGA_HSYNC	Horizontal sync output to VGA monitor
VGA_VSYNC	Vertical sync output to VGA monitor
VGA_ I^2C_CK	DDC clock line (I2C port dedicated to identify VGA monitor capabilities)
VGA_ I^2C_DAT	DDC data line.

2.4.2.1.12 USB Signals

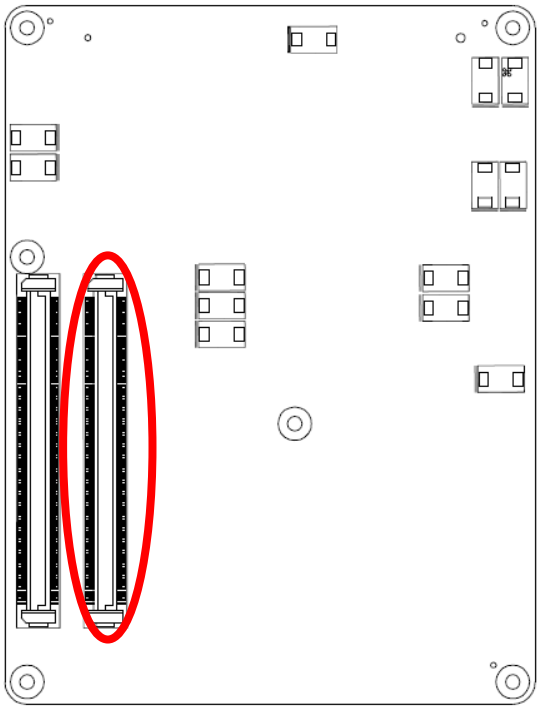
Signal	Signal Description
USB[0:7] +/-	USB differential pairs, channels 0 through 7
USB_0_1_OC#	USB over-current sense, USB channels 0 and 1
USB_2_3_OC#	USB over-current sense, USB channels 2 and 3
USB_4_5_OC#	USB over-current sense, USB channels 4 and 5
USB_6_7_OC#	USB over-current sense, USB channels 6 and 7

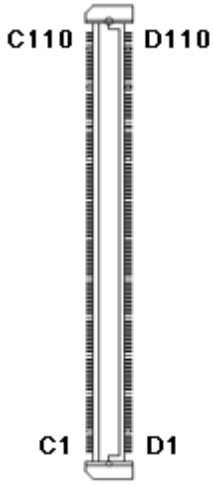
2.4.3 COM Express Connector 2 (CN1B)



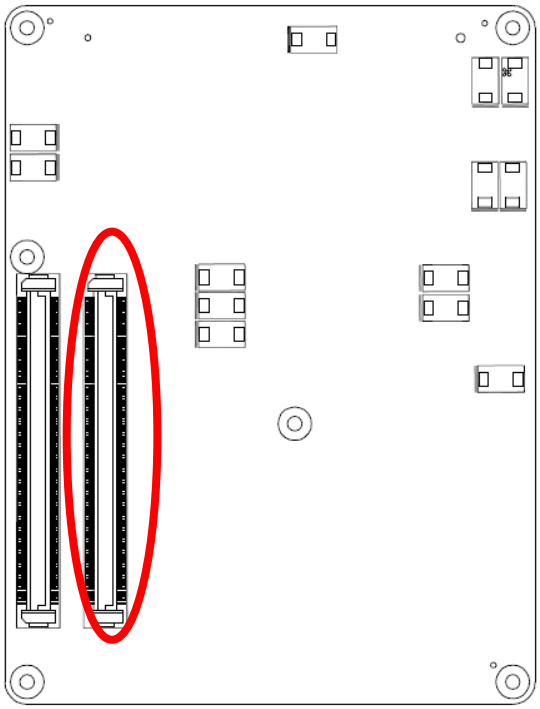


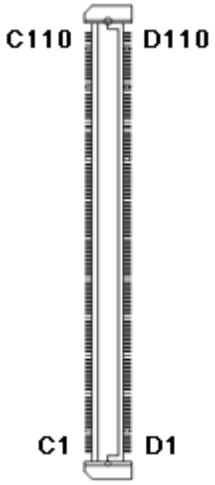
Signal	PIN	PIN	Signal
GND	C1	D1	GND
IDE_D7	C2	D2	IDE_D5
IDE_D6	C3	D3	IDE_D10
IDE_D3	C4	D4	IDE_D11
IDE_D15	C5	D5	IDE_D12
IDE_D8	C6	D6	IDE_D4
IDE_D9	C7	D7	IDE_D0
IDE_D2	C8	D8	IDE_REQ
IDE_D13	C9	D9	IDE_IOW#
IDE_D1	C10	D10	IDE_ACK#
GND	C11	D11	GND
IDE_D14	C12	D12	IDE_IRQ
IDE_IORDY	C13	D13	IDE_A0
IDE_IOR#	C14	D14	IDE_A1
PCI_PME#	C15	D15	IDE_A2
NC	C16	D16	IDE_CS1#
NC	C17	D17	IDE_CS3#
PCI_GNT1#	C18	D18	IDE_RESET#
PCI_REQ1#	C19	D19	NC
PCI_GNT0#	C20	D20	NC
GND	C21	D21	GND
PCI_REQ0#	C22	D22	PCI_AD1
PCI_RESET#	C23	D23	PCI_AD3
PCI_AD0	C24	D24	PCI_AD5
PCI_AD2	C25	D25	PCI_AD7
PCI_AD4	C26	D26	PCI_C/BE0#
PCI_AD6	C27	D27	PCI_AD9
PCI_AD8	C28	D28	PCI_AD11
PCI_AD10	C29	D29	PCI_AD13
PCI_AD12	C30	D30	PCI_AD15



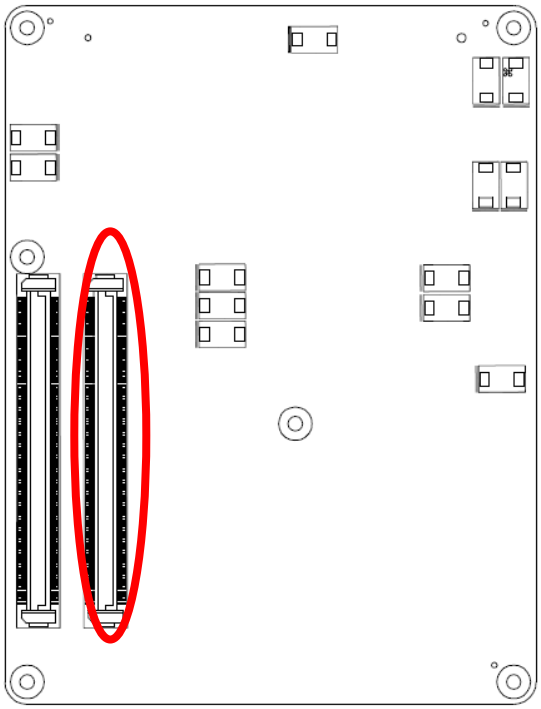


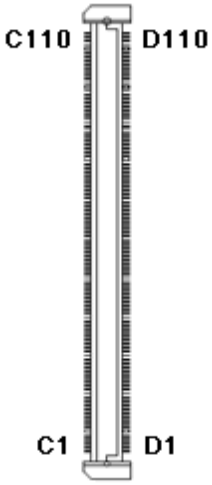
Signal	PIN	PIN	Signal
GND	C31	D31	GND
PCI_AD14	C32	D32	PCI_PAR
PCI_C/BE1#	C33	D33	PCI_SERR#
PCI_PERR#	C34	D34	PCI_STOP#
PCI_LOCK#	C35	D35	PCI_TRDY#
PCI_DEVSEL#	C36	D36	PCI_FRAME#
PCI_IRDY#	C37	D37	PCI_AD16
PCI_C/BE2#	C38	D38	PCI_AD18
PCI_AD17	C39	D39	PCI_AD20
PCI_AD19	C40	D40	PCI_AD22
GND	C41	D41	GND
PCI_AD21	C42	D42	PCI_AD24
PCI_AD23	C43	D43	PCI_AD26
PCI_C/BE3#	C44	D44	PCI_AD28
PCI_AD25	C45	D45	PCI_AD30
PCI_AD27	C46	D46	PCI_IRQC#
PCI_AD29	C47	D47	PCI_IRQD#
PCI_AD31	C48	D48	PCI_CLKRUN#
PCI_IRQA#	C49	D49	NC
PCI_IRQB#	C50	D50	PCI_CLK
GND	C51	D51	GND
NC	C52	D52	NC
NC	C53	D53	NC
NC	C54	D54	NC
NC	C55	D55	NC
NC	C56	D56	NC
NC	C57	D57	NC
NC	C58	D58	NC
NC	C59	D59	NC
GND	C60	D60	GND





Signal	PIN	PIN	Signal
NC	C61	D61	NC
NC	C62	D62	NC
NC	C63	D63	NC
NC	C64	D64	NC-
NC	C65	D65	NC
NC	C66	D66	NC
NC	C67	D67	GND
NC	C68	D68	NC
NC	C69	D69	NC
GND	C70	D70	GND
NC	C71	D71	NC
NC	C72	D72	NC
NC	C73	D73	NC
NC	C74	D74	NC
NC	C75	D75	NC
GND	C76	D76	GND
NC	C77	D77	IDE_CBLID#
NC	C78	D78	NC
NC	C79	D79	NC
GND	C80	D80	GND
NC	C81	D81	NC
NC	C82	D82	NC
NC	C83	D83	NC
GND	C84	D84	GND
NC	C85	D85	NC
NC	C86	D86	NC
GND	C87	D87	GND
NC	C88	D88	NC
NC	C89	D89	NC
GND	C90	D90	GND





Signal	PIN	PIN	Signal
NC	C91	D91	NC
NC	C92	D92	NC
GND	C93	D93	GND
NC	C94	D94	NC
NC	C95	D95	NC
GND	C96	D96	GND
NC	C97	D97	NC
NC	C98	D98	NC
NC	C99	D99	NC
GND	C100	D100	GND
NC	C101	D101	NC
NC	C102	D102	NC
GND	C103	D103	GND
VCC_12V	C104	D104	VCC_12V
VCC_12V	C105	D105	VCC_12V
VCC_12V	C106	D106	VCC_12V
VCC_12V	C107	D107	VCC_12V
VCC_12V	C108	D108	VCC_12V
VCC_12V	C109	D109	VCC_12V
GND	C110	D110	GND

2.4.3.1 Signal Description – COM Express Connector 2 (CN1B)

2.4.3.1.1 PCI Signals

Signal	Signal Description
PCI_AD[0:31]	PCI bus multiplexed address and data lines.
PCI_C/BE[0:3]#	PCI bus byte enable lines, active low.
PCI_DEVSEL#	PCI bus Device Select, active low.
PCI_FRAME#	PCI bus Frame control line, active low.
PCI_IRDY#	PCI bus Initiator Ready control line, active low.
PCI_TRDY#	PCI bus Target Ready control line, active low.
PCI_STOP#	PCI bus STOP control line, active low, driven by cycle initiator.
PCI_PAR	PCI bus parity.
PCI_PERR#	Parity Error: An external PCI device drives PERR# when it receives data that has a parity error.
PCI_REQ[0:3]#	PCI bus master request input lines, active low.
PCI_ GNT[0:3]#	PCI bus master grant output lines, active low.
PCI_RESET#	PCI Reset output, active low.
PCI_LOCK#	PCI Lock control line, active low.
PCI_SERR#	System Error: SERR# may be pulsed active by any PCI device that detects a system error condition.
PCI_PME#	PCI Power Management Event: PCI peripherals drive PME# to wake system from low-power states S1-S5.
PCI_CLKRUN#	Bidirectional pin used to support PCI clock run protocol for mobile systems.
PCI_IRQ[A:D]#	PCI interrupt request lines.
PCI_CLK	PCI 33MHz clock output.

2.4.3.1.2 IDE Signals

Signal	Signal Description
IDE_D[0:15]	Bidirectional data to / from IDE device.
IDE_A[0:2]	Address lines to IDE device.
IDE_LOW#	I/O write line to IDE device. Data latched on trailing (rising) edge.
IDE_IOR#	I/O read line to IDE device.
IDE_REQ	IDE Device DMA Request. It is asserted by the IDE device to request a data transfer.
IDE_ACK#	IDE Device DMA Acknowledge.

IDE_CS1#	IDE Device Chip Select for 1F0h to 1FFh range.
IDE_CS3#	IDE Device Chip Select for 3F0h to 3FFh range.
IDE_IORDY	IDE device I/O ready input Pulled low by the IDE device to extend the cycle.
IDE_RESET#	Reset output to IDE device, active low.
IDE_IRQ	Interrupt request from IDE device.
IDE_CBLID#	Input from off-Module hardware indicating the type of IDE cable being used.

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 CMOS 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> immediately after switching the system on, or
By pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self Test).

Press DEL to enter SETUP

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

Press F1 to Continue, DEL to enter SETUP

3.3 Using Setup

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

Button	Description
↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ 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 again.

3.5 In Case of Problems

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

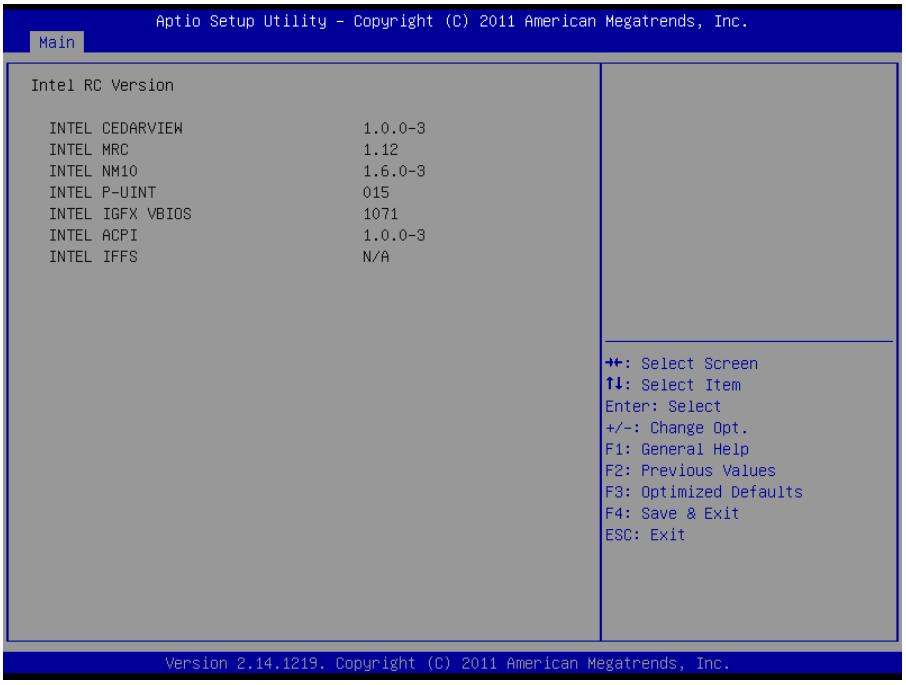
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your systems manufacturer to provide the absolute maximum performance and 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 AMI BIOS CMOS 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

Use this option to select system language

3.6.1.2 System Date

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

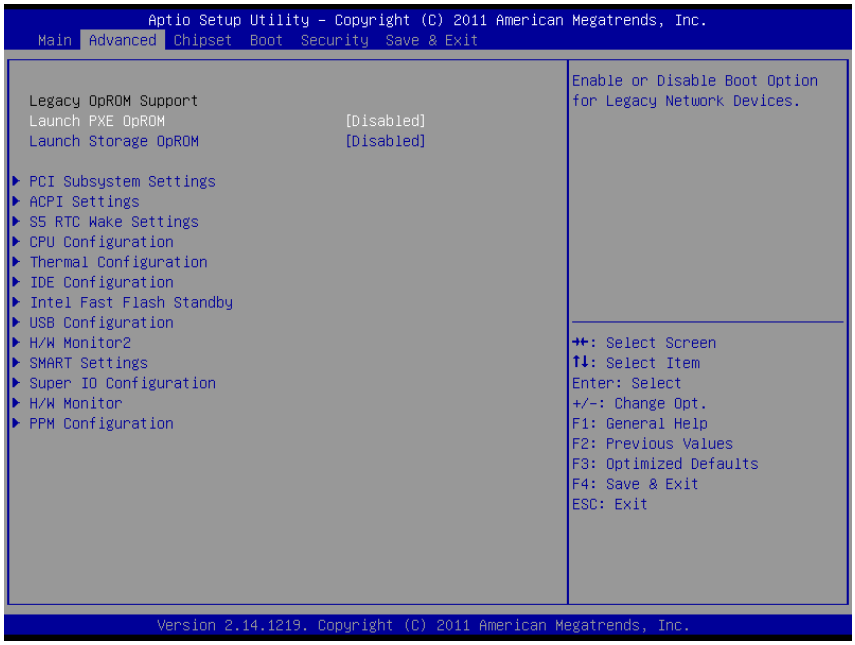
3.6.1.3 System Time

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

Note: BIOS setup screens shown in this chapter are for reference 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.

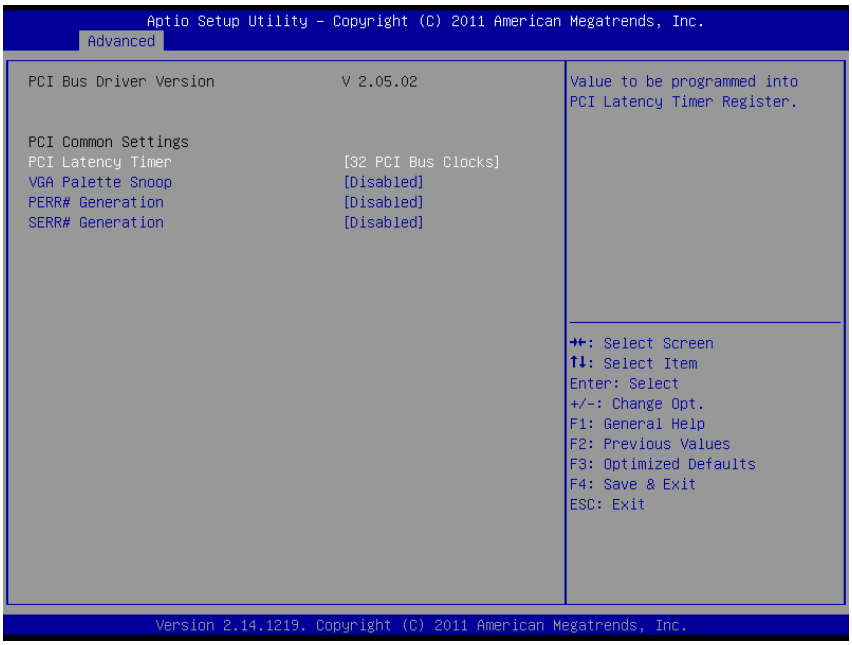
3.6.2 Advanced BIOS settings

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



Item	Options	Description
Launch PXE OpROM	Disabled, Enabled**[Default]**	Enable or Disable Boot Option for Legacy Network Devices
Launch Storage OpROM	Disabled, Enabled**[Default]**	Enable or Disable Boot Option for Legacy Mass Storage Devices with Option ROM.

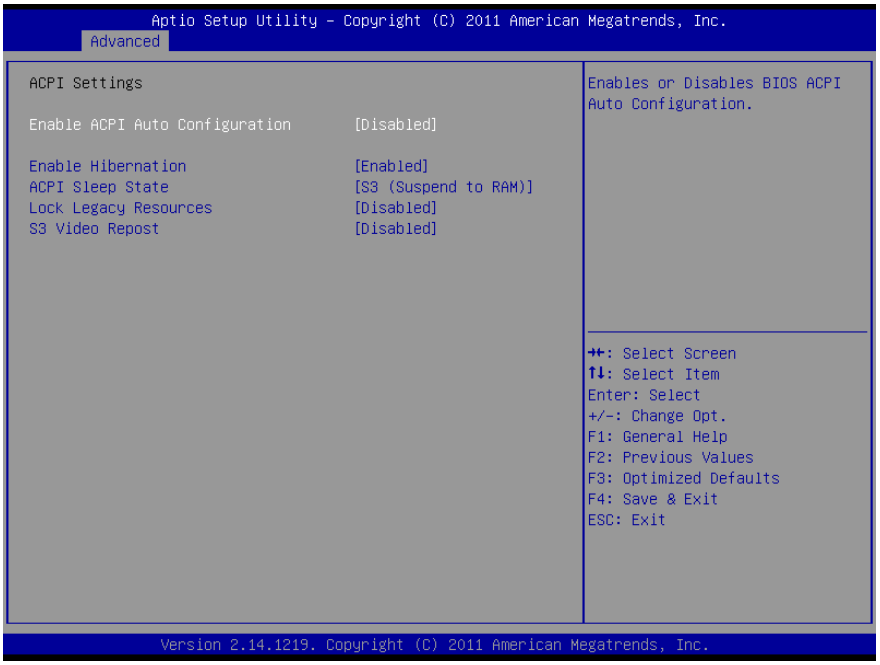
3.6.2.1 PCI Subsystem Settings



Item	Options	Description
PCI Latency Timer	32 PCI Bus Clocks**[Default]** 64 PCI Bus Clocks 96 PCI Bus Clocks 128 PCI Bus Clocks 160 PCI Bus Clocks 192 PCI Bus Clocks 224 PCI Bus Clocks 248 PCI Bus Clocks	Value to be programmed into PCI Latency Timer Register.
VGA Palette Snoop	Disabled**[Default]**, Enabled	Enables or Disables VGA Palette Registers Snooping.
PERR# Generation	Disabled**[Default]**, Enabled	Enables or Disables PCI Device to Generate PERR#
SERR# Generation	Disabled**[Default]**, Enabled	Enables or Disables PCI Device to Generate SERR#

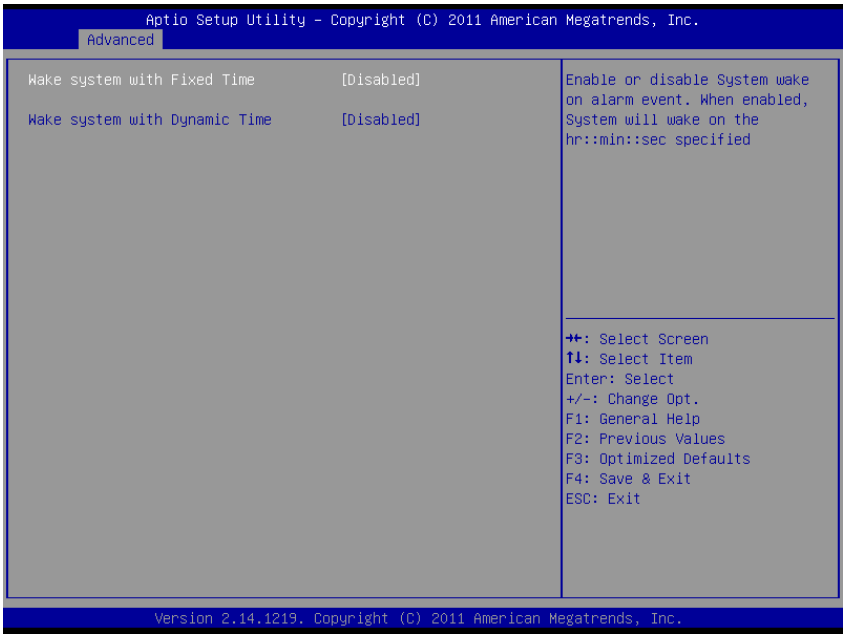
3.6.2.2 ACPI Settings

You can use this item to set up ACPI Configuration.



Item	Options	Description
Enable ACPI Auto Configuration	Disabled, Enabled**[Default]**	Enables or Disables BIOS ACPI Auto Configuration.
Enable Hibernation	Disabled, Enabled**[Default]**	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	Suspend Disabled S1 (CPU Stop Clock) S3 (Suspend to RAM) **[Default]**	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
Lock Legacy Resources	Disabled**[Default]**, Enabled	Enables or Disables Lock of Legacy Resources.
S3 Video Repost	Disabled**[Default]**, Enabled	Enable or Disable S3 Video Repost

3.6.2.3 S5 RTC Wake Settings



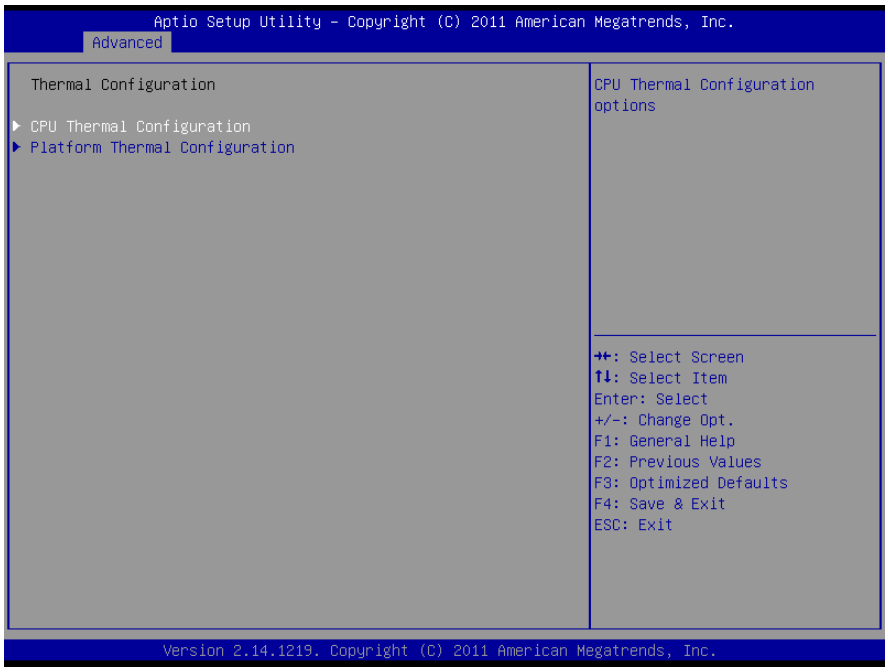
Item	Options	Description
Wake system with Fixed Time	Disabled**[Default]**, Enabled	Enables or disables wake on alarm event. When enabled, System will wake on the hr::min::sec specified.
Wake system with Dynamic Time	Disabled**[Default]**, Enabled	Enables or Disables wake on alarm event. When enabled, System will wake on the current time + Increase minutes(s).

3.6.2.4 CPU Configuration

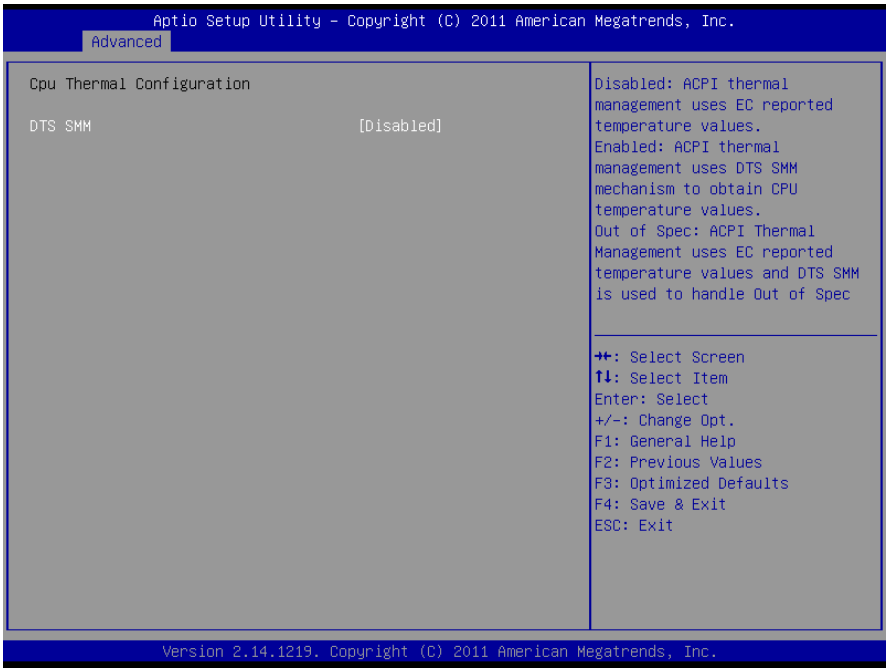
Use the CPU configuration menu to view detailed CPU specification and configure the CPU.

Item	Options	Description
Hyper-Threading	Disabled Enabled**[Default]**	Enabled for Windows XP and Linux (OS optimized for Hyper-Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology).
Execute Disable Bit	Disabled Enabled**[Default]**	XD can prevent certain classed of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.)
Limit CPUID Maximum	Disabled**[Default]**, Enabled	Disabled for Windows XP.

3.6.2.5 Thermal Configuration

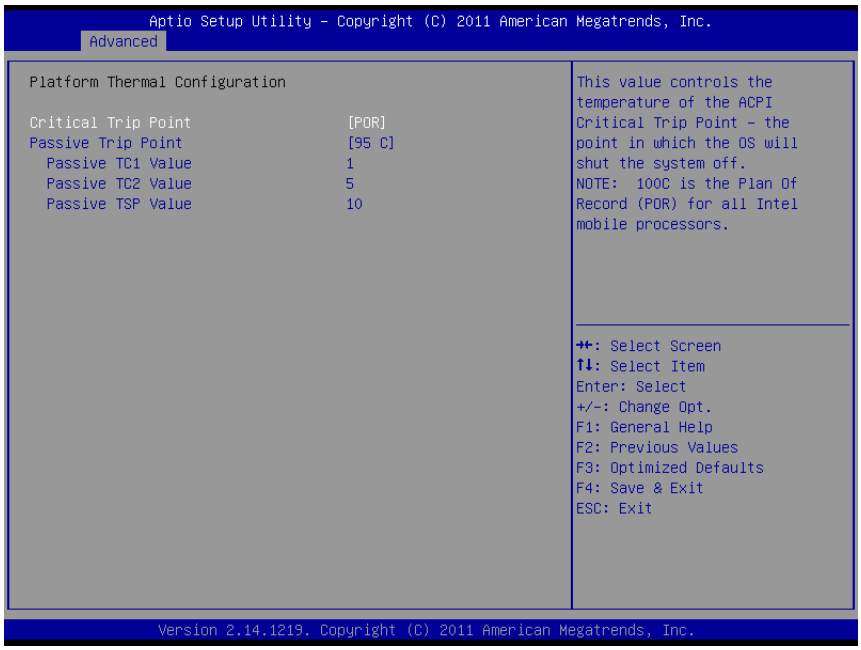


3.6.2.5.1 CPU Thermal Configuration



Item	Options	Description
DTS SMM	Disabled**[Default]** Enabled Critical Temp Reporting (Out of Spec)	Disabled: ACPI thermal management uses EC reported temperature values. Enabled: ACPI thermal management uses DTS SMM mechanism to obtain CPU temperature values. Out of spec: ACPI thermal management uses EC reported temperature values and DTS SMM is used to handle Out of spec condition.

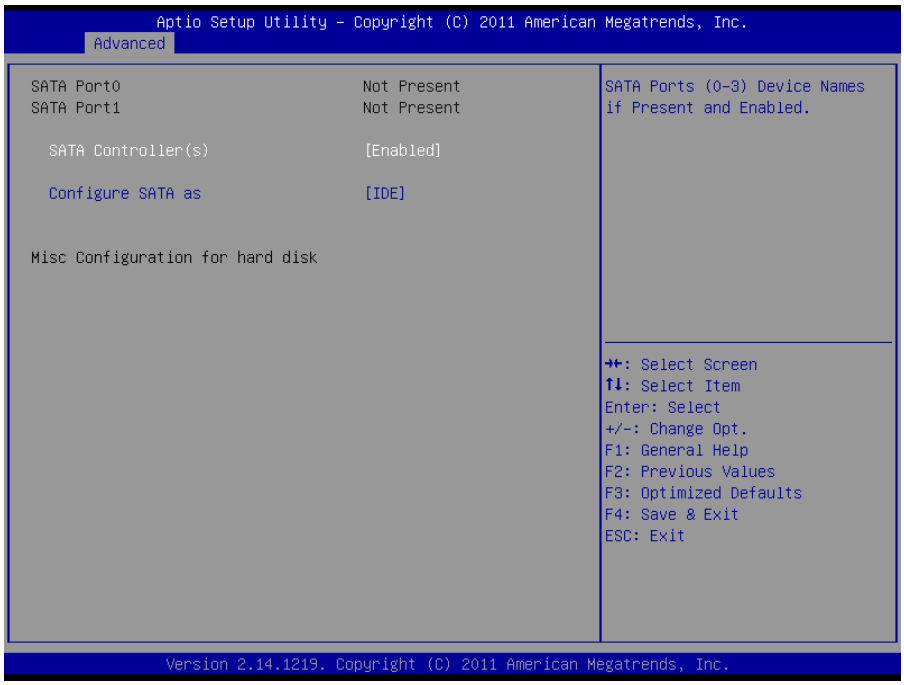
3.6.2.5.2 Platform Thermal Configuration



Item	Options	Description
Critical Trip Point	POR**[Default]** 15C 23C 31C 39C 47C 55C 63C 71C 79C 87C 95C 103C 111C 119C 127C	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
Passive Trip Point	Disabled 15C 23C 31C 39C 47C 55C 63C 71C 79C 87C 95C**[Default]** 103C 111C 119C	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	This value sets the TC1 -2 value for the ACPI Passive Cooling Formula. Range 1 – 16.
Passive TC2 Value		
Passive TSP Value	2 - 32	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

3.6.2.6 IDE Configuration



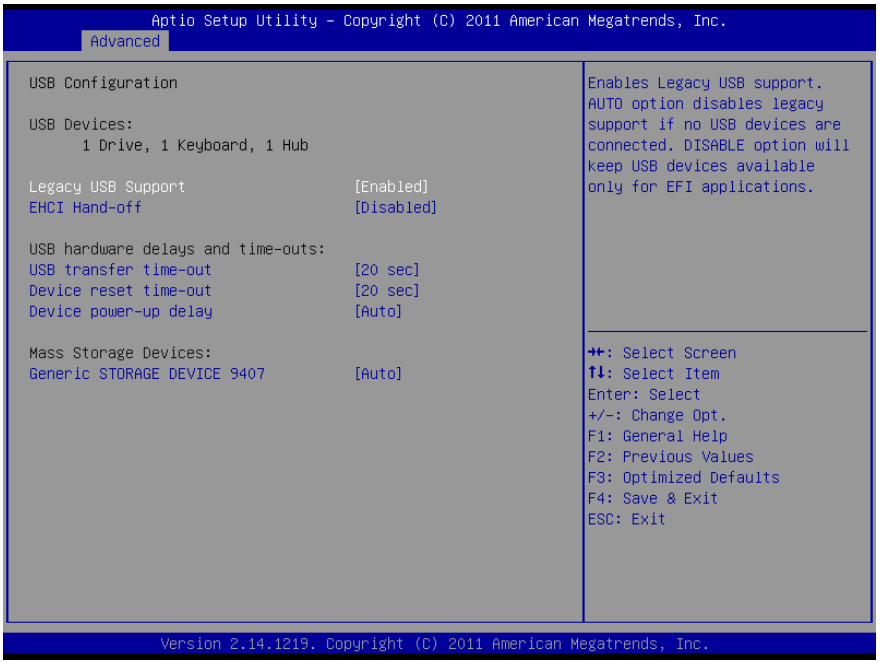
Item	Options	Description
SATA Controller(s)	Disabled, Enabled**[Default]**	SATA Ports (0-3) Device Names if Present and Enabled.
Configure SATA as	IDE**[Default]** AHCI	Select a configuration for SATA Controller

3.6.2.7 Intel Fast Flash Standby

Item	Options	Description
iFFS Support	Disabled**[Default]**, Enabled	Enable or Disable iFFS

3.6.2.8 USB Configuration

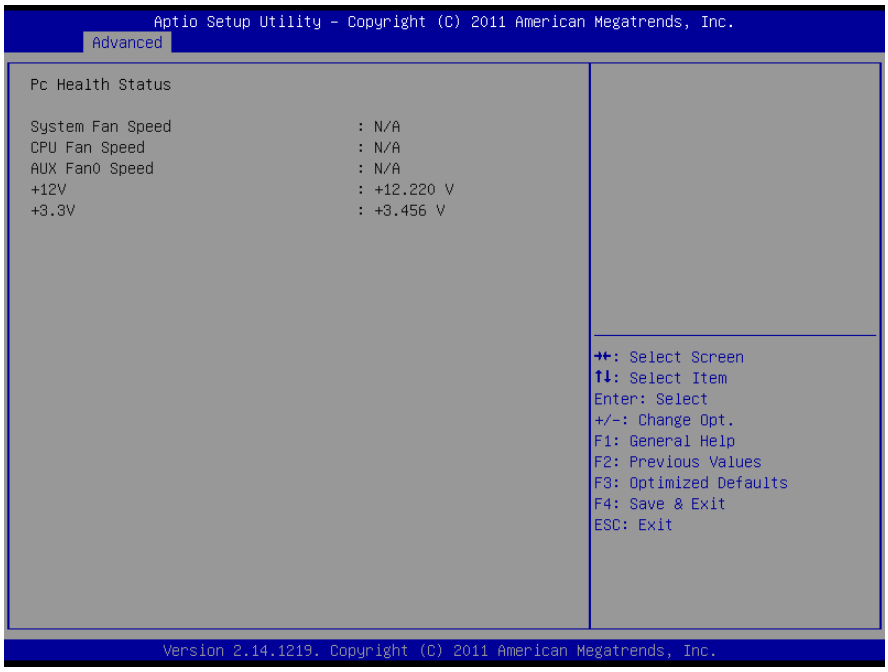
The USB configuration menu is used to read USB configuration information and configure USB.



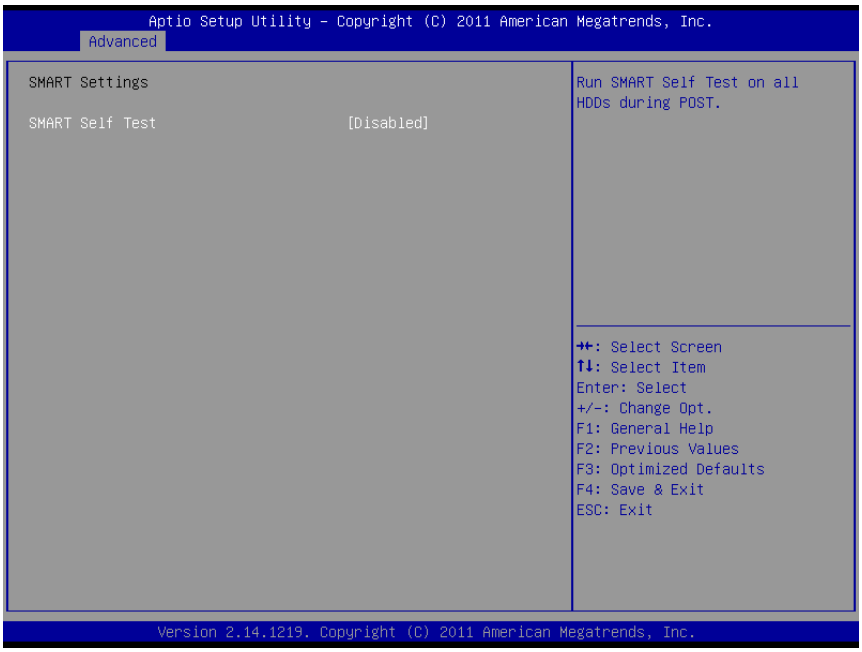
Item	Options	Description
Legacy USB support	Enabled**[Default]** Disabled Auto	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE will keep USB devices available only for EFI applications.
ECHI Hand-off	Disabled**[Default]** Enabled	This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.
USB transfer time-out	1sec / 5sec 10sec / 20sec**[Default]**	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10sec / 20sec**[Default]** 30sec / 40sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto**[Default]** Manual	Maximum time the device will take before it properly reports itself to the Host Controller. "Auto" uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.
Mass Storage Devices	Auto**[Default]** Floppy Forced FDD Hard Disk CD-ROM	Mass storage device emulation type. "AUTO" enumerates devices less than 530MB as floppies. Forced FDD option can be used to force HDD formatted drive to boot as FDD (e.g. ZIP drive).

3.6.2.9 H/W Monitor

The H/W Monitor shows the operating temperature, fan speeds and system voltages.



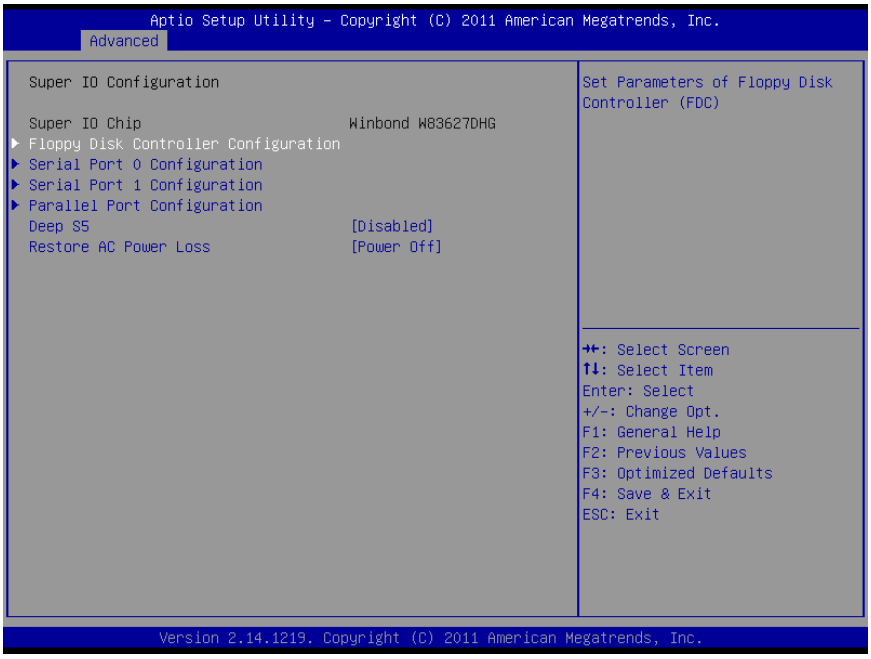
3.6.2.10 Smart Settings



Item	Options	Description
Smart Self Test	Disabled**[Default]** Enabled	Run SMART Self Test on all HDDs during POST

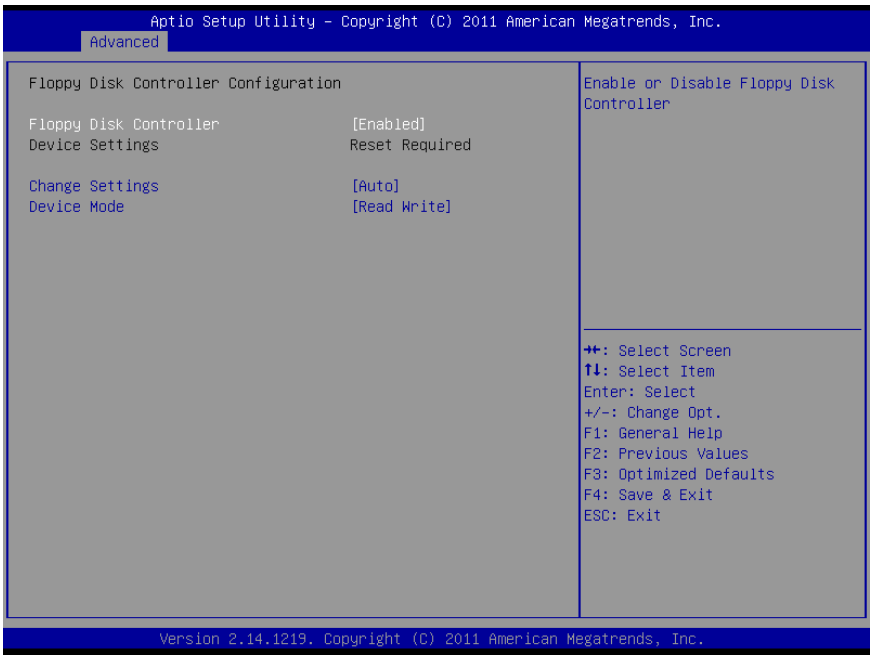
3.6.2.11 Super IO Configuration

You can use this item to set up or change the Super IO configuration for FDD controllers, parallel ports and serial ports. Please refer to 3.6.2.11.1, 3.6.2.11.2, 3.6.2.11.3 and 3.6.2.11.4 for more information.



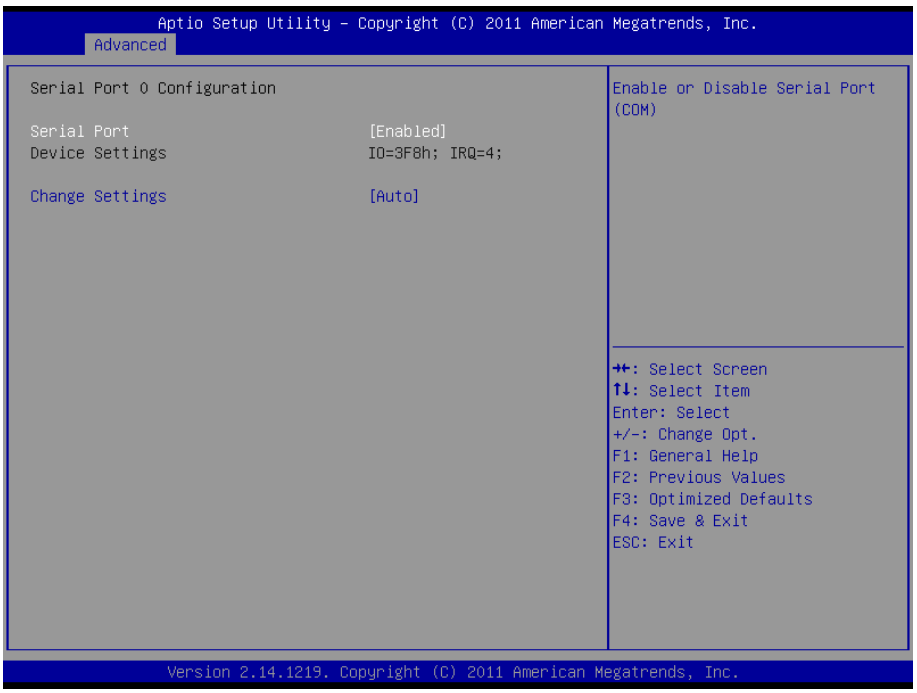
Item	Option	Description
Deep S5	Disabled**[Default]** Enabled	Deep S5 for power saving
Restore AC Power Loss	Power Off**[Default]** Power On Last State	Specify what state to go to when power is re-applied after a power failure (G3 state).

3.6.2.11.1 Floppy Disk Controller Configuration



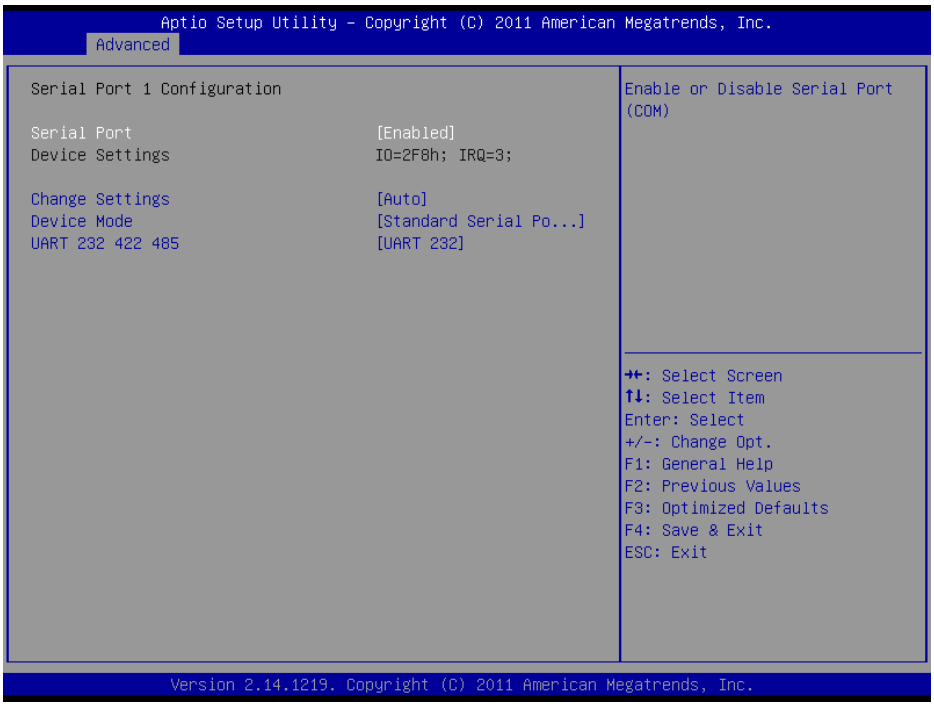
Item	Option	Description
Floppy Disk Controller	Disabled Enabled**[Default]**	Enable or Disable Floppy Disk Controller.
Change Settings	Auto**[Default]** IO=3F0h; IRQ=6; DMA=2; IO=3F0h; IRQ=3,4,5,6,7,10,11,12; DMA=2,3; IO=370h; IRQ=3,4,5,6,7,10,11,12; DMA=2,3;	Select an optimal setting for Super IO device.
Device Mode	Read Write**[Default]** Write Protect	Change mode of Floppy Controller. Select 'Read Write' for normal operation. Select 'Write Protect' mode for read only operation.

3.6.2.11.2 Serial Port 0 Configuration



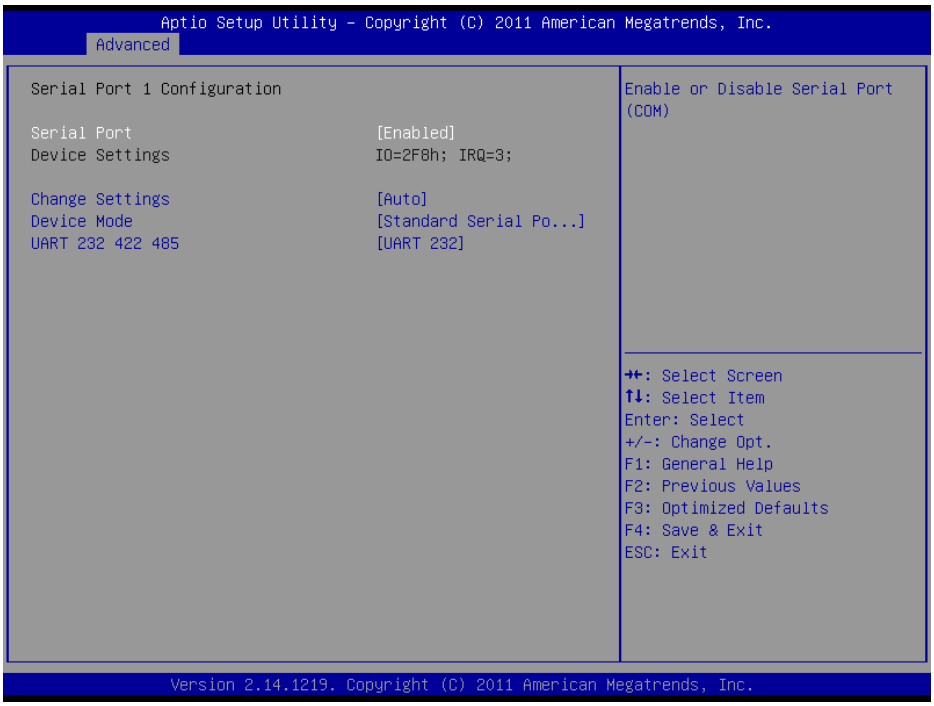
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**	Enable or Disable the Serial Port (COM).
Change Settings	Auto**[Default]** IO=3F8h; IRQ=4; IO=3F8h; IRQ=3,4,5,6,7,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,10,11,12;	Select an optimal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

3.6.2.11.3 Serial Port 1 Configuration



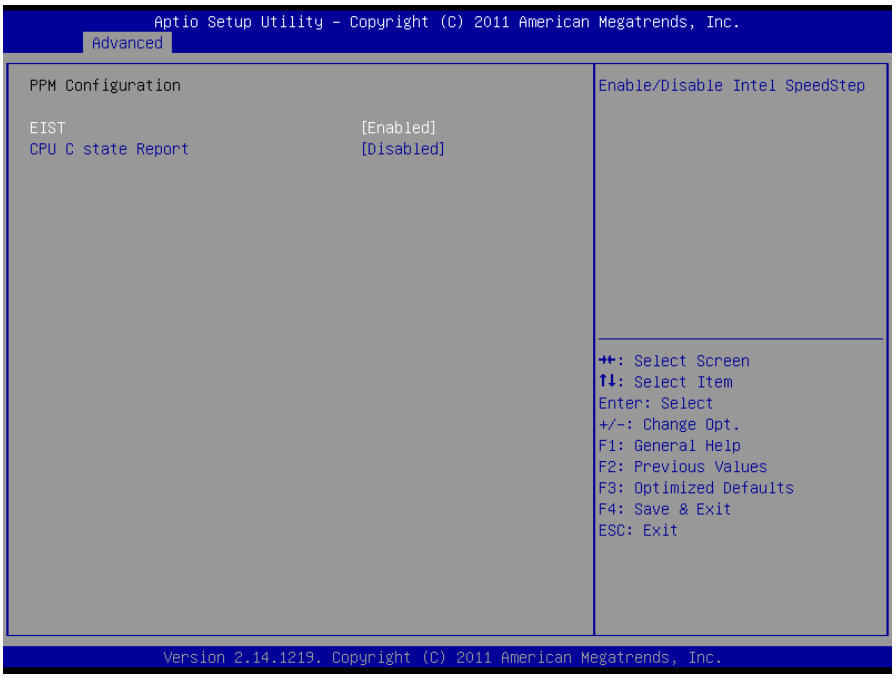
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]** IO=2F8h; IRQ=3, IO=3F8h; IRQ=3,4,5,6,7,10,11,12 IO=2F8h; IRQ=3,4,5,6,7,10,11,12 IO=3E8h; IRQ=3,4,5,6,7,10,11,12 IO=2E8h; IRQ=3,4,5,6,7,10,11,12	Select an optimal setting for Super IO device.
Device Mode	Standard Serial Port Mode**[Default]** IrDA 1 .0(HP SIR) Mode ASKIR Mode	Change the Serial Port mode. Select <High Speed> or <Normal mode> mode.
UART 232 422 485	UART 232, **[Default]** UART 422, UART 485	Change the Serial Port as RS232/422/485.

3.6.2.11.4 Parallel Port Configuration



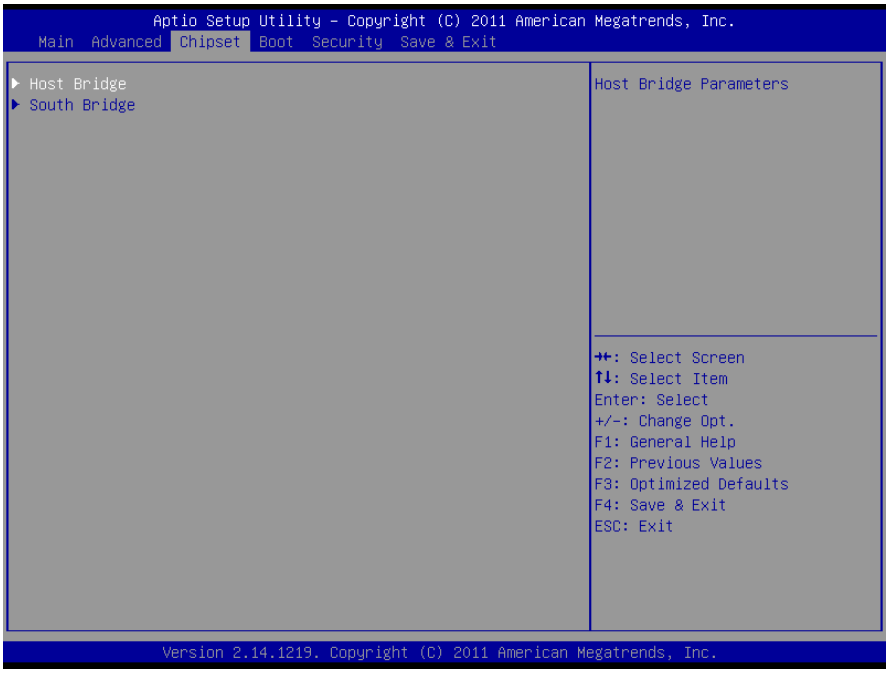
Item	Option	Description
Parallel Port	Disabled Enabled**[Default]**	Enable or Disable Parallel Port (LPT/LPTE).
Change Settings	Auto**[Default]** IO=378h; IRQ=5, IO=378h; IRQ=5,6,7,10,11,12 IO=278h; IRQ=5,6,7,10,11,12 IO=3BCh; IRQ=5,6,7,10,11,12 IO=378h; IO=278h; IO=3BCh;	Select an optimal setting for Super IO device.
Device Mode	STD Printer Mode**[Default]** SPP Mode EPP-1.9 and SPP Mode EPP-1.7 and SPP Mode ECP Mode ECP and EPP 1.9 Mode ECP and EPP 1.7 Mode	Change the Printer Port mode.

3.6.2.12 PPM configuration

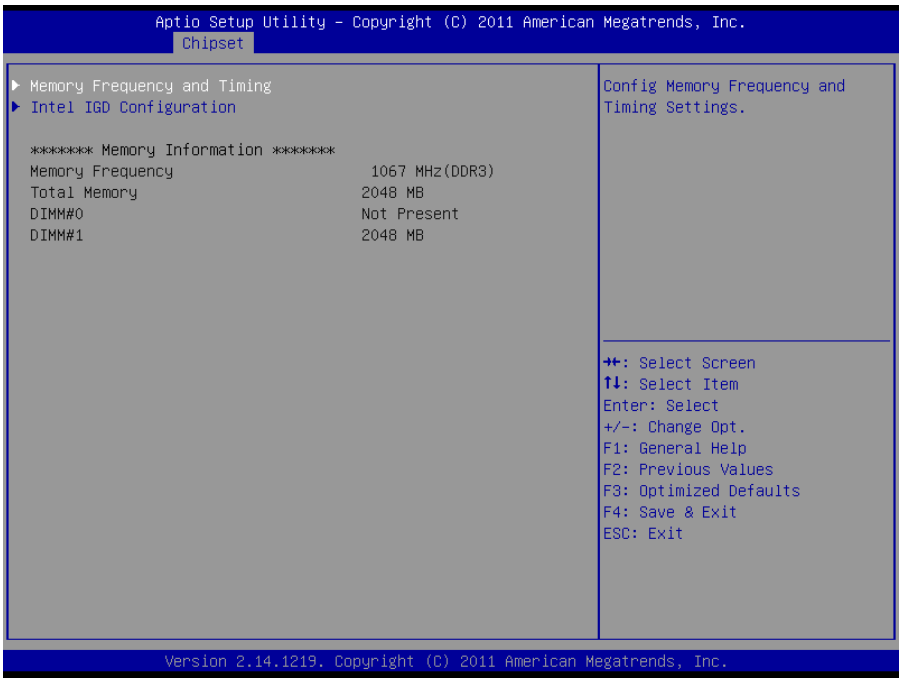


Item	Option	Description
EIST	Disabled Enabled**[Default]**	Enable/Disable Intel SpeedStep.
CPU C state Report	Disabled**[Default]** Enabled	Enable/Disable CPU C State report to OS.

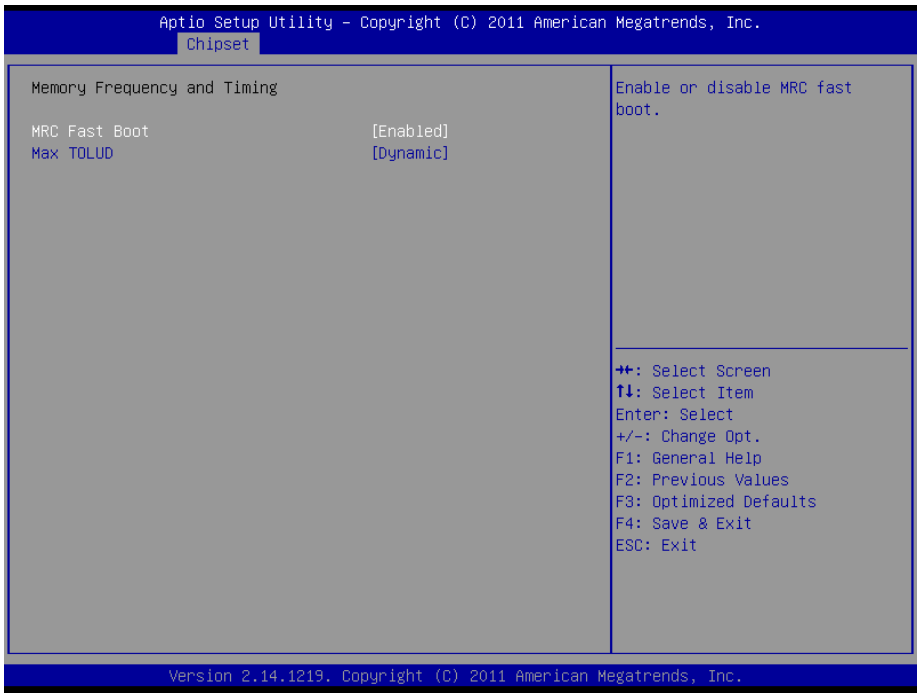
3.6.3 Advanced Chipset Features



3.6.3.1 Host bridge



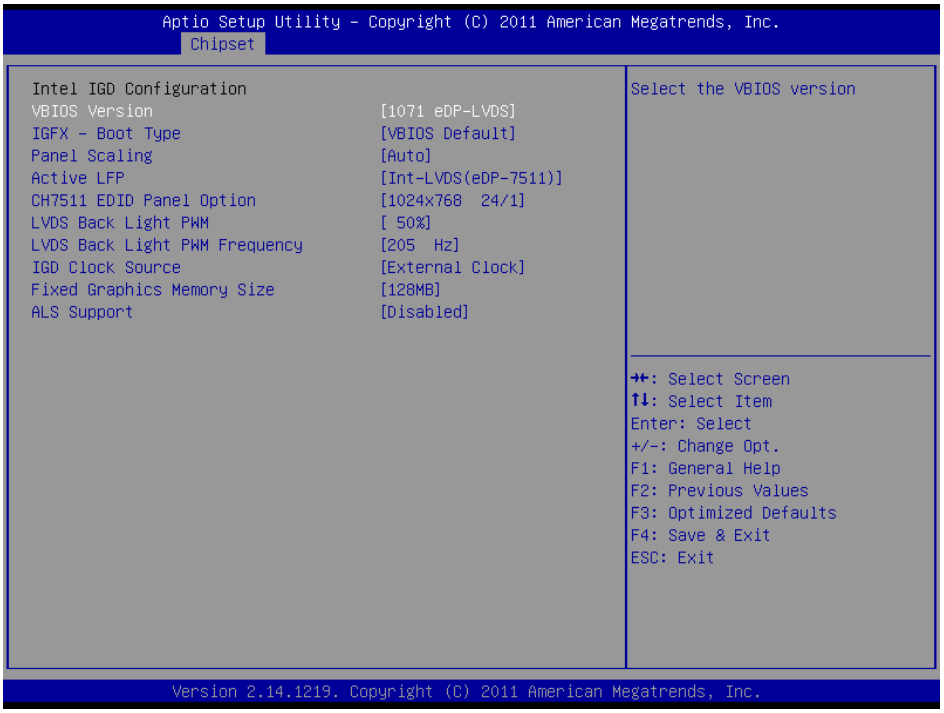
3.6.3.1.1 Memory Frequency and Timing



Item	Option	Description
MRC Fast Boot	Disabled Enabled**[Default]**	Enable or Disable MRC fast boot
Max TOLUD	Dynamic**[Default]** 1GB 1.25 GB	Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on

	1.5 GB 1.75 GB 2 GB 2.25 GB 2.5 GB 2.75 GB 3 GB 3.25 GB	largest MMIO length of installed graphic controller.

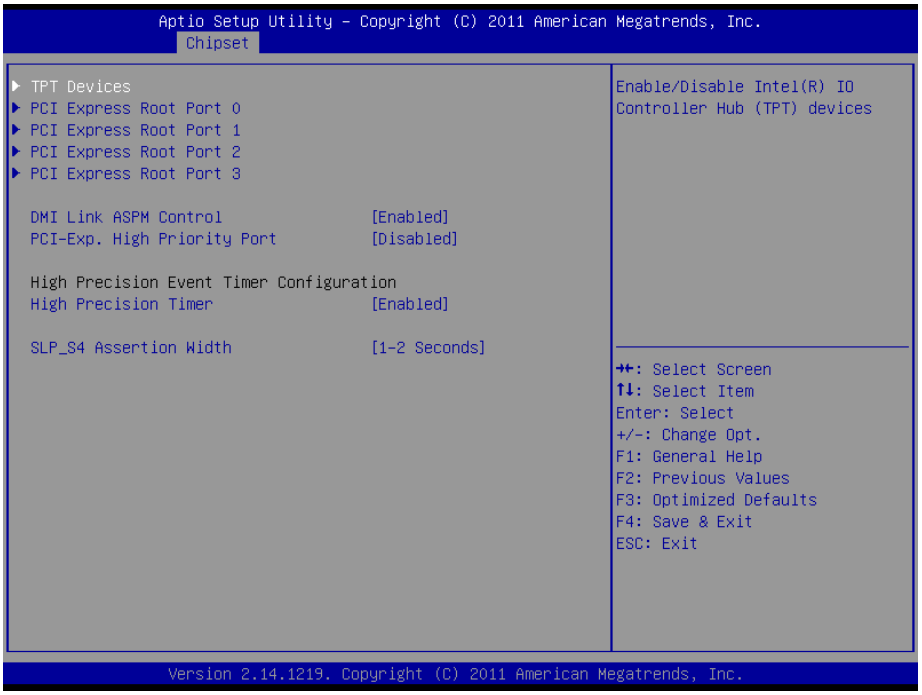
3.6.3.1.2 Intel IGD Configuration



Item	Option	Description
VBIOS Version	1071 eDP-LVDS**[Default]** 1085 eDP-LVDS EMGD (A813)	Select the VBIOS version
IGFX - Boot Type	VBIOS Default**[Default]** CRT, CRT+LVDS, LVDS, LVDS+CRT,	Select the Video Device which will be activated during POST. This has no effect if external graphics present.
Panel Scaling	Auto**[Default]** Force Scaling Off Maintain Aspect Ratio	Select the LCD panel scaling option used by the Internal Graphics Device.
Active LFP	No LVDS Int-LVDS (eDP-7511) **[Default]**	Select the Active LFP Configuration. No LVDS: VBIOS does not enable LVDS. Int-LVDS: VBIOS 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

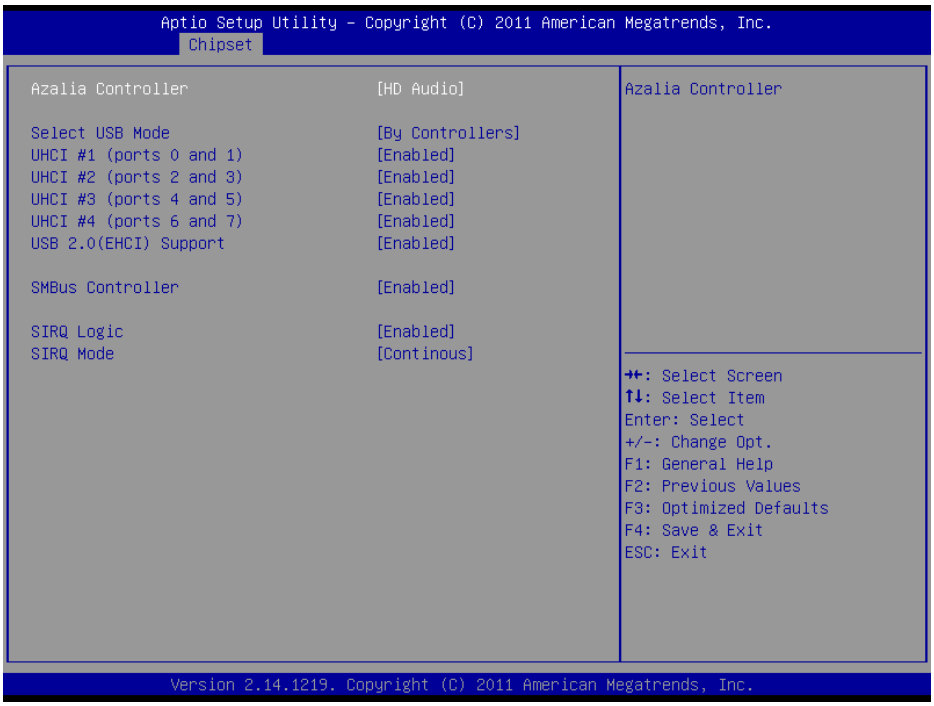
		Port-A. eDP Port-D: LFP Driven by Int-DisplayPort encoder from Port-D (through PCH).
CH7511 EDID Panel Option	1024x768 24/1**[Default]** 800x600 18/1 1024x768 18/1 1366x768 18/1 1024x600 18/1 1280x800 18/1 1920x1200 24/2 640x480 18/1 800x480 18/1 1920x1080 18/2 1280x1024 24/2 1440x900 18/2 1600x1200 24/2 1366x768 24/1 1920x1080 24/2 1680x1050 24/2	Port1-EDP to LVDS (Chrotel 7511) Panel EDID Option.
LVDS Back Light PWM	00% 25% 50%**[Default]** 75% 100%	Select LVDS back light PWM duty
LVDS Back Light PWM Frequency	128Hz 205Hz**[Default]** 340Hz 512Hz 1KHz 2KHz 3KHz 5KHz 10KHz 13KHz 26KHz 65KHz 130KHz	Select LVDS back light PWM Frequency
IGD Clock Source	External clock**[Default]** Internal clock	IGD clock selection
Fixed Graphics Memory Size	128MB**[Default]** 256MB	Configure Fixed Graphics Memory Size
ALS Support	Enabled Disabled**[Default]**	Valid only for ACPI. Legacy=ALS Support through the IGD INT10 function. ACPI=ALS support through an ACPI ALS driver

3.6.3.2 South bridge



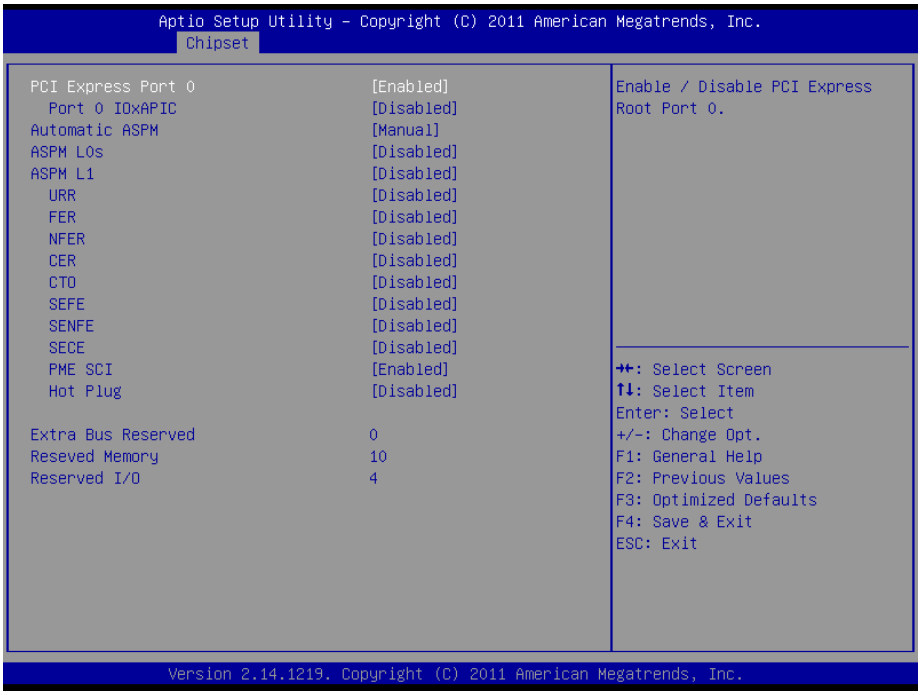
Item	Option	Description
DMI Link ASPM Control	Disabled Enabled**[Default]**	The control of Active State Power Management on both NB side and SB side of the DMI Link.
PCI-Exp. High Priority Port	Disabled**[Default]** Port0 Port1 Port2 Port3	Select a PCI Express High Priority Port.
High Precision Timer	Disabled Enabled**[Default]**	Enable or Disable the High Precision Event Timer.
SLP_S4 Assertion Width	1-2 Seconds**[Default]** 2-3 Seconds 3-4 Seconds 4-5 Seconds	Select a minimum assertion width of the SLP_S4# signal.

3.6.3.2.1 TPT Devices



Item	Option	Description
Azalia Controller	Disabled HD Audio**[Default]**	Azalia Controller.
Select USB Mode	By Ports By controllers**[Default]**	Select USB mode to control USB ports.
UHCI #1 (ports 0 and 1)	Disabled Enabled**[Default]**	Control the USB UHCI (USB1.1) functions. Disable from highest to lowest controller.
UHCI #2 (ports 2 and 3)	Disabled Enabled**[Default]**	
UHCI #3 (ports 4 and 5)	Disabled Enabled**[Default]**	
UHCI #4 (ports 6 and 7)	Disabled Enabled**[Default]**	
USB 2.0(EHCI) Support	Disabled Enabled**[Default]**	Enable or Disable USB 2.0 (EHCI) Support.
SMBus Controller	Disabled Enabled**[Default]**	Enable or Disable OnChip SMBus Controller.
SIRQ Logic	Disabled Enabled**[Default]**	Enable or Disable SIRQ logic
SIRQ Mode	Quiet Continous**[Default]**	Set SIRQ mode.

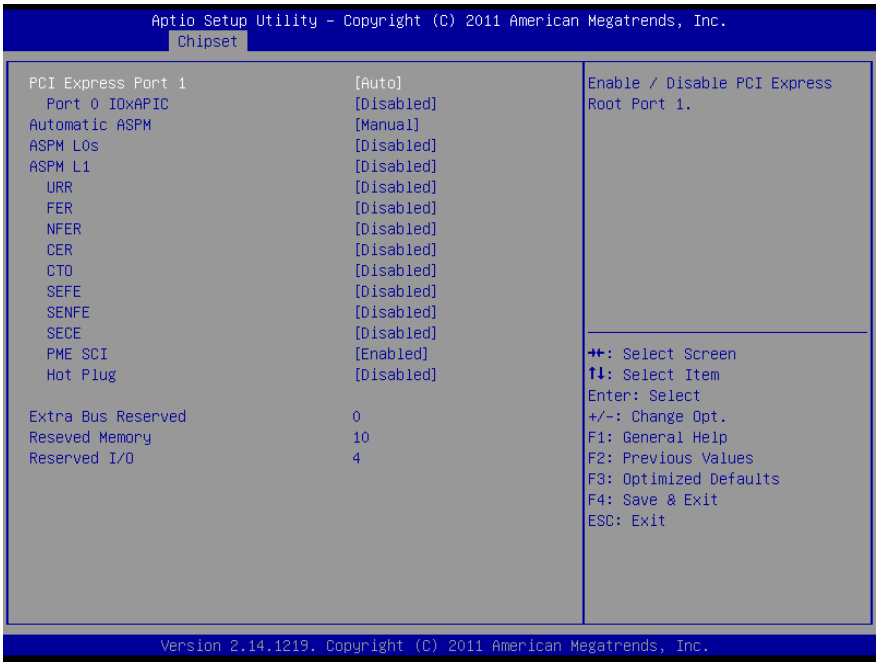
3.6.3.2.2 PCI Express Root Port 0

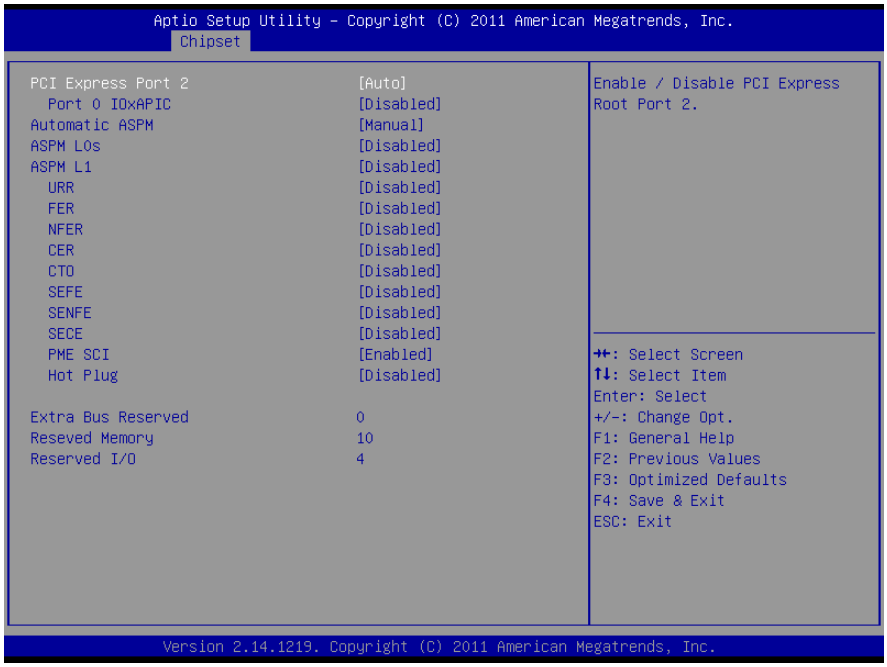


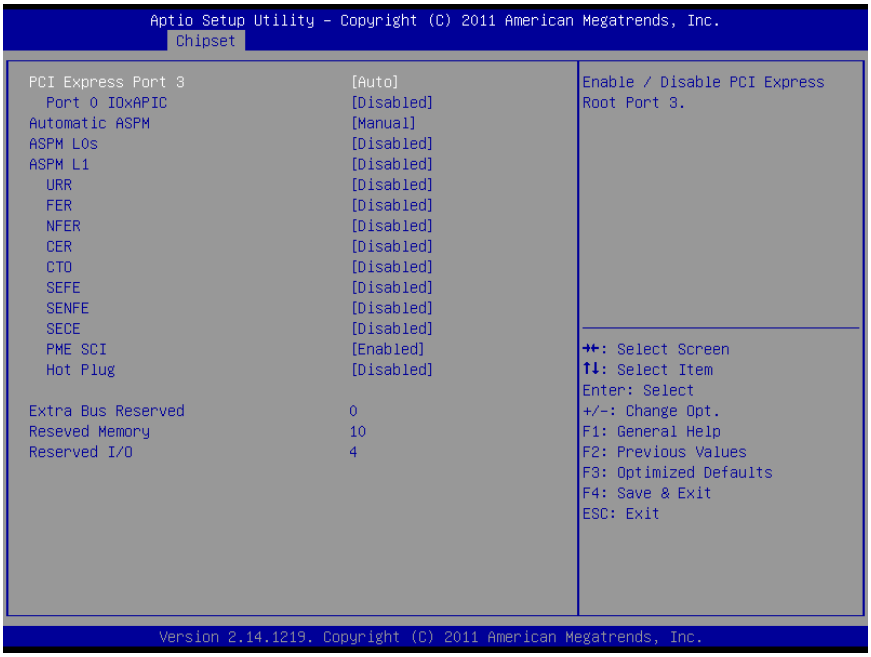
Item	Option	Description
PCI Express Port 0	Disabled Enabled**[Default]**	Enable / Disable PCI Express Root Port 0.
Port 0 IOxAPIC	Disabled**[Default]** Enabled	Enable / Disable PCI Express Root Port 0 I/O APIC.
Automatic ASPM	Manual**[Default]** Auto	Automatically enable ASPM based on reported capabilities and known issues.
ASPM L0s	Disabled**[Default]** Root Port Only Endpoint Port Only Both Root And Endpoint Ports	Enable PCIe ASPM L0s.
ASPM L1	Disabled**[Default]** Enabled	Enable PCIe ASPM L1.
URR	Disabled**[Default]** Enabled	PCI Express Unsupported Request Reporting Enable/Disable.
FER	Disabled**[Default]** Enabled	PCI Express Device Fatal Error Reporting Enable/Disable.
NFER	Disabled**[Default]** Enabled	PCI Express Device Non-Fatal Error Reporting Enable/Disable.
CER	Disabled**[Default]** Enabled	PCI Express Device Correctable Error Reporting Enable/Disable.
CTO	Disabled**[Default]** Enabled	PCI Express Completion Timer TO Enable/Disable.
SEFE	Disabled**[Default]** Enabled	Root PCI Express System Error on Fatal Error Enable/Disable
SENFE	Disabled**[Default]** Enabled	Root PCI Express System Error on Non-Fatal Error Enable/Disable
SECE	Disabled**[Default]**	Root PCI Express Error on

	Enabled	Correctable Error Enable/Disable
PME SCI	Disabled Enabled**[Default]**	PCI Express PME SCI Enable/Disable.
Hot Plug	Disabled**[Default]** Enabled	PCI Express Hot Plug Enable/Disable
Extra Bus Reserved	0 - 7	Extra Bus Reserved (0-7)for bridges behind this Root Bridge.
Reserved Memory	1 – 20MB	Reserved Memory and Prefetchable Memory (1-20MB) Range for this Root Bridge.
Reserved I/O	4K/8K/12K/16K/20K	Reserved I/O (4K/8K/12K/16K/20K) Range for this Root Bridge.

3.6.3.2.3 PCI Express Root Port 1/2/3



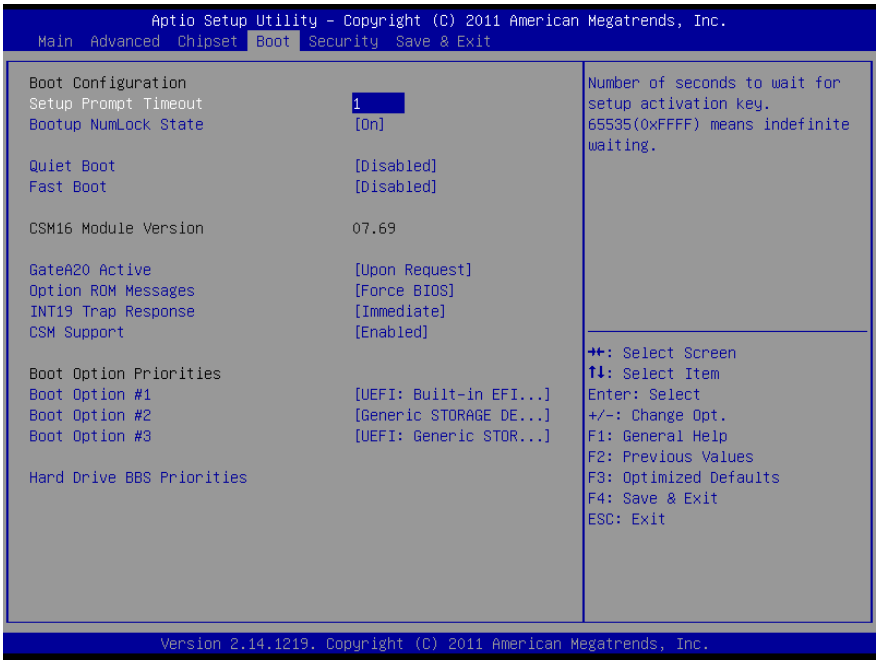




Item	Option	Description
PCI Express Port 1/2/3	Auto**[Default]** Enabled Disabled	Enable / Disable PCI Express Root Port 1/2/3.
Port 0 IOxAPIC	Disabled**[Default]** Enabled	Enable / Disable PCI Express Root Port 0 I/O APIC.
Automatic ASPM	Manual**[Default]** Auto	Automatically enable ASPM based on reported capabilities and known issues.
ASPM L0s	Disabled**[Default]** Root Port Only Endpoint Port Only Both Root And Endpoint Ports	Enable PCIe ASPM L0s.
ASPM L1	Disabled**[Default]** Enabled	Enable PCIe ASPM L1.
URR	Disabled**[Default]** Enabled	PCI Express Unsupported. Request Reporting Enable/Disable.
FER	Disabled**[Default]** Enabled	PCI Express Device Fatal Error Reporting Enable/Disable.
NFER	Disabled**[Default]** Enabled	PCI Express Device Non-Fatal Error Reporting Enable/Disable.
CER	Disabled**[Default]** Enabled	PCI Express Device Correctable Error Reporting Enable/Disable.
CTO	Disabled**[Default]** Enabled	PCI Express Completion Timer TO Enable/Disable.
SEFE	Disabled**[Default]** Enabled	Root PCI Express System Error on Fatal Error Enable/Disable.
SENFE	Disabled**[Default]** Enabled	Root PCI Express System Error on Non-Fatal Error Enable/Disable.
SECE	Disabled**[Default]** Enabled	Root PCI Express Error on Correctable Error Enable/Disable.
PME SCI	Disabled Enabled**[Default]**	PCI Express PME SCI Enable/Disable.
Hot Plug	Disabled**[Default]**	PCI Express Hot Plug

	Enabled	Enable/Disable.
Extra Bus Reserved	0 - 7	Extra Bus Reserved (0 -7)for bridges behind this Root Bridge.
Reserved Memory	1 – 20MB	Reserved Memory and Prefetchable Memory (1-20MB) Range for this Root Bridge.
Reserved I/O	4K/8K/12K/16K/20K	Reserved I/O (4K/8K/12K/16K/20K) Range for this Root Bridge.

3.6.4 Boot settings

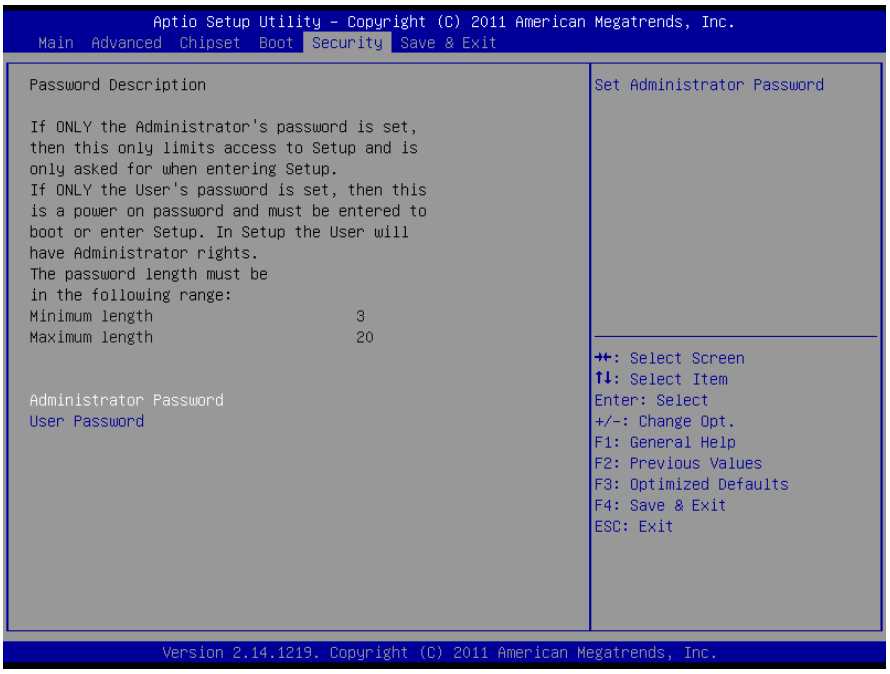


Item	Option	Description
Setup Prompt Timeout	1~65535	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	On**[Default]** Off	Select the keyboard NumLock state
Quiet Boot	Disabled**[Default]** Enabled	Enables or disables Quiet Boot option
Fast 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
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**[Default]** Keep Current	Set display mode for Option ROM

INT19 Trap Response	Immediate**[Default]** Postponed	BIOS reaction on INT19 ttapping by Option ROM: IMMEDIATE – execute the trap right away; POSTPONED – execute the trap during legacy boot.
CSM Support	Disabled Enabled**[Default]** Auto	Enable/Disable CSM Support. If Auto is selected, based on OS, CSM will be enabled/disabled automatically.
Boot Option #1/2/3	Sets the system boot order	

3.6.5 Security

Use the Security menu to set system and user password.



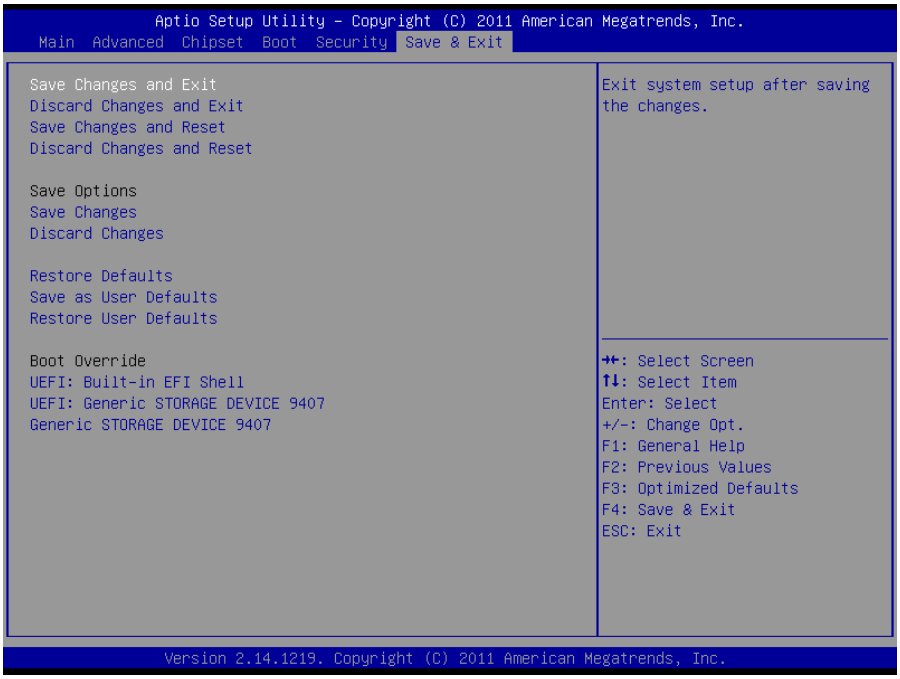
3.6.5.1 Administrator Password

This setting specifies a password that must be entered to access the BIOS Setup Utility. If only the Administrator's password is set, then this only limits access to the BIOS setup program and is only asked for when entering the BIOS setup program. By default, no password is specified.

3.6.5.2 User Password

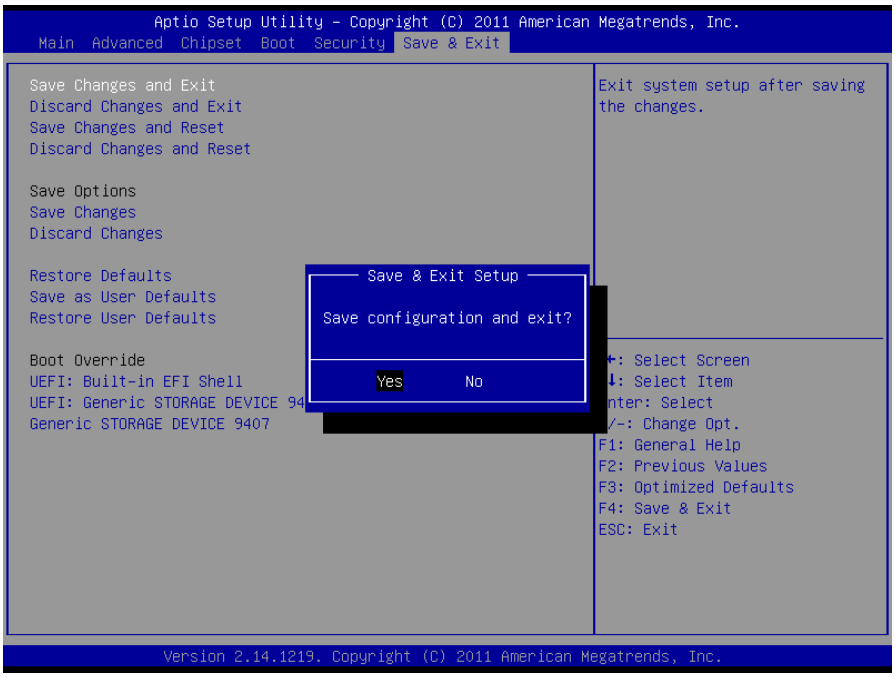
This setting specifies a password that must be entered to access the BIOS Setup Utility or to boot the system. If only the User's password is set, then this is a power on password and must be entered to boot or enter the BIOS setup program. In the BIOS setup program, the User will have Administrator rights. By default, no password is specified.

3.6.6 Save & Exit



3.6.6.1 Save Changes and Exit

Use the save changes and reset option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.



3.6.6.2 Discard Changes and Exit

Use the Discard changes and Exit option to exit the system without saving the changes made to the BIOS configuration setup program.

3.6.6.3 Save Changes and Reset

Any changes made to BIOS settings are stored in NVRAM. The setup program then exits and reboots the controller.

3.6.6.4 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.

3.6.6.5 Save Changes

Changes made to BIOS settings during this session are committed to NVRAM. The setup program remains active, allowing further changes.

3.6.6.6 Discard Changes

Any changes made to BIOS settings during this session of the BIOS setup program are discarded. The BIOS setup continues to be active.

3.6.6.7 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.

3.6.6.8 Save as User Defaults

This option saves a copy of the current BIOS settings as the User Defaults. This option is useful for preserving custom BIOS setup configurations.

3.6.6.9 Restore User Defaults

This option restores all BIOS settings to the user defaults. This option is useful for restoring previously preserved custom BIOS setup configurations.

3.6.6.10 Boot override

This option lists all possible bootable devices and allows the user to override the **Boot Option Priorities** list for the current boot. If no changes have been made to the BIOS setup options, the system will continue booting to the selected device without first rebooting. If BIOS setup options have been changed and saved, a reboot will be required and the boot override selection will not be valid.

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 VGA Driver

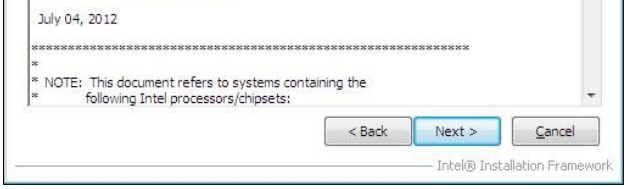
Insert the Supporting DVD-ROM to DVD-ROM drive, click on "start" icon and it should show the index page of Avalue's products automatically. If not, locate the folder HTML and choose the product from the targeted folder.

Note: The installation procedures and screen shots in this section are based on W7 operating system.

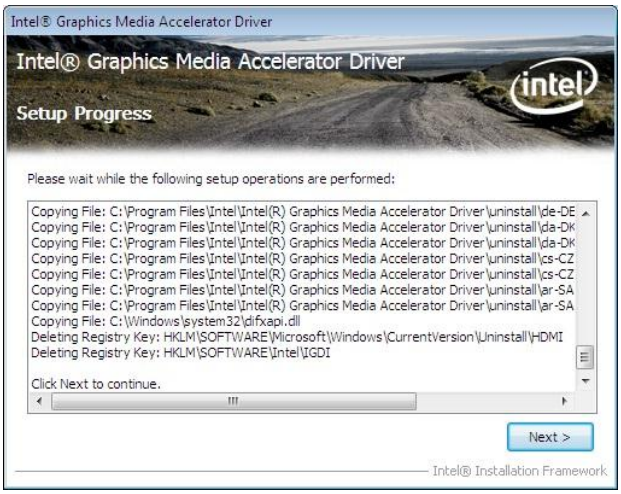
Step 1. Locate 「\VGA\ESM-CDV_VGA」.

Step 2. Select **Next** to start setup.

Step 3. Select **Yes** to the next step.



Step 4. Select **Next** to continue installation.



Step 5. Select **Next** to continue installation.

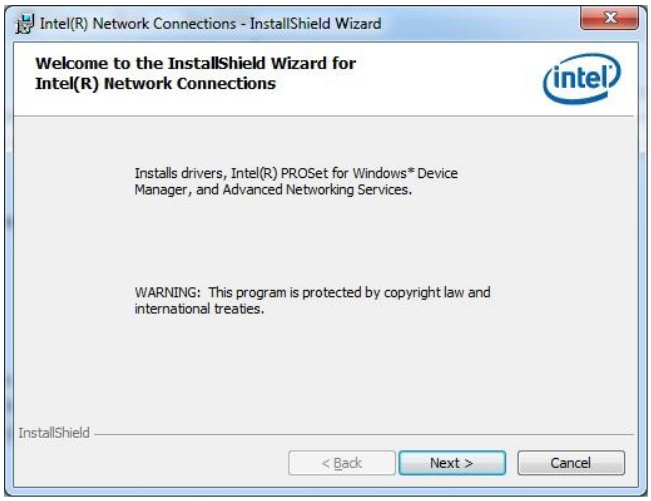
Step 6. Select **Finish** to complete installation

4.2 Install Ethernet Driver (For Intel 82574L)

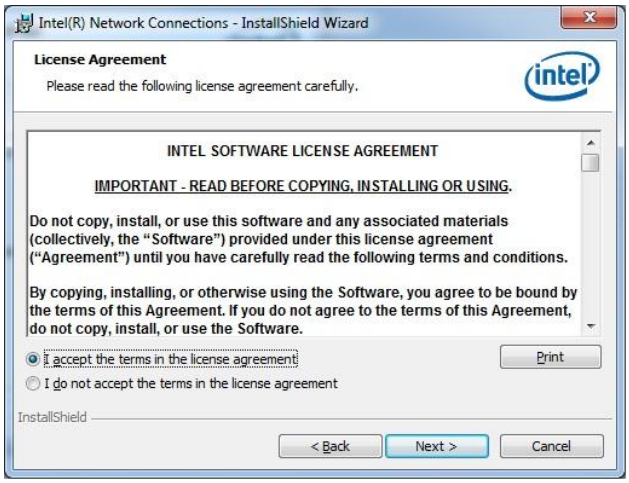
Insert the Supporting DVD-ROM to DVD-ROM drive, click on "start" icon and it should show the index page of Avalue's products automatically. If not, locate the folder HTML and choose the product from the targeted folder.

Note: The installation procedures and screen shots in this section are based on W7 operating system.

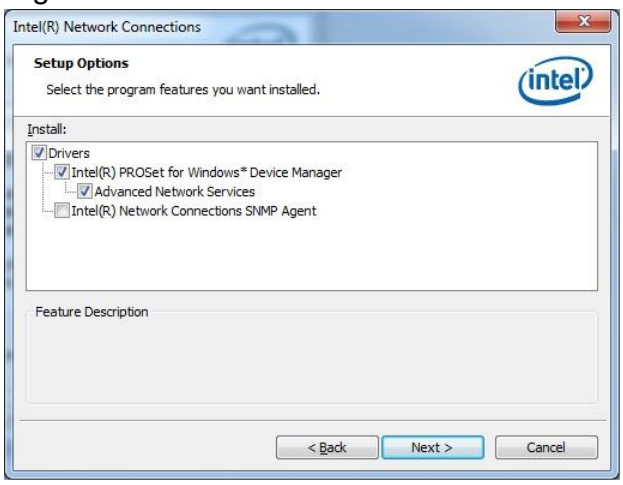
Step 1. Locate 「\Driver_Gigabit\Intel\82574L\ESM-CDV_LAN」



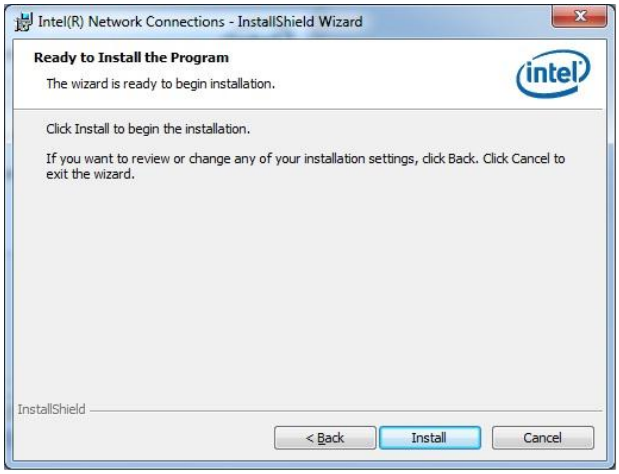
Step 2. Click **Next**.



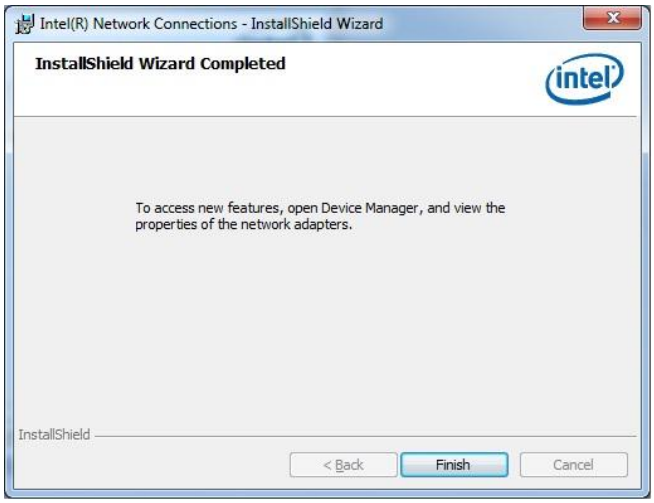
Step 3. Click **Next** to accept licence agreement.



Step 4. Click **Next** after selecting programs to install.



Step 5. Click **Install** to begin installation



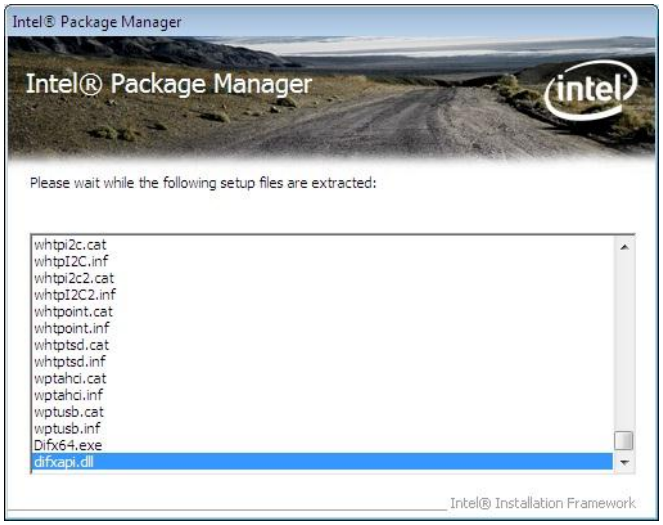
Step 6. Click **Finish** to complete installation.

4.3 Install Chipset Driver

Insert the Supporting DVD-ROM to DVD-ROM drive, click on "start" icon and it should show the index page of Avalue's products automatically. If not, locate the folder HTML and choose the product from the targeted folder.

Note: The installation procedures and screen shots in this section are based on W7 operating system.

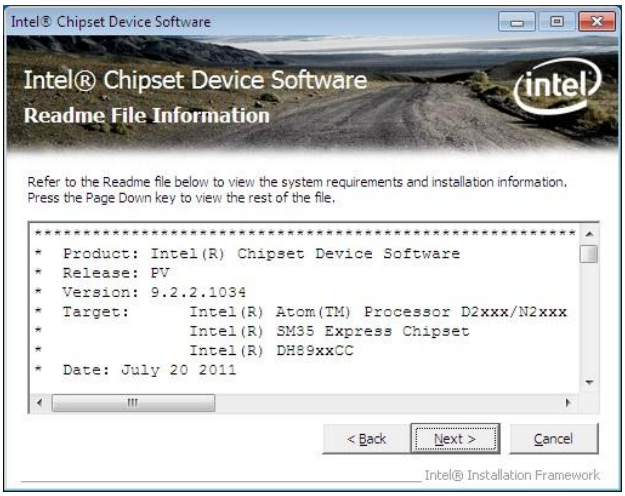
Step 1. Locate 「\Driver_Chipset\Intel\ESM-CDV_INF」



Step 2. Wait while the following setup files are extracted. .

Step 3. Click **Next**.

Step 4. Select **Yes** to the next step.

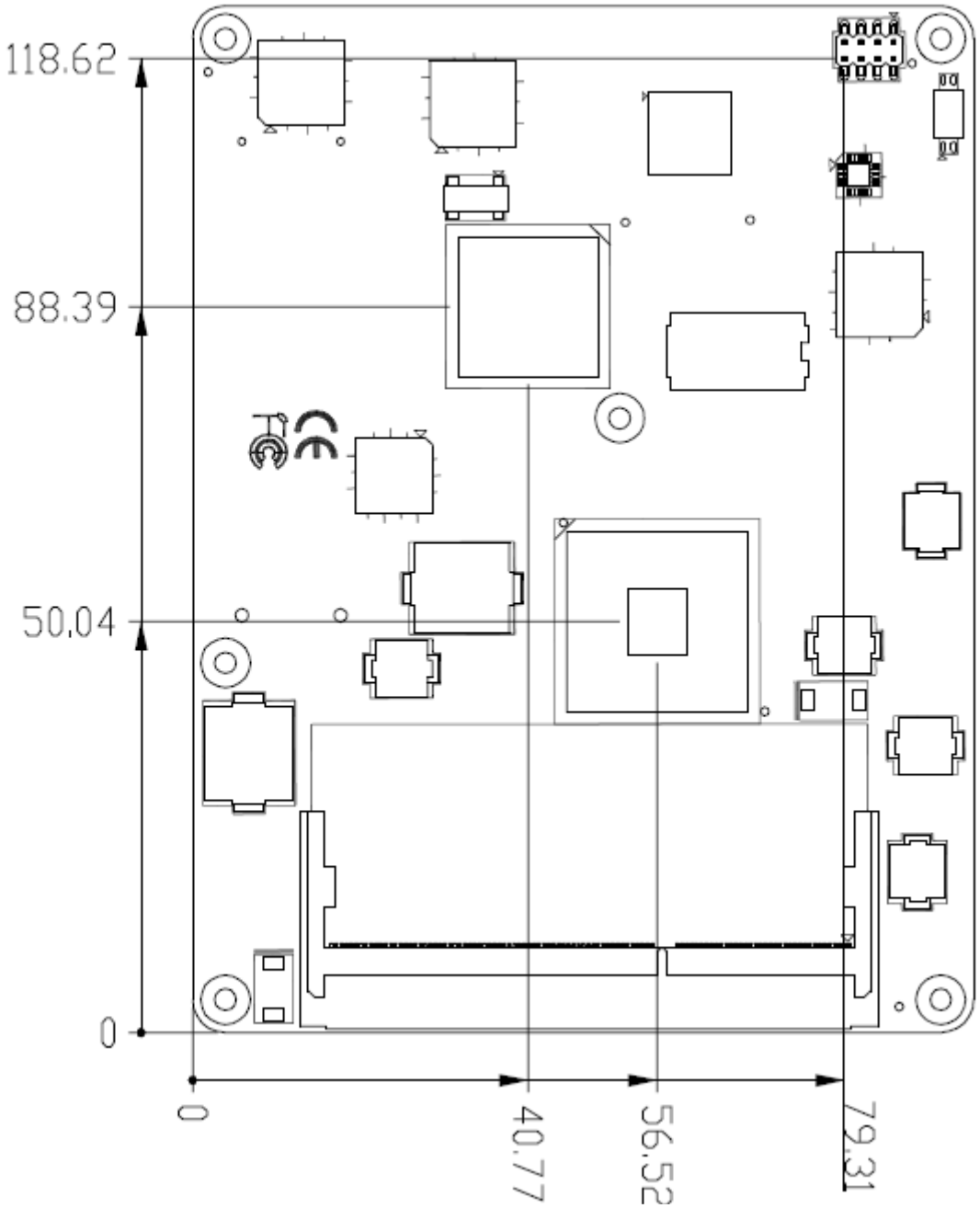


Step 5. Click **Next.**

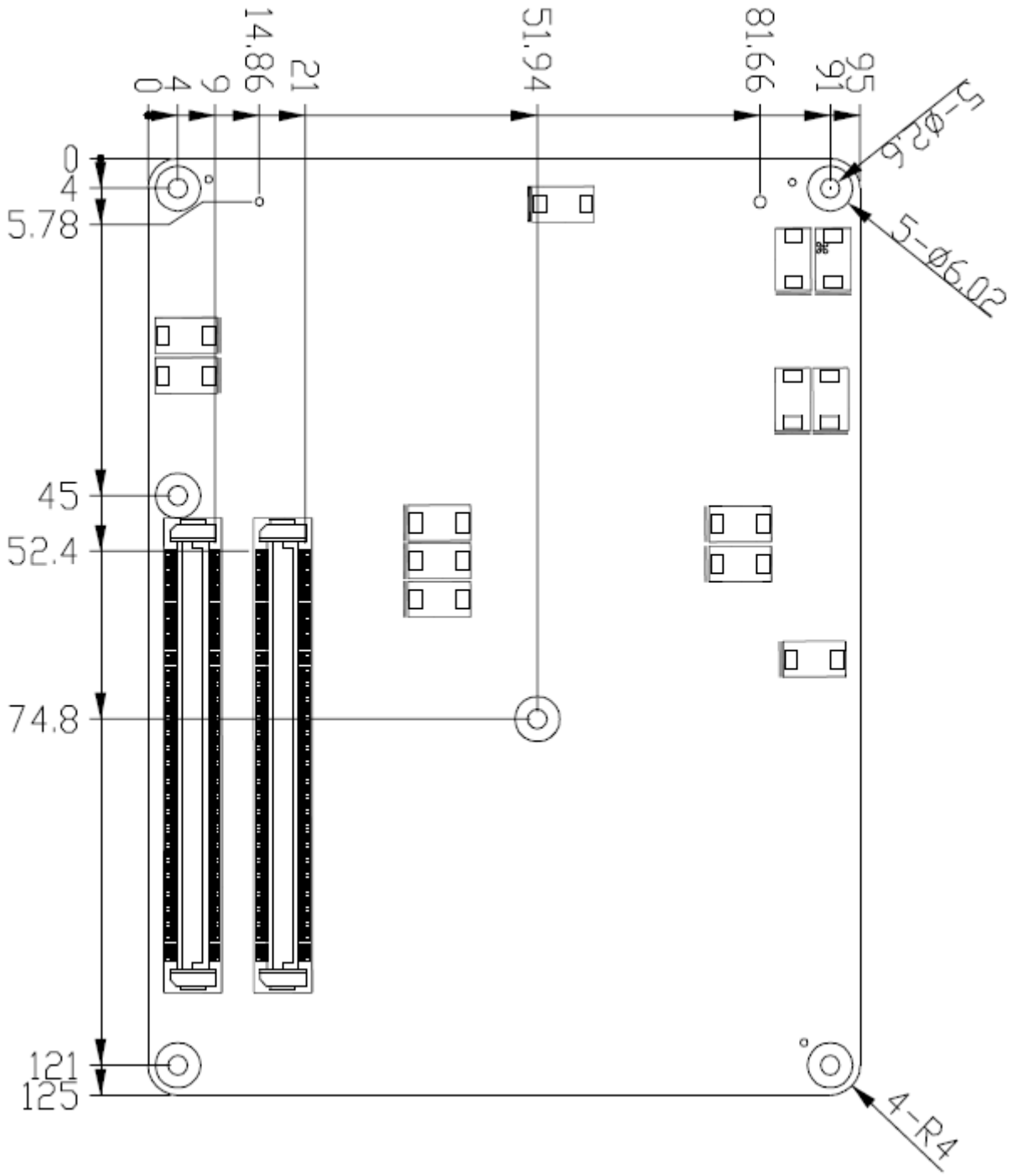
Step 6. Click **Next** to complete installation.

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

5. Mechanical Drawing



Unit: mm


95
91
81.66
51.94
21
14.86
9
4
0
5-Ø2.6
5-Ø6.02
0
4
5.78
45
52.4
74.8
121
125
4-R4

Unit: mm