IEI Integration Corp.

MODEL:

PCIE-Q670 Series

Full-Size PICMG 1.3 CPU Card Supports 32nm LGA1155 Intel® Core™ i7/i5/i3/Pentium®/Celeron® CPU, Intel® Q67 Chipset, DDR3, VGA, DVI-D, Dual Intel® PCIe GbE, Two SATA 6Gb/s Ports, PCIe Mini, HD Audio and RoHS

User Manual

Rev. 2.02 – November 16, 2015

RoHS Lead Free

Revision

Date	Version	Changes
November 16, 2015	2.02	Updated Section 1.7: Technical Specifications
September 12, 2014	2.01	Modified default value of the **SATA Mode** BIOS item to **IDE Mode** (on pages 74 and 75)
May 8, 2014	2.00	Modified for R20 version Modified LAN pinouts Updated Chapter 2: Packing List
July 9, 2013	1.03	Updated the optional LPT cable
October 16, 2012	1.02	Updated Section 1.7: Technical Specifications
February 3, 2012	1.01	Updated Section 1.6: Data Flow Updated Appendix B: One Key Recovery
November 15, 2011	1.00	Initial release

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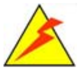

WARNING

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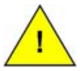
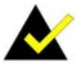


CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.



NOTE

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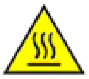

HOT SURFACE

This symbol indicates a hot surface that should not be touched without taking care.

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Chapter 1

Introduction

1.1 Introduction

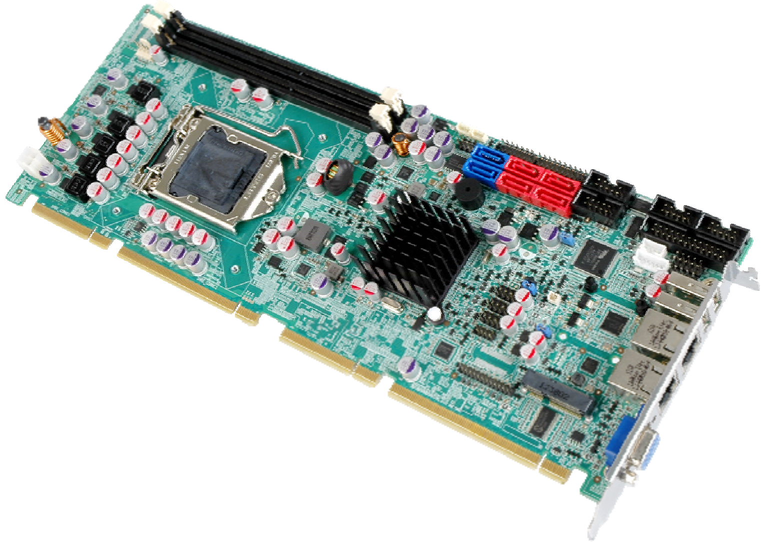


Figure 1-1: PCIE-Q670 Series

The PCIE-Q670 Series PICMG 1.3 CPU card is a Socket LGA1155 32nm Intel® Core™ i3/i5/i7/Pentium®/Celeron® processor platform that supports two 240-pin 1066/1333 MHz dual-channel DDR3 DIMM modules up to 16.0 GB.

The PCIE-Q670 Series supports two GbE interfaces through the Intel® 82579 Ethernet PHY (with Intel® AMT 7.0 support) and the Intel® 82583V Ethernet controller.

The integrated Intel® Q67 chipset supports two SATA 6Gb/s and four SATA 3Gb/s drives. Two USB 2.0 on the rear panel, six USB 2.0 by pin header and one PCIe Mini interface provide flexible expansion options. High Definition Audio (HDA) support ensures HDA devices can be easily implemented on the PCIE-Q670 Series.

1.2 Model Variations

The model variations of the PCIE-Q670 Series are listed below.

Model No.	CPU Supported	DVI-D by 26-pin header
PCIE-Q670-DVI-R10	LGA1155 Intel® Core™ i7/i5/i3/Pentium®/Celeron®	Yes
PCIE-Q670-R10	LGA1155 Intel® Core™ i7/i5/i3/Pentium®/Celeron®	No

Table 1-1: PCIE-Q670 Series Model Variations

1.3 Features

Some of the PCIE-Q670 Series motherboard features are listed below:

- PICMG 1.3 full-size graphics grade solution
- LGA1155 CPU socket
- Intel® Q67 chipset
- Dual-channel DDR3 DIMMs support up to 16.0 GB
- Dual independent display by VGA and DVI-D (DVI model only)
- One PCIe Mini expansion slot
- Two Intel® PCIe Gigabit Ethernet connectors (LAN2 with Intel® AMT 7.0 support)
- Two SATA 6Gb/s connectors with RAID function
- Four SATA 3Gb/s connectors with RAID function
- TPM V1.2 hardware security function supported by the TPM module
- High Definition Audio
- RoHS compliant

1.4 Connectors

The connectors on the PCIE-Q670 Series are shown in the figure below.

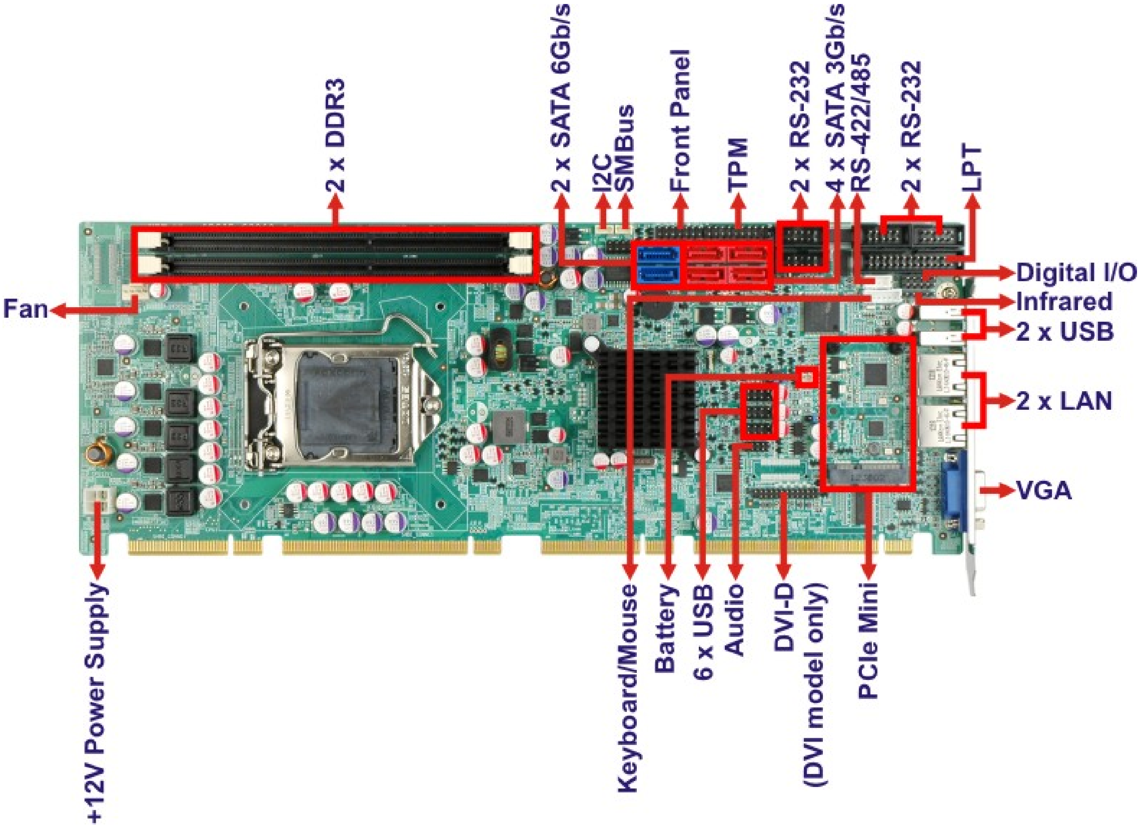

2 x DDR3
2 x SATA 6Gb/s
I2C
SMBus
Front Panel
TPM
2 x RS-232
4 x SATA 3Gb/s
RS-422/485
2 x RS-232
LPT
Fan
Digital I/O
Infrared
2 x USB
2 x LAN
VGA
+12V Power Supply
Keyboard/Mouse
Battery
6 x USB
Audio
DVI-D
(DVI model only)
PCIe Mini

Figure 1-2: Connectors

1.5 Dimensions

The main dimensions of the PCIE-Q670 Series are shown in the diagram below.

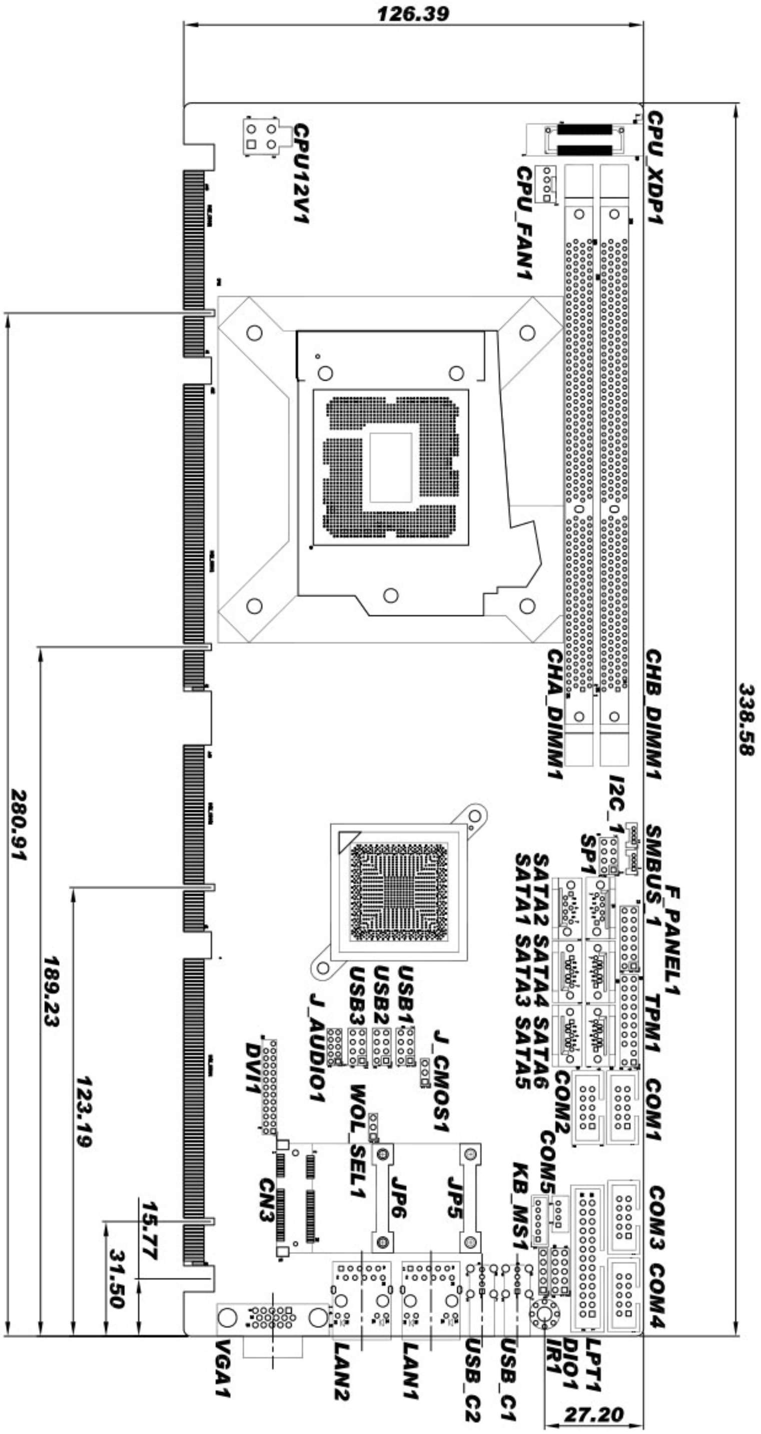

126.39
CPU12V1
CPU_XDP1
CPU_FAN1
CHA_DIMM1
CHB_DIMM1
338.58
280.91
189.23
123.19
15.77
31.50
I2C_1
SP1
SMBUS_1
F_PANEL1
SATA2
SATA1
SATA4
SATA3
SATA6
SATA5
TPM1
COM1
COM2
COM5
KB_MS1
COM3
COM4
USB1
USB2
USB3
J_CMOS1
J_AUDIO1
DVI1
WOL_SEL1
CN3
JP6
JP5
VGA1
LAN2
LAN1
USB_C2
USB_C1
LPT1
DIO1
IR1
27.20

Figure 1-3: PCIE-Q670 Series Dimensions (mm)

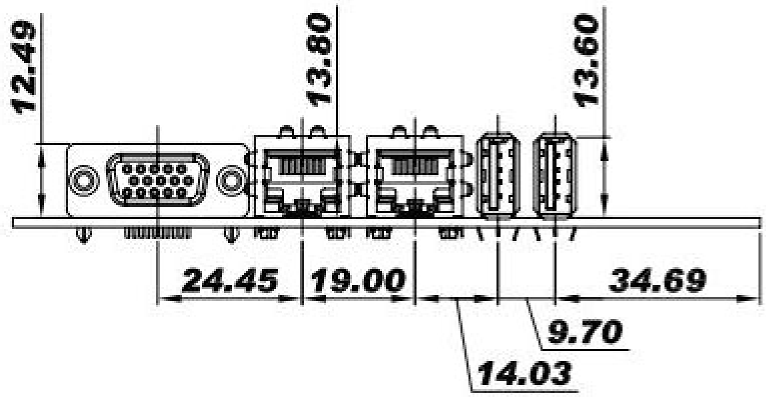

12.49
13.80
13.60
24.45
19.00
34.69
9.70
14.03

Figure 1-4: External Interface Panel Dimensions (mm)

1.6 Data Flow

Figure 1-5 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

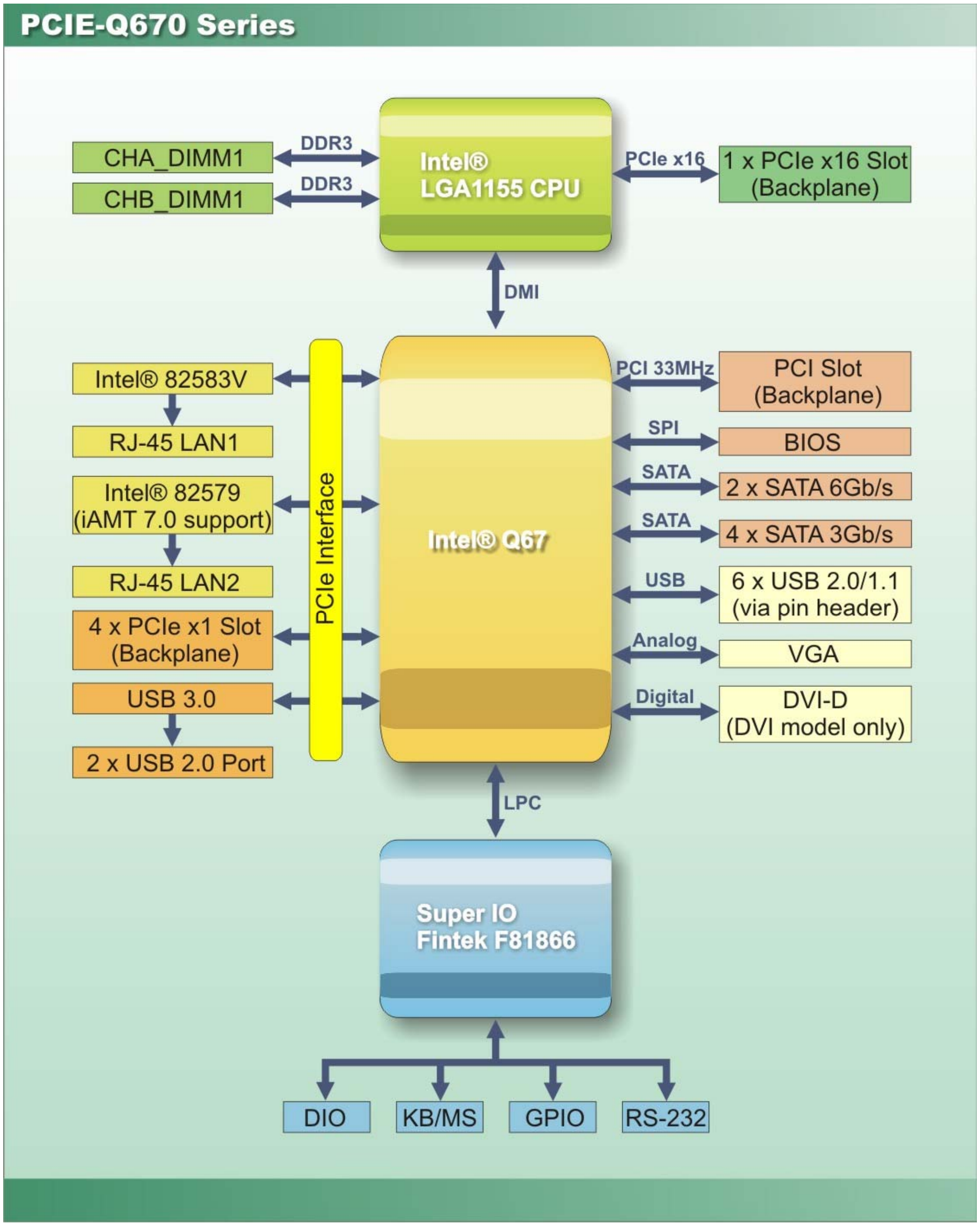

PCIE-Q670 Series
CHA_DIMM1
CHB_DIMM1
DDR3
DDR3
Intel® LGA1155 CPU
PCIe x16
1 x PCIe x16 Slot (Backplane)
DMI
Intel® 82583V
RJ-45 LAN1
Intel® 82579 (iAMT 7.0 support)
RJ-45 LAN2
4 x PCIe x1 Slot (Backplane)
USB 3.0
2 x USB 2.0 Port
PCIe Interface
Intel® Q67
PCI 33MHz
PCI Slot (Backplane)
SPI
BIOS
SATA
2 x SATA 6Gb/s
SATA
4 x SATA 3Gb/s
USB
6 x USB 2.0/1.1 (via pin header)
Analog
VGA
Digital
DVI-D (DVI model only)
LPC
Super IO Fintek F81866
DIO
KB/MS
GPIO
RS-232

Figure 1-5: Data Flow Diagram

1.7 Technical Specifications

The PCIE-Q670 Series technical specifications are listed below.

Specification/Model	**PCIE-Q670 Series**
Form Factor	PICMG 1.3
CPU Supported	LGA1155 Intel® Core™ i7/i5/i3/Pentium®/Celeron® CPU
PCH	Intel® Q67
Memory	Two 240-pin 1333/1066 MHz dual-channel unbuffered DDR3 SDRAM DIMMs support (system max. 16.0 GB)
Graphics Engine	Supports DirectX 10.1 and OpenGL3.0 Full MPEG2, VC1, AVC Decode
Audio	Supports IEI AC-KIT-888HD audio kit
BIOS	UEFI BIOS B202ARxx supports four PCIe x1 slots (default) V0V2ARxx supports one PCIe x4 slot
Ethernet Controllers	Intel® 82583V PCIe Ethernet controller Intel® 82579 PHY with Intel® AMT 7.0 support (LAN2)
Super I/O Controller	Fintek F81866
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Expansion	One PCIe Mini slot (with USB 2.0/1.1 signal) 4 x PCI link via golden finger **16-lane PCIe link from CPU via golden finger:** Support one PCIe x16 slot on the backplane **4-lane PCIe link from PCH via golden finger:** Support either one PCIe x4 slot or four PCIe x1 slots on the backplane For installing the PCIe x4 device on the backplane, the user must update BIOS to the version which supports one PCIe x4 slot

I/O Interface Connectors	
Audio Connector	One internal audio connector (10-pin header)
Digital I/O	8-bit digital I/O
Display Output	One VGA integrated in the Intel® Q67 (rear I/O) One DVI-D integrated in the Intel® Q67 (via 26-pin header to the DVI-D/USB kit; DVI model only)
Ethernet	Two RJ-45 GbE ports
Fan	One 4-pin wafer connector
Front Panel	One 14-pin header (power LED, HDD LED, speaker, power button, reset button)
I²C	One 4-pin wafer connector
Infrared	One via 5-pin header
Keyboard/Mouse	One 6-pin wafer connector
Parallel Port	One parallel port via internal 26-pin box header
Serial ATA	Four SATA 3Gb/s connectors (support RAID 0, 1, 5, 10) Two SATA 6Gb/s connectors (support RAID 0, 1, 5, 10)
Serial Ports	Four RS-232 via internal box headers One RS-422/485 via internal 4-pin wafer connector
SMBus	One 4-pin wafer connector
TPM	One via 20-pin header
USB Ports	Two external USB 2.0 ports on rear IO Six internal USB 2.0 ports by three pin headers
Environmental and Power Specifications	
Power Supply	5V/12V, AT/ATX power supported
Power Consumption	3.3V@1.69A, 5V@3.45A , 12V@0.32A, Vcore@5.24A, 5VSb@0.17 (3.40 GHz Intel® Core™ i7 2600 CPU with two 1333 MHz 2GB DDR3 memory)
Operating Temperature	-10ºC ~ 60ºC
Storage Temperature	-20ºC ~ 70ºC

Humidity	5% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	338 mm x 126 mm
Weight GW/NW	1200 g / 420 g

Table 1-2: PCIE-Q670 Series Specifications

Chapter

2

Packing List

2.1 Anti-static Precautions

WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband***: Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding***: Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad***: When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB***: Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the PCIE-Q670 Series is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the PCIE-Q670 Series was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The PCIE-Q670 Series is shipped with the following components:

Quantity	**Item and Part Number**	**Image**
1	PCIE-Q670 Series CPU card	
4	SATA cable (**P/N**: 32000-062800-RS)	
1	Dual RS-232 cable (**P/N**: 19800-000051-RS)	
1	Dual USB cable with bracket (**P/N**: 19800-003100-300-RS)	
1	Mini jumper pack	
1	DVI-D/USB kit (DVI model only) (**P/N**: IO-KIT-001-R20)	

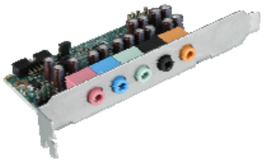
Quantity	Item and Part Number	Image
1	One Key Recovery CD (**P/N**: IEI-7B000-000478-RS)	
1	Utility CD	
1	Quick Installation Guide	QIG

Table 2-1: Packing List

2.4 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	Image
RS-422/485 cable, 200 mm (**P/N**: 32205-003800-300-RS)	
KB/MS cable with bracket (**P/N**: 19800-000075-RS)	
SATA to IDE/CF converter board (**P/N**: SAIDE-KIT01-R10)	
SATA power cable (**P/N**: 32102-000100-200-RS)	
LPT cable (**P/N**: 19800-000049-RS)	

Item and Part Number	Image
7.1-channel HD audio kit with Realtek ALC892 audio codec supporting dual audio stream (**P/N**: AC-KIT-892HD-R10)	
LGA1155/LGA1156 cooler kit (1U chassis compatible, 73W) (**P/N**: CF-1156A-RS-R11)	
LGA1155/LGA1156 cooler kit (1U chassis compatible, 45W) (**P/N**: CF-1156C-RS)	
LGA1155/LGA1156 cooler kit (1U chassis compatible, 65W) (**P/N**: CF-1156D-RS)	
High-performance LGA1155/LGA1156 cooler kit (95W) (**P/N**: CF-1156E-R11)	
Intel® Core™ i5-2500T processor (LGA1155, quad core 2.3 GHz, 6M cache, 45W, compatible with CF-1156C-RS CPU cooler kit) (**P/N**: CPU-DT-i5-2500T)	
Intel® Core™ i5-2390T processor (LGA1155, dual core 2.7 GHz, 3M cache, 35W, compatible with CF-1156C-RS CPU cooler kit) (**P/N**: CPU-DT-i5-2390T)	
Intel® Core™ i3-2120T processor (LGA1155, dual core 2.6 GHz, 3M cache, 35W, compatible with CF-1156C-RS CPU cooler kit) (**P/N**: CPU-DT-i3-2120T)	

Item and Part Number	Image
Intel® Pentium® G630T processor (LGA1155, dual core 2.3 GHz, 3M cache, 35W, compatible with CF-1156C-RS CPU cooler kit) (**P/N**: CPU-DT-P-G630T)	
Intel® Celeron® G440 processor (LGA1155, single core 1.6 GHz, 1M cache, 35W, compatible with CF-1156C-RS CPU cooler kit) (**P/N**: CPU-DT-C-G440)	

Table 2-2: Optional Items

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

3.1.1 PCIE-Q670 Series Layout

The figures below show all the connectors and jumpers.

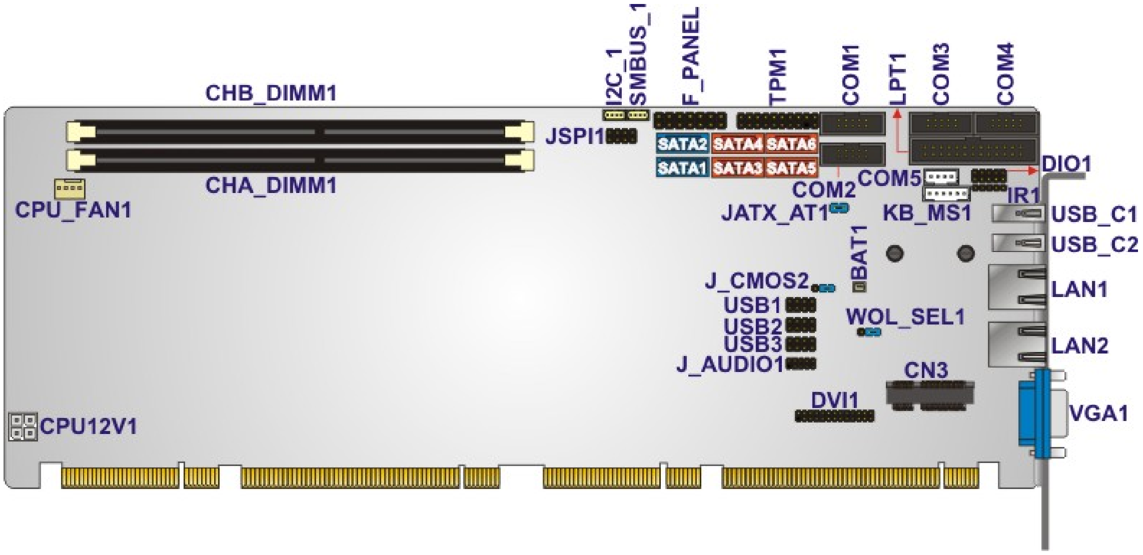

I2C_1
SMBUS_1
F_PANEL
TPM1
COM1
LPT1
COM3
COM4
CHB_DIMM1
JSPI1
SATA2
SATA4
SATA6
SATA1
SATA3
SATA5
DIO1
CHA_DIMM1
COM2
COM5
IR1
CPU_FAN1
JATX_AT1
KB_MS1
USB_C1
USB_C2
BAT1
J_CMOS2
LAN1
USB1
USB2
USB3
WOL_SEL1
J_AUDIO1
LAN2
CN3
DVI1
VGA1
CPU12V1

Figure 3-1: Connectors and Jumpers

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
+12V ATX power supply connector	4-pin Molex power connector	CPU12V1
Audio kit connector	10-pin header	J_AUDIO1
Battery connector	2-pin wafer	BT2
DDR3 DIMM sockets	240-pin socket	CHA_DIMM1 CHB_DIMM1
Digital I/O connector	10-pin header	DIO1
DVI-D connector (DVI model only)	26-pin header	DVI1

Connector	**Type**	**Label**
Fan connector (CPU)	4-pin wafer	CPU_FAN1
Front panel connector	14-pin header	F_PANEL1
I^2C connector	4-pin wafer	I2C_1
Infrared connector	5-pin header	IR1
Keyboard and mouse connector	6-pin wafer	KB_MS1
Parallel port connector	26-pin box header	LPT1
PCIe Mini slot	PCIe Mini	CN3
SATA 3Gb/s drive connector	7-pin SATA connector	SATA3, SATA4, SATA5, SATA6
SATA 6Gb/s drive connector	7-pin SATA connector	SATA1, SATA2
Serial port, RS-422/485	4-pin wafer	COM5
Serial port, RS-232	10-pin box header	COM1, COM2, COM3, COM4
SMBus connector	4-pin wafer	SMBUS_1
SPI ROM connector	8-pin header	JSPI1
TPM connector	20-pin header	TPM1
USB connectors	8-pin header	USB1, USB2, USB3

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

The table below lists the connectors on the external I/O panel.

Connector	**Type**	**Label**
Ethernet connector	RJ-45	LAN1
Ethernet connector	RJ-45	LAN2
USB port	USB	USB_C1
USB port	USB	USB_C2

Connector	Type	Label
VGA connector	15-pin female	VGA1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the PCIE-Q670 Series.

3.2.1 12V Power Connector

CN Label: **CPU12V1**

CN Type: 4-pin Molex power connector

CN Location: See **Figure 3-2**

CN Pinouts: See **Table 3-3**

The connector supports the 12V power supply.

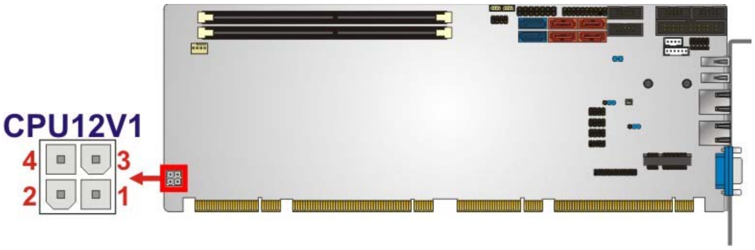


Figure 3-2: ATX Power Connector Pinout Location

Pin	Description	Pin	Description
1	GND	2	GND
3	+12V	4	+12V

Table 3-3: ATX Power Connector Pinouts

3.2.2 Audio Kit Connector

CN Label: **J_AUDIO1**

CN Type: 10-pin header

CN Location: See **Figure 3-3**

CN Pinouts: See **Table 3-4**

This connector connects to an external audio kit.

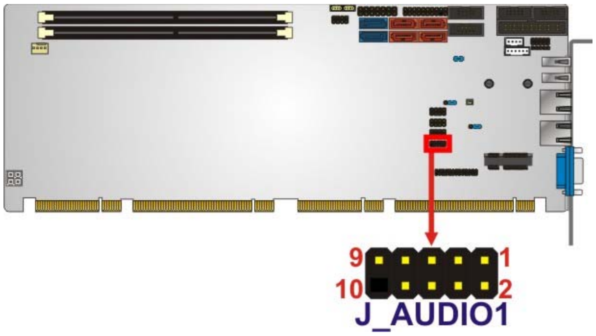


Figure 3-3: Audio Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	ACZ_SYNC	2	ACZ_BITCLK
3	ACZ_SDOUT	4	ACZ_PCBEEP
5	ACZ_SDIN	6	ACZ_RST#
7	ACZ_VCC	8	ACZ_GND
9	ACZ_12V	10	ACZ_GND

Table 3-4: Audio Connector Pinouts

3.2.3 Battery Connector

CAUTION:

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

CN Label: **BAT1**

CN Type: 2-pin wafer

CN Location: See **Figure 3-4**

CN Pinouts: See **Table 3-5**

This is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off.

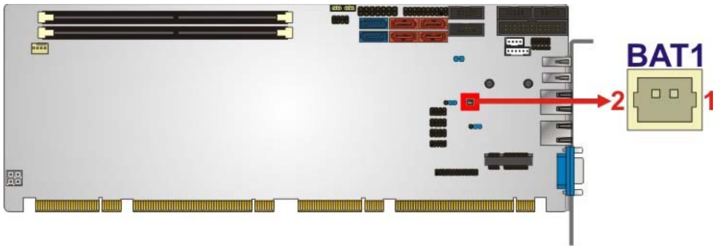


Figure 3-4: Battery Connector Location

Pin	Description
1	GND
2	Battery+

Table 3-5: Battery Connector Pinouts

3.2.4 DDR3 DIMM Slots

CN Label: **CHA_DIMM1, CHB_DIMM1**

CN Type: DDR3 DIMM slot

CN Location: See **Figure 3-5**

The DIMM slots are for DDR3 DIMM memory modules.

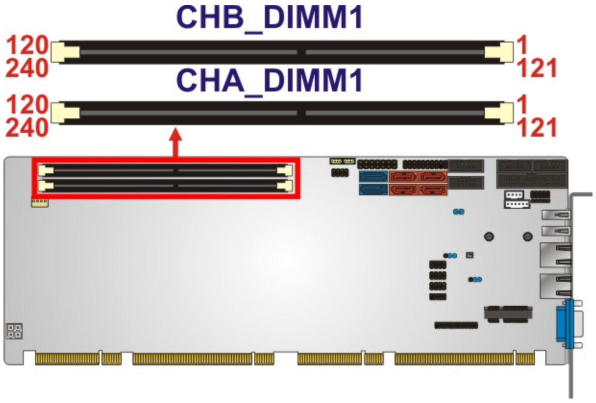

CHB_DIMM1
120
240
1
121
CHA_DIMM1
120
240
1
121

Figure 3-5: DDR3 DIMM Slot Locations

3.2.5 Digital I/O Connector

CN Label:	**DIO1**
CN Type:	10-pin header
CN Location:	See **Figure 3-6**
CN Pinouts:	See **Table 3-6**

The digital I/O connector provides programmable input and output for external devices.

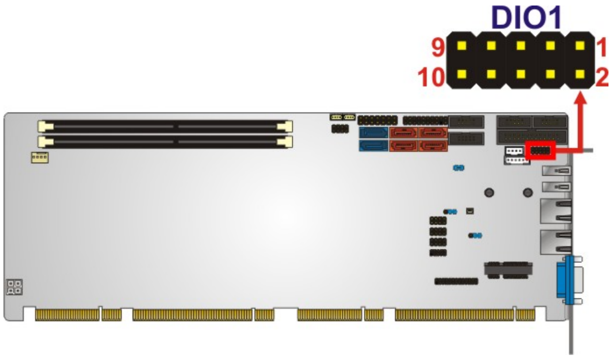


Figure 3-6: Digital I/O Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
9	Input 1	10	Input 0

Table 3-6: Digital I/O Connector Pinouts

3.2.6 DVI-D Connector (DVI Model Only)

CN Label:	**DVI1**
CN Type:	26-pin header
CN Location:	See **Figure 3-7**
CN Pinouts:	See **Table 3-7**

The DVI-D connector connects to a monitor that supports DVI video input via the DVI-D/USB kit.

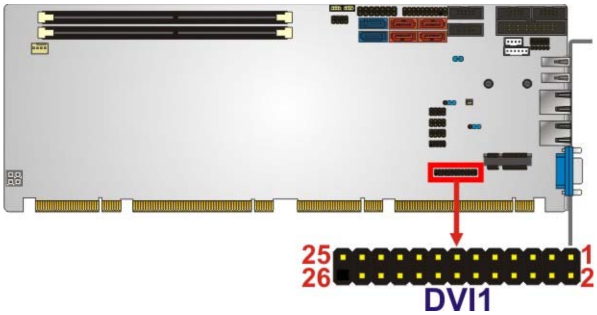


Figure 3-7: DVI-D Connector Location

Pin	Description	Pin	Description
1	Data 2-	2	Data 2+
3	GND	4	NC
5	NC	6	DDC Clock
7	DDC Data	8	NC
9	Data 1-	10	Data 1+
11	GND	12	NC
13	NC	14	VCC
15	GND	16	Hot Plug Detect
17	Data 0-	18	Data 0+
19	GND	20	NC

Pin	Description	Pin	Description
21	NC	22	GND
23	Clock +	24	Clock -
25	GND	26	NC

Table 3-7: DVI-D Connector Pinouts

3.2.7 Fan Connector (CPU)

CN Label:	**CPU_FAN1**
CN Type:	4-pin wafer
CN Location:	See **Figure 3-8**
CN Pinouts:	See **Table 3-8**

The fan connector attaches to a CPU cooling fan.

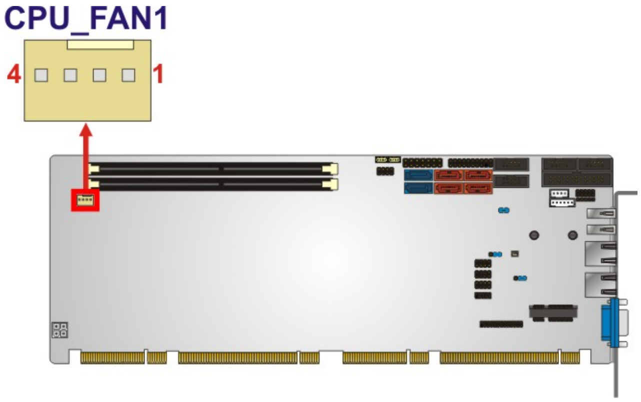


Figure 3-8: CPU Fan Connector Location

PIN NO.	DESCRIPTION
1	GND
2	+12 V
3	Rotation Signal
4	PWM Control Signal

Table 3-8: CPU Fan Connector Pinouts

3.2.8 Front Panel Connector

CN Label: **F_PANEL1**

CN Type: 14-pin header

CN Location: See **Figure 3-9**

CN Pinouts: See **Table 3-9**

The front panel connector connects to the indicator LEDs and buttons on the computer's front panel.

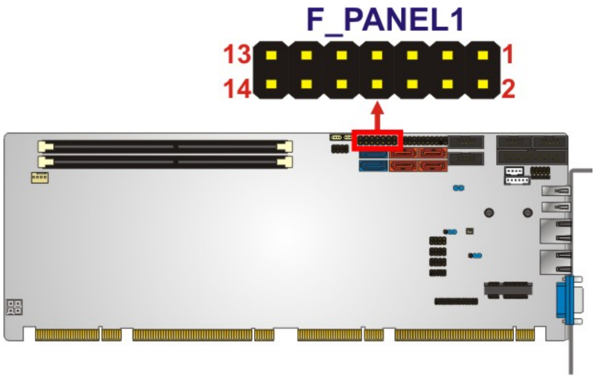


Figure 3-9: Front Panel Connector Location

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	+5V	Speaker	2	+5V
	3	N/C		4	N/C
	5	GROUND		6	N/C
Power Button	7	PWR_BTN+		8	Speaker
	9	PWR_BTN-	Reset	10	N/C
HDD LED	11	+5V		12	RESET-
	13	HDD_LED-		14	GROUND

Table 3-9: Front Panel Connector Pinouts

3.2.9 I^{2}C Connector

CN Label:	**I2C_1**
CN Type:	4-pin wafer
CN Location:	See **Figure 3-10**
CN Pinouts:	See **Table 3-10**

The I^{2}C connector is for system debug.

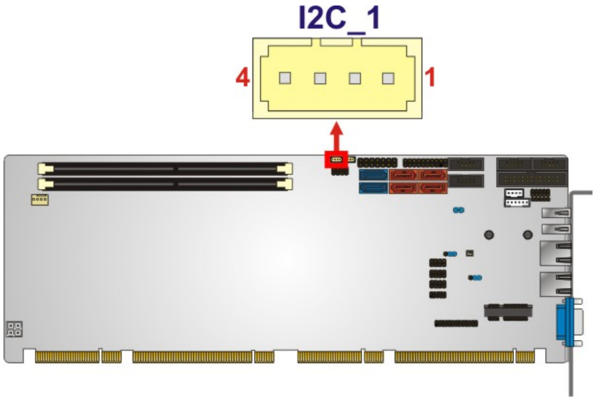


Figure 3-10: I^{2}C Connector Location

Pin	Description
1	GND
2	PCH_GP38_PU
3	PCH_GP39_PU
4	+5VS

Table 3-10: I^{2}C Connector Pinouts

3.2.10 Infrared Interface Connector

CN Label:	**IR1**
CN Type:	5-pin header
CN Location:	See **Figure 3-11**
CN Pinouts:	See **Table 3-11**

The infrared connector attaches to an infrared receiver for use with remote controls.

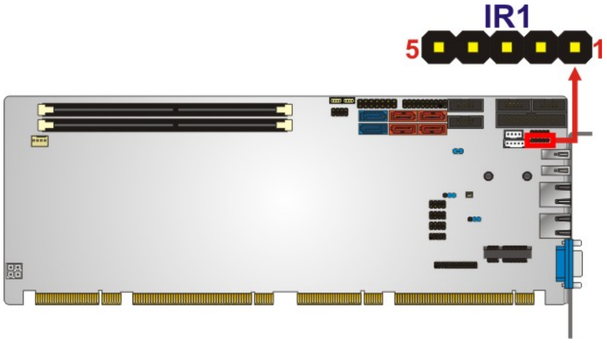


Figure 3-11: Infrared Connector Location

Pin	Description
1	VCC
2	NC
3	IR-RX
4	GND
5	IR-TX

Table 3-11: Infrared Connector Pinouts

3.2.11 Keyboard/Mouse Connector

CN Label: **KB_MS1**

CN Type: 6-pin wafer

CN Location: See **Figure 3-12**

CN Pinouts: See **Table 3-12**

The keyboard/mouse connector connects to a PS/2 Y-cable that can be connected to a PS/2 keyboard and mouse.

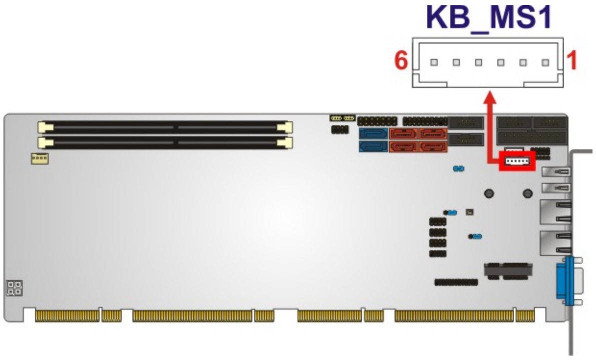


Figure 3-12: Keyboard/Mouse Connector Location

Pin	Description
1	+5 VCC
2	Mouse Data
3	Mouse Clock
4	Keyboard Data
5	Keyboard Clock
6	GROUND

Table 3-12: Keyboard/Mouse Connector Pinouts

3.2.12 Parallel Port Connector

CN Label:	**LPT1**
CN Type:	26-pin box header
CN Location:	See **Figure 3-13**
CN Pinouts:	See **Table 3-13**

The parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.

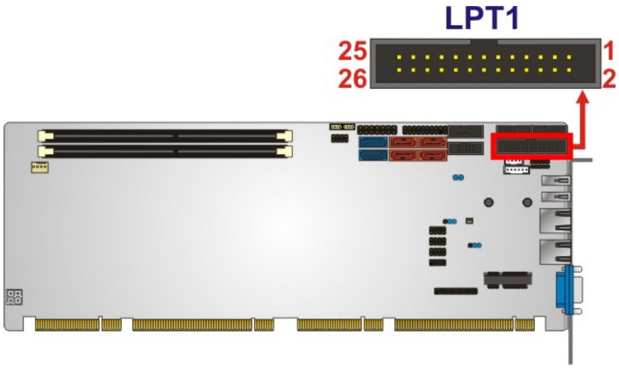


Figure 3-13: Parallel Port Connector Location

Pin	Description	Pin	Description
1	STROBE#	2	DATA0
3	DATA1	4	DATA2
5	DATA3	6	DATA4
7	DATA5	8	DATA6
9	DATA7	10	ACKNOWLEDGE#
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE#
17	PRINTER SELECT LN#	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND		

Table 3-13: Parallel Port Connector Pinouts

3.2.13 PCIe Mini Card Slot

CN Label: **CN3**

CN Type: PCIe Mini card slot

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-14**

The PCIe Mini card slot is for installing a PCIe Mini expansion card.

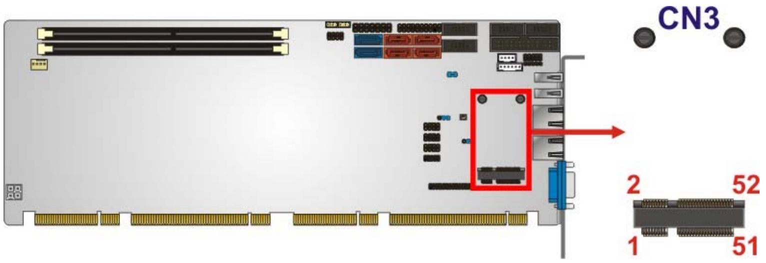


Figure 3-14: PCIe Mini Card Slot Location

Pin	Description	Pin	Description
1	PCIE_WAKE#	2	VCC3
3	NC	4	GND
5	NC	6	1.5V
7	CLKREQ#	8	LFRAME#
9	GND	10	LAD3
11	CLK-	12	LAD2
13	CLK+	14	LAD1
15	GND	16	LAD0
17	PCIRST#	18	GND
19	LPC	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USBD-
37	NC	38	USBD+
39	NC	40	GND
41	NC	42	NC
43	NC	44	RF_LINK#
45	NC	46	BLUELED#

Pin	Description	Pin	Description
47	NC	48	1.5V
49	NC	50	GND
51	NC	52	VCC3

Table 3-14: PCIe Mini Card Slot Pinouts

3.2.14 SATA 3Gb/s Drive Connector

CN Label:	**SATA3, SATA4, SATA5, SATA6**
CN Type:	7-pin SATA drive connector
CN Location:	See **Figure 3-15**
CN Pinouts:	See **Table 3-15**

The SATA drive connectors can be connected to SATA drives and support up to 3Gb/s data transfer rate.

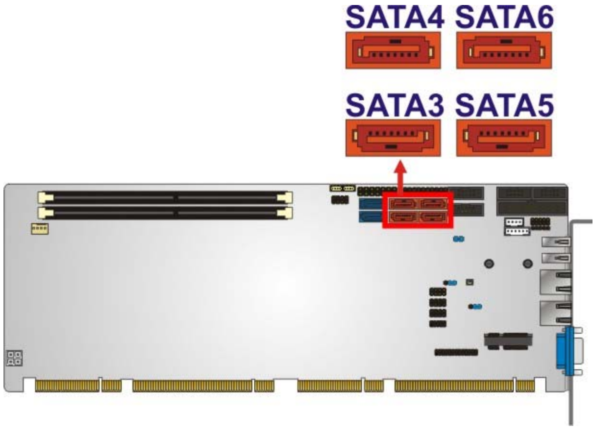


Figure 3-15: SATA 3Gb/s Drive Connector Location

Pin	Description	Pin	Description
1	GND	2	TX+
3	TX-	4	GND
5	RX-	6	RX+
7	GND		

Table 3-15: SATA 3Gb/s Drive Connector Pinouts

3.2.15 SATA 6Gb/s Drive Connector

CN Label: **SATA1, SATA2**

CN Type: 7-pin SATA drive connector

CN Location: See **Figure 3-16**

CN Pinouts: See **Table 3-16**

The SATA drive connectors can be connected to SATA drives and support up to 6Gb/s data transfer rate.

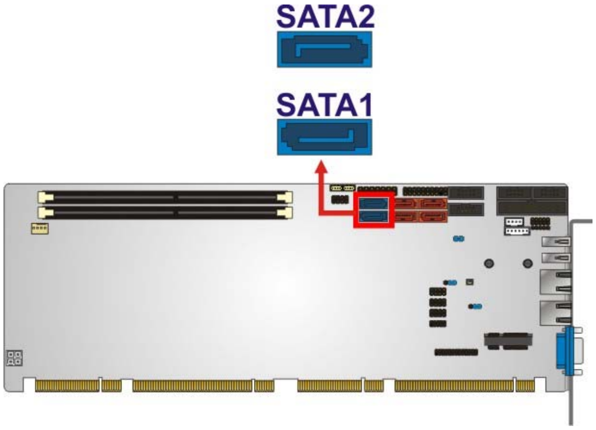


Figure 3-16: SATA 6Gb/s Drive Connector Location

Pin	Description	Pin	Description
1	GND	2	TX+
3	TX-	4	GND
5	RX-	6	RX+
7	GND		

Table 3-16: SATA 6Gb/s Drive Connector Pinouts

3.2.16 Serial Port Connectors, RS-232

CN Label: **COM1, COM2, COM3, COM4**

CN Type: 10-pin box header

CN Location: See **Figure 3-17**

CN Pinouts: See **Table 3-17**

Each of these connectors provides RS-232 connections.

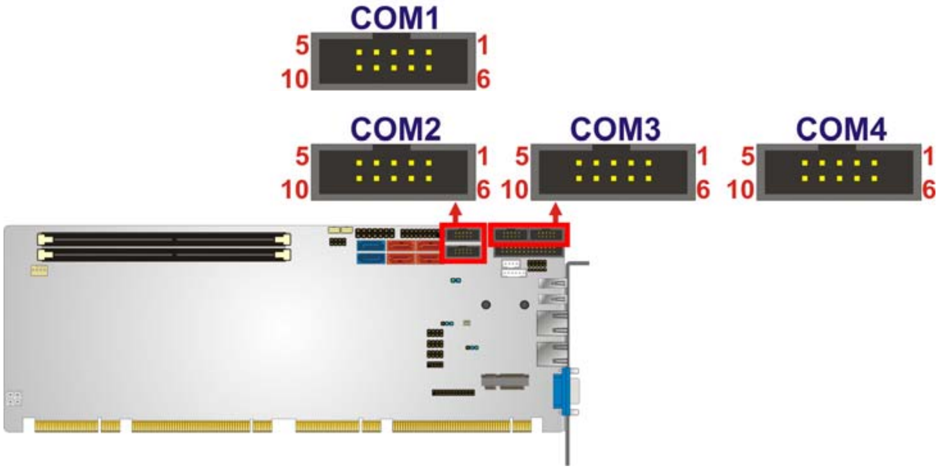


Figure 3-17: Serial Port Connector Location

Pin	Description	Pin	Description
1	Data Carrier Direct (DCD)	2	Receive Data (RXD)
3	Transmit Data (TXD)	4	Data Terminal Ready (DTR)
5	Ground (GND)	6	Data Set Ready (DSR)
7	Request To Send (RTS)	8	Clear To Send (CTS)
9	Ring Indicator (RI)	10	N/C

Table 3-17: Serial Port Connector Pinouts

3.2.17 Serial Port Connector, RS-422/485

CN Label: **COM5**

CN Type: 4-pin wafer

CN Location: See **Figure 3-18**

CN Pinouts: See **Table 3-18**

This connector provides RS-422 or RS-485 communications.

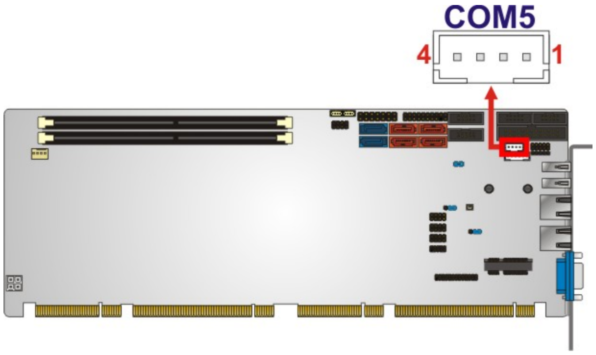


Figure 3-18: RS-422/485 Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RXD422-	3	TXD422+/TXD485+
2	RXD422+	4	TXD422-/TXD485-

Table 3-18: RS-422/485Connector Pinouts

Use the optional RS-422/485 cable to connect to a serial device. The pinouts of the DB-9 connector are listed below.

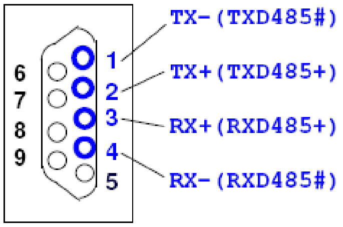
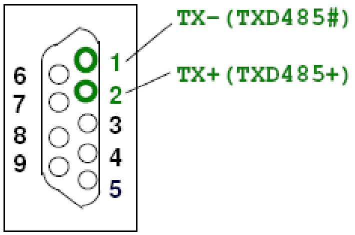
RS-422 Pinouts	RS-485 Pinouts
 TX-(TXD485#) TX+(TXD485+) RX+(RXD485+) RX-(RXD485#) 1 2 3 4 5 6 7 8 9	 TX-(TXD485#) TX+(TXD485+) 1 2 3 4 5 6 7 8 9

Table 3-19: DB-9 RS-422/485 Pinouts

3.2.18 SMBus Connector

CN Label:	**SMBUS_1**
CN Type:	4-pin wafer
CN Location:	See **Figure 3-19**
CN Pinouts:	See **Table 3-20**

The SMBus (System Management Bus) connector provides low-speed system management communications.

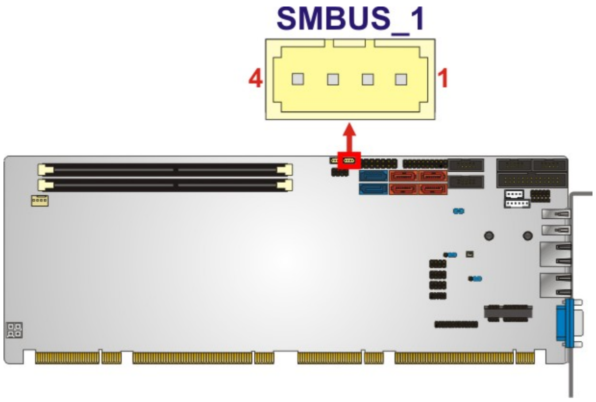


Figure 3-19: SMBus Connector Location

Pin	Description
1	GND
2	SMB_DATA
3	SMB_CLK
4	+V5S

Table 3-20: SMBus Connector Pinouts

3.2.19 SPI ROM Connector

CN Label:	**JSPI1**
CN Type:	8-pin header
CN Location:	See **Figure 3-20**
CN Pinouts:	See **Table 3-21**

The SPI connector is used to flash the BIOS.

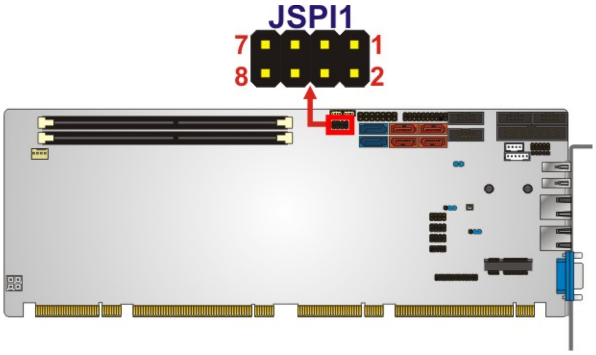


Figure 3-20: SPI Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	GND
3	SPI_CS0	4	SPI_CLK
5	SPI_SO0	6	SPI_SI
7	NC	8	NC

Table 3-21: SPI Connector Pinouts

3.2.20 TPM Connector

CN Label: **TPM1**

CN Type: 20-pin header

CN Location: See **Figure 3-21**

CN Pinouts: See **Table 3-22**

The TPM connector connects to a TPM module.

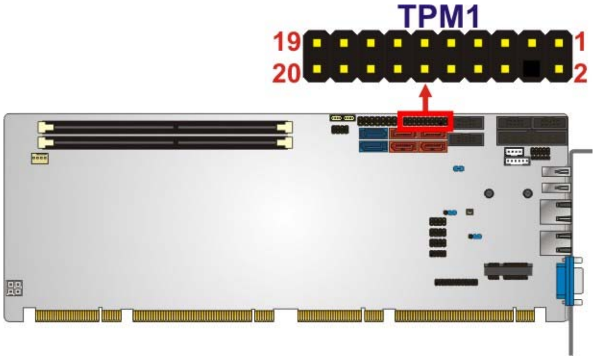


Figure 3-21: TPM Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	CLK	2	GND
3	ERAME#	4	NC
5	RESRT#	6	+5V
7	AD3	8	AD2
9	+3V	10	AD1
11	AD0	12	GND
13	SMB_CLK	14	SMB_DATA
15	SB3V	16	SERIRQ
17	GND	18	CLKRUN#
19	PM_SUS_STAT#	20	DRQ#

Table 3-22: TPM Connector Pinouts

3.2.21 USB Connectors

CN Label:	**USB1, USB2, USB3**
CN Type:	8-pin header
CN Location:	See **Figure 3-22**
CN Pinouts:	See **Table 3-23**

The USB connectors connect to USB devices. Each pin header provides two USB ports.

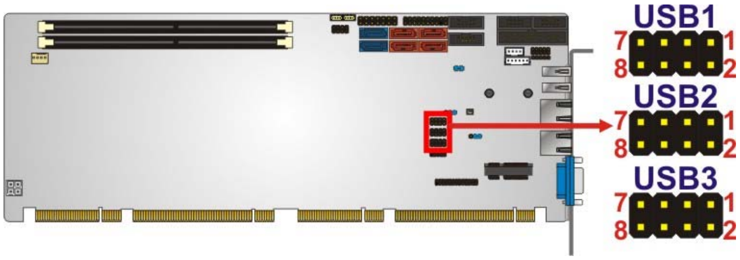


Figure 3-22: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC

Table 3-23: USB Port Connector Pinouts

3.3 External Peripheral Interface Connector Panel

The figure below shows the external peripheral interface connector (EPIC) panel. The EPIC panel consists of the following:

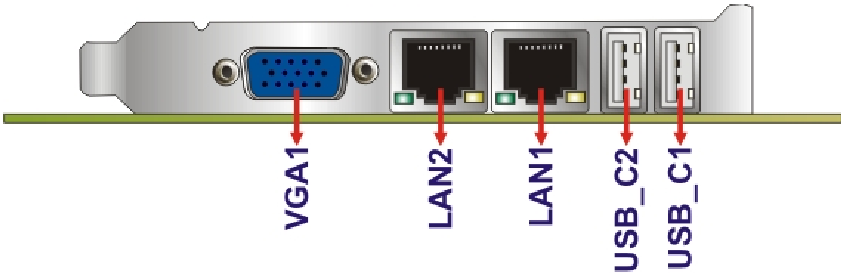


Figure 3-23: External Peripheral Interface Connector

3.3.1 Ethernet Connectors

CN Label:	**LAN1** and **LAN2**
CN Type:	RJ-45
CN Location:	See **Figure 3-23**
CN Pinouts:	See **Figure 3-24** and **Table 3-24**

The PCIE-Q670 Series is equipped with two built-in RJ-45 Ethernet controllers. Each controller can connect to the LAN through one RJ-45 LAN connector.

Pin	Description	Pin	Description
1	MDIA3-	5	MDIA2+
2	MDIA3+	6	MDIA1+
3	MDIA1-	7	MDIA0-
4	MDIA2-	8	MDIA0+

Table 3-24: LAN Pinouts

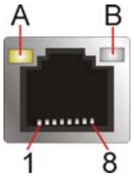


Figure 3-24: Ethernet Connector

LED	Description	LED	Description
A	on: linked blinking: data is being sent/received	B	off: 10 Mb/s green: 100 Mb/s orange: 1000 Mb/s

Table 3-25: Connector LEDs

3.3.2 USB Connectors

CN Label: **USB_C1 and USB_C2**

CN Type: USB port

CN Location: See **Figure 3-23**

CN Pinouts: See **Table 3-26**

The PCIE-Q670 Series has two external USB 2.0 ports. The ports connect to both USB 2.0 and USB 1.1 devices.

Pin	Description
1	VCC
2	DATA-

Pin	Description
3	DATA+
4	GROUND

Table 3-26: USB Port Pinouts

3.3.3 VGA Connector

CN Label: **VGA1**

CN Type: 15-pin Female

CN Location: See **Figure 3-23**

CN Pinouts: See **Figure 3-25** and **Table 3-27**

The VGA connector connects to a monitor that accepts a standard VGA input.

Pin	Description	Pin	Description
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VGAVCC	10	GND
11	NC	12	DDCDAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 3-27: VGA Connector Pinouts

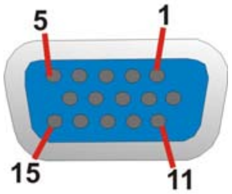


Figure 3-25: VGA Connector

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the PCIE-Q670 Series may result in permanent damage to the PCIE-Q670 Series and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PCIE-Q670 Series. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PCIE-Q670 Series or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the PCIE-Q670 Series, place it on an anti-static pad. This reduces the possibility of ESD damaging the PCIE-Q670 Series.
- ***Only handle the edges of the PCB***:-: When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the PCIE-Q670 Series installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the PCIE-Q670 Series on an anti-static pad:
  - When installing or configuring the motherboard, place it on an anti-static pad. This helps to prevent potential ESD damage.
- Turn all power to the PCIE-Q670 Series off:
  - When working with the PCIE-Q670 Series, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the PCIE-Q670 Series **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.2.1 Socket LGA1155 CPU Installation

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

DO NOT touch the pins at the bottom of the CPU. When handling the CPU, only hold it on the sides.

To install the CPU, follow the steps below.

Step 1: **Disengage the load lever** by pressing the lever down and slightly outward to clear the retention tab. Fully open the lever. See **Figure 4-1**.

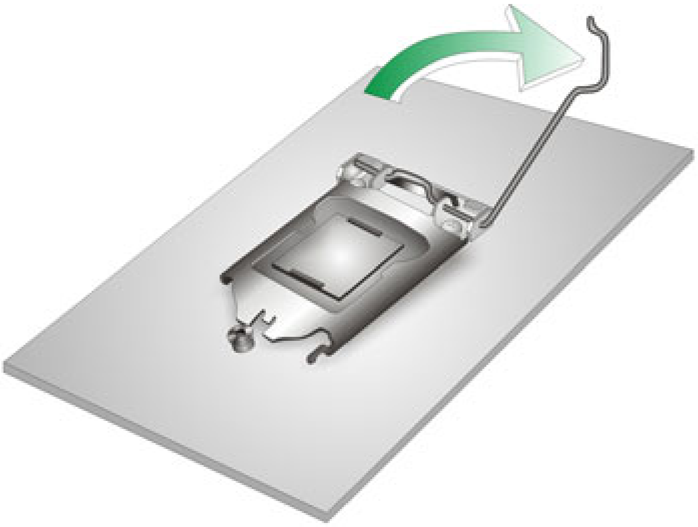


Figure 4-1: Disengage the CPU Socket Load Lever

Step 2: **Open the socket and remove the protective cover.** The black protective cover can be removed by pulling up on the tab labeled "Remove". See **Figure 4-2**.

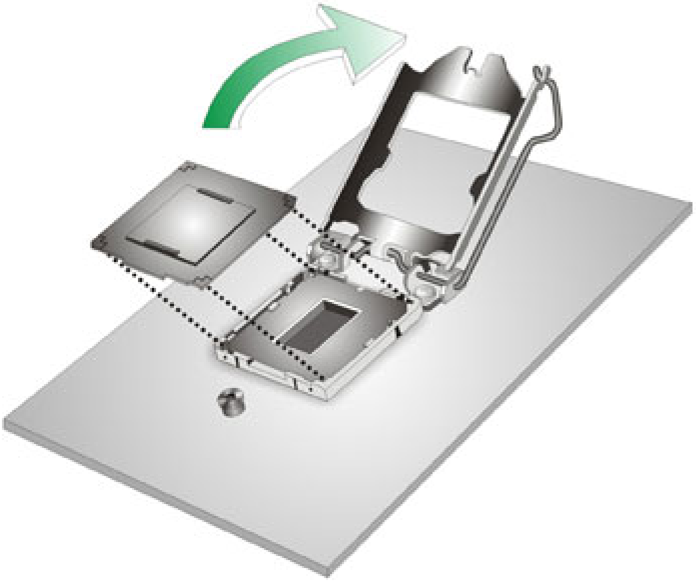


Figure 4-2: Remove Protective Cover

Step 3: **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 4: **Orientate the CPU properly.** The contact array should be facing the CPU socket.

Step 5: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket.

Step 6: **Align the CPU pins.** Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.

Step 7: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See **Figure 4-3**.

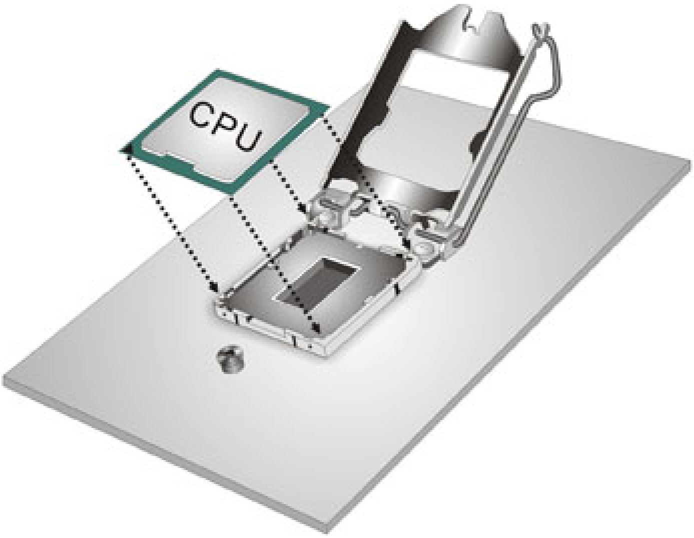


Figure 4-3: Insert the Socket LGA1155 CPU

Step 8: **Close the CPU socket.** Close the load plate and pull the load lever back a little to have the load plate be able to secure to the knob. Engage the load lever by pushing it back to its original position (**Figure 4-4**). There will be some resistance, but will not require extreme pressure.

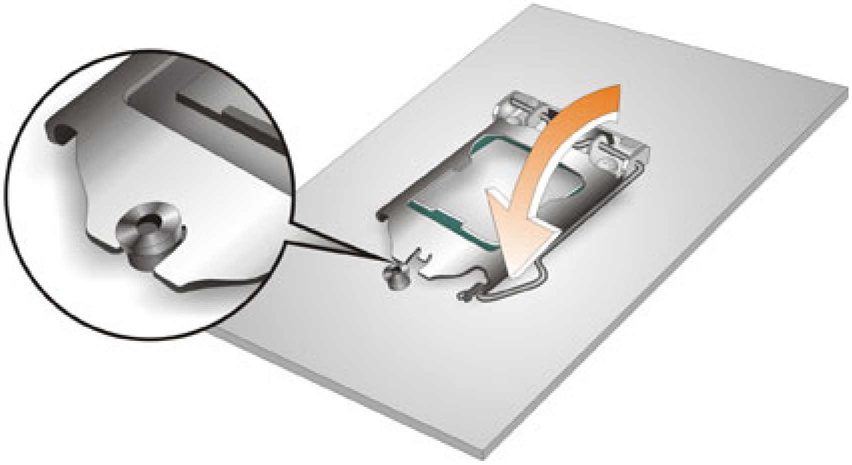


Figure 4-4: Close the Socket LGA1155

Step 9: **Connect the 12 V power to the board.** Connect the 12 V power from the power supply to the board.

4.2.2 Socket LGA1155 Cooling Kit Installation

The cooling kit can be bought from IEI. The cooling kit has a heatsink and fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, follow the instructions below.

Step 1: A cooling kit bracket is pre-installed on the rear of the motherboard. See **Figure 4-5.**

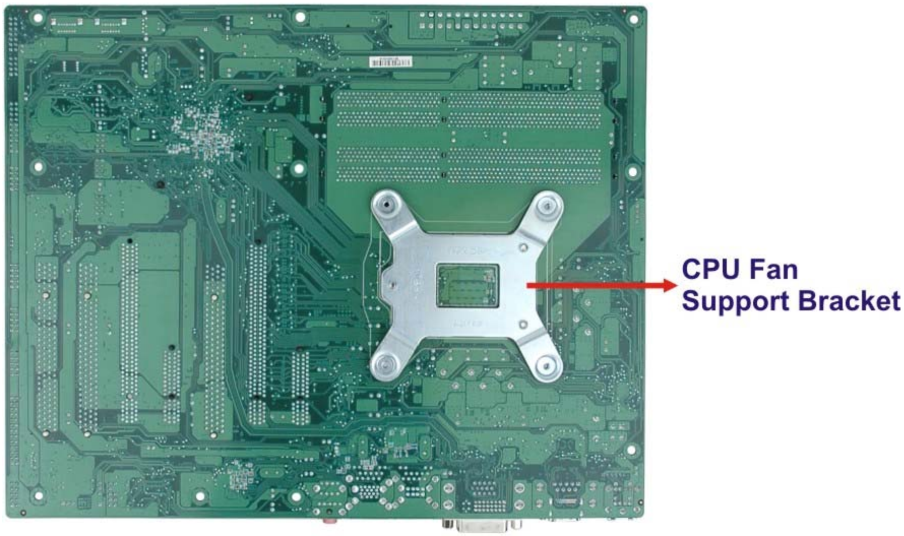


Figure 4-5: Cooling Kit Support Bracket

Step 2: **Place the cooling kit onto the socket LGA1155 CPU**. Make sure the CPU cable can be properly routed when the cooling kit is installed.

Step 3: **Mount the cooling kit**. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the holes of the cooling kit bracket.

Step 4: **Secure the cooling kit** by fastening the four retention screws of the cooling kit.

Step 5: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the PCIE-Q670 Series. Carefully route the cable and avoid heat generating chips and fan blades.

4.2.3 DIMM Installation

To install a DIMM, please follow the steps below and refer to **Figure 4-6**.

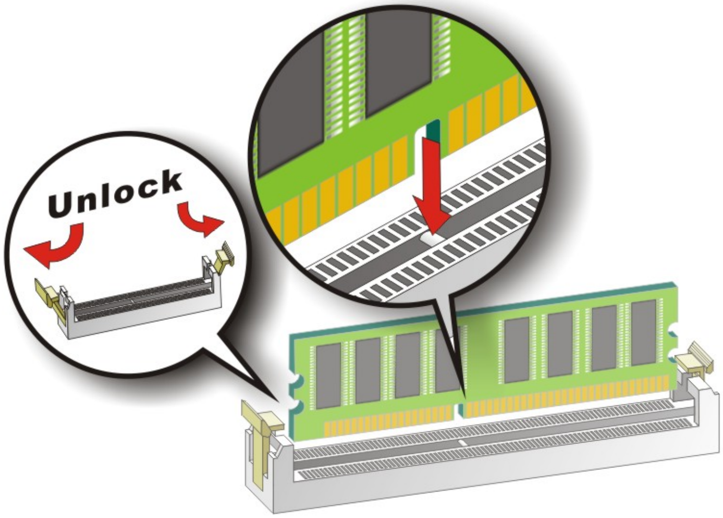


Figure 4-6: DIMM Installation

Step 1: **Open the DIMM socket handles**. Open the two handles outwards as far as they can. See **Figure 4-6**.

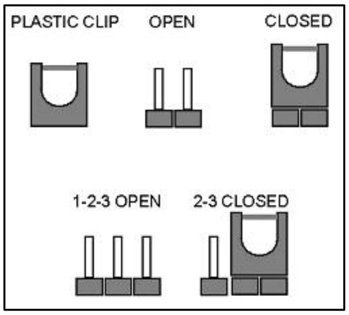
Step 2: **Align the DIMM with the socket**. Align the DIMM so the notch on the memory lines up with the notch on the memory socket. See **Figure 4-6**.

Step 3: **Insert the DIMM**. Once aligned, press down until the DIMM is properly seated. Clip the two handles into place. See **Figure 4-6**.

Step 4: **Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

4.3 Jumper Settings

NOTE:



A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

The hardware jumpers must be set before installation. Jumpers are shown in **Table 4-1**.

Description	Label	Type
AT/ATX power select	JATX_AT1	2-pin header
Clear CMOS jumper	J_CMOS1	3-pin header
Wake-on LAN	WOL_SEL1	3-pin header

Table 4-1: Jumpers

4.3.1 AT/ATX Power Select Jumper

Jumper Label:	**JATX_AT1**
Jumper Type:	2-pin header
Jumper Settings:	See **Table 4-2**
Jumper Location:	See **Figure 4-7**

The AT/ATX Power Select jumper specifies the systems power mode as AT or ATX.

Setting	Description
Closed	ATX power (Default)
Open	AT power

Table 4-2: AT/ATX Power Mode Jumper Settings

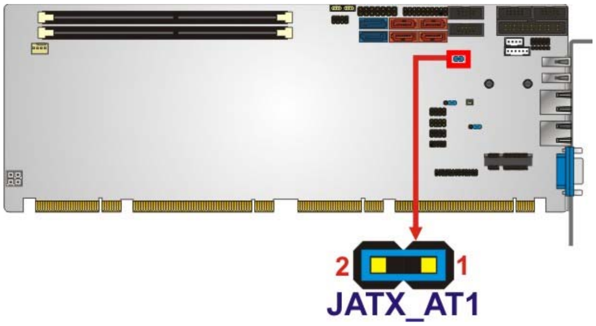


Figure 4-7: AT/ATX Power Mode Jumper Location

4.3.2 Clear CMOS Jumper

Jumper Label:	**J_CMOS1**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 4-3**
Jumper Location:	See **Figure 4-8**

To reset the BIOS, move the jumper to the "Clear BIOS" position for 3 seconds or more, and then move back to the default position.

Setting	Description
Short 1-2	Normal
Short 2-3	Clear BIOS

Table 4-3: Clear BIOS Jumper Settings

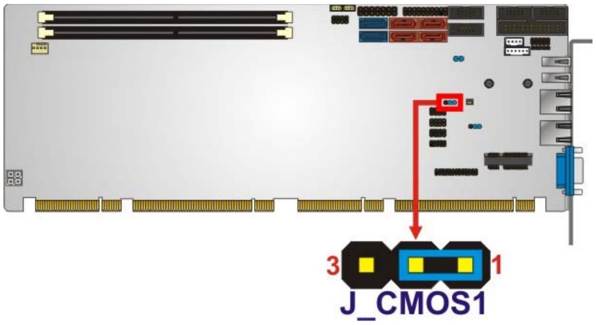


Figure 4-8: Clear BIOS Jumper Location

4.3.3 Wake-on LAN Jumper

CN Label:	**WOL_SEL1**
CN Type:	3-pin header
CN Location:	See **Figure 4-9**
CN Pinouts:	See **Table 4-4**

The Wake-on LAN connector allows the user to enable or disable the Wake-on LAN (WOL) function.

PIN NO.	DESCRIPTION
Short 1-2	Enable Wake-on LAN (Default)
Short 2-3	Disable Wake-on LAN

Table 4-4: Wake-on LAN Connector Pinouts

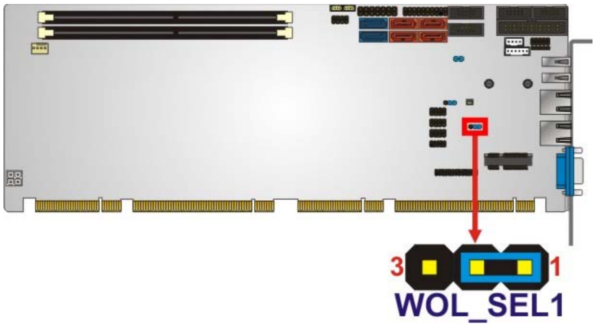


Figure 4-9: Wake-on LAN Connector Pinout Locations

4.4 Chassis Installation

4.4.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the PCIE-Q670 Series must have air vents to allow cool air to move into the system and hot air to move out.

The PCIE-Q670 Series must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

4.4.2 CPU Card Installation

To install the CPU card onto the backplane, carefully align the CPU card edge connector with the CPU card socket on the backplane. To do this, please refer to the reference material that came with the backplane. Next, secure the CPU card to the chassis. To do this, please refer to the reference material that came with the chassis.

4.5 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the onboard connectors.

4.5.1 Dual RS-232 Cable with Slot Bracket

The dual RS-232 cable slot connector consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a slot. To install the dual RS-232 cable, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the RS-232 connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connectors**. Insert one connector into each serial port box headers (**Figure 4-10**). A key on the front of the cable connectors ensures the connector can only be installed in one direction.

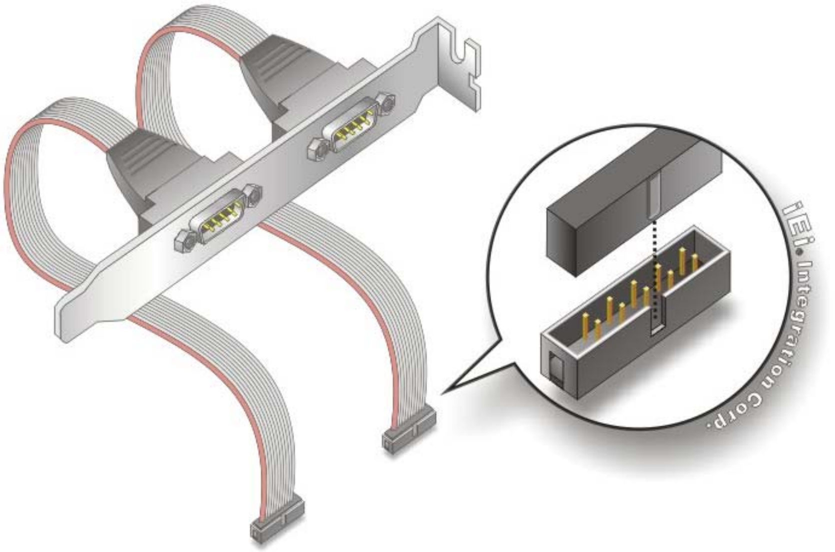


Figure 4-10: Dual RS-232 Cable Installation

Step 3: **Secure the bracket**. The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis.

4.5.2 DVI-D/USB Kit Installation (DVI Model Only)

The DVI-D/USB kit, consisting of one DVI-D and four USB ports, connects to the DVI-D and USB connectors on the PCIE-Q670 Series. To install the DVI-D/USB kit, please follow the steps below.

Step 1: **Connect the cables to the DVI-D/USB kit**. Connect the included cables to the DVI-D/USB kit.

Step 2: **Connect the cables to the board**. Connect the other ends of the included cables to the board.

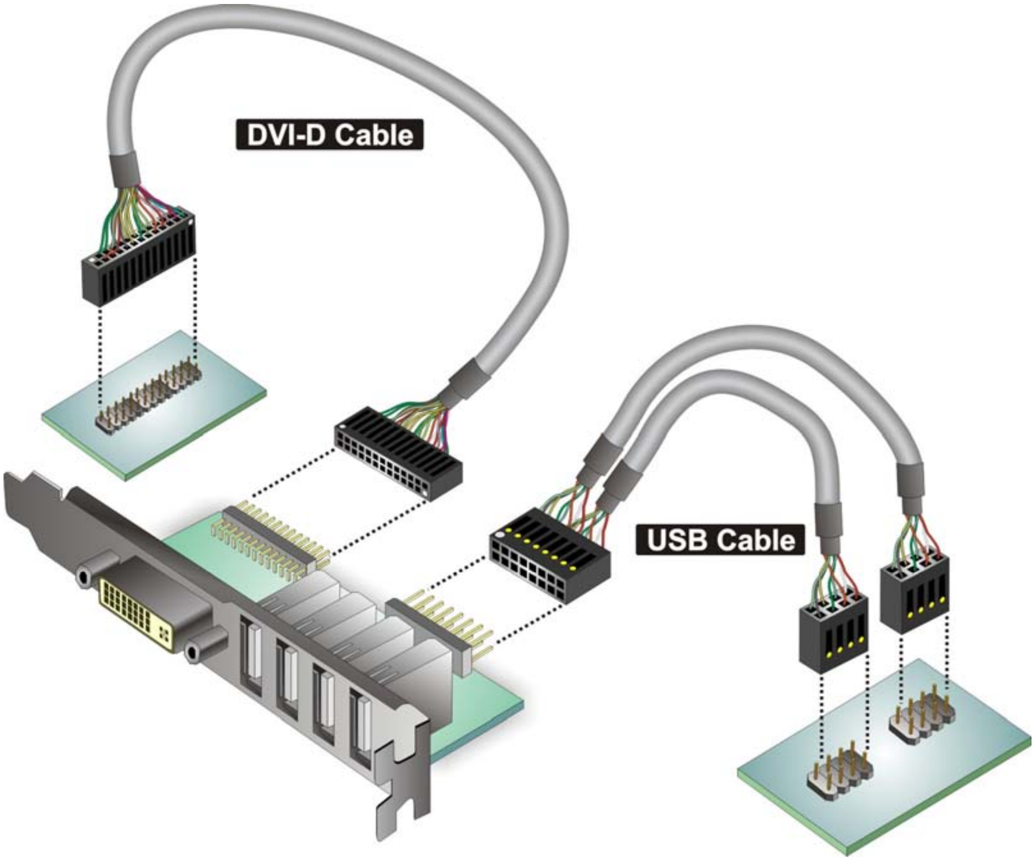


Figure 4-11: DVI-D/USB Kit Installation

Step 3: **Mount the DVI-D/USB kit onto the chassis**. Once the DVI-D/USB kit is connected to the board, secure the DVI-D/USB kit bracket to the system chassis.

4.5.3 SATA Drive Connection

The PCIE-Q670 Series is shipped with four SATA drive cables. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Insert the cable connector into the on-board SATA drive connector until it clips into place. See **Figure 4-12**.

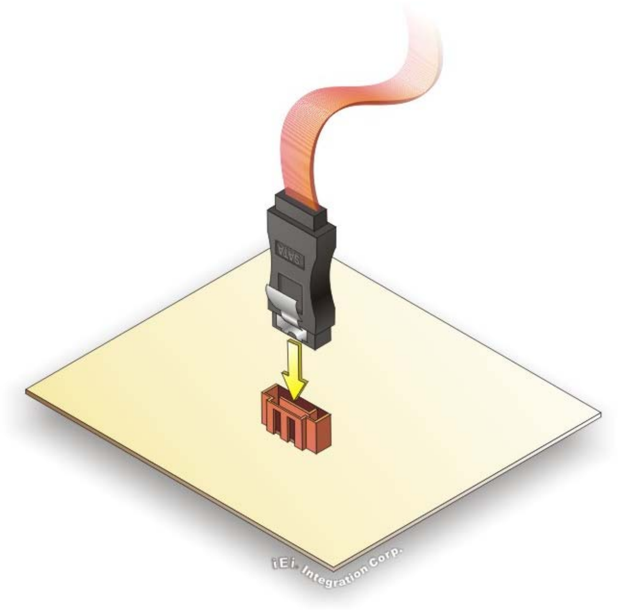


Figure 4-12: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-13**.

Step 4: **Connect the SATA power cable (optional)**. Connect the SATA power connector to the back of the SATA drive. See **Figure 4-13**.

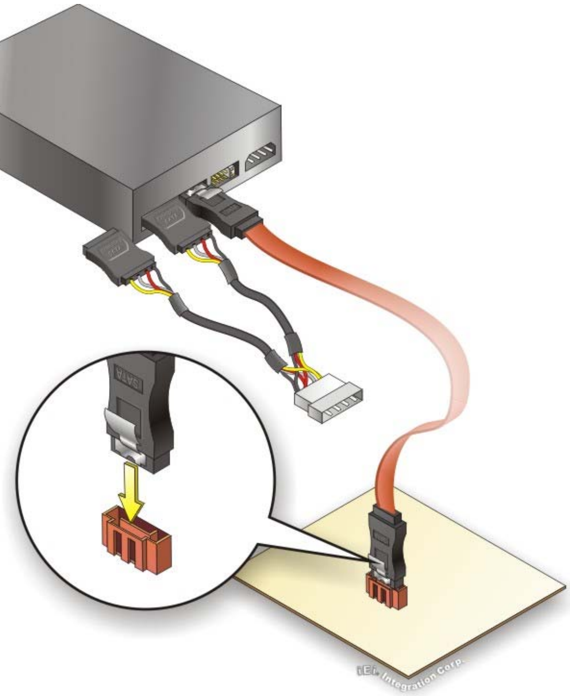


Figure 4-13: SATA Power Drive Connection

4.5.4 USB Cable (Dual Port) with Slot Bracket

The PCIE-Q670 Series is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 3**.

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors.** The cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the PCIE-Q670 Series USB connector.

Step 3: **Insert the cable connectors** Once the cable connectors are properly aligned with the USB connectors on the PCIE-Q670 Series, connect the cable connectors to the on-board connectors. See **Figure 4-14**.

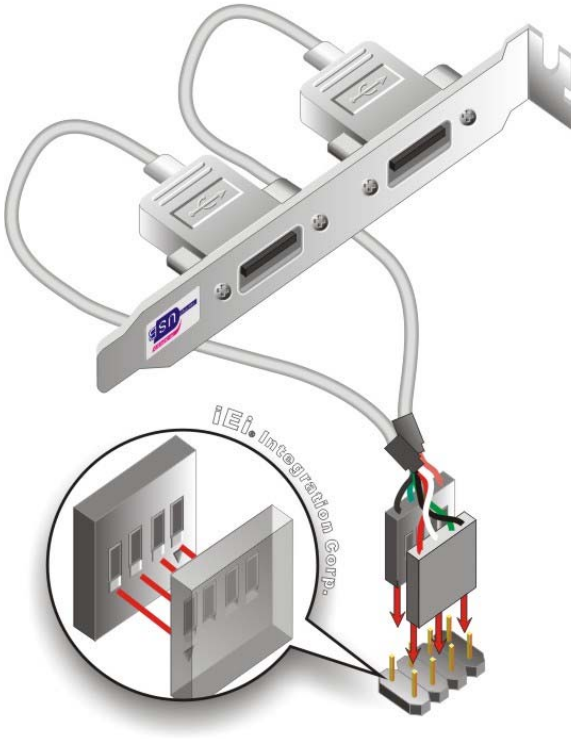


Figure 4-14: Dual USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

4.5.5 PCIe Mini Card Installation

To install the PCIe Mini card, please refer to the diagram and instructions below.

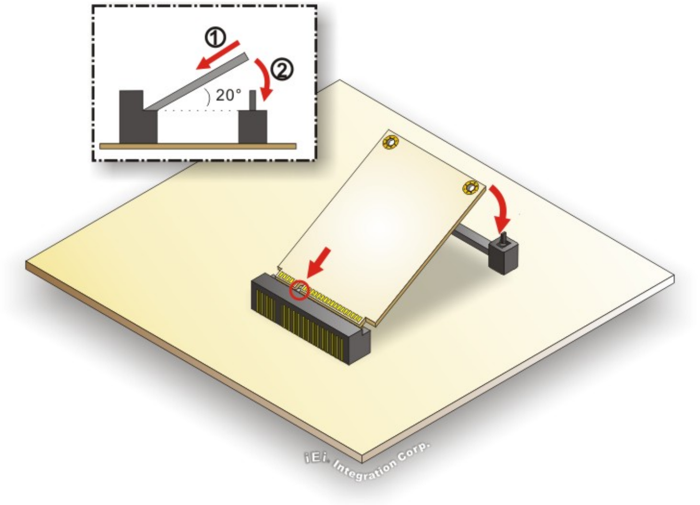


Figure 4-15: PCIe Mini Card Installation

Step 1: **Insert into the socket at and angle**. Line up the notch on the card with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20º.

Step 2: **Push down until the card clips into place**. Push the other end of the card down until it clips into place on the plastic connector.

4.6 External Peripheral Interface Connection

This section describes connecting devices to the external connectors on the PCIE-Q670 Series.

4.6.1 LAN Connection

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors**. The locations of the RJ-45 connectors are shown in **Chapter 3**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the PCIE-Q670 Series. See **Figure 4-16**.

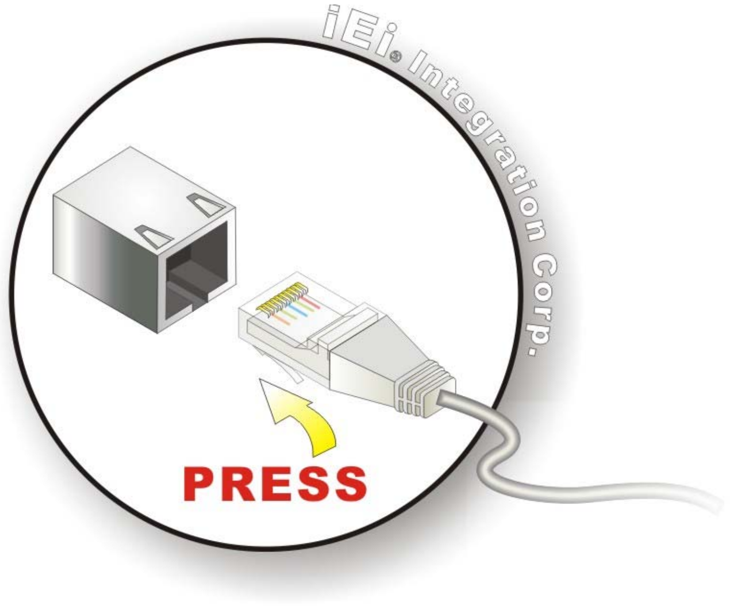


Figure 4-16: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the on-board RJ-45 connector.

4.6.2 USB Device Connection (Single Connector)

There are two external USB 2.0 connectors. Both connectors are perpendicular to the PCIE-Q670 Series. To connect a USB 2.0 or USB 1.1 device, please follow the instructions below.

Step 1: **Located the USB connectors**. The locations of the USB connectors are shown in **Chapter 3**

Step 2: **Align the connectors.** Align the USB device connector with one of the connectors on the PCIE-Q670 Series. See **Figure 4-17**.

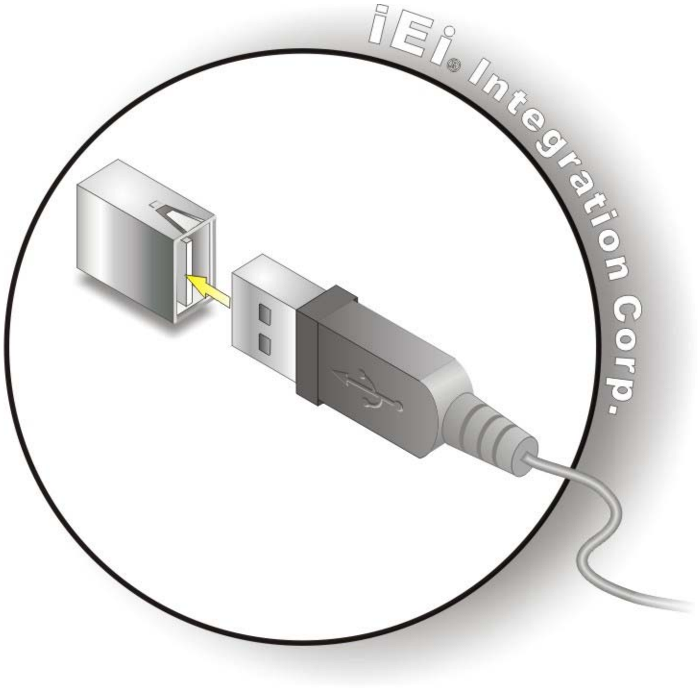

iEi® Integration Corp.

Figure 4-17: USB Device Connection

Step 3: **Insert the device connector.** Once aligned, gently insert the USB device connector into the on-board connector.

4.6.3 VGA Monitor Connection

The PCIE-Q670 Series has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the PCIE-Q670 Series, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the PCIE-Q670 Series. See **Figure 4-18**.

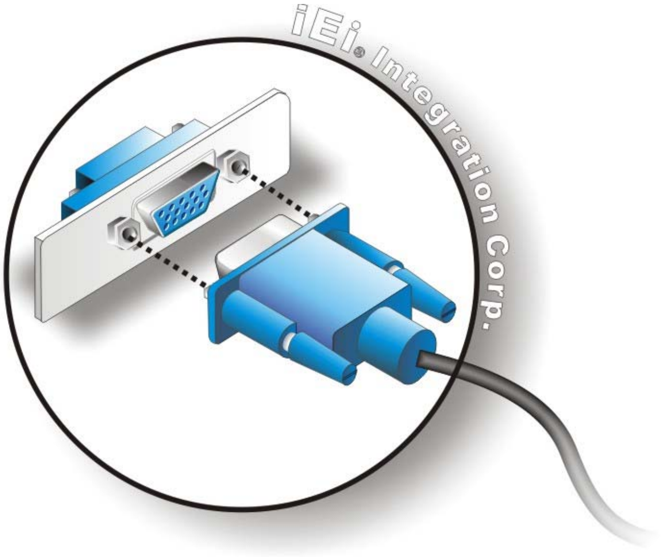

iEi Integration Corp.

Figure 4-18: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

4.7 Intel® AMT Setup Procedure

The PCIE-Q670 Series is featured with the Intel® Active Management Technology (AMT). To enable the Intel® AMT function, follow the steps below.

Step 1: Make sure the **CHA_DIMM1** socket is installed with one DDR3 DIMM.

Step 2: Connect an Ethernet cable to the RJ-45 connector labeled **LAN2**.

Step 3: The AMI BIOS options regarding the Intel® ME or Intel® AMT must be enabled,

Step 4: Properly install the Intel® Management Engine Components drivers from the iAMT Driver & Utility directory in the driver CD. See **Section 6.7**.

Step 5: Configure the Intel® Management Engine BIOS extension (MEBx). To get into the Intel® MEBx settings, press <Ctrl+P> after a single beep during boot-up process. Enter the Intel® current ME password as it requires (the Intel® default password is **admin**).

NOTE:

To change the password, enter a new password following the strong password rule (containing at least one upper case letter, one lower case letter, one digit and one special character, and be at least eight characters).

Chapter

5

BIOS

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

NOTE:

Some of the BIOS options may vary throughout the life cycle of the product and are subject to change without prior notice.

5.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DEL** or **F2** key as soon as the system is turned on or
2. Press the **DEL** or **F2** key when the "**Press DEL or F2 to enter SETUP**" message appears on the screen.

If the message disappears before the **DEL or F2** key is pressed, restart the computer and try again.

5.1.2 Using Setup

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. Navigation keys are shown in.

Key	**Function**
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes

Key	Function
-	Decrease the numeric value or make changes
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
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
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter **4**.

5.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

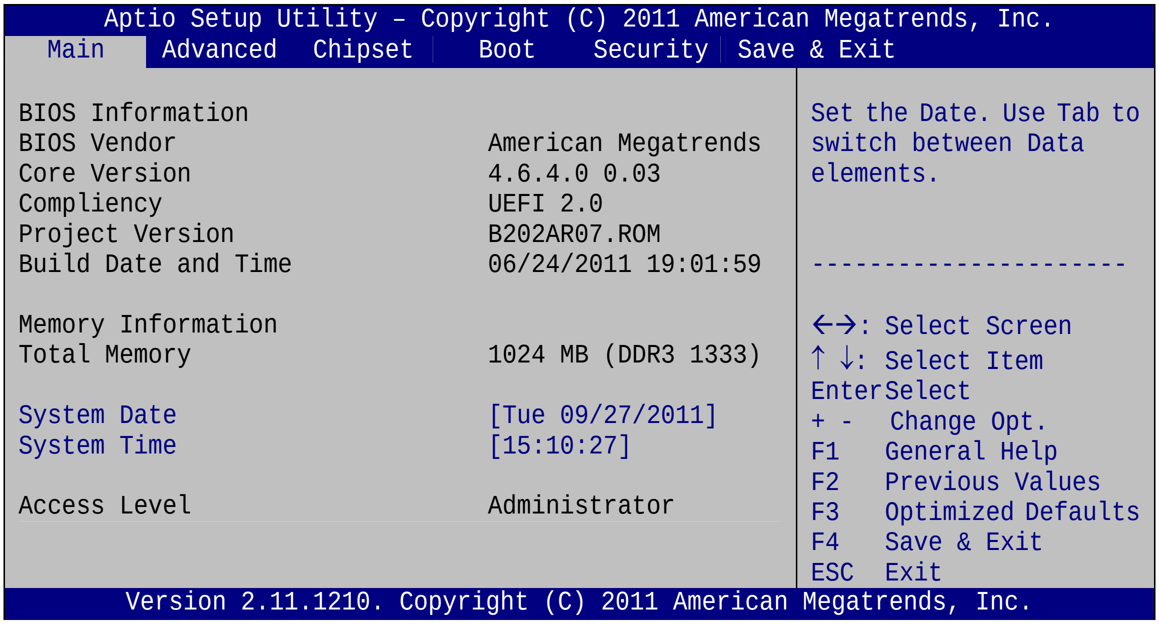
- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.

- Save & Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.



```
       Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
   Main    Advanced   Chipset     Boot     Security  Save & Exit

 BIOS Information                                 Set the Date. Use Tab to
 BIOS Vendor                American Megatrends   switch between Data
 Core Version               4.6.4.0 0.03          elements.
 Compliency                 UEFI 2.0
 Project Version            B202AR07.ROM
 Build Date and Time        06/24/2011 19:01:59   ----------------------

 Memory Information                               ←→: Select Screen
 Total Memory               1024 MB (DDR3 1333)   ↑ ↓: Select Item
                                                  EnterSelect
 System Date                [Tue 09/27/2011]      + -   Change Opt.
 System Time                [15:10:27]            F1    General Help
                                                  F2    Previous Values
 Access Level               Administrator         F3    Optimized Defaults
                                                  F4    Save & Exit
                                                  ESC   Exit
        Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 1: Main

➔ System Overview

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Project Version:** the board version
- **Build Date and Time:** Date and time the current BIOS version was made

➔ **Memory Information**

The **Memory Information** lists a brief summary of the on-board memory. The fields in **Memory Information** cannot be changed.

- Total Memory: Displays the auto-detected system memory size and type.

The System Overview field also has two user configurable fields:

➔ **System Date [xx/xx/xx]**

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

➔ **System Time [xx:xx:xx]**

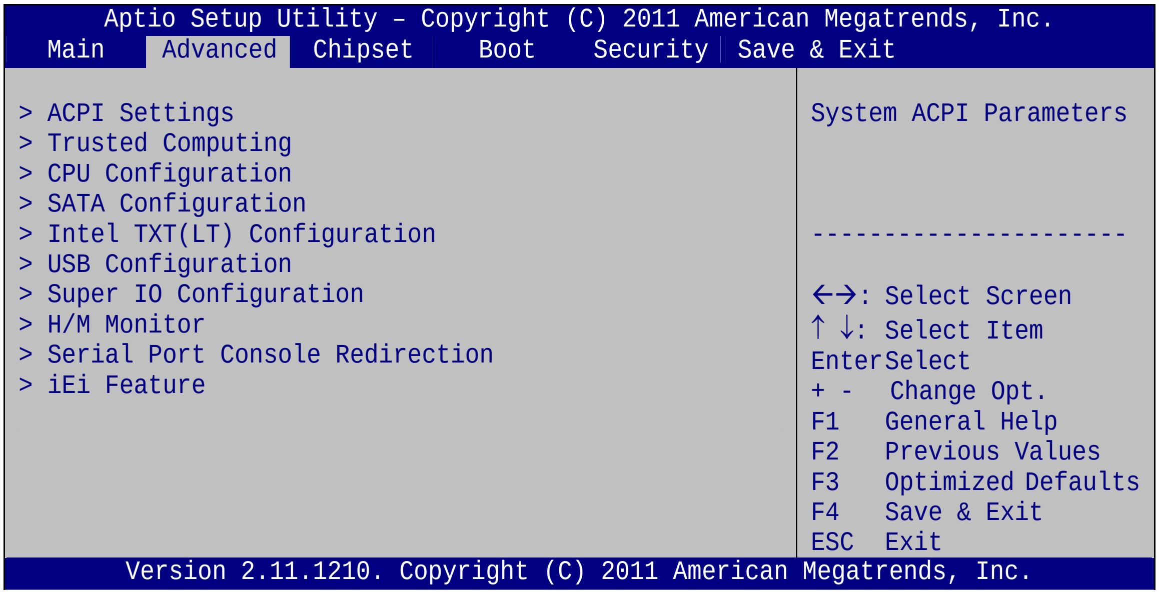
Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING!

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

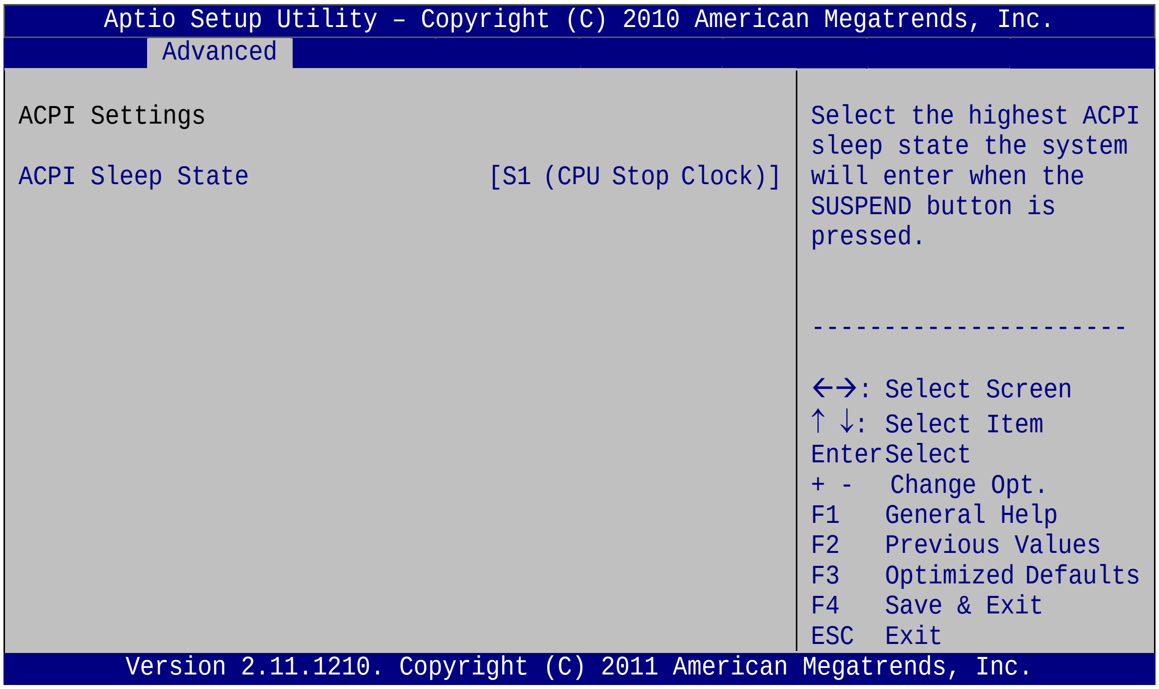


```
     Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
  Main    Advanced  Chipset    Boot    Security  Save & Exit

> ACPI Settings                                   System ACPI Parameters
> Trusted Computing
> CPU Configuration
> SATA Configuration
> Intel TXT(LT) Configuration                     ----------------------
> USB Configuration
> Super IO Configuration                          ←→: Select Screen
> H/M Monitor                                     ↑ ↓: Select Item
> Serial Port Console Redirection                 EnterSelect
> iEi Feature                                     + -   Change Opt.
                                                  F1    General Help
                                                  F2    Previous Values
                                                  F3    Optimized Defaults
                                                  F4    Save & Exit
                                                  ESC   Exit
      Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 2: Advanced

5.3.1 ACPI Settings

The **ACPI Settings** menu (**BIOS Menu 3**) configures the Advanced Configuration and Power Interface (ACPI) options.



```
     Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
          Advanced

ACPI Settings                                     Select the highest ACPI
                                                  sleep state the system
ACPI Sleep State              [S1 (CPU Stop Clock)] will enter when the
                                                  SUSPEND button is
                                                  pressed.


                                                  ----------------------

                                                  ←→: Select Screen
                                                  ↑ ↓: Select Item
                                                  EnterSelect
                                                  + -   Change Opt.
                                                  F1    General Help
                                                  F2    Previous Values
                                                  F3    Optimized Defaults
                                                  F4    Save & Exit
                                                  ESC   Exit
      Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 3: ACPI Configuration

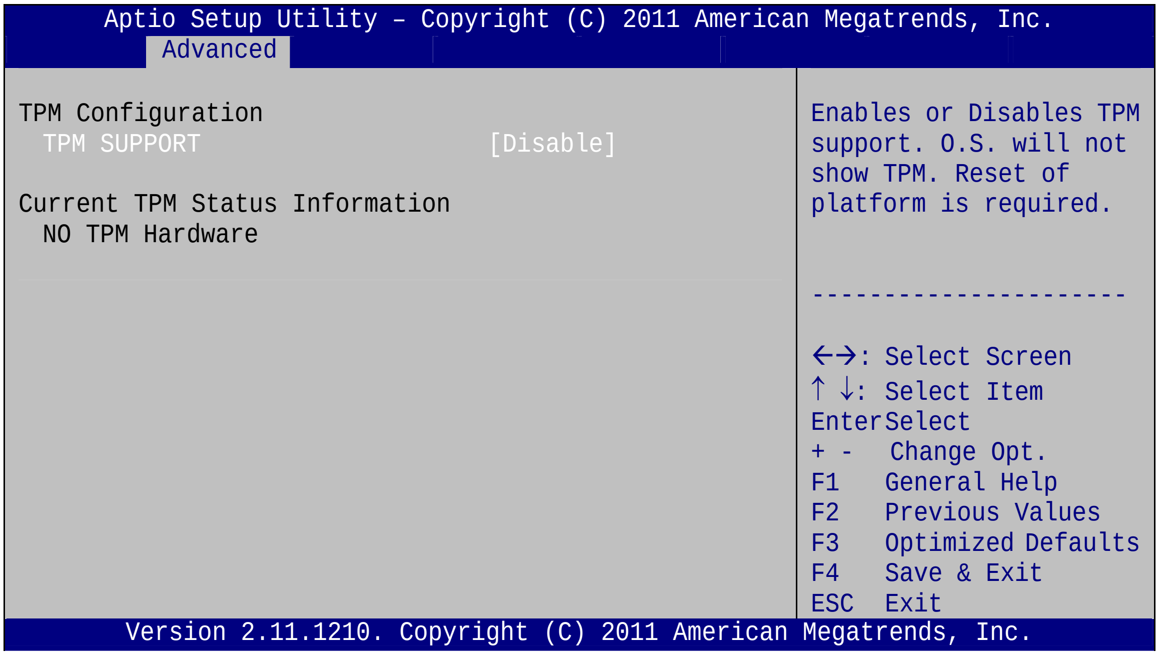
➔ **ACPI Sleep State [S1 (CPU Stop Clock)]**

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

➔ **Suspend Disabled**		
➔ **S1 (CPU Stop Clock)**	**DEFAULT**	The system enters S1 (POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.
➔ **S3 (Suspend to RAM)**		The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

5.3.2 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 4**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
      Advanced

TPM Configuration                                  Enables or Disables TPM
  TPM SUPPORT                    [Disable]         support. O.S. will not
                                                   show TPM. Reset of
Current TPM Status Information                     platform is required.
  NO TPM Hardware

                                                   ----------------------

                                                   ←→: Select Screen
                                                   ↑ ↓: Select Item
                                                   EnterSelect
                                                   + -   Change Opt.
                                                   F1   General Help
                                                   F2   Previous Values
                                                   F3   Optimized Defaults
                                                   F4   Save & Exit
                                                   ESC  Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 4: TPM Configuration

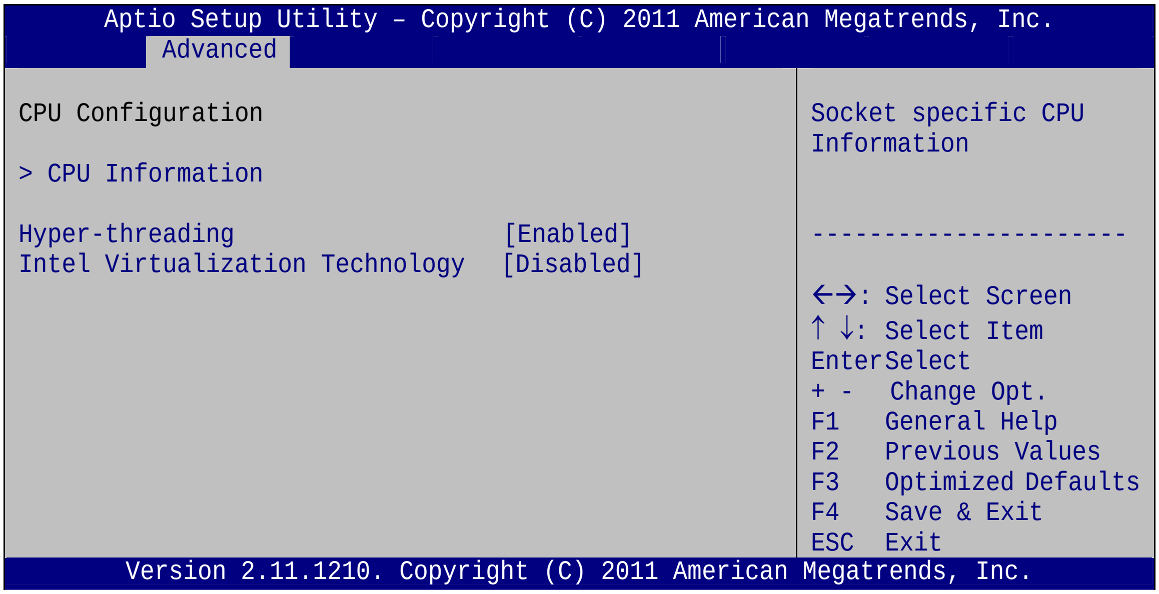
→ TPM Support [Disable]

Use the **TPM Support** option to configure support for the TPM.

- **Disable** **DEFAULT** TPM support is disabled.
- **Enable** TPM support is enabled.

5.3.3 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 5**) to enter the **CPU Information** submenu or enable Intel Virtualization Technology.



```
      Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
           Advanced
CPU Configuration                                    Socket specific CPU
                                                     Information
> CPU Information

Hyper-threading                   [Enabled]          ----------------------
Intel Virtualization Technology   [Disabled]
                                                     ←→: Select Screen
                                                     ↑ ↓: Select Item
                                                     EnterSelect
                                                     + -   Change Opt.
                                                     F1    General Help
                                                     F2    Previous Values
                                                     F3    Optimized Defaults
                                                     F4    Save & Exit
                                                     ESC   Exit
        Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 5: CPU Configuration

→ Hyper-threading [Enabled]

Use the **Hyper-threading** BIOS option to enable or disable the Intel Hyper-Threading Technology.

- **Disabled** Disables the Intel Hyper-Threading Technology.
- **Enabled** **DEFAULT** Enables the Intel Hyper-Threading Technology.

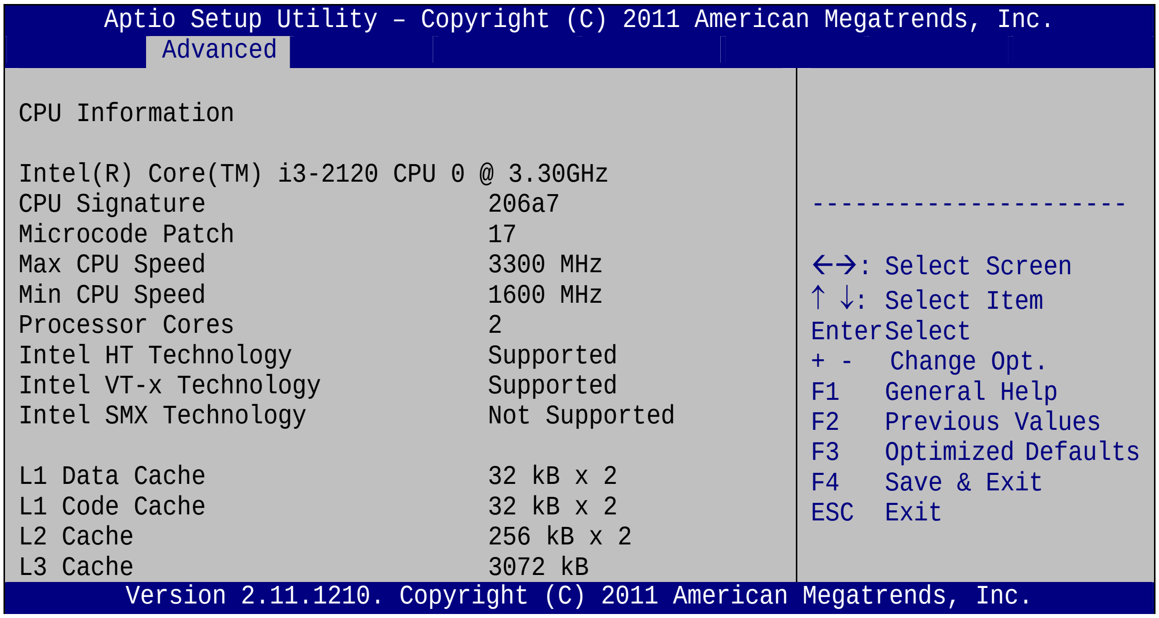
➔ **Intel Virtualization Technology [Disabled]**

Use the **Intel Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel® Virtualization technology allows several OSs to run on the same system at the same time.

➔	**Disabled**	**DEFAULT**	Disables Intel Virtualization Technology.
➔	**Enabled**		Enables Intel Virtualization Technology.

5.3.3.1 CPU Information

Use the **CPU Information** submenu (**BIOS Menu 6**) to view detailed CPU specifications and configure the CPU.



```
    Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
           Advanced

CPU Information                          |
                                         |
Intel(R) Core(TM) i3-2120 CPU 0 @ 3.30GHz|
CPU Signature              206a7         | ---------------------
Microcode Patch            17            |
Max CPU Speed              3300 MHz      | ←→: Select Screen
Min CPU Speed              1600 MHz      | ↑ ↓: Select Item
Processor Cores            2             | EnterSelect
Intel HT Technology        Supported     | + -   Change Opt.
Intel VT-x Technology      Supported     | F1    General Help
Intel SMX Technology       Not Supported | F2    Previous Values
                                         | F3    Optimized Defaults
L1 Data Cache              32 kB x 2     | F4    Save & Exit
L1 Code Cache              32 kB x 2     | ESC   Exit
L2 Cache                   256 kB x 2    |
L3 Cache                   3072 kB       |
     Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 6: CPU Configuration

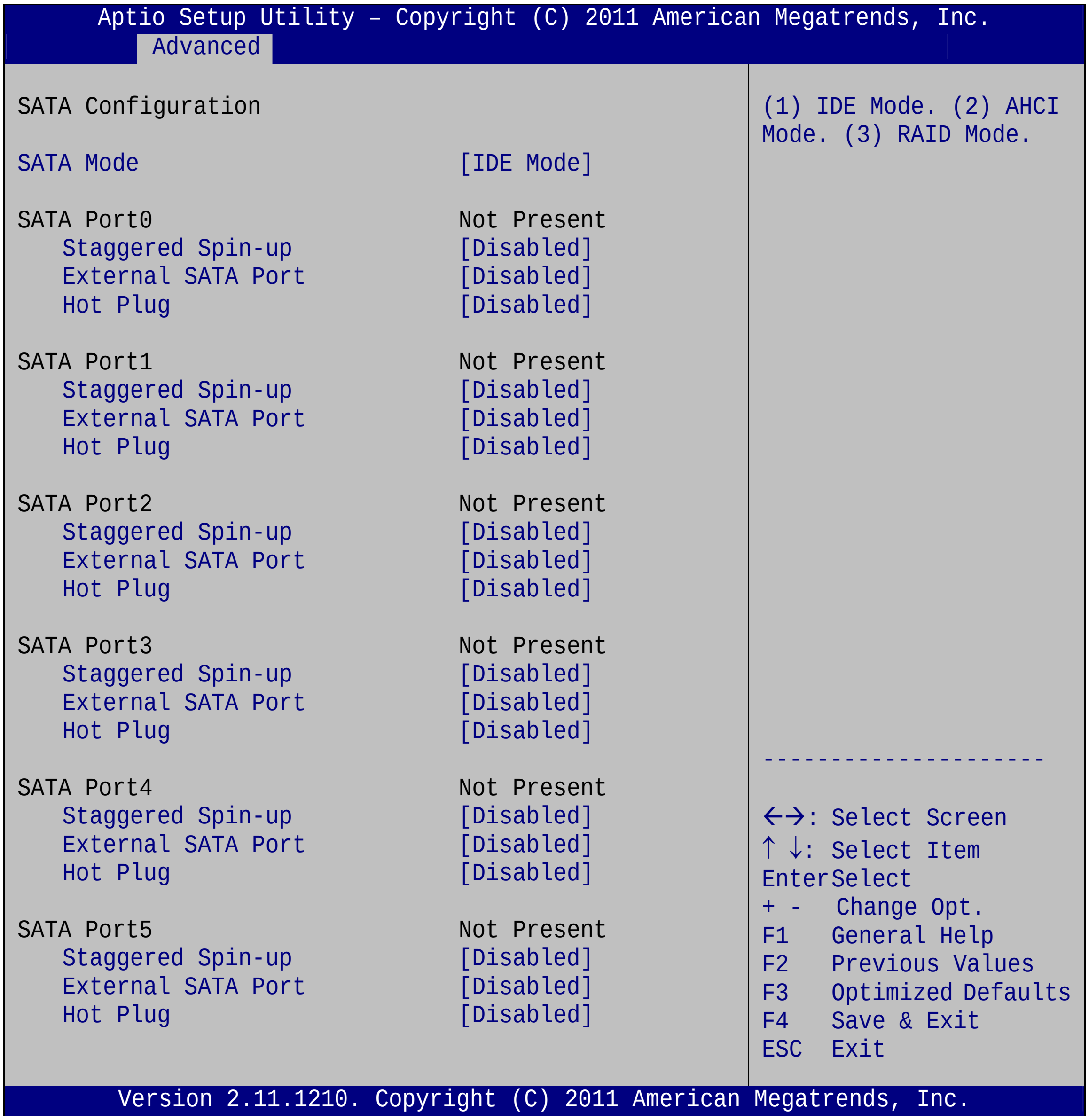
The CPU Configuration menu (**BIOS Menu 6**) lists the following CPU details:

- Processor Type: Lists the brand name of the CPU being used
- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.
- Max CPU Speed: Lists the maximum CPU processing speed.
- Min CPU Speed: Lists the minimum CPU processing speed.

- Processor Cores: Lists the number of the processor core
- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.
- Intel SMX Technology: Indicates if Intel SMX Technology is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.

5.3.4 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 7**) to change and/or set the configuration of the SATA devices installed in the system.



```
  Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
        Advanced
SATA Configuration                                (1) IDE Mode. (2) AHCI
                                                  Mode. (3) RAID Mode.
SATA Mode                       [IDE Mode]

SATA Port0                      Not Present
   Staggered Spin-up            [Disabled]
   External SATA Port           [Disabled]
   Hot Plug                     [Disabled]

SATA Port1                      Not Present
   Staggered Spin-up            [Disabled]
   External SATA Port           [Disabled]
   Hot Plug                     [Disabled]

SATA Port2                      Not Present
   Staggered Spin-up            [Disabled]
   External SATA Port           [Disabled]
   Hot Plug                     [Disabled]

SATA Port3                      Not Present
   Staggered Spin-up            [Disabled]
   External SATA Port           [Disabled]
   Hot Plug                     [Disabled]
                                                  ---------------------
SATA Port4                      Not Present
   Staggered Spin-up            [Disabled]        ←→: Select Screen
   External SATA Port           [Disabled]        ↑ ↓: Select Item
   Hot Plug                     [Disabled]        EnterSelect
                                                  + -   Change Opt.
SATA Port5                      Not Present       F1   General Help
   Staggered Spin-up            [Disabled]        F2   Previous Values
   External SATA Port           [Disabled]        F3   Optimized Defaults
   Hot Plug                     [Disabled]        F4   Save & Exit
                                                  ESC  Exit
     Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 7: SATA Configuration

➔ **SATA Mode [IDE Mode]**

Use the **SATA Mode** option to configure SATA devices as normal IDE devices.

➔ **Disabled**		Disables SATA devices.
➔ **IDE Mode**	**DEFAULT**	Configures SATA devices as normal IDE device.
➔ **AHCI Mode**		Configures SATA devices as AHCI device.
➔ **RAID Mode**		Configures SATA devices as RAID device.

➔ Staggered Spin-up [Disabled]

Staggered Spin-up allows the system to power up one drive at a time to prevent excess power consumption. Use the **Staggered Spin-up** option to enable or disable the staggered spin-up function.

➔ **Disabled**	**DEFAULT**	Disables staggered spin-up.
➔ **Enabled**		Enables staggered spin-up.

➔ External SATA Port [Disabled]

Use the **External SATA Port** option to enable or disable the external SATA port.

➔ **Disabled**	**DEFAULT**	Disables the external SATA port.
➔ **Enabled**		Enables the external SATA port.

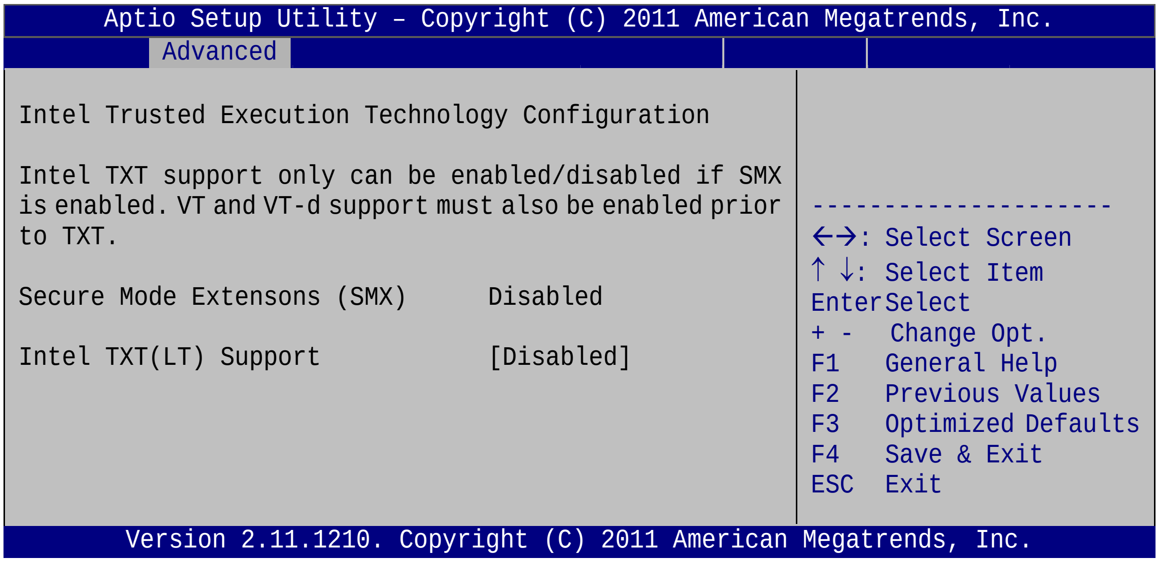
➔ Hot Plug [Disabled]

Use the **Hot Plug** option to enable or disable the hot plug function.

➔ **Disabled**	**DEFAULT**	Disables the hot plug function.
➔ **Enabled**		Enables the hot plug function.

5.3.5 Intel TXT(LT) Configuration

Use the **Intel TXT(LT) Configuration** menu to configure Intel Trusted Execution Technology support.

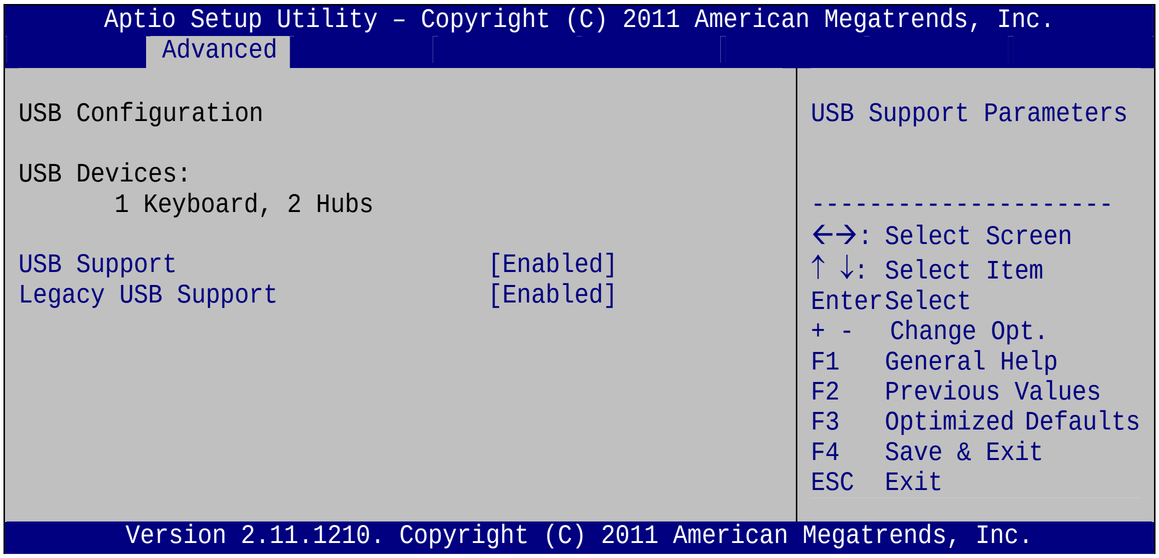


```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
            Advanced

Intel Trusted Execution Technology Configuration

Intel TXT support only can be enabled/disabled if SMX
is enabled. VT and VT-d support must also be enabled prior
to TXT.                                                    ---------------------
                                                           ←→: Select Screen
Secure Mode Extensons (SMX)      Disabled                  ↑ ↓: Select Item
                                                           EnterSelect
Intel TXT(LT) Support            [Disabled]                + -   Change Opt.
                                                           F1    General Help
                                                           F2    Previous Values
                                                           F3    Optimized Defaults
                                                           F4    Save & Exit
                                                           ESC   Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 8: Intel TXT(LT) Configuration

5.3.6 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 9**) to read USB configuration information and configure the USB settings.



```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
            Advanced

USB Configuration                                          USB Support Parameters

USB Devices:
      1 Keyboard, 2 Hubs                                   ---------------------
                                                           ←→: Select Screen
USB Support                      [Enabled]                 ↑ ↓: Select Item
Legacy USB Support               [Enabled]                 EnterSelect
                                                           + -   Change Opt.
                                                           F1    General Help
                                                           F2    Previous Values
                                                           F3    Optimized Defaults
                                                           F4    Save & Exit
                                                           ESC   Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 9: USB Configuration

➔ USB Devices

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

→ USB Support [Enabled]

Use the **USB Support** option to enable or disable USB support on the system.

→	**Disabled**		USB support disabled
→	**Enabled**	**DEFAULT**	USB support enabled

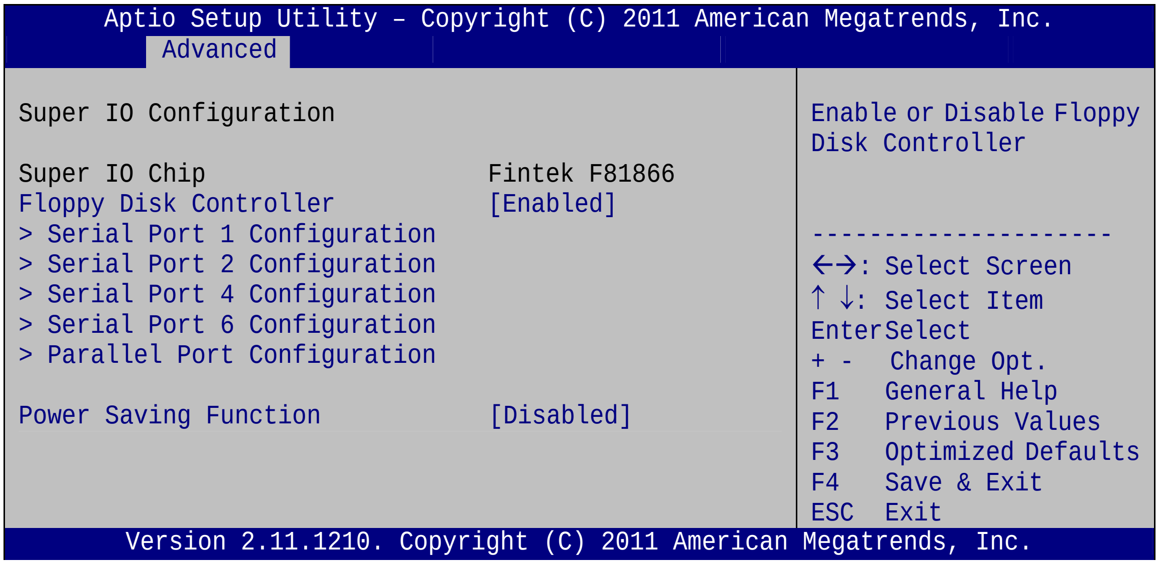
→ Legacy USB Support [Enabled]

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

→	**Enabled**	**DEFAULT**	Legacy USB support enabled
→	**Disabled**		Legacy USB support disabled

5.3.7 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 10**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



```
     Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
                Advanced

 Super IO Configuration                                   Enable or Disable Floppy
                                                          Disk Controller
 Super IO Chip                    Fintek F81866
 Floppy Disk Controller           [Enabled]
 > Serial Port 1 Configuration                            ---------------------
 > Serial Port 2 Configuration                            ←→: Select Screen
 > Serial Port 4 Configuration                            ↑ ↓: Select Item
 > Serial Port 6 Configuration                            EnterSelect
 > Parallel Port Configuration                            + -   Change Opt.
                                                          F1    General Help
 Power Saving Function            [Disabled]              F2    Previous Values
                                                          F3    Optimized Defaults
                                                          F4    Save & Exit
                                                          ESC   Exit
       Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 10: Super IO Configuration

➔ **Floppy Disk Controller [Enabled]**

Use the **Floppy Disk Controller** option to enable or disable the floppy disk controller.

➔	**Disabled**		Floppy disk controller disabled
➔	**Enabled**	**DEFAULT**	Floppy disk controller enabled

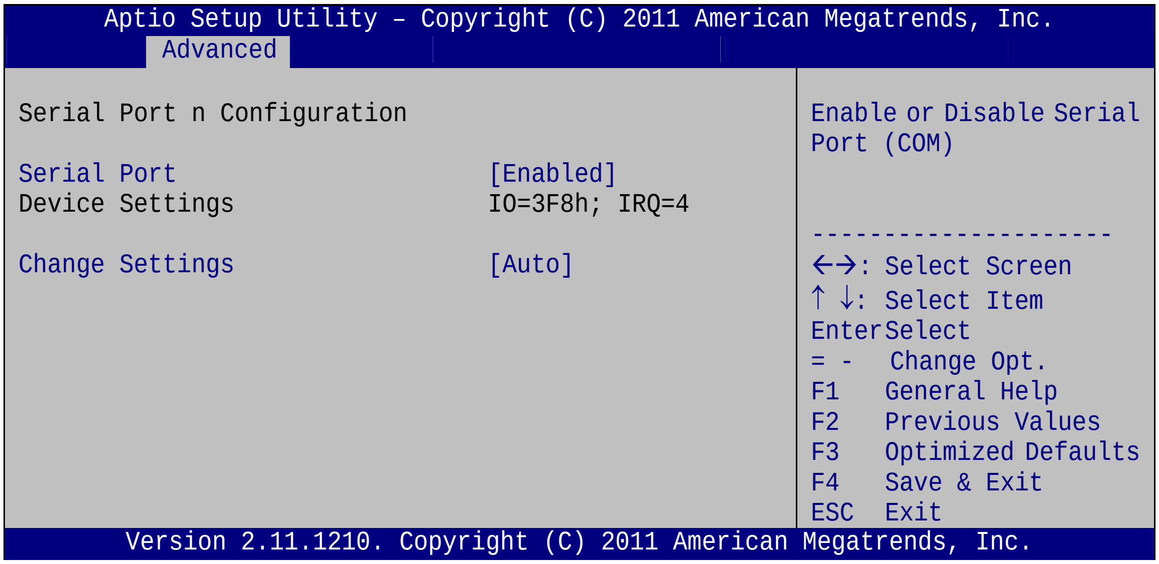
➔ **Power Saving Function [Disabled]**

Use the **Power Saving Function** BIOS option to enable or reduce power consumption in the S5 state. When enabled, the system can only be powered-up using the power button.

➔	**Disabled**	**DEFAULT**	Power Saving Function support disabled
➔	**Enabled**		Power Saving Function support enabled

5.3.7.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 11**) to configure the serial port n.



```
     Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
        Advanced

Serial Port n Configuration                             Enable or Disable Serial
                                                        Port (COM)
Serial Port                      [Enabled]
Device Settings                  IO=3F8h; IRQ=4
                                                        ---------------------
Change Settings                  [Auto]                 ←→: Select Screen
                                                        ↑ ↓: Select Item
                                                        EnterSelect
                                                        = -   Change Opt.
                                                        F1    General Help
                                                        F2    Previous Values
                                                        F3    Optimized Defaults
                                                        F4    Save & Exit
                                                        ESC   Exit
      Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 11: Serial Port n Configuration Menu

5.3.7.1.1 Serial Port 1 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔	**Disabled**		Disable the serial port
➔	**Enabled**	**DEFAULT**	Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔	**Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔	**IO=3F8h; IRQ=4**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ4

➔ **IO=3F8h; IRQ=3, 4**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
➔ **IO=2F8h; IRQ=3, 4**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
➔ **IO=2C0h; IRQ=3, 4**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4
➔ **IO=2C8h; IRQ=3, 4**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4

5.3.7.1.2 Serial Port 2 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2F8h; IRQ=3**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3
➔ **IO=3F8h; IRQ=3, 4**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
➔ **IO=2F8h; IRQ=3, 4**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
➔ **IO=2C0h; IRQ=3, 4**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4

➔ **IO=2C8h;** **IRQ=3, 4**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4

5.3.7.1.3 Serial Port 4 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2E8h;** **IRQ=10**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ10
➔ **IO=3E8h;** **IRQ=10, 11**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
➔ **IO=2E8h;** **IRQ=10, 11**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
➔ **IO=2D0h;** **IRQ=10, 11**		Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
➔ **IO=2D8h;** **IRQ=10, 11**		Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11

5.3.7.1.4 Serial Port 6 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔	**Disabled**		Disable the serial port
➔	**Enabled**	**DEFAULT**	Enable the serial port

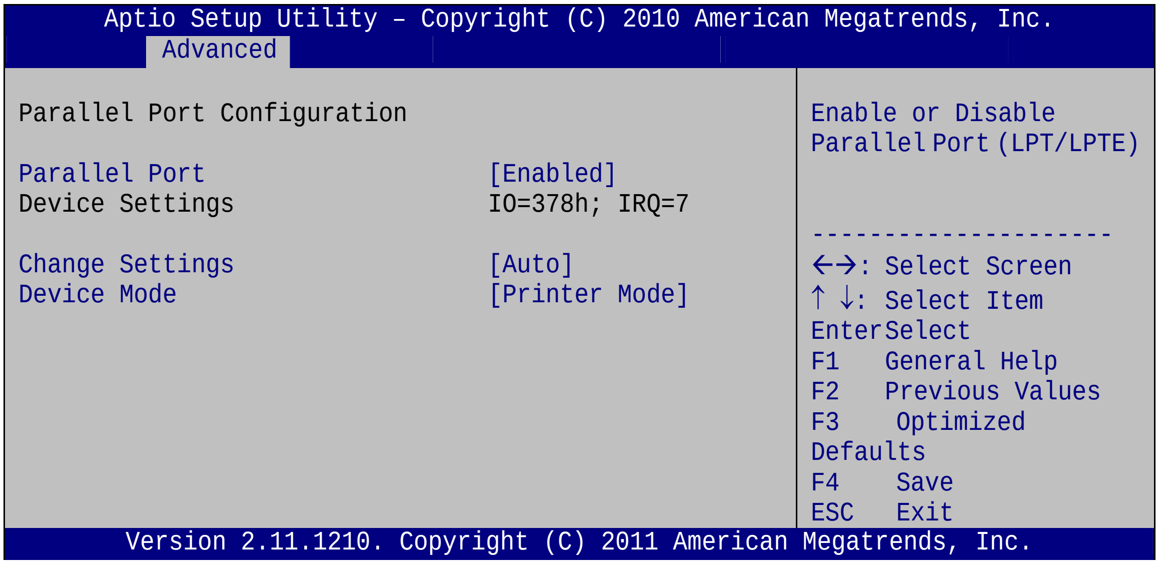
➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔	**Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔	**IO=2D8h; IRQ=10**		Serial Port I/O port address is 2D8h and the interrupt address is IRQ10
➔	**IO=2C0h; IRQ=10, 11**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
➔	**IO=2C8h; IRQ=10, 11**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11
➔	**IO=2D0h; IRQ=10, 11**		Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
➔	**IO=2D8h; IRQ=10, 11**		Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11
➔	**IO=2E0h; IRQ=10, 11**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

5.3.7.2 Parallel Port Configuration

Use the **Parallel Port Configuration** menu (**BIOS Menu 11**) to configure the serial port n.



```
      Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
         Advanced

Parallel Port Configuration                                  Enable or Disable
                                                             Parallel Port (LPT/LPTE)
Parallel Port                      [Enabled]
Device Settings                    IO=378h; IRQ=7

Change Settings                    [Auto]                    ---------------------
Device Mode                        [Printer Mode]            ←→: Select Screen
                                                             ↑ ↓: Select Item
                                                             EnterSelect
                                                             F1   General Help
                                                             F2   Previous Values
                                                             F3    Optimized
                                                             Defaults
                                                             F4    Save
                                                             ESC   Exit
      Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 12: Parallel Port Configuration Menu

➔ Parallel Port [Enabled]

Use the **Parallel Port** option to enable or disable the parallel port.

➔	**Disabled**		Disable the parallel port
➔	**Enabled**	**DEFAULT**	Enable the parallel port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the parallel port IO port address and interrupt address.

➔	**Auto**	**DEFAULT**	The parallel port IO port address and interrupt address are automatically detected.
➔	**IO=378h; IRQ=7**		Parallel Port I/O port address is 378h and the interrupt address is IRQ7
➔	**IO=278h; IRQ=7**		Parallel Port I/O port address is 278h and the interrupt address is IRQ7

➔ **IO=3BCh; IRQ=7** Parallel Port I/O port address is 3BCh and the interrupt address is IRQ7

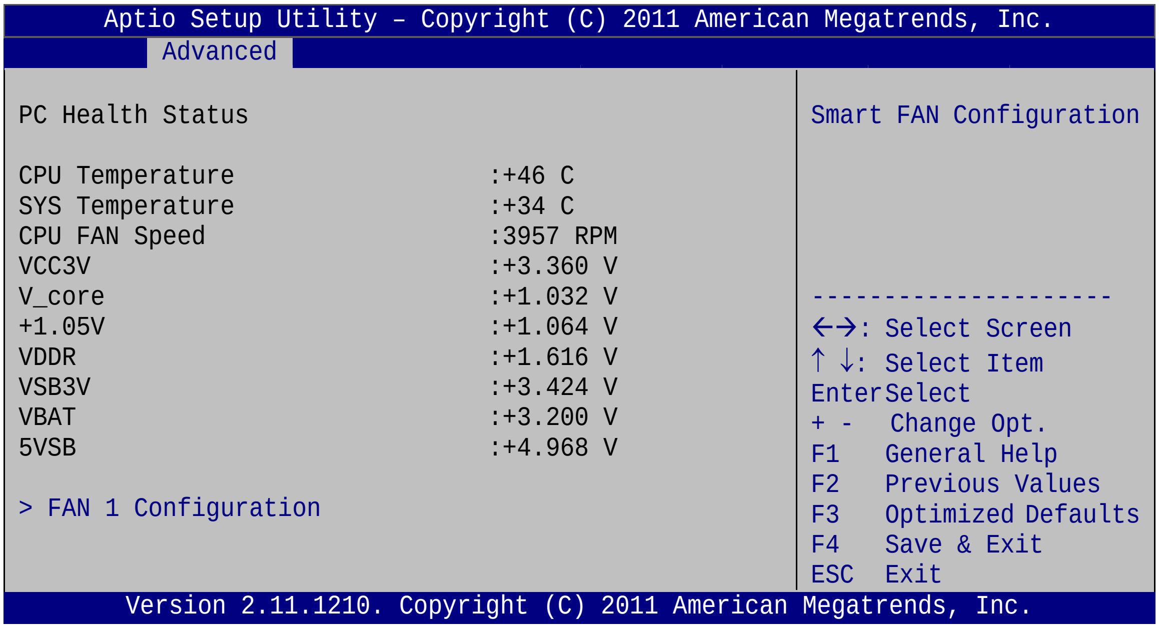
➔ Device Mode [Printer Mode]

Use the **Device Mode** option to select the mode the parallel port operates in. Configuration options are listed below.

- 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

5.3.8 H/W Monitor

The H/W Monitor menu (**BIOS Menu 13**) contains the fan configuration submenus and displays operating temperature, fan speeds and system voltages.



```
     Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
          Advanced

 PC Health Status                                    Smart FAN Configuration

 CPU Temperature                 :+46 C
 SYS Temperature                 :+34 C
 CPU FAN Speed                   :3957 RPM
 VCC3V                           :+3.360 V
 V_core                          :+1.032 V           ---------------------
 +1.05V                          :+1.064 V           ←→: Select Screen
 VDDR                            :+1.616 V           ↑ ↓: Select Item
 VSB3V                           :+3.424 V           EnterSelect
 VBAT                            :+3.200 V           + -   Change Opt.
 5VSB                            :+4.968 V           F1    General Help
                                                     F2    Previous Values
 > FAN 1 Configuration                               F3    Optimized Defaults
                                                     F4    Save & Exit
                                                     ESC   Exit
        Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 13: H/W Monitor

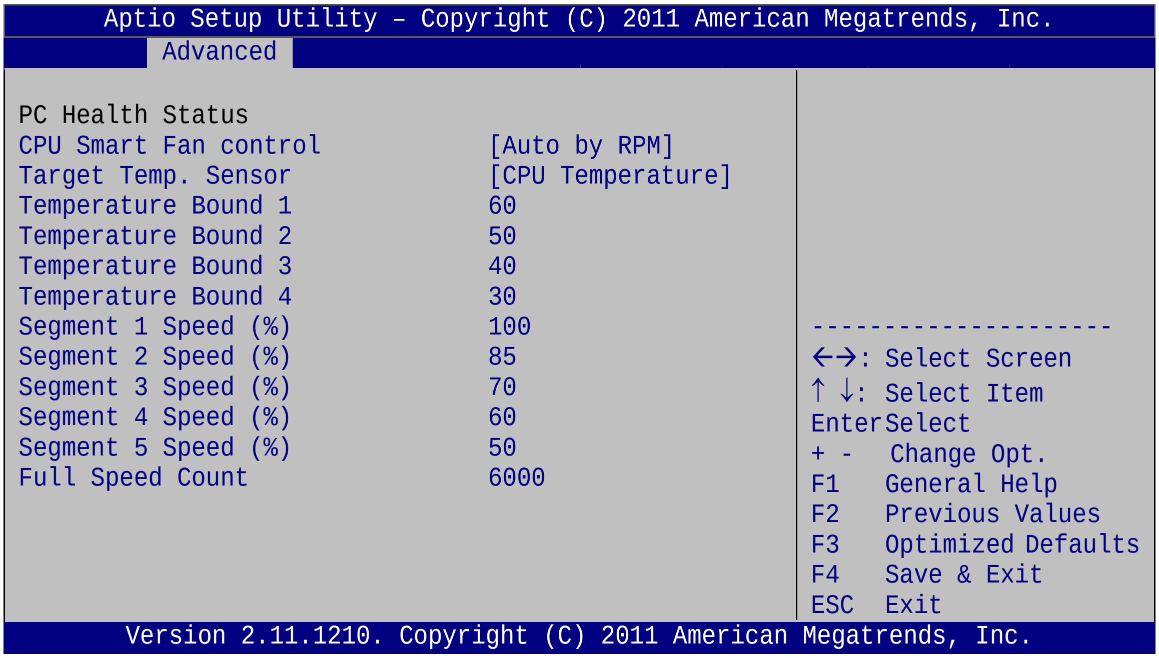
➔ **PC Health Status**

The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
    - CPU Temperature
    - System Temperature
- Fan Speeds:
    - CPU Fan Speed
- Voltages:
    - VCC3V
    - Vcore
    - Vcc
    - +1.05V
    - VDDR
    - VSB3V
    - VBAT
    - 5VSB

5.3.8.1 FAN 1 Configuration

Use the **FAN 1 Configuration submenu** (**BIOS Menu 14**) to configure fan 1 temperature and speed settings.



```
              Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
                  Advanced

  PC Health Status
  CPU Smart Fan control              [Auto by RPM]
  Target Temp. Sensor                [CPU Temperature]
  Temperature Bound 1                60
  Temperature Bound 2                50
  Temperature Bound 3                40
  Temperature Bound 4                30
  Segment 1 Speed (%)                100                  ---------------------
  Segment 2 Speed (%)                85                   ←→: Select Screen
  Segment 3 Speed (%)                70                   ↑ ↓: Select Item
  Segment 4 Speed (%)                60                   EnterSelect
  Segment 5 Speed (%)                50                   + -   Change Opt.
  Full Speed Count                   6000                 F1    General Help
                                                          F2    Previous Values
                                                          F3    Optimized Defaults
                                                          F4    Save & Exit
                                                          ESC   Exit
              Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 14: FAN 1 Configuration

➔ CPU Smart Fan control [Auto by RPM]

Use the **CPU Smart Fan control** option to configure the CPU Smart Fan.

➔ **Auto by RPM**	**DEFAULT**	The fan adjusts its speed using Auto by RPM settings
➔ **Auto by Duty-Cycle**		The fan adjusts its speed using Auto by Duty-Cycle settings
➔ **Manual by RPM**		The fan spins at the speed set in Manual by RPM settings
➔ **Manual by Duty-Cycle**		The fan spins at the speed set in Manual by Duty Cycle settings

➔ Target Temp. Sensor [CPU Temperature]

Use the **Target Temp. Sensor** option to set the target CPU temperature.

➔ **CPU Temperature**	**DEFAULT**	Sets the target temperature sensor to the CPU temperature.

- **SYS Temperature** Sets the target temperature sensor to the System Temperature setting.

- **Temperature Bound n**

Use the + or – key to change the fan **Temperature Bound n** value. Enter a decimal number between 0 and 127.

- **Segment n Speed (%)**

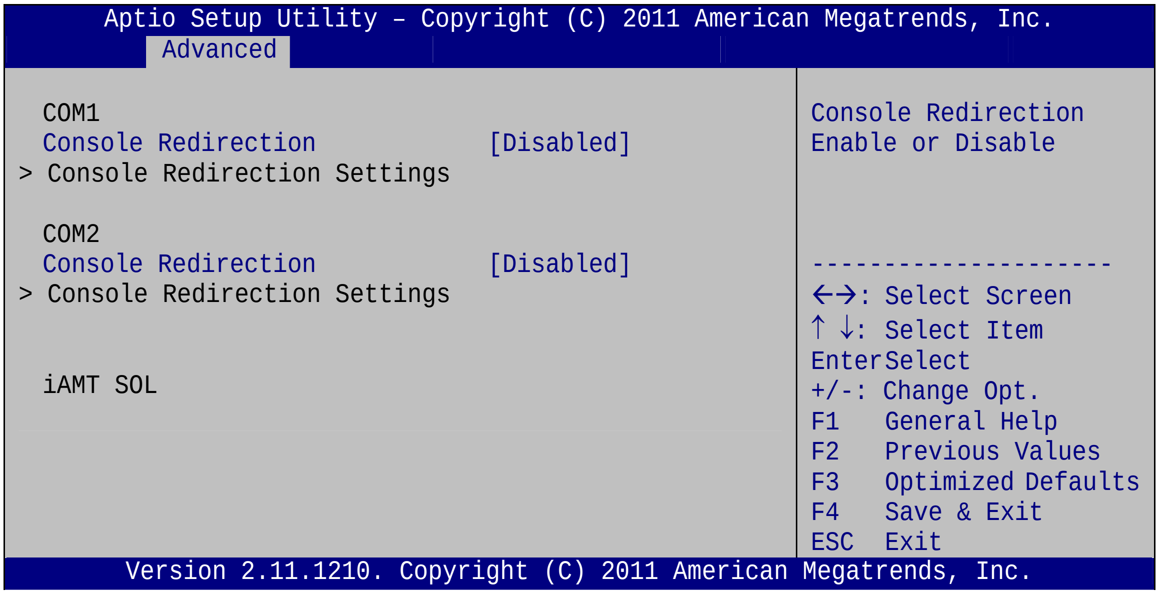
Use the + or – key to change the fan **Segment n Speed** value in percentage. Enter a decimal number between 0 and 100.

- **Full Speed Count**

Use the + or – key to change the fan **Full Speed Count** value. Enter a decimal number between 500 and 15000.

5.3.9 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 15**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



```
     Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
          Advanced

  COM1                                        Console Redirection
  Console Redirection          [Disabled]     Enable or Disable
> Console Redirection Settings

  COM2
  Console Redirection          [Disabled]     ---------------------
> Console Redirection Settings                ←→: Select Screen
                                              ↑ ↓: Select Item
                                              EnterSelect
  iAMT SOL                                    +/-: Change Opt.
                                              F1   General Help
                                              F2   Previous Values
                                              F3   Optimized Defaults
                                              F4   Save & Exit
                                              ESC  Exit
      Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 15: Serial Port Console Redirection

➔ Console Redirection [Disabled]

Use **Console Redirection** option to enable or disable the console redirection function.

➔ **Disabled**	**DEFAULT**	Disabled the console redirection function
➔ **Enabled**		Enabled the console redirection function

➔ Terminal Type [VT-100+]

Use the **Terminal Type** option to specify the remote terminal type.

➔ **VT100**		The target terminal type is VT100
➔ **VT100+**	**DEFAULT**	The target terminal type is VT100+
➔ **VT-UTF8**		The target terminal type is VT-UTF8
➔ **ANSI**		The target terminal type is ANSI

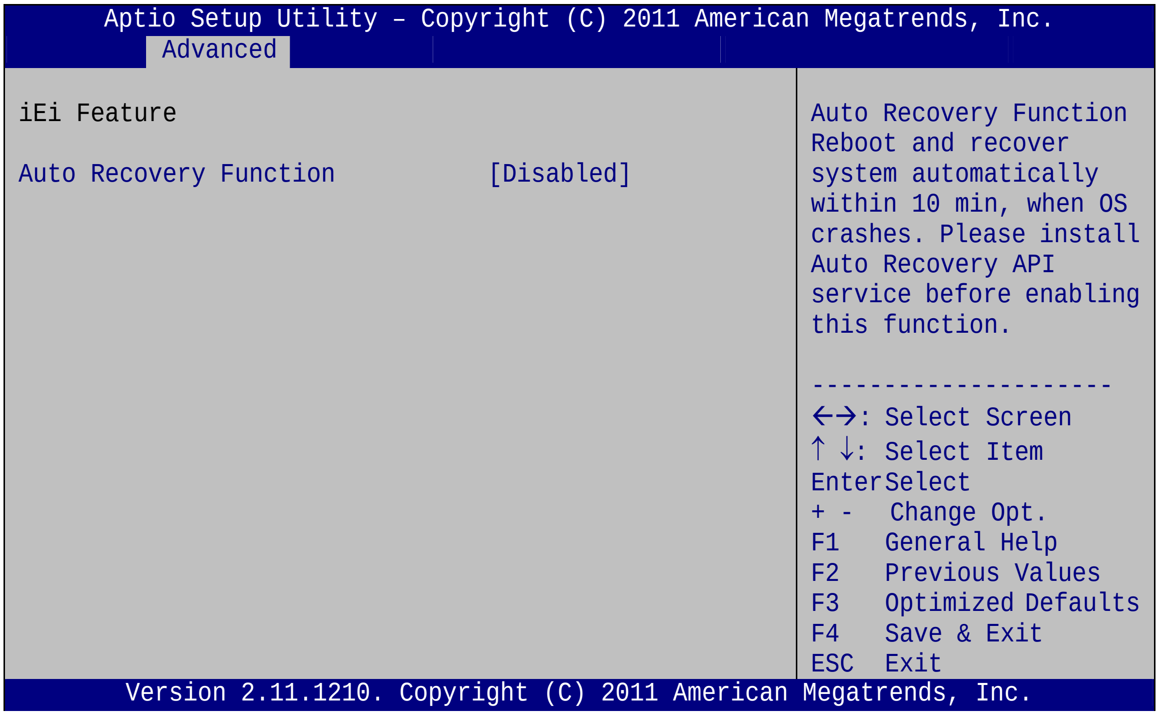
➔ Bits per second [115200]

Use the **Bits per second** option to specify the serial port transmission speed. The speed must match the other side. Long or noisy lines may require lower speeds.

➔ **9600**		Sets the serial port transmission speed at 9600.
➔ **19200**		Sets the serial port transmission speed at 19200.
➔ **38400**		Sets the serial port transmission speed at 38400.
➔ **57600**		Sets the serial port transmission speed at 57600.
➔ **115200**	**DEFAULT**	Sets the serial port transmission speed at 115200.

5.3.10 iEi Feature

Use the **iEi Feature** menu (**BIOS Menu 16**) to configure One Key Recovery function.



```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
      Advanced

iEi Feature                             Auto Recovery Function
                                        Reboot and recover
Auto Recovery Function    [Disabled]    system automatically
                                        within 10 min, when OS
                                        crashes. Please install
                                        Auto Recovery API
                                        service before enabling
                                        this function.

                                        ---------------------
                                        ←→: Select Screen
                                        ↑ ↓: Select Item
                                        EnterSelect
                                        + -   Change Opt.
                                        F1    General Help
                                        F2    Previous Values
                                        F3    Optimized Defaults
                                        F4    Save & Exit
                                        ESC   Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 16: IEI Feature

➔ Auto Recovery Function [Disabled]

Use the **Auto Recovery Function** BIOS option to enable or disable the auto recovery function of the IEI One Key Recovery.

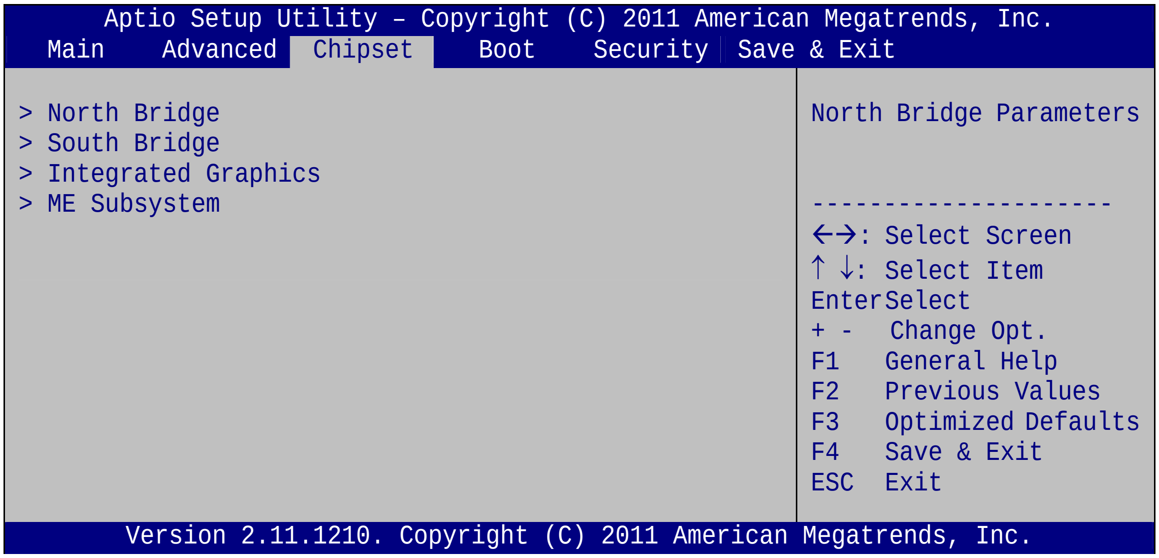
➔	**Disabled**	**DEFAULT**	Auto recovery function disabled
➔	**Enabled**		Auto recovery function enabled

5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 17**) to access the Northbridge, Southbridge, Integrated Graphics, and ME Subsystem configuration menus.

WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

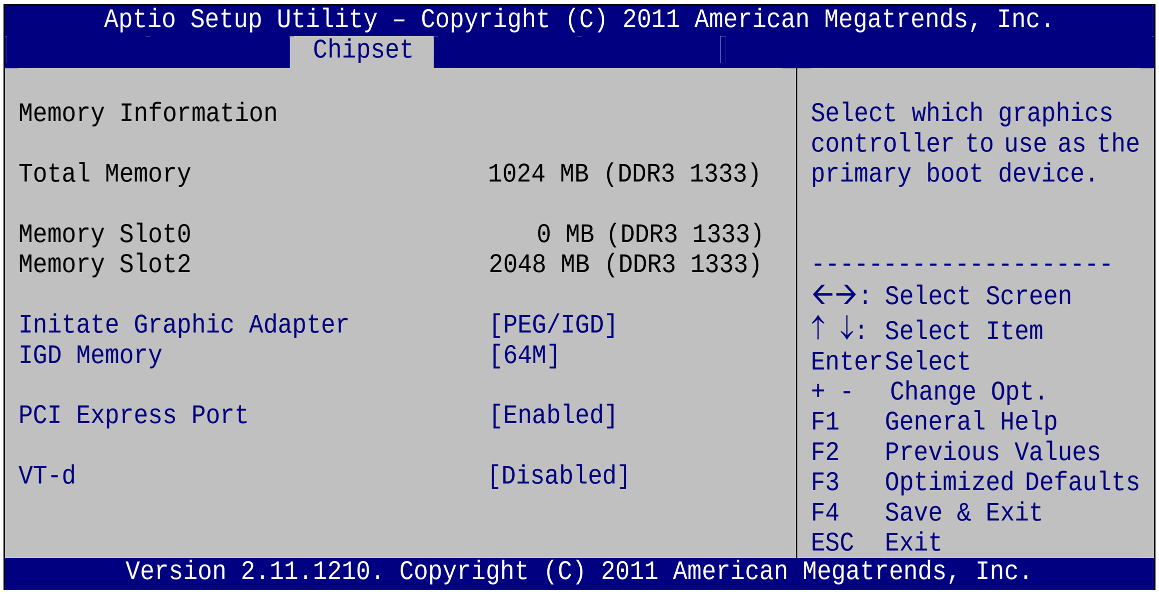


```
     Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
  Main    Advanced   Chipset     Boot    Security  Save & Exit

> North Bridge                                 North Bridge Parameters
> South Bridge
> Integrated Graphics
> ME Subsystem
                                               ---------------------
                                               ←→: Select Screen
                                               ↑ ↓: Select Item
                                               EnterSelect
                                               + -   Change Opt.
                                               F1    General Help
                                               F2    Previous Values
                                               F3    Optimized Defaults
                                               F4    Save & Exit
                                               ESC   Exit
        Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 17: Chipset

5.4.1 Northbridge Configuration

Use the **North Bridge** menu (**BIOS Menu 18**) to configure the Northbridge chipset.



```
     Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
                             Chipset

Memory Information                             Select which graphics
                                               controller to use as the
Total Memory                1024 MB (DDR3 1333)  primary boot device.

Memory Slot0                   0 MB (DDR3 1333)
Memory Slot2                2048 MB (DDR3 1333)  ---------------------
                                               ←→: Select Screen
Initate Graphic Adapter     [PEG/IGD]          ↑ ↓: Select Item
IGD Memory                  [64M]              EnterSelect
                                               + -   Change Opt.
PCI Express Port            [Enabled]          F1    General Help
                                               F2    Previous Values
VT-d                        [Disabled]         F3    Optimized Defaults
                                               F4    Save & Exit
                                               ESC   Exit
        Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 18:Northbridge Chipset Configuration

➔ Initiate Graphic Adapter [PEG/IGD]

Use the **Initiate Graphic Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD
- PCI/IGD
- PCI/PEG
- PEG/IGD **DEFAULT**
- PEG/PCI

➔ IGD Memory [64M]

Use the **IGD Memory** option to specify the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**		
➔ **32M**		32 MB of memory used by internal graphics device
➔ **64M**	**DEFAULT**	64 MB of memory used by internal graphics device
➔ **96M**		96 MB of memory used by internal graphics device
➔ **128M**		128 MB of memory used by internal graphics device
➔ **160M**		160 MB of memory used by internal graphics device
➔ **192M**		192 MB of memory used by internal graphics device
➔ **224M**		224 MB of memory used by internal graphics device
➔ **256M**		256 MB of memory used by internal graphics device

➔ **288M**		288 MB of memory used by internal graphics device
➔ **320M**		320 MB of memory used by internal graphics device
➔ **352M**		352 MB of memory used by internal graphics device
➔ **384M**		384 MB of memory used by internal graphics device
➔ **416M**		416 MB of memory used by internal graphics device
➔ **448M**		448 MB of memory used by internal graphics device
➔ **480M**		480 MB of memory used by internal graphics device
➔ **512M**		512 MB of memory used by internal graphics device

➔ **PCI Express Port [Enabled]**

Use the **PCI Express Port** option to enable or disable the PCI Express port.

➔ **Disabled**		Disables the PCI Express port.
➔ **Enabled**	**DEFAULT**	Enables the PCI Express port.

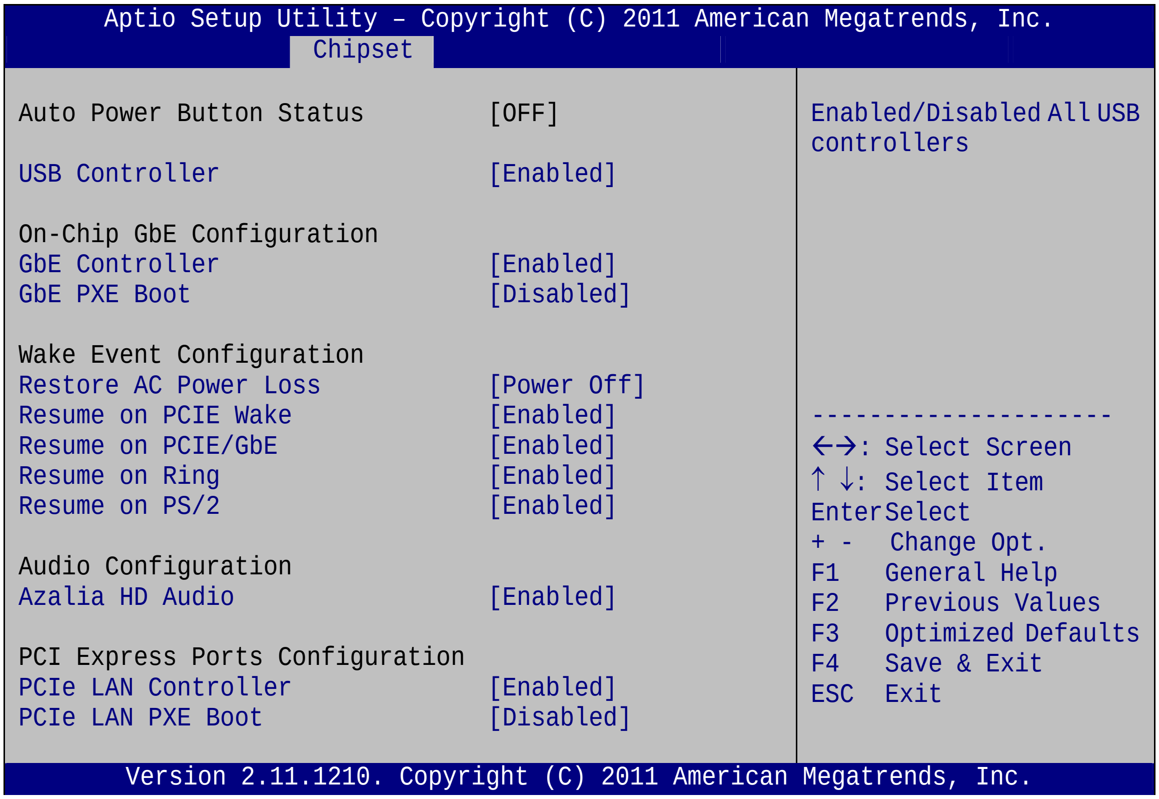
➔ **VT-d [Disabled]**

Use the **VT-d** option to enable or disable VT-d support.

➔ **Disabled**	**DEFAULT**	Disables VT-d support.
➔ **Enabled**		Enables VT-d support.

5.4.2 Southbridge Configuration

Use the **South Bridge** menu (**BIOS Menu 19**) to configure the Southbridge chipset.



```
   Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
                     Chipset

 Auto Power Button Status         [OFF]            Enabled/Disabled All USB
                                                   controllers
 USB Controller                   [Enabled]

 On-Chip GbE Configuration
 GbE Controller                   [Enabled]
 GbE PXE Boot                     [Disabled]

 Wake Event Configuration
 Restore AC Power Loss            [Power Off]
 Resume on PCIE Wake              [Enabled]        ---------------------
 Resume on PCIE/GbE               [Enabled]        ←→: Select Screen
 Resume on Ring                   [Enabled]        ↑ ↓: Select Item
 Resume on PS/2                   [Enabled]        EnterSelect
                                                   + -   Change Opt.
 Audio Configuration                               F1    General Help
 Azalia HD Audio                  [Enabled]        F2    Previous Values
                                                   F3    Optimized Defaults
 PCI Express Ports Configuration                   F4    Save & Exit
 PCIe LAN Controller              [Enabled]        ESC   Exit
 PCIe LAN PXE Boot                [Disabled]

     Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 19: Southbridge Chipset Configuration

➔ **USB Controller [Enabled]**

Use the **USB Controller** option to enable or disable all USB controller.

➔ **Disabled**		All of the onboard USB controllers are disabled
➔ **Enabled**	**DEFAULT**	All of the onboard USB controller are enabled

➔ **GbE Controller [Enabled]**

Use the **GbE Controller** option to enable or disable the GbE controller. Before disabling the GbE controller, the AMT function must be disabled.

➔ **Disabled**		The onboard GbE controller is disabled

Enabled	**DEFAULT**	The onboard GbE controller is enabled

GbE PXE Boot [Disabled]

Use the **GbE PXE Boot** option to enable or disable the boot option for GbE devices.

Disabled	**DEFAULT**	Disables the GbE PXE Boot option
Enabled		Enables the GbE PXE Boot option

Restore on AC Power Loss [Power Off]

Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

Power Off	**DEFAULT**	The system remains turned off
Power On		The system turns on
Last State		The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

Resume on PCIE Wake [Enabled]

Use the **Resume on PCIE Wake** option to enable or disable resuming from the PCIe wake message and WAKE# signal.

Disabled		Disables Resume on PCIe Wake option
Enabled	**DEFAULT**	Enables Resume on PCIe Wake option

Resume on PME/GbE [Enabled]

Use the **Resume on PME/GbE** option to enable or disable resuming from PCI PME# or GbE signal.

Disabled		Disables Resume on PCI PME/GbE option
Enabled	**DEFAULT**	Enables Resume on PCI PME/GbE option

➔ **Resume on Ring [Enabled]**

Use the **Resume on Ring** option to enable or disable resuming from RI# signal.

➔	**Disabled**		Disables Resume on Ring option
➔	**Enabled**	**DEFAULT**	Enables Resume on Ring option

➔ **Resume on PS/2 [Enabled]**

Use the **Resume on PS/2** option to enable or disable resuming from PS/2 activation.

➔	**Disabled**		Disables Resume on PS/2 option
➔	**Enabled**	**DEFAULT**	Enables Resume on PS/2 option

➔ **Azalia HD Audio [Enabled]**

Use the **Azalia HD Audio** option to enable or disable the High Definition Audio controller.

➔	**Disabled**		The onboard High Definition Audio controller is disabled
➔	**Enabled**	**DEFAULT**	The onboard High Definition Audio controller is detected automatically and enabled

➔ **PCIe LAN Controller [Enabled]**

Use the **PCIe LAN Controller** option to enable or disable the PCI Express LAN controller.

➔	**Disabled**		The onboard PCIe LAN controller is disabled
➔	**Enabled**	**DEFAULT**	The onboard PCIe LAN controller is ensabled

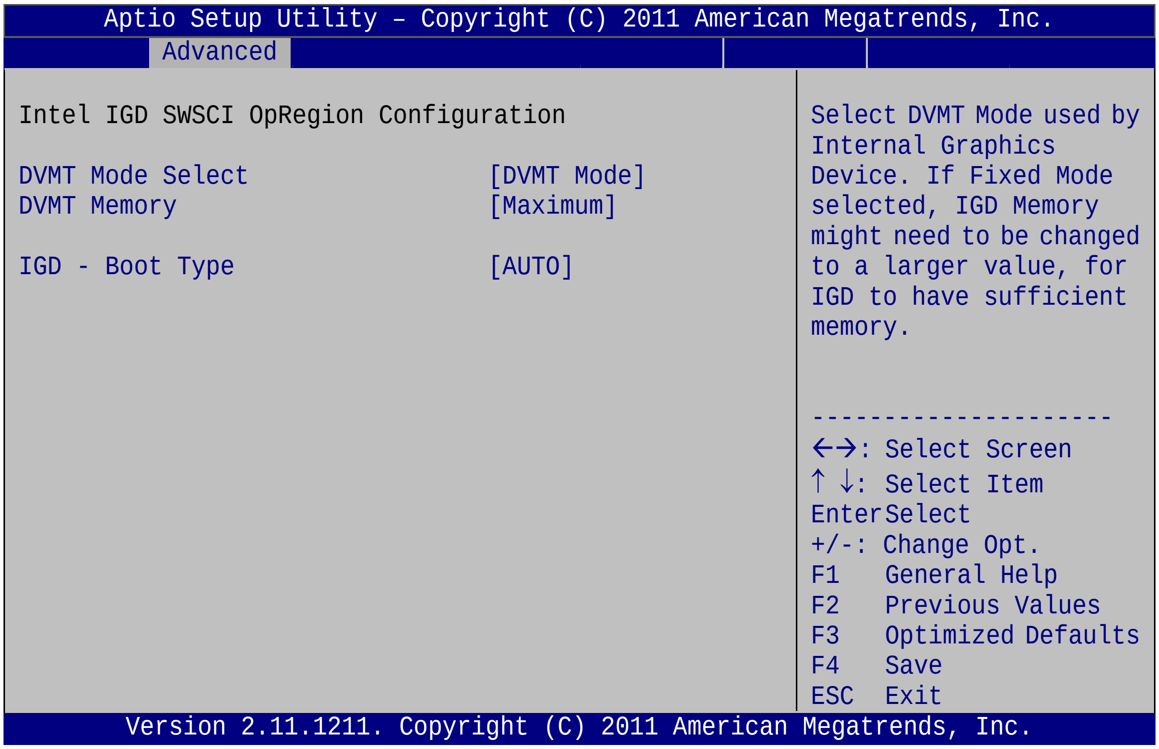
➔ **PCIe LAN PXE Boot [Disabled]**

Use the **PCIe LAN PXE Boot** option to enable or disable the boot option for the PCIe LAN PXE.

➔	**Disabled**	**DEFAULT**	Disables PCIe LAN PXE Boot option
➔	**Enabled**		Enables PCIe LAN PXE Boot option

5.4.3 Integrated Graphics

Use the **Integrated Graphics** menu (**BIOS Menu 20**) to configure the video device connected to the system.



```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
          Advanced

Intel IGD SWSCI OpRegion Configuration           Select DVMT Mode used by
                                                 Internal Graphics
DVMT Mode Select                [DVMT Mode]      Device. If Fixed Mode
DVMT Memory                     [Maximum]        selected, IGD Memory
                                                 might need to be changed
IGD - Boot Type                 [AUTO]           to a larger value, for
                                                 IGD to have sufficient
                                                 memory.


                                                 ---------------------
                                                 ←→: Select Screen
                                                 ↑ ↓: Select Item
                                                 EnterSelect
                                                 +/-: Change Opt.
                                                 F1   General Help
                                                 F2   Previous Values
                                                 F3   Optimized Defaults
                                                 F4   Save
                                                 ESC  Exit
Version 2.11.1211. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 20: Integrated Graphics

➔ DVMT Mode Select [DVMT Mode]

Use the **DVMT Mode Select** option to select the Intel Dynamic Video Memory Technology (DVMT) operating mode.

- ➔ **Fixed Mode** A fixed portion of graphics memory is reserved as graphics memory.
- ➔ **DVMT Mode** **DEFAULT** Graphics memory is dynamically allocated according to the system and graphics needs.

➔ DVMT Memory [Maximum]

Use the **DVMT Memory** option to specify the maximum amount of memory that can be allocated as graphics memory. Configuration options are listed below.

- 128 MB
- 256 MB
- Maximum **DEFAULT**

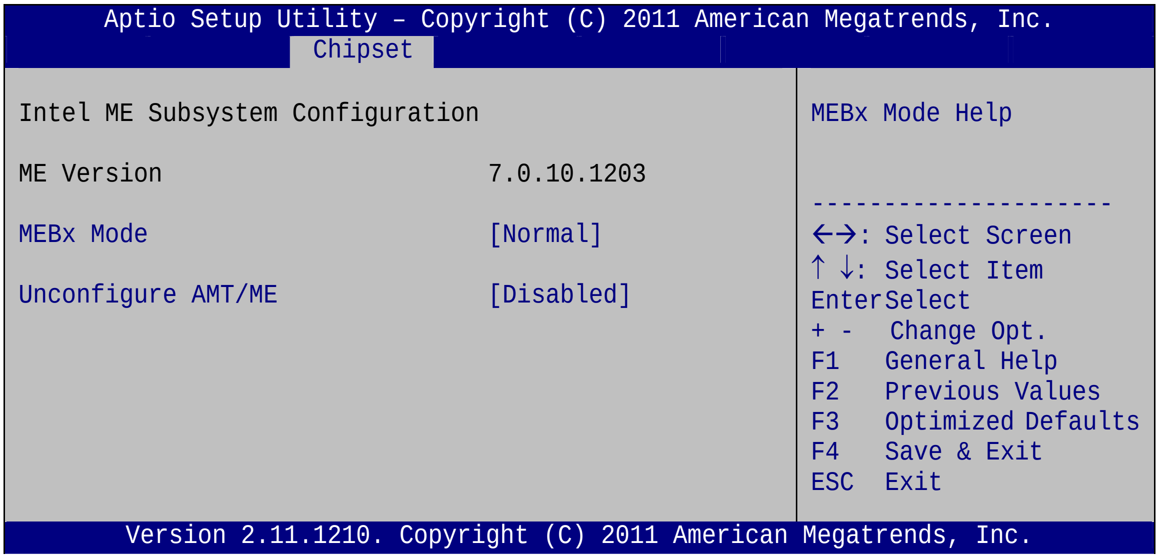
→ **IGD - Boot Type [AUTO]**

Use the **IGD - Boot Type** option to select the display device used by the system when it boots. For dual display support, select "Auto." Configuration options are listed below.

- AUTO **DEFAULT**
- CRT
- DVI

5.4.4 ME Subsystem

Use the **ME Subsystem** menu (**BIOS Menu 21**) to configure the Intel® Management Engine (ME) configuration options.



```
   Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
                    Chipset

 Intel ME Subsystem Configuration                 MEBx Mode Help

 ME Version                     7.0.10.1203
                                                  ---------------------
 MEBx Mode                      [Normal]          ←→: Select Screen
                                                  ↑ ↓: Select Item
 Unconfigure AMT/ME             [Disabled]        EnterSelect
                                                  + -   Change Opt.
                                                  F1    General Help
                                                  F2    Previous Values
                                                  F3    Optimized Defaults
                                                  F4    Save & Exit
                                                  ESC   Exit

      Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 21: ME Subsystem

→ **MEBx Mode [Normal]**

Use the **MEBx Mode** option to configure MEBx Mode options.

→ **Normal** **DEFAULT** Enables normal mode

➔	**Hidden Ctrl + P**	Enables hidden Ctrl+P function
➔	**Enter MEBx Setup**	Enables user to enter MEBx setup

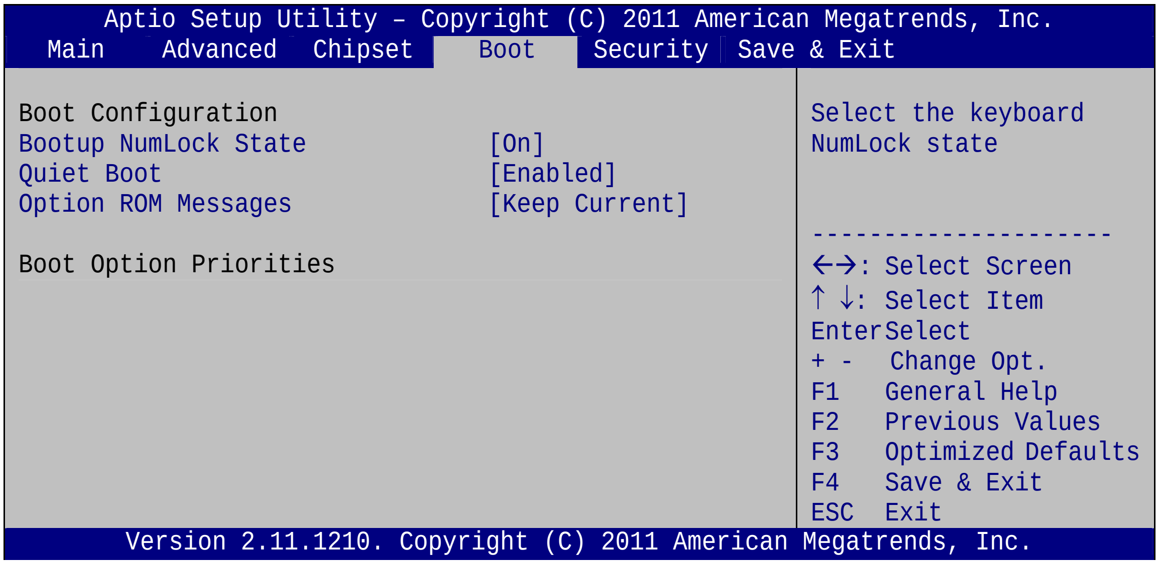
➔ Unconfigure AMT/ME [Disabled]

Use the **Unconfigure AMT/ME** option to perform AMT/ME unconfigure without password operation.

➔	**Disabled**	**DEFAULT**	Disable AMT/ME unconfigure
➔	**Enabled**		Enable AMT/ME unconfigure

5.5 Boot

Use the **Boot** menu (**BIOS Menu 22**) to configure system boot options.



```
     Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
  Main    Advanced   Chipset      Boot     Security  Save & Exit

 Boot Configuration                                   Select the keyboard
 Bootup NumLock State              [On]               NumLock state
 Quiet Boot                        [Enabled]
 Option ROM Messages               [Keep Current]
                                                      ---------------------
 Boot Option Priorities                               ←→: Select Screen
                                                      ↑ ↓: Select Item
                                                      EnterSelect
                                                      + -   Change Opt.
                                                      F1    General Help
                                                      F2    Previous Values
                                                      F3    Optimized Defaults
                                                      F4    Save & Exit
                                                      ESC   Exit
        Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 22: Boot

➔ Bootup NumLock State [On]

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **On**	DEFAULT	Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.
➔ **Off**		Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ Quiet Boot [Enabled]

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**		Normal POST messages displayed
➔ **Enabled**	DEFAULT	OEM Logo displayed instead of POST messages

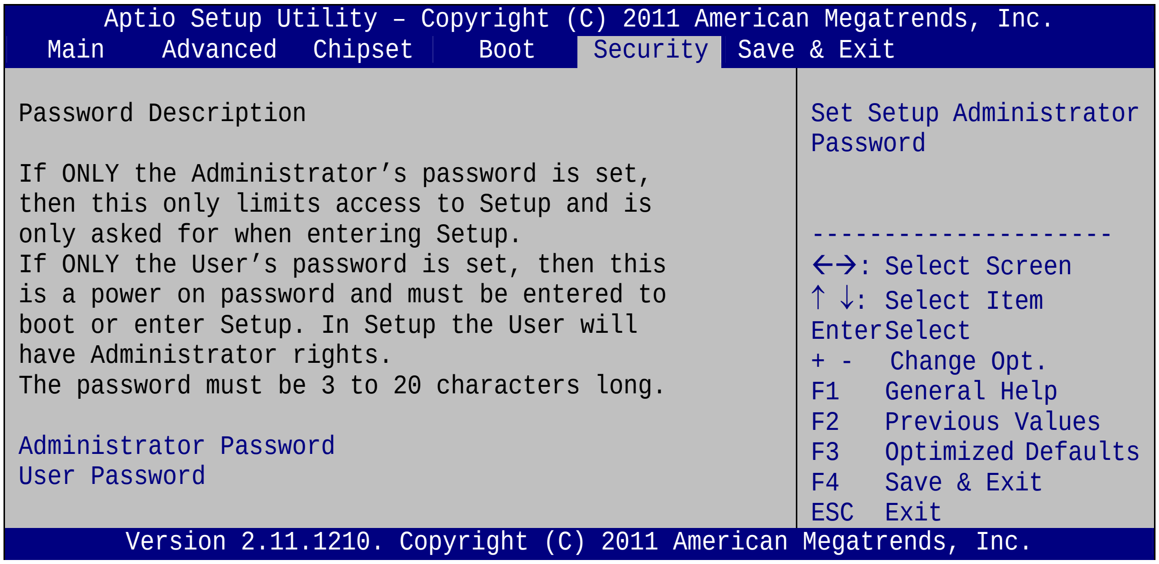
➔ Option ROM Messages [Keep Current]

Use the **Option ROM Messages** option to set the Option ROM display mode.

➔ **Force BIOS**		Sets display mode to force BIOS.
➔ **Keep Current**	DEFAULT	Sets display mode to current.

5.6 Security

Use the **Security** menu (**BIOS Menu 23**) to set system and user passwords.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main
Advanced
Chipset
Boot
Security
Save & Exit

```
Password Description                                  Set Setup Administrator
                                                      Password
If ONLY the Administrator's password is set,
then this only limits access to Setup and is
only asked for when entering Setup.                   ---------------------
If ONLY the User's password is set, then this         ←→: Select Screen
is a power on password and must be entered to         ↑ ↓: Select Item
boot or enter Setup. In Setup the User will           EnterSelect
have Administrator rights.                            + -   Change Opt.
The password must be 3 to 20 characters long.         F1    General Help
                                                      F2    Previous Values
Administrator Password                                F3    Optimized Defaults
User Password                                         F4    Save & Exit
                                                      ESC   Exit
```

Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

BIOS Menu 23: Security

➔ Administrator Password

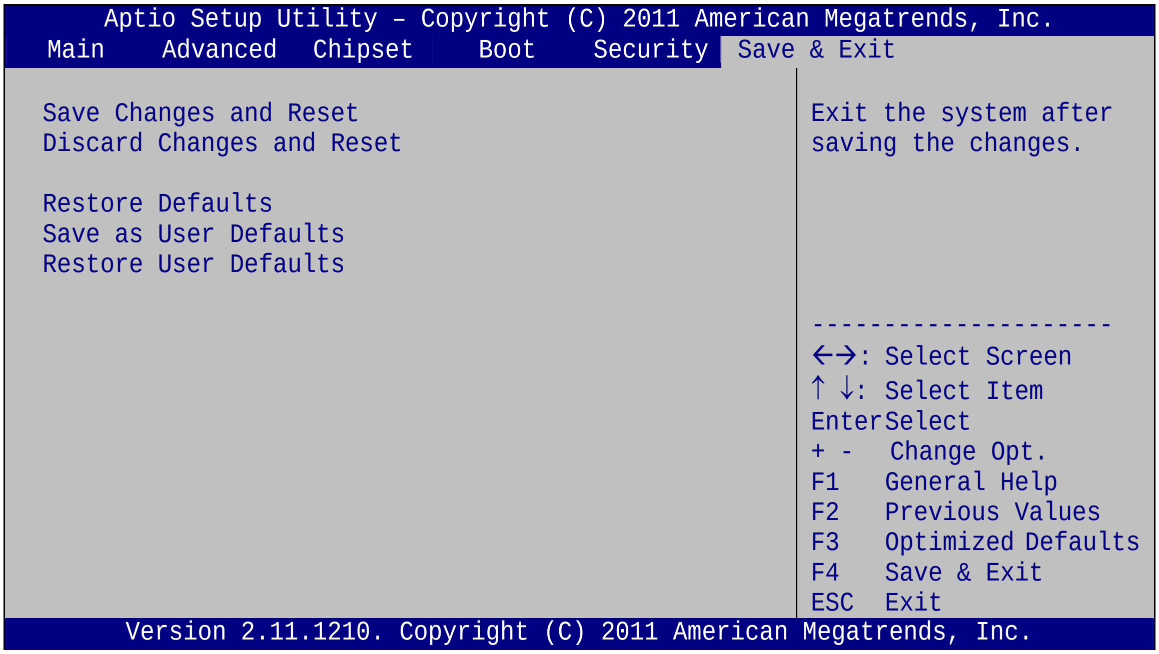
Use the **Administrator Password** to set or change a administrator password.

➔ User Password

Use the **User Password** to set or change a user password.

5.7 Exit

Use the **Exit** menu (**BIOS Menu 24**) to load default BIOS values, optimal failsafe values and to save configuration changes.



```
      Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
   Main     Advanced   Chipset     Boot     Security  Save & Exit

  Save Changes and Reset                                Exit the system after
  Discard Changes and Reset                             saving the changes.

  Restore Defaults
  Save as User Defaults
  Restore User Defaults


                                                        ---------------------
                                                        ←→: Select Screen
                                                        ↑ ↓: Select Item
                                                        EnterSelect
                                                        + -   Change Opt.
                                                        F1    General Help
                                                        F2    Previous Values
                                                        F3    Optimized Defaults
                                                        F4    Save & Exit
                                                        ESC   Exit
        Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 24:Exit

➔ Save Changes and Reset

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and reset the system.

➔ Discard Changes and Reset

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

➔ Restore Defaults

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

➔ Save as User Defaults

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

➔ Restore User Defaults

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Chapter

6

Software Drivers

6.1 Available Software Drivers

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system:

- Chipset
- Graphic
- LAN
- Audio
- Intel® AMT
    - Intel® Management Engine Components driver
    - Intel® IT Director application

Installation instructions are given below.

6.2 Software Installation

All the drivers for the PCIE-Q670 Series are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

NOTE:

If the installation program doesn't start automatically:
Click "Start->My Computer->CD Drive->autorun.exe"

Step 2: The driver main menu appears (**Figure 6-1**).

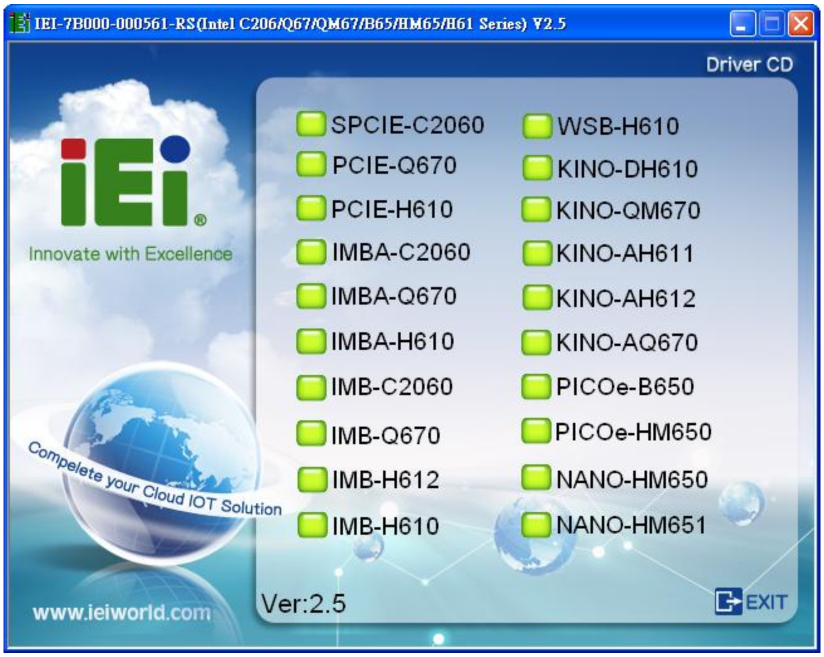

IEI-7B000-000561-RS(Intel C206/Q67/QM67/B65/HM65/H61 Series) V2.5
Driver CD
iEi
Innovate with Excellence
Compelete your Cloud IOT Solution
www.ieiworld.com
SPCIE-C2060
PCIE-Q670
PCIE-H610
IMBA-C2060
IMBA-Q670
IMBA-H610
IMB-C2060
IMB-Q670
IMB-H612
IMB-H610
WSB-H610
KINO-DH610
KINO-QM670
KINO-AH611
KINO-AH612
KINO-AQ670
PICOe-B650
PICOe-HM650
NANO-HM650
NANO-HM651
Ver:2.5
EXIT

Figure 6-1: Introduction Screen

Step 3: Click PCIE-Q670.

Step 4: A new screen with a list of available drivers appears (**Figure 6-2**).

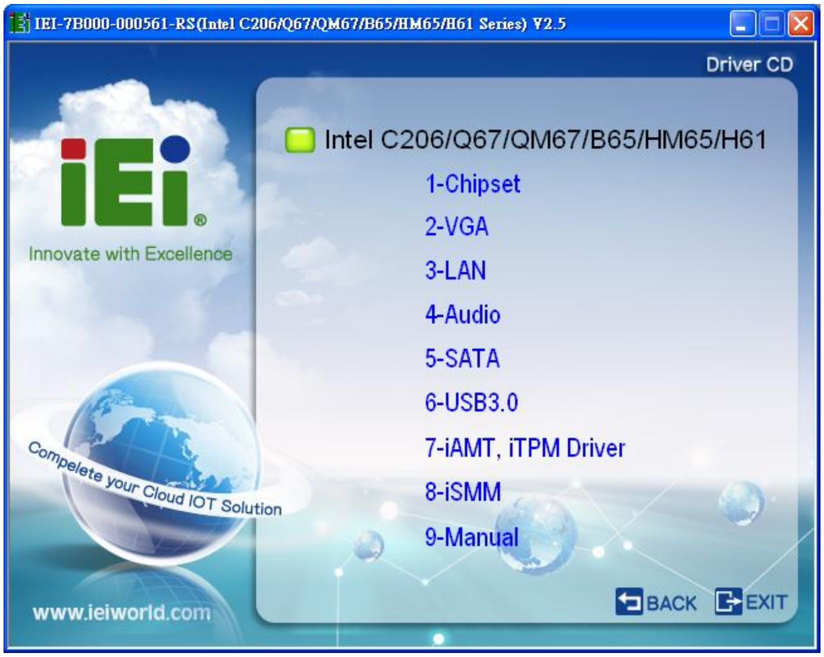

IEI-7B000-000561-RS(Intel C206/Q67/QM67/B65/HM65/H61 Series) V2.5
Driver CD
iEi
Innovate with Excellence
Compelete your Cloud IOT Solution
www.ieiworld.com
Intel C206/Q67/QM67/B65/HM65/H61
1-Chipset
2-VGA
3-LAN
4-Audio
5-SATA
6-USB3.0
7-iAMT, iTPM Driver
8-iSMM
9-Manual
BACK
EXIT

Figure 6-2: Available Drivers

Step 5: Install all of the necessary drivers in this menu.

6.3 Chipset Driver Installation

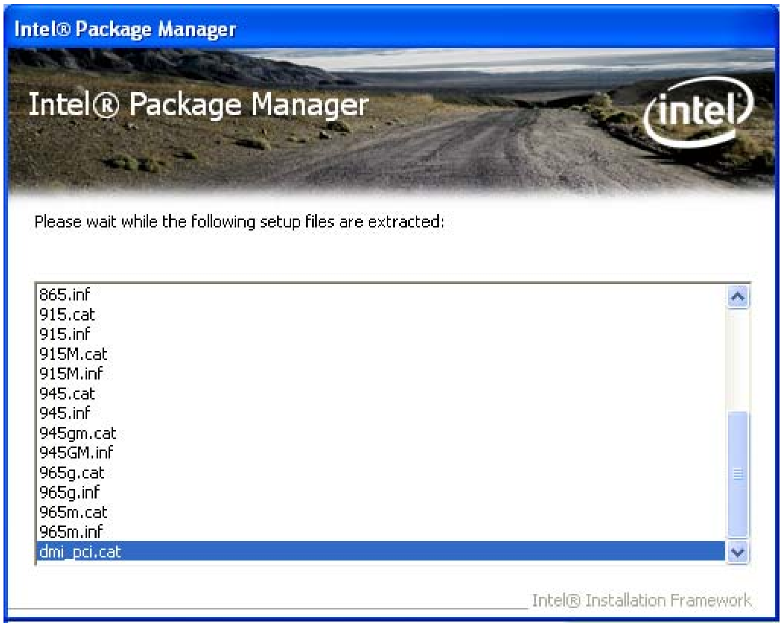
To install the chipset driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click “**Chipset**”.

Step 3: Locate the setup file and double click on it.

Step 4: The setup files are extracted as shown in **Figure 6-3**.


Intel® Package Manager
Intel® Package Manager
intel
Intel® Installation Framework

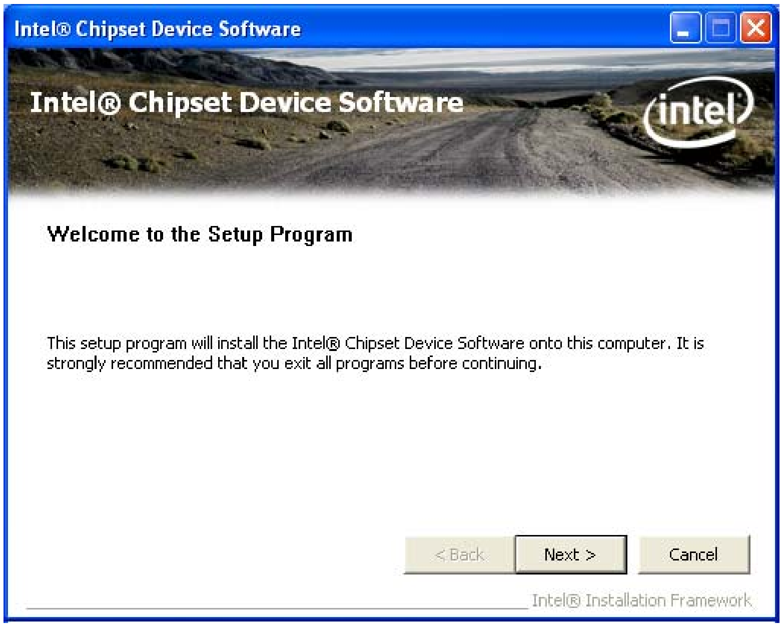
Please wait while the following setup files are extracted:

```
865.inf
915.cat
915.inf
915M.cat
915M.inf
945.cat
945.inf
945gm.cat
945GM.inf
965g.cat
965g.inf
965m.cat
965m.inf
dmi_pci.cat
```

Figure 6-3: Chipset Driver Screen

Step 5: When the setup files are completely extracted the **Welcome Screen** in **Figure 6-4** appears.

Step 6: Click **Next** to continue.


Intel® Chipset Device Software
Intel® Chipset Device Software
intel
< Back
Next >
Cancel
Intel® Installation Framework

Welcome to the Setup Program

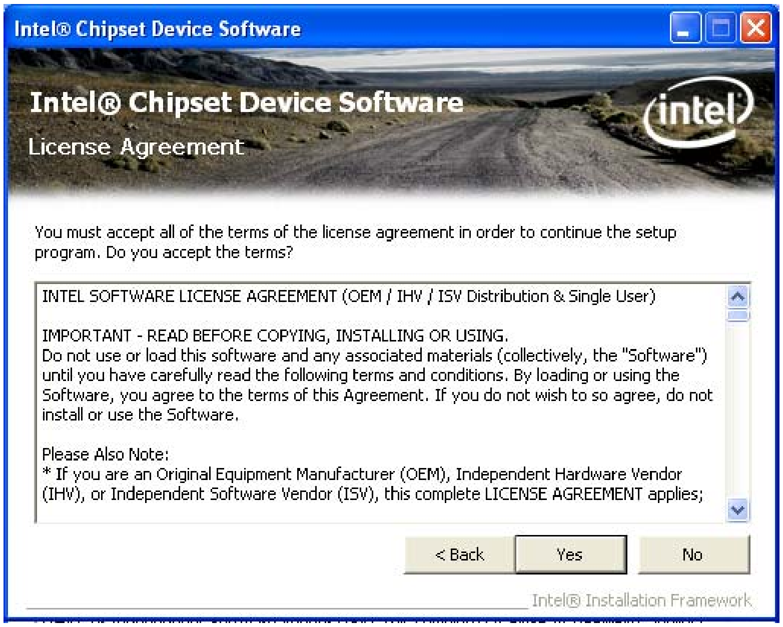
This setup program will install the Intel® Chipset Device Software onto this computer. It is strongly recommended that you exit all programs before continuing.

Figure 6-4: Chipset Driver Welcome Screen

Step 7: The license agreement in **Figure 6-5** appears.

Step 8: Read the **License Agreement**.

Step 9: Click **Yes** to continue.


Intel® Chipset Device Software
Intel® Chipset Device Software
License Agreement
intel
< Back
Yes
No
Intel® Installation Framework

You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?

INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)

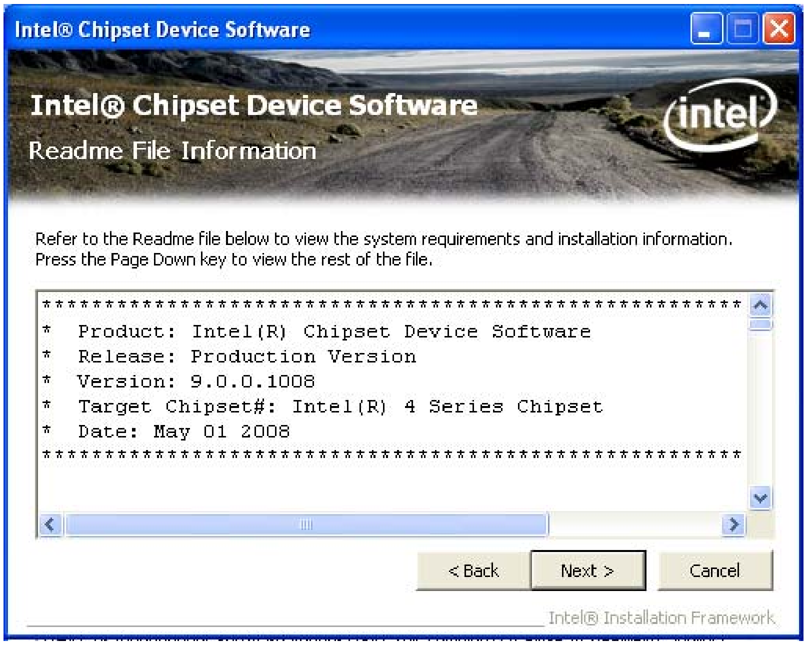
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.

Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;

Figure 6-5: Chipset Driver License Agreement

Step 10: The **Read Me** file in **Figure 6-6** appears.

Step 11: Click **Next** to continue.



Intel® Chipset Device Software

Intel® Chipset Device Software

Readme File Information

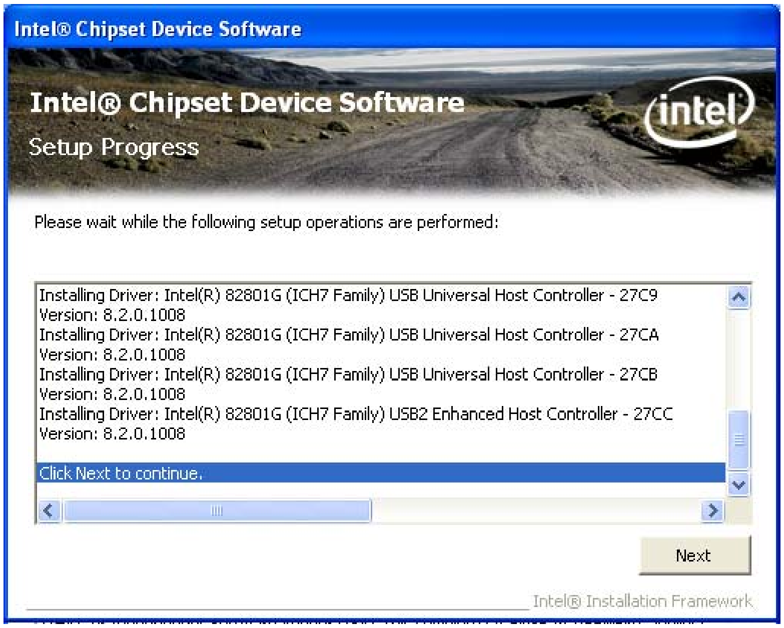
Refer to the Readme file below to view the system requirements and installation information.
Press the Page Down key to view the rest of the file.

```
************************************************************
*  Product: Intel(R) Chipset Device Software
*  Release: Production Version
*  Version: 9.0.0.1008
*  Target Chipset#: Intel(R) 4 Series Chipset
*  Date: May 01 2008
************************************************************
```

Figure 6-6: Chipset Driver Read Me File

Step 12: **Setup Operations** are performed as shown in **Figure 6-7**.

Step 13: Once the **Setup Operations** are complete, click **Next** to continue.



Intel® Chipset Device Software

Intel® Chipset Device Software

Setup Progress

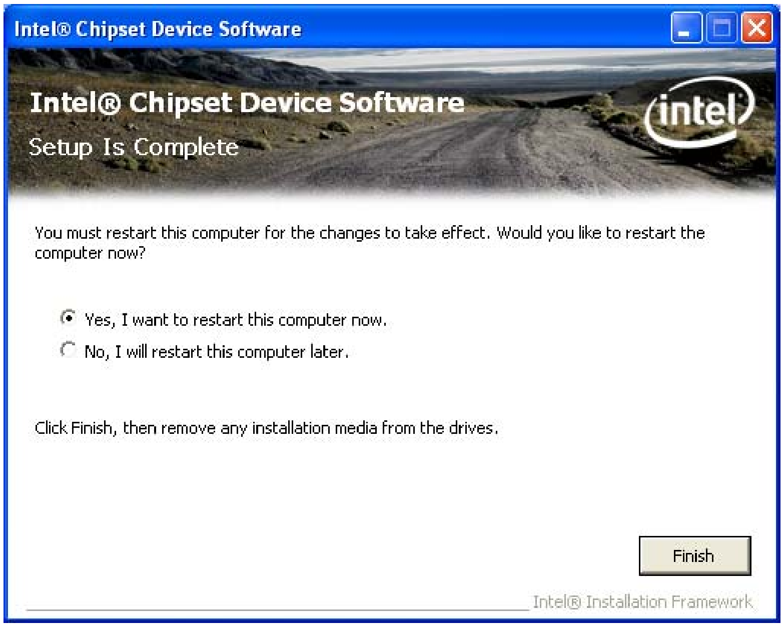
Please wait while the following setup operations are performed:

```
Installing Driver: Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
Version: 8.2.0.1008
Installing Driver: Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
Version: 8.2.0.1008
Installing Driver: Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
Version: 8.2.0.1008
Installing Driver: Intel(R) 82801G (ICH7 Family) USB2 Enhanced Host Controller - 27CC
Version: 8.2.0.1008

Click Next to continue.
```

Figure 6-7: Chipset Driver Setup Operations

Step 14: The **Finish** screen in **Figure 6-8** appears.

Step 15: Select "**Yes, I want to restart this computer now**" and click **Finish**.


Intel® Chipset Device Software
Intel® Chipset Device Software
Setup Is Complete
intel
Finish
Intel® Installation Framework

You must restart this computer for the changes to take effect. Would you like to restart the computer now?

● Yes, I want to restart this computer now.
○ No, I will restart this computer later.

Click Finish, then remove any installation media from the drives.

Figure 6-8: Chipset Driver Installation Finish Screen

6.4 Graphics Driver Installation

To install the Graphics driver, please do the following.

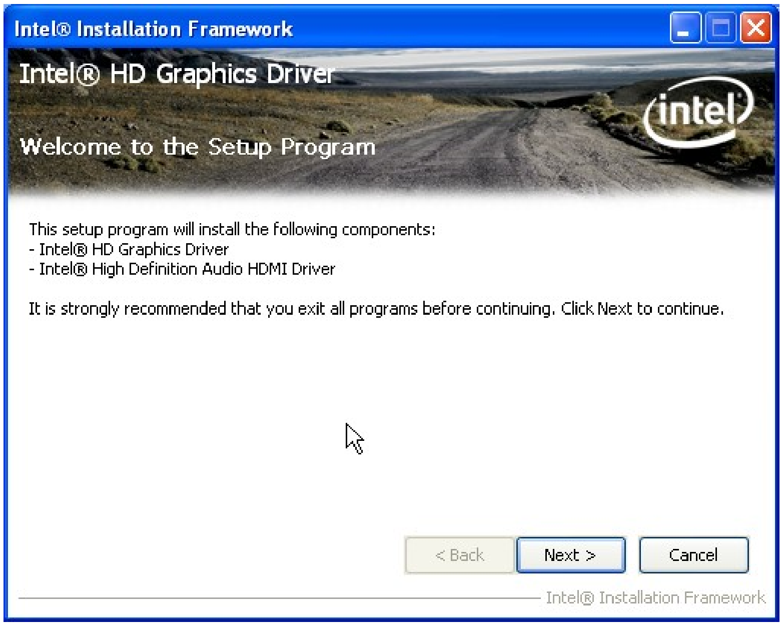
Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click "**VGA**" and select the folder which corresponds to the operating system.

Step 3: Double click the setup file.

Step 4: The **Welcome Screen** in **Figure 6-9** appears.

Step 5: Click **Next** to continue.


Intel® Installation Framework
Intel® HD Graphics Driver
Welcome to the Setup Program
< Back
Next >
Cancel
Intel® Installation Framework

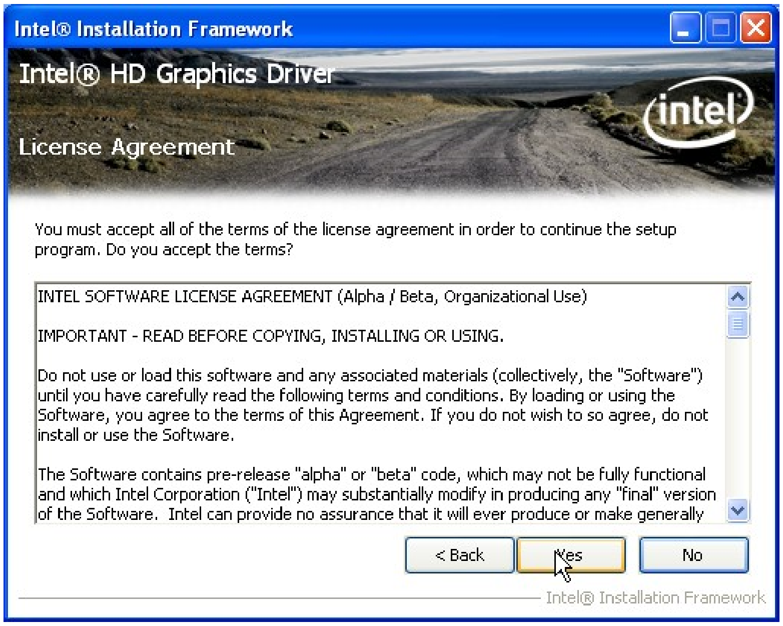
This setup program will install the following components:
- Intel® HD Graphics Driver
- Intel® High Definition Audio HDMI Driver

It is strongly recommended that you exit all programs before continuing. Click Next to continue.

Figure 6-9: Graphics Driver Welcome Screen

Step 6: The **License Agreement** in **Figure 6-10** appears.

Step 7: Click **Yes** to accept the agreement and continue.


Intel® Installation Framework
Intel® HD Graphics Driver
License Agreement
< Back
Yes
No
Intel® Installation Framework

You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?

INTEL SOFTWARE LICENSE AGREEMENT (Alpha / Beta, Organizational Use)

IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.

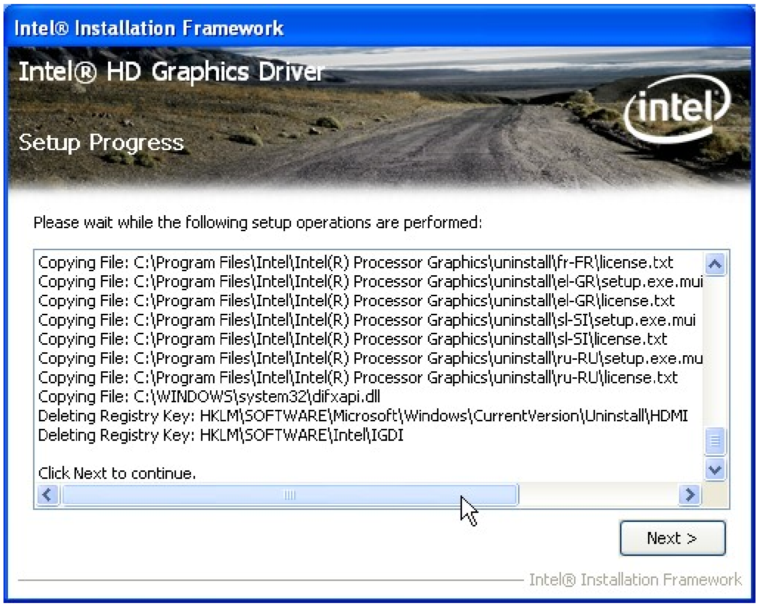
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.

The Software contains pre-release "alpha" or "beta" code, which may not be fully functional and which Intel Corporation ("Intel") may substantially modify in producing any "final" version of the Software. Intel can provide no assurance that it will ever produce or make generally

Figure 6-10: Graphics Driver License Agreement

Step 8: **Setup Operations** are performed as shown in **Figure 6-11**.

Step 9: Once the **Setup Operations** are complete, click **Next** to continue.


Intel® Installation Framework
Intel® HD Graphics Driver
Setup Progress
intel
Next >
Intel® Installation Framework

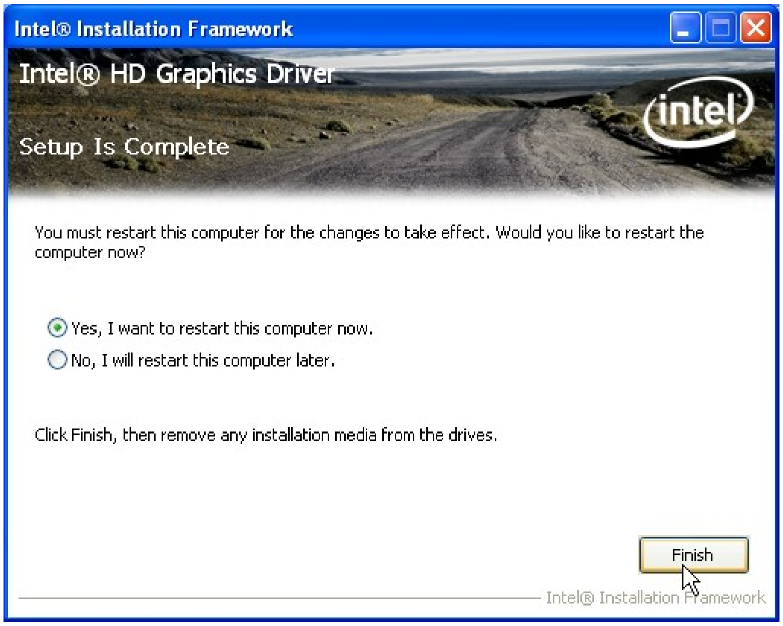
Please wait while the following setup operations are performed:

```
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\fr-FR\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\el-GR\setup.exe.mui
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\el-GR\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\sl-SI\setup.exe.mui
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\sl-SI\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\ru-RU\setup.exe.mu
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\ru-RU\license.txt
Copying File: C:\WINDOWS\system32\difxapi.dll
Deleting Registry Key: HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\HDMI
Deleting Registry Key: HKLM\SOFTWARE\Intel\IGDI

Click Next to continue.
```

Figure 6-11: Graphics Driver Setup Operations

Step 10: The **Finish** screen in **Figure 6-12** appears.

Step 11: Select “**Yes, I want to restart this computer now**” and click **Finish**.


Intel® Installation Framework
Intel® HD Graphics Driver
Setup Is Complete
intel
Finish
Intel® Installation Framework

You must restart this computer for the changes to take effect. Would you like to restart the computer now?

● Yes, I want to restart this computer now.

○ No, I will restart this computer later.

Click Finish, then remove any installation media from the drives.

Figure 6-12: Graphics Driver Installation Finish Screen

6.5 LAN Driver Installation

To install the LAN driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click “**LAN**”.

Step 3: Locate the Autorun file and double click it.

Step 4: The Intel® Network Connection menu in **Figure 6-13** appears.

Step 5: Click **Install Drivers and Software**.

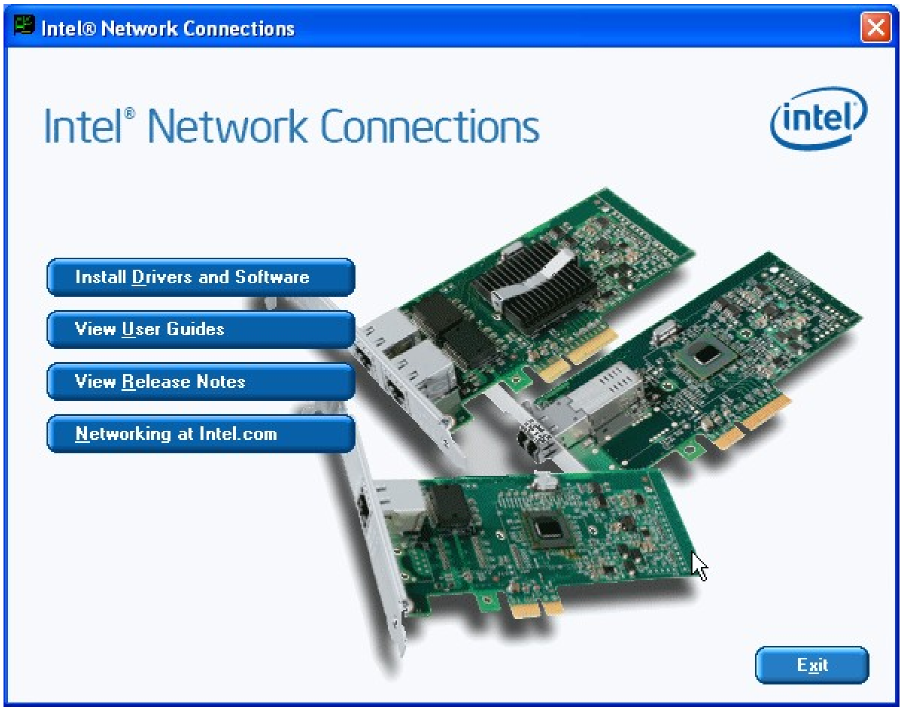
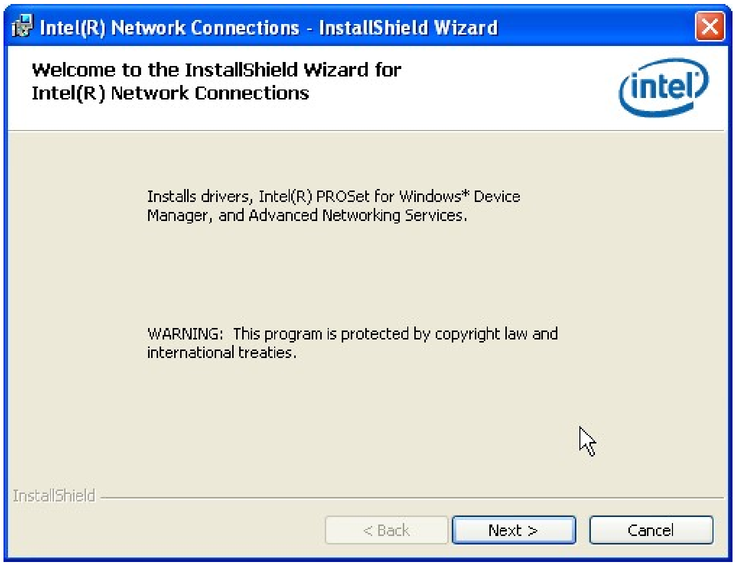

Intel® Network Connections
Intel® Network Connections
intel
Install Drivers and Software
View User Guides
View Release Notes
Networking at Intel.com
Exit

Figure 6-13: Intel® Network Connection Menu

Step 6: The **Welcome** screen in **Figure 6-14** appears.


Intel(R) Network Connections - InstallShield Wizard
InstallShield
< Back
Next >
Cancel

Welcome to the InstallShield Wizard for Intel(R) Network Connections

Installs drivers, Intel(R) PROSet for Windows* Device Manager, and Advanced Networking Services.

WARNING: This program is protected by copyright law and international treaties.

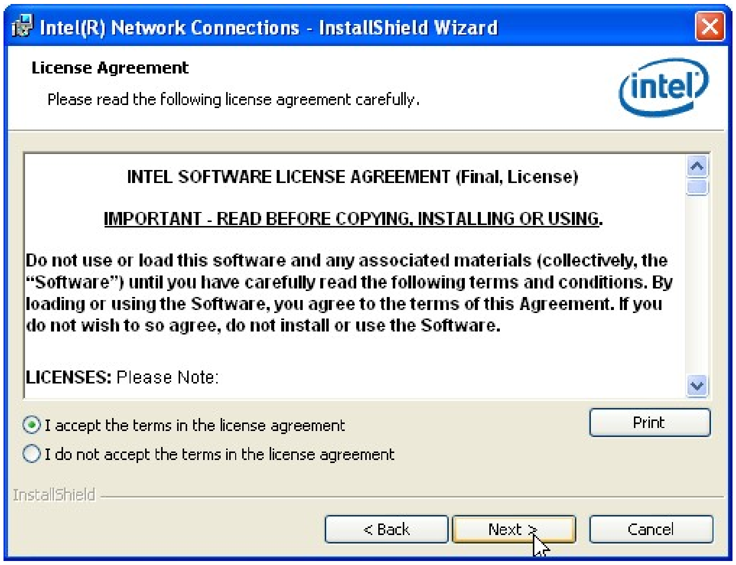
Figure 6-14: LAN Driver Welcome Screen

Step 7: Click **Next** to continue.

Step 8: The **License Agreement** in **Figure 6-15** appears.

Step 9: Accept the agreement by selecting "I accept the terms in the license agreement".

Step 10: Click **Next** to continue.


Intel(R) Network Connections - InstallShield Wizard
Print
InstallShield
< Back
Next >
Cancel

License Agreement

Please read the following license agreement carefully.

INTEL SOFTWARE LICENSE AGREEMENT (Final, License)

IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.

Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.

LICENSES: Please Note:

● I accept the terms in the license agreement

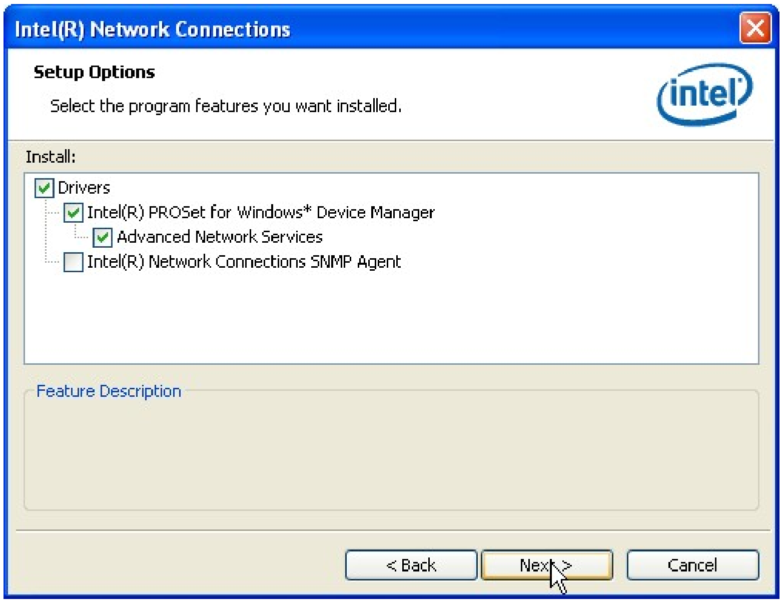
○ I do not accept the terms in the license agreement

Figure 6-15: LAN Driver License Agreement

Step 11: The **Setup Options** screen in **Figure 6-16** appears.

Step 12: Select program features to install.

Step 13: Click **Next** to continue.



Intel(R) Network Connections

Setup Options

Select the program features you want installed.

Install:

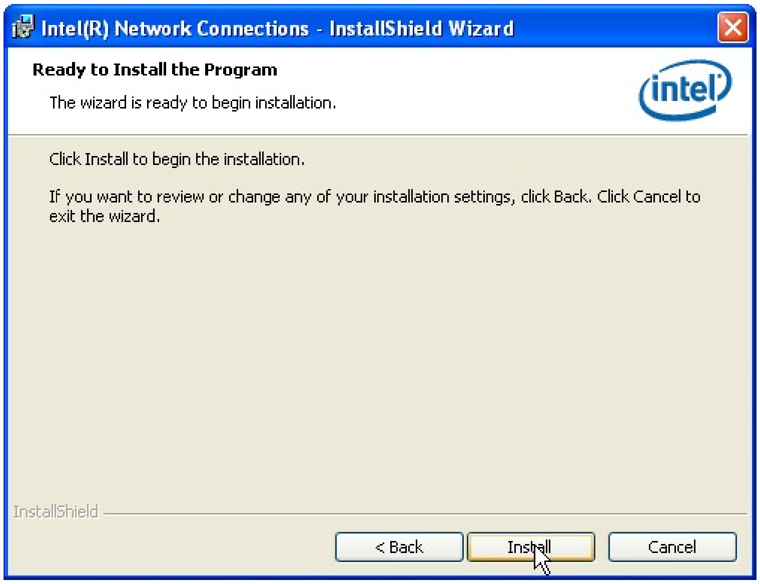
☑ Drivers
  ☑ Intel(R) PROSet for Windows* Device Manager
    ☑ Advanced Network Services
  ☐ Intel(R) Network Connections SNMP Agent

Feature Description

Figure 6-16: LAN Driver Setup Options

Step 14: The **Ready to Install the Program** screen in **Figure 6-17** appears.

Step 15: Click **Install** to proceed with the installation.


Intel(R) Network Connections - InstallShield Wizard

Ready to Install the Program

The wizard is ready to begin installation.

Click Install to begin the installation.

If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.

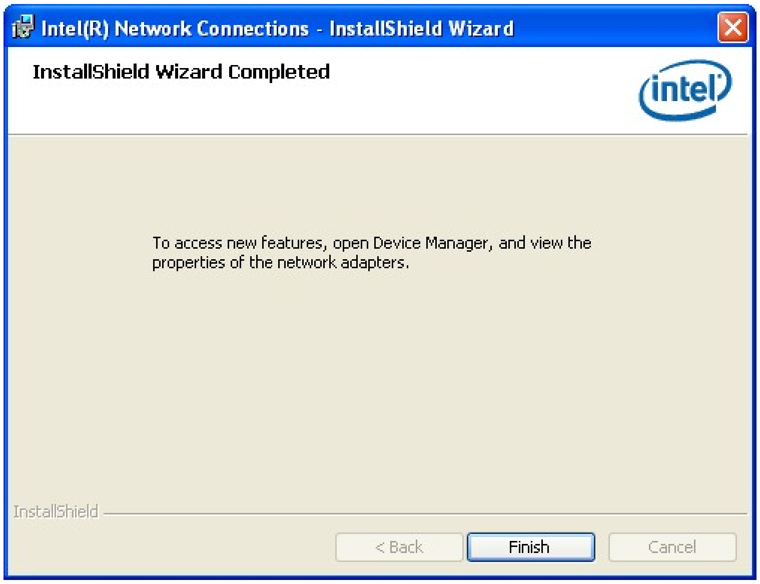
intel
InstallShield
< Back
Install
Cancel

Figure 6-17: LAN Driver Installation

Step 16: The program begins to install.

Step 17: When the driver installation is complete, the screen in **Figure 6-18** appears.

Step 18: Click **Finish** to exit.


Intel(R) Network Connections - InstallShield Wizard

InstallShield Wizard Completed

To access new features, open Device Manager, and view the properties of the network adapters.

intel
InstallShield
< Back
Finish
Cancel

Figure 6-18: LAN Driver Installation Complete

6.6 Audio Driver Installation

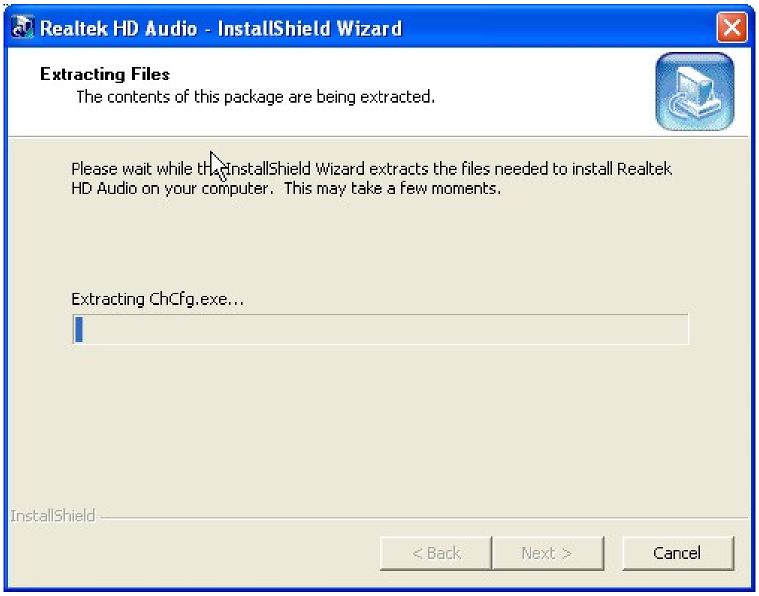
To install the audio driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click “**Audio**” and select the folder which corresponds to the operating system.

Step 3: Double click the setup file.

Step 4: The InstallShield Wizard starts to extracting files (**Figure 6-19**).


Realtek HD Audio - InstallShield Wizard
Extracting Files
InstallShield
< Back
Next >
Cancel

The contents of this package are being extracted.

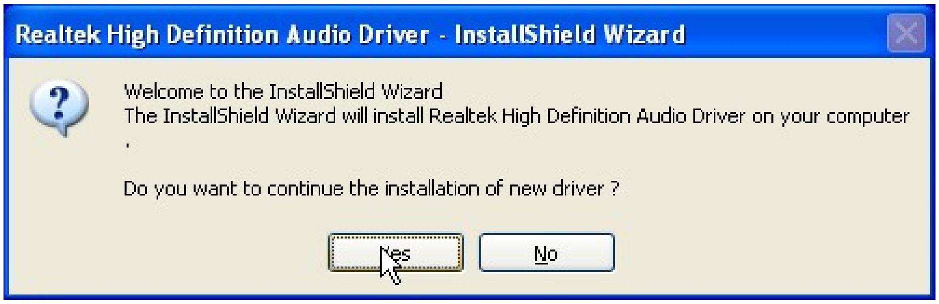
Please wait while the InstallShield Wizard extracts the files needed to install Realtek HD Audio on your computer. This may take a few moments.

Extracting ChCfg.exe...

Figure 6-19: Audio Driver – Extracting Files

Step 5: The **Audio Driver Welcome** message in **Figure 6-20** appears.

Step 6: Click **Yes** to install the audio driver.



Realtek High Definition Audio Driver - InstallShield Wizard

Welcome to the InstallShield Wizard
The InstallShield Wizard will install Realtek High Definition Audio Driver on your computer
.

Do you want to continue the installation of new driver ?

Figure 6-20: Audio Driver Welcome Screen

Step 7: The audio driver installation begins. See **Figure 6-21**.

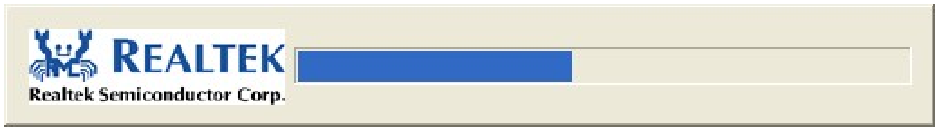
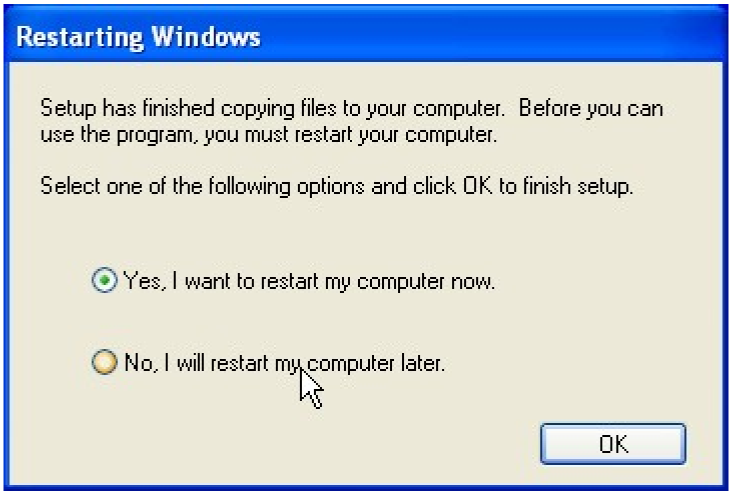


Figure 6-21: Audio Driver Installation

Step 8: When the installation is complete, the screen in **Figure 6-22** appears.

Step 9: Select “**Yes, I want to restart my computer now**” and click **Finish**.



Restarting Windows

Setup has finished copying files to your computer. Before you can use the program, you must restart your computer.

Select one of the following options and click OK to finish setup.

● Yes, I want to restart my computer now.

○ No, I will restart my computer later.

Figure 6-22: Audio Driver Installation Complete

6.7 Intel® AMT Driver and Application

6.7.1 Intel® Management Engine Components Installation

The package of the Intel® ME components includes

- Intel® Management Engine Interface (Intel® ME Interface)
- Serial Over LAN (SOL) driver
- Local Manageability Service (LMS)
- User Notification Service (UNS)
- Intel® ME WMI provider
- Intel® Active Management Technology NAC Posture Plug-in
- Intel Control Center
- Intel® Management and Security Status Application

To install these Intel® ME components, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

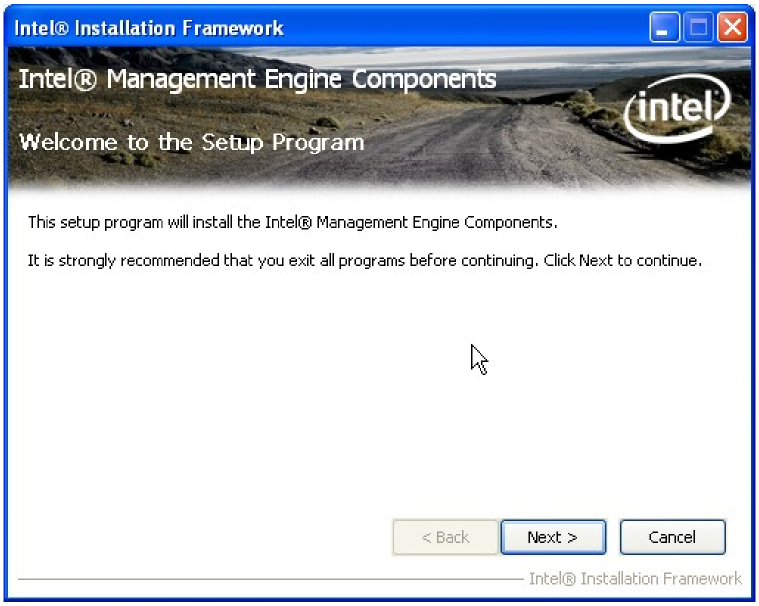
Step 2: Click “**iAMT**”.

Step 3: Double click the setup file in the **ME_SW_IS** folder.

Step 4: Locate the setup file and double click it.

Step 5: When the setup files are completely extracted the **Welcome Screen** in **Figure 6-23** appears.

Step 6: Click **Next** to continue.


Intel® Installation Framework
Intel® Management Engine Components
Welcome to the Setup Program
< Back
Next >
Cancel
Intel® Installation Framework

This setup program will install the Intel® Management Engine Components.

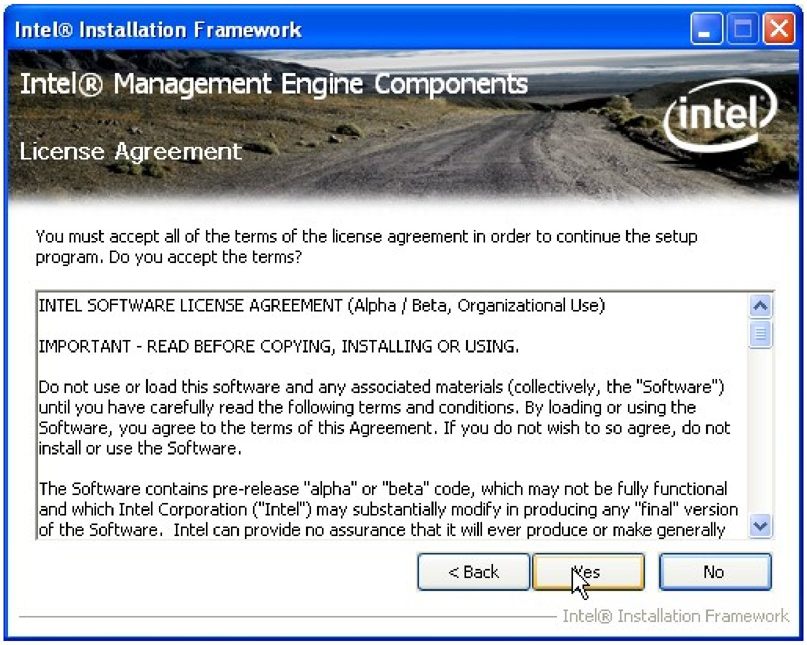
It is strongly recommended that you exit all programs before continuing. Click Next to continue.

Figure 6-23: Intel® ME Driver Welcome Screen

Step 7: The license agreement in **Figure 6-24** appears.

Step 8: Read the **License Agreement**.

Step 9: Click **Yes** to continue.


Intel® Installation Framework
Intel® Management Engine Components
License Agreement
< Back
Yes
No
Intel® Installation Framework

You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?

INTEL SOFTWARE LICENSE AGREEMENT (Alpha / Beta, Organizational Use)

IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.

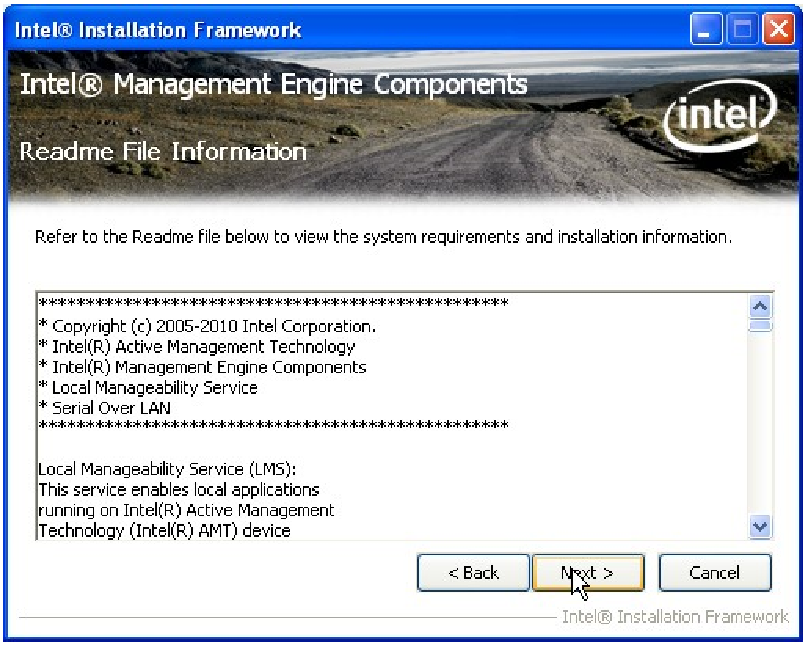
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.

The Software contains pre-release "alpha" or "beta" code, which may not be fully functional and which Intel Corporation ("Intel") may substantially modify in producing any "final" version of the Software. Intel can provide no assurance that it will ever produce or make generally

Figure 6-24: Intel® ME Driver License Agreement

Step 10: The **Read Me** file in **Figure 6-25** appears.

Step 11: Click **Next** to continue.


Intel® Installation Framework
Intel® Management Engine Components
Readme File Information
intel
< Back
Next >
Cancel
Intel® Installation Framework

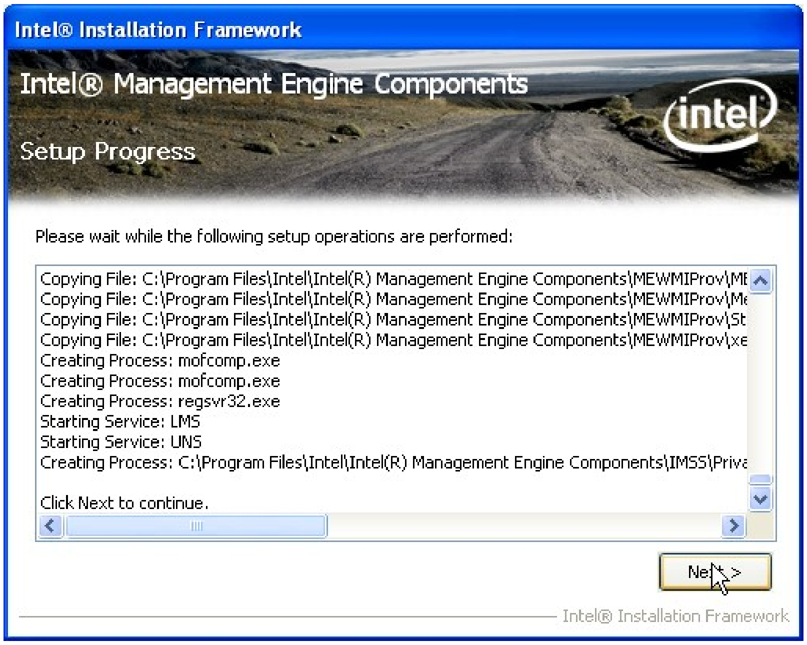
Refer to the Readme file below to view the system requirements and installation information.

```
************************************************************
* Copyright (c) 2005-2010 Intel Corporation.
* Intel(R) Active Management Technology
* Intel(R) Management Engine Components
* Local Manageability Service
* Serial Over LAN
************************************************************

Local Manageability Service (LMS):
This service enables local applications
running on Intel(R) Active Management
Technology (Intel(R) AMT) device
```

Figure 6-25: Intel® ME Driver Read Me File

Step 12: **Setup Operations** are performed as shown in **Figure 6-26**.

Step 13: Once the **Setup Operations** are complete, click **Next** to continue.


Intel® Installation Framework
Intel® Management Engine Components
Setup Progress
Next >
Intel® Installation Framework

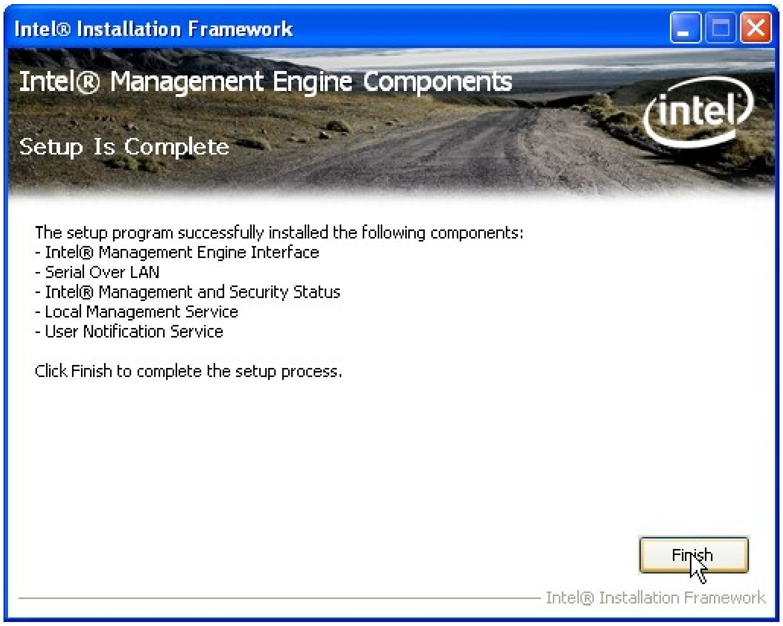
Please wait while the following setup operations are performed:

```
Copying File: C:\Program Files\Intel\Intel(R) Management Engine Components\MEWMIProv\ME
Copying File: C:\Program Files\Intel\Intel(R) Management Engine Components\MEWMIProv\Me
Copying File: C:\Program Files\Intel\Intel(R) Management Engine Components\MEWMIProv\St
Copying File: C:\Program Files\Intel\Intel(R) Management Engine Components\MEWMIProv\xe
Creating Process: mofcomp.exe
Creating Process: mofcomp.exe
Creating Process: regsvr32.exe
Starting Service: LMS
Starting Service: UNS
Creating Process: C:\Program Files\Intel\Intel(R) Management Engine Components\IMSS\Priva

Click Next to continue.
```

Figure 6-26: Intel® ME Driver Setup Operations

Step 14: The **Finish** screen in **Figure 6-27** appears.

Step 15: Select “**Yes, I want to restart this computer now**” and click **Finish**.


Intel® Installation Framework
Intel® Management Engine Components
Setup Is Complete
Finish
Intel® Installation Framework

The setup program successfully installed the following components:
- Intel® Management Engine Interface
- Serial Over LAN
- Intel® Management and Security Status
- Local Management Service
- User Notification Service

Click Finish to complete the setup process.

Figure 6-27: Intel® ME Driver Installation Finish Screen

6.7.2 Intel® IT Director Application Installation

Intel® IT Director is an application that helps address key IT security, data protection and network health concerns of small businesses. To install the Intel® IT Director application, please do the following.

NOTE:

For Windows XP system, please make sure to install the .net Framework 3.5 before installing the Intel® IT Director application. The .net Framework 3.5 setup file is located at **\7-iAMT, iTPM Driver & Utility\Microsoft .NET Framework 3.5** of the driver CD.

Step 1: Access the driver list. (See **Section 6.2**)

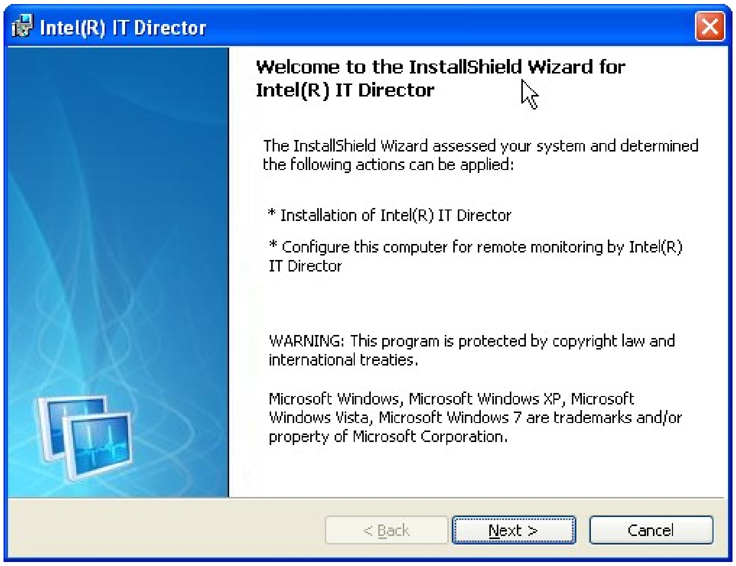
Step 2: Click “**iAMT**”.

Step 3: Double click the setup file in the **Intel_ IT Director** folder.

Step 4: Locate the **ITDirector_Setup.exe** setup file and double click it.

Step 5: The **Welcome Screen** in **Figure 6-28** appears.

Step 6: Click **Next** to continue.



Welcome to the InstallShield Wizard for Intel(R) IT Director

The InstallShield Wizard assessed your system and determined the following actions can be applied:

* Installation of Intel(R) IT Director

* Configure this computer for remote monitoring by Intel(R) IT Director

WARNING: This program is protected by copyright law and international treaties.

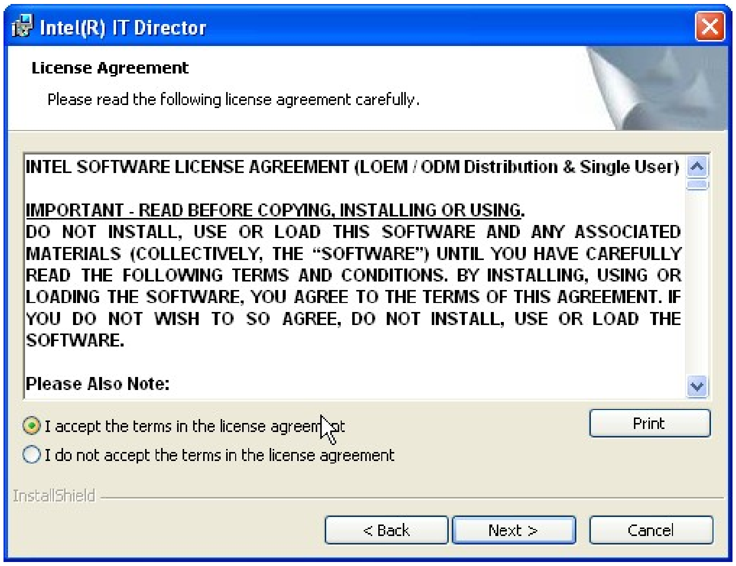
Microsoft Windows, Microsoft Windows XP, Microsoft Windows Vista, Microsoft Windows 7 are trademarks and/or property of Microsoft Corporation.

Figure 6-28: IT Director Welcome Screen

Step 7: The license agreement in **Figure 6-29** appears.

Step 8: Accept the agreement by selecting "I accept the terms in the license agreement".

Step 9: Click **Next** to continue.



License Agreement

Please read the following license agreement carefully.

INTEL SOFTWARE LICENSE AGREEMENT (LOEM / ODM Distribution & Single User)

IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
DO NOT INSTALL, USE OR LOAD THIS SOFTWARE AND ANY ASSOCIATED MATERIALS (COLLECTIVELY, THE "SOFTWARE") UNTIL YOU HAVE CAREFULLY READ THE FOLLOWING TERMS AND CONDITIONS. BY INSTALLING, USING OR LOADING THE SOFTWARE, YOU AGREE TO THE TERMS OF THIS AGREEMENT. IF YOU DO NOT WISH TO SO AGREE, DO NOT INSTALL, USE OR LOAD THE SOFTWARE.

Please Also Note:

● I accept the terms in the license agreement

○ I do not accept the terms in the license agreement

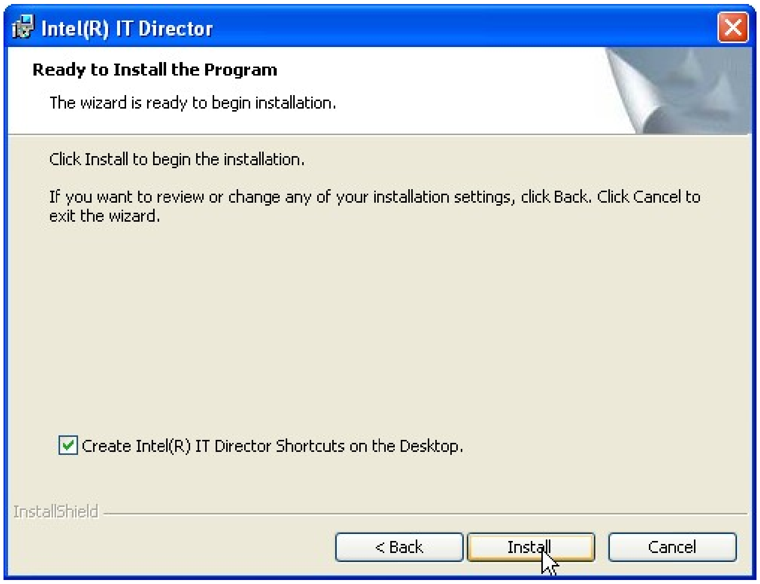
Figure 6-29: IT Director License Agreement

Step 10: Continue to choose the installation type and the destination folder for the IT

Director application.

Step 11: The **Ready to Install the Program** screen in **Figure 6-30** appears.

Step 12: Click **Install** to proceed with the installation.


Intel(R) IT Director
Ready to Install the Program
InstallShield
< Back
Install
Cancel

The wizard is ready to begin installation.

Click Install to begin the installation.

If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.

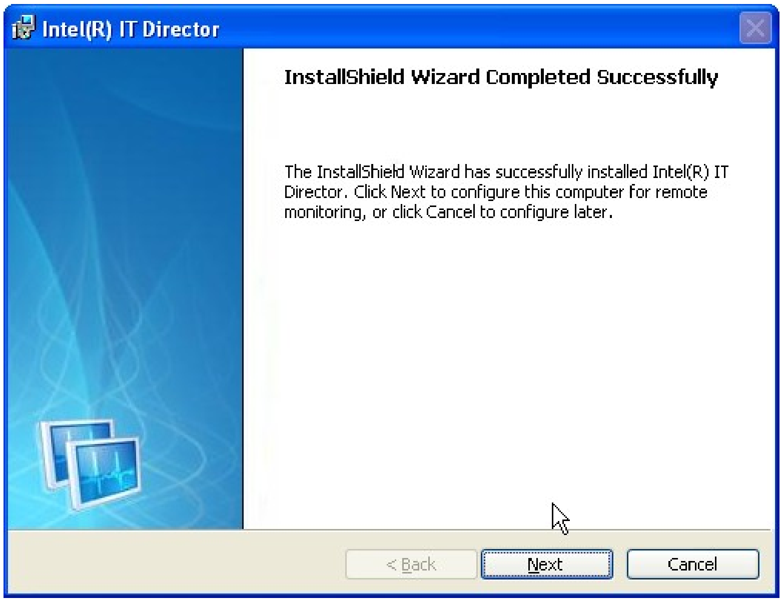
☑ Create Intel(R) IT Director Shortcuts on the Desktop.

Figure 6-30: IT Director Installation

Step 13: The program begins to install.

Step 14: When the driver installation is complete, the screen in **Figure 6-31** appears.

Step 15: Click **Next** to configure the system for remote monitoring or Cancel to exit the program and configure the system later.

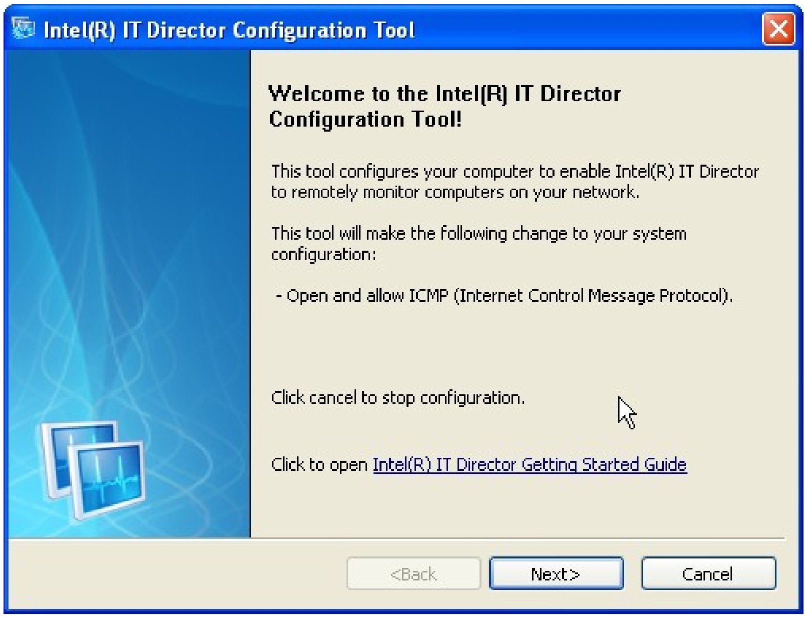

Intel(R) IT Director
< Back
Next
Cancel

InstallShield Wizard Completed Successfully

The InstallShield Wizard has successfully installed Intel(R) IT Director. Click Next to configure this computer for remote monitoring, or click Cancel to configure later.

Figure 6-31: IT Director Installation Complete

Step 16: The Welcome Screen of the IT Director Configuration Tool in **Figure 6-32** appears.


Intel(R) IT Director Configuration Tool
<Back
Next>
Cancel

Welcome to the Intel(R) IT Director Configuration Tool!

This tool configures your computer to enable Intel(R) IT Director to remotely monitor computers on your network.

This tool will make the following change to your system configuration:

- Open and allow ICMP (Internet Control Message Protocol).

Click cancel to stop configuration.

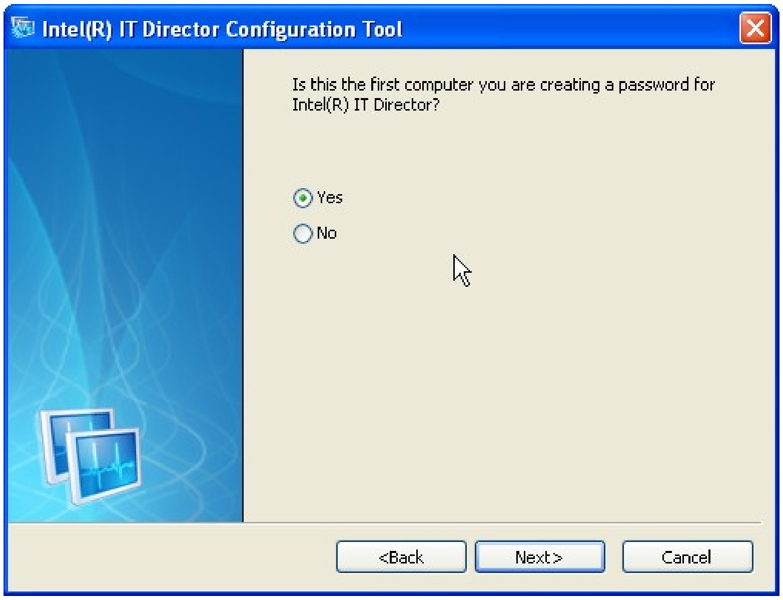
Click to open Intel(R) IT Director Getting Started Guide

Figure 6-32: IT Director Configuration Tool Welcome Screen

NOTE:

It is recommended to open the Intel® IT Director Getting Started Guide shown in **Figure 6-32** to fully understand the configuration process.

Step 17: Select whether this is the first computer you are creating a password for IT Director. (**Figure 6-33**).



Intel(R) IT Director Configuration Tool

Is this the first computer you are creating a password for Intel(R) IT Director?

● Yes

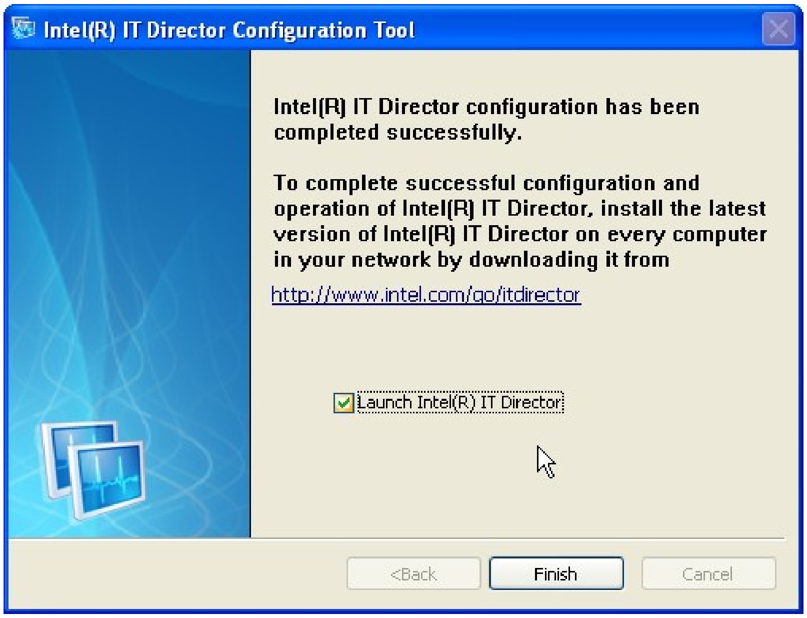
○ No

Figure 6-33: IT Director – Creating Password

Step 18: Follow the instructions to create a new password or enter the password created previously.

Step 19: When the configuration is complete, the screen in **Figure 6-34** appears.

Step 20: Click **Finish** to exit.



Intel(R) IT Director configuration has been completed successfully.

To complete successful configuration and operation of Intel(R) IT Director, install the latest version of Intel(R) IT Director on every computer in your network by downloading it from

http://www.intel.com/go/itdirector

Intel(R) IT Director Configuration Tool
☑ Launch Intel(R) IT Director
<Back
Finish
Cancel

Figure 6-34: IT Director Configuration Complete

NOTE:

If the network connection doesn't work after installing the Intel® IT Director in a Windows Vista system, please install the network adapter driver. The driver is located at **\7-iAMT, iTPM Driver & Utility\AMT Hot Fix\V1.0C0206** of the driver CD. Follow the instruction in the Intel Website Message PDF file in the same folder to install the driver.

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

This equipment has been tested and found to comply with specifications for CE marking. If the user modifies and/or installs other devices in the equipment, the CE conformity declaration may no longer apply.

FCC WARNING

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- 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.

Appendix

B

BIOS Options

Below is a list of BIOS configuration options in the BIOS chapter.

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Memory Information 68
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Hyper-threading [Enabled] 71
Intel Virtualization Technology [Disabled] 72
SATA Mode [IDE Mode] 74
Staggered Spin-up [Disabled] 75
External SATA Port [Disabled] 75
Hot Plug [Disabled] 75
USB Devices 76
USB Support [Enabled] 77
Legacy USB Support [Enabled] 77
Floppy Disk Controller [Enabled] 78
Power Saving Function [Disabled] 78
Serial Port [Enabled] 79
Change Settings [Auto] 79
Serial Port [Enabled] 80
Change Settings [Auto] 80
Serial Port [Enabled] 81
Change Settings [Auto] 81
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Save as User Defaults 102
Restore User Defaults 102

Appendix

C

Terminology

AC ’97	Audio Codec 97 (AC’97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude (“volume”) of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.

DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Output Control Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.
LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.

LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

D

Digital I/O Interface

D.1 Introduction

The DIO connector on the PCIE-Q670 Series is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

NOTE:

For further information, please refer to the datasheet for the Super I/O chipset.

The BIOS interrupt call **INT 15H** controls the digital I/O.

INT 15H:

AH – 6FH	
Sub-function:	
AL – 8	:Set the digital port as INPUT
AL	:Digital I/O input value

D.2 Assembly Language Sample 1

```
MOV     AX, 6F08H       ;setting the digital port as input
INT     15H             ;
```

AL low byte = value

AH – 6FH	
Sub-function:	
AL – 9	:Set the digital port as OUTPUT
BL	:Digital I/O input value

D.3 Assembly Language Sample 2

```
MOV     AX, 6F09H       ;setting the digital port as output
MOV     BL, 09H         ;digital value is 09H
INT     15H             ;
```

Digital Output is 1001b

Appendix

E

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. Contact IEI support or visit the IEI website for specific drivers for other operating systems.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table E-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

EXAMPLE PROGRAM:

```
; INITIAL TIMER PERIOD COUNTER

;
W_LOOP:
;

        MOV          AX, 6F02H               ;setting the time-out value
        MOV          BL, 30                  ;time-out value is 48 seconds
        INT     15H

;
; ADD THE APPLICATION PROGRAM HERE
;

        CMP          EXIT_AP, 1              ;is the application over?
        JNE     W_LOOP                  ;No, restart the application

        MOV          AX, 6F02H               ;disable Watchdog Timer
        MOV          BL, 0              ;
        INT     15H

;
; EXIT ;
```

Appendix

F

Intel® Matrix Storage Manager

F.1 Introduction

The PCIE-Q670 Series can provide data protection for serial ATA (SATA) disks via the Intel® Matrix Storage Manager using one of three fault-tolerant RAID levels: RAID 1, 5 or 10. When using two hard drives, matrix RAID allows RAID 0 and RAID 1 functions to be combined, where critical files can be stored on RAID 1, and RAID 0 can be used for non-critical items such as software. RAID 5 and RAID 0 can be combined to provide higher performance, capacity, and fault tolerance.

CAUTION!

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

F.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.

WARNING!

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

CAUTION!

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

F.2 Features and Benefits

- Supports RAID levels 0, 1, 5 and 10
- Supports connectivity to two or more disk drives
- Supported Operating Systems include: Windows XP, Windows Server 2003, Windows Server 2008, Windows Vista and Windows 7

F.3 Accessing the Intel® Matrix Storage Manager

To access the Intel® Matrix Storage Manager, please follow the steps below.

Step 1: **Connect SATA drives to the system**. Connect two or more SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

NOTE:

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration. If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 2: **Enable SATA drives in BIOS**. Start the computer and access the BIOS setup program. Enable RAID support for all SATA devices. Refer to the applicable BIOS configuration section in this user manual.

Step 3: **Configure "Option ROM Messages"** BIOS option to **Force BIOS**. This is to allow the "Press <CTRL+I> to enter Configuration Utility……" message to appear during the POST. Refer to the applicable BIOS configuration section in this user manual.

Step 4: **Save and Exit BIOS**. After the SATA support option is enabled, save and exit the BIOS.

Step 5: **Reboot the system**. Reboot the system after saving and exiting the BIOS.

Step 6: **Press Ctrl+I. during the system boot process**. Press Ctrl+I when prompted to enter the RAID configuration software.

Step 7: **Configure the RAID settings**. Use the Intel® Matrix Storage Manager to configure the RAID array. Brief descriptions of configuration options are given below.

F.4 Installing the Operating System to the RAID Array

To install the operating system to the RAID array some extra steps are necessary during the installation process.

Step 1: **Prepare a RAID driver floppy disk on another computer**. If installing on the RAID array a RAID driver floppy disk must be made. The RAID driver floppy disk utility is on the CD in the “5-SATA/Floppy Configuration Utility” folder. The floppy disk will be formatted and the drivers installed.

Step 2: **Restart the system with a floppy drive attached**. Attach a normal floppy drive or USB floppy drive to the system.

Step 3: **Press F6 when prompted**. During the installation process, Windows OS prompts the user to press F6 to install the RAID drivers. Press F6 and choose from the drivers on the floppy disk.

Step 4: **Install the OS**. Continue with OS installation as usual.

Appendix

G

Hazardous Materials Disclosure

G.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	**Toxic or Hazardous Substances and Elements**					
	Lead (Pb)	**Mercury (Hg)**	**Cadmium (Cd)**	**Hexavalent Chromium (CR(VI))**	**Polybrominated Biphenyls (PBB)**	**Polybrominated Diphenyl Ethers (PBDE)**
Housing	O	O	O	O	O	O
Display	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有”环境友好使用期限”的标签，此期限是估算这些物质”不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 **(Pb)**	汞 **(Hg)**	镉 **(Cd)**	六价铬 **(CR(VI))**	多溴联苯 **(PBB)**	多溴二苯醚 **(PBDE)**
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						