

QB702-B

Qseven Board User's Manual

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Trademarks

Product names or trademarks appearing in this manual are for identification purpose only and are the properties of the respective owners.

Qseven Specification Reference

<http://www.qseven-standard.org/>

FCC and DOC Statement on Class B

This equipment has been tested and found to comply with the limits for a Class B 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 residential installation. 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

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About this Manual

An electronic file of this manual is included in the CD. To view the user's manual in the CD, insert the CD into a CD-ROM drive. The autorun screen (Main Board Utility CD) will appear. Click "User's Manual" on the main menu.

Warranty

1. Warranty does not cover damages or failures that arised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.
2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.
3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.
4. We will not be liable for any indirect, special, incidental or consequential damages to the product that has been modified or altered.

Static Electricity Precautions

It is quite easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.



Important:

Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

Safety Measures

To avoid damage to the system:

- Use the correct AC input voltage range.

To reduce the risk of electric shock:

- Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

About the Package

The package contains the following items. If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

- One QB702-B board
- One DVD
- One QR (Quick Reference)

Optional Items

- Q7-100 carrier board kit
- Two standoff bolts
- Two sets of nut and bolt
- One bracket
- Heat spreader with heat sink
- Heat spreader

The board and accessories in the package may not come similar to the information listed above. This may differ in accordance with the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.

Chapter 1 - Introduction

Specifications

Processor	<ul style="list-style-type: none"> • QB702-B620T102 <ul style="list-style-type: none"> - Intel® Atom™ E620T (512KB L2 cache, 600 MHz, 3.3W) • QB702-B640T102 <ul style="list-style-type: none"> - Intel® Atom™ E640T (512KB L2 cache, 1.0 GHz, 3.6W) • QB702-B660T102 <ul style="list-style-type: none"> - Intel® Atom™ E660T (512KB L2 cache, 1.3 GHz, 3.6W) • QB702-B680T102 <ul style="list-style-type: none"> - Intel® Atom™ E680T (512KB L2 cache, 1.6 GHz, 4.5W)
Chipset	<ul style="list-style-type: none"> • Intel® EG20T PCH
System Memory	<ul style="list-style-type: none"> • 1GB DDR2 onboard • Supports memory down (single 32-bit channel)
Graphics	<ul style="list-style-type: none"> • Intel® GMA 600 • Supports up to 400MHz graphics frequency • Ultra low power integrated 3D graphics • High definition hardware video decoder and encoder engine • Supports LVDS and SDVO interfaces <ul style="list-style-type: none"> - LVDS: Supports pixel clock depths of 18/24-bit, single channel, max. pixel clock of 80MHz, equates to 1280x768 @ 60Hz - SDVO: Up to 160MHz pixel clock, equates to 1280x1024 @ 85Hz
Audio	<ul style="list-style-type: none"> • Supports High Definition Audio interface
LAN	<ul style="list-style-type: none"> • Integrated Intel® PCH GbE MAC • One Micrel KSZ9021RNI Ethernet PHY • Supports 10Mbps, 100Mbps and 1Gbps data transmission • IEEE 802.3 (10/100Mbps) and IEEE 802.3ab (1Gbps) compliant
Serial ATA	<ul style="list-style-type: none"> • Supports 2 SATA interfaces <ul style="list-style-type: none"> - One port shared with SSD • SATA speed up to 3Gb/s (SATA 2.0)
SDIO/MMC Interface	<ul style="list-style-type: none"> • Supports 1 SDIO/MMC • Supports SDA Standard Ver 1.0, SD memory card specification Ver 2.0, SDIO card specification Ver 1.0, MMC System specification Ver 4.1 • Conforms to Secure Digital Host Controller (SDHC) speed class 6
Trusted Platform Module-TPM (optional)	<ul style="list-style-type: none"> • Provides a Trusted PC for secure transactions • Provides software license protection, enforcement and password protection
SSD (optional)	<ul style="list-style-type: none"> • 2GB/4GB/8GB/16GB/32GB

Expansion Interfaces	<ul style="list-style-type: none"> • Supports 8 USB 2.0 interfaces: <ul style="list-style-type: none"> - 7 Host and 1 Host/Client (selectable) • Supports 1 LPC interface • Supports 1 SMBus interface • Supports 1 I²C interface • Supports 3 PCIe x1 interfaces • Supports CAN-bus (Controller-Area Network) interface • Supports ExpressCard (PCIe signal only) • Supports 1 serial interface (TX/RX) • Supports 8-bit DIO interface
Energy Efficient Design	<ul style="list-style-type: none"> • Supports ACPI 2.0/1.0 specification • Enhanced Intel® SpeedStep Technology
BIOS	<ul style="list-style-type: none"> • AMI BIOS <ul style="list-style-type: none"> - 16Mbit SPI Flash BIOS (UEFI BIOS)
Watchdog Timer	<ul style="list-style-type: none"> • Software programmable from 1 to 255 seconds
Power	<ul style="list-style-type: none"> • Input: VCC_RTC, 5V standby, 5V • Supports ATX/AT mode
Power Consumption	<ul style="list-style-type: none"> • 7.6 W with E680 at 1.6GHz and 1GB DDR2 onboard
OS Support	<ul style="list-style-type: none"> • Windows XP Professional x86 & SP3 (32-bit)
Temperature	<ul style="list-style-type: none"> • Operating: -40°C to 85°C • Storage: -40°C to 85°C
Humidity	<ul style="list-style-type: none"> • 10% to 90%
PCB	<ul style="list-style-type: none"> • Dimensions <ul style="list-style-type: none"> - Qseven form factor - 70mm (2.76") x 70mm (2.76") • Compliance <ul style="list-style-type: none"> - Qseven specification revision 1.2

Features

• DDR2

DDR2 is a higher performance DDR technology whose data transfer rate delivers bandwidth of 4.3 GB per second and beyond. That is twice the speed of the conventional DDR without increasing its power consumption. DDR2 SDRAM modules work at 1.8V supply compared to 2.6V memory voltage for DDR modules. DDR2 also incorporates new innovations such as the On-Die Termination (ODT) as well as larger 4-bit pre-fetch against DDR which fetches 2 bits per clock cycle.

• Graphics

The integrated Intel® HD graphics engine delivers an excellent blend of graphics performance and features to meet business needs. It provides excellent video and 3D graphics with outstanding graphics responsiveness. These enhancements deliver the performance and compatibility needed for today's and tomorrow's business applications. Supports LVDS and SDVO display outputs.

• Serial ATA

Serial ATA is a storage interface that is compliant with SATA 2.0a specification. With speed of up to 3Gb/s (SATA 2.0), it improves hard drive performance faster than the standard parallel ATA whose data transfer rate is 100MB/s. The bandwidth of the SATA 3.0 will be limited by carrier board design.

• Gigabit LAN

The Micrel KSZ9021RNI Ethernet Phy controller supports up to 1Gbps data transmission.

• Watchdog Timer

The Watchdog Timer function allows your application to regularly "clear" the system at the set time interval. If the system hangs or fails to function, it will reset at the set time interval so that your system will continue to operate.

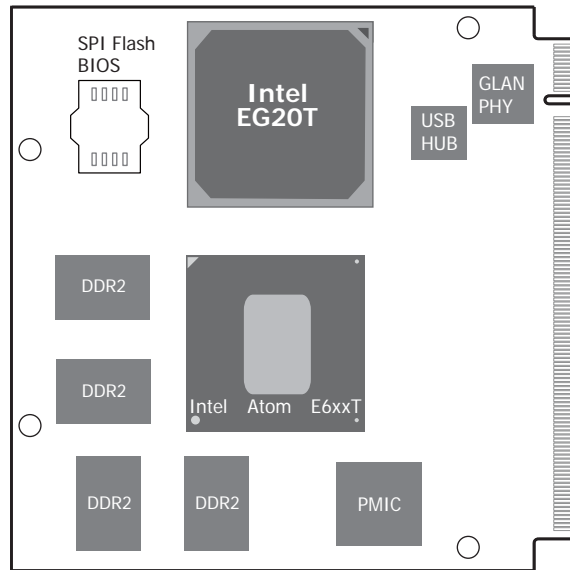
Specification Comparison Table

The table below shows the Qseven standard specifications and the corresponding specifications supported on the QB702-B module.

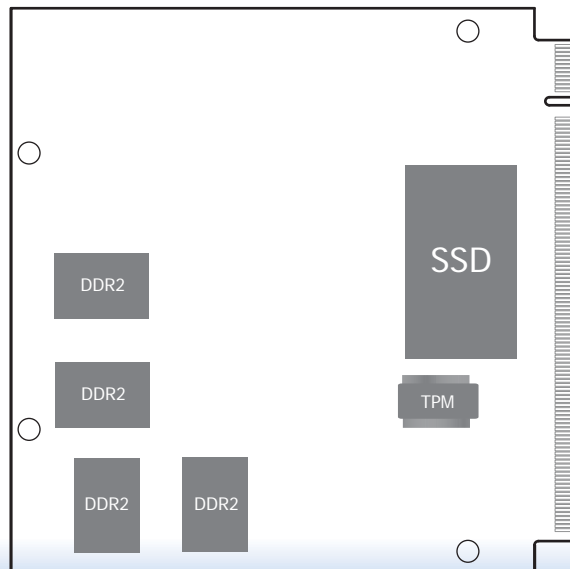
System I/O Interface	ARM/RISC Based Minimum Configuration	X86 Based Minimum Configuration	Maximum Configuration	DFI QB702 Configuration
PCI Express Lanes	0	1 (x1 link)	4	3
Serial ATA channels	0	0	2	2
USB 2.0 ports	3	4	8	8
LVDS channels	0	0	Dual Channel 24bits	Single Channel 24bits
DisplayPort, TMDS,	0	0	1	1
High Definition Audio/AC'97	0	0	1	1
Ethernet 10/100 Mbit/Gigabit	0	0	1 (Gigabit Ethernet)	1
ExpressCard support	0	0	2	2
Low Pin Count bus	0	0	1	1
Secure Digital I/O 8-bit for SD/MMC cards	0	0	1	1
System Management	0	1	1	1
I ² C Bus	1	1	1	1
SPI Bus	0	0	1	1
CAN Bus	0	0	1	1
Watchdog Trigger	1	1	1	1
Power Button	1	1	1	1
Power Good	1	1	1	1
Reset Button	1	1	1	1
LID Button	0	0	1	1
Sleep Button	0	0	1	1
Suspend To RAM (S3 mode)	0	0	1	1
Wake	0	0	1	1
Battery low alarm	0	0	1	1
Thermal control	0	0	1	1
FAN control	0	0	1	1

Chapter 2 - Hardware Installation

Board Layout

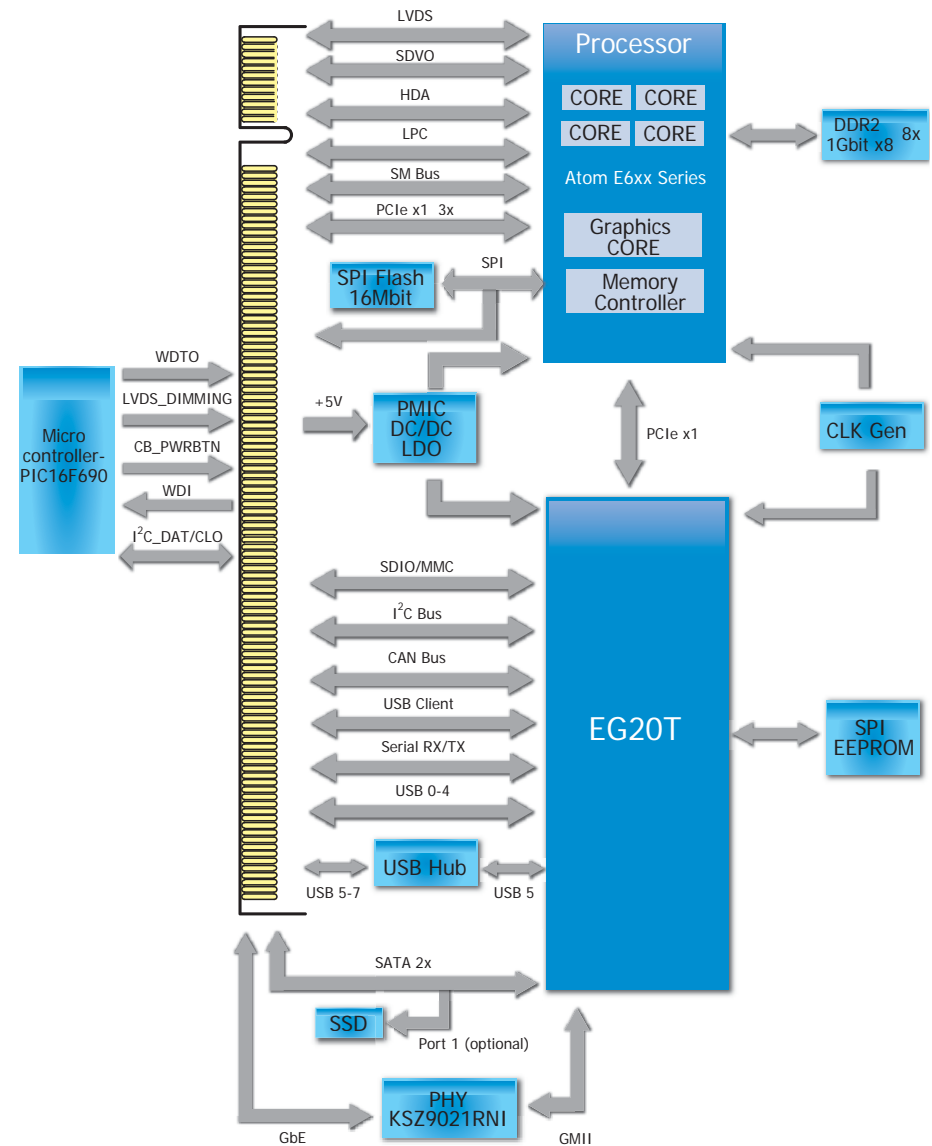


Top View



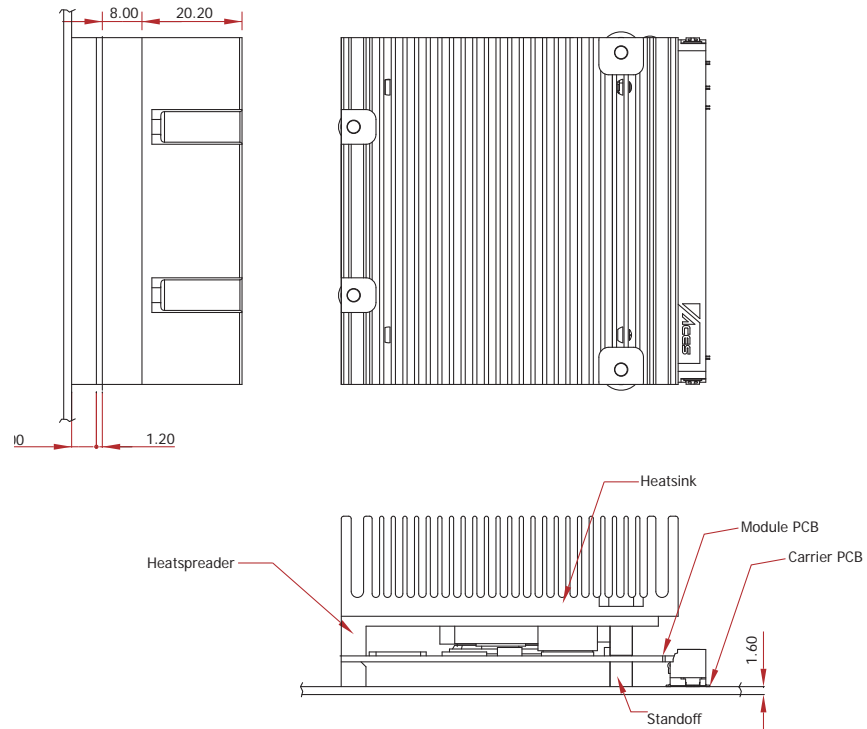
Bottom View

Block Diagram



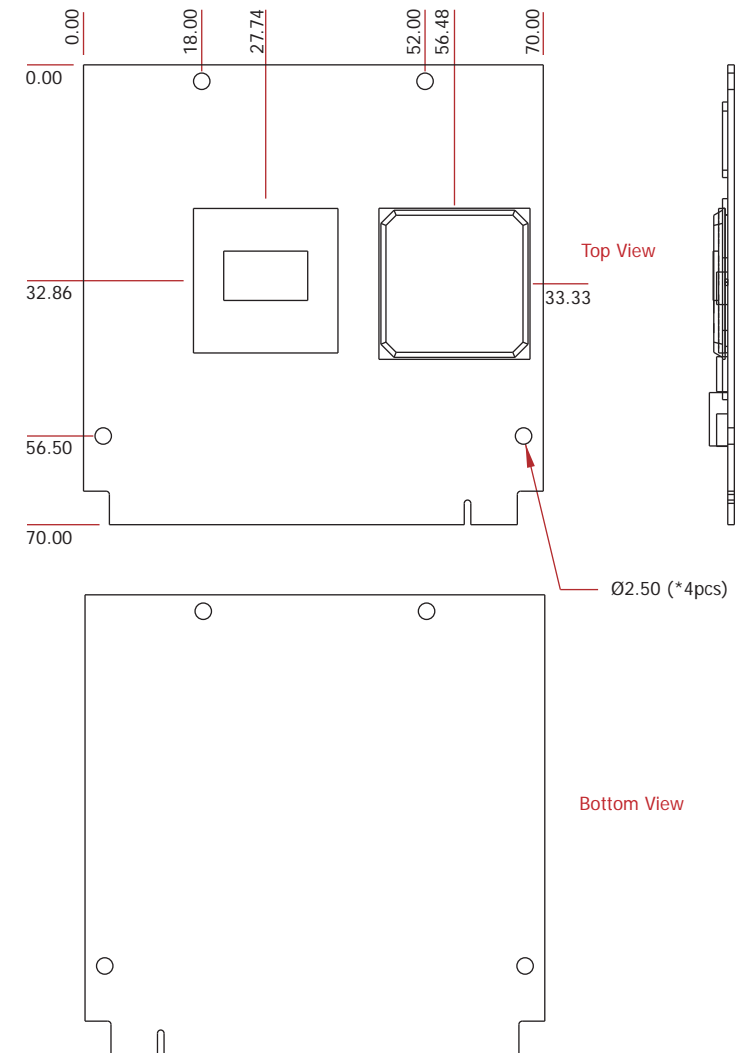
Mechanical Diagram

QB702-B Module with thermal solution



Side View of the Module with thermal solution and Carrier Board

QB702-B Module

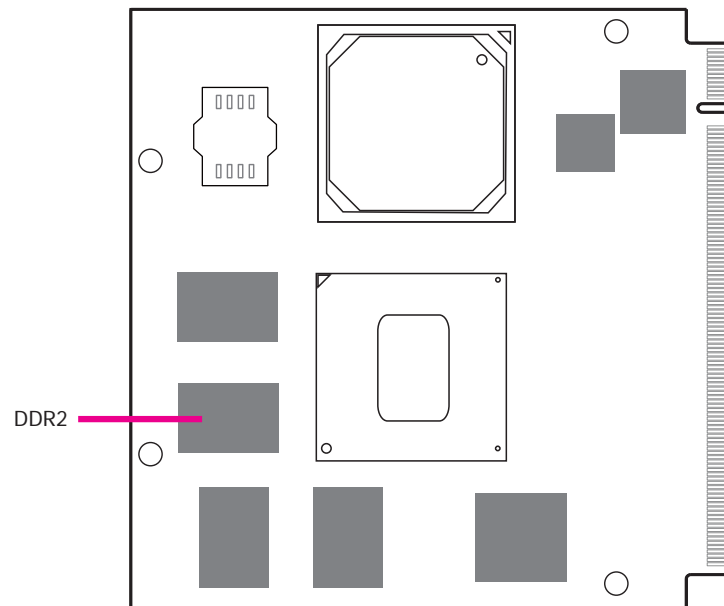


**Important:**

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System Memory

The system board is equipped with memory down (single 32-bit channel) that support DDR2.

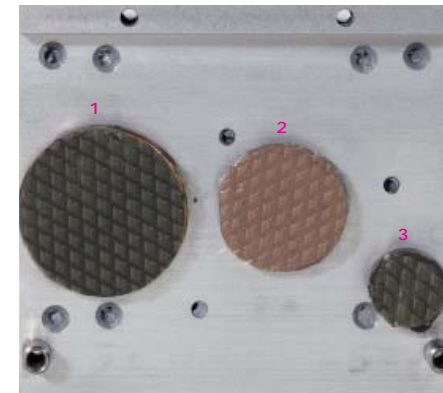


Cooling Option

Heat Spreader with Heat Sink



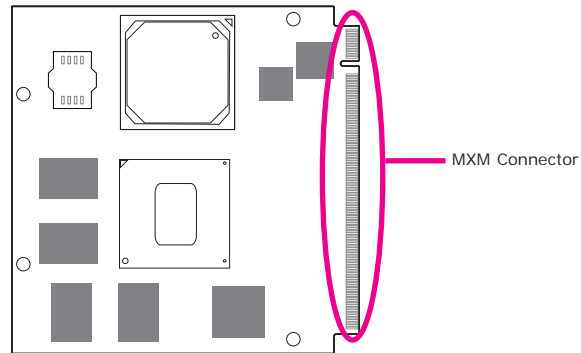
Top View of the Heat Sink



Bottom View of the Heat Spreader

- "1", "2" and "3" denote the locations of the thermal pads designed to contact the corresponding components that are on QB702-B Series.
- Remove the plastic covering from the thermal pads prior to mounting the heat sink onto QB702-B Series.

MXM Connector



The MXM connector is used to interface with the carrier board. Insert QB702-B series to the MXM connector on the carrier board. Refer to the following page for the pin function of this connector.

Refer to “Installing QB702-B Series onto a Carrier Board” section for more information.

Pin	Signal	Pin	Signal
1	GND	2	GND
3	GBE_MDI3-	4	GBE_MDI2-
5	GBE_MDI3+	6	GBE_MDI2+
7	GBE_LINK100#	8	GBE_LINK1000#
9	GBE_MDI1-	10	GBE_MDI0-
11	GBE_MDI1+	12	GBE_MDI0+
13	GBE_LINK#	14	GBE_ACT#
15	GBE_CTREF	16	SUS_S5#
17	WAKE#	18	SUS_S3#
19	SUS_STAT#	20	PWRBTN#
21	SLP_BTN#	22	LID_BTN#
23	GND	24	GND
KEY		KEY	
25	GND	26	PWGIN
27	BATLOW#	28	RSTBTN#
29	SATA0_TX+	30	SATA1_TX+
31	SATA0_TX-	32	SATA1_TX-
33	SATA_ACT#	34	GND
35	SATA0_RX+	36	SATA1_RX+
37	SATA0_RX-	38	SATA1_RX-
39	GND	40	GND
41	BIOS_DISABLE# / BOOT_ALT#	42	SDIO_CLK#
43	SDIO_CD#	44	SDIO_LED
45	SDIO_CMD	46	SDIO_WP
47	SDIO_PWR#	48	SDIO_DAT1
49	SDIO_DAT0	50	SDIO_DAT3
51	SDIO_DAT2	52	SDIO_DAT5
53	SDIO_DAT4	54	SDIO_DAT7
55	SDIO_DAT6	56	RSVD
57	GND	58	GND
59	HDA_SYNC	60	SMB_CLK
61	HDA_RST#	62	SMB_DAT
63	HDA_BITCLK	64	SMB_ALERT#
65	HDA_SDI	66	I2C_CLK
67	HDA_SDO	68	I2C_DAT

Pin	Signal	Pin	Signal
69	THRM#	70	WDTRIG#
71	THRMTRIP#	72	WDOUT
73	GND	74	GND
75	USB_P7-	76	USB_P6-
77	USB_P7+	78	USB_P6+
79	USB_6_7_OC#	80	USB_4_5_OC#
81	USB_P5-	82	USB_P4-
83	USB_P5+	84	USB_P4+
85	USB_2_3_OC#	86	USB_0_1_OC#
87	USB_P3-	88	USB_P2-
89	USB_P3+	90	USB_P2+
91	USB_CC	92	USB_ID
93	USB_P1-	94	USB_P0-
95	USB_P1+	96	USB_P0+
97	GND	98	GND
99	LVDS_A0+	100	LVDS_B0+
101	LVDS_A0-	102	LVDS_B0-
103	LVDS_A1+	104	LVDS_B1+
105	LVDS_A1-	106	LVDS_B1-
107	LVDS_A2+	108	LVDS_B2+
109	LVDS_A2-	110	LVDS_B2-
111	LVDS_PPEN	112	LVDS_BLEN
113	LVDS_A3+	114	LVDS_B3+
115	LVDS_A3-	116	LVDS_B3-
117	GND	118	GND
119	LVDS_A_CLK+	120	LVDS_B_CLK+
121	LVDS_A_CLK-	122	LVDS_B_CLK-
123	LVDS_BLT_CTRL /GP_PWM_OUT0	124	RSVD
125	LVDS_DID_DAT /GP_I2C_DAT	126	LVDS_BLC_DAT
127	LVDS_DID_CLK /GP_I2C_CLK	128	LVDS_BLC_CLK
129	CAN0_TX	130	CAN0_RX
131	SDVO_BCLK+	132	SDVO_INT+
133	SDVO_BCLK-	134	SDVO_INT-
135	GND	136	GND
137	SDVO_GREEN+	138	SDVO_FLDSTALL+
139	SDVO_GREEN-	140	SDVO_FLDSTALL-
141	GND	142	GND
143	SDVO_BLUE+	144	SDVO_TVCLKIN+
145	SDVO_BLUE-	146	SDVO_TVCLKIN-
147	GND	148	GND

Pin	Signal	Pin	Signal
149	SDVO_RED+	150	SDVO_CTRL_DAT
151	SDVO_RED-	152	SDVO_CTRL_CLK
153	HDMI_HPD#	154	DP_HPD#
155	PCIE_CLK_REF+	156	PCIE_WAKE#
157	PCIE_CLK_REF-	158	PCIE_RST#
159	GND	160	GND
161	PCIE3_TX+	162	PCIE3_RX+
163	PCIE3_TX-	164	PCIE3_RX-
165	GND	166	GND
167	PCIE2_TX+	168	PCIE2_RX+
169	PCIE2_TX-	170	PCIE2_RX-
171	EXCD0_PERST#	172	EXCD1_PERST#
173	PCIE1_TX+	174	PCIE1_RX+
175	PCIE1_TX-	176	PCIE1_RX-
177	EXCD0_CPPE#	178	EXCD1_CPPE#
179	PCIE0_TX+	180	PCIE0_RX+
181	PCIE0_TX-	182	PCIE0_RX-
183	GND	184	GND
185	LPC_AD0	186	LPC_AD1
187	LPC_AD2	188	LPC_AD3
189	LPC_CLK	190	LPC_FRAME#
191	SERIRQ	192	LPC_LDRQ#
193	VCC_RTC	194	SPKR / GP_PWM_OUT2
195	FAN_TACHOIN /GP_TIMER_IN	196	FAN_PWMOUT /GP_PWM_OUT1
197	GND	198	GND
199	SPI_MOSI	200	SPI_CS0#
201	SPI_MISO	202	SPI_CS1#
203	SPI_SCK	204	MFG_NC4
205	VCC_5V_SB	206	VCC_5V_SB
207	MFG_NC0	208	MFG_NC2
209	MFG_NC1	210	MFG_NC3
211	VCC	212	VCC
213	VCC	214	VCC
215	VCC	216	VCC
217	VCC	218	VCC
219	VCC	220	VCC
221	VCC	222	VCC
223	VCC	224	VCC
225	VCC	226	VCC
227	VCC	228	VCC
229	VCC	230	VCC

MXM Connector Signal Description

PCI Express Interface Signals Descriptions					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DFI-QB702)	Description
PCIE0_RX+	180	I PCIE	PCIE		PCI Express channel 0, Receive Input differential pair.
PCIE0_RX-	182				
PCIE0_TX+	179	O PCUE	PCIE		PCI Express channel 0, Transmit Output differential pair.
PCIE0_TX-	181				
PCIE1_RX+	174	I PCIE	PCIE		PCI Express channel 1, Receive Input differential pair.
PCIE1_RX-	176				
PCIE1_TX+	173	O PCUE	PCIE		PCI Express channel 1, Transmit Output differential pair.
PCIE1_TX-	175				
PCIE2_RX+	168	I PCIE	PCIE		PCI Express channel 2, Receive Input differential pair.
PCIE2_RX-	170				
PCIE2_TX+	167	O PCUE	PCIE		PCI Express channel 2, Transmit Output differential pair.
PCIE2_TX-	169				
PCIE3_RX+	162	I PCIE	PCIE		PCI Express channel 3, Receive Input differential pair.
PCIE3_RX-	164				
PCIE3_TX+	161	O PCUE	PCIE		PCI Express channel 3, Transmit Output differential pair.
PCIE3_TX-	163				
PCIE_CLK_REF+	155	O PCUE	PCIE		PCI Express Reference Clock for Lanes 0 to 3.
PCIE_CLK_REF-	157				
PCIE_WAKE#	156	I CMOS	3.3V Suspend/3.3V	PU 10K to 3.3V Suspend	PCI Express Wake Event: Sideband wake signal asserted by components requesting wakeup.
PCIE_RST#	158	O CMOS	3.3V/3.3V		Reset Signal for external devices.
Express Card Support Pins					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DFI-QB702)	Description
EXCD0_CPPE#	177	I CMOS	3.3V	PU 10K to 3.3V	ExpressCard slot #0 capable card request
EXCD0_PERST#	171	O CMOS	3.3V	PU 10K to 3.3V	ExpressCard slot #0 reset.
EXCD1_CPPE#	178	I CMOS	3.3V	PU 10K to 3.3V	ExpressCard slot #1 capable card request.
EXCD1_PERST#	172	O CMOS	3.3V		ExpressCard slot #1 reset.
Gigabit Ethernet Signals					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DFI-QB702)	Description
GBE_MDIO+	12	I/O GB_LAN	GB_LAN		Media Dependent Interface (MDI) differential pair 0. The MDI can operate in 1000, 100, and 10Mbit/sec modes.This signal pair is used for all modes.
GBE_MDIO-	10				
GBE_MDIO+	11	I/O GB_LAN	GB_LAN		Media Dependent Interface (MDI) differential pair 1. The MDI can operate in 1000, 100, and 10Mbit/sec modes.This signal pair is used for all modes.
GBE_MDIO-	9				
GBE_MDIO+	6	I/O GB_LAN	GB_LAN		Media Dependent Interface (MDI) differential pair 2. The MDI can operate in 1000, 100, and 10Mbit/sec modes.This signal pair is used for all modes.
GBE_MDIO-	4				
GBE_MDIO+	5	I/O GB_LAN	GB_LAN		Media Dependent Interface (MDI) differential pair 3. The MDI can operate in 1000, 100, and 10Mbit/sec modes.This signal pair is used for all modes.
GBE_MDIO-	3				
GBE_CTREF	15	I/O GB_LAN	GB_LAN		Reference voltage for carrier board Ethernet channel 0 magnetics center tap. The reference voltage is determined by the requirements of the module's PHY and may be as low as 0V and as high as 3.3V. The reference voltage output should be current limited on the module. In a case in which the reference is shorted to ground, the current must be limited to 250mA or less.
GBE_LINK#	13	O CMOS 3.3V PP	3.3V/3.3V	PU 10K to 2.5V	Ethernet controller 0 link indicator, active low.
GBE_LINK100#	7	O CMOS 3.3V PP	3.3V/3.3V		Ethernet controller 0 100Mbit/sec link indicator, active low.
GBE_LINK1000#	8	O CMOS 3.3V PP	3.3V/3.3V		Ethernet controller 0 1000Mbit/sec link indicator, active low.
GBE_ACT#	14	O CMOS 3.3V PP	3.3V/3.3V	PU 10K to 2.5V	Ethernet controller 0 activity indicator, active low.

Serial ATA Interface Signals					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DFI-QB702)	Description
SATA0_RX+	35	I SATA	AC coupled on Module		Serial ATA channel 0, Receive Input differential pair.
SATA0_RX-	37		AC coupled on Module		
SATA0_TX+	29	O SATA	AC coupled on Module		Serial ATA channel 0, Transmit Output differential pair.
SATA0_TX-	31		AC coupled on Module		
SATA1_RX+	36	I SATA	AC coupled on Module		Serial ATA channel 1, Receive Input differential pair.
SATA1_RX-	38		AC coupled on Module		
SATA1_TX+	30	O SATA	AC coupled on Module		Serial ATA channel 1, Transmit Output differential pair.
SATA1_TX-	32		AC coupled on Module		
SATA_ACT#	33	O OC 3.3V	3.3V/3.3V		Serial ATA Led. Open collector output pin driven during SATA command activity.

USB Interface Signals					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DFI-QB702)	Description
USB_P0+	96	I/O USB	USB		Universal Serial Bus Port 0 differential pair.
USB_P0-	94				
USB_P1+	95	I/O USB	USB		Universal Serial Bus Port 1 differential pair.This port may be optionally used as USB client port.
USB_P1-	93				
USB_P2+	90	I/O USB	USB		Universal Serial Bus Port 2 differential pair.
USB_P2-	88				
USB_P3+	89	I/O USB	USB		Universal Serial Bus Port 3 differential pair.
USB_P3-	87				
USB_P4+	84	I/O USB	USB		Universal Serial Bus Port 4 differential pair.
USB_P4-	82				
USB_P5+	83	I/O USB	USB		Universal Serial Bus Port 5 differential pair.
USB_P5-	81				
USB_P6+	78	I/O USB	USB		Universal Serial Bus Port 6 differential pair.
USB_P6-	76				
USB_P7+	77	I/O USB	USB		Universal Serial Bus Port 7 differential pair.
USB_P7-	75				
USB_0_1_OC#	86	I CMOS	3.3V Suspend/3.3V	PU 10K to 3.3V Suspend	Over current detect input 1. This pin is used to monitor the USB power over current of the USB Ports 0 and 1.
USB_2_3_OC#	85	I CMOS	3.3V Suspend/3.3V	PU 10K to 3.3V Suspend	Over current detect input 2. This pin is used to monitor the USB power over current of the USB Ports 2 and 3.
USB_4_5_OC#	80	I CMOS	3.3V Suspend/3.3V	PU 10K to 3.3V Suspend	Over current detect input 3. This pin is used to monitor the USB power over current of the USB Ports 4 and 5.
USB_6_7_OC#	79	I CMOS	3.3V Suspend/3.3V	Not support	Over current detect input 4. This pin is used to monitor the USB power over current of the USB Ports 6 and 7.
USB_ID	92	I CMOS	3.3V Suspend/3.3V	PD 10K	USB ID pin.Configures the mode of the USB Port 1. If the signal is detected as being 'high active' the BIOS will automatically configure USB Port 1 as USB Client and enable USB Client support. This signal should be driven as OC signal by external circuitry.
USB_CC	91	I CMOS	3.3V Suspend/3.3V	PD 10K	USB Client Connect pin.If USB Port 1 is configured for client mode then an externally connected USB host should set this signal to high-active in order to properly make the connection with the module's internal USB client controller. If the external USB host is disconnected, this signal should be set to low-active in order to inform the USB client controller that the external host has been disconnected. A level shifter/protection circuitry should be implemented on the carrier board for this signal.

SDIO Interface Signals					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DFI-QB702)	Description
SDIO_CD#	43	I/O CMOS	3.3V/3.3V	PU 10K to 3.3V	SDIO Card Detect. This signal indicates when a SDIO/MMC card is present.
SDIO_CLK	42	O CMOS	3.3V/3.3V		SDIO Clock. With each cycle of this signal a one-bit transfer on the command and each data line occurs. This signal has maximum frequency of 48 MHz.
SDIO_CMD	45	I/O OD/PP CMOS	3.3V/3.3V		SDIO Command/Response. This signal is used for card initialization and for command transfers. During initialization mode this signal is open drain. During command transfer this signal is in push-pull mode.
SDIO_LED	44	O CMOS	3.3V/3.3V		SDIO LED. Used to drive an external LED to indicate when transfers occur on the bus.
SDIO_WP	46	I/O CMOS	3.3V/3.3V	PU 10K to 3.3V	SDIO Write Protect. This signal denotes the state of the write-protect tab on SD cards.
SDIO_PWR#	47	O CMOS	3.3V/3.3V		SDIO Power Enable. This signal is used to enable the power being supplied to a SD/MMC card device.
SDIO_DAT0-7	48-55	I/O PP CMOS	3.3V/3.3V		SDIO Data lines. These signals operate in push-pull mode

High Definition Audio Signals/AC'97

Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DFI-QB702)	Description
HDA_RST#	61	O CMOS	3.3V/3.3V		HD Audio/AC'97 Codec Reset.
HDA_SYNC	59	O CMOS	3.3V/3.3V		Serial Bus Synchronization
HDA_BCLK	63	O CMOS	3.3V/3.3V		HD Audio/AC'97 24 MHz Serial Bit Clock from Codec.
HDA_SDO	67	O CMOS	3.3V/3.3V		HD Audio/AC'97 Serial Data Output to Codec.
HDA_SDIN	65	I CMOS	3.3V/3.3V		HD Audio/AC'97 Serial Data Input to Codec.

LVDS Flat Panel Signals

Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DFI-QB702)	Description
LVDS_PPEN	111	O CMOS	3.3V/3.3V		Controls panel power enable.
LVDS_BLEN	112	O CMOS	3.3V/3.3V		Controls panel Backlight enable.
LVDS_BLT_CTRL/GP_PWM_OUT0	123	O CMOS	3.3V/3.3V		Primary functionality is to control the panel backlight brightness via pulse width modulation (PWM). When not in use for this primary purpose it can be used as General Purpose PWM Output.
LVDS_A0+	99	O LVDS	LVDS		LVDS primary channel differential pair 0.
LVDS_A0-	101	O LVDS	LVDS		
LVDS_A1+	103	O LVDS	LVDS		LVDS primary channel differential pair 1.
LVDS_A1-	105	O LVDS	LVDS		
LVDS_A2+	107	O LVDS	LVDS		LVDS primary channel differential pair 2.
LVDS_A2-	109	O LVDS	LVDS		
LVDS_A3+	113	O LVDS	LVDS		LVDS primary channel differential pair 3.
LVDS_A3-	115	O LVDS	LVDS		
LVDS_A_CLK+	119	O LVDS	LVDS		LVDS primary channel differential pair clock lines.
LVDS_A_CLK-	121	O LVDS	LVDS		
LVDS_B0+	100	O LVDS	LVDS		LVDS secondary channel differential pair 0.
LVDS_B0-	102	O LVDS	LVDS		
LVDS_B1+	104	O LVDS	LVDS		LVDS secondary channel differential pair 1.
LVDS_B1-	106	O LVDS	LVDS		
LVDS_B2+	108	O LVDS	LVDS		LVDS secondary channel differential pair 2.
LVDS_B2-	110	O LVDS	LVDS		
LVDS_B3+	114	O LVDS	LVDS		LVDS secondary channel differential pair 3.
LVDS_B3-	112	O LVDS	LVDS		
LVDS_B_CLK+	120	O LVDS	LVDS		LVDS secondary channel differential pair clock lines.
LVDS_B_CLK-	122	O LVDS	LVDS		
LVDS_DID_CLK/GP_I2C_CLK	127	I/O OD CMOS	3.3V/3.3V		Primary functionality is DisplayID DDC clock line used for LVDS flat panel detection. If primary functionality is not used it can be as General Purpose I2C bus clock line.
LVDS_DID_DAT/GP_I2C_DAT	125	I/O OD CMOS	3.3V/3.3V		Primary functionality DisplayID DDC data line used for LVDS flat panel detection. If primary functionality is not used it can be as General Purpose I2C bus data line.
LVDS_BLC_CLK	128	I/O OD CMOS	3.3V/3.3V		Control clock signal for external SSC clock chip.
LVDS_BLC_DAT	126	I/O OD CMOS	3.3V/3.3V		Control data signal for external SSC clock chip.

SDVO Interface Signals

Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DFI-QB702)	Description
SDVO_BCLK-	133	O PCIE	SDVO		SDVO differential pair clock lines.
SDVO_BCLK+	131				
SDVO_INT-	134	I PCIE	SDVO		SDVO differential pair interrupt input lines.
SDVO_INT+	132				
SDVO_GREEN-	139	O PCIE	SDVO		SDVO differential pair green data lines.
SDVO_GREEN+	137				
SDVO_BLUE-	145	O PCIE	SDVO		SDVO differential pair blue data lines.
SDVO_BLUE+	143				
SDVO_RED-	151	O PCIE	SDVO		SDVO differential pair red data lines.
SDVO_RED+	149				
SDVO_FLDSTALL-	140	I PCIE	SDVO		SDVO differential pair field stall lines.
SDVO_FLDSTALL+	138				
SDVO_TVCLKIN-	146	I PCIE	SDVO		SDVO differential pair TV-Out synchronization clock lines.
SDVO_TVCLKIN+	144				
SDVO_CTRL_CLK	152	I/O OD CMOS	3.3V/3.3V		I2C based control signal (clock) for SDVO device. Note: If the control bus from the SDVO device has a different signaling voltage, then a level shifting device will be required on the carrier board to properly translate the voltage level for this signal.
SDVO_CTRL_DAT	150	I/O OD CMOS	3.3V/3.3V		I2C based control signal (data) for SDVO device. Note: If the control bus from the SDVO device has a different signaling voltage, then a level shifting device will be required on the carrier board to properly translate the voltage level for this signal.

HDMI Interface Signals					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DF1-QB702)	Description
TMDS_CLK- (SDVO_BCLK-)	133	O TMDS	TMDS		TMDS differential pair clock lines.
TMDS_CLK+ (SDVO_BCLK+)	131				
TMDS_LANE0- (SDVO_BLUE-)	145	O TMDS	TMDS		TMDS differential pair lines lane 0.
TMDS_LANE0+ (SDVO_BLUE+)	143				
TMDS_LANE1- (SDVO_GREEN-)	139	O TMDS	TMDS		TMDS differential pair lines lane 1.
TMDS_LANE1+ (SDVO_GREEN+)	137				
TMDS_LANE2- (SDVO_RED-)	151	O TMDS	TMDS		TMDS differential pair lines lane 2.
TMDS_LANE2+ (SDVO_RED+)	149				
HDMI_CTRL_CLK (SDVO_CTRL_CLK)	152	I/O OD CMOS	3.3V/3.3V		DDC based control signal (clock) for HDMI device. Note: Level shifters must be implemented on the carrier board for this signal in order to be compliant with the HDMI Specification.
HDMI_CTRL_DAT (SDVO_CTRL_DAT)	150	I/O OD CMOS	3.3V/3.3V		DDC based control signal (data) for HDMI device. Note: Level shifters must be implemented on the carrier board for this signal in order to be compliant with the HDMI Specification
HDMI_HPD#	153	I CMOS	3.3V/3.3V		Hot plug detection signal that serves as an interrupt request.
DisplayPort Interface Signals					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DF1-QB702)	Description
DP_LANE3- (SDVO_BCLK-)	133	O PCIE	DP		DisplayPort differential pair lines lane 3.
DP_LANE3+ (SDVO_BCLK+)	131				
DP_LANE2- (SDVO_BLUE-)	145	O PCIE	DP		DisplayPort differential pair lines lane 2.
DP_LANE2+ (SDVO_BLUE+)	143				
DP_LANE1- (SDVO_GREEN-)	139	O PCIE	DP		DisplayPort differential pair lines lane 1.
DP_LANE1+ (SDVO_GREEN+)	137				
DP_LANE0- (SDVO_RED-)	151	O PCIE	DP		DisplayPort differential pair lines lane 0.
DP_LANE0+ (SDVO_RED+)	149				
DP_AUX- (SDVO_FLDSTALL-)	140	I/O PCIE	DP		Auxiliary channel used for link management and device control. Differential pair lines.
DP_AUX+ (SDVO_FLDSTALL+)	138				
DP_HPD#	154	I CMOS	3.3V/3.3V		Hot plug detection signal that serves as an interrupt request.
LPC Interface Signals					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DF1-QB702)	Description
LPC_AD[0..3]	185-188	I/O CMOS	3.3V/3.3V		Multiplexed Command, Address and Data.
LPC_FRAME#	190	O CMOS	3.3V/3.3V		LPC frame indicates the start of a new cycle or the termination of a broken cycle.
LPC_LDRO#	192	I CMOS	3.3V/3.3V		LPC DMA request.
LPC_CLK	189	O CMOS	3.3V/3.3V		LPC clock.
SERIRQ	191	I/O CMOS	3.3V/3.3V		Serialized Interrupt.
SPI Interface Signals					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DF1-QB702)	Description
SPI_MOSI	199	O CMOS	3.3V/3.3V		Master serial output/Slave serial input signal. SPI serial output data from Oseven module to the SPI device.
SPI_MISO	201	I CMOS	3.3V/3.3V		Master serial input/Slave serial output signal. SPI serial input data from the SPI device to Oseven module.
SPI_SCK	203	O CMOS	3.3V/3.3V		SPI clock output.
SPI_CS0#	200	O CMOS	3.3V/3.3V		SPI chip select 0 output.
SPI_CS1#	202	O CMOS	3.3V/3.3V		SPI Chip Select 1 signal is used as the second chip select when two devices are used. Do not use when only one SPI device is used.
CAN Bus Interface Signals					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DF1-QB702)	Description
CAN0_TX	129	O CMOS	3.3V/3.3V		CAN (Controller Area Network) TX output for CAN Bus channel 0. In order to connect a CAN controller device to the Oseven module's CAN bus it is necessary to add transceiver hardware to the carrier board.
CAN0_RX	130	I CMOS	3.3V/3.3V	PU 10K to 3.3V	RX input for CAN Bus channel 0. In order to connect a CAN controller device to the Oseven module's CAN bus it is necessary to add transceiver hardware to the carrier board.

Power Control Signals					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DFI-QB702)	Description
PWGIN	26	I CMOS	5V/5V		High active input for the Oseven® module indicates that all power rails located on the carrier board are ready for use.
PWRBTN#	20	I CMOS	3.3V Standby		Power Button: Low active power button input. This signal is triggered on the falling edge.
Power Management Signals					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DFI-QB702)	Description
RSTBTN#	28	I CMOS	3.3V/3.3V		Reset button input. This input may be driven active low by an external circuitry to reset the Oseven module.
BATLOW#	27	I CMOS	3.3V Suspend/3.3V	PU 10K to 3.3V Suspend	Battery low input. This signal may be driven active low by external circuitry to signal that the system battery is low or may be used to signal some other external battery management event.
WAKE#	17	I CMOS	3.3V Suspend/3.3V	PU 10K to 3.3V Suspend	External system wake event. This may be driven active low by external circuitry to signal an external wake-up event.
SUS_STAT#	19	O CMOS	3.3V Suspend/3.3V	PU 10K to 3.3V Suspend	Suspend Status: indicates that the system will be entering a low power state soon.
SUS_S3#	18	O CMOS	3.3V Suspend/3.3V		S3 State: This signal shuts off power to all runtime system components that are not maintained during S3 (Suspend to Ram), S4 or S5 states. The signal SUS_S3# is necessary in order to support the optional S3 cold power state.
SUS_S5#	16	O CMOS	3.3V Suspend/3.3V		S5 State: This signal indicates S4 or S5 (Soft Off) state.
SLP_BTN#	21	I CMOS	3.3V Suspend/3.3V	PU 10K to 3.3V Suspend	Sleep button. Low active signal used by the ACPI operating system to transition the system into sleep state or to wake it up again. This signal is triggered on falling edge.
LID_BTN#	22	I CMOS	3.3V Suspend/3.3V	PU 10K to 3.3V Suspend	LID button. Low active signal used by the ACPI operating system to detect a LID switch and to bring system into sleep state or to wake it up again. Open/Close state may be software configurable.
Miscellaneous Signals					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DFI-QB702)	Description
WDTRIG#	70	I CMOS	3.3V/3.3V		Watchdog trigger signal. This signal restarts the watchdog timer of the Oseven module on the falling edge of a low active pulse.
WDOUT	72	O CMOS	3.3V/3.3V		Watchdog event indicator. High active output used for signaling a missing watchdog trigger. Will be deasserted by software, system reset or a system power down.
I2C_CLK	66	I/O OD CMOS	3.3V/3.3V	PU 10K to 3.3V	Clock line of I²C bus.
I2C_DAT	68	I/O OD CMOS	3.3V/3.3V	PU 10K to 3.3V	Data line of I²C bus.
SMB_CLK	60	I/O OD CMOS	3.3V Suspend/3.3V	PU 2K to 3.3V Suspend	Clock line of System Management Bus.
SMB_DAT	62	I/O OD CMOS	3.3V Suspend/3.3V	PU 2K to 3.3V Suspend	Data line of System Management Bus.
SMB_ALERT#	64	O CMOS	3.3V/3.3V	PU 2K to 3.3V Suspend	System Management Bus Alert input. This signal may be driven low by SMB devices to signal an event on the SM Bus.
SPKR/GP_PWM_OUT2	194	O CMOS	3.3V/3.3V		Primary functionality is output for audio enunciator, the "speaker" in PC AT systems. When not in use for this primary purpose it can be used as General Purpose PWM Output.
BIOS_DISABLE#/BOOT_ALT#	41	I CMOS	3.3V/3.3V		Module BIOS disable input signal. Pull low to disable module's on-board BIOS. Allows off-module BIOS implementations. This signal can also be used to disable standard boot firmware flash device and enable an alternative boot firmware source, for example a boot loader.
RSVD	56,124,	NC			Do not connect
Manufacturing Signals					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DFI-QB702)	Description
MFG_NC0	207	N.A	N.A		This pin is reserved for manufacturing and debugging purposes. May be used as JTAG_TCK signal for boundary scan purposes during production or as a vendor specific control signal. When used as a vendor specific control signal the multiplexer must be controlled by the MFG_NC4 signal.
MFG_NC1	209	N.A	N.A		This pin is reserved for manufacturing and debugging purposes. May be used as JTAG_TDO signal for boundary scan purposes during production. May also be used, via a multiplexer, as a UART_TX signal to connect a simple UART for firmware and boot loader implementations. In this case the multiplexer must be controlled by the MFG_NC4 signal.
MFG_NC2	208	N.A	N.A		This pin is reserved for manufacturing and debugging purposes. May be used as JTAG_TDI signal for boundary scan purposes during production. May also be used, via a multiplexer, as a UART_RX signal to connect a simple UART for firmware and boot loader implementations. In this case the multiplexer must be controlled by the MFG_NC4 signal.
MFG_NC3	210	N.A	N.A		This pin is reserved for manufacturing and debugging purposes. May be used as JTAG_TMS signal for boundary scan purposes during production. May also be used, via a multiplexer, as vendor specific BOOT signal for firmware and boot loader implementations. In this case the multiplexer must be controlled by the MFG_NC4 signal.
MFG_NC4	204	N.A	N.A		This pin is reserved for manufacturing and debugging purposes. May be used as JTAG_TRST# signal for boundary scan purposes during production. May also be used as control signal for a multiplexer circuit on the module enabling secondary function for MFG_NC0..3 (JTAG / UART). When MFG_NC4 is high active it is being used for JTAG purposes. When MFG_NC4 is low active it is being used for UART purposes.

Thermal Management Signals					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DF1-QB702)	Description
THRM#	69	I CMOS	3.3V/3.3V	PU 10K to 3.3V	Thermal Alarm active low signal generated by the external hardware to indicate an over temperature situation. This signal can be used to initiate thermal throttling.
THRMTRIP#	71	O CMOS	3.3V/3.3V	PU 10K to 3.3V	Thermal Trip indicates an overheating condition of the processor. If 'THRMTRIP#' goes active the system immediately transitions to the S5 State (Soft Off).
Fan Control Implementation					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DF1-QB702)	Description
FAN_PWMOUT/GP_PWM_OUT1	196	O CMOS	3.3V/3.3V		Primary functionality is fan speed control. Uses the Pulse Width Modulation (PWM) technique to control the Fan's RPM based on the CPU's die temperature. When not in use for this primary purpose it can be used as General Purpose PWM Output.
FAN_TACHOIN/GP_TIMER_IN	195	I CMOS	3.3V/3.3V		Primary functionality is fan tachometer input. When not in use for this primary purpose It can be used as General Purpose Timer Input.
Input Power Pins					
Signal	Pin#	Pin Type	Pwr Rail /Tolerance	PU/PD (DF1-QB702)	Description
VCC	211-230	Power			Power Supply +5VDC $\pm 5\%$
VCC_5V_SB	205-206	Power			Standby Power Supply +5VDC $\pm 5\%$
VCC_RTC	193	Power			3 V backup cell input. VCC_RTC should be connected to a 3V backup cell for RTC operation and storage register non-volatility in the absence of system power. (VCC_RTC = 2.4 - 3.3 V).
GND	1-2, 23-25, 34, 39-40, 57-58, 73-74, 97-98, 117-118, 135-136, 141-142, 147-148, 159-160, 165-166, 183-184, 197-198,	Power Ground			Power Ground.

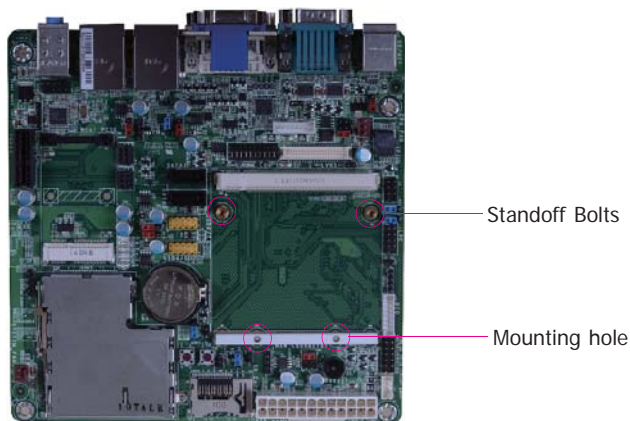
Installing QB702-B Series onto a Carrier Board



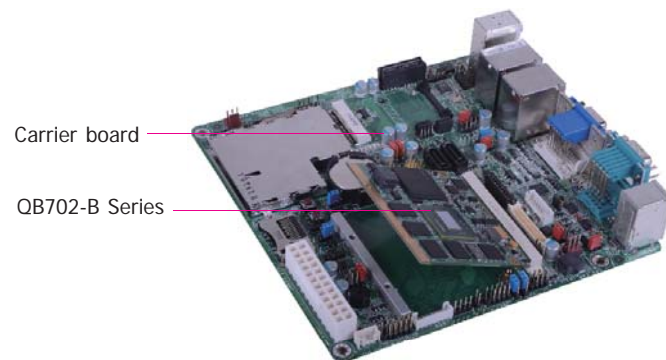
Important:

The carrier board used in this section is for reference purpose only and may not resemble your carrier board. These illustrations are mainly to guide you on how to install QB702-B Series onto the carrier board of your choice.

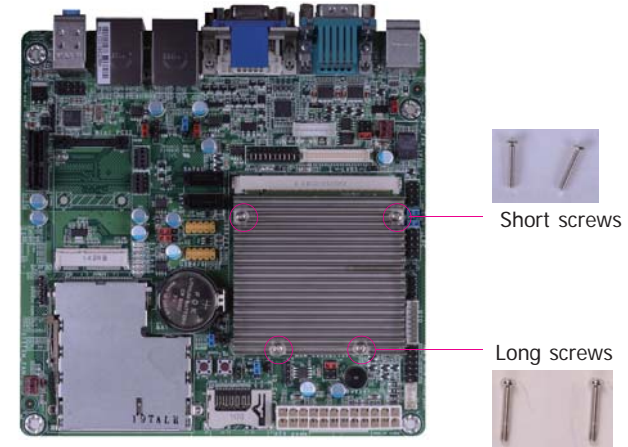
1. The photo below shows the locations of the mounting holes and the bolts already fixed in place.



2. Grasping QB702-B Series by its edges, insert it into the carrier board, and you will hear a distinctive "click" indicating QB702-B Series is correctly locked into position.



3. Press down QB702-B Series and put on the heat sink on top of QB702-B Series with its mounting holes and bolts aligned on the carrier board. Use the mounting screw to fix QB702-B Series and heat sink on place.



Chapter 3 - BIOS Setup

Overview

The BIOS is a program that takes care of the basic level of communication between the CPU and peripherals. It contains codes for various advanced features found in this system board. The BIOS allows you to configure the system and save the configuration in a battery-backed CMOS so that the data retains even when the power is off. In general, the information stored in the CMOS RAM of the EEPROM will stay unchanged unless a configuration change has been made such as a hard drive replaced or a device added. It is possible that the CMOS battery will fail causing CMOS data loss. If this happens, you need to install a new CMOS battery and reconfigure the BIOS settings.


Note:

The BIOS is constantly updated to improve the performance of the system board; therefore the BIOS screens in this chapter may not appear the same as the actual one. These screens are for reference purpose only.

Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering the BIOS Setup Utility

The BIOS Setup Utility can only be operated from the keyboard and all commands are keyboard commands. The commands are available at the right side of each setup screen.

The BIOS Setup Utility does not require an operating system to run. After you power up the system, the BIOS message appears on the screen and the memory count begins. After the memory test, the message "Press DEL to run setup" will appear on the screen. If the message disappears before you respond, restart the system or press the "Reset" button. You may also restart the system by pressing the <Ctrl> <Alt> and keys simultaneously.

Legends

KEYs	Function
Right and Left Arrows	Moves the highlight left or right to select a menu.
Up and Down Arrows	Moves the highlight up or down between submenus or fields.
<Esc>	Exits to the BIOS setup utility
+ (plus key)	Scrolls forward through the values or options of the highlighted field.
- (minus key)	Scrolls backward through the values or options of the highlighted field.
Tab	Select a field
<F1>	Displays general help
<F4>	Saves and exits the setup program
<Enter>	Press <Enter> to enter the highlighted submenu

Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

Submenu

When "►" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press <Enter>.

AMI BIOS Setup Utility

Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.		
Main	Advanced	Chipset
BIOS Information BIOS Vendor Core Version Project Version Build Date Memory Information MRC Version Total Memory System Date System Time Access Level	American Megatrends 4.6.3.7 OABTN 0.32 12/18/2012 14:19:08 01.00 1024 MB (DDR2) [Thu 01/01/2009] [18:36:56] Administraor	Set the Date. Use TAB to switch between Data elements. → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1980 to 2099.

System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.



Important:

Setting incorrect field values may cause the system to malfunction.

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.		
Main	Advanced	Chipset
Legacy OpROM Support Launch PXE OpROM Launch Storage OpROM ▶ APCI Settings ▶ CPU Configuration ▶ SDIO Configuration ▶ USB Configuration ▶ Module Board H/W Monitor	[Disabled] [Enabled]	Enable or Disable Boot Option for Legacy Net- work Devices. → ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

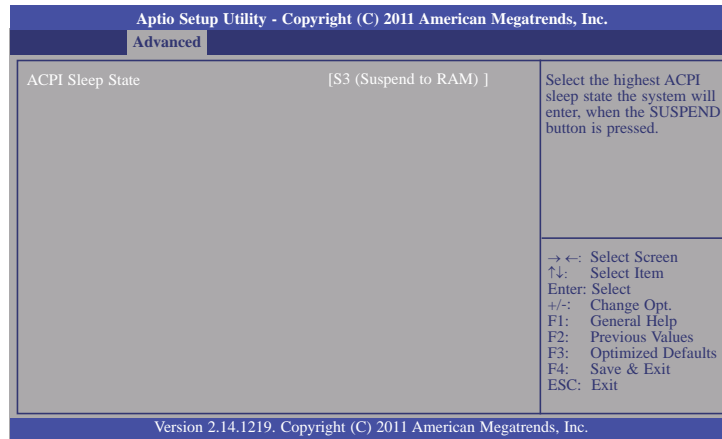
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Launch Storage OpROM

Enable or Disable Boot Option for Legacy Mass Storage Devices with Option ROM.

ACPI Settings

This section is used to configure the ACPI Settings.



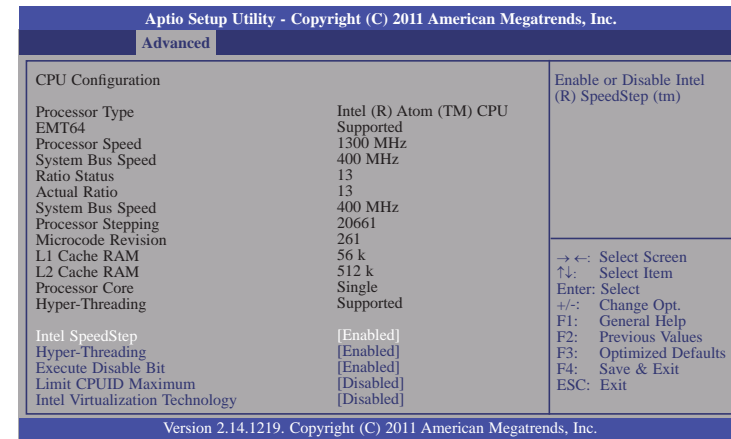
ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

S3(STR) Enables the Suspend to RAM function.

CPU Configuration

This section is used to configure the CPU. It will also display the detected CPU information.



Hyper-Threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology).

Execute Disable Bit

XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP sp2, SuSE Linux 9.2, RedHat Enterprise 3 update 3.)

Limit CPUID Maximum

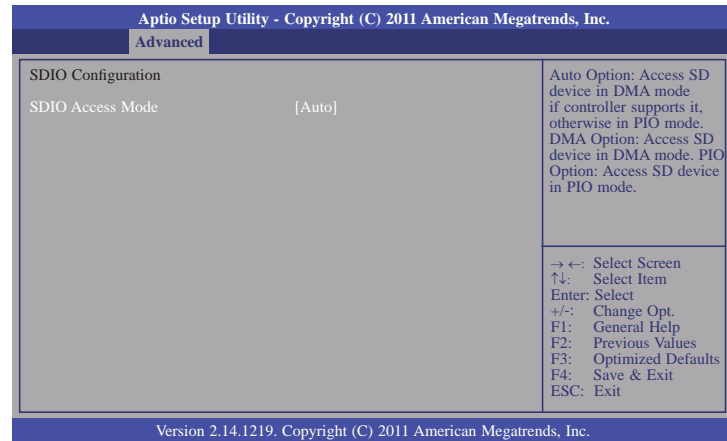
Disabled for Windows XP.

Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by vanderpool Technology.

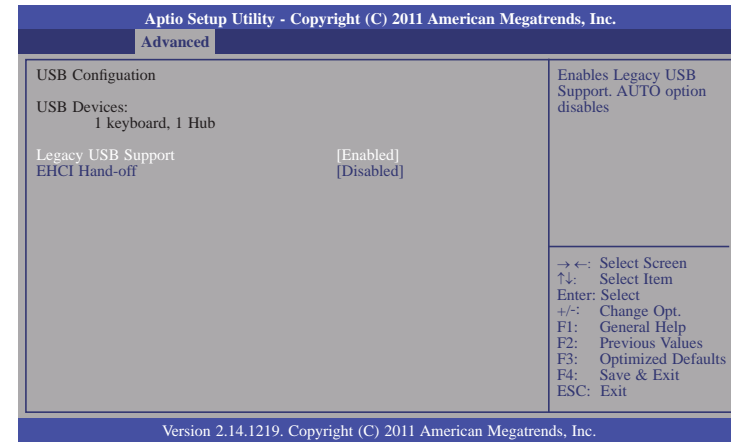
SDIO Configuration

This section configures settings relevant to SDIO.



USB Configuration

This section is used to configure USB.

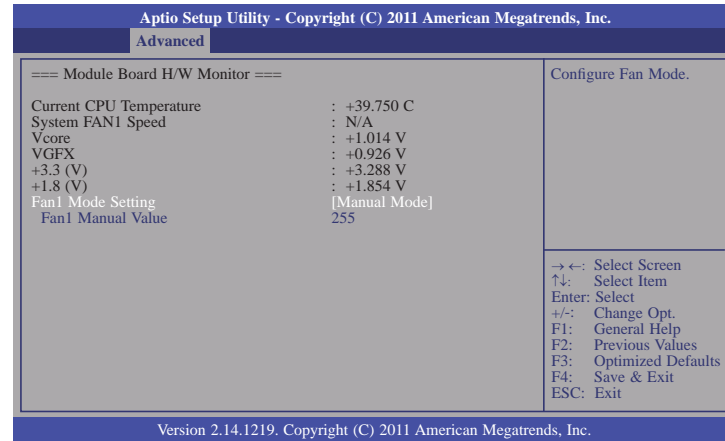


EHCI Hand-off

This is a workaround for Oses without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

Module Board H/W Monitor

This section is used to configure Module Board H/W Monitor.

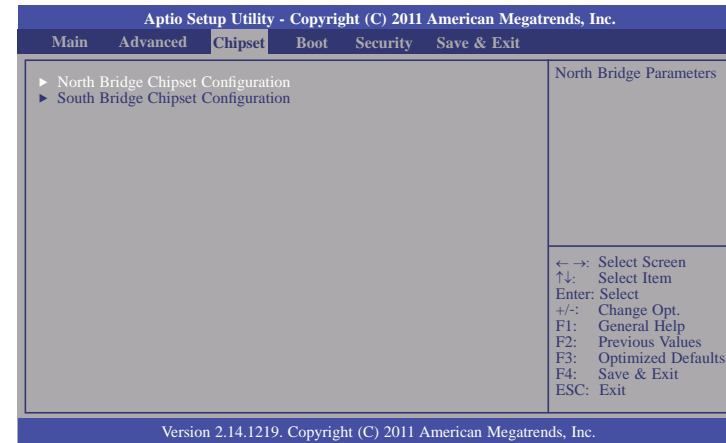


Fan1 Manual Value

Fan Manual Value Setting Min=0, Max=255. Please input Dec Number:

Chipset

Configures relevant chipset functions.



North Bridge Chipset Configuration

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.		
Main	Advanced	Chipset
North Bridge Chipset Configuration Memory Information MRC Version 01.00 Total Memory 1024 MB (DDR2) vBIOS Version 2032 IGD Mode Select [Enabled, 8MB]		Select the amount of system memory used by the Integrated Graphics Cards. ← →: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

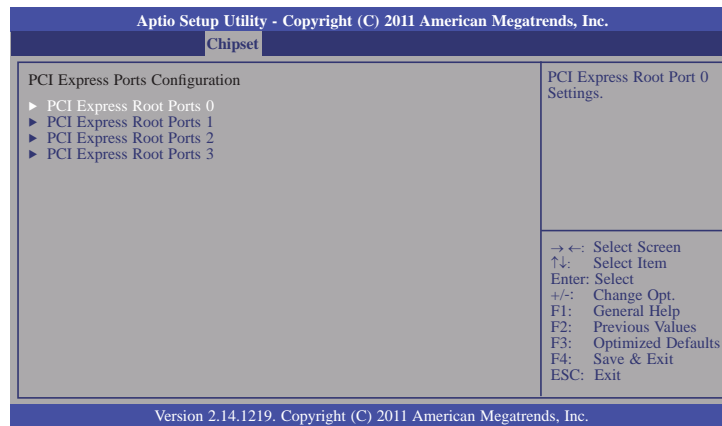
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

South Bridge Chipset Configuration

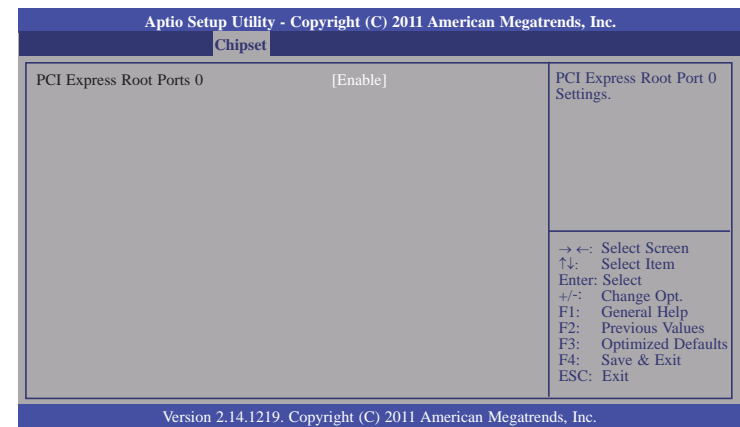
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.	
Chipset	
South Bridge Chipset Configuration Audio Configuration [Auto] ▶ PCI Express Ports Configuration	Audio Controller options. → ←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

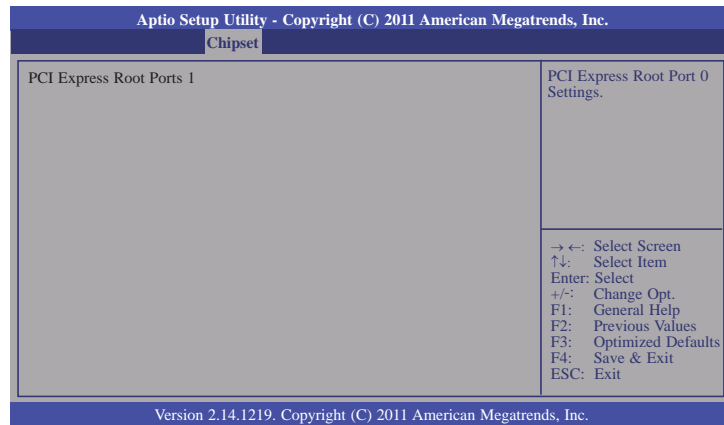
PCI Express Ports Configuration



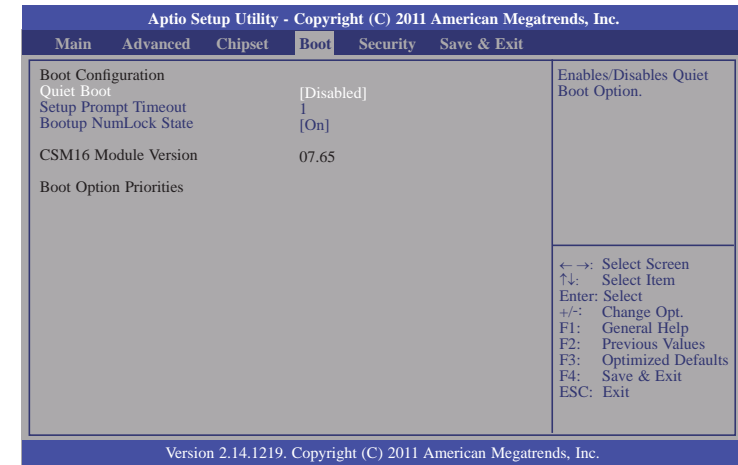
PCI Express Root Ports 0



PCI Express Root Ports 1~3



Boot



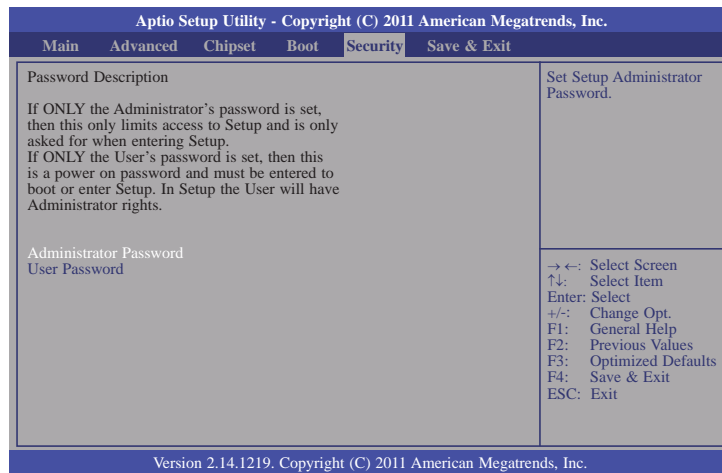
Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state.

Security



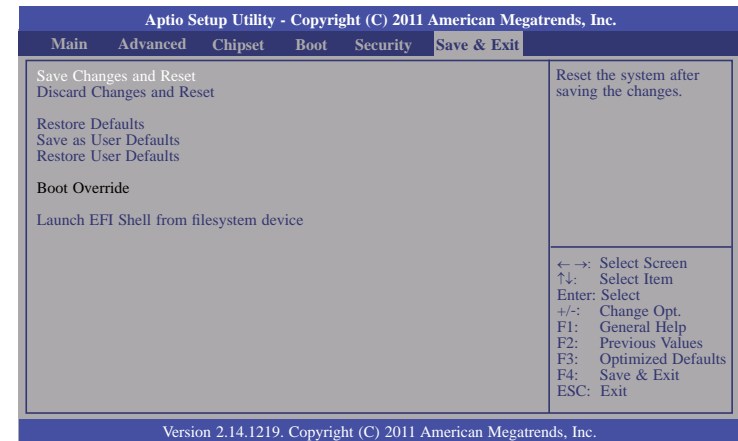
Administrator Password

Sets the administrator password.

User Password

Sets the user password.

Save & Exit



Discard Changes and Reset

Reset system setup without saving any changes.

Restore Defaults

Restore/Load Defaults values for all the setup options.

Save as User Defaults

Save the changes done so far as User Defaults.

Restore User Defaults

Restore the User Defaults to all the setup options.

Launch EFI Shell from filesystem device

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

Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility, AFU238.EXE. Please contact technical support or your sales representative for the files.

To execute the utility, type:

A:> AFU238 BIOS_File_Name /b /p /n
then press <Enter>.

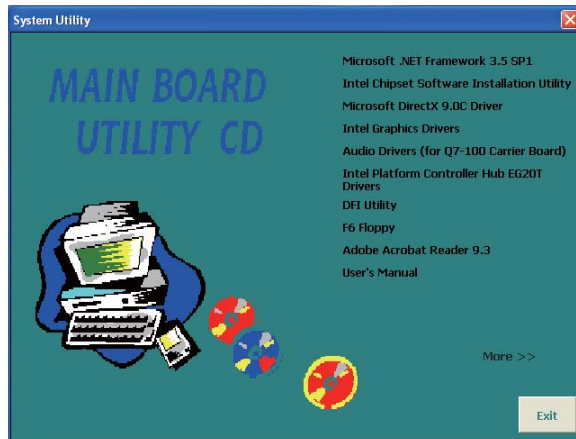
```
C:\AFU\AFU238>afu238 filename /b /p /n
+-----+
|               AMI Firmware Update Utility(APTIO) v2.25               |
|               Copyright (C)2011 American Megatrends Inc. All Rights Reserved.               |
+-----+
Reading file ..... done
Erasing flash ..... done
Writing flash ..... done
Verifying flash ..... done
Erasing BootBlock ..... done
Writing BootBlock ..... done
Verifying BootBlock ..... done
C:\AFU\AFU238>
```

After finishing BIOS update, please turn off the AC power. Wait about 10 seconds and then turn on the AC power again.

Chapter 4 - Supported Software

The CD that came with the system board contains drivers, utilities and software applications required to enhance the performance of the system board.

Insert the CD into a CD-ROM drive. The autorun screen (Mainboard Utility CD) will appear. If after inserting the CD, "Autorun" did not automatically start (which is, the Mainboard Utility CD screen did not appear), please go directly to the root directory of the CD and double-click "Setup".



Microsoft .NET Framework 3.5 SP1



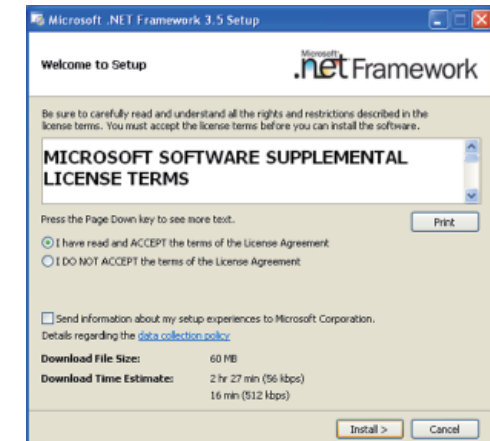
Note:

Before installing Microsoft .NET Framework 3.5 SP1, make sure you have updated your Windows XP operating system to Service Pack 3.

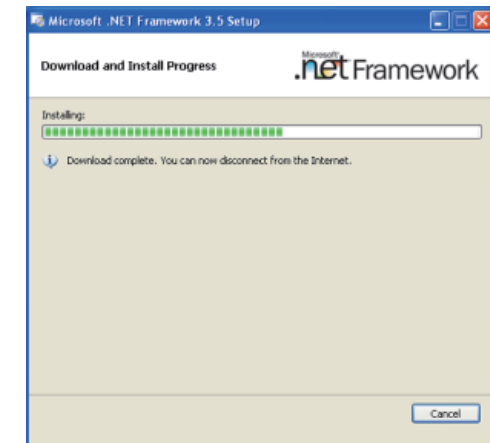
To install the driver, click "Microsoft .NET Framework 3.5 SP1" on the main menu.

1. Read the license agreement carefully.

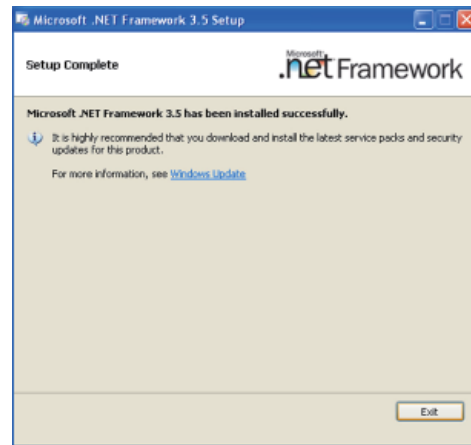
Click "I have read and accept the terms of the License Agreement" then click Install.



2. Setup is now installing the driver.



3. Click Exit.



Intel Chipset Software Installation Utility

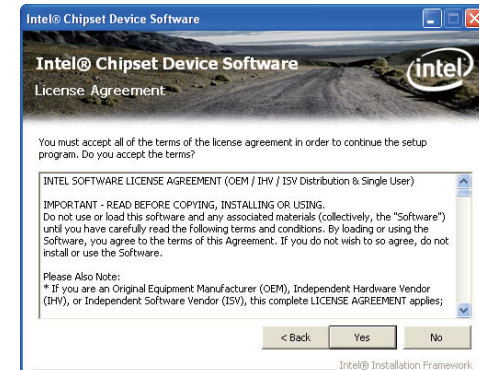
The Intel Chipset Software Installation Utility is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

To install the utility, click “Intel Chipset Software Installation Utility” on the main menu.

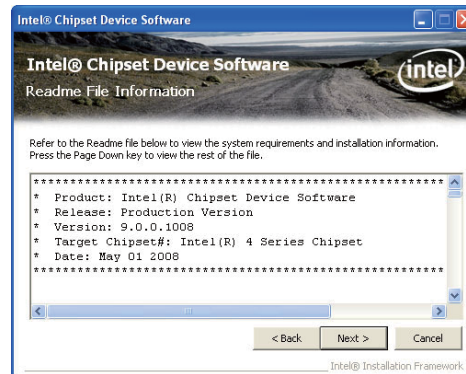
1. Setup is ready to install the utility. Click Next.



2. Read the license agreement then click Yes.



- Go through the readme document for more installation tips then click Next.



- After all setup operations are done, click Next.



- Click "Yes, I want to restart this computer now" then click Finish.

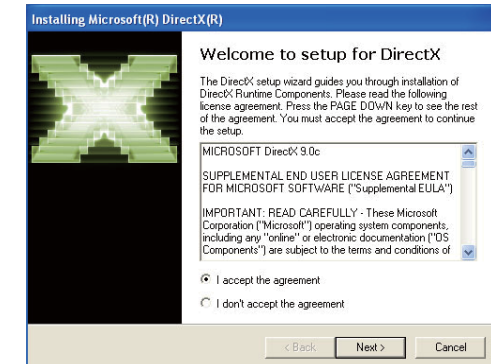
Restarting the system will allow the new software installation to take effect.



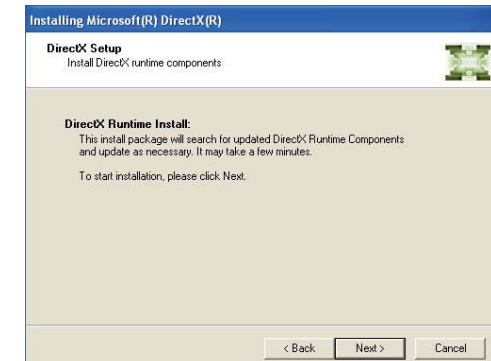
Microsoft DirectX 9.0C Driver

To install the utility, click "Microsoft DirectX 9.0C Driver" on the main menu.

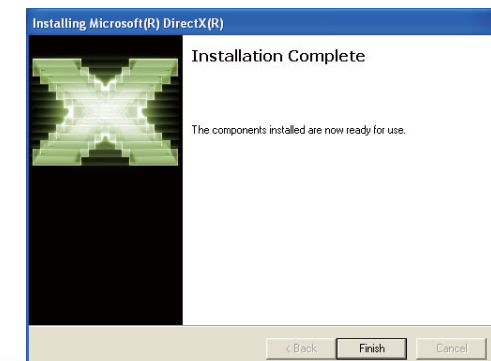
- Click "I accept the agrment" then click Next.



- To start installation, click Next.



- Click Finish. Reboot the system for DirectX to take effect.



Intel Graphics Drivers

To install the driver, click “Intel Embedded Media and Graphics Drivers” on the main menu.



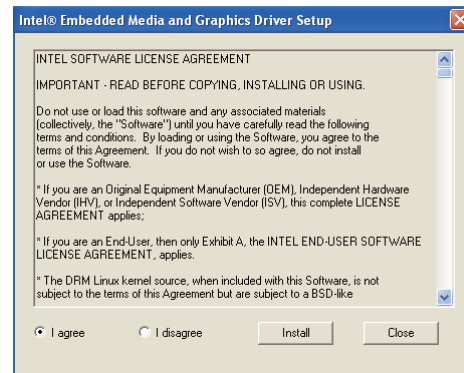
Note:

Before installing Intel Graphics Drivers, make sure you have installed Microsoft .NET Framework 3.5 SP1.

1. Setup is now ready to install the graphics driver. Click on “Installs driver and application files”, then click on Next.



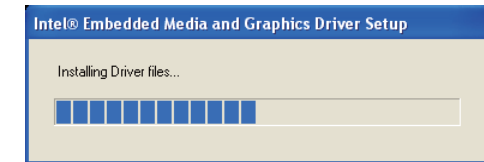
2. Read the license agreement carefully. Click “I agree” then click Install.



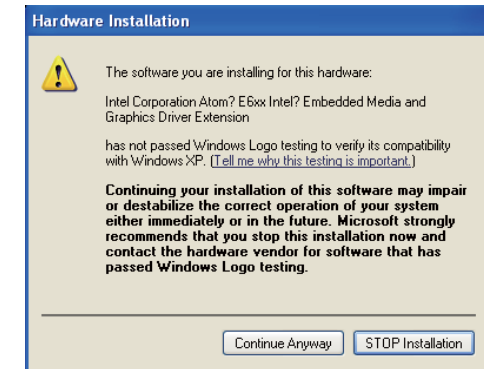
3. Click on “Continue Anyway”.



4. Setup is now installing the driver.



5. Click on “Continue Anyway”.



6. Click “Yes” to restart this computer now.

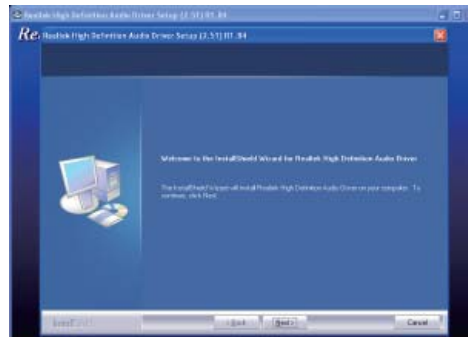
Restarting the system will allow the new software installation to take effect.



Audio Drivers (for Q7-100 Carrier Board)

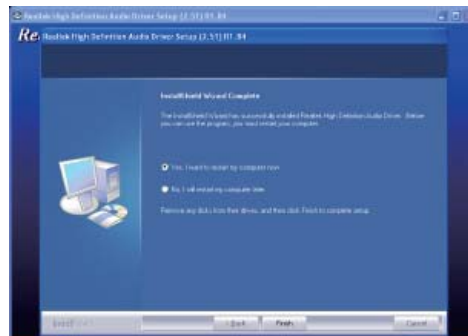
To install the driver, click “Audio Drivers” on the main menu.

1. Setup is now ready to install the audio driver. Click Next.
2. Follow the remainder of the steps on the screen; clicking “Next” each time you finish a step.



3. Click “Yes, I want to restart my computer now” then click Finish.

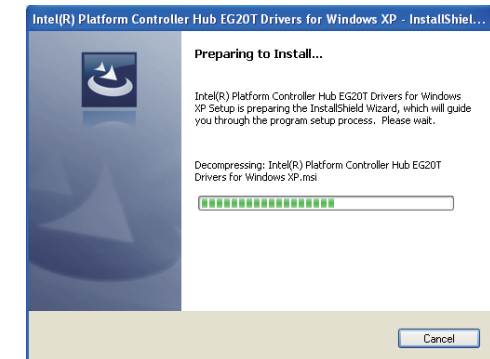
Restarting the system will allow the new software installation to take effect.



Intel Platform Controller Hub EG20T Drivers

To install the driver, click “Intel Platform Controller Hub EG20t Drivers” on the main menu.

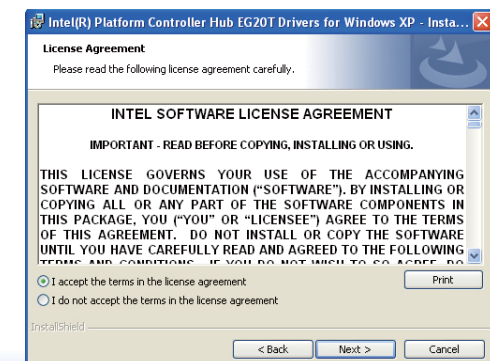
1. Setup is now preparing to install the driver.



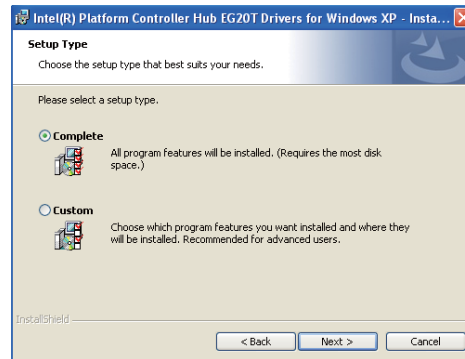
2. Setup is now ready to install the driver. Click Next.



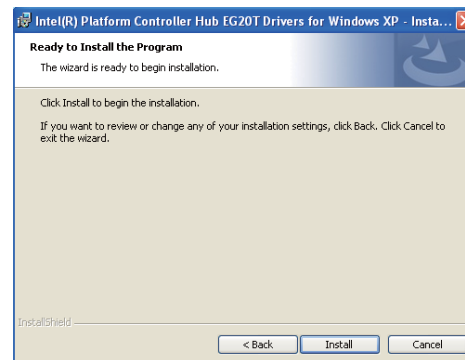
3. Click “I accept the terms in the license agreement” then click “Next”.



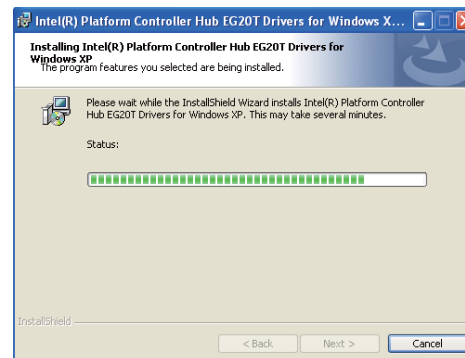
4. Click Next.



5. Click Install to begin installation.



6. Wait until the driver is being installed, then click Next.



7. Click Continue Anyway or Stop Installation.



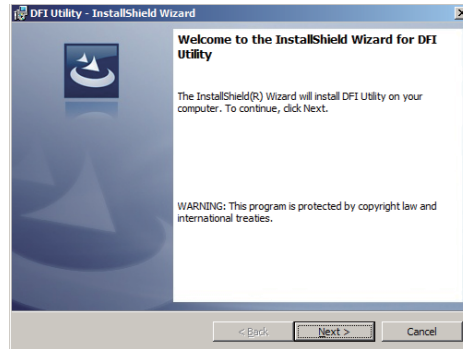
8. Click Finish to exit installation.



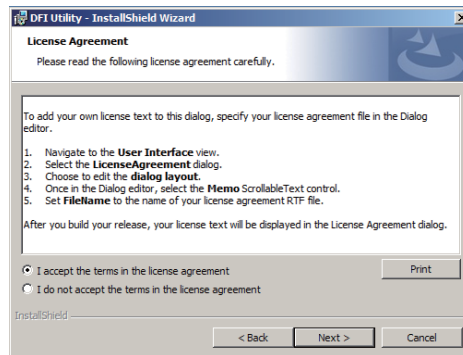
DFI Utility

DFI Utility provides information about the board, HW Health, Watchdog, DIO, and Backlight. To access the utility, click “DFI Utility” on the main menu.

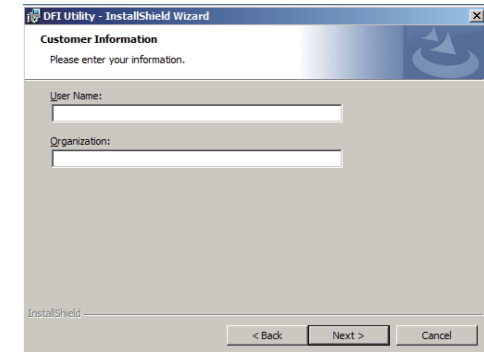
1. Setup is ready to install the DFI Utility driver. Click Next.



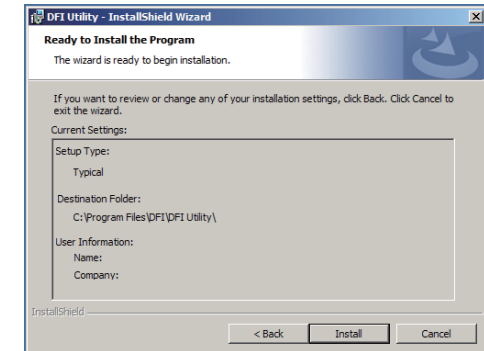
2. Click “I accept the terms in the license agreement” and then click Next.



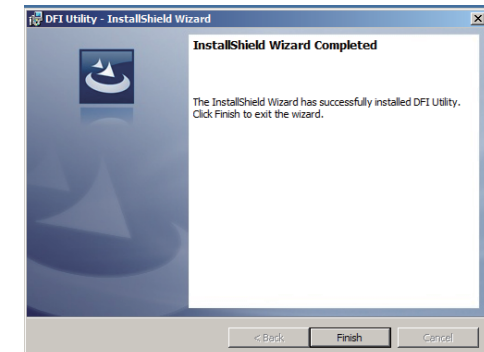
3. Enter “User Name” and “Organization” information and then click Next.



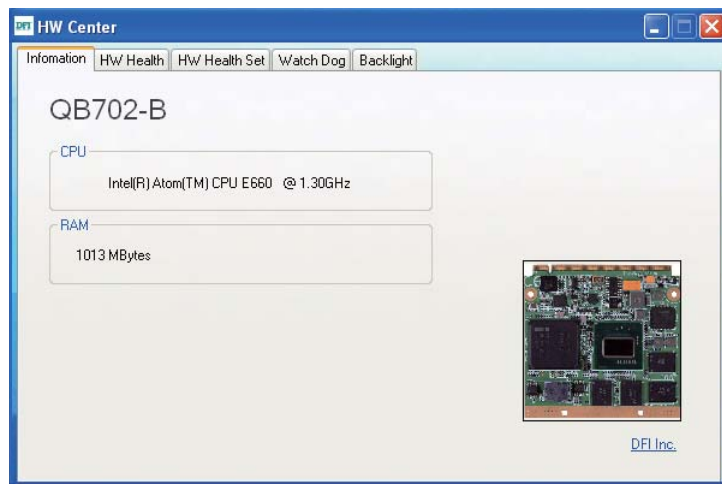
4. Click Install to begin the installation.



5. After completing installation, click Finish.



The DFI Utility icon will appear on the desktop. Double-click the icon to open the utility.



F6 Floppy

This is used to create a floppy driver diskette needed when you install Windows® XP using the F6 installation method. This will allow you to install the operating system onto a hard drive when in AHCI mode.

1. Insert a blank floppy diskette.
2. Locate for the drivers in the CD then copy them to the floppy diskette. The CD includes drivers for both 32-bit and 64-bit operating systems. The path to the drivers are shown below.

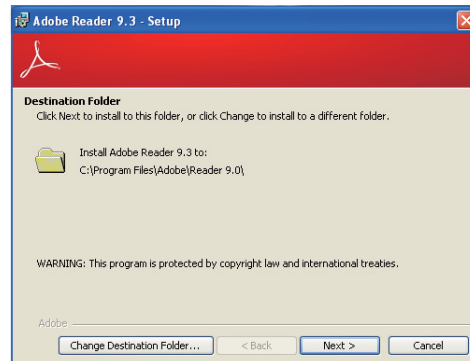
32-bit

CD Drive:\AHCI_RAID\F6FLOPPY\f6flpy32

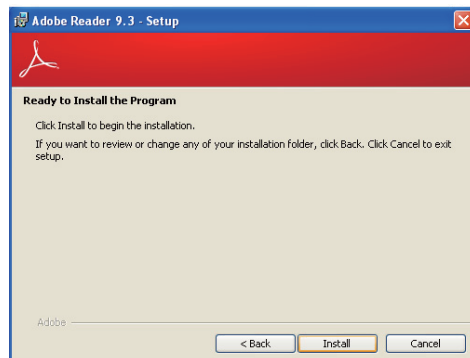
Adobe Acrobat Reader 9.3

To install the reader, click “Adobe Acrobat Reader 9.3” on the main menu.

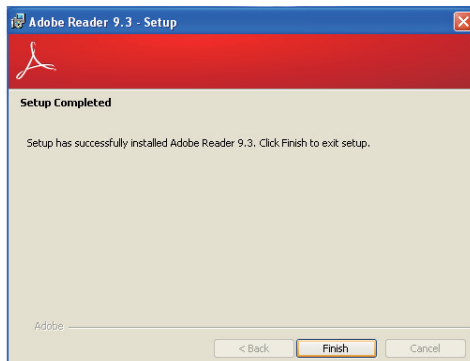
1. Click Next to install or click Change Destination Folder to select another folder.



2. Click Install to begin installation.



3. Click Finish to exit installation.



Appendix A - NLITE and AHCI Installation Guide

nLite

nLite is an application program that allows you to customize your XP installation disc by integrating the RAID/AHCI drivers into the disc. By using nLite, the F6 function key usually required during installation is no longer needed.


Note:

The installation steps below are based on nLite version 1.4.9. Installation procedures may slightly vary if you're using another version of the program.

1. Download the program from nLite's official website.

<http://www.nliteos.com/download.html>

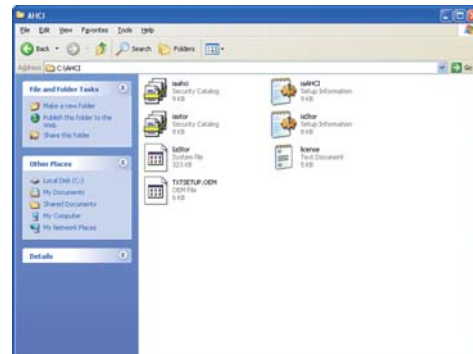
2. Install nLite.


Important:

Due to it's coding with Visual.Net, you may need to first install .NET Framework prior to installing nLite.

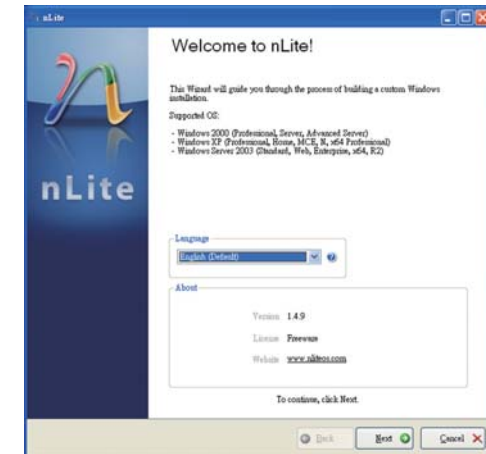
3. Download relevant RAID/AHCI driver files from Intel's website. The drivers you choose will depend on the operating system and chipset used by your computer.

The downloaded driver files should include iaahci.cat, iaAHCI.inf, iastor.cat, iaStor.inf, iaStor.sys, license.txt and TXTSETUP.OEM.



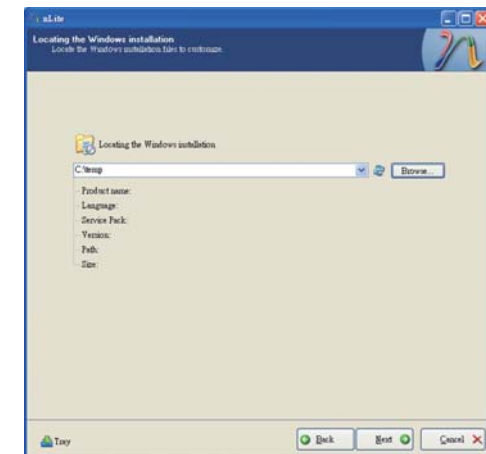
4. Insert the XP installation disc into an optical drive.

5. Launch nLite. The Welcome screen will appear. Click Next.

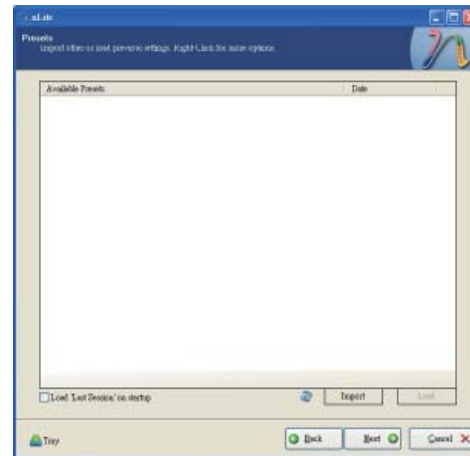


6. Click Next to temporarily save the Windows installation files to the designated default folder.

If you want to save them in another folder, click Browse, select the folder and then click Next.



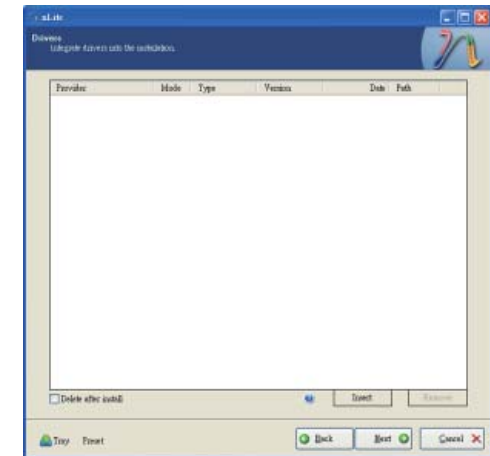
7. Click Next.



8. In the Task Selection dialog box, click Drivers and Bootable ISO. Click Next.

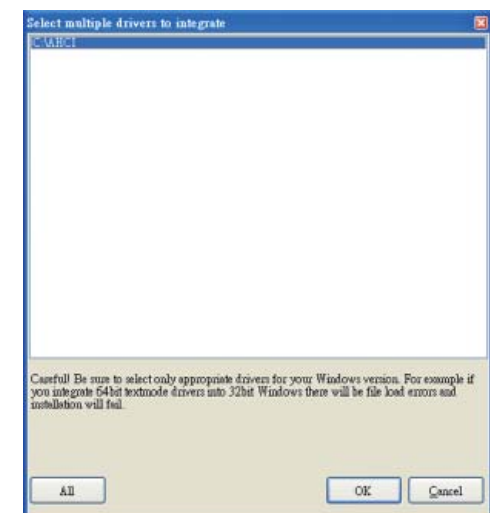


9. Click Insert and then select Multiple driver folder to select the drivers you will integrate. Click Next.



10. Select only the drivers appropriate for the Windows version that you are using and then click OK.

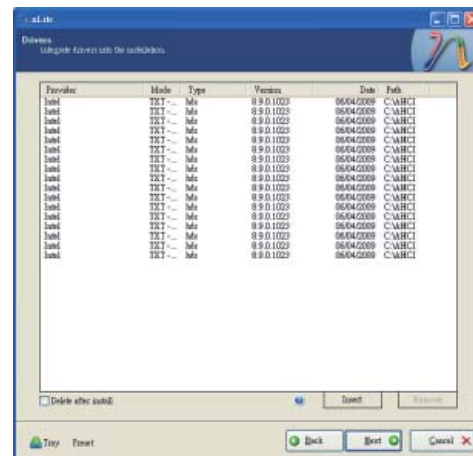
Integrating 64-bit drivers into 32-bit Windows or vice versa will cause file load errors and failed installation.



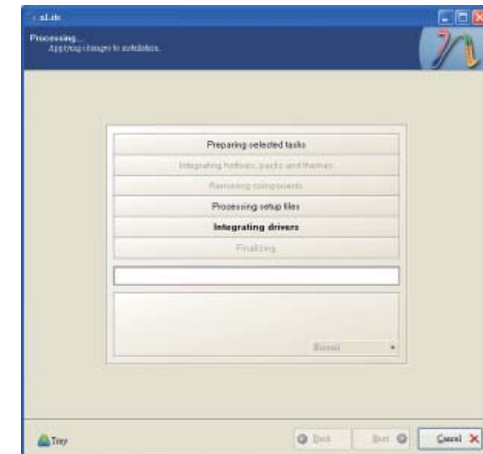
11. If you are uncertain of the southbridge chip used on your motherboard, select all RAID/AHCI controllers and then click OK.



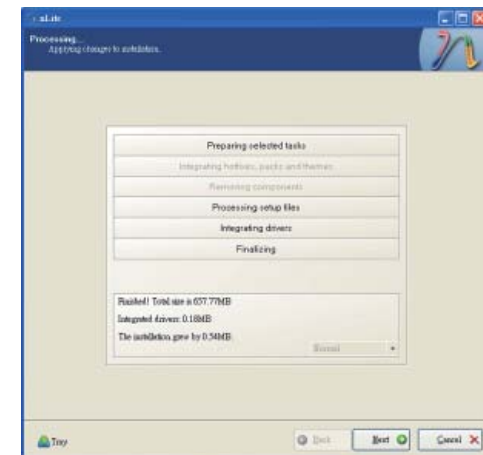
12. Click Next.



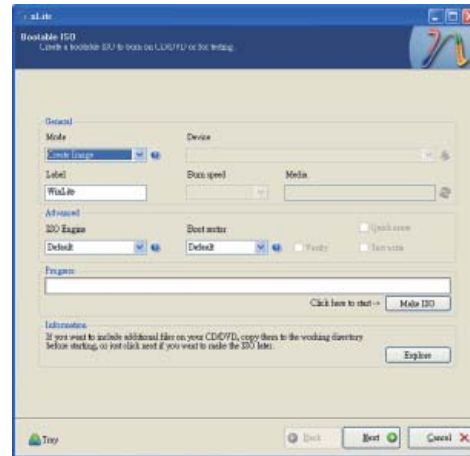
13. The program is currently integrating the drivers and applying changes to the installation.



14. When the program is finished applying the changes, click Next.

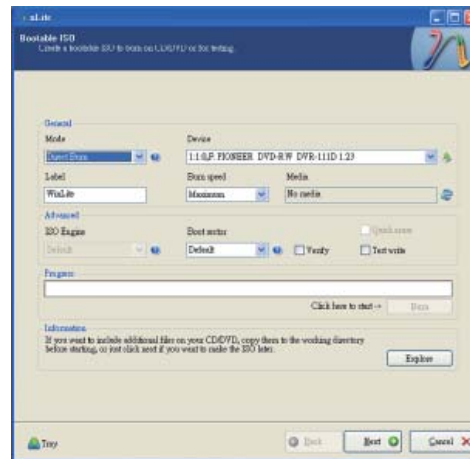


15. To create an image, select the Create Image mode under the General section and then click Next.



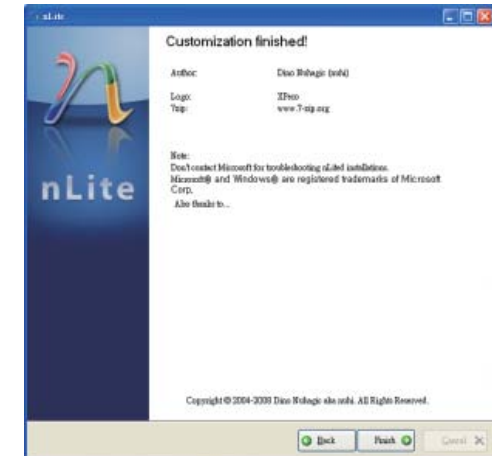
16. Or you can choose to burn it directly to a disc by selecting the Direct Burn mode under the General section.

Select the optical device and all other necessary settings and then click Next.



17. You have finished customizing the Windows XP installation disc. Click Finish.

Enter the BIOS utility to configure the SATA controller to RAID/AHCI. You can now install Windows XP.

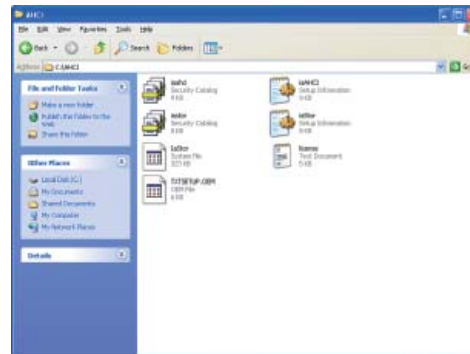


AHCI

The installation steps below will guide you in configuring your SATA drive to AHCI mode.

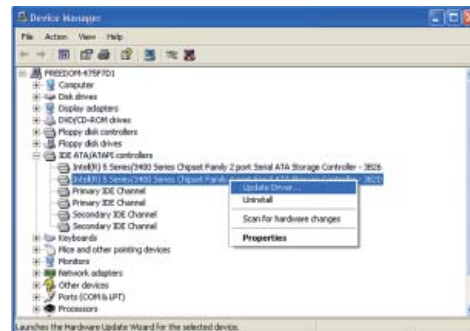
1. Enter the BIOS utility and configure the SATA controller to IDE mode.
2. Install Windows XP but do not press F6.
3. Download relevant RAID/AHCI driver files supported by the motherboard chipset from Intel's website.

Transfer the downloaded driver files to C:\AHCI.



4. Open Device Manager and right click on one of the Intel Serial ATA Storage Controllers, then select Update Driver.

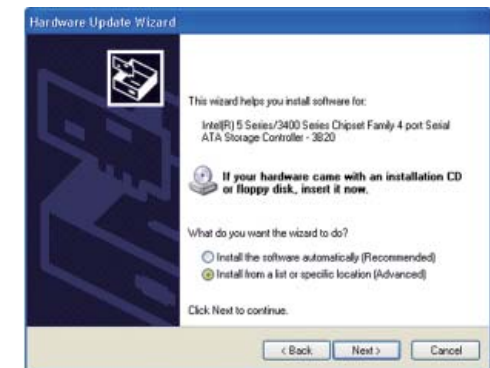
If the controller you selected did not work, try selecting another one.



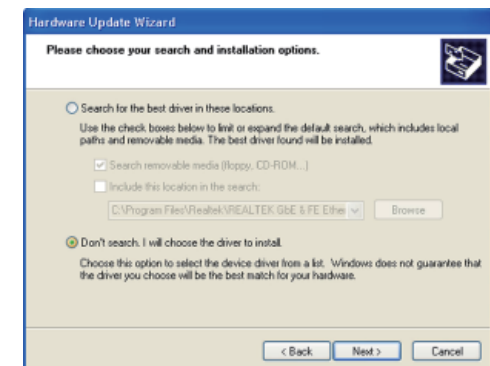
5. In the Hardware Update Wizard dialog box, select "No, not this time" then click Next.



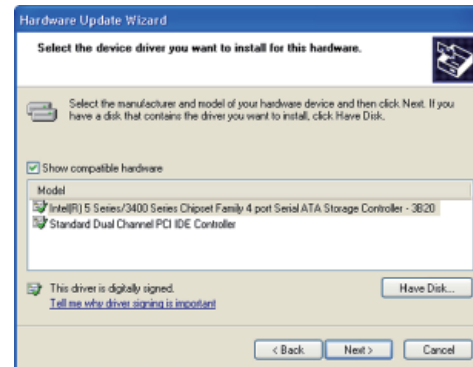
6. Select "Install from a list or specific location (Advanced)" and then click Next.



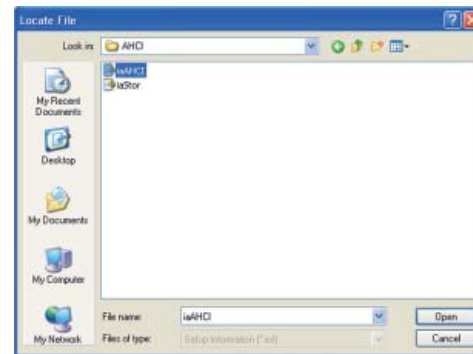
7. Select "Don't search. I will choose the driver to install" and then click Next.



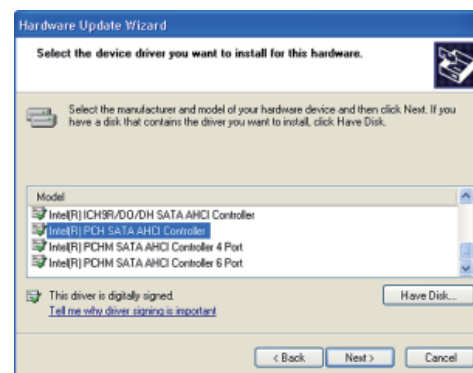
8. Click "Have Disk".



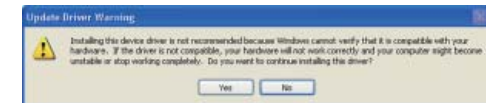
9. Select C:\AHCI\iaAHCI.inf and then click Open.



10. Select the appropriate AHCI Controller of your hardware device and then click Next.

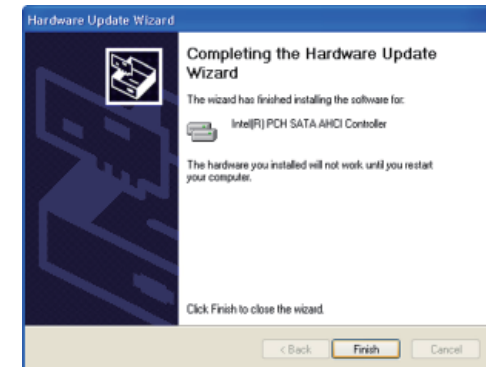


11. A warning message appeared because the selected SATA controller did not match your hardware device.

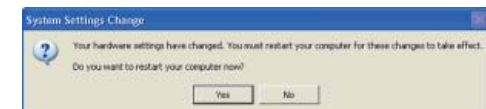


Ignore the warning and click Yes to proceed.

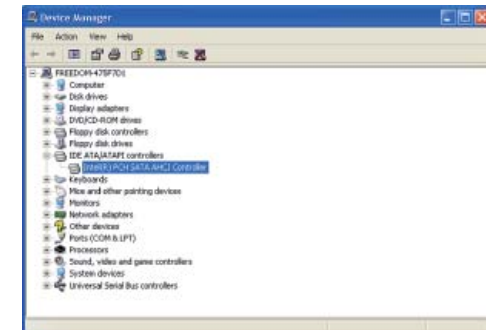
12. Click Finish.



13. The system's settings have been changed. Windows XP requires that you restart the computer. Click Yes.



14. Enter the BIOS utility and modify the SATA controller from IDE to AHCI. By doing so, Windows will work normally with the SATA controller that is in AHCI mode.



Appendix B - System Error Message

When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and the message, PRESS F1 TO CONTINUE, CTRL-ALT-ESC or DEL TO ENTER SETUP, will be shown in the information box at the bottom. Enter Setup to correct the error.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list indicates the error messages for all Awards BIOSes:

CMOS BATTERY HAS FAILED

The CMOS battery is no longer functional. It should be replaced.

**Important:**

Danger of explosion if battery incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the battery manufacturer's instructions.

CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISPLAY SWITCH IS SET INCORRECTLY

The display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, either turn off the system and change the jumper or enter Setup and change the VIDEO selection.

Appendix C - Troubleshooting

Troubleshooting Checklist

This chapter of the manual is designed to help you with problems that you may encounter with your personal computer. To efficiently troubleshoot your system, treat each problem individually. This is to ensure an accurate diagnosis of the problem in case a problem has multiple causes.

Some of the most common things to check when you encounter problems while using your system are listed below.

1. The power switch of each peripheral device is turned on.
2. All cables and power cords are tightly connected.
3. The electrical outlet to which your peripheral devices are connected is working. Test the outlet by plugging in a lamp or other electrical device.
4. The monitor is turned on.
5. The display's brightness and contrast controls are adjusted properly.
6. All add-in boards in the expansion slots are seated securely.
7. Any add-in board you have installed is designed for your system and is set up correctly.

Monitor/Display

If the display screen remains dark after the system is turned on:

1. Make sure that the monitor's power switch is on.
2. Check that one end of the monitor's power cord is properly attached to the monitor and the other end is plugged into a working AC outlet. If necessary, try another outlet.
3. Check that the video input cable is properly attached to the monitor and the system's display adapter.
4. Adjust the brightness of the display by turning the monitor's brightness control knob.

The picture seems to be constantly moving.

1. The monitor has lost its vertical sync. Adjust the monitor's vertical sync.
2. Move away any objects, such as another monitor or fan, that may be creating a magnetic field around the display.
3. Make sure your video card's output frequencies are supported by this monitor.

The screen seems to be constantly wavering.

1. If the monitor is close to another monitor, the adjacent monitor may need to be turned off. Fluorescent lights adjacent to the monitor may also cause screen wavering.

Power Supply

When the computer is turned on, nothing happens.

1. Check that one end of the AC power cord is plugged into a live outlet and the other end properly plugged into the back of the system.
2. Make sure that the voltage selection switch on the back panel is set for the correct type of voltage you are using.
3. The power cord may have a "short" or "open". Inspect the cord and install a new one if necessary.

Hard Drive

Hard disk failure.

1. Make sure the correct drive type for the hard disk drive has been entered in the BIOS.
2. If the system is configured with two hard drives, make sure the bootable (first) hard drive is configured as Master and the second hard drive is configured as Slave. The master hard drive must have an active/bootable partition.

Excessively long formatting period.

If your hard drive takes an excessively long period of time to format, it is likely a cable connection problem. However, if your hard drive has a large capacity, it will take a longer time to format.

Serial Port

The serial device (modem, printer) doesn't output anything or is outputting garbled characters.

1. Make sure that the serial device's power is turned on and that the device is on-line.
2. Verify that the device is plugged into the correct serial port on the rear of the computer.
3. Verify that the attached serial device works by attaching it to a serial port that is working and configured correctly. If the serial device does not work, either the cable or the serial device has a problem. If the serial device works, the problem may be due to the onboard I/O or the address setting.
4. Make sure the COM settings and I/O address are configured correctly.

Keyboard

Nothing happens when a key on the keyboard was pressed.

1. Make sure the keyboard is properly connected.
2. Make sure there are no objects resting on the keyboard and that no keys are pressed during the booting process.

System Board

1. Make sure the add-in card is seated securely in the expansion slot. If the add-in card is loose, power off the system, re-install the card and power up the system.
2. Check the jumper settings to ensure that the jumpers are properly set.
3. Verify that all memory modules are seated securely into the memory sockets.
4. Make sure the memory modules are in the correct locations.
5. If the board fails to function, place the board on a flat surface and seat all socketed components. Gently press each component into the socket.
6. If you made changes to the BIOS settings, re-enter setup and load the BIOS defaults.