



®

AXIOMTEK

PICO822

**Intel® Atom™ E620T/E680T
All-In-One Pico-ITX Board**

User's Manual



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CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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Table of Contents

Disclaimers.....	ii
ESD Precautions.....	iii
Chapter 1 Introduction.....	1
1.1 Features.....	2
1.2 Specifications.....	2
1.3 Utilities Supported.....	3
Chapter 2 Board and Pin Assignments.....	5
2.1 Board Dimensions and Fixing Holes.....	5
2.2 Board Layout.....	8
2.3 Assembly Drawing.....	10
2.4 Switch Settings.....	13
2.4.1 LVDS Voltage Selection (SW1).....	13
2.4.2 LVDS Brightness Control Voltage Selection (SW2).....	13
2.5 Connectors.....	14
2.5.1 Serial ATA Power Connector (CN1).....	14
2.5.2 DC Power Connector (CN2).....	14
2.5.3 USB and Front Panel Connector (CN4).....	15
2.5.4 LVDS Connector (CN6).....	16
2.5.5 COM and Audio Connector (CN7).....	17
2.5.6 Ethernet Connector (CN8).....	18
2.5.7 Serial ATA Connector (SATA1).....	18
2.5.8 CMOS Battery Connector (BAT1).....	18
2.5.9 Expansion Connector (SCN1).....	19
Chapter 3 Hardware Description.....	21
3.1 Microprocessors.....	21
3.2 Additional Note.....	21
3.3 BIOS.....	22
3.4 System Memory.....	22
3.5 I/O Port Address Map.....	23
3.6 Interrupt Controller (IRQ) Map.....	25
3.7 Memory Map.....	26
Chapter 4 AMI BIOS Setup Utility.....	27

4.1	Starting	27
4.2	Navigation Keys	27
4.3	Main Menu	29
4.4	Advanced Menu	30
4.5	Chipset Menu	35
4.6	Boot Menu	40
4.7	Save & Exit Menu	41
 Chapter 5 Drivers Installation		43
5.1	Drivers for Windows® XP	43
5.1.1	Installing Chipset Driver	43
5.1.2	Installing PCH Driver	47
5.1.3	Installing Graphics Driver	54
5.1.4	Installing Audio Driver.....	58
5.1.5	Installing Ethernet Driver	60
5.1.6	Installing Serial (COM) Port Driver.....	62
5.2	Drivers for Windows® 7	63
5.2.1	Installing Chipset Driver	63
5.2.2	Installing PCH Driver	68
5.2.3	Installing Graphics Driver	81
5.2.4	Installing Audio Driver.....	87
5.2.5	Installing Ethernet Driver	89
5.2.6	Installing SATA Driver	91
5.2.7	Installing Serial (COM) Port Driver.....	95
5.3	Installing AHCI Driver during OS Installation	96
 Appendix A Expansion Module (Optional)		99
AX93268 Specifications		99
AX93268 Dimensions and Fixing Holes		100
AX93268 Layout		103
Connectors		104
	VGA Connector (CN1)	104
	PCI-Express Mini Card Connector (CN2).....	105
	Expansion Connector (CN3).....	106
 Appendix B Watchdog Timer		107
About Watchdog Timer		107
How to Use Watchdog Timer		107
 Appendix C Digital I/O		109
About Digital I/O		109

Sample Program 109

Chapter 1

Introduction



The PICO822 is a Pico-ITX board with Intel® Atom™ single core E620T/E680T and PCH EG20T chipset that delivers outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions.

The PICO822 is designed with onboard unbuffered 1GB DDR2 800MHz memory, It also features one Gigabit/Fast Ethernet, one serial ATA port with transfer rates up to 3Gb/s, four USB 2.0 high speed compliant and built-in high definition audio codec that can achieve the best stability and reliability for industrial applications. Additionally, it provides you with unique embedded features, such as two serial ports and Pico-ITX form factor that applies an extensive array of PC peripherals. The board can be enhanced by its built-in watchdog timer function, a special industrial feature not commonly seen on other motherboards.

Moreover, the high-speed board to board connector on the rear side has the ability to extend I/O module in a flexible manner.

1.1 Features

- Ultra low power Intel® Atom™ single core E620T (0.6GHz) and E680T (1.6GHz)
- Intel® PCH EG20T
- 2 COM ports
- 4 USB 2.0 and 1 client USB 2.0
- 1 Gigabit/Fast Ethernet
- Onboard SATA SSD (optional)

1.2 Specifications

- **CPU**
 - Intel® Atom™ single core E620T (0.6GHz) and E680T (1.6GHz).
- **System Chipset**
 - Intel® PCH EG20T.
- **BIOS**
 - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.
 - 16Mbit SPI Flash, DMI, Plug and Play.
 - RPL/PXE Ethernet Boot ROM.
- **System Memory**
 - Onboard unbuffered 1GB DDR2 memory.
- **SSD (Optional)**
 - SATA SSD 8GB/16GB/32GB (optional).
- **Onboard Multi I/O**
 - Controller: Fintek F81801U.
 - Serial ports: Two ports for RS-232.
- **Serial ATA**
 - One SATA-300 connector.
- **USB**
 - Four USB ports with fuse protection and complies with USB Spec. Rev. 2.0.
 - One USB 2.0 client port.
- **Display**
 - One 2x15-pin connector for 18-bit/24-bit single channel LVDS and one 8-pin inverter connector. LVDS resolution is up to 1024x768 in 18-bit/24-bit.
- **Watchdog Timer**
 - 1~255 seconds or minutes; up to 255 levels.
- **Ethernet**
 - One port with Realtek RTL8111E for Gigabit/Fast Ethernet and supports Wake-on-LAN RPL/PXE Boot ROM.
- **Audio**
 - HD audio compliant as MIC-in/line-in/line-out with Realtek ALC662.
 - Support multi-channel audio stream, 32-bit sample depth, and sample rate up to 192KHz.

- **SMBus**
 - System Management Bus for advanced monitoring/control.
- **Expansion Connector**
 - 2x30-pin high speed connector; containing one serial digital video out, one PCI-Express x1, one USB 2.0, one serial port, one digital I/O and one SMBus.
- **Power Input**
 - Customized connector via power cable.
 - +12V DC-in only.
- **Power Management**
 - ACPI (Advanced Configuration and Power Interface).
- **Form Factor**
 - Pico-ITX form factor.



Note: All specifications and images are subject to change without notice.

1.3 Utilities Supported

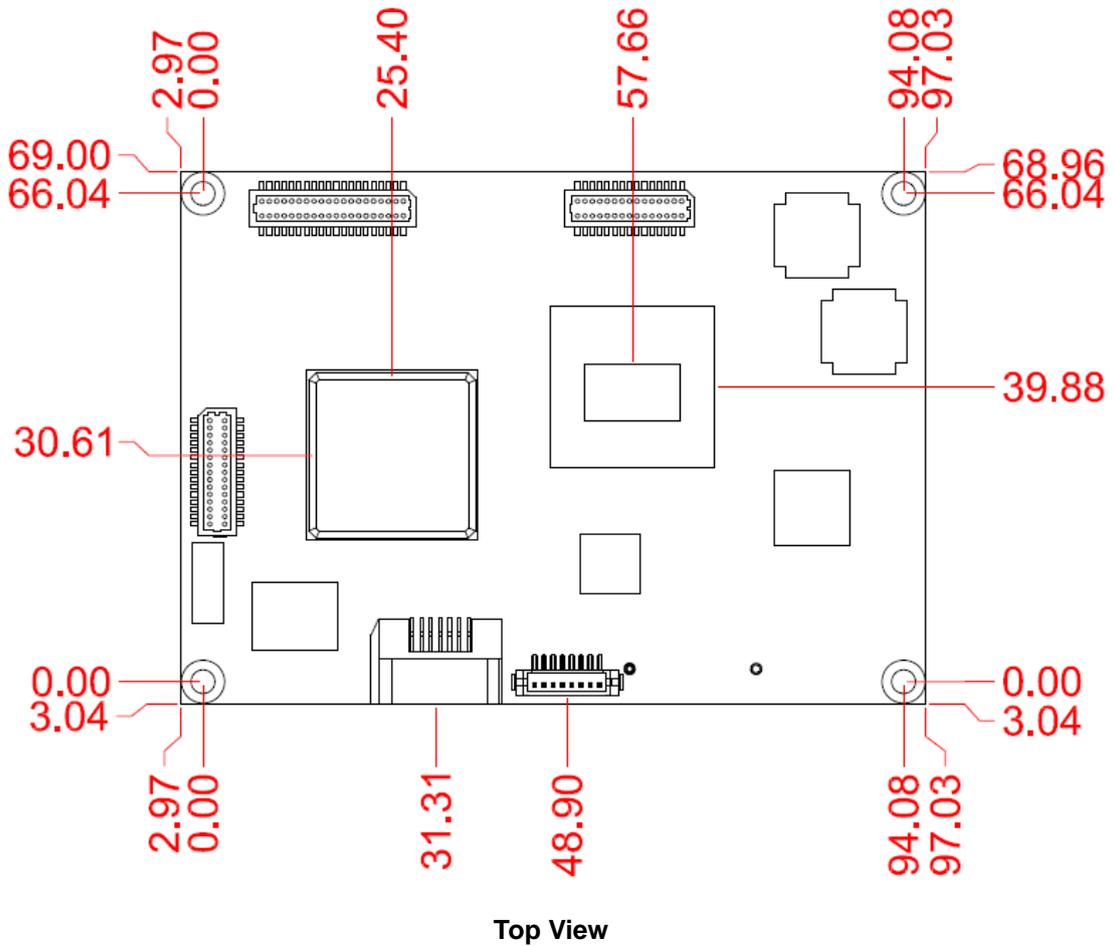
- Chipset driver
- PCH driver
- Graphics driver
- Audio driver
- Ethernet driver (RTL8111E)
- Serial ATA driver
- Serial (COM) port driver
- AHCI driver
- Unify API for hardware monitor and watchdog timer

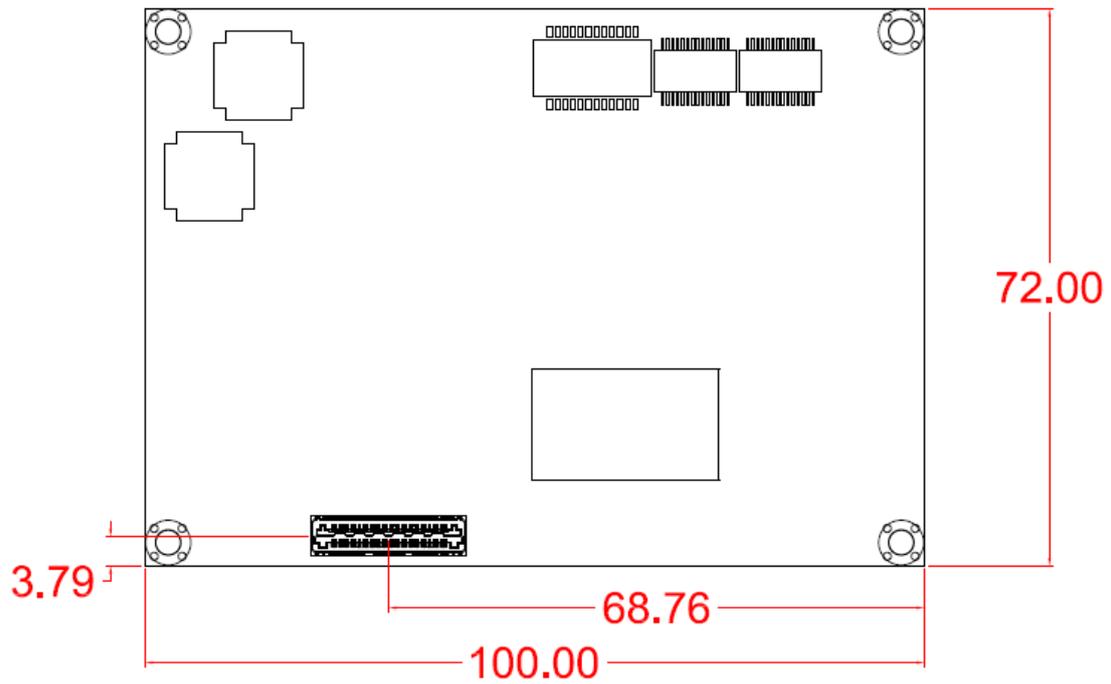
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Chapter 2

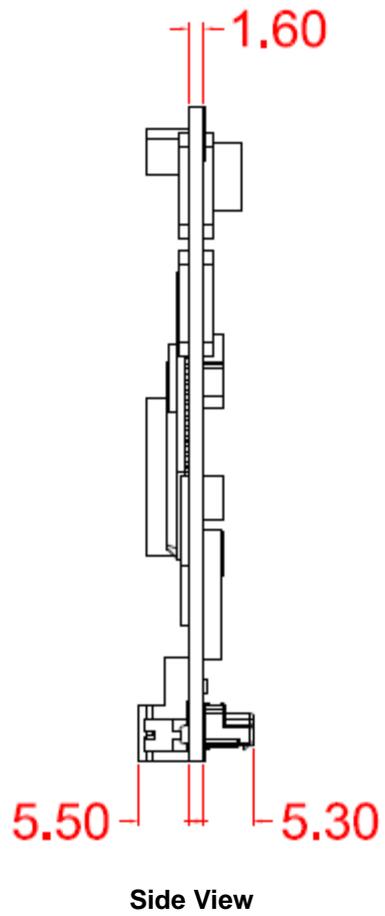
Board and Pin Assignments

2.1 Board Dimensions and Fixing Holes

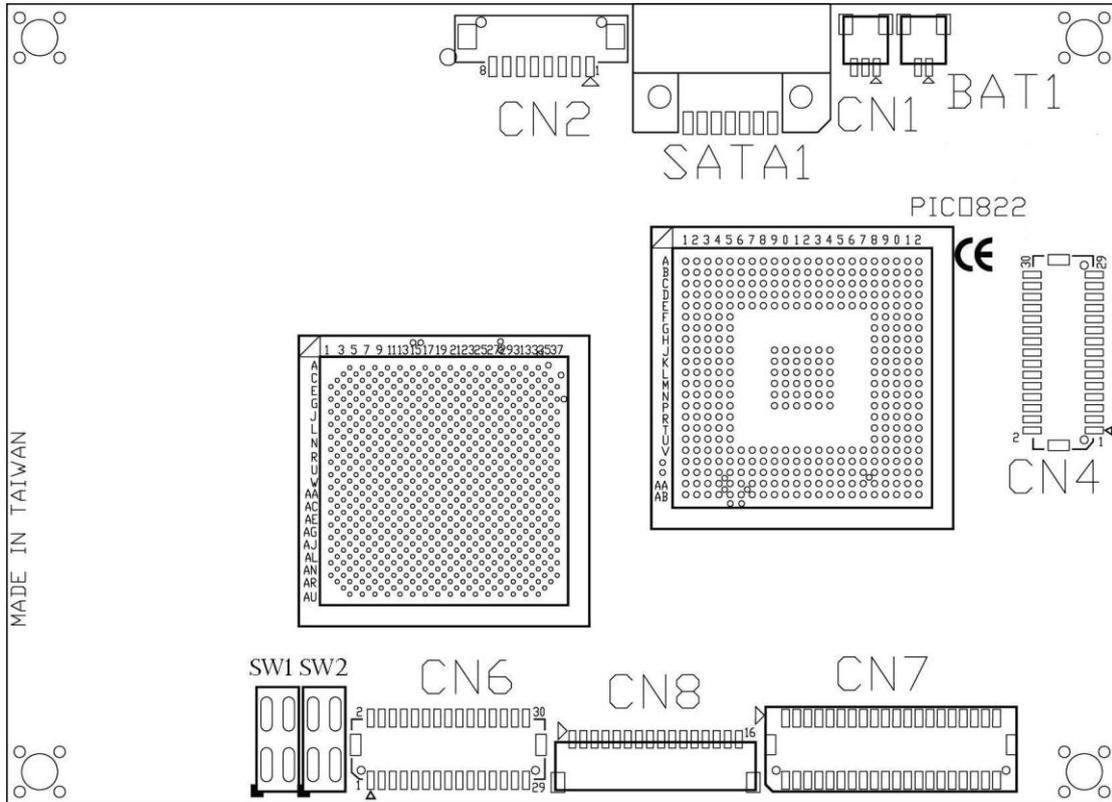




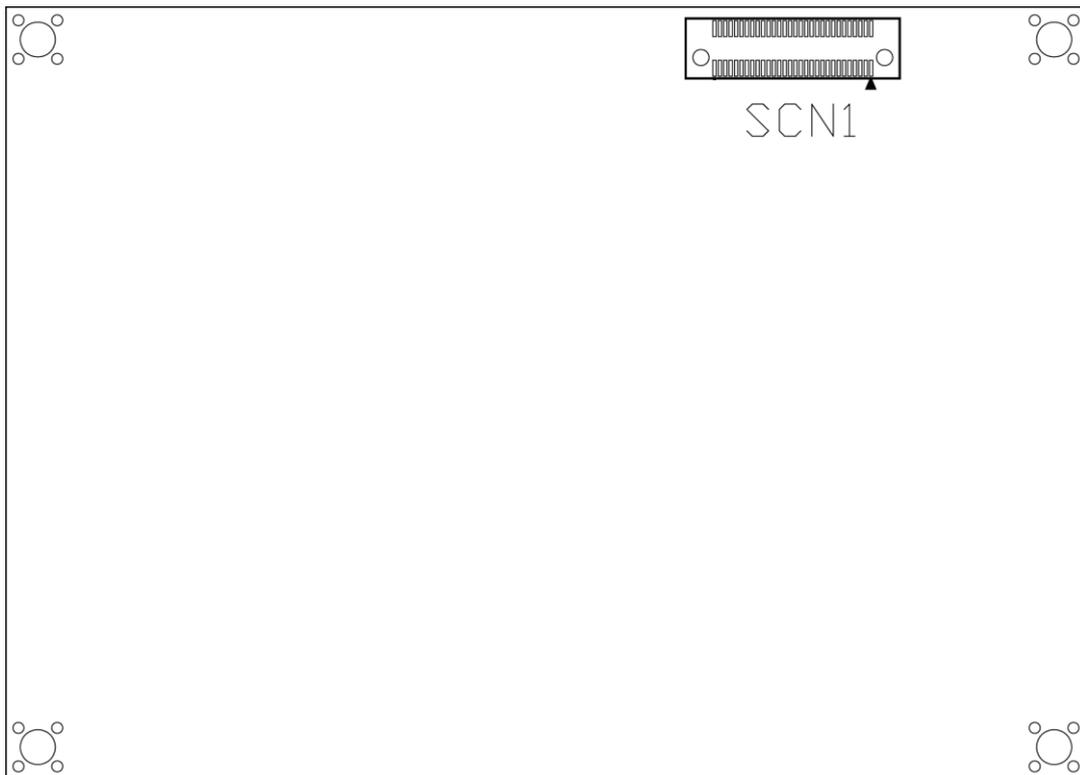
Bottom View



2.2 Board Layout



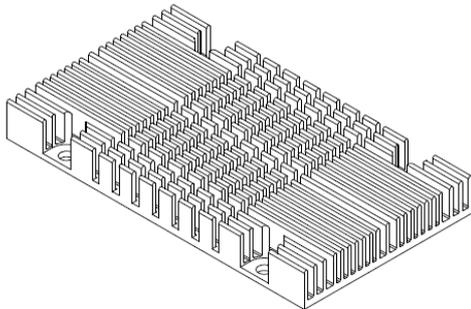
Top View



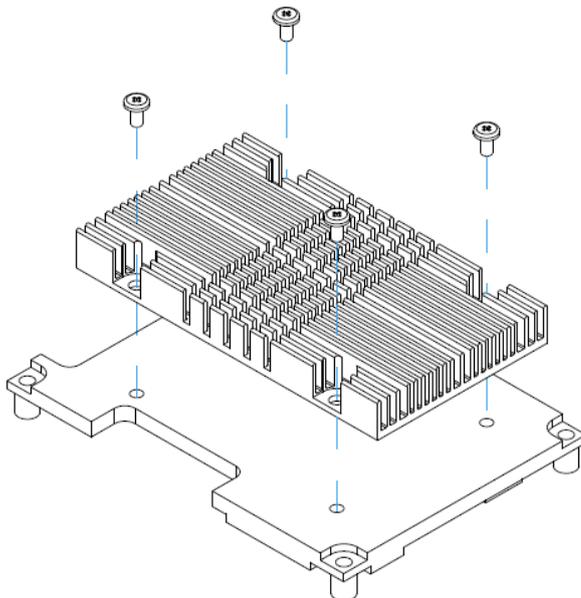
Bottom View

2.3 Assembly Drawing

Heatsink for PICO822 (see image below):



First of all, screw heatsink into heatspreader.



x4

For thermal dissipation, a heatspreader enables the PICO822's components to dissipate heat efficiently. Images below illustrate how to install the heat spreader.

Installing Heatspreader

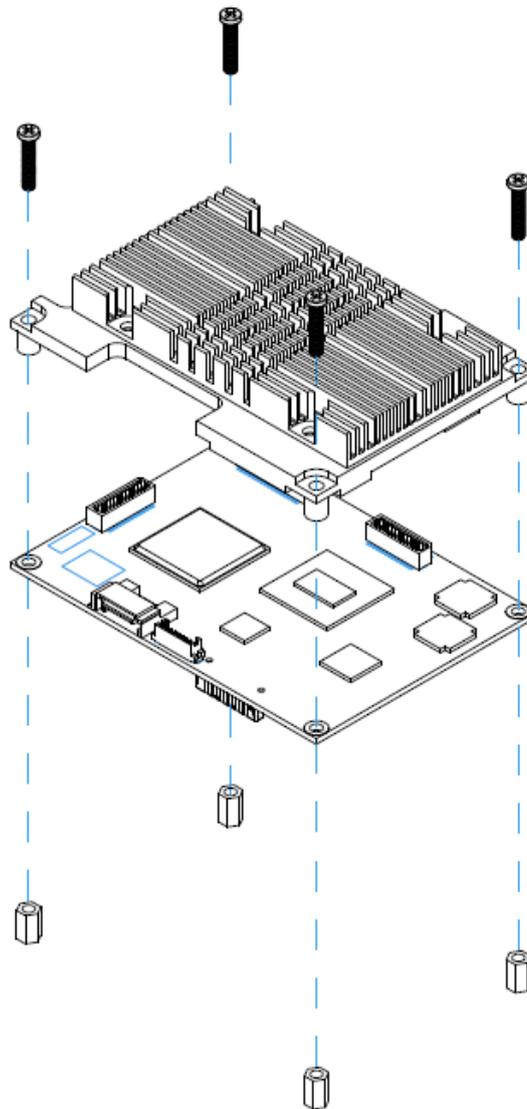
The PICO822 has four assembly holes for installing heatspreader plate. Align both of them and use the four screws to firmly secure the heatspreader plate to the PICO822. Be careful not to over-tighten the screws.



x4



x4



Installing Heatspreader and AX93268 Expansion Module

Gently insert expansion module into SCN1. Align four assembly holes and use the four screws to firmly secure the heatspreader plate and expansion module to the PICO822. Be careful not to over-tighten the screws. See chapter 3 for details of AX93268 expansion module.



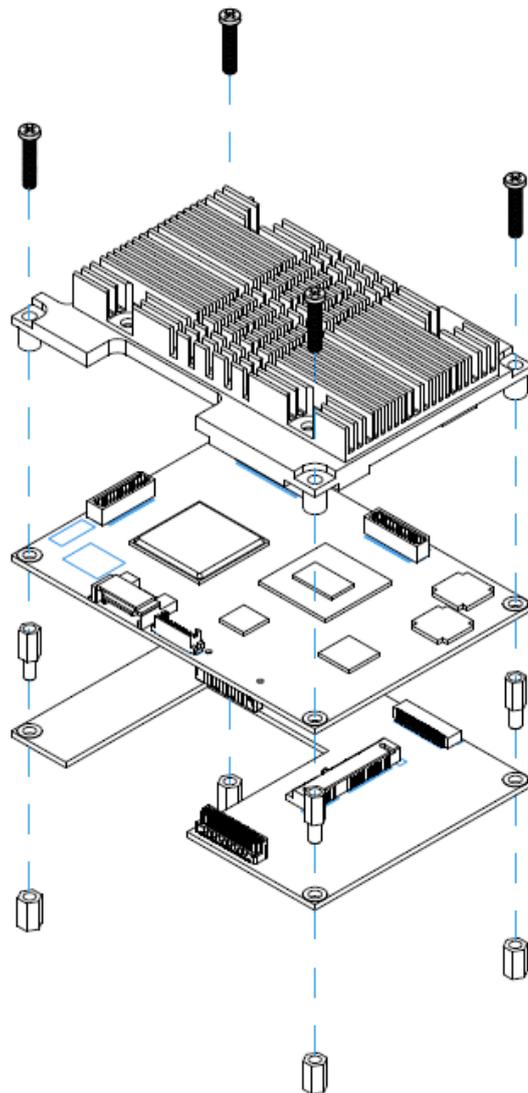
x4



x4



x4



2.4 Switch Settings

Properly configure switches on the PICO822 to meet your application purpose. Below you can find a summary table of onboard default settings.



Note: Once the default setting needs to be changed, please do it under power-off condition.

Switch	Description	Setting
SW1	LVDS Voltage Selection Default: +3.3V	SW1-1 ON SW1-2 OFF
SW2	LVDS Brightness Control Voltage Selection Default: 0V	SW2-1 ON SW2-2 OFF

2.4.1 LVDS Voltage Selection (SW1)

The board supports voltage selection for flat panel displays. Use SW1 to set LVDS connector (CN6) pin 27~30 VCCM to +3.3V or +5V.

Function	Setting
+3.3V (Default)	SW1-1 ON SW1-2 OFF
+5V	SW1-1 OFF SW1-2 ON



2.4.2 LVDS Brightness Control Voltage Selection (SW2)

The SW2 enables you to select voltage for brightness control of LVDS panel.

Function	Setting
0V (Default)	SW2-1 ON SW2-2 OFF
+5V	SW2-1 OFF SW2-2 ON



2.5 Connectors

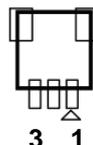
Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows all connectors on the hardware.

Connector	Description
CN1	Serial ATA Power Connector
CN2	DC Power Connector
CN4	USB and Front Panel Connector
CN6	LVDS Connector
CN7	COM and Audio Connector
CN8	Ethernet Connector
SATA1	Serial ATA Connector
BAT1	CMOS Battery Connector
SCN1	Expansion Connector

2.5.1 Serial ATA Power Connector (CN1)

The CN1 is a 1.0mm pitch connector for serial ATA (SATA) power interface.

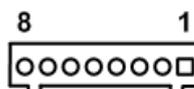
Pin	Signal
1	+5VS
2	N.C
3	GND



2.5.2 DC Power Connector (CN2)

The CN2 is a DC power connector for DC +12V input.

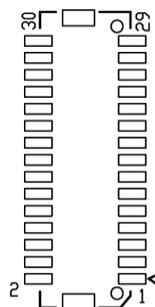
Pin	Signal
1	+12V
2	+12V
3	+12V
4	+12V
5	GND
6	GND
7	GND
8	GND



2.5.3 USB and Front Panel Connector (CN4)

The CN4 is for USB and front panel signal connector.

Pin	Signal	Pin	Signal
1	USB_PWR	2	USB_PWR
3	USB_0#	4	USB_1#
5	USB_0	6	USB_1
7	USB_GND	8	USB_GND
9	USB_GND	10	USB_GND
11	USB_2	12	USB_3
13	USB_2#	14	USB_3#
15	USB_PWR	16	USB_PWR
17	USB_Client_DT	18	USB_Client#
19	+5VS / N.C	20	USB_Client
21	N.C	22	GND
23	GND	24	+5VS
25	GND	26	PWR_BUTTON
27	GND	28	Reset
29	HDD LED DT	30	+3.3VS



USB:

Pin 1 to pin 20 are for Universal Serial Bus (USB) signal, including four USB 2.0 and one client USB 2.0.



Note: When Windows® XP is installed, please attach keyboard and mouse on USB port 0 and port 2.

Front Panel:

Power LED

Pin 23(-) and 24(+) connect the case-mounted system power LED indicator switch. The power LED lights up when the system is powered on.

Power On/Off Button

Pin 25 and 26 connect the power button on front panel to the CPU board, which allows users to turn on or off power supply.

System Reset Switch

Pin 27 and 28 connect the case-mounted reset switch that reboots your computer without turning off the power switch. It is a better way to reboot your system for a longer life of system power supply.

HDD Activity LED

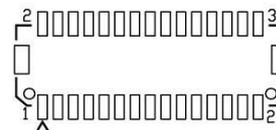
This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 29(-) and 30(+) connect the hard disk drive to the front panel HDD LED.

2.5.4 LVDS Connector (CN6)

This board has a 30-pin connector for LVDS LCD interface. It is strongly recommended to use the matching JST SHDR-30VS-B 30-pin connector for LVDS interface. Pin 27~30 VCCM can be set to +3.3V or +5V by setting SW1 (see section 2.4.1).

18-bit single channel

Pin	Signal	Pin	Signal
1	+5VS	2	+12V
3	+5VS	4	+12V
5	Backlight_EN +5V	6	Backlight_EN +3.3V
7	GND	8	GND
9	Channel A D0-	10	Brightness Control
11	Channel A D0+	12	GND
13	GND	14	N.C
15	Channel A D1-	16	N.C
17	Channel A D1+	18	GND
19	GND	20	Channel A CLK-
21	Channel A D2-	22	Channel A CLK+
23	Channel A D2+	24	GND
25	GND	26	N.C
27	VCCM	28	VCCM
29	VCCM	30	VCCM



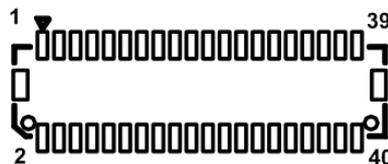
24-bit single channel

Pin	Signal	Pin	Signal
1	+5VS	2	+12V
3	+5VS	4	+12V
5	Backlight_EN +5V	6	Backlight_EN +3.3V
7	GND	8	GND
9	Channel A D0-	10	Brightness Control
11	Channel A D0+	12	GND
13	GND	14	Channel A D3-
15	Channel A D1-	16	Channel A D3+
17	Channel A D1+	18	GND
19	GND	20	Channel A CLK-
21	Channel A D2-	22	Channel A CLK+
23	Channel A D2+	24	GND
25	GND	26	N.C
27	VCCM	28	VCCM
29	VCCM	30	VCCM

2.5.5 COM and Audio Connector (CN7)

The CN7 is a 40-pin connector for two COM (RS-232), GPIO (digital I/O) and audio interface.

Pin	Signal	Pin	Signal
1	DCD1	2	DSR1
3	RXD1	4	RTS1
5	TXD1	6	CTS1
7	DTR1	8	RI1
9	COM_GND	10	DSR2
11	DCD2	12	RTS2
13	RXD2	14	CTS2
15	TXD2	16	RI2
17	DTR2	18	COM_GND
19	GND	20	GND
21	GPIO5	22	GPIO0
23	GPIO6	24	GPIO1
25	GPIO8	26	GPIO2
27	SMBus_DATA	28	GPIO3
29	SMBus_CLK	30	GPIO4
31	AUTO_BUTTON#	32	AUTO_BUTTON
33	LINE_IN_L	34	Audio_GND
35	LINE_IN_R	36	LINE_OUT_R
37	Audio_GND	38	LINE_OUT_L
39	MIC	40	Audio_GND

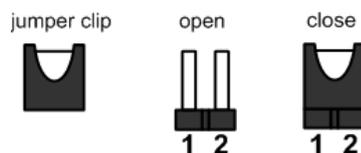


The voltage range of GPIO0~GPIO6 is 0~+5V and the voltage range of GPIO8 is 0~+3.3V.

Input Mode (Default)		Output Mode	
GPIO0	High:5VSB; Low:0V	GPO0	High:3.3V; Low:0V
GPIO1	High:5VSB; Low:0V	GPO1	High:3.3V; Low:0V
GPIO2	High:5VSB; Low:0V	GPO2	High:3.3V; Low:0V
GPIO3	High:5VSB; Low:0V	GPO3	High:3.3V; Low:0V
GPIO4	High:5VSB; Low:0V	GPO4	High:3.3V; Low:0V
GPIO5	High:5VSB; Low:0V	GPO5	High:3.3V; Low:0V
GPIO6	High:5VSB; Low:0V	GPO6	High:3.3V; Low:0V
GPIO8	High:3.3V; Low:0V	GPO8	High:3.3V; Low:0V

Pin 31 and pin 32 are for auto power on jumper. Once it is enabled, the system will be automatically power on without pressing soft power button. If it is disabled, it is necessary to manually press soft power button to power on system.

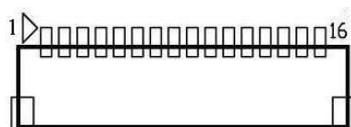
Function	Setting
Disable auto power on (Default)	Open
Enable auto power on	Close



2.5.6 Ethernet Connector (CN8)

The CN8 is a connector for Ethernet interface.

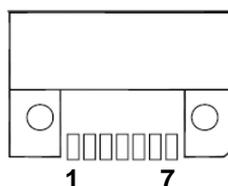
Pin	Signal
1	1000_LAN_LED
2	100_LAN_LED
3	GND
4	MDI3-
5	MDI3+
6	MDI1-
7	MDI2-
8	MDI2+
9	MDI1+
10	MDI0-
11	MDI0+
12	GND
13	VDD3
14	LINK_ACT
15	GND
16	GND



2.5.7 Serial ATA Connector (SATA1)

This Serial Advanced Technology Attachment (Serial ATA or SATA) connector is for high-speed SATA interface port. It is a computer bus interface for connecting to devices such as hard disk drives.

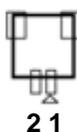
Pin	Signal
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND



2.5.8 CMOS Battery Connector (BAT1)

This connector is for CMOS battery interface.

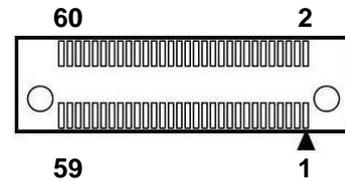
Pin	Signal
1	GND
2	+3V



2.5.9 Expansion Connector (SCN1)

The board is equipped with an expansion connector (SCN1) on the bottom side. This SCN1 is for connecting PICO822 to expansion module such as AX93268 (see Appendix A for the details of AX93268).

Pin	Signal	Pin	Signal
1	+12V	2	GND
3	+12V	4	GND
5	+12V	6	GND
7	+12V	8	GND
9	+12V	10	GND
11	+12V	12	GND
13	UART_RX	14	UART_TX
15	GND	16	GND
17	SMBus_CLK	18	SMBus_DATA
19	GND	20	GND
21	PEG_RX+	22	PEG_TX+
23	PEG_RX-	24	PEG_TX-
25	GND	26	GND
27	SDVO_INT+	28	PEG_CLK+
29	SDVO_INT-	30	PEG_CLK-
31	GND	32	GND
33	SDVO_STALL+	34	SDVO_RED+
35	SDVO_STALL-	36	SDVO_RED-
37	GND	38	GND
39	SDVO_CTRL_DATA	40	SDVO_GREEN+
41	SDVO_CTRL_CLK	42	SDVO_GREEN-
43	GND	44	GND
45	Reset	46	SDVO_BLUE+
47	GPIO	48	SDVO_BLUE-
49	USB_PWR	50	GND
51	USB_DN0	52	SDVO_CLK+
53	USB_DP0	54	SDVO_CLK-
55	GND	56	GND
57	HD_SPDIF	58	GPIO
59	PEG_WAKE	60	SLP_PLB (Default)



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Chapter 3

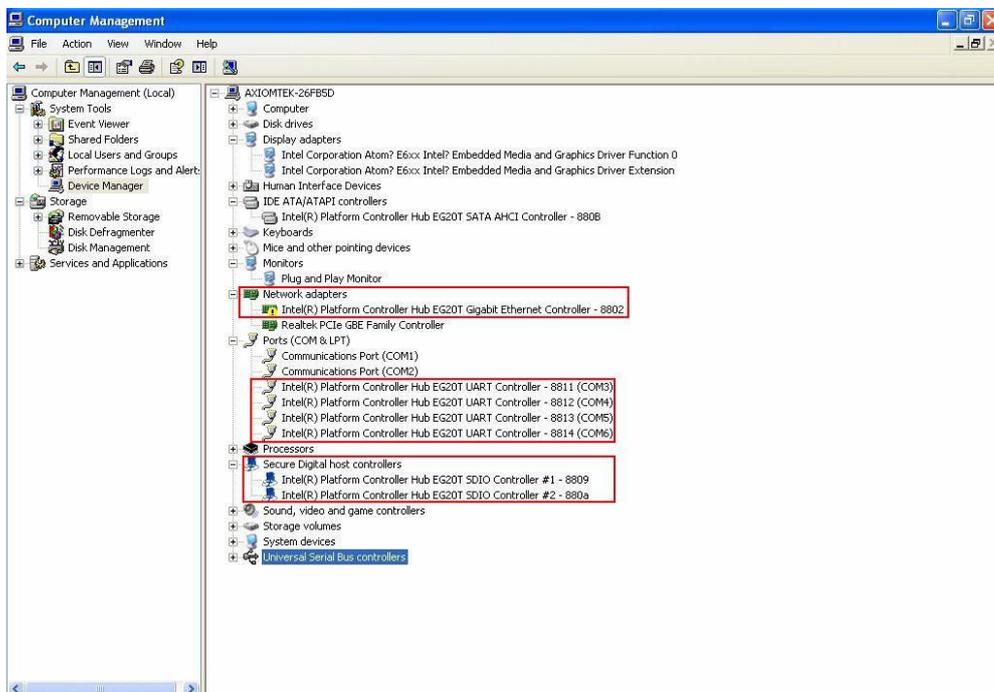
Hardware Description

3.1 Microprocessors

The PICO822 supports Intel® Atom™ processor E620T and E680T, which enable your system to operate under Windows® XP environment. Moreover, the PICO822 with E680T can operate under Windows® 7 environment. The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

3.2 Additional Note

- Windows® XP installation failed to install a couple of SATA DVD-ROM drives as indicated the list below. BSOD (0x7B) – blue screen error occurs after drivers are loaded and just before drives are partitioned.
 - PLEXTOR DVD/CD REWRITABLE DRIVE PX-712SA
 - LITE-ON IT CORP. DVD-ROM DRIVE Model DH-16D3504C
 - AsusTec Computer. Model No: DVD-E616A3T
- After installing the OS, BIOS fails to unload some built-in devices of PCH EG20T. That's why you can see some extra driver entries in the device manager as the image below. Please just ignore them.



3. The Intel® E620 CPU clock speed has already set to designed lowest rate possible 0.6G, hence Intel® SpeedStep function will not perform any CPU speed changing.
4. Clear CMOS function is not supported in PICO822.

3.3 BIOS

The PICO822 uses AMI Plug and Play BIOS with a single 16Mbit SPI Flash.

3.4 System Memory

The PICO822 has 1GB DDR2 SDRAM onboard.

3.5 I/O Port Address Map

The Intel® Atom™ processor E6xx series communicate via I/O ports. Total 1KB port addresses are available for assigning to other devices via I/O expansion cards.

[00000000 - 0000000F]	Direct memory access controller
[00000000 - 00000CF7]	PCI bus
[00000010 - 0000001F]	Motherboard resources
[00000020 - 00000021]	Programmable interrupt controller
[00000022 - 0000003F]	Motherboard resources
[00000024 - 00000025]	Programmable interrupt controller
[00000028 - 00000029]	Programmable interrupt controller
[0000002C - 0000002D]	Programmable interrupt controller
[00000030 - 00000031]	Programmable interrupt controller
[00000034 - 00000035]	Programmable interrupt controller
[00000038 - 00000039]	Programmable interrupt controller
[0000003C - 0000003D]	Programmable interrupt controller
[00000040 - 00000043]	System timer
[00000044 - 0000005F]	Motherboard resources
[00000050 - 00000053]	System timer
[00000060 - 00000060]	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000061 - 00000061]	System speaker
[00000063 - 00000063]	Motherboard resources
[00000064 - 00000064]	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000065 - 00000065]	Motherboard resources
[00000067 - 0000006F]	Motherboard resources
[00000070 - 00000077]	System CMOS/real time clock
[00000072 - 0000007F]	Motherboard resources
[00000080 - 00000080]	Motherboard resources
[00000081 - 00000083]	Direct memory access controller
[00000084 - 00000086]	Motherboard resources
[00000087 - 00000087]	Direct memory access controller
[00000088 - 00000088]	Motherboard resources
[00000089 - 0000008B]	Direct memory access controller
[0000008C - 0000008E]	Motherboard resources
[0000008F - 0000008F]	Direct memory access controller
[00000090 - 0000009F]	Motherboard resources
[000000A0 - 000000A1]	Programmable interrupt controller
[000000A2 - 000000BF]	Motherboard resources
[000000A4 - 000000A5]	Programmable interrupt controller
[000000A8 - 000000A9]	Programmable interrupt controller

	[000000AC - 000000AD]	Programmable interrupt controller
	[000000B0 - 000000B1]	Programmable interrupt controller
	[000000B4 - 000000B5]	Programmable interrupt controller
	[000000B8 - 000000B9]	Programmable interrupt controller
	[000000BC - 000000BD]	Programmable interrupt controller
	[000000C0 - 000000DF]	Direct memory access controller
	[000000E0 - 000000EF]	Motherboard resources
	[000000F0 - 000000FF]	Numeric data processor
	[00000274 - 00000277]	ISAPNP Read Data Port
	[00000279 - 00000279]	ISAPNP Read Data Port
	[000002F8 - 000002FF]	Communications Port (COM2)
	[000003B0 - 000003BB]	Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0
	[000003C0 - 000003DF]	Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0
	[000003F8 - 000003FF]	Communications Port (COM1)
	[00000400 - 0000043F]	System board
	[00000480 - 000004BF]	System board
	[000004D0 - 000004D1]	Motherboard resources
	[000004D0 - 000004D1]	Programmable interrupt controller
	[00000900 - 0000097F]	System board
	[000009C0 - 000009FF]	System board
	[00000A00 - 00000A0F]	Motherboard resources
	[00000A10 - 00000A1F]	Motherboard resources
	[00000A79 - 00000A79]	ISAPNP Read Data Port
	[00000D00 - 0000FFFF]	PCI bus
	[0000D000 - 0000D0FF]	Realtek PCIe GBE Family Controller #2
	[0000D000 - 0000DFFF]	Intel(R) Atom(TM) Processor E6xx PCI Express Port 2 - 8185
	[0000E000 - 0000E01F]	Intel(R) Platform Controller Hub EG20T SATA AHCI Controller - 880B
	[0000E000 - 0000EFFF]	Intel(R) Atom(TM) Processor E6xx PCI Express Port 1 - 8184
	[0000E000 - 0000EFFF]	Intel(R) Platform Controller Hub EG20T PCI Express Port - 8800
	[0000E040 - 0000E047]	Intel(R) Platform Controller Hub EG20T UART Controller - 8814 (COM6)
	[0000E050 - 0000E057]	Intel(R) Platform Controller Hub EG20T UART Controller - 8813 (COM5)
	[0000E060 - 0000E067]	Intel(R) Platform Controller Hub EG20T UART Controller - 8812 (COM4)
	[0000E070 - 0000E077]	Intel(R) Platform Controller Hub EG20T UART Controller - 8811 (COM3)
	[0000F000 - 0000F007]	Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Extension
	[0000F010 - 0000F017]	Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0

3.6 Interrupt Controller (IRQ) Map

The interrupt controller (IRQ) mapping list is shown as follows:

	(ISA) 0	System timer
	(ISA) 1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
	(ISA) 3	Communications Port (COM2)
	(ISA) 4	Communications Port (COM1)
	(ISA) 8	System CMOS/real time clock
	(ISA) 9	Microsoft ACPI-Compliant System
	(ISA) 12	Microsoft PS/2 Mouse
	(ISA) 13	Numeric data processor
	(PCI) 5	Intel(R) Platform Controller Hub EG20T DMA Controller #2 - 8815
	(PCI) 11	Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Extension
	(PCI) 16	Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0
	(PCI) 16	Intel(R) Atom(TM) Processor E6xx PCI Express Port 1 - 8184
	(PCI) 16	Intel(R) Atom(TM) Processor E6xx PCI Express Port 2 - 8185
	(PCI) 16	Intel(R) Atom(TM) Processor E6xx PCI Express Port 3 - 8180
	(PCI) 16	Intel(R) Atom(TM) Processor E6xx PCI Express Port 4 - 8181
	(PCI) 16	Intel(R) Platform Controller Hub EG20T General Purpose IO Controller - 8803
	(PCI) 16	Intel(R) Platform Controller Hub EG20T PCI Express Port - 8800
	(PCI) 16	Intel(R) Platform Controller Hub EG20T USB OHCI Controller #1 - 880c
	(PCI) 16	Intel(R) Platform Controller Hub EG20T USB OHCI Controller #2 - 880d
	(PCI) 16	Intel(R) Platform Controller Hub EG20T USB OHCI Controller #3 - 880e
	(PCI) 16	Intel(R) Platform Controller Hub EG20T USB2 EHCI Controller #1 - 880f
	(PCI) 16	Microsoft UAA Bus Driver for High Definition Audio
	(PCI) 17	Intel(R) Platform Controller Hub EG20T SATA AHCI Controller - 880B
	(PCI) 17	Realtek PCIe GBE Family Controller #2
	(PCI) 18	Intel(R) Platform Controller Hub EG20T Controller Area Network (CAN) Controller - 8818
	(PCI) 18	Intel(R) Platform Controller Hub EG20T I2C Controller - 8817
	(PCI) 18	Intel(R) Platform Controller Hub EG20T IEEE 1588 Hardware Assist - 8819
	(PCI) 18	Intel(R) Platform Controller Hub EG20T SDIO Controller #1 - 8809
	(PCI) 18	Intel(R) Platform Controller Hub EG20T SDIO Controller #2 - 880a
	(PCI) 18	Intel(R) Platform Controller Hub EG20T Serial Peripheral Interface Bus - 8816
	(PCI) 19	Intel(R) Platform Controller Hub EG20T DMA Controller #1 - 8810
	(PCI) 19	Intel(R) Platform Controller Hub EG20T UART Controller - 8811 (COM3)
	(PCI) 19	Intel(R) Platform Controller Hub EG20T UART Controller - 8812 (COM4)
	(PCI) 19	Intel(R) Platform Controller Hub EG20T UART Controller - 8813 (COM5)
	(PCI) 19	Intel(R) Platform Controller Hub EG20T UART Controller - 8814 (COM6)
	(PCI) 19	Intel(R) Platform Controller Hub EG20T USB Client Controller - 8808
	(PCI) 19	Intel(R) Platform Controller Hub EG20T USB OHCI Controller #4 - 8804
	(PCI) 19	Intel(R) Platform Controller Hub EG20T USB OHCI Controller #5 - 8805
	(PCI) 19	Intel(R) Platform Controller Hub EG20T USB OHCI Controller #6 - 8806
	(PCI) 19	Intel(R) Platform Controller Hub EG20T USB2 EHCI Controller #2 - 8807

3.7 Memory Map

The memory mapping list is shown as follows:

[000A0000 - 000BFFFF]	Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0
[000A0000 - 000BFFFF]	PCI bus
[000C0000 - 000DFFFF]	System board
[000E0000 - 000EFFFF]	System board
[000F0000 - 000FFFFF]	System board
[3F6F0000 - 3F6FFFFF]	System board
[3F700000 - 3F7FFFFF]	System board
[3F800000 - 3FFFFFFF]	System board
[40000000 - FFFFFFFF]	PCI bus
[80000000 - BFFFFFFF]	Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Extension
[C0000000 - CFFFFFFF]	Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0
[D0000000 - D00FFFFF]	Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0
[D0100000 - D01FFFFF]	Intel(R) Platform Controller Hub EG20T PCI Express Port - 8800
[D0100000 - D02FFFFF]	Intel(R) Atom(TM) Processor E6xx PCI Express Port 1 - 8184
[D0140000 - D0141FFF]	Intel(R) Platform Controller Hub EG20T USB Client Controller - 8808
[D0142000 - D01420FF]	Intel(R) Platform Controller Hub EG20T IEEE 1588 Hardware Assist - 8819
[D0143000 - D01431FF]	Intel(R) Platform Controller Hub EG20T Controller Area Network (CAN) Controller - 8818
[D0144000 - D01440FF]	Intel(R) Platform Controller Hub EG20T I2C Controller - 8817
[D0145000 - D014501F]	Intel(R) Platform Controller Hub EG20T Serial Peripheral Interface Bus - 8816
[D0146000 - D01460FF]	Intel(R) Platform Controller Hub EG20T DMA Controller #2 - 8815
[D0147000 - D014700F]	Intel(R) Platform Controller Hub EG20T UART Controller - 8814 (COM6)
[D0148000 - D014800F]	Intel(R) Platform Controller Hub EG20T UART Controller - 8813 (COM5)
[D0149000 - D014900F]	Intel(R) Platform Controller Hub EG20T UART Controller - 8812 (COM4)
[D014A000 - D014A00F]	Intel(R) Platform Controller Hub EG20T UART Controller - 8811 (COM3)
[D0148000 - D01480FF]	Intel(R) Platform Controller Hub EG20T DMA Controller #1 - 8810
[D014C000 - D014C0FF]	Intel(R) Platform Controller Hub EG20T USB2 EHCI Controller #1 - 880f
[D014D000 - D014D0FF]	Intel(R) Platform Controller Hub EG20T USB OHCI Controller #3 - 880e
[D014E000 - D014E0FF]	Intel(R) Platform Controller Hub EG20T USB OHCI Controller #2 - 880d
[D014F000 - D014F0FF]	Intel(R) Platform Controller Hub EG20T USB OHCI Controller #1 - 880c
[D0150000 - D01503FF]	Intel(R) Platform Controller Hub EG20T SATA AHCI Controller - 880B
[D0151000 - D01511FF]	Intel(R) Platform Controller Hub EG20T SDIO Controller #2 - 880a
[D0152000 - D01521FF]	Intel(R) Platform Controller Hub EG20T SDIO Controller #1 - 8809
[D0153000 - D01530FF]	Intel(R) Platform Controller Hub EG20T USB2 EHCI Controller #2 - 8807
[D0154000 - D01540FF]	Intel(R) Platform Controller Hub EG20T USB OHCI Controller #6 - 8806
[D0155000 - D01550FF]	Intel(R) Platform Controller Hub EG20T USB OHCI Controller #5 - 8805
[D0156000 - D01560FF]	Intel(R) Platform Controller Hub EG20T USB OHCI Controller #4 - 8804
[D0157000 - D015703F]	Intel(R) Platform Controller Hub EG20T General Purpose IO Controller - 8803
[D0159000 - D01597FF]	Intel(R) Platform Controller Hub EG20T Packet Hub - 8801
[D0300000 - D037FFFF]	Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Extension
[D0380000 - D03BFFFF]	Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Extension
[D03C0000 - D03FFFFFFF]	Intel Corporation Atom? E6xx Intel? Embedded Media and Graphics Driver Function 0
[D0400000 - D0403FFF]	Microsoft UAA Bus Driver for High Definition Audio
[E0000000 - EFFFFFFF]	System board
[FEC00000 - FEC85FFF]	System board
[FED1C000 - FED1FFFF]	System board
[FEE00000 - FEEFFFFFFF]	System board
[FF700000 - FF703FFF]	Realtek PCIe GBE Family Controller #2
[FF700000 - FF77FFFF]	Intel(R) Atom(TM) Processor E6xx PCI Express Port 2 - 8185
[FF704000 - FF704FFF]	Realtek PCIe GBE Family Controller #2
[FF800000 - FFFFFFFF]	System board

Chapter 4

AMI BIOS Setup Utility

The AMI UEFI BIOS provides users with a built-in setup program to modify basic system configuration. All configured parameters are stored in a flash chip to save the setup information whenever the power is turned off. This chapter provides users with detailed description about how to set up basic system configuration through the AMI BIOS setup utility.

4.1 Starting

To enter the setup screens, follow the steps below:

1. Turn on the computer and press the key immediately.
2. After you press the key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.

It is strongly recommended that you should avoid changing the chipset's defaults. Both AMI and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

4.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

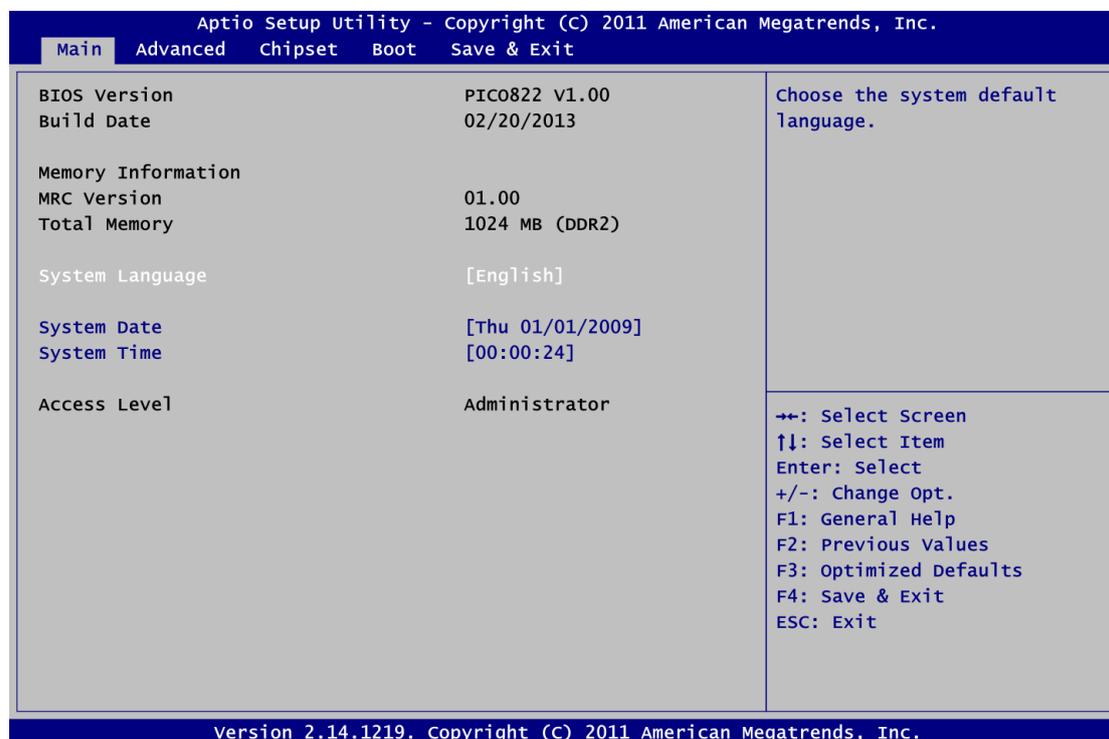


Note: *Some of the navigation keys differ from one screen to another.*

Hot Keys	Description
→← Left/Right	The Left and Right <Arrow> keys allow you to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow you to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
Tab	The <Tab> key allows you to select setup fields.
F1	The <F1> key allows you to display the General Help screen.
F2	The <F2> key allows you to Load Previous Values.
F3	The <F3> key allows you to Load Optimized Defaults.
F4	The <F4> key allows you to save any changes you have made and exit Setup. Press the <F4> key to save your changes.
Esc	The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving your changes.
Enter	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens.

4.3 Main Menu

When you first enter the setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is shown below.



- Memory Information**
 Display the auto-detected memory information.
- System Language**
 Use this option to choose the system default language.
- System Date/Time**
 Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.
- Access Level**
 Display the access level of current user.

4.4 Advanced Menu

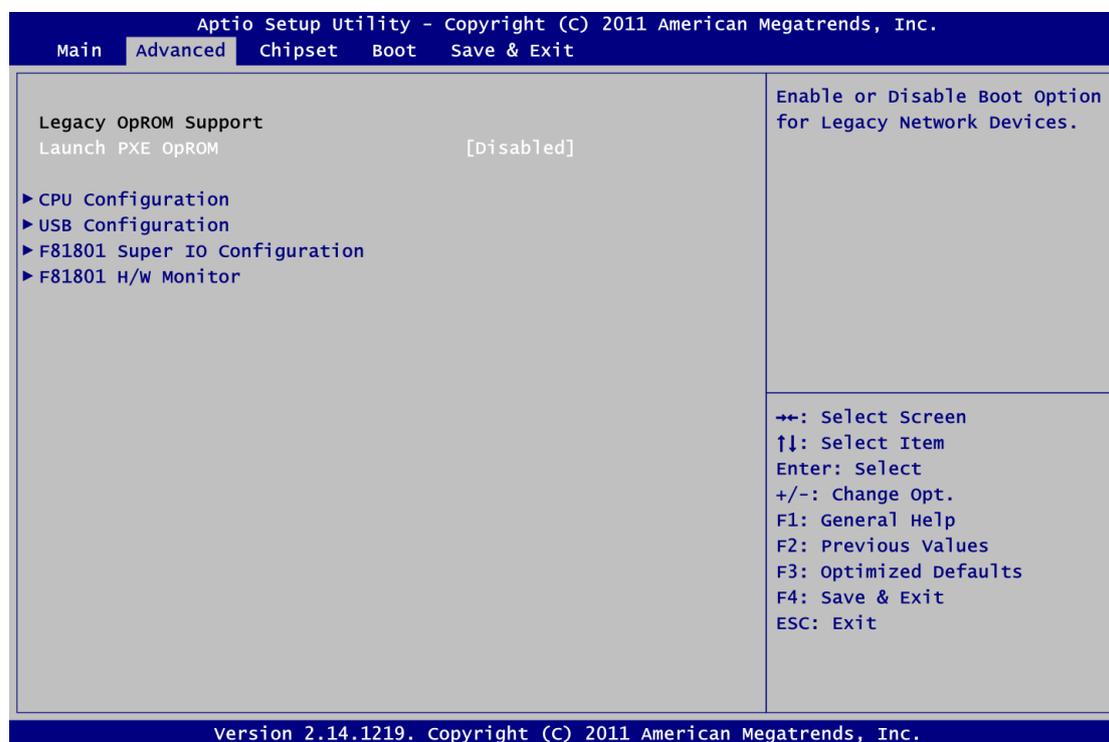
- **Launch PXE OpROM**

Use this item to enable or disable the boot ROM function of the onboard LAN chip when the system boots up.

The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

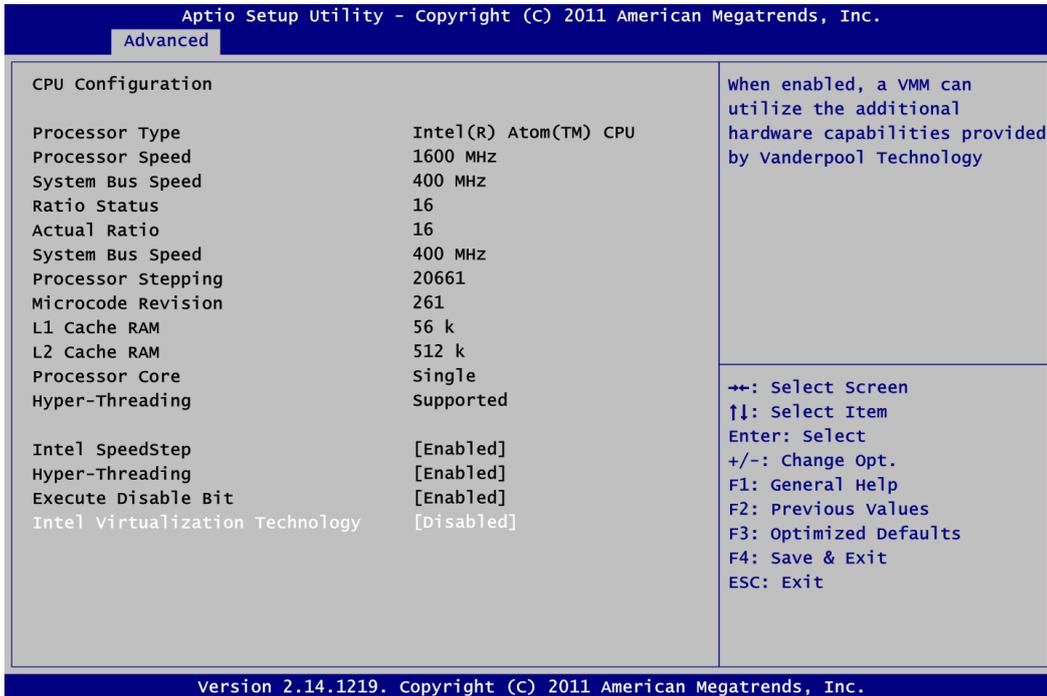
- ▶ CPU Configuration
- ▶ USB Configuration
- ▶ F81801 Super IO Configuration
- ▶ F81801 H/W Monitor

For items marked with “▶”, please press <Enter> for more options.



- **CPU Configuration**

This screen shows the CPU Configuration.

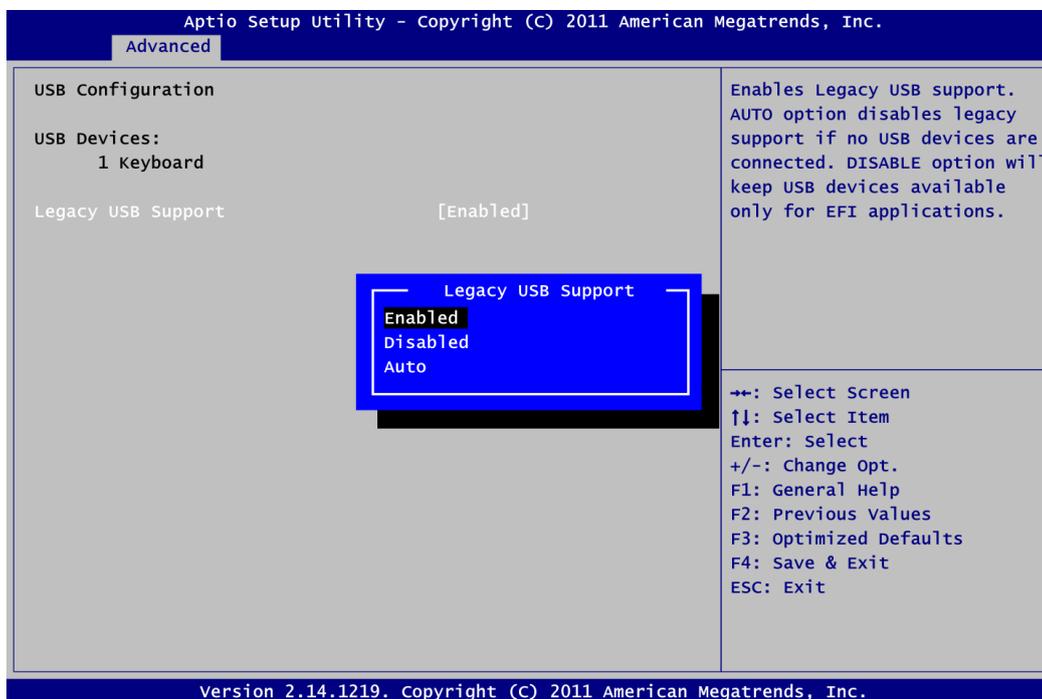


Intel Virtualization Technology

This item allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.

- **USB Configuration**

You can use this screen to select options for the USB Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

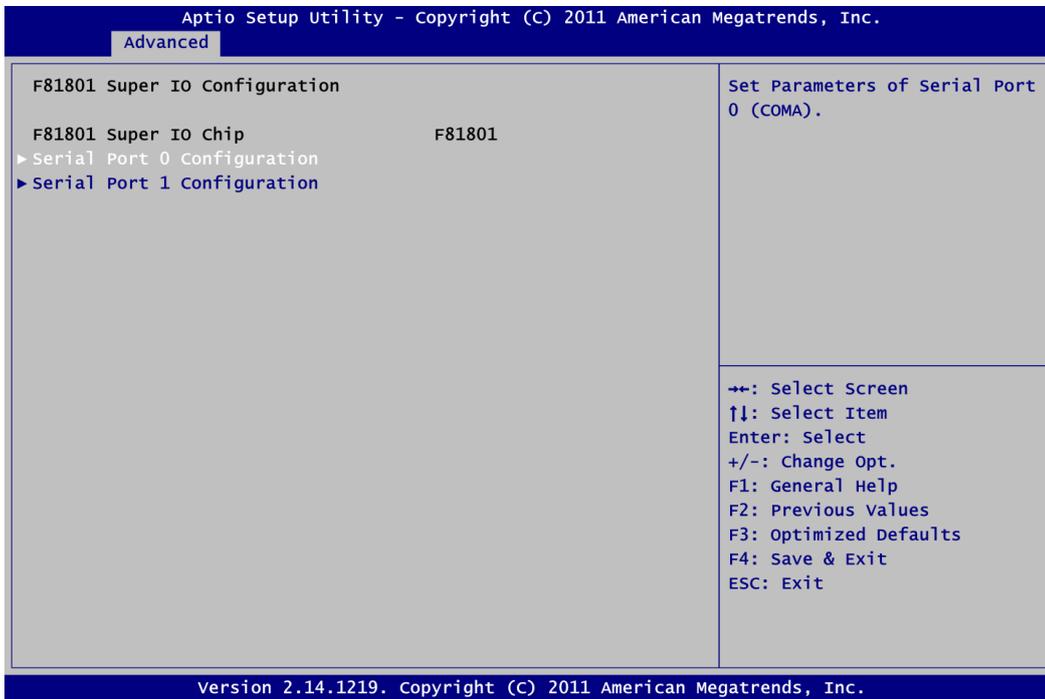


Legacy USB Support

Use this item to enable or disable support for USB device on legacy operating system. The default setting is Enabled. Auto option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications.

- **F81801 Super IO Configuration**

You can use this screen to select options for the Super IO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "▶", please press <Enter> for more options.

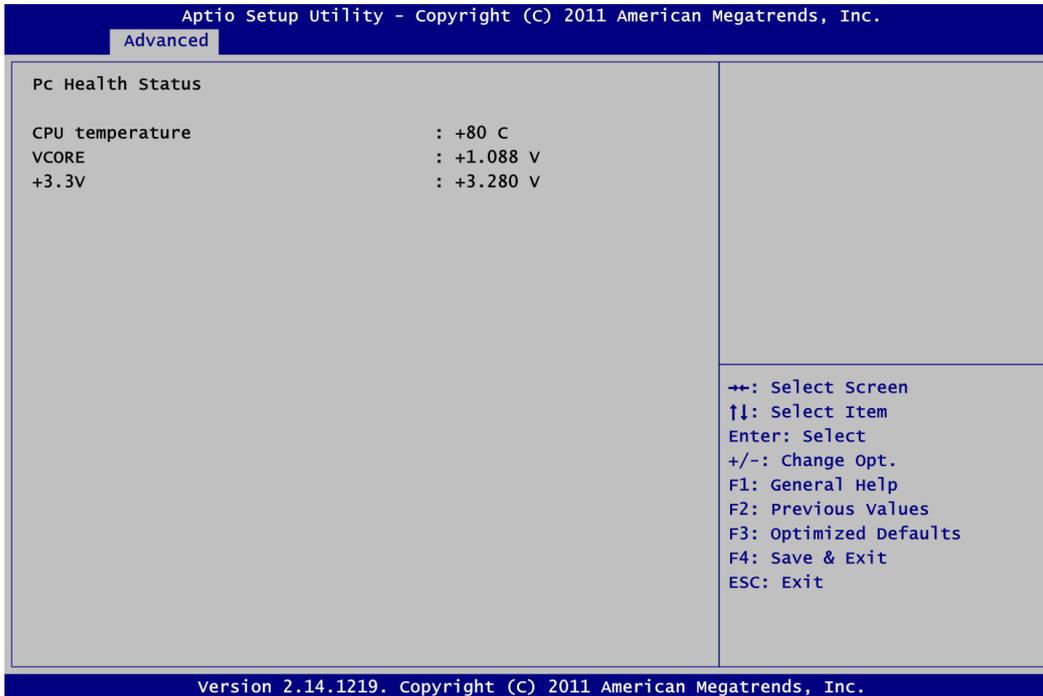


Serial Port 0~1 Configuration

Enable or disable serial port 0 to 1.

- **F81801 H/W Monitor**

This screen monitors hardware health status.



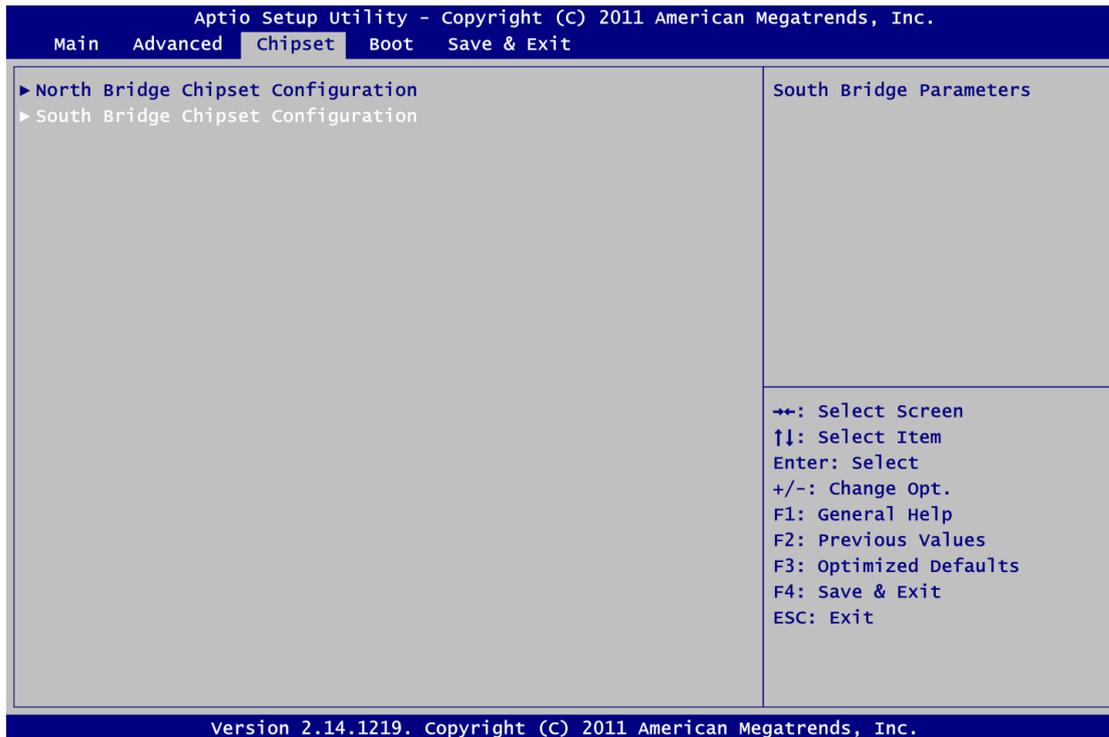
This screen displays the temperature of CPU and system voltages (VCORE and +3.3V).

4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

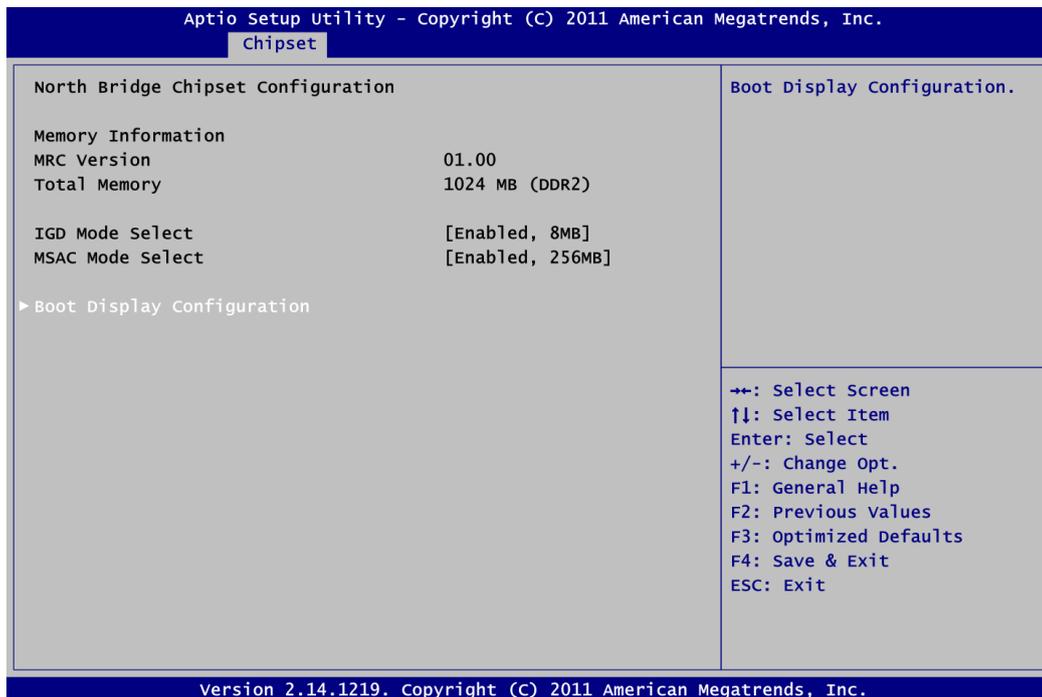
- ▶ North Bridge Chipset Configuration
- ▶ South Bridge Chipset Configuration

For items marked with “▶”, please press <Enter> for more options.



- **North Bridge Chipset Configuration**

This screen allows users to configure parameters of North Bridge chipset.



Memory Information

Display the auto-detected memory information.

IGD Mode Select

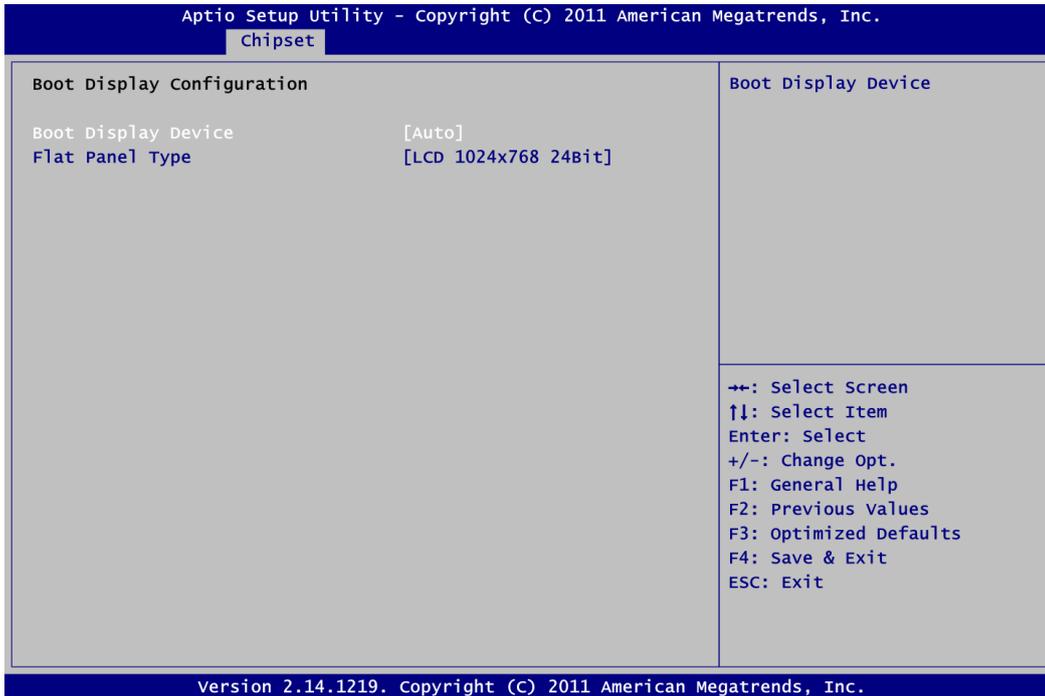
Default enabled and 8MB are shared from system memory to IGD (Integrated Graphics Device).

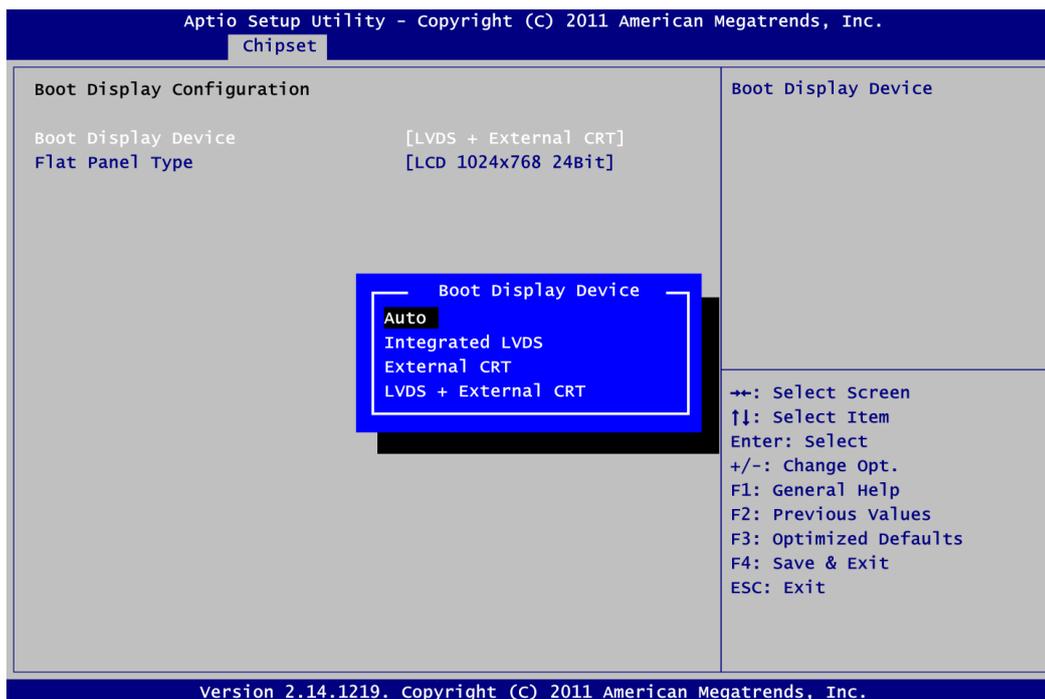
MSAC Mode Select

Default enabled and 256MB are the graphics memory Multi-Size Aperture Control used by IGD (Integrated Graphics Device).

- **Boot Display Configuration**

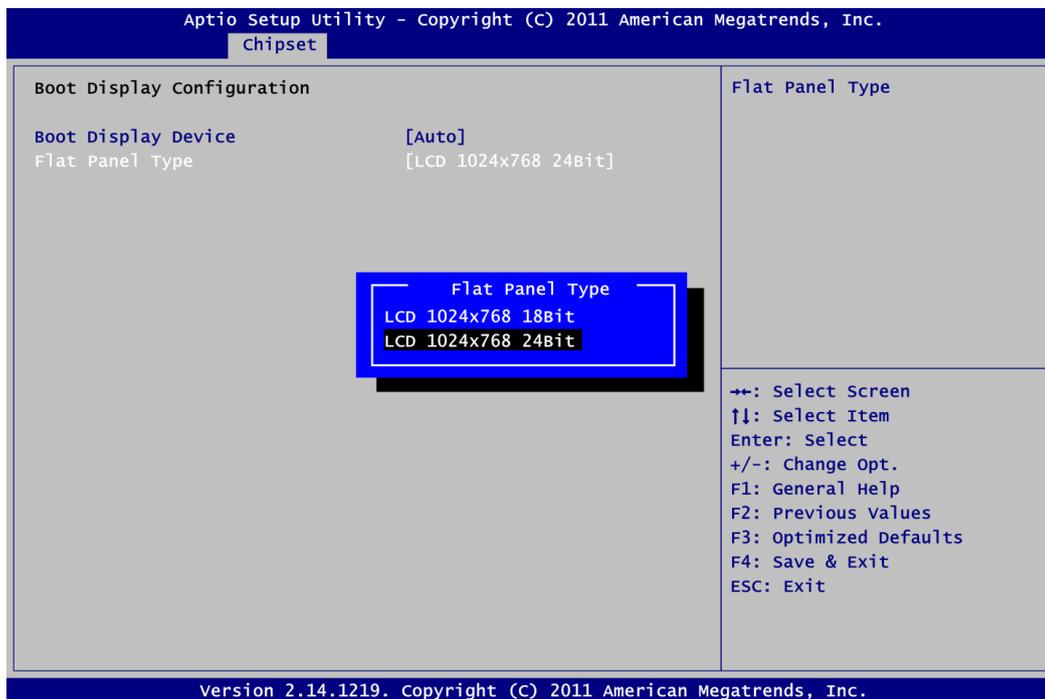
This screen provides access to boot display parameter settings.





Boot Display Device

Select boot display device. Auto is the default. External CRT is worked when AX93268 is installed (see Appendix A).

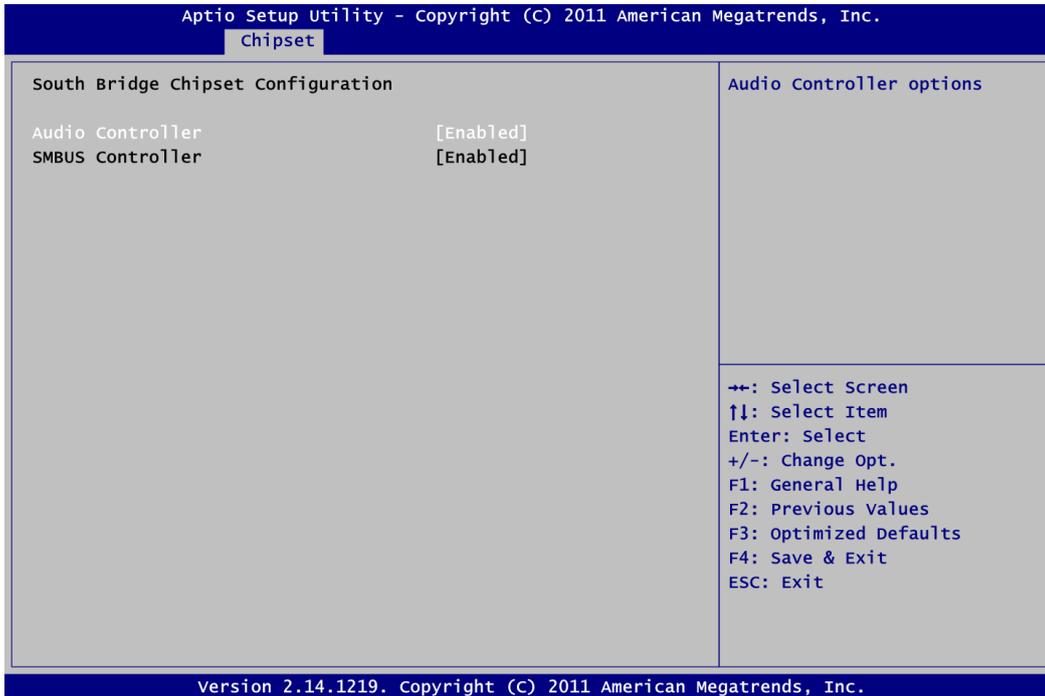


Flat Panel Type

Select flat panel resolution.

- **South Bridge Chipset Configuration**

This screen allows users to configure parameters of South Bridge chipset.



Audio Controller

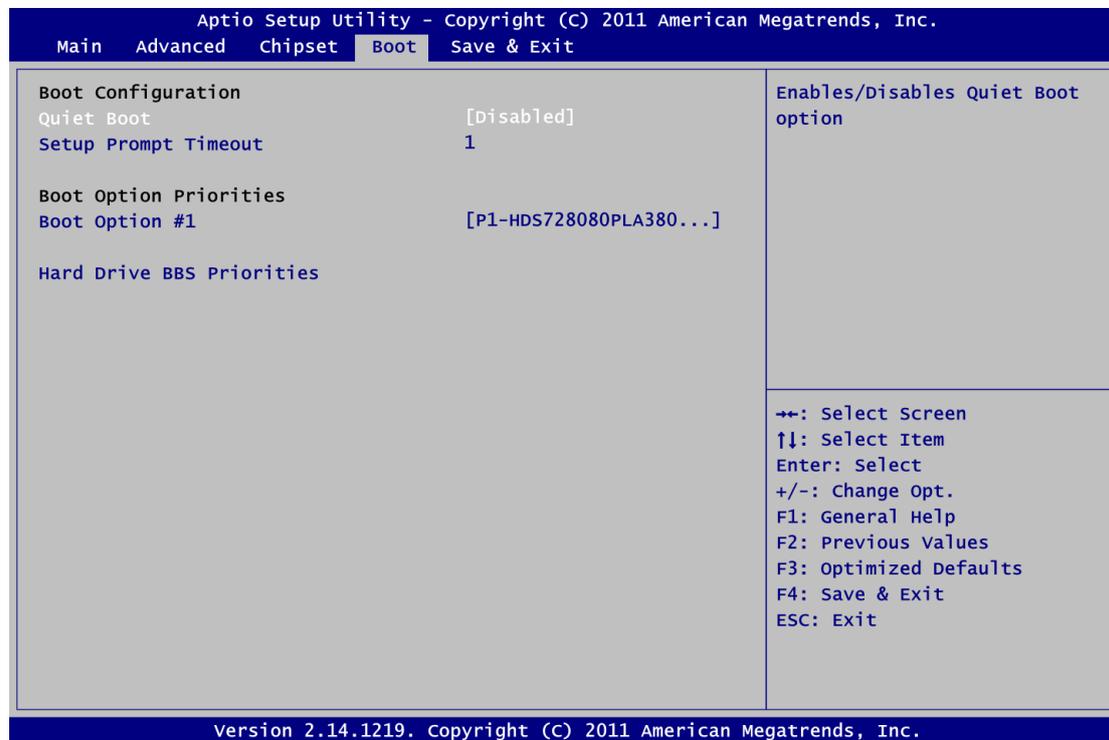
Enable or disable the HD audio controller.

SMBus Controller

Enable SMBus controller.

4.6 Boot Menu

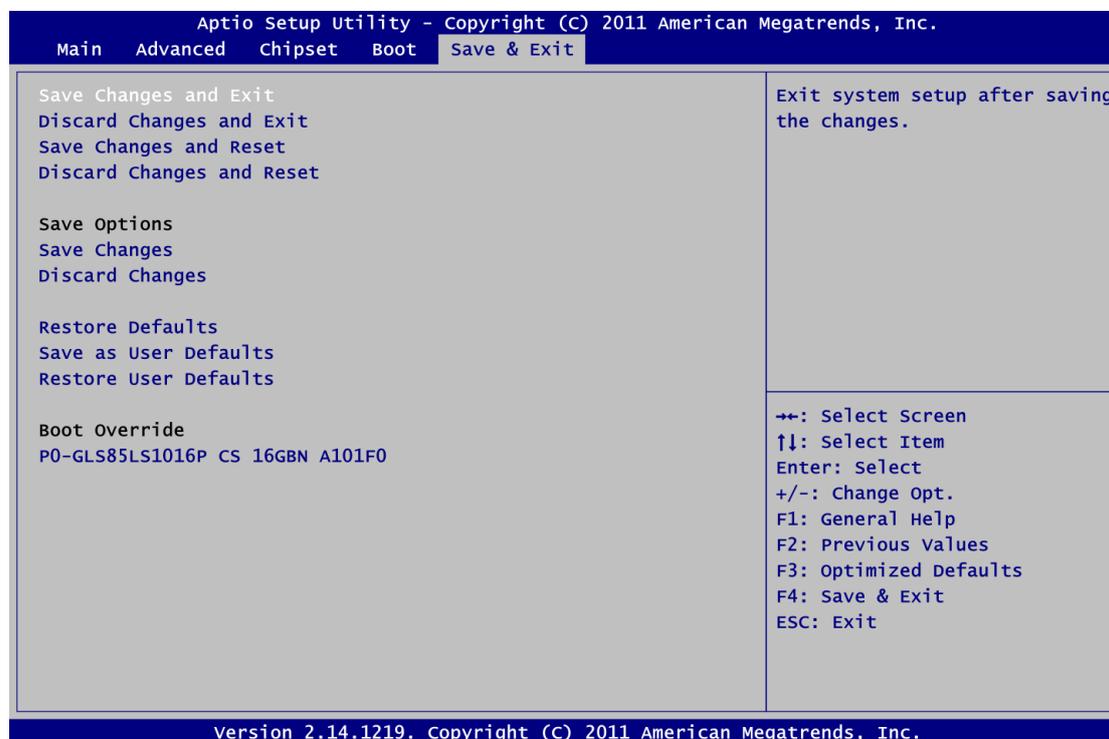
The Boot menu allows users to change boot options of the system.



- **Quiet Boot**
Select to display either POST output messages or a splash screen during boot-up.
- **Setup Prompt Timeout**
Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
- **Boot Option Priorities**
These are settings for boot priority. Specify the boot device priority sequence from the available devices.
- **Hard Drive BBS Priorities**
Set the order of the legacy devices in this group.

4.7 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or fail-safe default values.



- Save Changes and Exit**
When you have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.
- Discard Changes and Exit**
Select this option to quit Setup without making any permanent changes to the system configuration and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.
- Save Changes and Reset**
When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.
- Discard Changes and Reset**
Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.
- Save Changes**
When you have completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

- **Discard Changes**
Select this option to quit Setup without making any permanent changes to the system configuration. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.
- **Restore Defaults**
It automatically sets all Setup options to a complete set of default settings when you select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.
- **Save as User Defaults**
Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.
- **Restore User Defaults**
It automatically sets all Setup options to a complete set of User Defaults when you select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.
- **Boot Override**
Select a drive to immediately boot that device regardless of the current boot order.

Chapter 5

Drivers Installation

5.1 Drivers for Windows® XP

The device drivers are located on the product information CD that comes with the PICO822 series package. The auto-run function of drivers will guide you to install the utilities and device drivers under Windows® XP operating system. You can follow the onscreen instructions to install these devices:

- Chipset
- PCH
- Graphics
- Audio
- Ethernet
- Serial (COM) port

5.1.1 Installing Chipset Driver

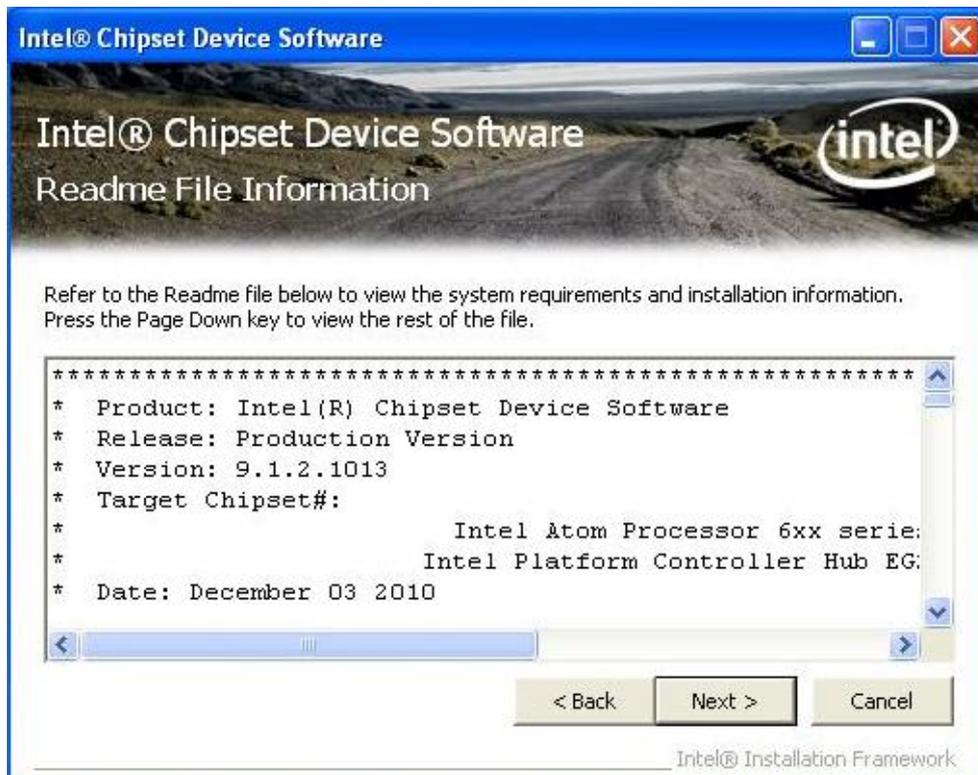
1. Run the SETUP.EXE program for chipset from the driver directory in product information CD. Click “Next” to next step.



- An Intel® License Agreement screen appears to show you the important information. Click “Yes” to next step.



- A Readme File Information screen appears to show you the system requirements and installation information. Click “Next” to next step.



4. Please wait while setup processes the following operations.



5. You will be asked to reboot your computer when the installation is completed. Please select “Yes, I want to restart my computer now” if you don’t need to install any other drivers. Then click “Finish” to complete the setup process and reboot. Otherwise, please select “No, I will restart my computer later” and click “Finish” to complete the installation.



5.1.2 Installing PCH Driver

1. Run the PCH_EG20T_WinXP_WePOS_All_260.EXE program from the driver directory in product information CD. Click “Next” to next step.



2. An Intel® License Agreement screen appears to show you the important information. Click “I accept the terms in the license agreement” and “Next” to next step.



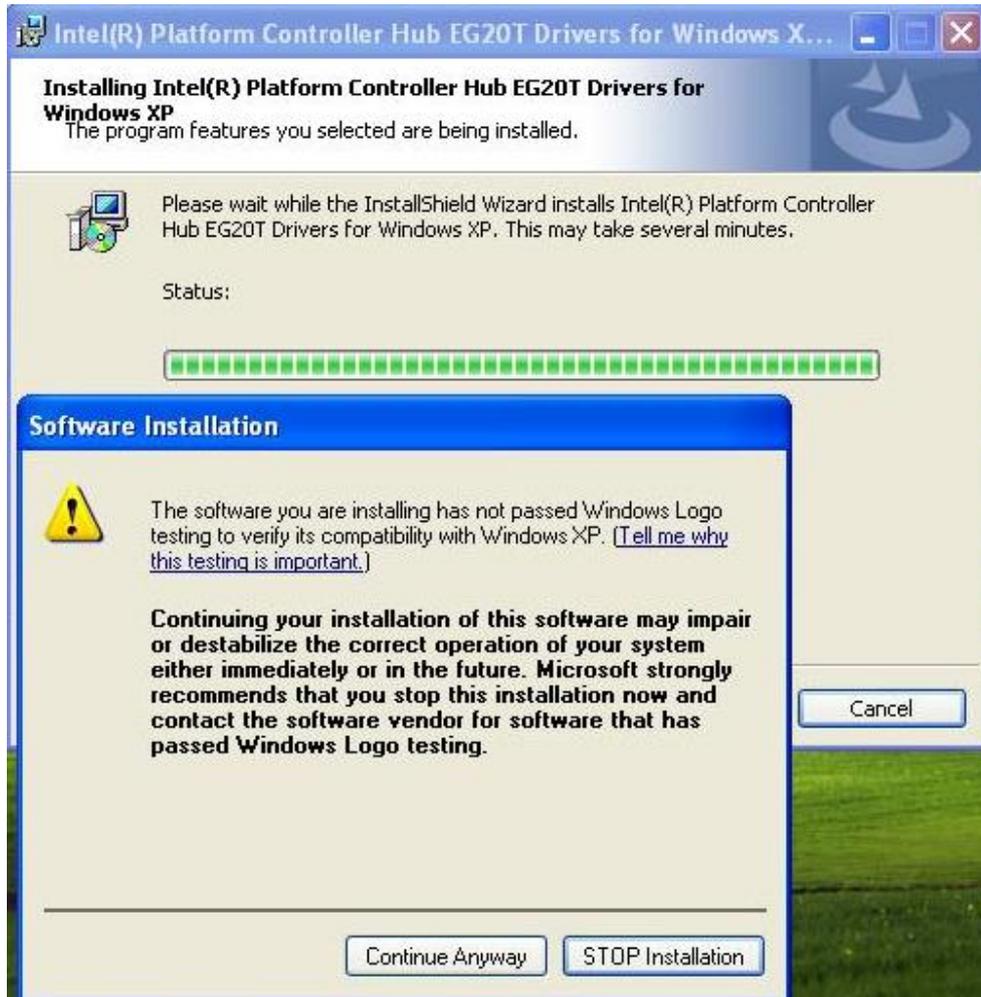
3. Click “Complete” and “Next” to next step.



4. To begin installation, click “Install” to next step.



5. Click “Continue Anyway” to next step.



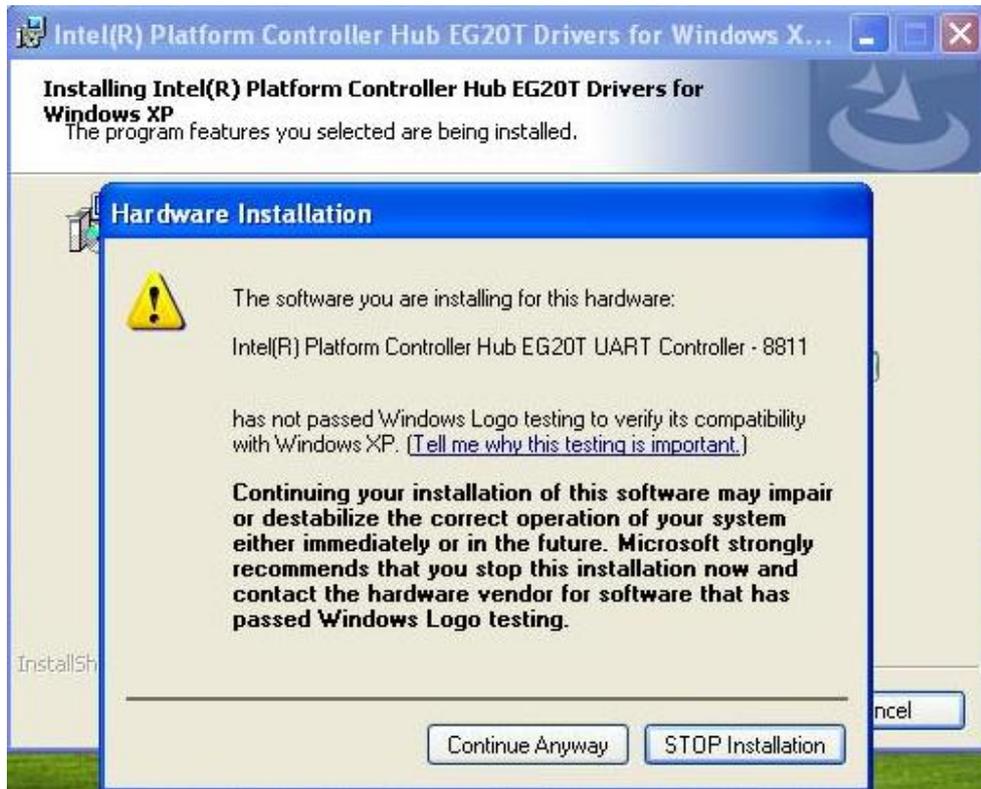
6. Click “Continue Anyway” to next step.



7. Click “Continue Anyway” to next step.



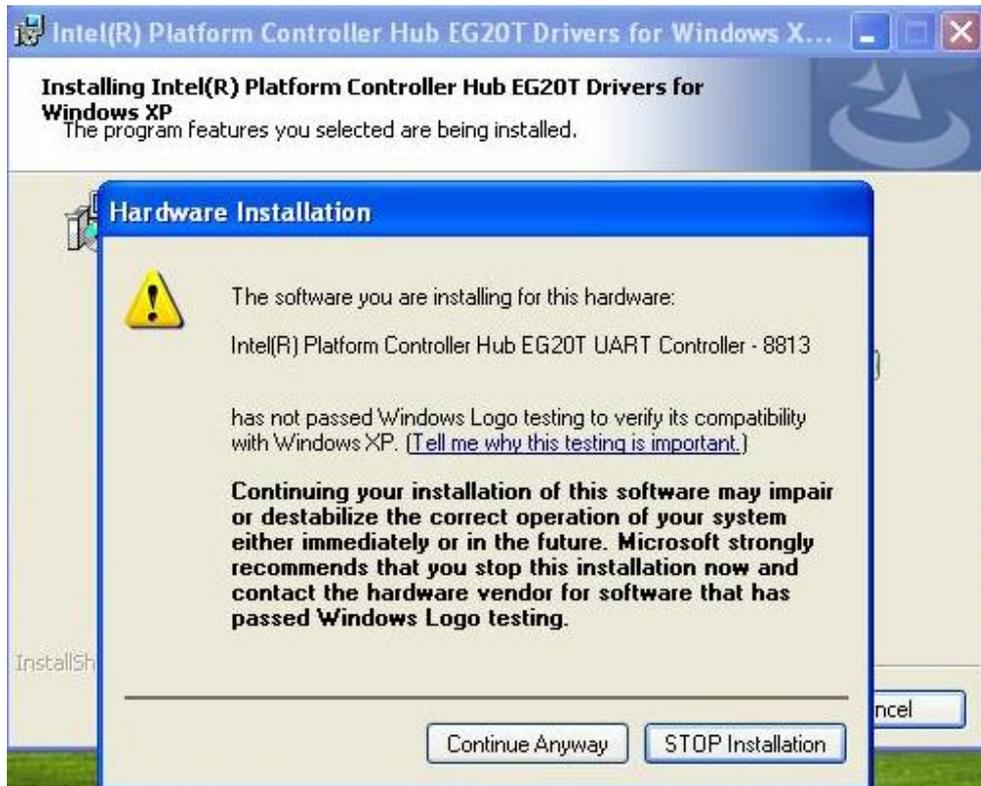
- Click "Continue Anyway" to next step.



- Click "Continue Anyway" to next step.



10. Click “Continue Anyway” to next step.



11. Click “Continue Anyway” to next step.



12. Click “Continue Anyway” to next step.



13. Click “Continue Anyway” to next step.



14. Click “Finish” to complete the installation.

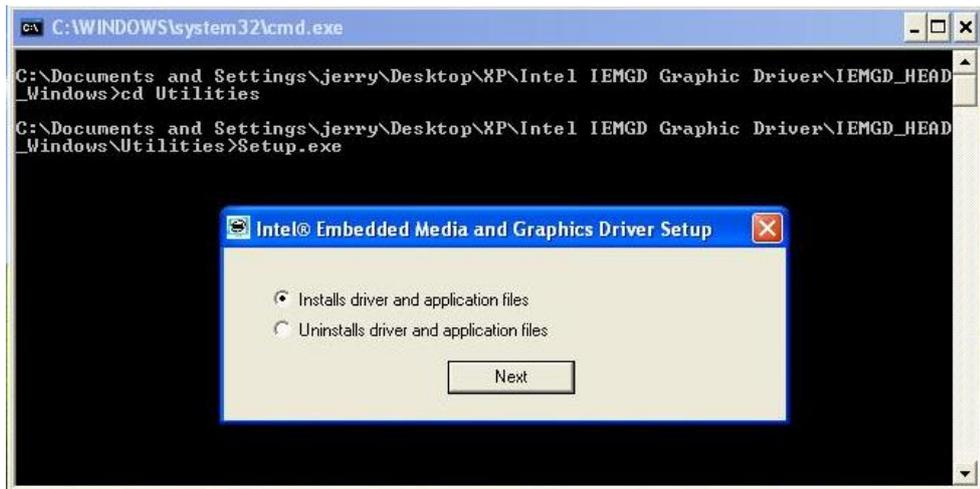


5.1.3 Installing Graphics Driver

1. Run the WindowsDriverSETUP.cmd program from the driver directory in product information CD.



2. Click “Install driver and application files” to next step.



3. An Intel® License Agreement screen appears to show you the important information. Select “I agree” and click “Install” to next step.



4. Click “Continue Anyway” to next step.



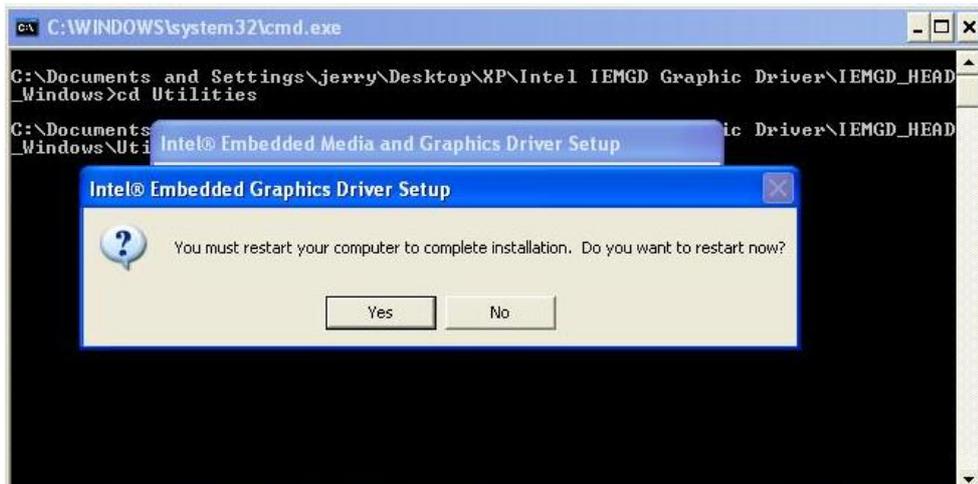
5. Click “Continue Anyway” to next step.



- Click “Continue Anyway” to next step.



- You will be asked to restart your computer when the installation is completed. Please click “Yes” if you don't need to install any other drivers. Otherwise, please click “No” to go on next step.



5.1.4 Installing Audio Driver

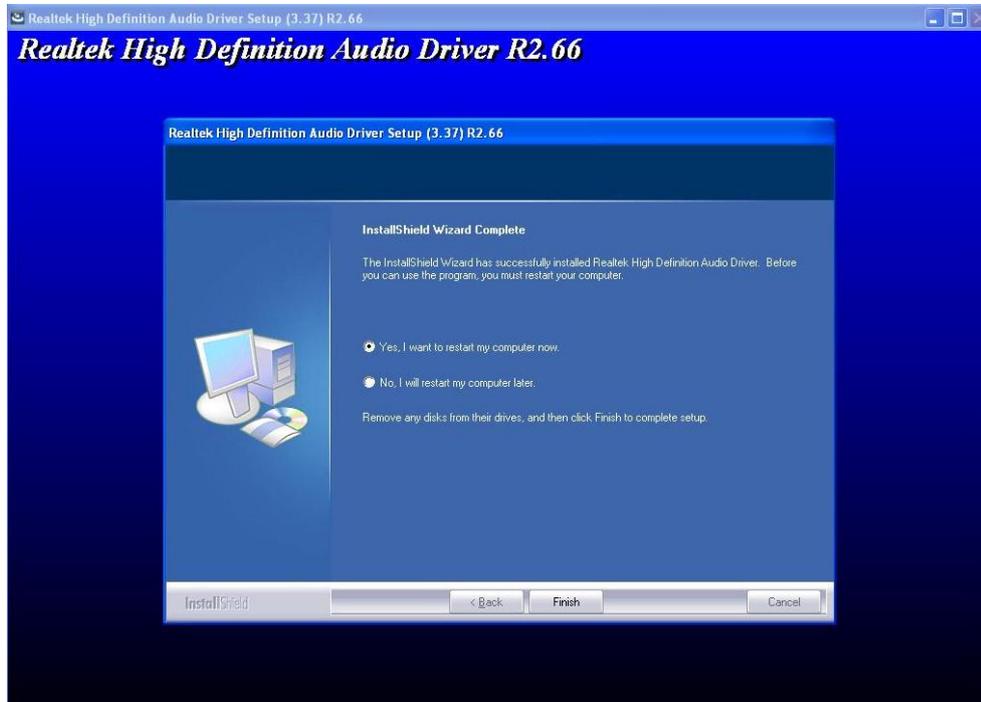
1. Run the WDM_R266.exe for audio from the driver di in product information CD. Click “Next” to continue.



2. Please wait while setup processes the following operations.

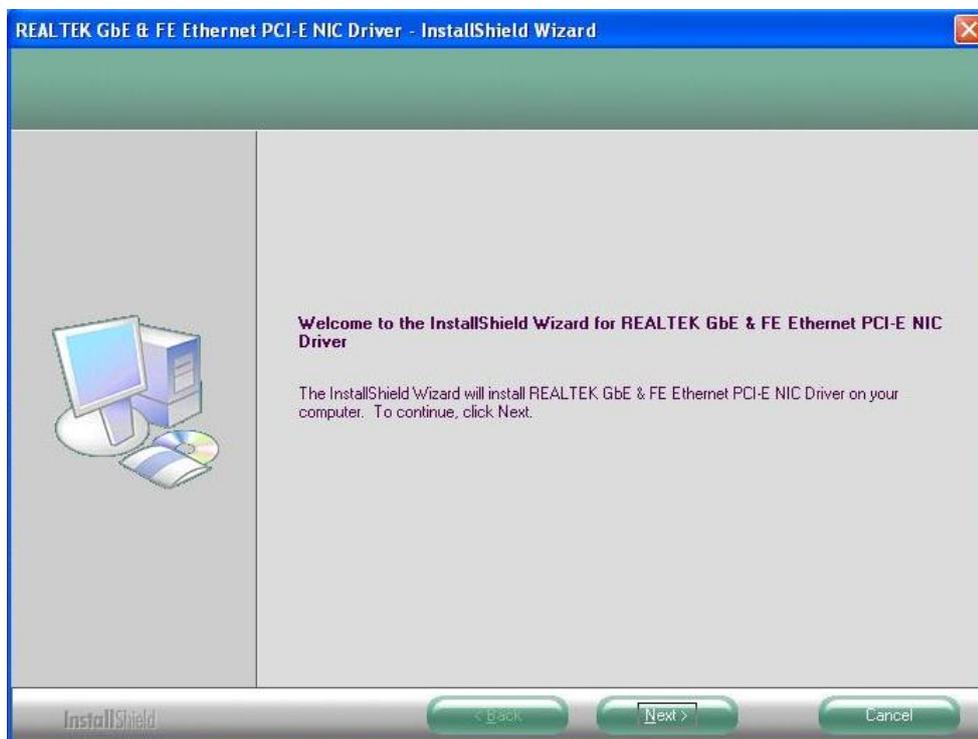


3. You will be asked to reboot your computer when the installation is completed. Please select “Yes, I want to restart my computer now” if you don’t need to install any other drivers. Then click “Finish” to complete the setup process and reboot. Otherwise, please select “No, I will restart my computer later” and click “Finish” to complete the installation.

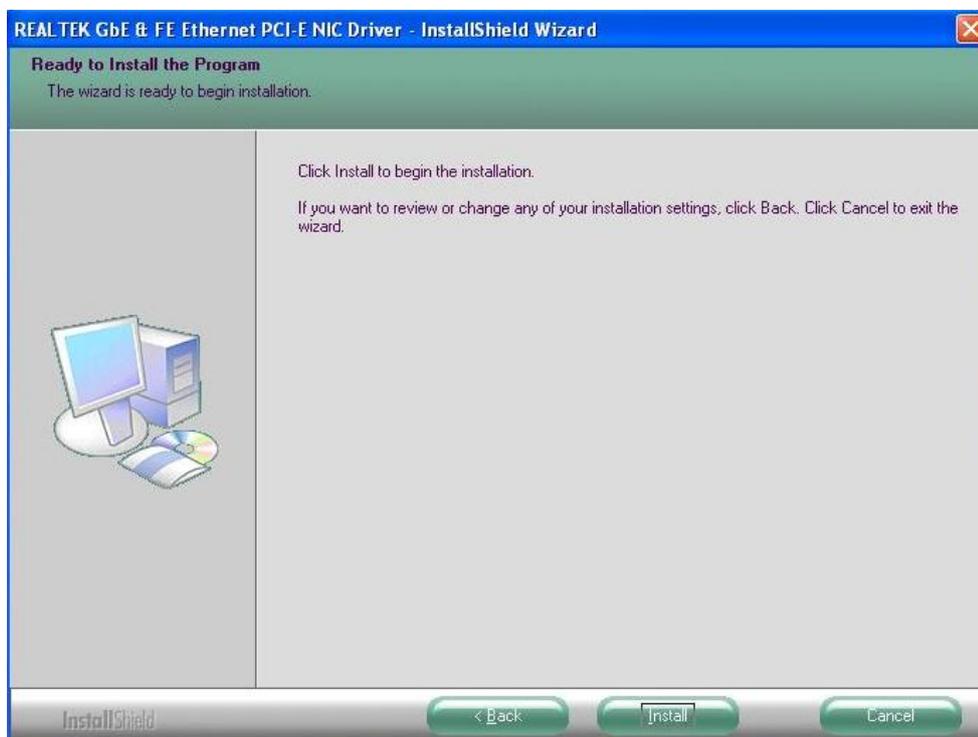


5.1.5 Installing Ethernet Driver

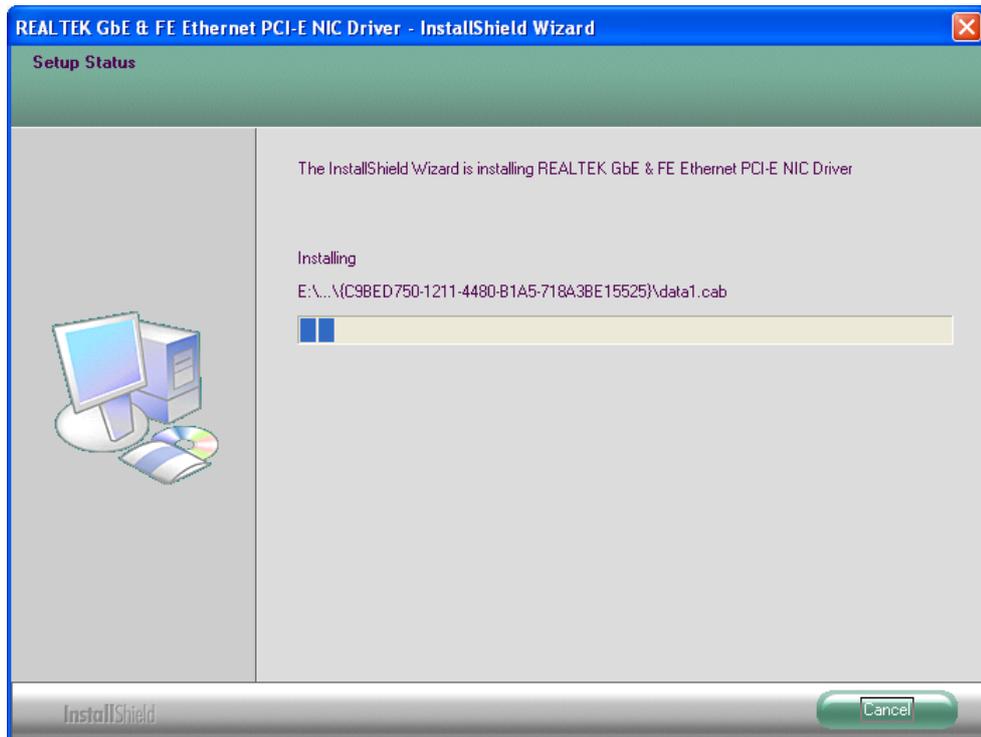
1. Run the SETUP.EXE for Ethernet from the driver directory in product information CD. Click “Next” to continue.



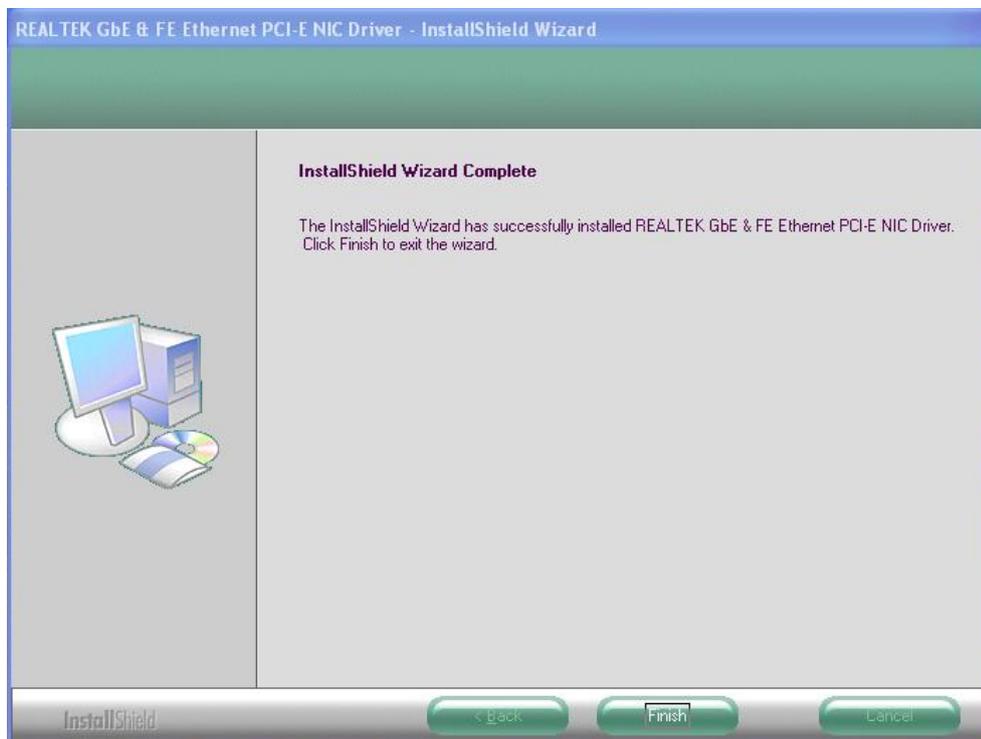
2. Click “Install” to start the installation.



3. Please wait while setup processes the following operations.



4. Click "Finish" to complete the installation.

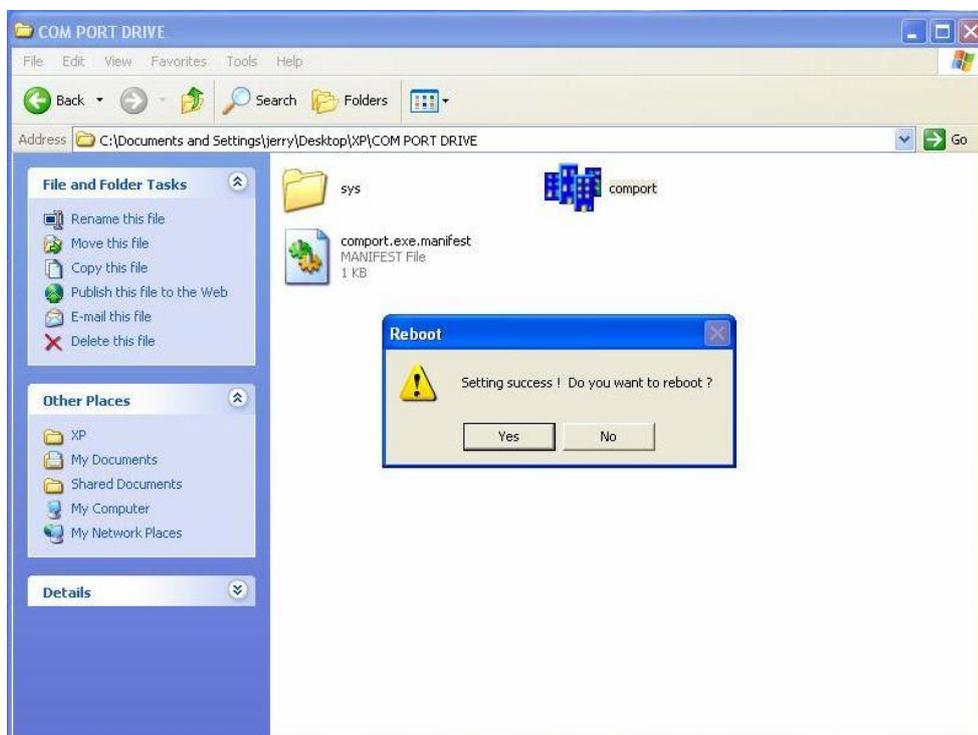


5.1.6 Installing Serial (COM) Port Driver

1. Run the comports.exe from the driver directory in product information CD. Click “Next” to continue.



2. You will be asked to restart your computer when the installation is completed. Please click “Yes” if you don’t need to install any other drivers. Otherwise, please click “No” to go on next step.



5.2 Drivers for Windows® 7

The device drivers are located on the product information CD that comes with the PICO822 series package. The auto-run function of drivers will guide you to install the utilities and device drivers under Windows® 7 operating system. You can follow the onscreen instructions to install these devices:

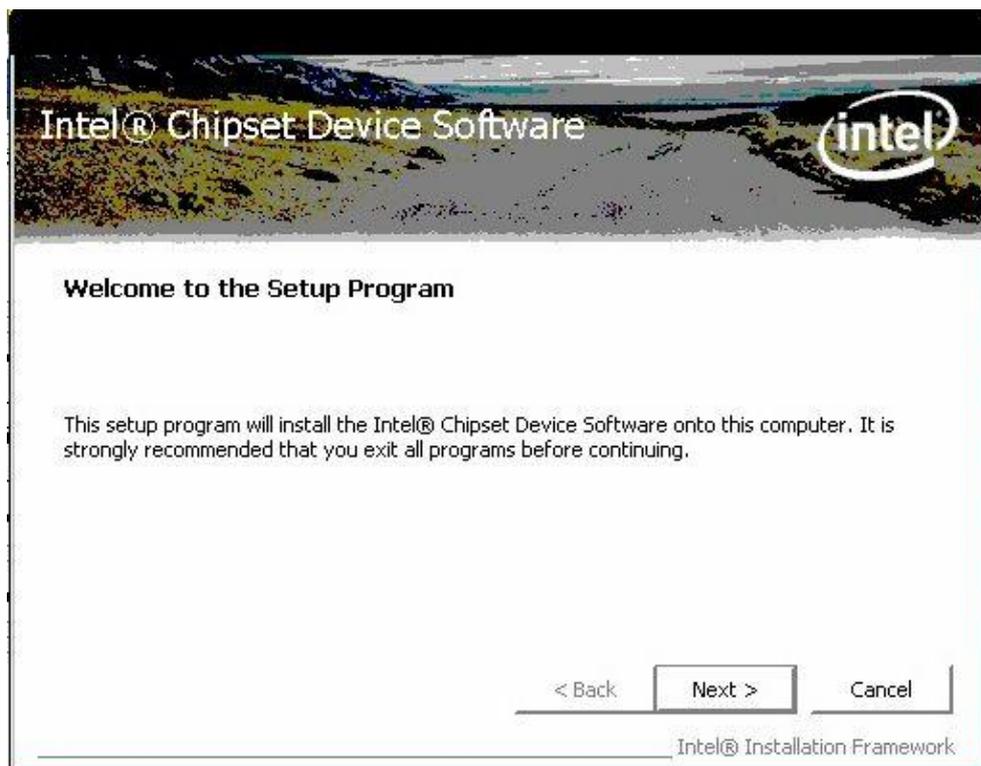
- Chipset
- PCH
- Graphics
- Audio
- Ethernet
- Serial ATA (SATA)
- Serial (COM) port



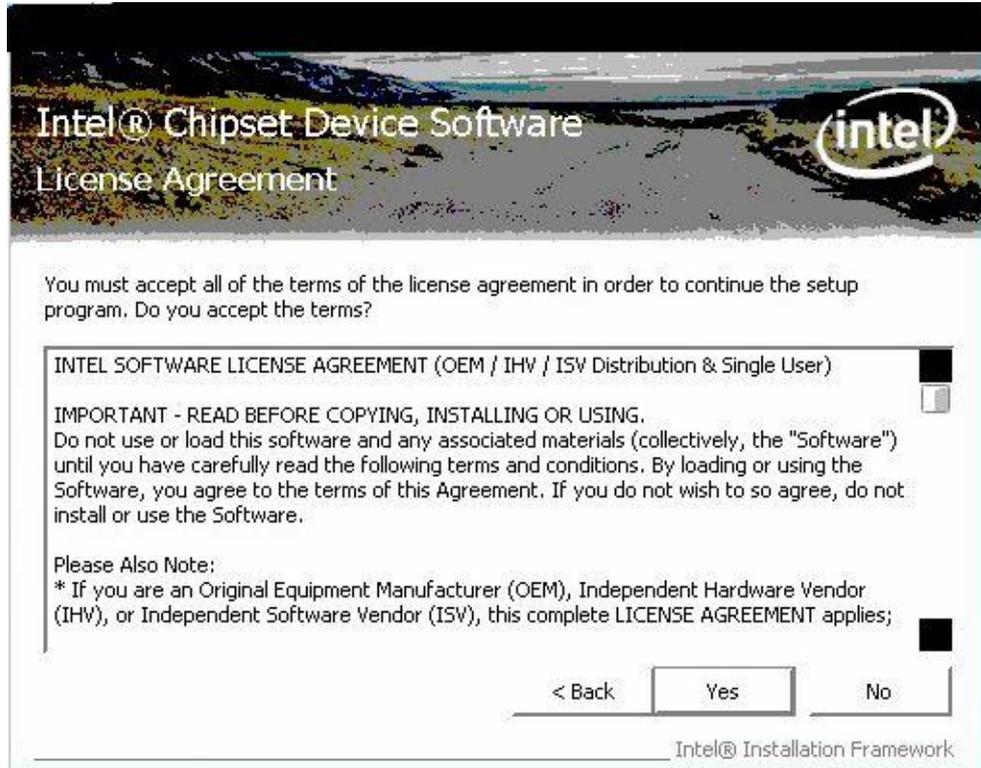
Note: Only E680T can run under Windows® 7.

5.2.1 Installing Chipset Driver

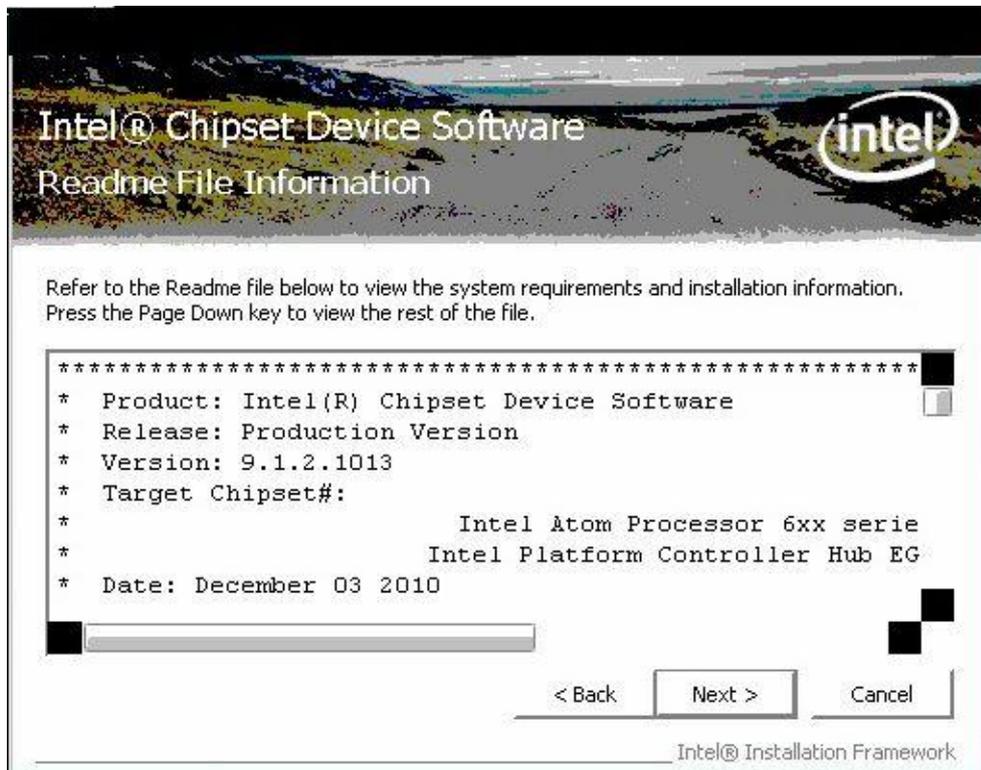
1. Run the SETUP.EXE program for chipset from the driver directory in product information CD. Click “Next” to next step.



- An Intel® License Agreement screen appears to show you the important information. Click “Yes” to next step.



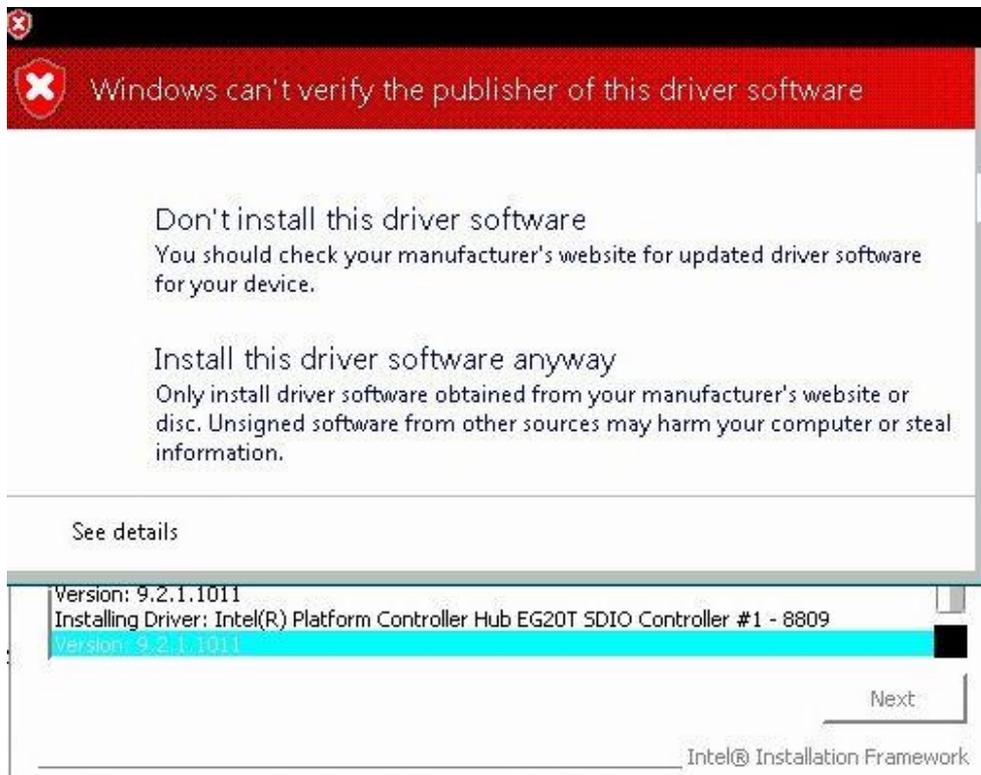
- A Readme File Information screen appears to show you the system requirements and installation information. Click “Next” to next step.



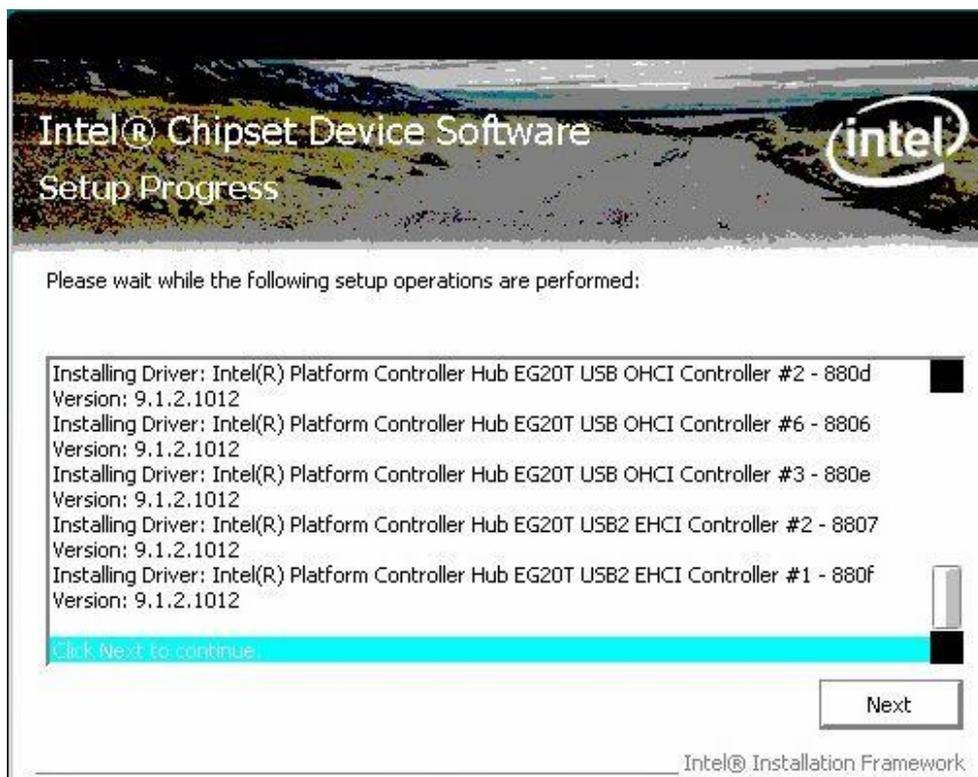
4. Click "Install this driver software anyway" to next step.



5. Click "Install this driver software anyway" to next step.



6. Please wait while setup processes the following operations.

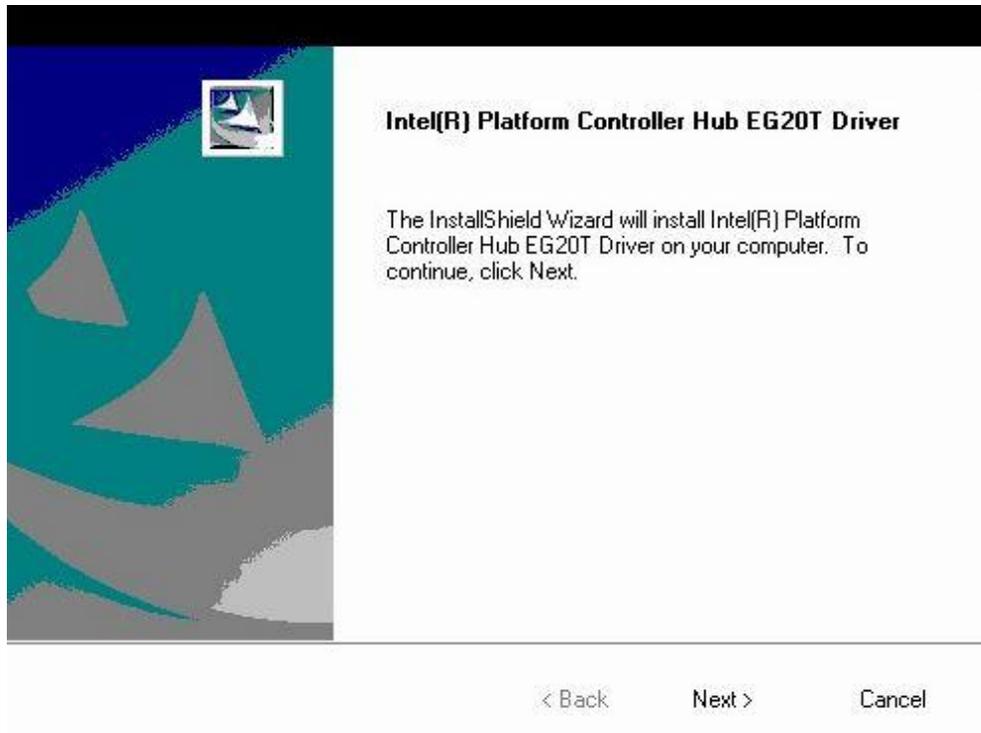


7. You will be asked to reboot your computer when the installation is completed. Please select “Yes, I want to restart my computer now” if you don’t need to install any other drivers. Then click “Finish” to complete the setup process and reboot. Otherwise, please select “No, I will restart my computer later” and click “Finish” to complete the installation.



5.2.2 Installing PCH Driver

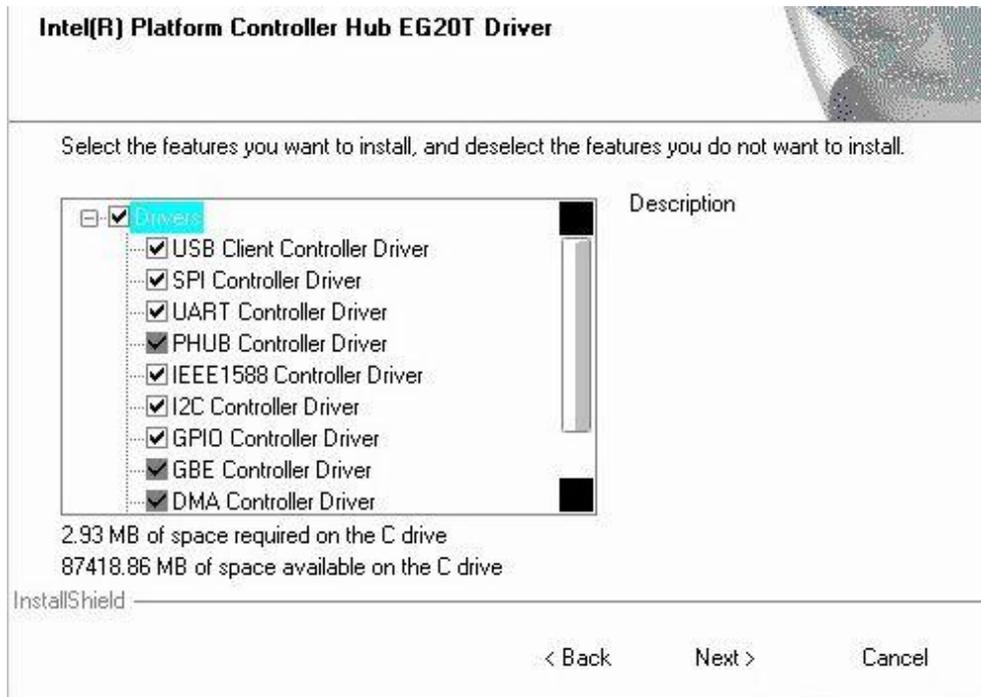
1. Run the EG20T_Win7_Setup_140.exe program from the driver directory in product information CD. Click “Next” to next step.



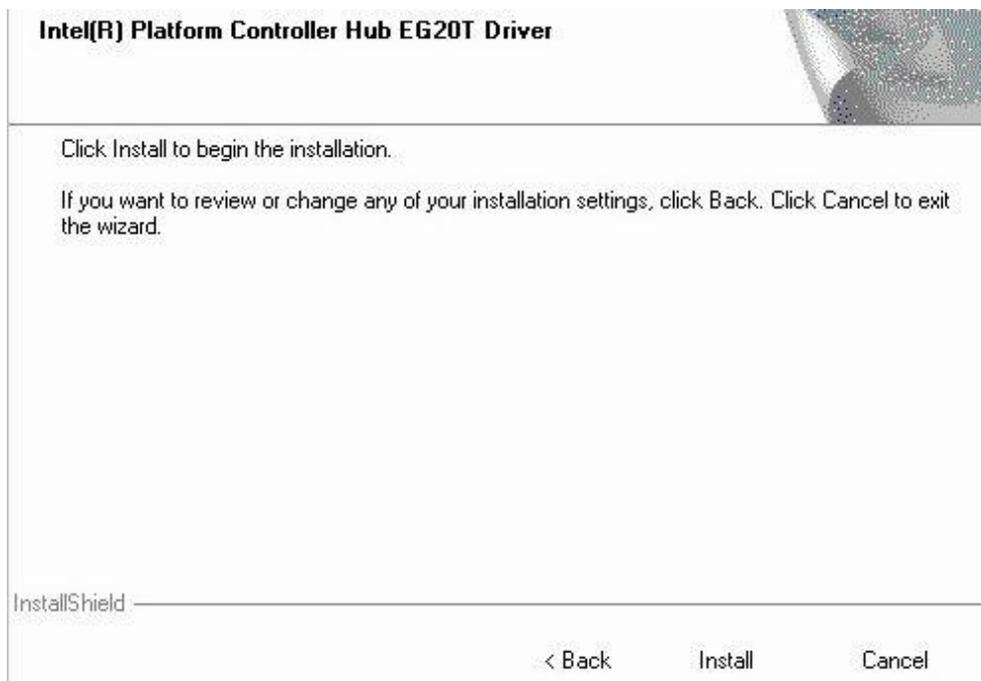
2. An Intel® License Agreement screen appears to show you the important information. Click “I accept the terms in the license agreement” and “Next” to next step.



3. Select the features you want to install and deselect the features you do not want to install. Then click “Next” to next step.



4. Click “Install” to begin the installation.



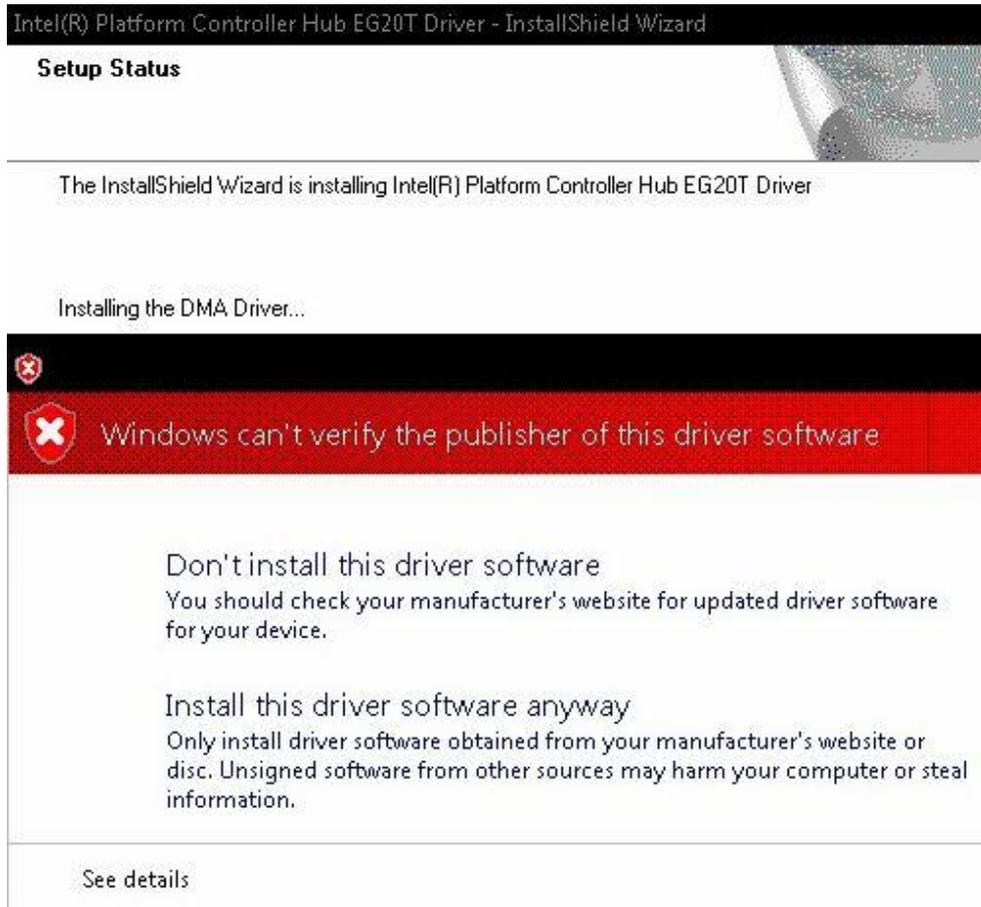
5. Click “Install this driver software anyway” to next step.



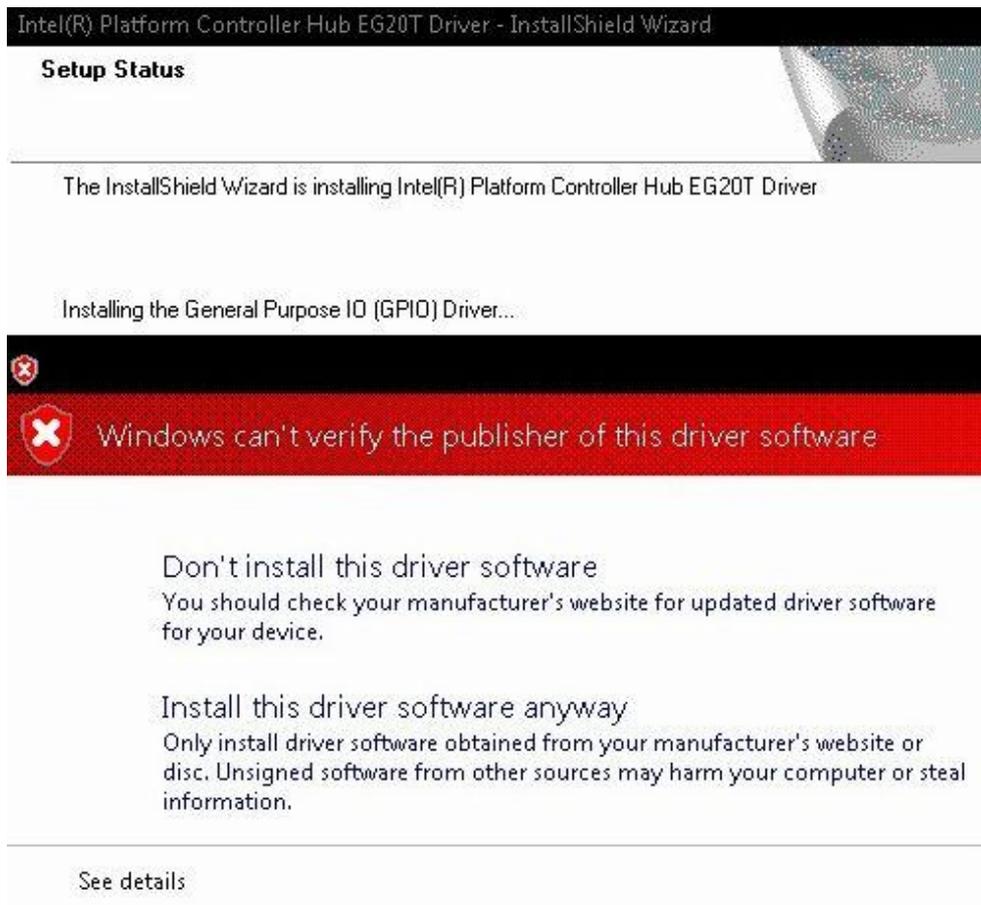
6. Click “Install this driver software anyway” to next step.



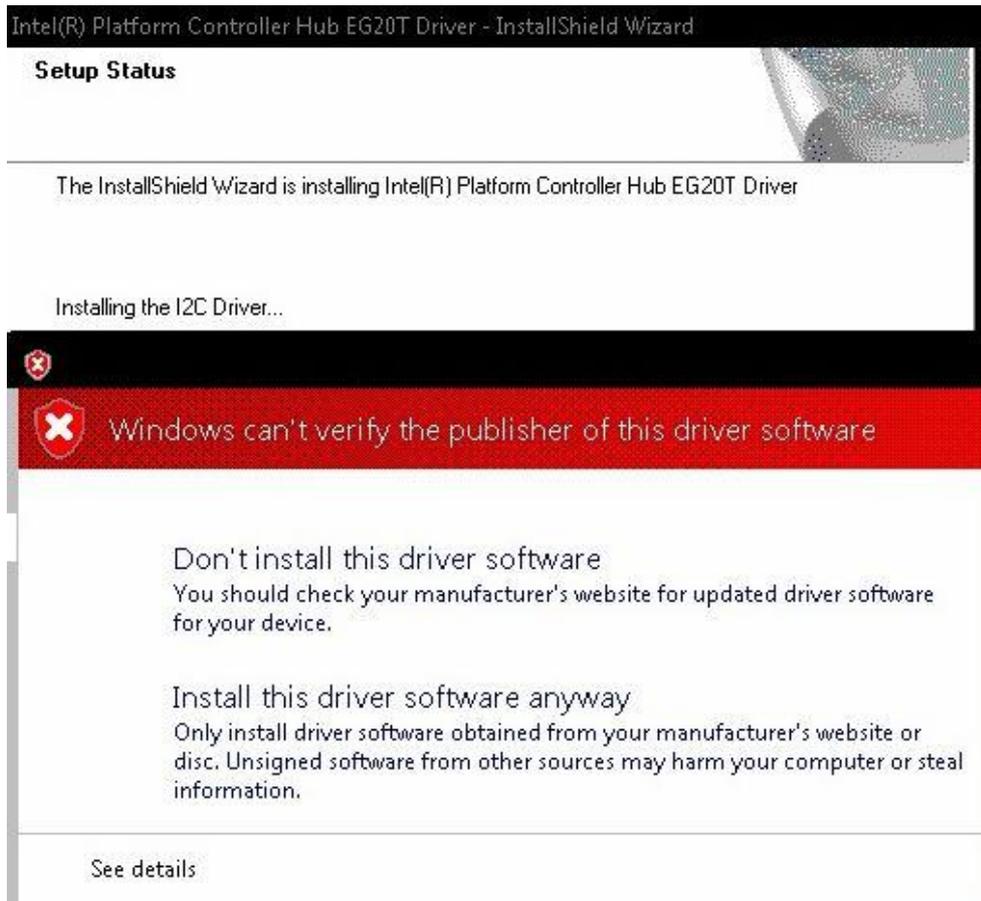
7. Click “Install this driver software anyway” to next step.



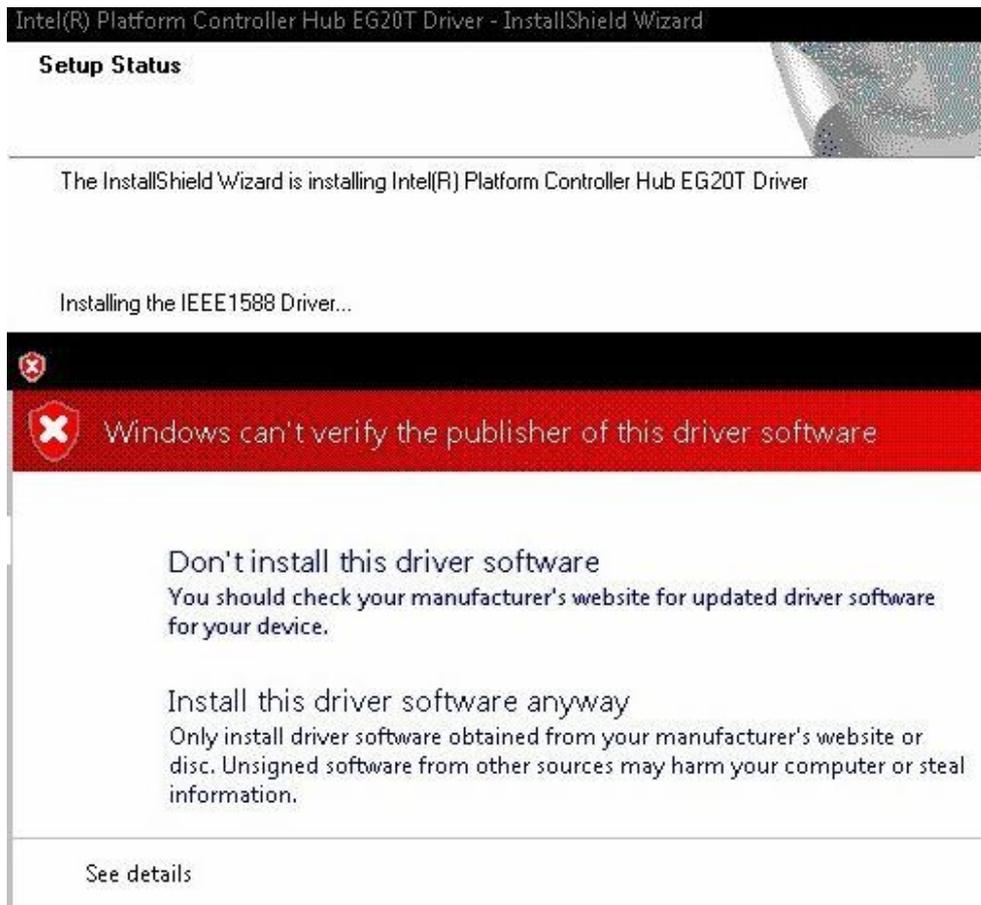
8. Click "Install this driver software anyway" to next step.



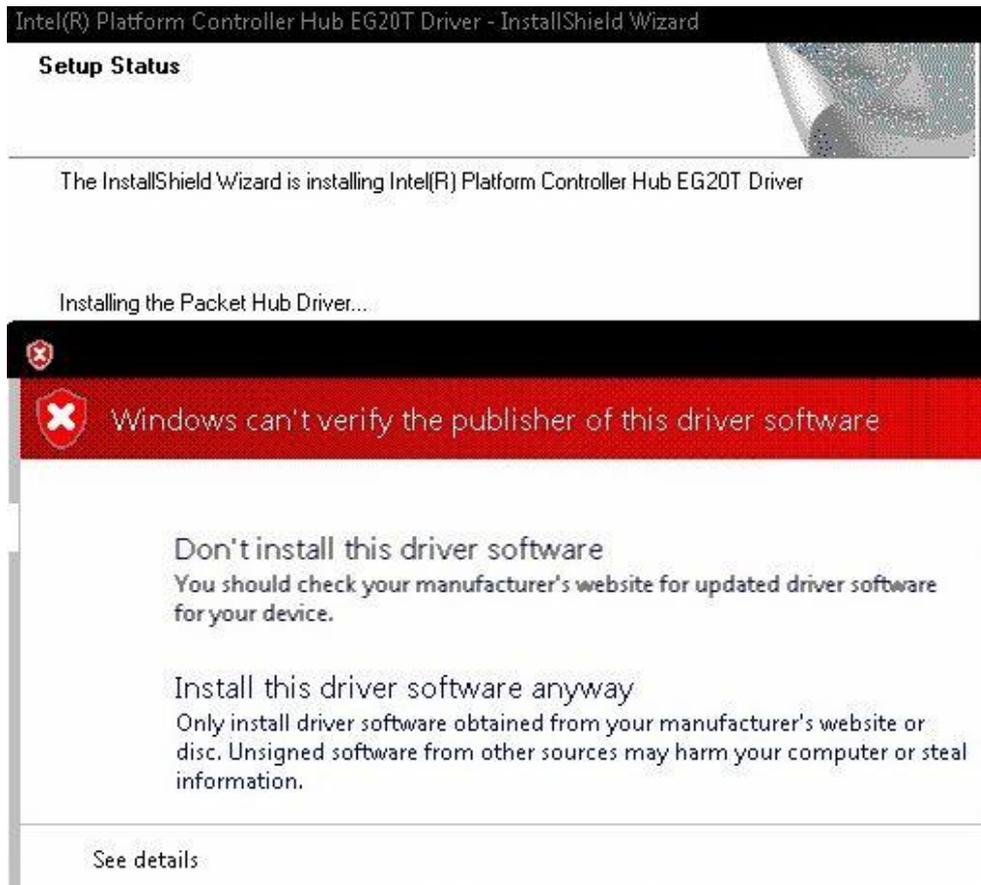
9. Click "Install this driver software anyway" to next step.



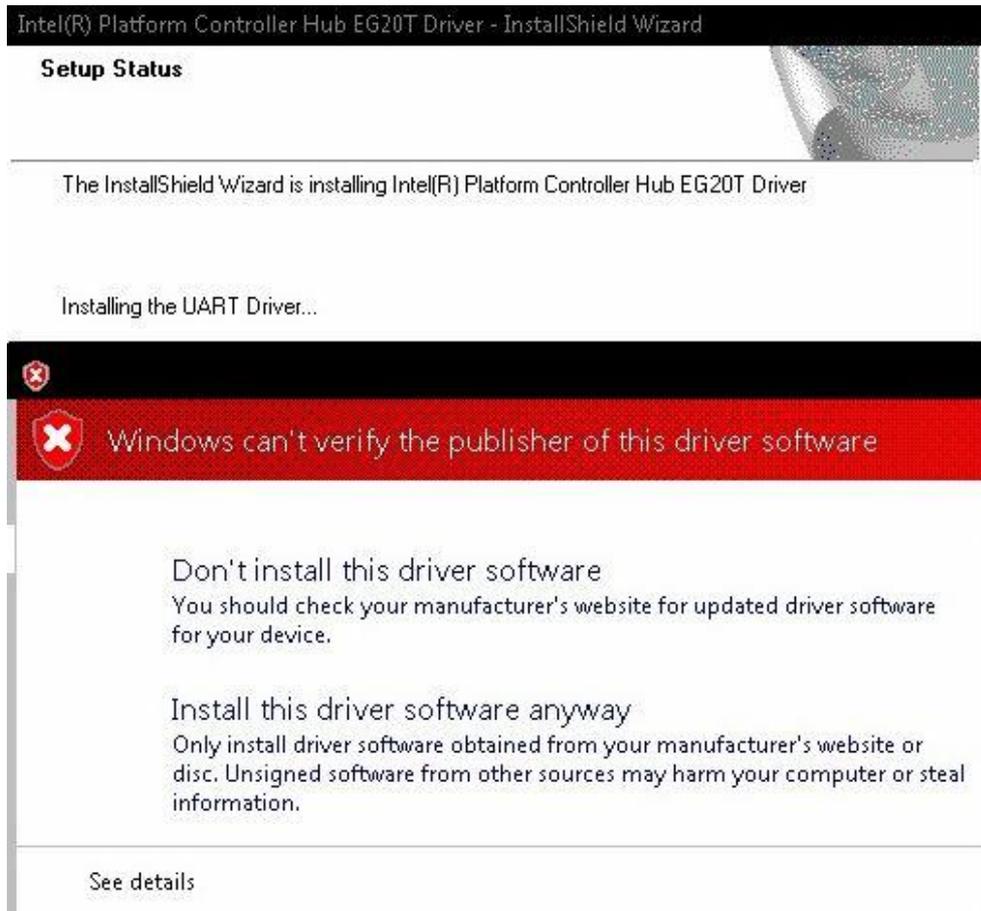
10. Click “Install this driver software anyway” to next step.



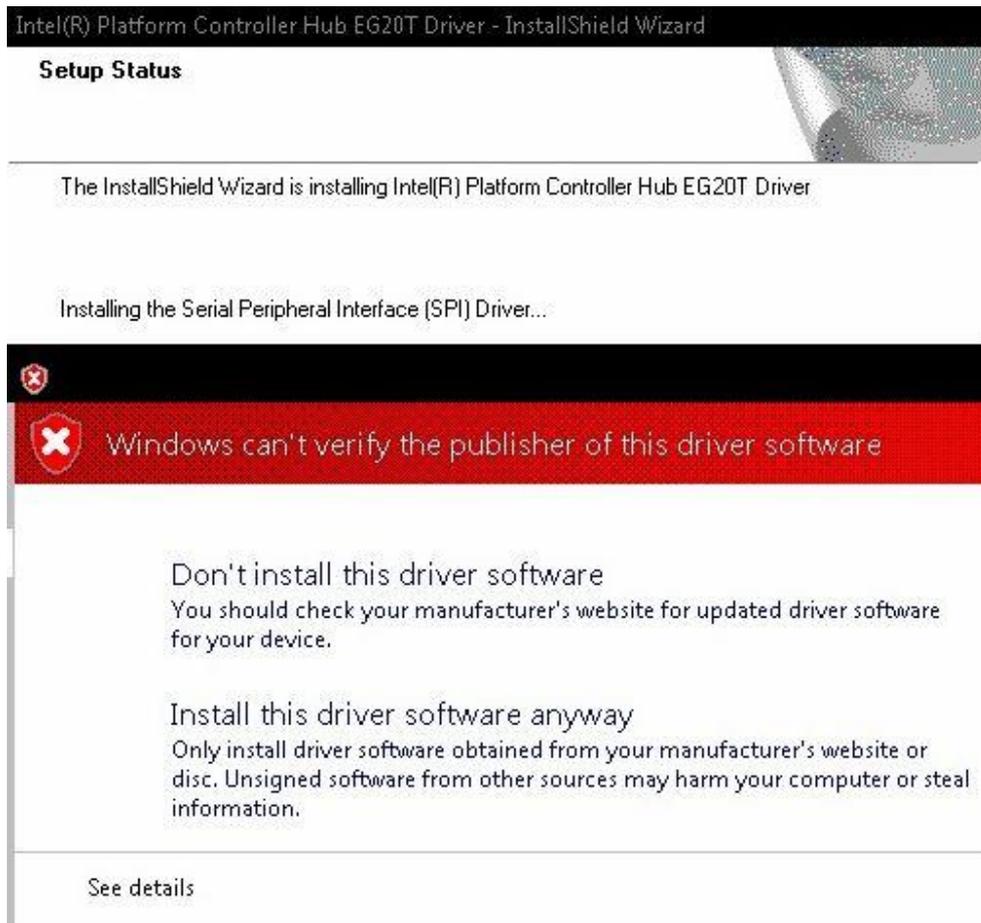
11. Click “Install this driver software anyway” to next step.



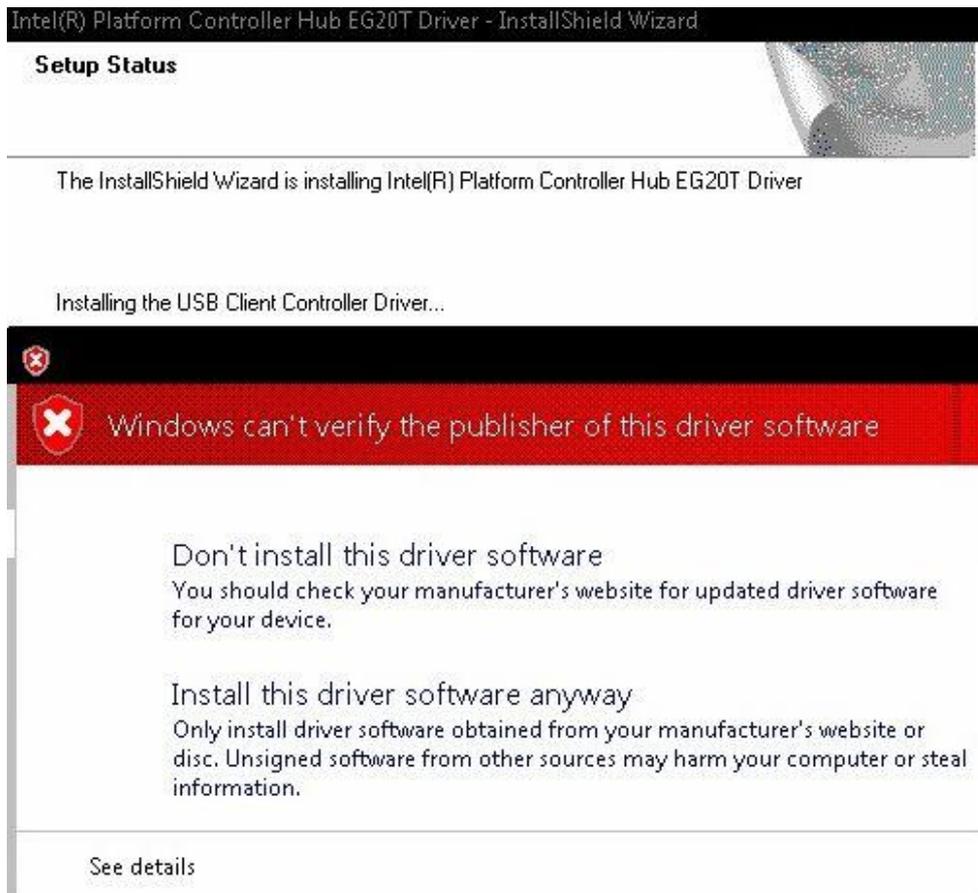
12. Click “Install this driver software anyway” to next step.



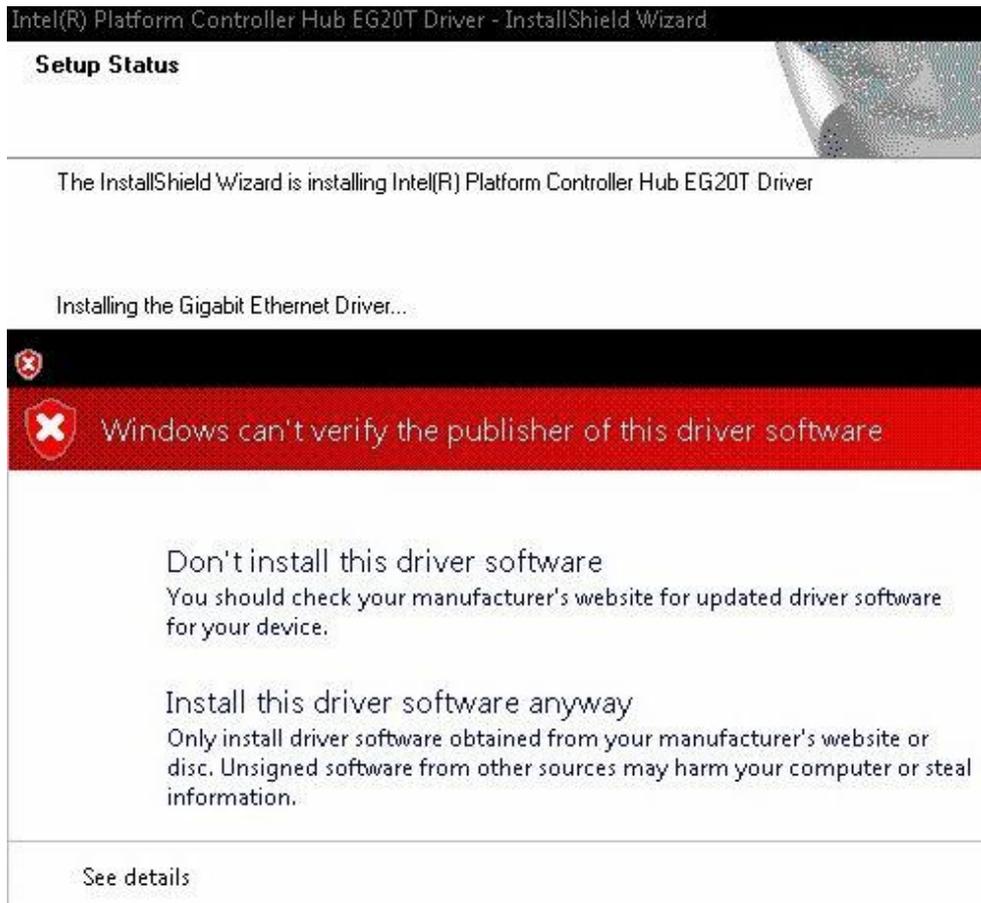
13. Click “Install this driver software anyway” to next step.



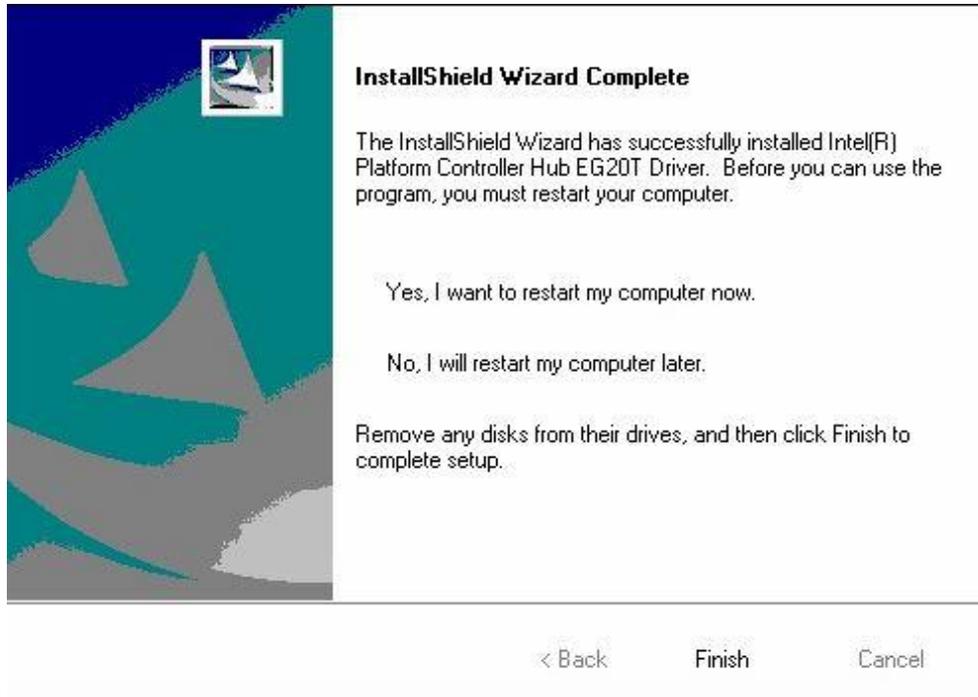
14. Click "Install this driver software anyway" to next step.



15. Click “Install this driver software anyway” to next step.



16. You will be asked to reboot your computer when the installation is completed. Please select “Yes, I want to restart my computer now” if you don’t need to install any other drivers. Then click “Finish” to complete the setup process and reboot. Otherwise, please select “No, I will restart my computer later” and click “Finish” to complete the installation.

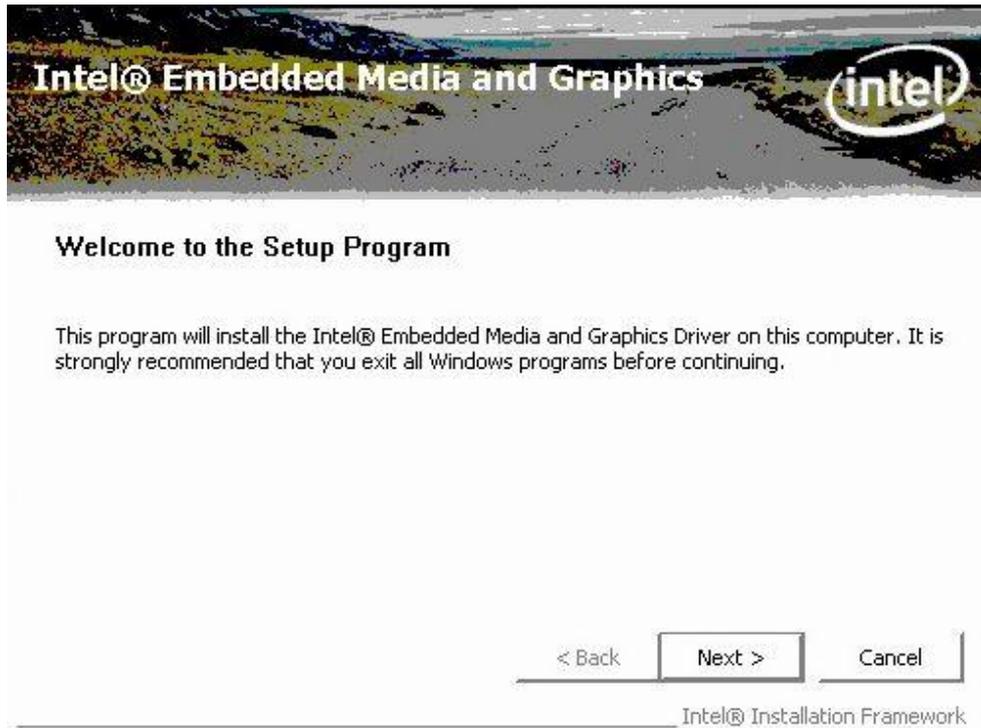


5.2.3 Installing Graphics Driver

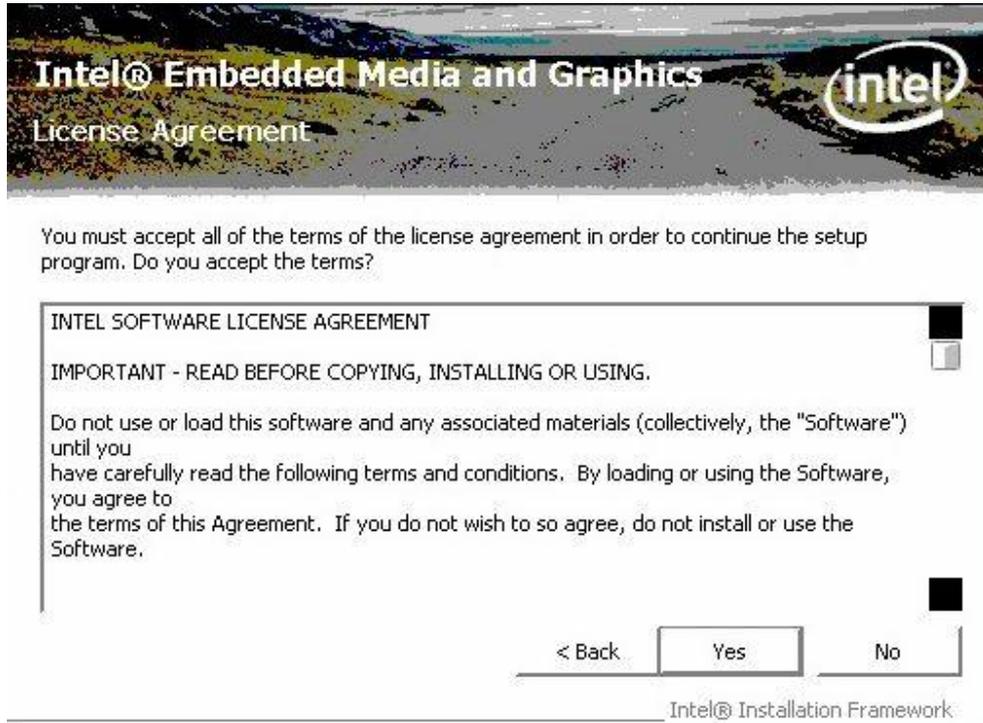


Note: After Windows® 7 installation completed, the system is in 16 colors, please install the graphics driver for displaying correct or higher color depth.

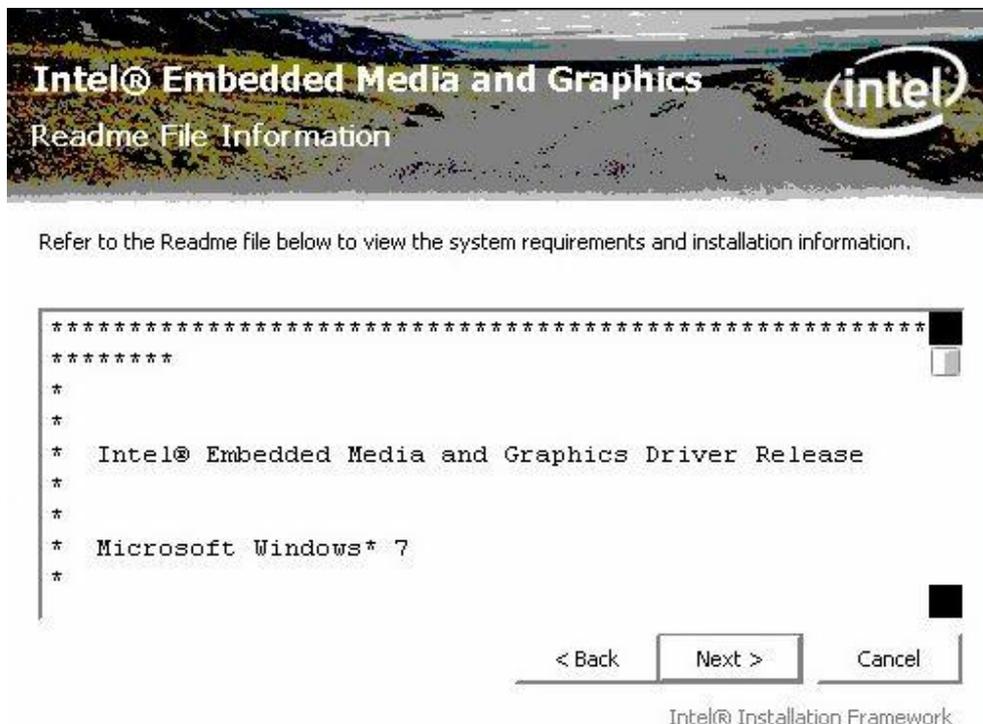
1. Run the Setup.exe program for graphics from the driver directory in product information CD. Click “Next” to continue.



2. An Intel® License Agreement screen appears to show you the important information. Click “Yes” to next step.



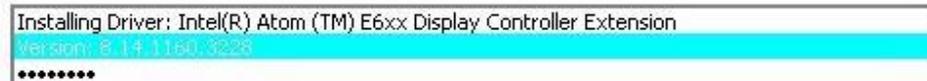
3. A Readme File Information screen appears to show you the system requirements and installation information. Click “Next” to next step.



4. Please wait while setup processes the following operations. Click “Install this driver software anyway” to next step.



Please wait while the following setup operations are performed:



5. Please wait while setup processes the following operations. Click “Install this driver software anyway” to next step.



Please wait while the following setup operations are performed:

Installing Driver: Intel(R) Atom (TM) E6xx Display Controller Extension
Version: 8.14.1160.3228
Installing Driver: Intel(R) Atom (TM) E6xx Embedded Media and Graphics Controller
Version: 8.14.1160.3228



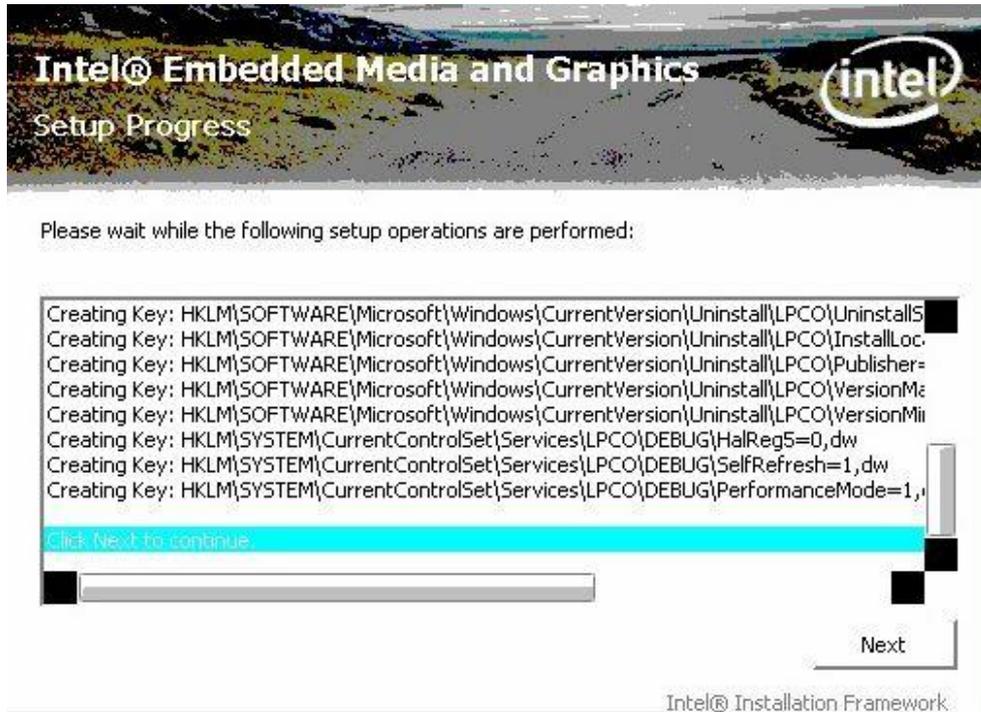
Don't install this driver software

You should check your manufacturer's website for updated driver software for your device.

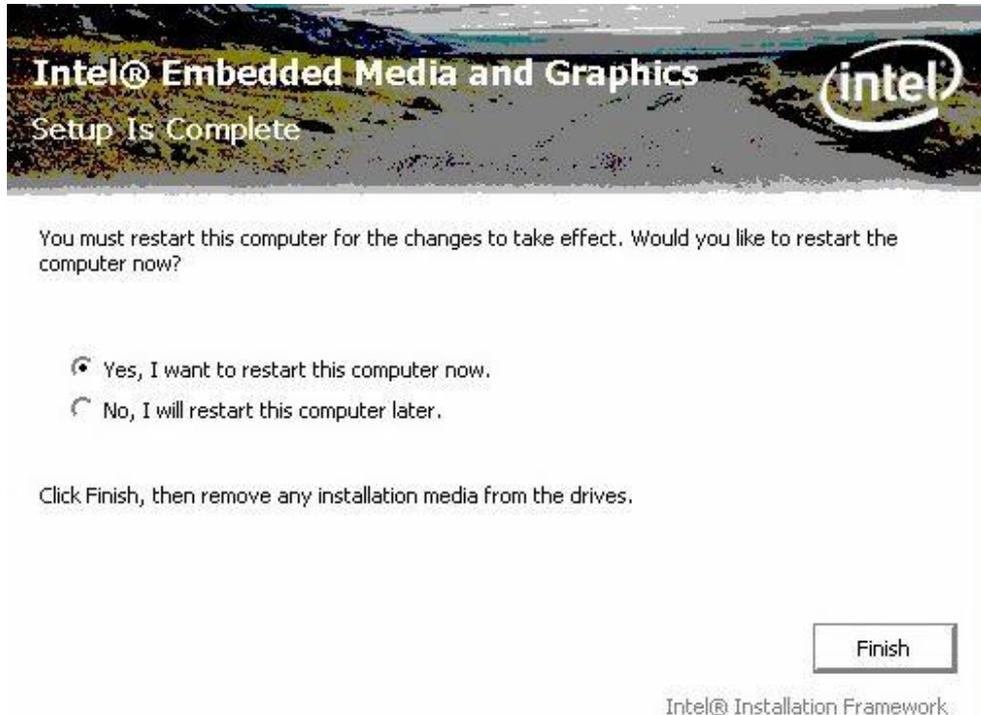
Install this driver software anyway

Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information.

6. Please wait while setup processes the following operations. Click “Next” to continue.

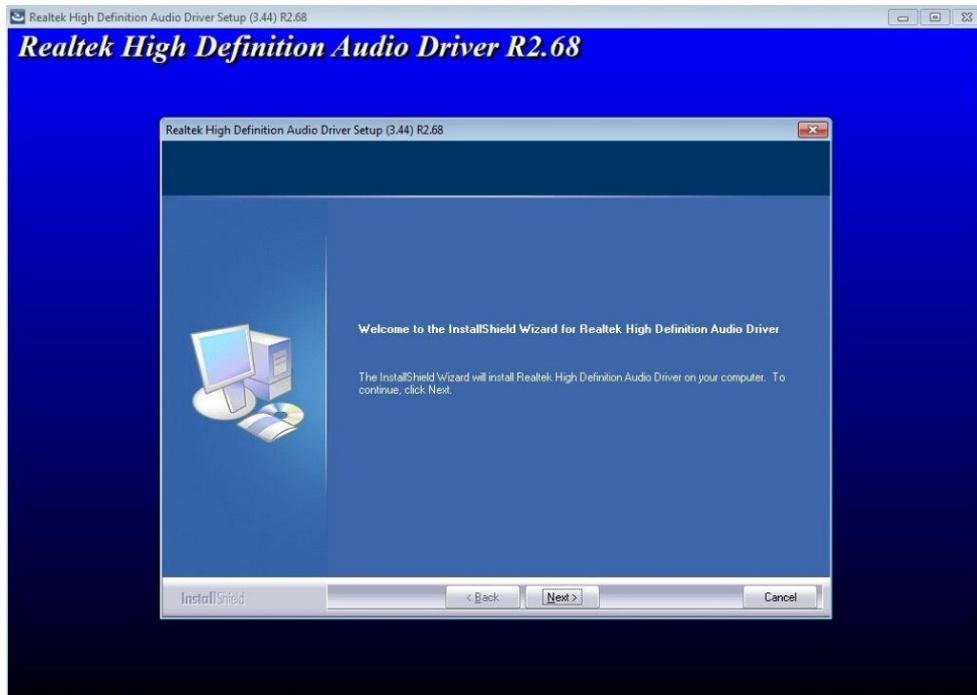


7. You will be asked to reboot your computer when the installation is completed. Please select “Yes, I want to restart my computer now” if you don’t need to install any other drivers. Then click “Finish” to complete the setup process and reboot. Otherwise, please select “No, I will restart my computer later” and click “Finish” to complete the installation.



5.2.4 Installing Audio Driver

1. Run the 32bit_Vista_Win7_R268.exe for audio from the driver directory in product information CD. Click “Next” to continue.



2. Please wait while setup processes the following operations.

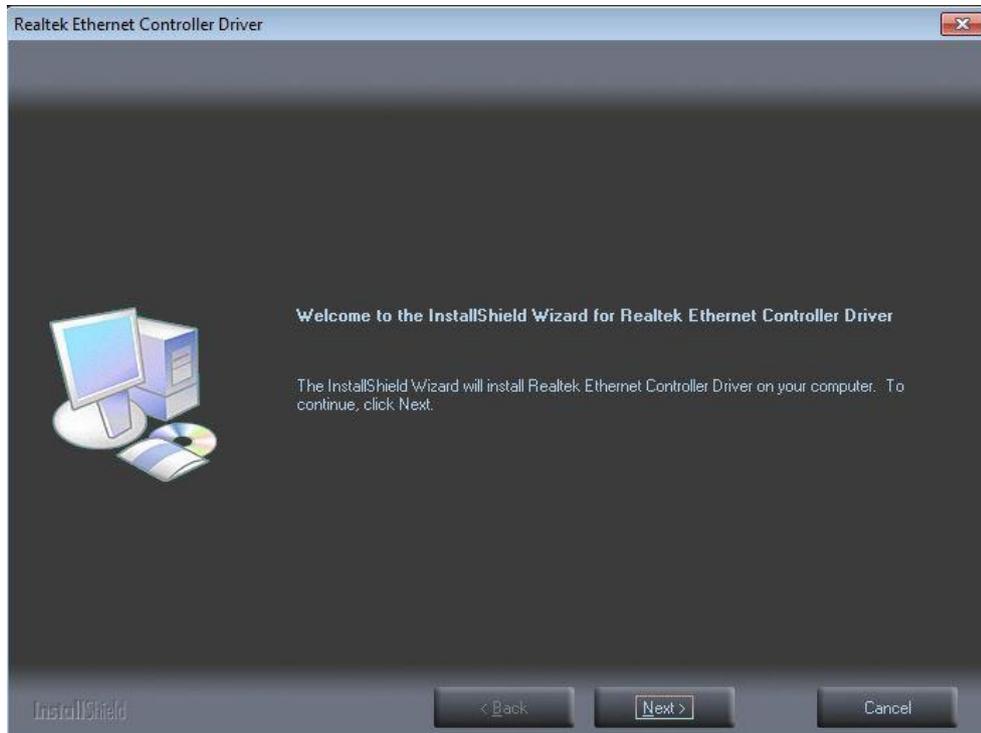


3. You will be asked to reboot your computer when the installation is completed. Please select “Yes, I want to restart my computer now” if you don’t need to install any other drivers. Then click “Finish” to complete the setup process and reboot. Otherwise, please select “No, I will restart my computer later” and click “Finish” to complete the installation.

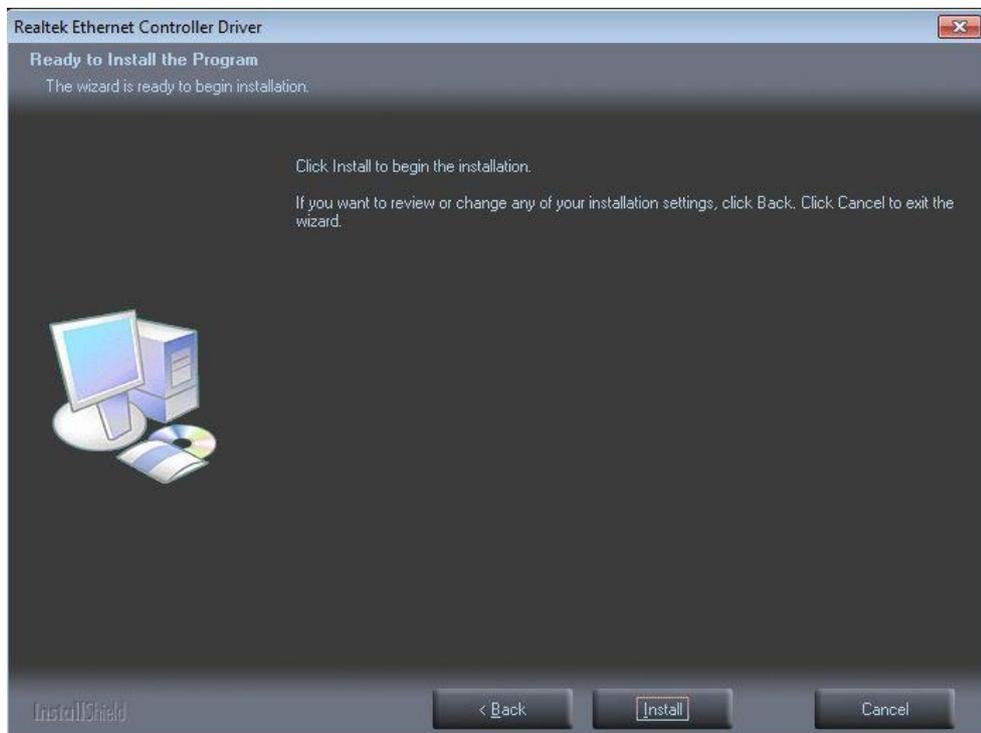


5.2.5 Installing Ethernet Driver

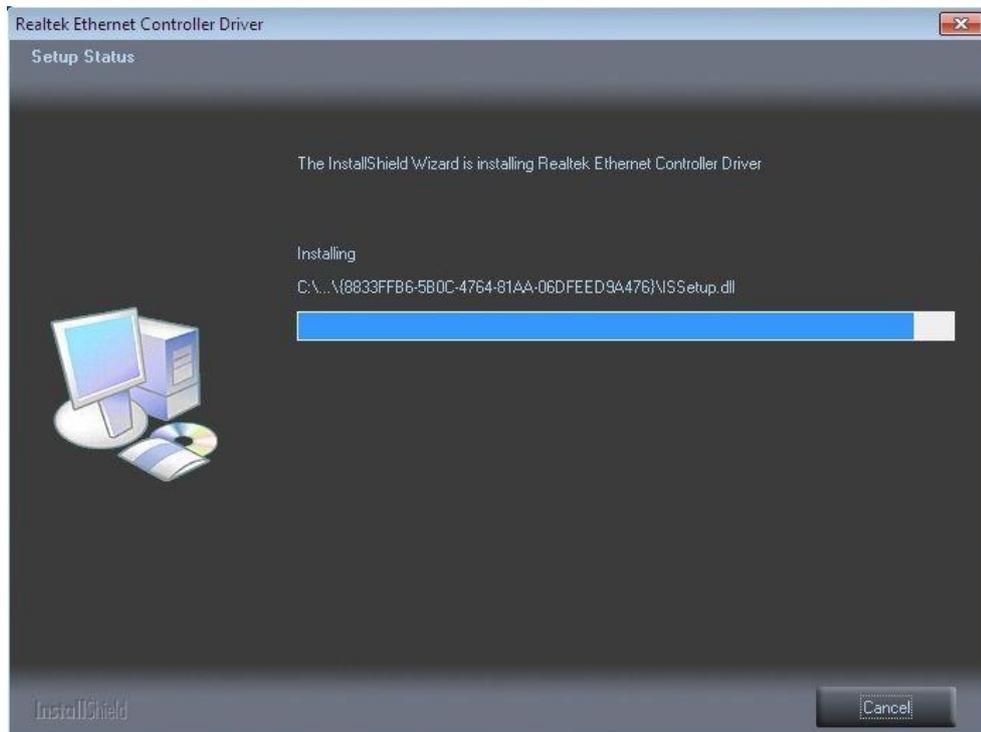
1. Run the SETUP.EXE for Ethernet from the driver directory in product information CD. Click “Next” to continue.



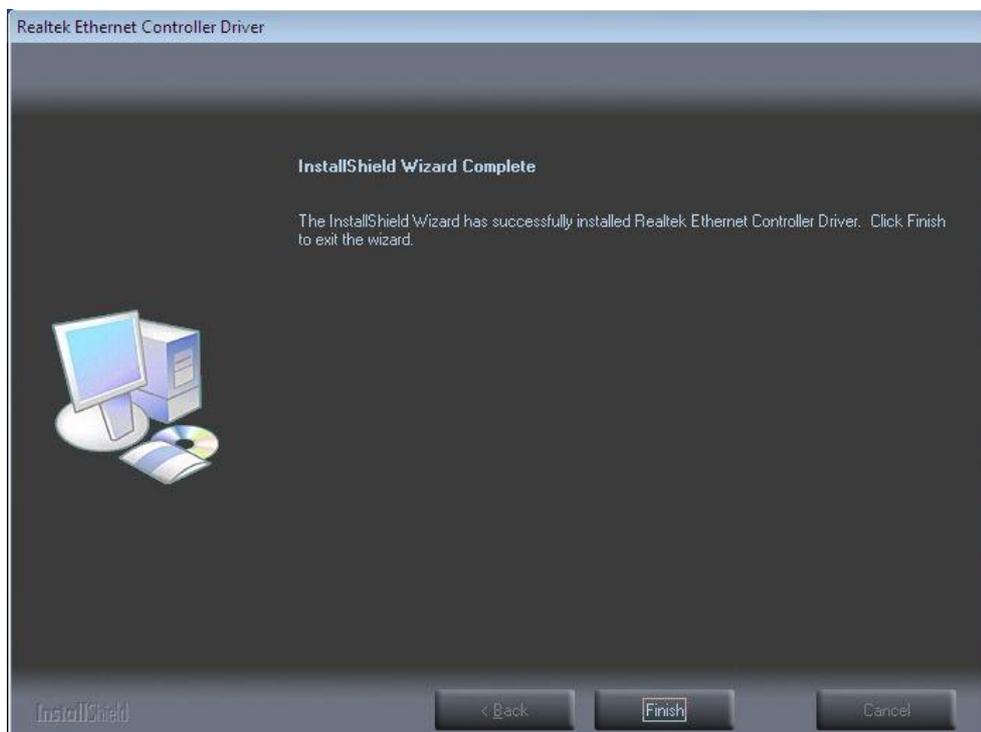
2. Click “Install” to start the installation.



3. Please wait while setup processes the following operations.

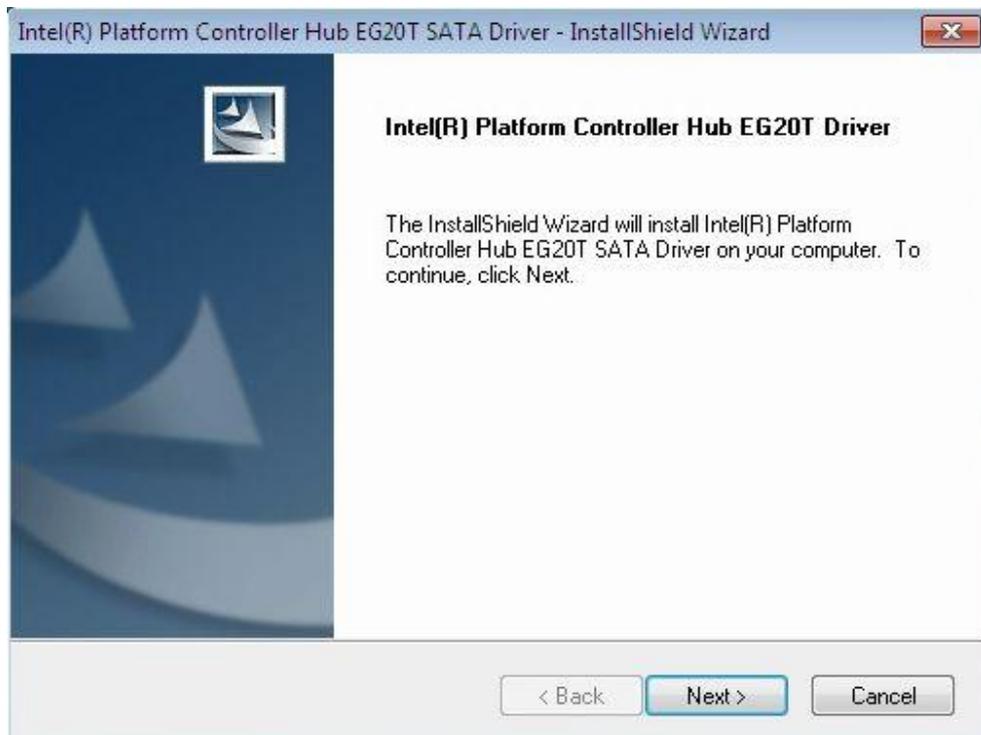


4. Click "Finish" to complete the installation.



5.2.6 Installing SATA Driver

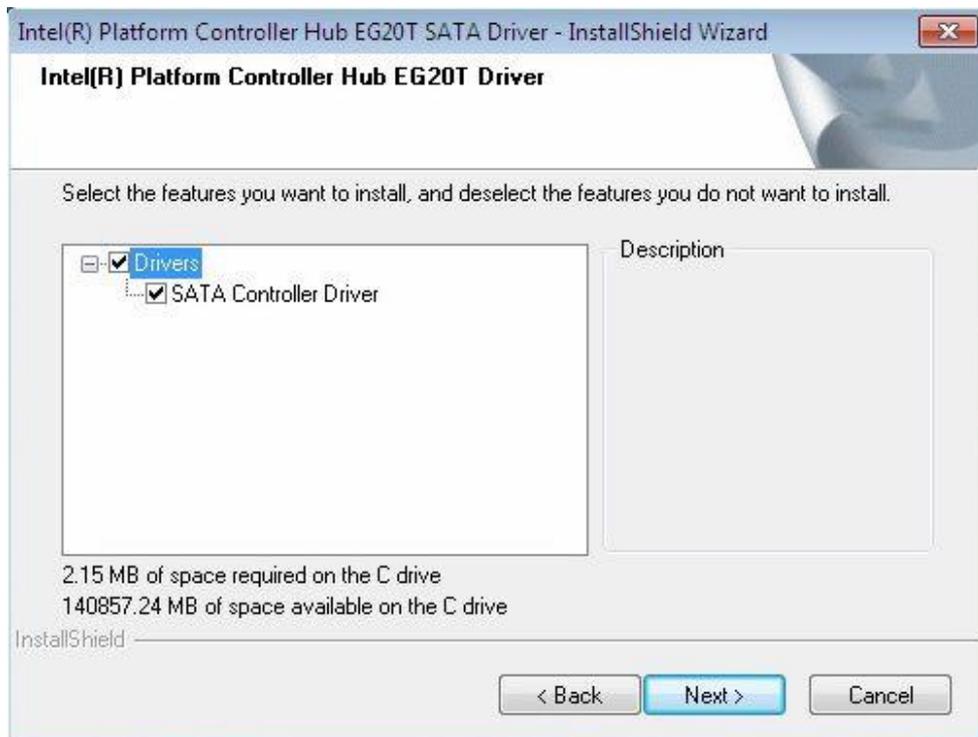
1. Run the EG20T_Win7_SATA_setup_120.exe program from the driver directory in product information CD. Click “Next” to continue.



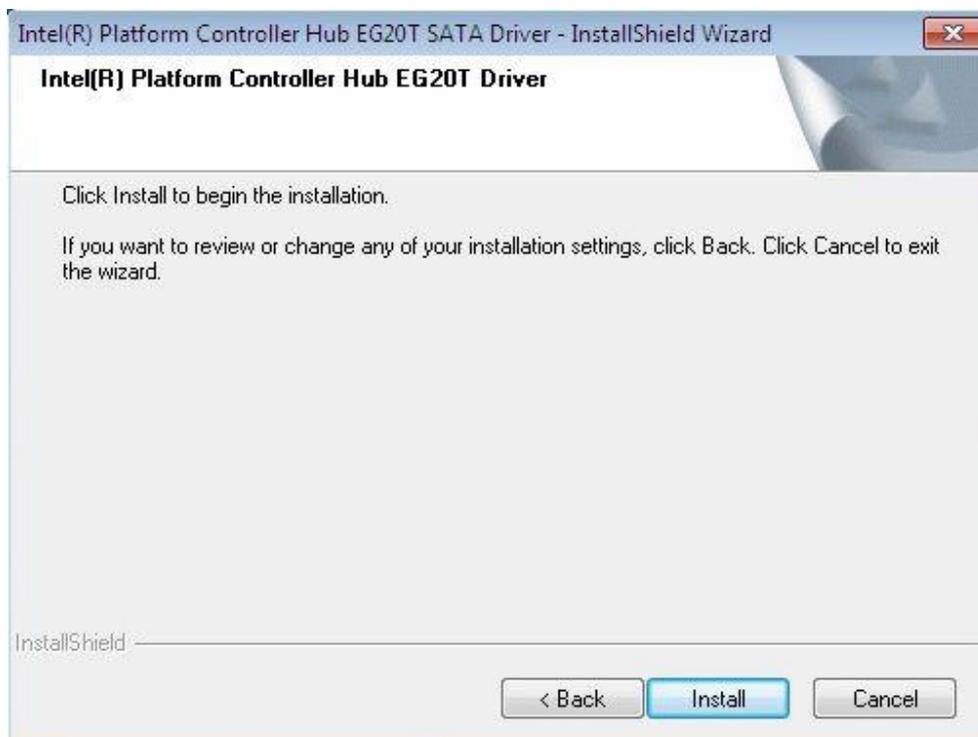
2. An Intel® License Agreement screen appears to show you the important information. Click “I accept the terms in the license agreement” and “Next” to next step.



3. When the following screen appears, select and deselect features according to you needs. Click "Next" to continue.



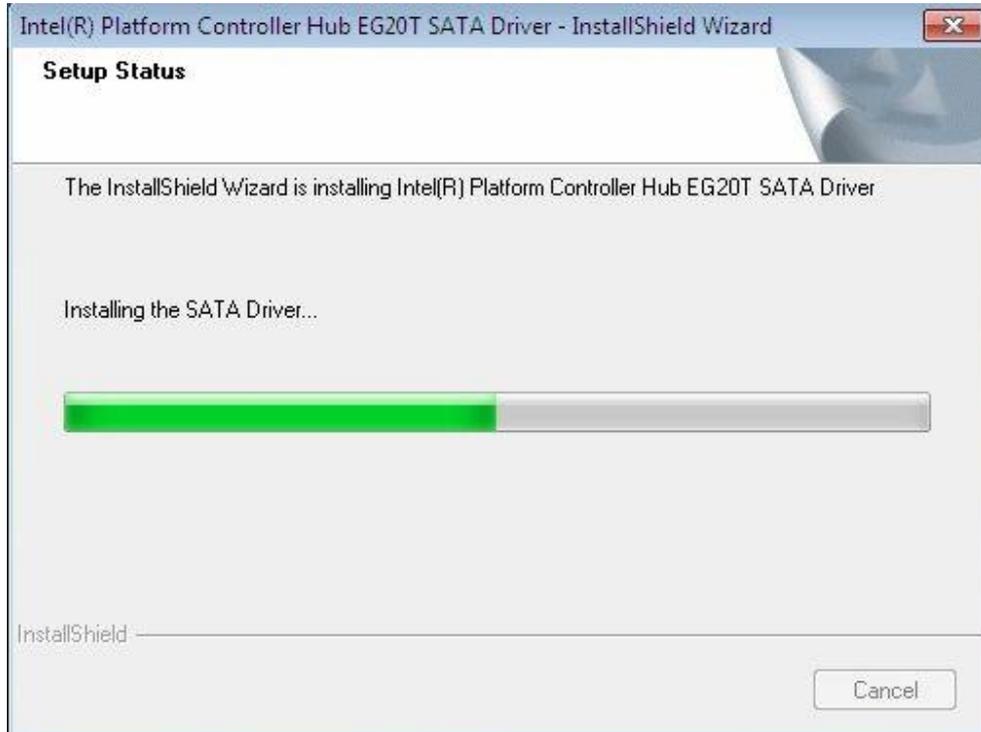
4. Click "Install" to start the installation.



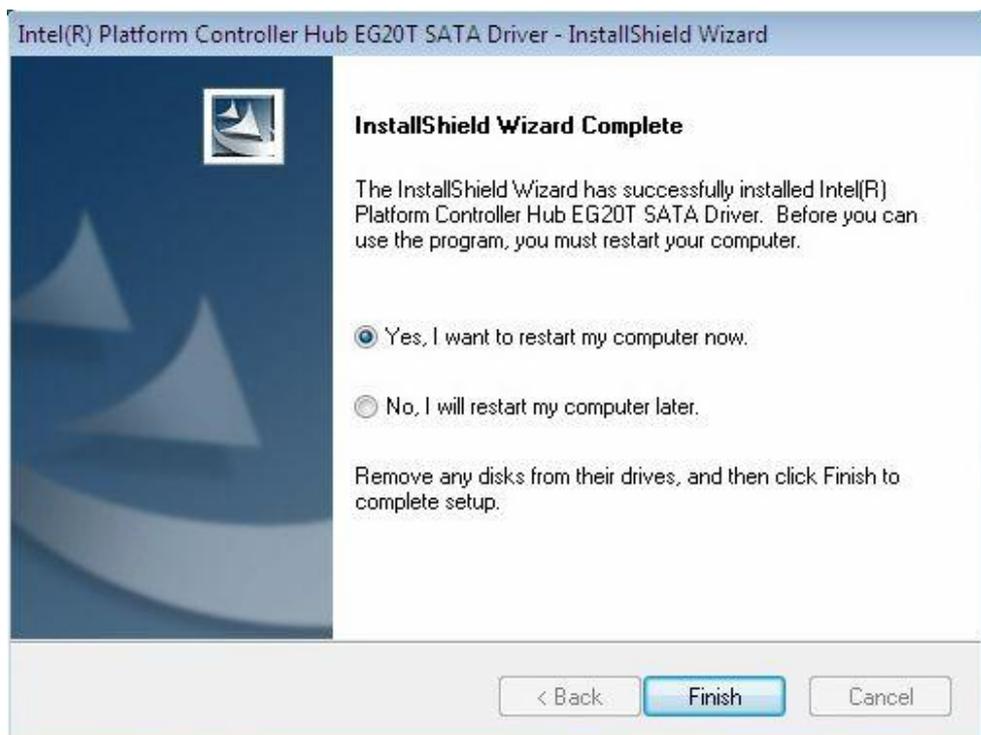
5. Please wait while setup processes the following operations. Click “Install this driver software anyway” to next step.



- Please wait while setup processes the following operations. Click “Next” to continue.

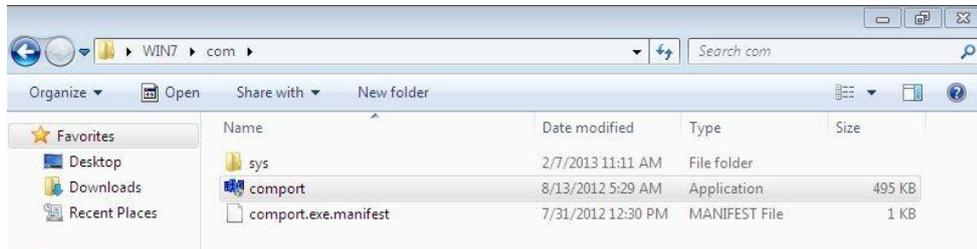


- You will be asked to reboot your computer when the installation is completed. Please select “Yes, I want to restart my computer now” if you don’t need to install any other drivers. Then click “Finish” to complete the setup process and reboot. Otherwise, please select “No, I will restart my computer later” and click “Finish” to complete the installation.

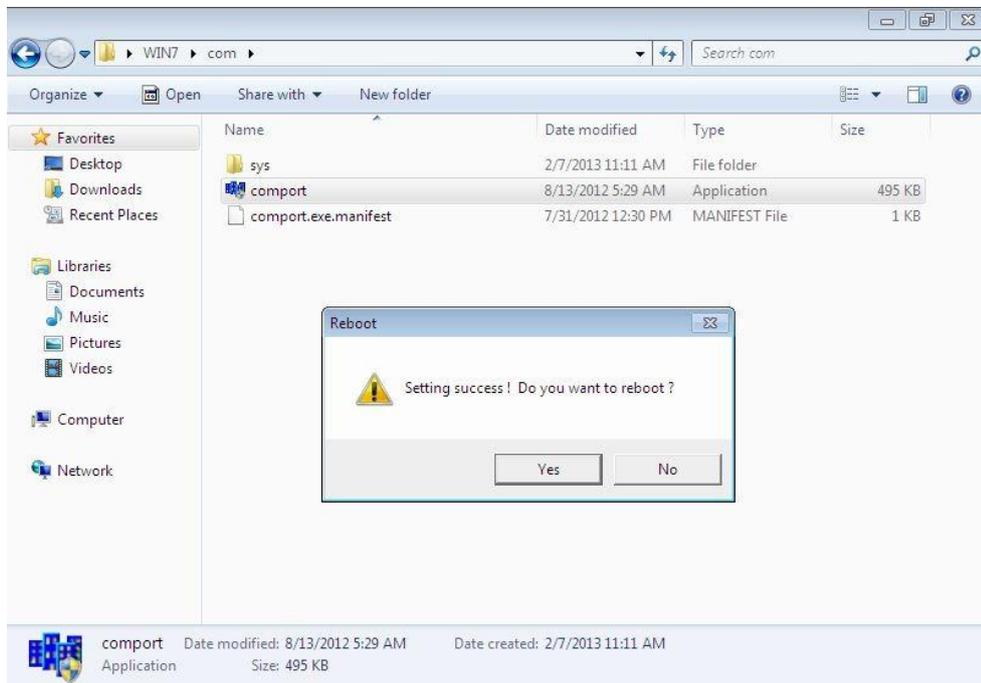


5.2.7 Installing Serial (COM) Port Driver

1. Run the comport.exe from the driver directory in product information CD. Click “Next” to continue.



2. You will be asked to restart your computer when the installation is completed. Please click “Yes” if you don’t need to install any other drivers. Otherwise, please click “No” to go on next step.

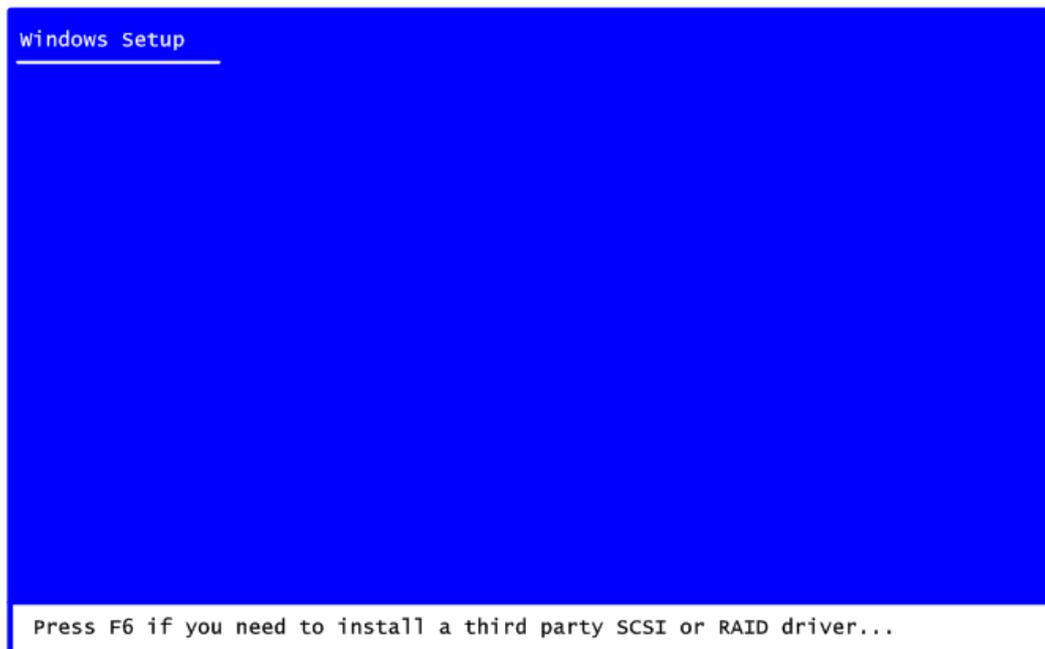


Note: *It is strongly recommended to install this driver, otherwise the failure of data transmission via COM port will occur.*

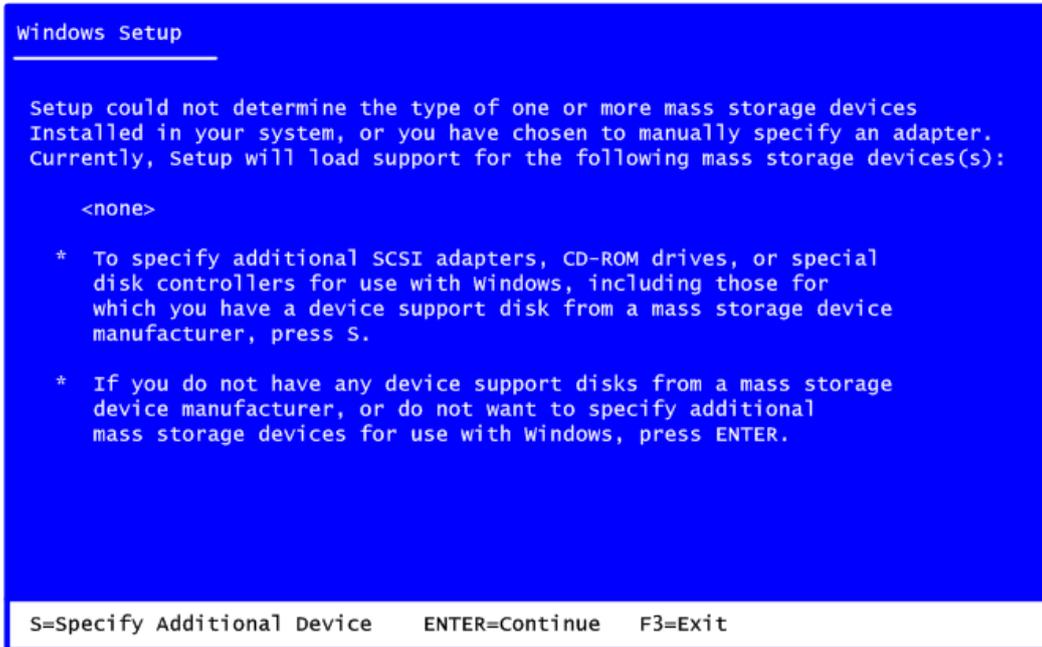
5.3 Installing AHCI Driver during OS Installation

PCH EG20T SATA does not support an IDE interface that is compatible with Legacy. Windows® XP* SP3 does not contain the required SATA AHCI driver natively hence you must follow the instructions below to install the PCH EG20T SATA AHCI driver. Here is an example for Windows® XP installation.

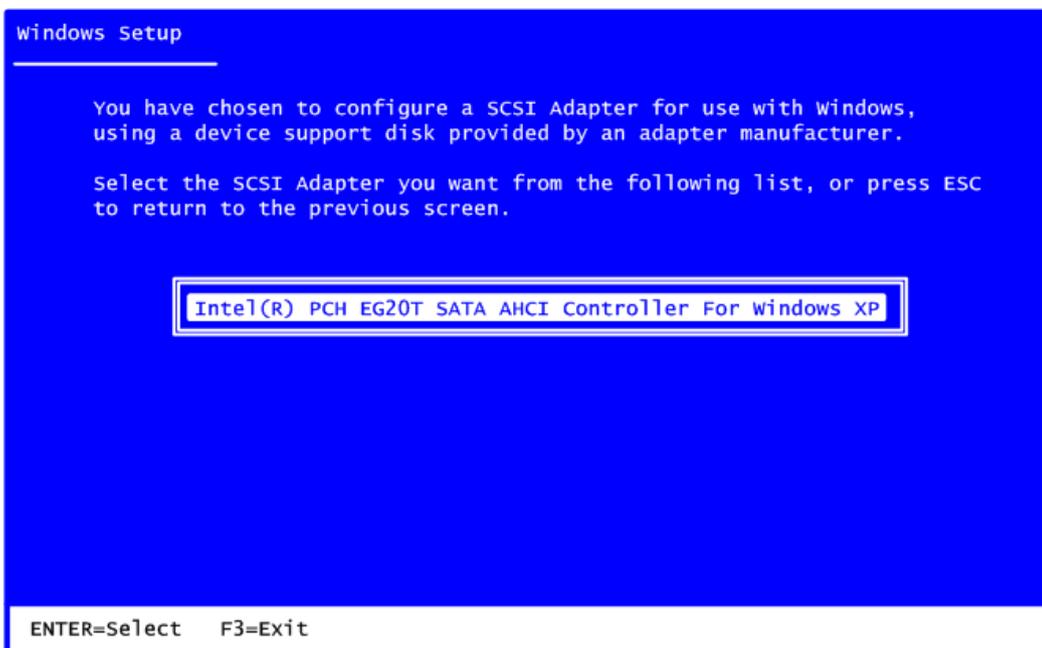
1. Copy the following files in FD_Inst_WinXP directory in the SATA driver package to the root of a floppy disk.
 - iohsata.cat
 - iohsata.inf
 - iohsata.sys
 - txtsetup.oem
2. Insert the floppy disk prepared in step 1 into the USB floppy drive and connect it to the USB port.
3. Insert Windows® XP* SP3 installer into the CD-ROM and boot from the CD-ROM to start Windows® XP* SP3 installation.
4. Press <F6> to add further SCSI/RAID drivers when prompted during the very early stage of Windows® installation.



5. Press <S> to add an additional SCSI device.



6. Select the correct driver (PCH EG20T SATA AHCI Controller for Windows® XP) and press <Enter> to continue the installation. This will install the PCH EG20T SATA AHCI controller driver.



7. Finish the Windows® XP installation according to your needs.



Some USB floppy drivers are not supported when you press <F6> (step 4 above) during installation. See details at <http://support.microsoft.com/kb/916196/en-us> .



Note: *If a message on the screen saying that one or some file(s) cannot be found, please check the floppy disk or copy the correct AHCI driver again from the driver CD.*

Appendix A

Expansion Module (Optional)

The AX93268 (optional) is an expansion module for PICO822. Its specifications and detailed information are given in this appendix.

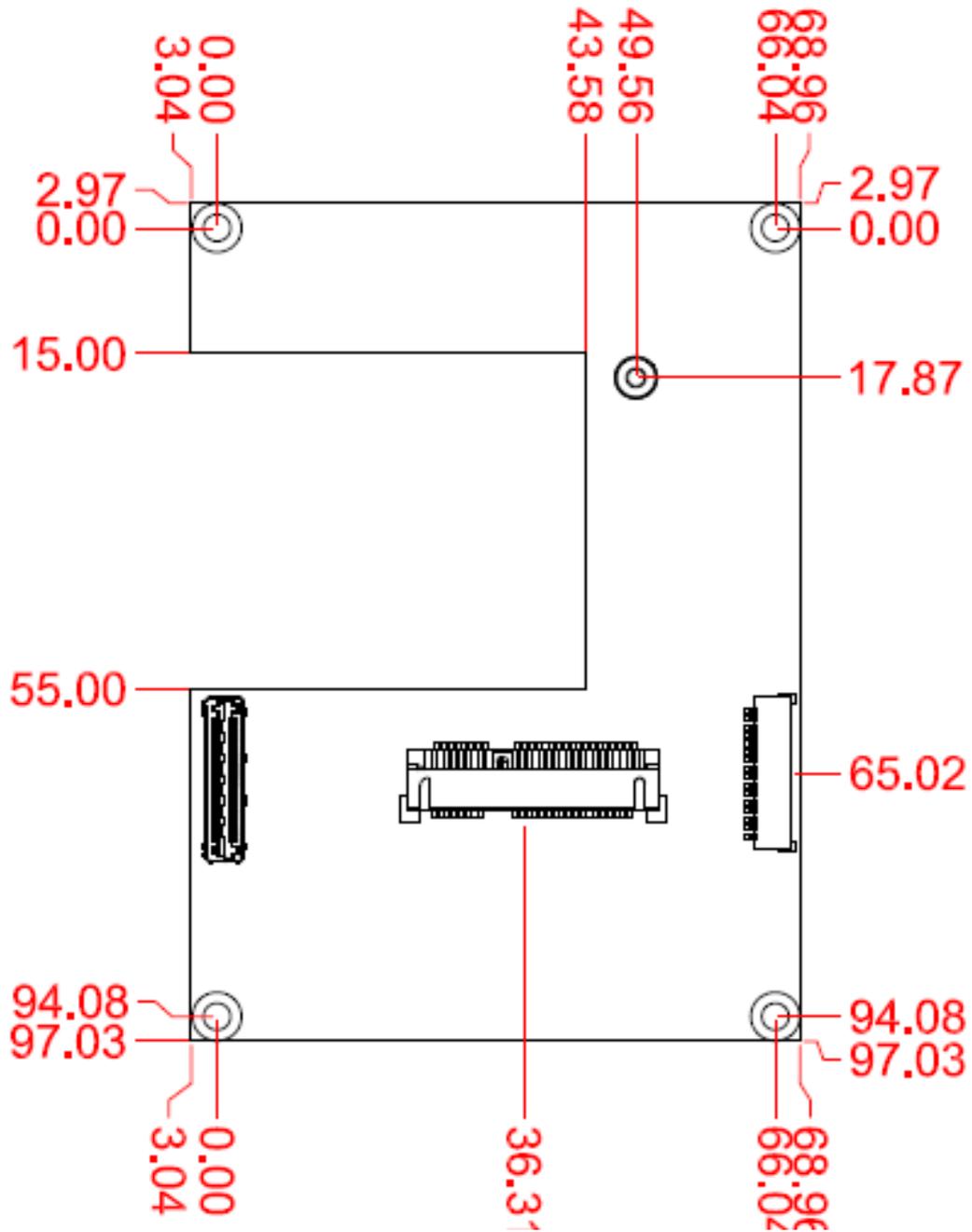
AX93268 Specifications

- **Size**
 - 100mm x 72mm
- **Features**
 - One 1.0mm pitch 16-pin connector as VGA connector. VGA resolution is up to 1920x1080.
 - One PCI-Express Mini Card socket.

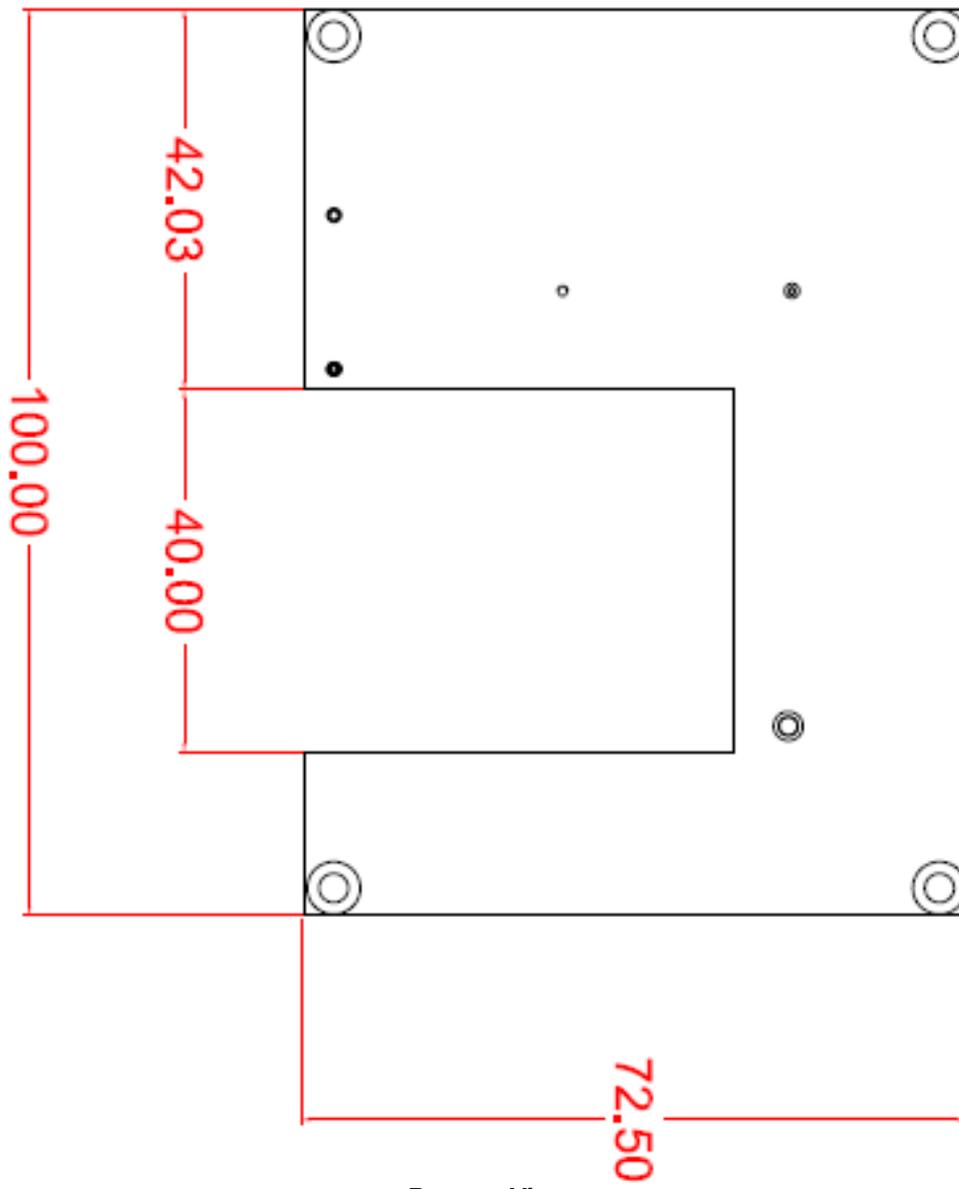


Note: *All specifications and images are subject to change without notice.*

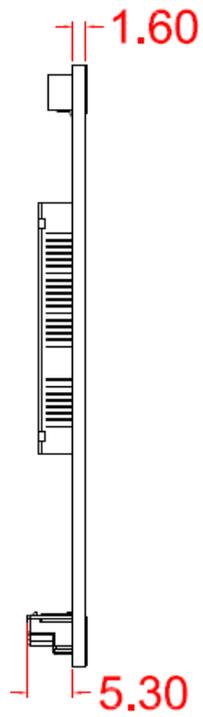
AX93268 Dimensions and Fixing Holes



Top View

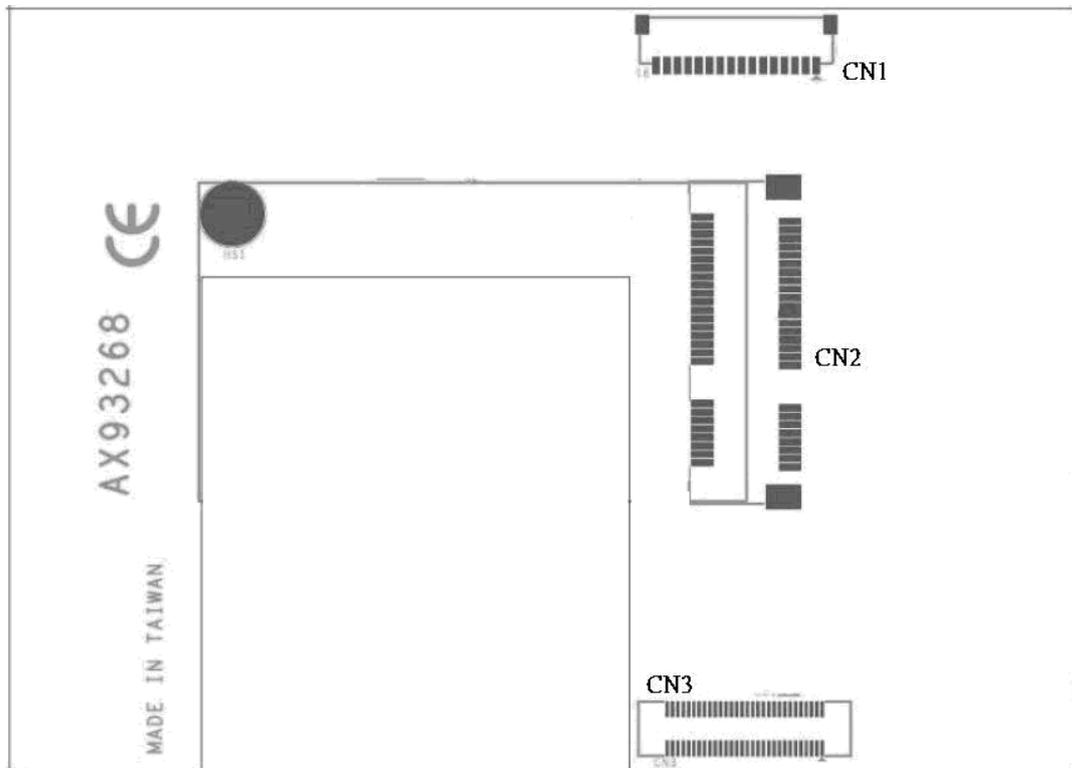


Bottom View



Side View

AX93268 Layout



Top View

Connectors

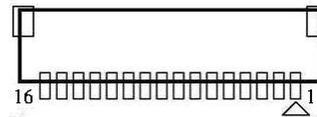
Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows all connectors on the hardware.

Connector	Description
CN1	VGA Connector
CN2	PCI-Express Mini Card Connector
CN3	Expansion Connector

VGA Connector (CN1)

This is a 16-pin connector for VGA interface. Its pin assignments are listed in table below.

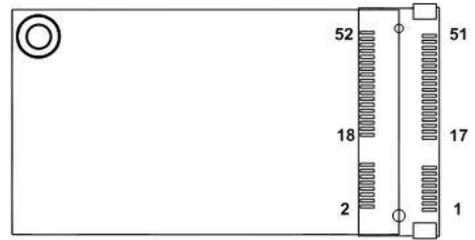
Pin	Signal
1	RGND
2	RED
3	GGND
4	GREEN
5	BGND
6	BLUE
7	GND
8	+5V
9	DATA
10	GND
11	GND
12	HSYNC
13	GND
14	VSYNC
15	CLK
16	GND



PCI-Express Mini Card Connector (CN2)

This is a PCI-Express Mini Card connector which supports PCI-Express x1 link and USB 2.0 link. A PCI-Express Mini Card can be applied to either PCI-Express or USB 2.0. It complies with PCI-Express Mini Card Spec. V1.2.

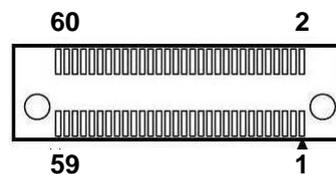
Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3VSB
3	No use	4	GND
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	GND	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	W_DISABLE#
21	GND	22	PERST#
23	PE_RXN2	24	+3.3VSB
25	PE_RXP2	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PE_TXN2	32	SMB_DATA
33	PE_TXP2	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3VSB	40	GND
41	+3.3VSB	42	No use
43	GND	44	No use
45	No use	46	No use
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3VSB



Expansion Connector (CN3)

The CN3 is for connecting this expansion module to PICO822. Please gently insert CN3 into SCN1 of PICO822.

Pin	Signal	Pin	Signal
1	GND	2	+12V
3	GND	4	+12V
5	GND	6	+12V
7	GND	8	+12V
9	GND	10	+12V
11	GND	12	+12V
13	No use	14	No use
15	GND	16	GND
17	SMBus_ DATA	18	SMBus_ CLK
19	GND	20	GND
21	PEG_TX+	22	PEG_RX+
23	PEG_TX-	24	PEG_RX-
25	GND	26	GND
27	PEG_CLK+	28	No use
29	PEG_CLK-	30	No use
31	GND	32	GND
33	SDVO_RED+	34	No use
35	SDVO_RED-	36	No use
37	GND	38	GND
39	SDVO_GREEN+	40	SDVO_CTRL_DATA
41	SDVO_GREEN-	42	SDVO_CTRL_CLK
43	GND	44	GND
45	SDVO_BLUE+	46	Reset
47	SDVO_BLUE-	48	No use
49	GND	50	No use
51	SDVO_CLK+	52	USB_DN4
53	SDVO_CLK-	54	USB_DP4
55	GND	56	GND
57	GPIO	58	No use
59	SLP_PLB (Default)	60	PEG_WAKE



Appendix B

Watchdog Timer

About Watchdog Timer

After the system stops working for a while, it can be auto-reset by the watchdog timer. The integrated watchdog timer can be set up in the system reset mode by program.

How to Use Watchdog Timer

Start

↓

1. Enable Configuration:

-O 2E 87
-O 2E 87

↓

2. Select Logic device:

-O 2E 07
-O 2F 07

↓

3. Enable WDT:

-O 2E 30
-O 2F 01

↓

4. Activate WDT:

-O 2E F0
-O 2F 80

↓

5. Set base timer:

-O 2E F6
-O 2F 0A ; Set reset time. Ex: A->reset time=10sec

↓

6. Set timer unit (second or minute):

-O 2E F5
-O 2F 71 ; Set timer unit.
; Ex: 1->timer unit=second, 9->timer unit=minute

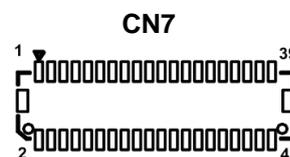
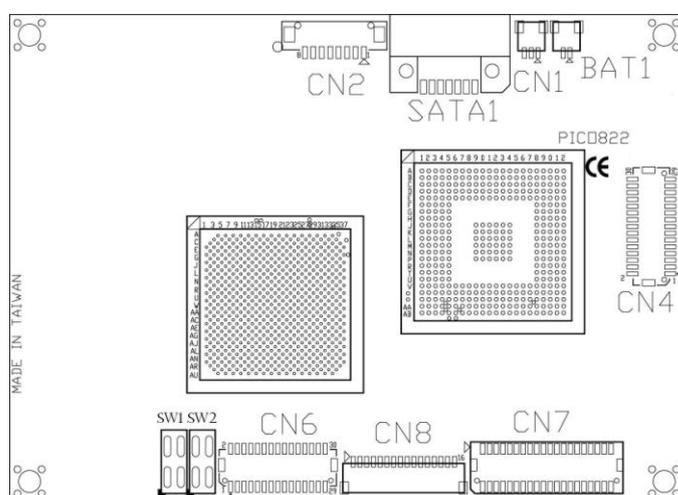
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Appendix C

Digital I/O

About Digital I/O

The onboard GPIO (digital I/O) has 8 bits. Each bit can be set to function as input or output by software programming. In default, GPIO0~GPIO6 are pulled high with +5V level (according to standby power) and GPIO8 is pulled high with +3.3V level (according to main power). The BIOS default settings are 8 inputs where all of these pins are set to 1. Use these GPIO signals to control cash drawers and sense warning signals from an Uninterrupted Power System (UPS), or perform store security control.



CN7 Signal	
Pin 21:	GPIO5
Pin 22:	GPIO0
Pin 23:	GPIO6
Pin 24:	GPIO1
Pin 25:	GPIO8
Pin 26:	GPIO2
Pin 28:	GPIO3
Pin 30:	GPIO4

Sample Program

```
#include <windows.h>
#include <winioctl.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <strsafe.h>
#include <initguid.h>
#include <setupapi.h>

#include "ioh_gpio_common.h"
#include "ioh_gpio_ioctls.h"

extern BOOL RunGPIOsSample(__in LPCTSTR DriverName, __in int argc,
__in_ecount(argc) char *argv[]);
extern BOOL GetDevicePath(__in LPGUID pGuid, __out PCHAR pDeviceName);

int __cdecl main(__in int argc, __in_ecount(argc) char *argv[])
{
    CHAR DevicePath[MAX_PATH];

    if((argc == 2) || (argc == 3))
    {
        GetDevicePath((LPGUID)&GUID_DEVINTERFACE_IOHGPI0, DevicePath);
        RunGPIOsSample(DevicePath, argc-1, argv+1);
    }
}
```

```

else
{
    printf("\n");
    printf("Usage: %s port [output]\n", argv[0]);
    printf(" port      Specify the port number (port=0-11 decimal).\n");
    printf(" output     Specify the port value (output=0 | 1).\n");
    printf("            when this is not specified, the port direction is set
input mode.\n");
    printf("            when this is specified, the port is output mode.\n");
    printf("\n");
}

return 0;
}

// Get GPIO Device Path
BOOL GetDevicePath(LPGUID pGuid, PCHAR pDeviceName)
{
HDEVINFO hardwareDeviceInfo = NULL;

SP_DEVICE_INTERFACE_DATA deviceInterfaceData = {0};
PSP_DEVICE_INTERFACE_DETAIL_DATA deviceInterfaceDetailData = NULL;
ULONG predictedLength = 0;
ULONG requiredLength = 0, bytes=0;
int i =0;
BOOL bRet = FALSE;

//
// open a handle to the device interface information set of all
// present system class interfaces.
//

hardwareDeviceInfo = SetupDiGetClassDevs(pGuid, NULL, NULL,
(DIGCF_PRESENT | // Only Devices present
DIGCF_DEVICEINTERFACE)); // Function class devices.
if( INVALID_HANDLE_VALUE == hardwareDeviceInfo )
{
    printf("SetupDiGetClassDevs failed: %d\n", (INT)GetLastError());
    return bRet;
}

deviceInterfaceData.cbSize = sizeof(SP_DEVICE_INTERFACE_DATA);

//
// Enumerate devices
//
do
{
    if (SetupDiEnumDeviceInterfaces (hardwareDeviceInfo, 0,
// No care about specific PDOS
pGuid,
i, //
&deviceInterfaceData))
    {
        //
        // Allocate a function class device data structure to
        // receive the information about this particular device.
        //
        //
        // First find out required length of the buffer
        //
        if(!SetupDiGetDeviceInterfaceDetail (
            hardwareDeviceInfo,
            &deviceInterfaceData,
            NULL, // probing so no output buffer yet
            0, // probing so output buffer length of zero
            &requiredLength,
            NULL))
        { // not interested in the specific dev-node
            if(ERROR_INSUFFICIENT_BUFFER != GetLastError())
            {
                printf("SetupDiGetDeviceInterfaceDetail failed %d\n",
                    (INT)GetLastError());
                SetupDiDestroyDeviceInfoList (hardwareDeviceInfo);
                break;
            }
        }
    }
}

```

```

    }
}
predictedLength = requiredLength;
deviceInterfaceDetailData = malloc (predictedLength);
if(deviceInterfaceDetailData)
{
    deviceInterfaceDetailData->cbSize =
        sizeof(SP_DEVICE_INTERFACE_DETAIL_DATA);
} else
{
    printf("Couldn't allocate %d bytes for device interface
        details.\n", (INT)predictedLength);
    SetupDiDestroyDeviceInfoList (hardwareDeviceInfo);
    break;
}
if (! SetupDiGetDeviceInterfaceDetail (
    hardwareDeviceInfo,
    &deviceInterfaceData,
    deviceInterfaceDetailData,
    predictedLength,
    &requiredLength,
    NULL))
{
    printf("Error in SetupDiGetDeviceInterfaceDetail\n");
    SetupDiDestroyDeviceInfoList (hardwareDeviceInfo);
    free (deviceInterfaceDetailData);
    break;
}

printf("%d) %s\n", ++i, deviceInterfaceDetailData->DevicePath);
strcpy_s(pDeviceName,MAX_PATH,deviceInterfaceDetailData->Device
    Path);
bRet = TRUE;
break;
}
else if (ERROR_NO_MORE_ITEMS != GetLastError())
{
    free (deviceInterfaceDetailData);
    deviceInterfaceDetailData = NULL;
    break;
}
} while (FALSE);

SetupDiDestroyDeviceInfoList (hardwareDeviceInfo);

if(!deviceInterfaceDetailData)
{
    printf("No device interfaces present\n");
    bRet = FALSE;
}
return bRet;
}

// Run GPIO Device Driver Check
BOOL RunGPIONSample(
    __in LPCTSTR DriverName,
    __in int argc,
    __in_ecount(argc) char *argv[])
{
    BOOL bRC = FALSE;
    HANDLE hDevice;
    DWORD portnum=0;
    DWORD portval=0;
    DWORD errNum = 0;

    ioh_gpio_reqt objGpioReqOut;
    ioh_gpio_reqt objGpioReqIn;

    // DeviceIoControl parameters
    LPVOID lpOutBuffer;
    DWORD nOutBufferSize;
    LPVOID lpInBuffer;
    DWORD nInBufferSize;
    DWORD dwBytesReturned;
    LPOVERLAPPED lpOverlapped;

```

```

printf("\n===== \n");

printf("GPIO Device Driver Check(%s) \n", DriverName);
printf("===== \n");

if (argc>0)
{
    portnum = (UCHAR)atoi(argv[0]);
    printf("Specified port number : %d\n", (INT)portnum);
}

printf("\n*** CreateFile(%s) \n", DriverName);
hDevice = CreateFile(DriverName, GENERIC_READ | GENERIC_WRITE,
    FILE_SHARE_WRITE, NULL, OPEN_EXISTING,
    FILE_FLAG_OVERLAPPED, NULL);
if(hDevice != INVALID_HANDLE_VALUE)
{
    printf(" Sucess CreateFile %s (hDevice:%08X)\n", DriverName,
        (UINT)hDevice);
    if (argc == 1)
    {
        printf("\n*** DeviceIoControl(code:IOCTL_GPIO_DIRECTION <0,
            GPIO%d, INPUT, 0>)\n", (INT)portnum);
        objGpioReqOut.port=0;
        objGpioReqOut.pins=(1<<portnum);
        objGpioReqOut.mode=INPUT_SEL;
        objGpioReqOut.enable=0;
        lpOutBuffer = (LPVOID)&objGpioReqOut;
        nOutBufferSize = sizeof(objGpioReqOut);
        lpInBuffer = (LPVOID)&objGpioReqIn;
        nInBufferSize = sizeof(objGpioReqIn);
        memset(lpInBuffer,0, nInBufferSize); // clear for in buffer
        dwBytesReturned = 0;
        lpOverlapped = NULL;

        bRc = DeviceIoControl(hDevice, IOCTL_GPIO_DIRECTION,
            lpOutBuffer, nOutBufferSize, lpInBuffer, nInBufferSize,
            &dwBytesReturned, lpOverlapped);
        if(bRc == TRUE)
        {
            printf(" Sucess DeviceIoControl\n");
            printf("    dwBytesReturned = %ld, output buffer = {port:%lx,
                pins:%lx, mode:%lx, enable:%lx}\n", dwBytesReturned,
                objGpioReqIn.port, objGpioReqIn.pins,
                objGpioReqIn.mode, objGpioReqIn.enable);

            printf("\n*** DeviceIoControl(code:IOCTL_GPIO_READ <0,
                GPIO%d, 0, 0>)\n", (INT)portnum);
            objGpioReqOut.port=0;
            objGpioReqOut.pins=(1<<portnum);
            objGpioReqOut.mode=0;
            objGpioReqOut.enable=0;
            lpOutBuffer = (LPVOID)&objGpioReqOut;
            nOutBufferSize = sizeof(objGpioReqOut);
            lpInBuffer = (LPVOID)&objGpioReqIn;
            nInBufferSize = sizeof(objGpioReqIn);
            memset(lpInBuffer,0, nInBufferSize);

            // clear for in buffer
            dwBytesReturned = 0;
            lpOverlapped = NULL;
            bRc = DeviceIoControl(hDevice, IOCTL_GPIO_READ, lpOutBuffer,
                nOutBufferSize, lpInBuffer, nInBufferSize,
                &dwBytesReturned, lpOverlapped);
            if(bRc == TRUE)
            {
                printf(" Sucess DeviceIoControl\n");
                printf("    dwBytesReturned = %ld, output buffer =
                    {port:%lx, pins:%lx, mode:%lx, enable:%lx}\n",
                    dwBytesReturned, objGpioReqIn.port,
                    objGpioReqIn.pins, objGpioReqIn.mode,
                    objGpioReqIn.enable);
                portval = (objGpioReqIn.pins & (1<<portnum));
                printf("\nGPIO%d = %s\n", (INT)portnum, (portval ?
                    "HIGH" : "LOW"));
            }
        }
    }
}

```



```
    if(CloseHandle(hDevice))
    {
        printf("\n*** CloseHandle(hDevice:%08X)\n", (UINT)hDevice);
        if(CloseHandle(hDevice))
        {
            printf(" Success CloseHandle\n");
            bRC = TRUE;
        }
    }
}
else
{
    printf("Failue CreateFile %s (LastError:%d)\n", DriverName,
        (INT)GetLastError());
}
return bRC;
}
```