

**MODEL:
ICE-BT-T10**

**COM Express R2.1 Module (Type 10),
22nm Intel® Atom™ or Celeron® Processor
2 GB DDR3, EEPROM and RoHS Compliant**

User Manual

Revision

Date	Version	Changes
November 4, 2015	1.01	Modified B89 pin definition in Table 3-2
August 27, 2014	1.00	Initial release

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Manual Conventions

**WARNING**

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.

**CAUTION**

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

**NOTE**

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.

**HOT SURFACE**

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

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Chapter

1

Introduction



1.1 Introduction

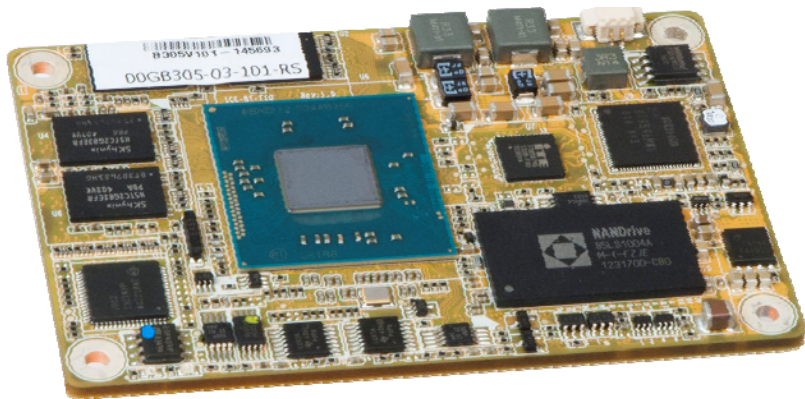


Figure 1-1: ICE-BT-T10

The ICE-BT-T10 COM Express Type 10 module provides the main processing chips and is connected to a compatible COM Express baseboard. The ICE-BT-T10 is preinstalled with 4th generation Intel® Atom™ or Celeron® processor. The COM Express standard allows the COM Express baseboard to be designed, while leaving the choice of processor till the later stages of design. The ICE-BT-T10 provides a low power option with the full range of modern I/O options. The ICE-BT-T10 embedded module is designed for flexible integration by system developers into customized platform devices.



ICE-BT-T10 COM Express Module

1.2 Model Variations

There are eight models of the ICE-BT-T10 series. The model variations are listed in Table 1-1.

Model	On-board SoC	Max. Memory Size
Standard		
ICE-BT-T10-E38151	Intel® Atom™ processor E3815 (1.46 GHz, single-core, 512 KB cache)	4 GB
ICE-BT-T10-E38251	Intel® Atom™ processor E3825 (1.33 GHz, dual-core, 1 MB cache)	4 GB
By Request (MOQ: 100 pcs/lot)		
ICE-BT-T10-E38261	Intel® Atom™ processor E3826 (1.46 GHz, dual-core, 1 MB cache)	8 GB
ICE-BT-T10-E38271	Intel® Atom™ processor E3827 (1.75 GHz, dual-core, 1 MB cache)	8 GB
ICE-BT-T10-E38451	Intel® Atom™ processor E3845 (1.91 GHz, quad-core, 2 MB cache)	8 GB
ICE-BT-T10-J19001	Intel® Celeron® processor J1900 (2 GHz, quad-core, 2 MB cache)	8 GB
ICE-BT-T10-N28071	Intel® Celeron® processor N2807 (1.58 GHz, dual-core, 2 MB cache)	4 GB
ICE-BT-T10-N29301	Intel® Celeron® processor N2930 (1.83 GHz, quad-core, 2 MB cache)	8 GB

Table 1-1: Model Variations

1.3 Features

Some of the ICE-BT-T10 COM Express module features are listed below:

- Complies with COM Express Type 10 form factor
- On-board 22nm Intel® Atom™ or Celeron® processor
- On-board 2 GB DDR3 memory

- Optional on-board 4 GB SSD
- Supports analog CRT (VGA), DisplayPort and HDMI
- Supports USB 3.0, SATA 3Gb/s and GbE
- RoHS compliant

1.4 Board Overview

The on-board components and connectors of the ICE-BT-T10 are shown in the figures below.

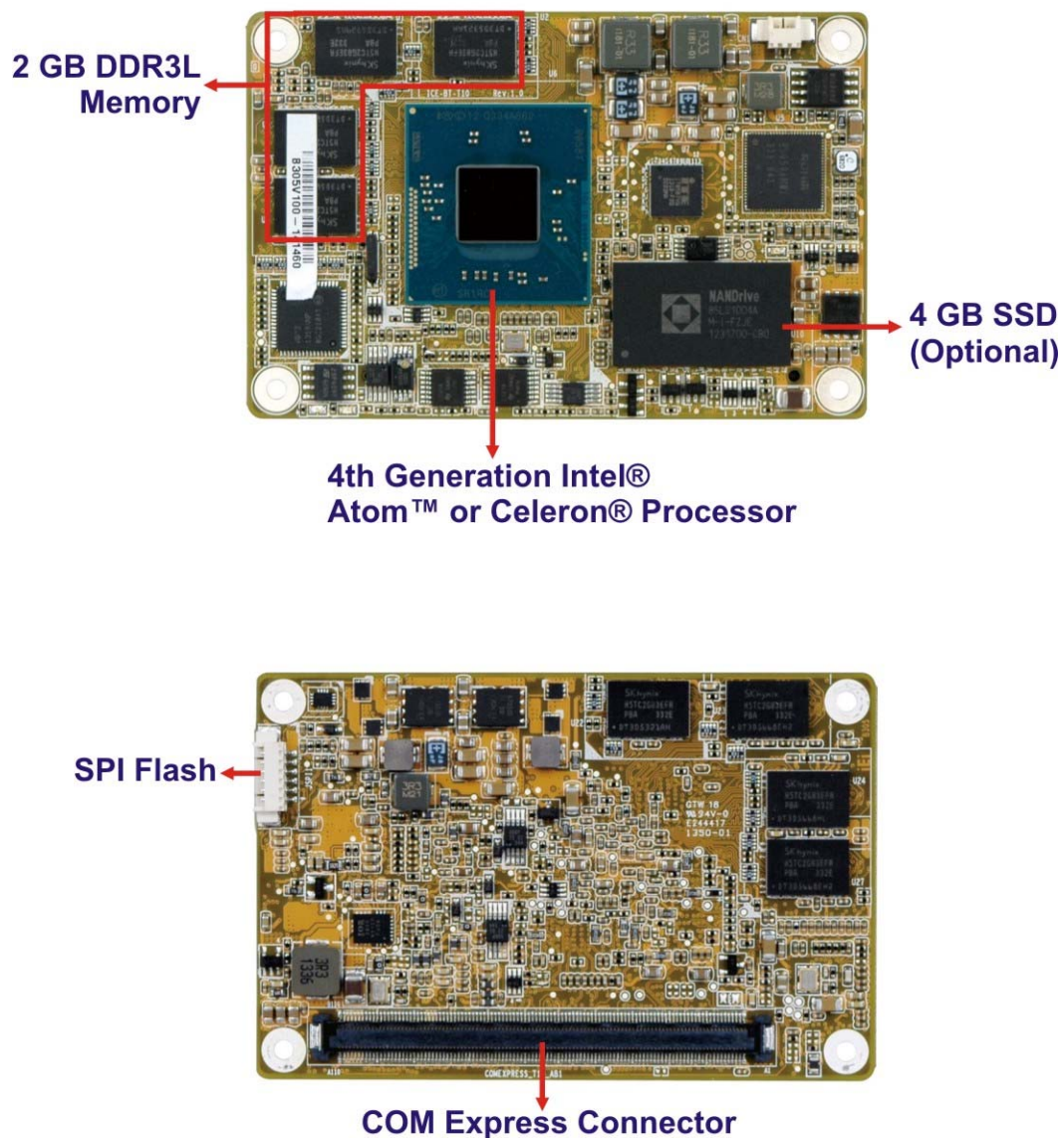


Figure 1-2: On-board Components and Connectors

ICE-BT-T10 COM Express Module

1.5 Dimensions

The main dimensions of the ICE-BT-T10 are shown in the diagram below.

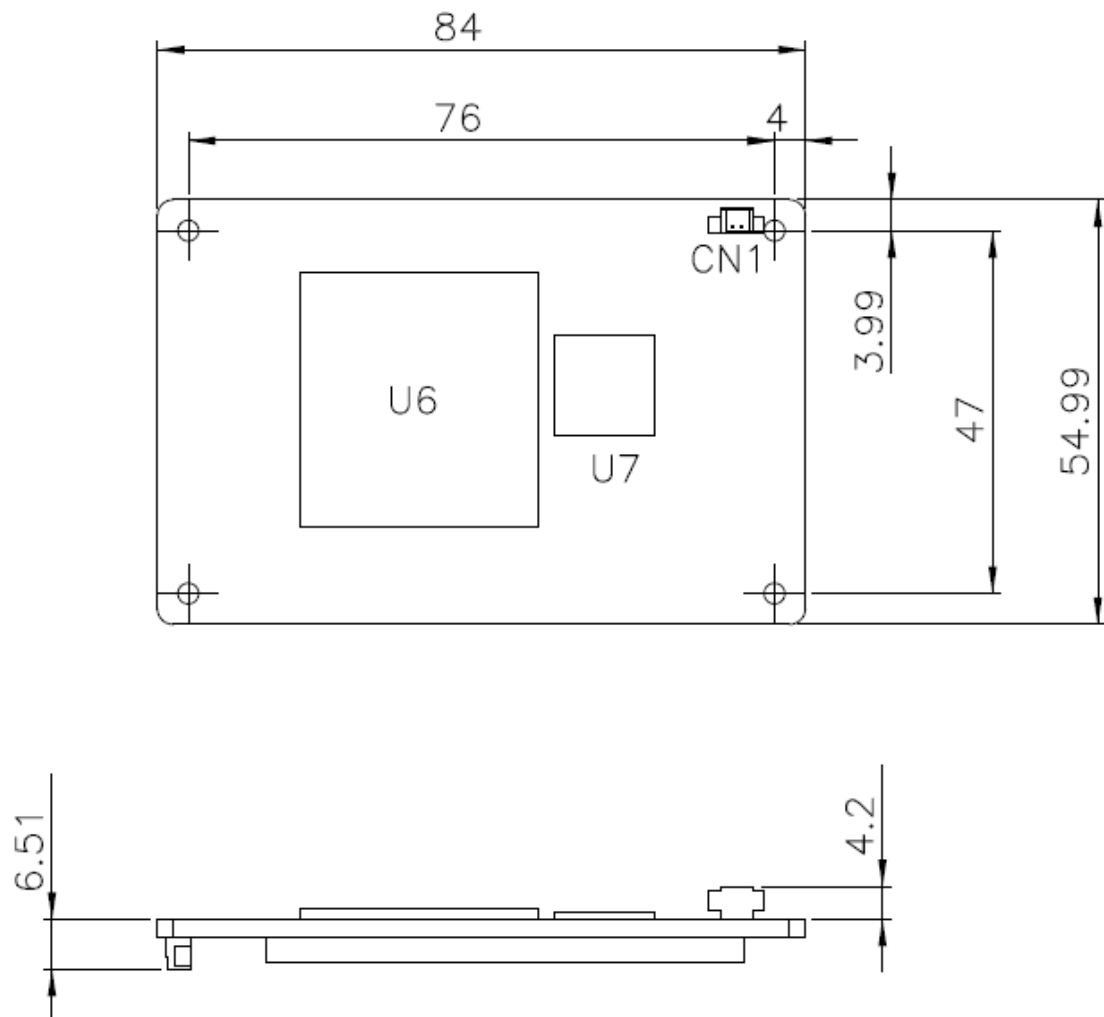


Figure 1-3: ICE-BT-T10 Dimensions (mm)

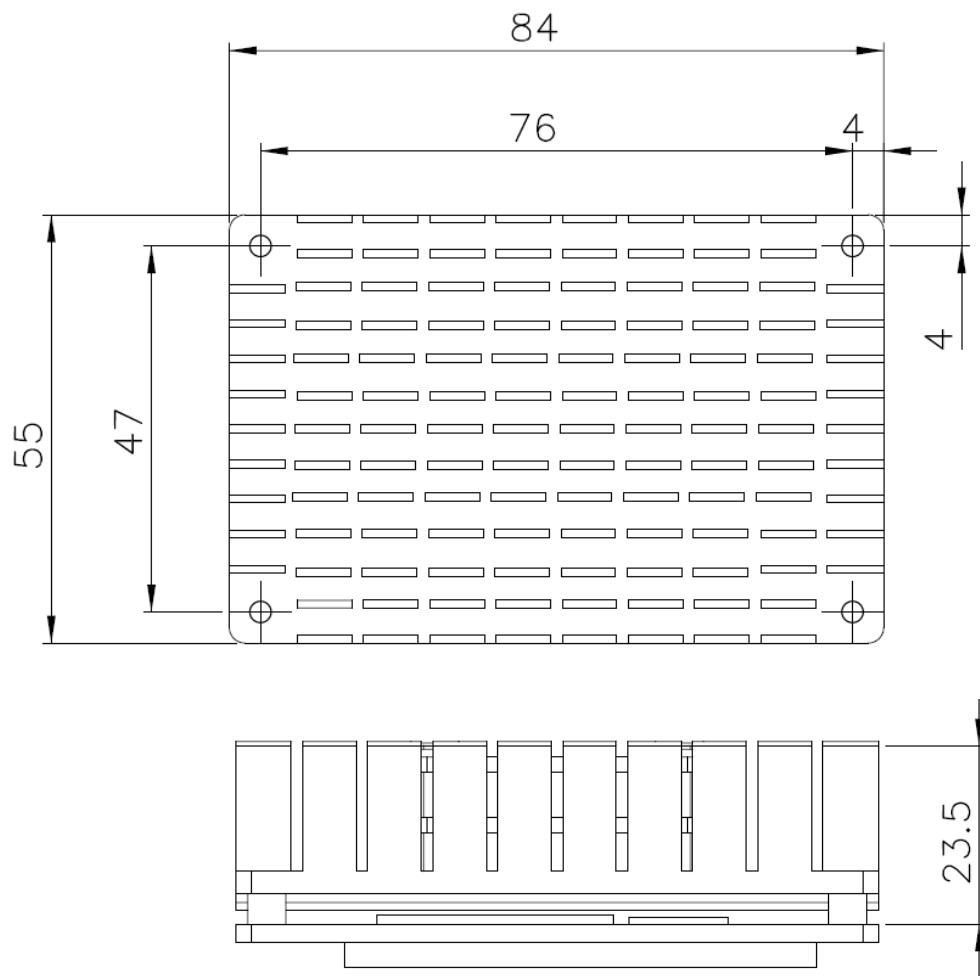


Figure 1-4: ICE-BT-T10 Heatsink Dimensions (mm)

ICE-BT-T10 COM Express Module

1.6 Data Flow

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

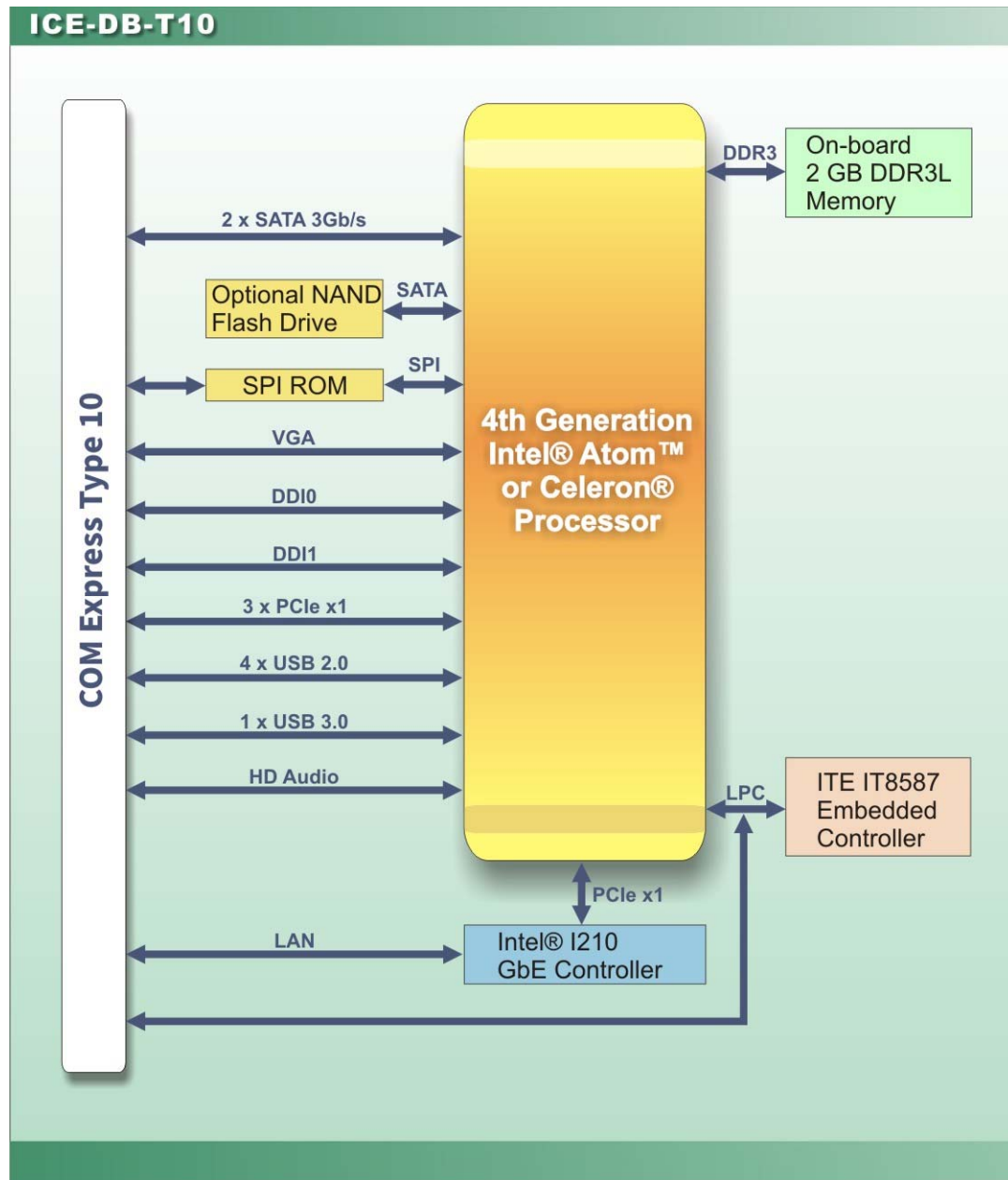


Figure 1-5: Data Flow Diagram



1.7 Technical Specifications

The ICE-BT-T10 technical specifications are listed below.

	ICE-BT-T10
Form Factor	PICMG COM Express R2.1 Type 10
On-board SoC	<ul style="list-style-type: none">▪ Standard<ul style="list-style-type: none">○ Intel® Atom™ processor E3825 (1.33GHz, dual-core, 1MB cache, TDP=6W)○ Intel® Atom™ processor E3815 (1.46GHz, single-core, 512KB cache, TDP=5W)Intel®▪ By request (MOQ: 100 pcs/lot)<ul style="list-style-type: none">○ Intel® Atom™ processor E3845 (1.91GHz, quad-core, 2MB cache, TDP=10W)○ Intel® Atom™ processor E3827 (1.75GHz, dual-core, 1MB cache, TDP=8W)○ Intel® Atom™ processor E3826 (1.46GHz, dual-core, 1MB cache, TDP=7W)○ Celeron® processor J1900 (2GHz, quad-core, 2MB cache, TDP=10W)○ Intel® Celeron® processor N2930 (1.83GHz, quad-core, 2MB cache, TDP=7.5W)○ Intel® Celeron® processor N2807 (1.58GHz, dual-core, 2MB cache, TDP=4.5W)
Memory	2 GB DDR3 on-board memory
Internal Storage	2-Kb serial I ² C bus EEPROM supports EAPI Rev. 1.0
Graphics Engine	Intel® HD Graphics Gen 7 with four execution units Supports DirectX 11.1, OpenGL 4.2 and OpenCL 1.2
Ethernet	Intel® I210 Ethernet Controller
BIOS	UEFI BIOS
Embedded Controller	ITE IT8587VG-FX
Watchdog Timer	Software programmable supports 1~255 sec. system reset



ICE-BT-T10 COM Express Module

	ICE-BT-T10
Storage	Two SATA 3Gb/s (signal to baseboard) Optional on-board 4 GB SSD (SATA port1)
Display (Signal to Baseboard)	One VGA via reserved pin (up to 2560 x 1600) One DDI (DP: up to 2560 x 1600; HDMI: up to 1920 x 1080) One eDP
Expansions (Signal to Baseboard)	Three PCIe x1
I/O Interfaces (Signal to Baseboard)	Four USB 2.0 One USB 3.0 Two RS-232 (TX and RX from EC) HD Audio 8-bit GPIO SMBus I ² C LPC SPI
Power Consumption	+12V @ 0.43 A , Vcore_12V @ 0.9 A (1.91 GHz Intel® Atom™ E3845 CPU with 2 GB 1333 MHz DDR3L memory)
Operating Temperature	-20°C ~ 60°C
Storage Temperature	-30°C ~ 70°C
Operating Humidity	5% ~ 95% (non-condensing)
Dimensions	84 mm x 55 mm
Weight (GW/NW)	300 g/150 g

Table 1-2: ICE-BT-T10 Specifications

Chapter

2

Packing List

ICE-BT-T10 COM Express Module

2.1 Anti-static Precautions



WARNING!

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

Make sure to adhere to the following guidelines:

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

2.2 Unpacking Precautions

When the ICE-BT-T10 is unpacked, please do the following:

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

2.3 Packing List



NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the ICE-BT-T10 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The ICE-BT-T10 is shipped with the following components:


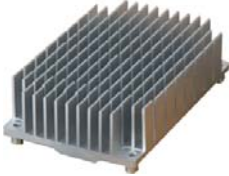


Quantity	Item and Part Number	Image
1	ICE-BT-T10 COM Express Module	
1	Heatsink	
1	Utility CD	
1	Quick Installation Guide	

Table 2-1: Packing List

ICE-BT-T10 COM Express Module

2.4 Optional Items

The following are optional components which may be separately purchased:


Item and Part Number	Image
Baseboard for COM Express Type 10 modules (P/N: ICE-DB-T10-R10)	

Table 2-2: Optional Items

Chapter

3

Connectors

ICE-BT-T10 COM Express Module

3.1 Peripheral Interface Connectors

This chapter details all the connectors.

3.1.1 ICE-BT-T10 Layout

The figure below shows all the connectors.

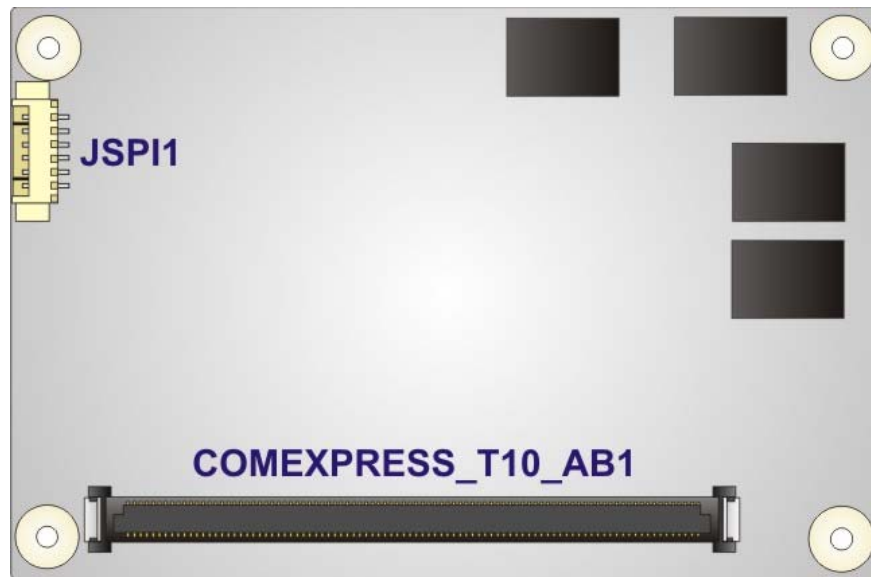


Figure 3-1: Connectors (Solder Side)

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the ICE-BT-T10.

Connector	Type	Label
COM Express connector AB	COM Express connector	COMEXPRESS_T10_AB1
SPI Flash (BIOS)	6-pin wafer	JSP11

Table 3-1: Peripheral Interface Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the ICE-BT-T10.

3.2.1 COM Express Connector

- CN Label:

COMEXPRESS_T10_AB1
- CN Type:

220-pin COM Express connector
- CN Location:

See Figure 3-2
- CN Pinouts:

See Table 3-2

The standard COM Express connector location and pinouts are shown below.

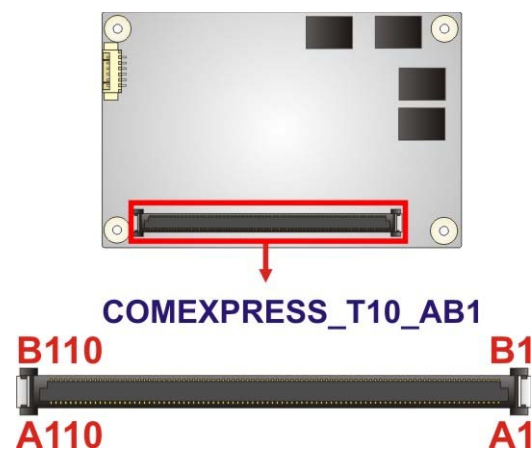


Figure 3-2: COM Express Connector Location

Pin No.	Description	Pin No.	Description
A1	GND	B1	GND15
A2	GBE0_MDI3-	B2	GBE0_ACT#
A3	GBE0_MDI3+	B3	LPC_FRAME#
A4	GBE0_LINK100#	B4	LPC_AD0
A5	GBE0_LINK1000#	B5	LPC_AD1
A6	GBE0_MDI2-	B6	LPC_AD2
A7	GBE0_MDI2+	B7	LPC_AD3
A8	GBE0_LINK#	B8	RSVD
A9	GBE0_MDI1-	B9	RSVD

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Pin No.	Description	Pin No.	Description
A10	GBE0_MDI1+	B10	LPC_CLK
A11	GND1	B11	GND16
A12	GBE0_MDI0-	B12	PWRBTN#
A13	GBE0_MDI0+	B13	SMB_CK
A14	GBE0_CTREF	B14	SMB_DAT
A15	SUS_S3#	B15	SMB_ALERT#
A16	SATA0_TX+	B16	SATA1_TX+
A17	SATA0_TX-	B17	SATA1_TX-
A18	SUS_S4#	B18	SUS_STAT#
A19	SATA0_RX+	B19	SATA1_RX+
A20	SATA0_RX-	B20	SATA1_RX-
A21	GND2	B21	GND17
A22	USB_SSRX0-	B22	USB_SSTX0-
A23	USB_SSRX0+	B23	USB_SSTX0+
A24	RSVD	B24	RSVD
A25	RSVD	B25	RSVD
A26	RSVD	B26	RSVD
A27	BATLOW#	B27	WDT
A28	ATA_ACT#	B28	RSVD
A29	HDA_SYNC	B29	HDA_SDIN1
A30	HDA_RST#	B30	HDA_SDIN0
A31	GND3	B31	GND18
A32	HDA_BITCLK	B32	SPKR
A33	HDA_SDOUT	B33	I2C_CK
A34	BIOS_DISABLE#	B34	I2C_DAT
A35	RSVD	B35	RSVD
A36	RSVD	B36	RSVD
A37	RSVD	B37	RSVD
A38	RSVD	B38	RSVD
A39	RSVD	B39	RSVD
A40	RSVD	B40	RSVD
A41	GND4	B41	GND

Pin No.	Description	Pin No.	Description
A42	USB2-	B42	USB3-
A43	USB2+	B43	USB3+
A44	USB_2_3_OC#	B44	USB_0_1_OC#
A45	USB0-	B45	USB1-
A46	USB0+	B46	USB1+
A47	VCC_RTC	B47	RSVD
A48	RSVD	B48	RSVD
A49	RSVD	B49	SYS_RESET#
A50	LPC_SERIRQ	B50	CB_RESET#
A51	GND5	B51	GND20
A52	VGA_HSYNC	B52	RSVD
A53	VGA_VSYNC	B53	VGA_RED
A54	GPI0	B54	GPO1
A55	VGA_I2C_CK	B55	VGA_GRN
A56	VGA_I2C_DAT	B56	VGA_BLU
A57	GND6	B57	GPO2
A58	RSVD	B58	RSVD
A59	RSVD	B59	RSVD
A60	GND7	B60	GND
A61	PCIE_TX2+	B61	PCIE_RX2+
A62	PCIE_TX2-	B62	PCIE_RX2-
A63	GPI1	B63	GPO3
A64	PCIE_TX1+	B64	PCIE_RX1+
A65	PCIE_TX1-	B65	PCIE_RX1-
A66	GND8	B66	WAKE0#
A67	GPI2	B67	RSVD
A68	PCIE_TX0+	B68	PCIE_RX0+
A69	PCIE_TX0-	B69	PCIE_RX0-
A70	GND9	B70	GND22
A71	DDIO_TXP2 (eDP)	B71	DDI1_TXP0
A72	DDIO_TXN2 (eDP)	B72	DDI1_TXN0
A73	DDIO_TXP1 (eDP)	B73	DDI1_TXP1

ICE-BT-T10 COM Express Module

Pin No.	Description	Pin No.	Description
A74	DDIO_TXN1 (eDP)	B74	DDI1_TXN1
A75	DDIO_TXP0 (eDP)	B75	DDI1_TXP0
A76	DDIO_TXN0 (eDP)	B76	DDI1_TXN0
A77	DDIO_ENVDD (eDP)	B77	RSVD
A78	RSVD	B78	RSVD
A79	RSVD	B79	DDIO_ENBKL
A80	GND10	B80	GND23
A81	DDIO_TXP3 (eDP)	B81	DDI1_TXP3
A82	DDIO_TXN3 (eDP)	B82	DDI1_TXN3
A83	DDIO_AUXP (eDP)	B83	DDIO_PWM (eDP)
A84	DDIO_AUXN (eDP)	B84	VCC5SBY
A85	GPI3	B85	VCC5SBY
A86	RSVD	B86	VCC5SBY
A87	eDP_HPD	B87	VCC5SBY
A88	PCIE0_CK_REF+	B88	BIOS_DIS1#
A89	PCIE0_CK_REF-	B89	DDI1_HPD
A90	GND11	B90	GND24
A91	SPI_VCC	B91	RSVD
A92	SPI_MISO	B92	RSVD
A93	GPO0	B93	RSVD
A94	SPI_CLK	B94	RSVD
A95	SPI_MOSI	B95	DDI1_DDC_AUX_SEL
A96	RSVD	B96	RSVD
A97	TYPE10#	B97	SPI_CS#
A98	RS1_TX	B98	DDI1_CTRLCLK_AUXP
A99	RS1_RX	B99	DDI1_CTRLDATA_AUXN
A100	GND13	B100	GND25
A101	RS2_TX	B101	FAN_PWMOUT
A102	RS2_RX	B102	FAN_TACHIN
A103	LID#	B103	SLEEP#
A104	VCC_12V	B104	VCC_12V
A105	VCC_12V	B105	VCC_12V

Pin No.	Description	Pin No.	Description
A106	VCC_12V	B106	VCC_12V
A107	VCC_12V	B107	VCC_12V
A108	VCC_12V	B108	VCC_12V
A109	VCC_12V	B109	VCC_12V
A110	GND14	B110	GND26

Table 3-2: COM Express Connector Pin Definitions

3.2.2 SPI Flash Connector

- CN Label:JSPI1
- CN Type:6-pin wafer
- CN Location:See Figure 3-3
- CN Pinouts:See Table 3-3

The SPI Flash connector is for flashing new BIOS onto the SPI BIOS chip.

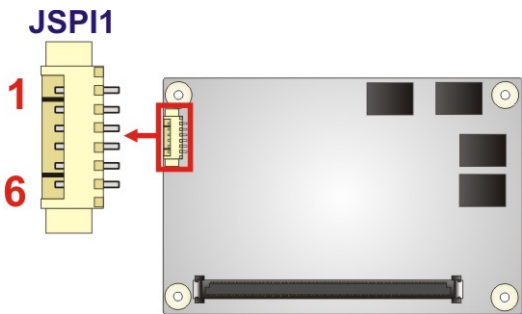


Figure 3-3: SPI Flash Connector Location

Pin	Description
1	+V1.8M_SPI_CON
2	SPI_CS
3	SPI_SO
4	SPI_CLK
5	SPI_SI
6	GND

Table 3-3: SPI Flash Connector Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the ICE-BT-T10 may result in permanent damage to the ICE-BT-T10 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ICE-BT-T10. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ICE-BT-T10 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:*** Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the ICE-BT-T10, place it on an anti-static pad. This reduces the possibility of ESD damaging the ICE-BT-T10.
- ***Only handle the edges of the PCB:*** When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations



NOTE:

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

ICE-BT-T10 COM Express Module



WARNING:

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

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

- Read the user manual:
 - The user manual provides a complete description of the ICE-BT-T10 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
 - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the ICE-BT-T10 on an antistatic pad:
 - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the ICE-BT-T10 off:
 - When working with the ICE-BT-T10, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the ICE-BT-T10 **DO NOT:**

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

4.3 Mounting ICE-BT-T10 to Baseboard

**NOTE:**

Baseboard can be designed by the end user, customized by IEI, or purchased from IEI. For more information visit the IEI website (www.ieiworld.com) or contact an IEI sales representative.

**WARNING:**

Never run the COM Express module without the heatsink and a thermal pad. The thermal pad acts as a thermal interface between the module and the heatsink. The heatsink must be installed on the ICE-BT-T10 to maintain proper operating temperatures. Make sure to maintain the heatsink temperature under 60°C in operation.

Follow the steps below to install the ICE-BT-T10 to the optional baseboard.

- Step 1:** Align the two COM Express connector on the solder side of the ICE-BT-T10 with the corresponding connector on the baseboard. Gently push the COM Express module down to ensure the connectors are properly connected (Figure 4-1).

ICE-BT-T10 COM Express Module

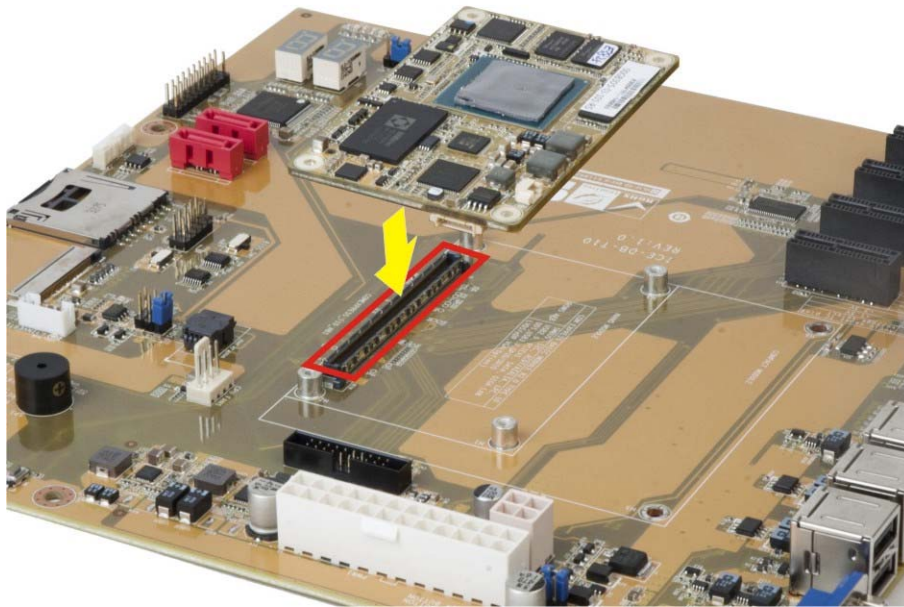


Figure 4-1: Connect the COM Express Connectors

- Step 2:** Ensure a thermal pad is placed on the CPU of the ICE-BT-T10.
- Step 3:** Place the heatsink on the ICE-BT-T10, aligning the retention screw holes (Figure 4-2).
- Step 4:** Secure the heatsink to the ICE-BT-T10 and the baseboard with the supplied retention screws (Figure 4-2).

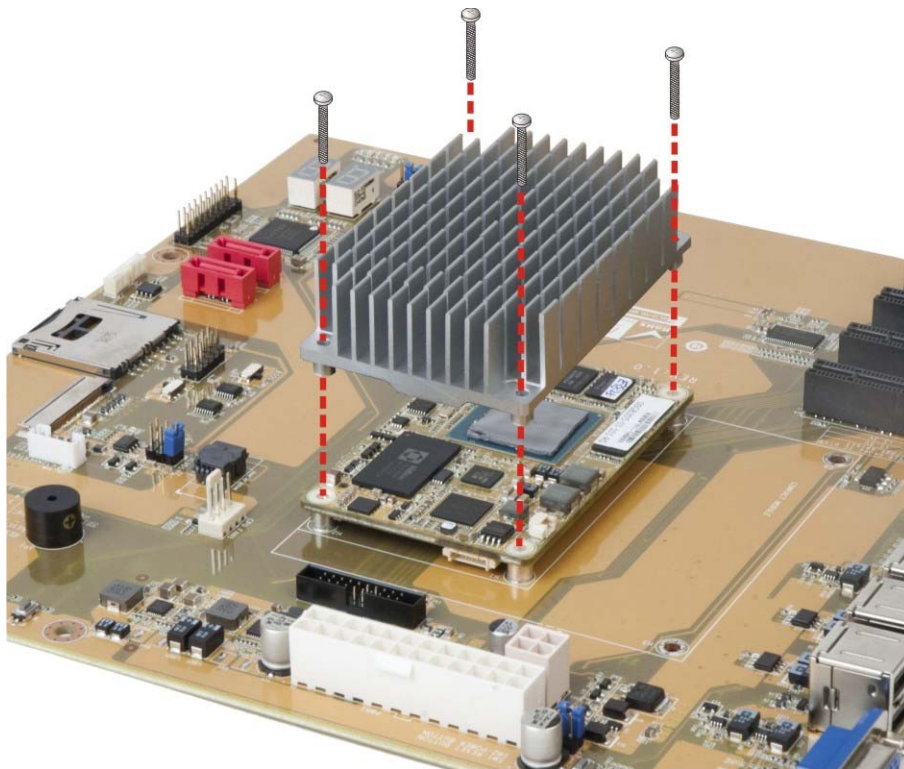


Figure 4-2: Secure the Heatsink

Chapter

5

BIOS

5.1 Introduction

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

5.1.1 Starting Setup

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

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

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

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **Esc** to quit. Navigation keys are shown in the following table.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Page Up key	Move to the next page
Page Dn key	Move to the previous page

ICE-BT-T10 COM Express Module

Key	Function
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Load previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

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

5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration are made, CMOS defaults. Use the clear CMOS jumper described in the baseboard user manual.

5.1.5 BIOS Menu Bar

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

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Save & Exit – Selects exit options and loads default settings.

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

5.2 Main

The **Main BIOS** menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.			
Main	Advanced	Chipset	Security Boot Save & Exit
BIOS Information			Set the Date. Use Tab to switch between Date elements.
BIOS Vendor		American Megatrends	
Core Version		5.009	
Compliance		UEFI 2.3; PI 1.2	
Project Version		B305AI10.ROM	
Build Date and Time		07/30/2014 16:42:55	
iWDD Vendor		iEi	
iWDD Version		B305ER10.bin	
CPU Configuration			
Microcode Patch		321	
BayTrail SoC		B3 Stepping	
Memory Information			
Total Memory		2048 MB (LPDDR3)	
GOP Information			
Intel(R) GOP Driver		[N/A]	
TXE Information			
Sec RC Version		00.05.00.00	
TXE FW Version		01.00.02.1060	
System Date		[Fri 01/01/2010]	
System Time		[15:10:27]	
Access Level		Administrator	
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.			

BIOS Menu 1: Main

The System Overview field also has two user configurable fields:

➔ **System Date [xx/xx/xx]**

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

➔ **System Time [xx:xx:xx]**

ICE-BT-T10 COM Express Module

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

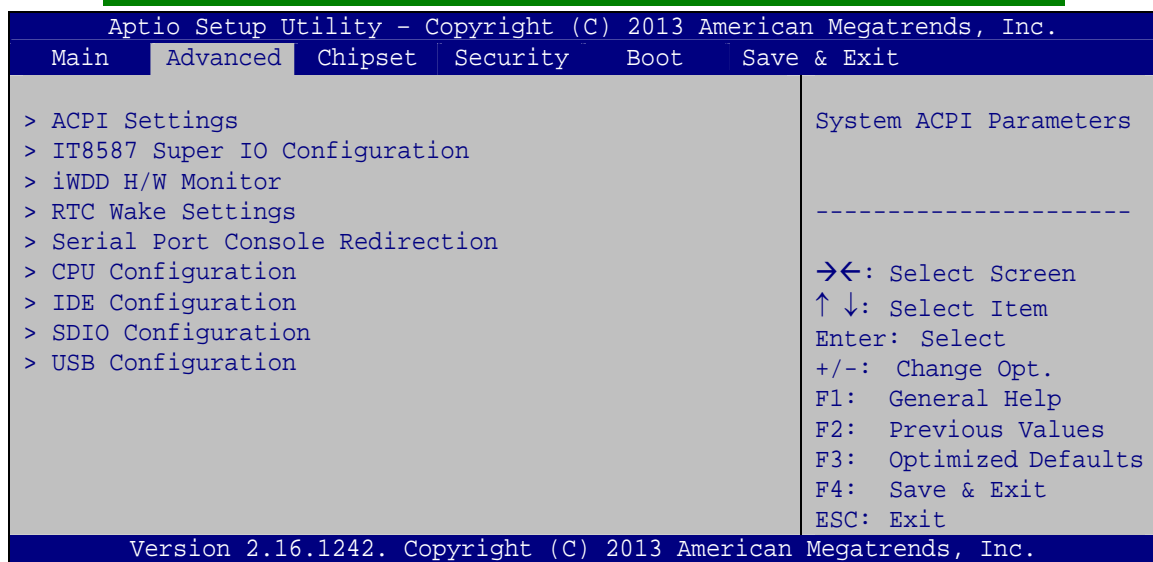
5.3 Advanced

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



WARNING:

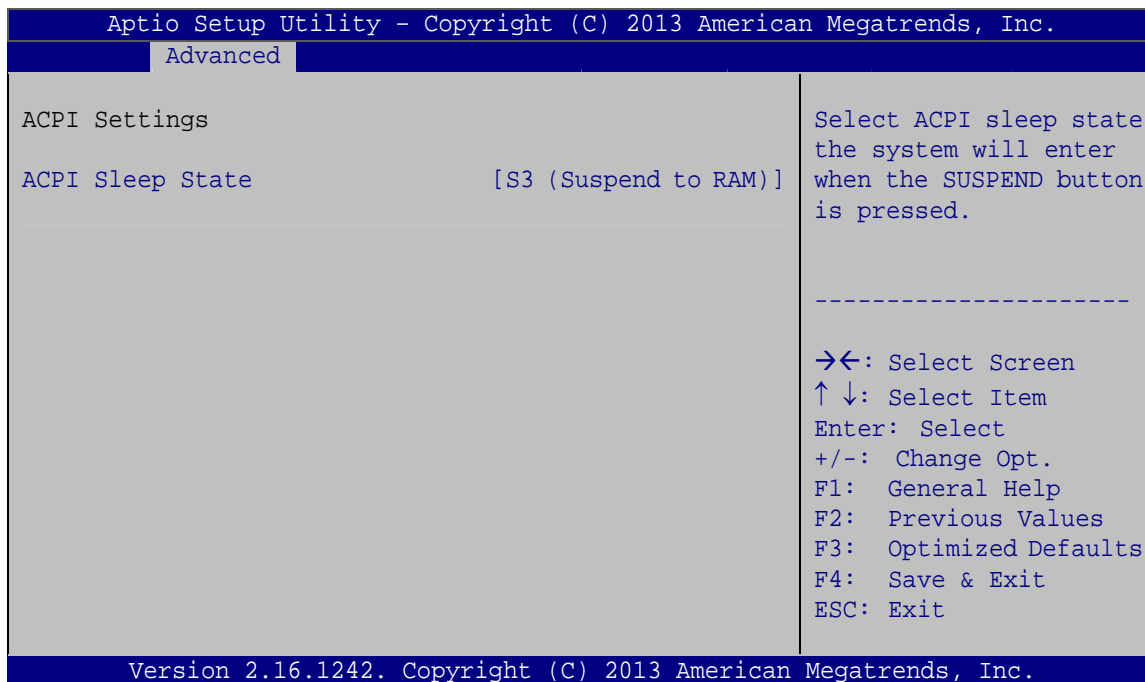
Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.



BIOS Menu 2: Advanced

5.3.1 ACPI Settings

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



BIOS Menu 3: ACPI Settings

➔ ACPI Sleep State [S3 (Suspend to RAM)]

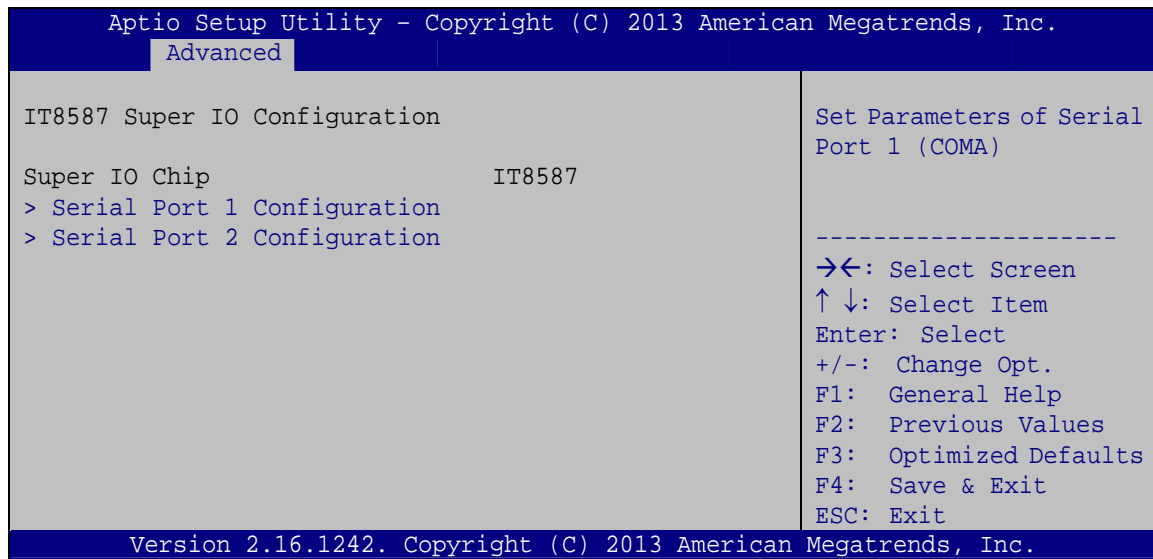
Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

- ➔ **S3 (Suspend to DEFAULT RAM)** The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

ICE-BT-T10 COM Express Module

5.3.2 IT8587 Super IO Configuration

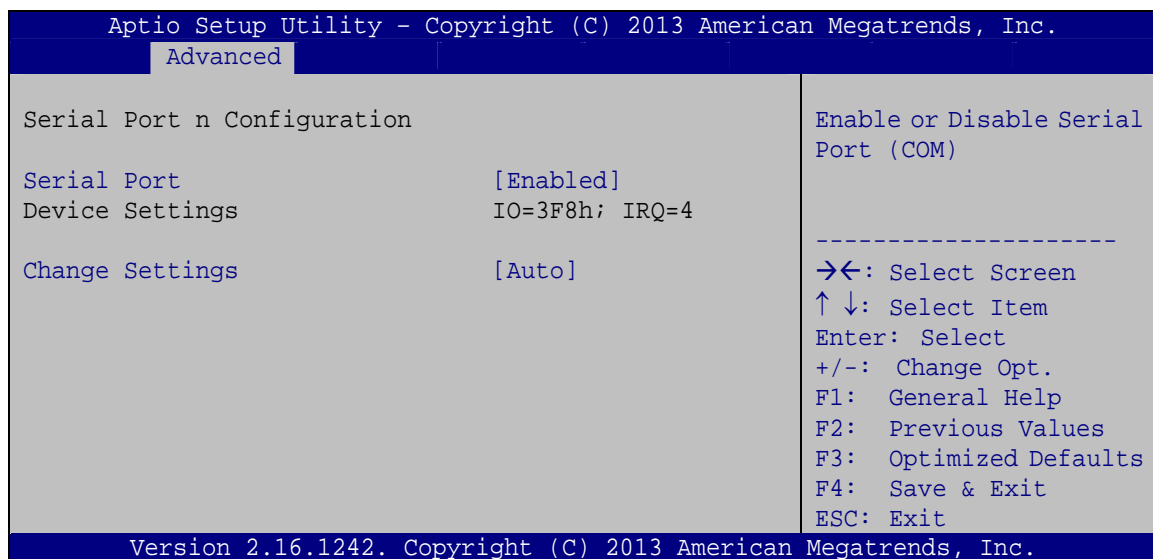
Use the **IT8587 Super IO Configuration** menu (**BIOS Menu 4**) to set or change the configurations for the serial ports.



BIOS Menu 4: IT8587 Super IO Configuration

5.3.2.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 5**) to configure the serial port n.



BIOS Menu 5: Serial Port n Configuration Menu



5.3.2.1.1 Serial Port 1 Configuration

➔ Serial Port [Enabled]

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

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

➔ Change Settings [Auto]

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

- ➔ Auto **DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- ➔ IO=3F8h;
 IRQ=4 Serial Port I/O port address is 3F8h and the interrupt address is IRQ4
- ➔ IO=3F8h;
 IRQ=3, 4,
 5, 6, 7, 9,
 10, 11, 12 Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
- ➔ IO=2F8h;
 IRQ=3, 4,
 5, 6, 7, 9,
 10, 11, 12 Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
- ➔ IO=3E8h;
 IRQ=3, 4,
 5, 6, 7, 9,
 10, 11, 12 Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
- ➔ IO=2E8h;
 IRQ=3, 4,
 5, 6, 7, 9,
 10, 11, 12 Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12



ICE-BT-T10 COM Express Module

5.3.2.1.2 Serial Port 2 Configuration

➔ Serial Port [Enabled]

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

- | | | | |
|---|-----------------|----------------|-------------------------|
| ➔ | Disabled | | Disable the serial port |
| ➔ | Enabled | DEFAULT | Enable the serial port |

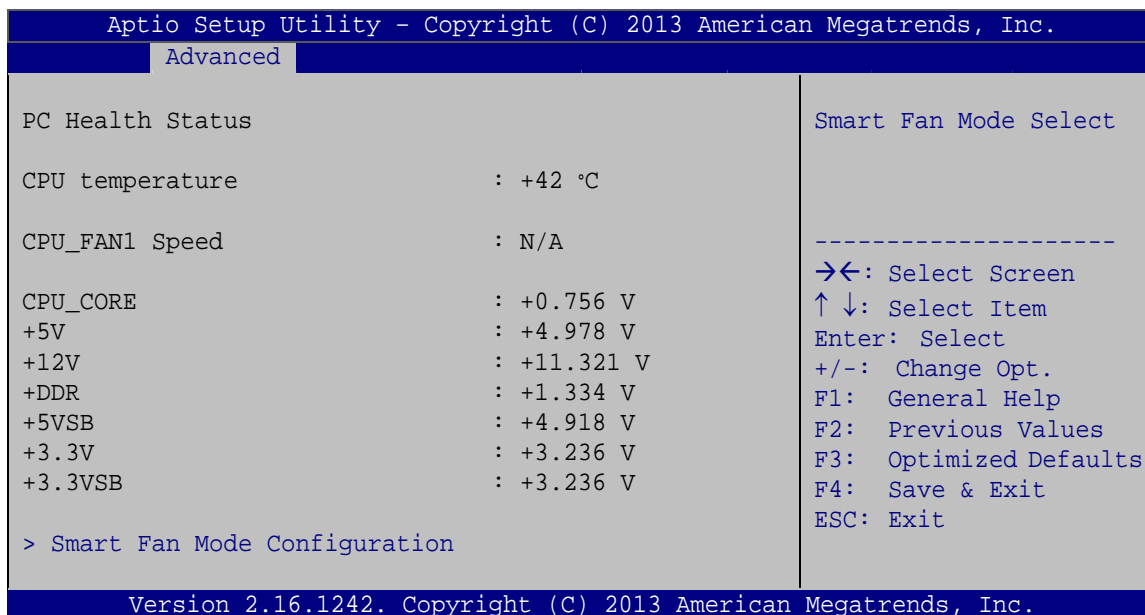
➔ Change Settings [Auto]

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

- | | | | |
|---|--|----------------|---|
| ➔ | Auto | DEFAULT | The serial port IO port address and interrupt address are automatically detected. |
| ➔ | IO=2F8h;
IRQ=3 | | Serial Port I/O port address is 2F8h and the interrupt address is IRQ3 |
| ➔ | IO=3F8h;
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 | | Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12 |
| ➔ | IO=2F8h;
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 | | Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12 |
| ➔ | IO=3E8h;
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 | | Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12 |
| ➔ | IO=2E8h;
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 | | Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12 |

5.3.3 iWDD H/W Monitor

The **iWDD H/W Monitor** menu (**BIOS Menu 6**) displays the CPU temperature and CPU fan speed, and contains the fan configuration submenu.



BIOS Menu 6: iWDD H/W Monitor

➔ PC Health Status

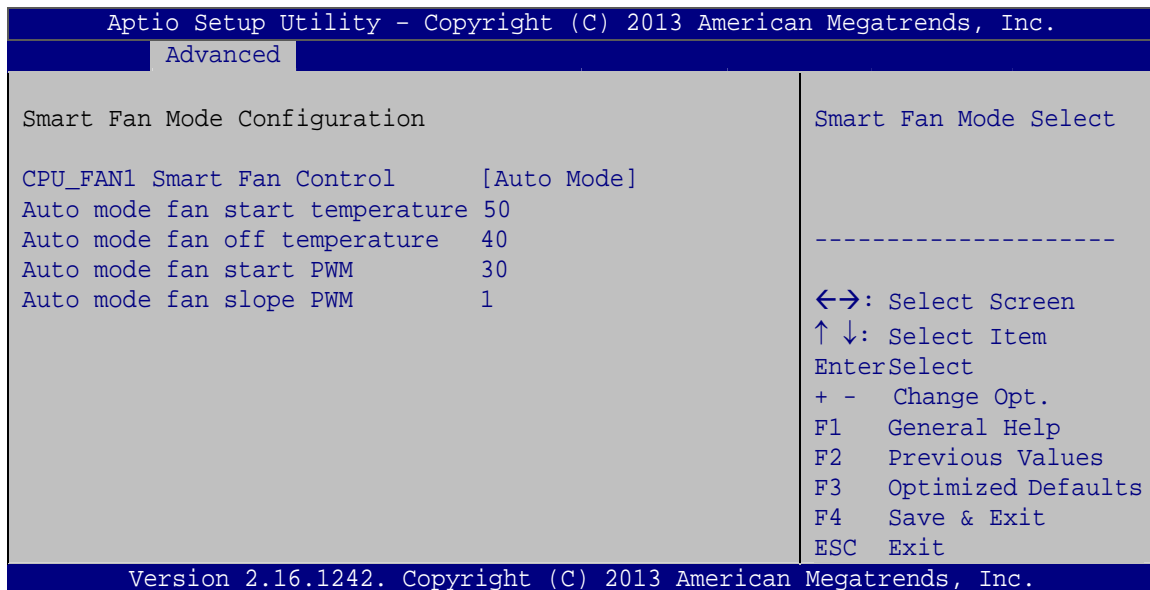
The following system parameters and values are shown. The system parameters that are monitored are:

- CPU temperature
- CPU_FAN1 Speed
- CPU_CORE
- +5V
- +12V
- +DDR
- +5VSB
- +3.3V
- +3.3VSB

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5.3.3.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 7**) to configure the smart fan temperature and speed settings.



BIOS Menu 7: Smart Fan Mode Configuration

➔ Fan 1 Smart Fan Control [Auto Mode]

Use the **Fan 1 Smart Fan Control** option to configure the CPU Smart Fan.

➔ **Manual Mode** The fan spins at the speed set in Manual by Duty Cycle settings

➔ **Auto Mode** **DEFAULT** The fan adjusts its speed using Auto by Duty-Cycle settings

➔ Auto mode fan start/off temperature

Use the + or – key to change the **Auto mode fan start/off temperature** value. Enter a decimal number between 1 and 100.

➔ Auto mode fan start PWM

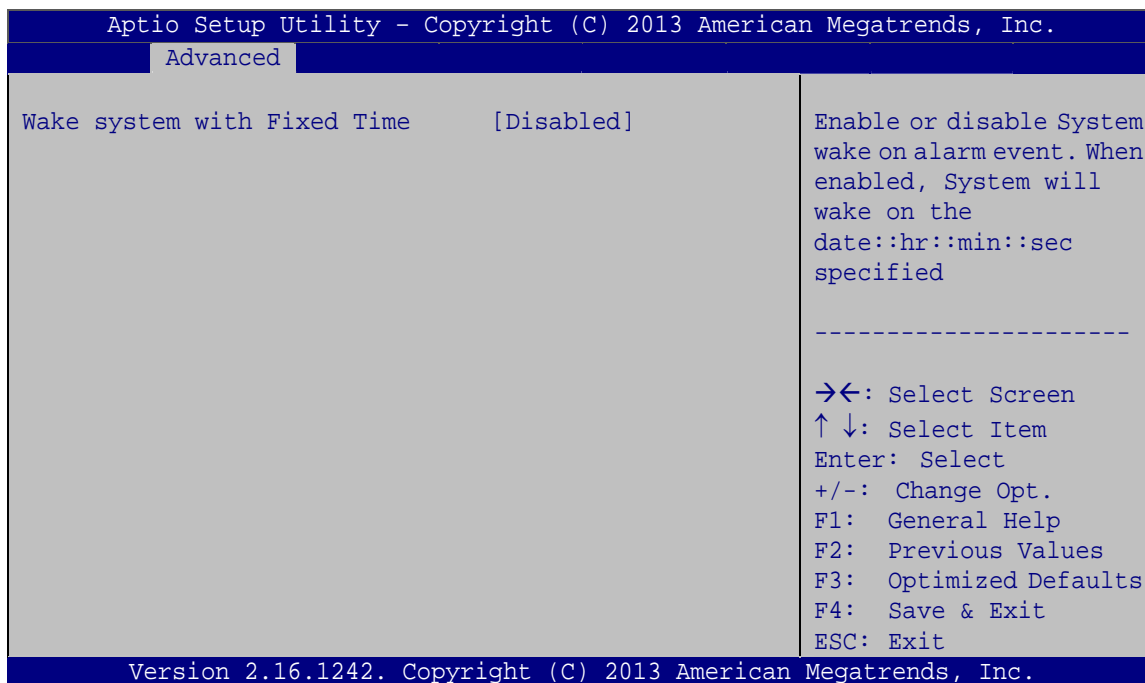
Use the + or – key to change the **Auto mode fan start PWM** value. Enter a decimal number between 1 and 100.

➔ Auto mode fan slope PWM

Use the + or – key to change the **Auto mode fan slope PWM** value. Enter a decimal number between 1 and 64.

5.3.4 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 8**) enables the system to wake at the specified time.



BIOS Menu 8: RTC Wake Settings

➔ Wake system with Fixed Time [Disabled]

Use the **Wake system with Fixed Time** option to enable or disable the system wake on alarm event.

- | | | | |
|---|-----------------|----------------|---|
| ➔ | Disabled | DEFAULT | The real time clock (RTC) cannot generate a wake event |
| ➔ | Enabled | | If selected, the Wake up every day option appears allowing you to enable to disable the system to wake every day at the specified time. Besides, the |

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following options appear with values that can be selected:

Wake up date

Wake up hour

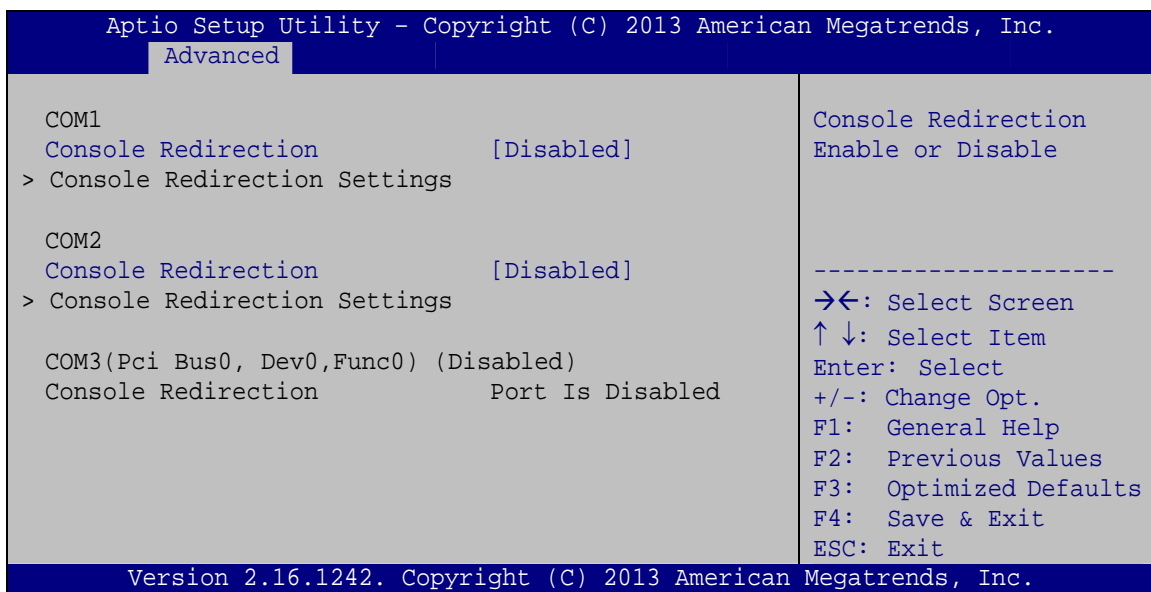
Wake up minute

Wake up second

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

5.3.5 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 9**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



BIOS Menu 9: Serial Port Console Redirection

➔ Console Redirection [Disabled]

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

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

- ➔ **Enabled** Enabled the console redirection function

**NOTE:**

The following five options appear when the **Console Redirection** option is enabled.

➔ **Terminal Type [ANSI]**

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

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

➔ **Bits per second [115200]**

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

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

➔ **Data Bits [8]**

Use the **Data Bits** option to specify the number of data bits.

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- ➔ 7 Sets the data bits at 7.
- ➔ 8 **DEFAULT** Sets the data bits at 8.

➔ **Parity [None]**

Use the **Parity** option to specify the parity bit that can be sent with the data bits for detecting the transmission errors.

- ➔ **None** **DEFAULT** No parity bit is sent with the data bits.
- ➔ **Even** The parity bit is 0 if the number of ones in the data bits is even.
- ➔ **Odd** The parity bit is 0 if the number of ones in the data bits is odd.
- ➔ **Mark** The parity bit is always 1. This option does not provide error detection.
- ➔ **Space** The parity bit is always 0. This option does not provide error detection.

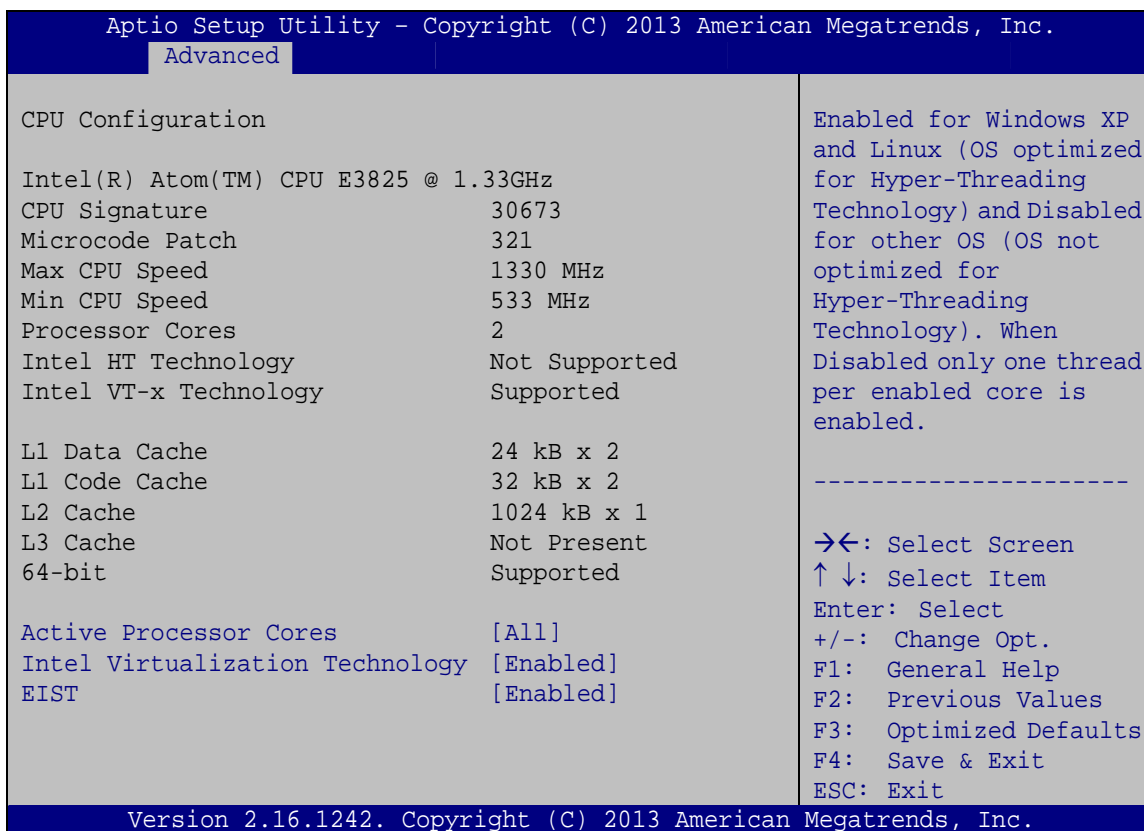
➔ **Stop Bits [1]**

Use the **Stop Bits** option to specify the number of stop bits used to indicate the end of a serial data packet. Communication with slow devices may require more than 1 stop bit.

- ➔ 1 **DEFAULT** Sets the number of stop bits at 1.
- ➔ 2 Sets the number of stop bits at 2.

5.3.6 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 10**) to view detailed CPU specifications and configure the CPU.



BIOS Menu 10: CPU Configuration

The CPU Configuration menu (**BIOS Menu 10**) lists the following CPU details:

- Processor Type: Lists the brand name of the CPU being used
- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.
- Max CPU Speed: Lists the maximum CPU processing speed.
- Min CPU Speed: Lists the minimum CPU processing speed.
- Processor Cores: Lists the number of the processor core
- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.

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- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.
- 64-bit: Indicates if 64-bit is supported by the CPU.

➔ Active Processor Cores [All]

Use the **Active Processor Cores** BIOS option to enable numbers of cores in the processor package.

- ➔ **All** **DEFAULT** Enable all cores in the processor package.
- ➔ **1** Enable one core in the processor package.

➔ Intel Virtualization Technology [Enabled]

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

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

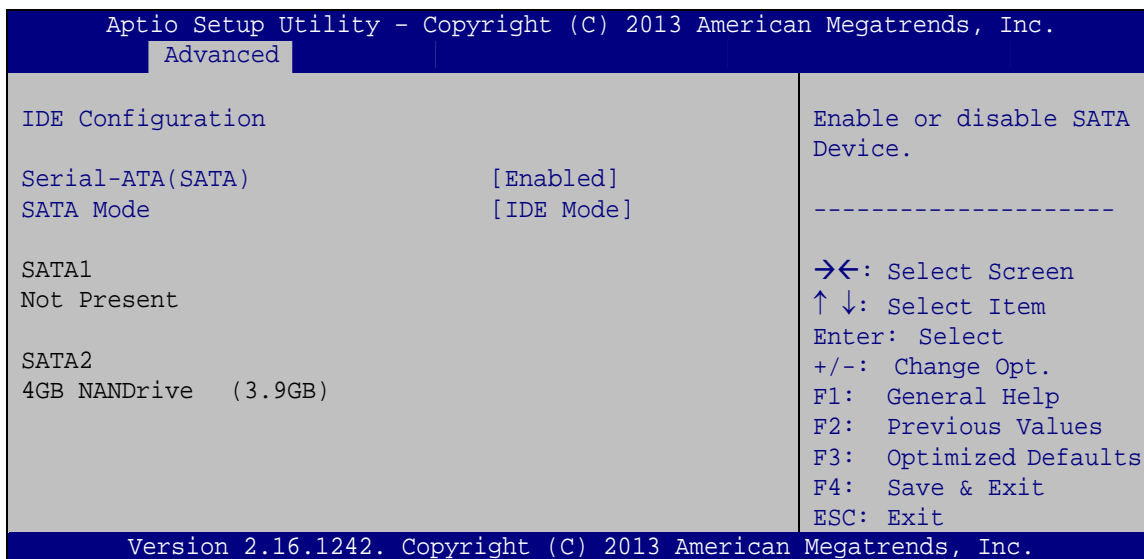
➔ EIST [Enabled]

Use the **EIST** option to enable or disable Enhanced Intel SpeedStep® Technology (EIST).

- ➔ **Disabled** Disables Enhanced Intel SpeedStep® Technology.
- ➔ **Enabled** **DEFAULT** Enables Enhanced Intel SpeedStep® Technology.

5.3.7 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 11**) to change and/or set the configuration of the SATA devices installed in the system.



BIOS Menu 11: SATA Configuration

➔ Serial-ATA (SATA) [Enabled]

Use the **Serial-ATA (SATA)** option to enable or disable the SATA controller.

➔ **Enabled** **DEFAULT** Enable SATA controller.

➔ **Disabled** Disable SATA controller.

➔ SATA Mode Selection [IDE]

Use the **SATA Mode Selection** option to configure SATA devices.

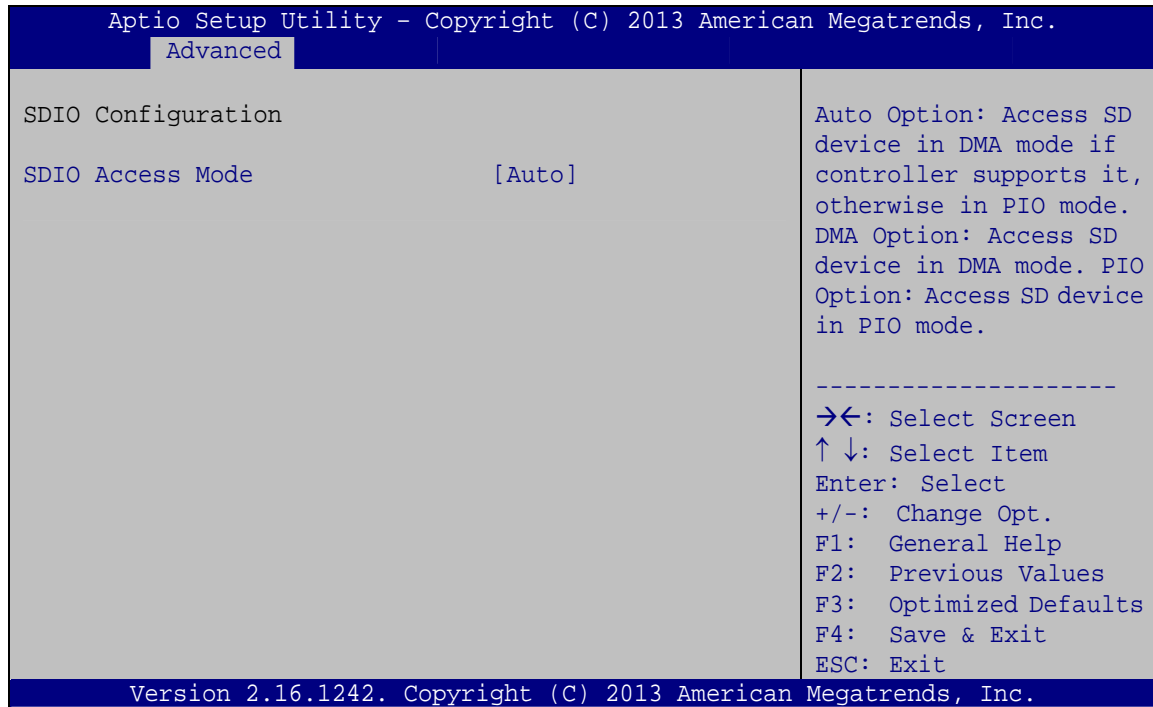
➔ **IDE** **DEFAULT** Configures SATA devices as normal IDE device.

➔ **AHCI** Configures SATA devices as AHCI device.

ICE-BT-T10 COM Express Module

5.3.8 SDIO Configuration

Use the **SDIO Configuration** menu (**BIOS Menu 12**) to configure the SD card slot.



BIOS Menu 12: USB Configuration

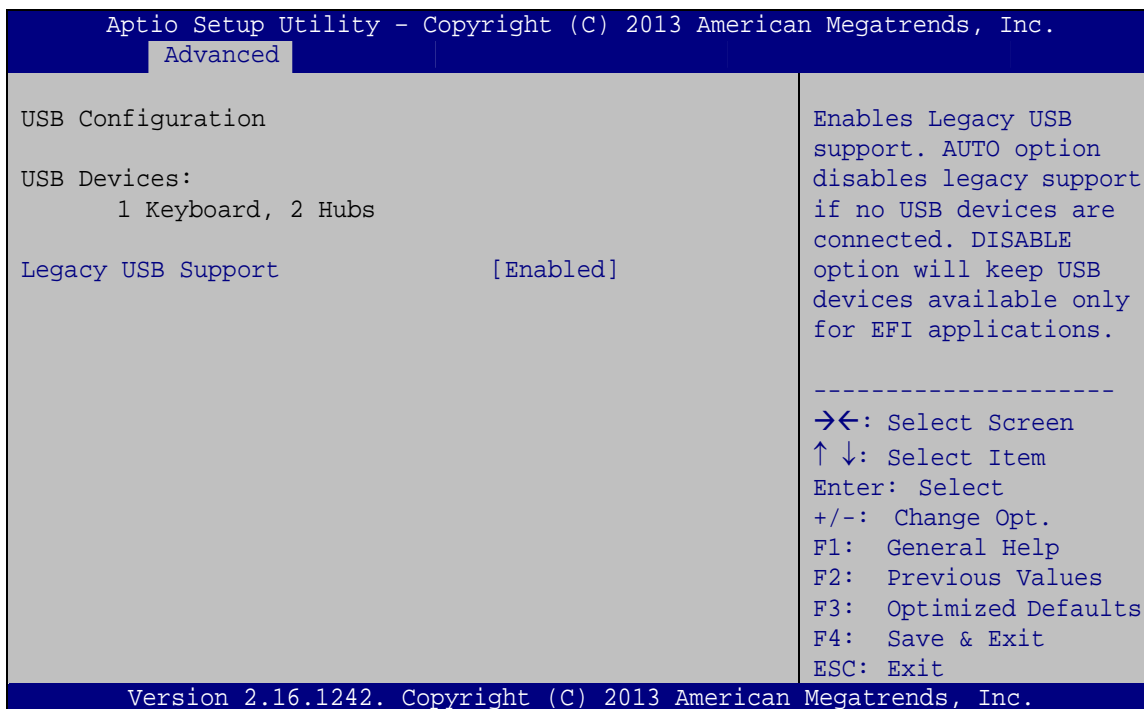
→ SDIO Access Mode [Auto]

Use the **SDIO Access Mode** BIOS to select SD device access modes.

- | | | | |
|---|-------------|----------------|---|
| → | Auto | DEFAULT | If controller supports DMA mode, access SD device in DMA mode; if not, access in PIO mode |
| → | DMA | | Access SD device in DMA mode |
| → | PIO | | Access SD device in PIO mode |

5.3.9 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 13**) to read USB configuration information and configure the USB settings.



BIOS Menu 13: USB Configuration

➔ USB Devices

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

➔ Legacy USB Support [Enabled]

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

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

➔ **Enabled** **DEFAULT** Legacy USB support enabled

ICE-BT-T10 COM Express Module

- | | | |
|---|-----------------|---|
| ➔ | Disabled | Legacy USB support disabled |
| ➔ | Auto | Legacy USB support disabled if no USB devices are connected |

5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 14**) to access the North Bridge and South Bridge configuration menus.



WARNING!

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

```

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
Main      Advanced  Chipset    Security    Boot      Save & Exit

> North Bridge
> South Bridge

North Bridge Parameters.

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

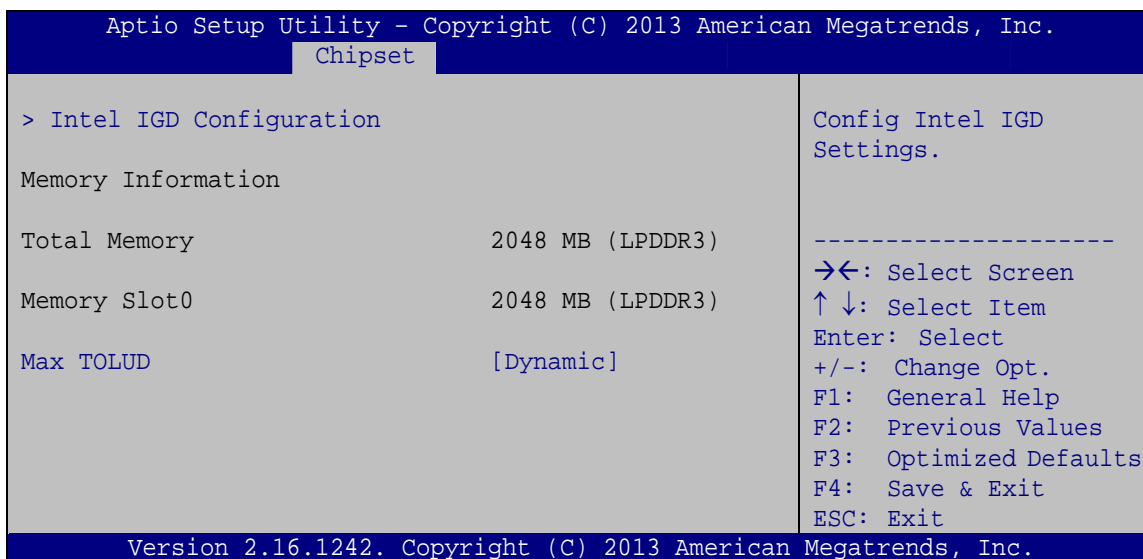
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

```

BIOS Menu 14: Chipset

5.4.1 North Bridge

Use the **North Bridge** menu (**BIOS Menu 15**) to configure the north bridge parameters.



BIOS Menu 15: North Bridge Configuration

➔ Max TOLUD [Dynamic]

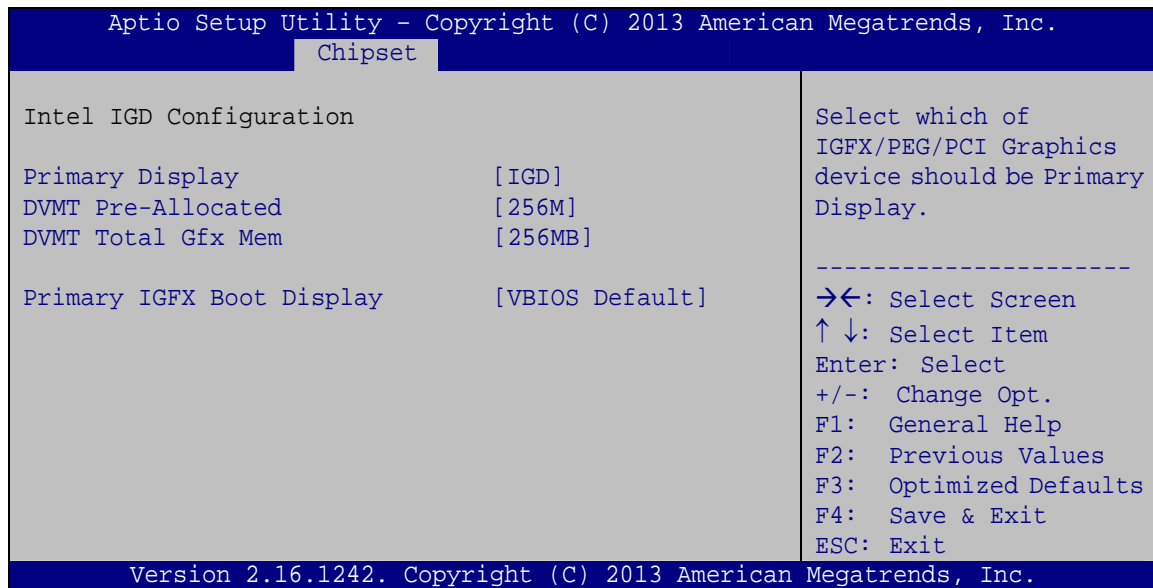
Use the **Max TOLUD** option to select the maximum value of TOLUD.

- Dynamic **DEFAULT**
- 2 GB
- 2.25 GB
- 2.5 GB
- 2.75 GB
- 3 GB

ICE-BT-T10 COM Express Module

5.4.1.1 Intel IGD Configuration

Use the **Intel IGD Configuration** submenu (**BIOS Menu 16**) to configure the graphics settings.



BIOS Menu 16: Graphics Configuration

➔ Primary Display [Auto]

Use the **Primary Display** option to select the primary graphics controller the system uses. The following options are available:

- Auto
- IGD **Default**
- PCIe
- SG

➔ DVMT Pre-Allocated [256M]

Use the **DVMT Pre-Allocated** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- 64M

- 128M
- 256M **Default**
- 512M

➔ **DVMT Total Gfx Mem [MAX]**

Use the **DVMT Total Gfx Mem** option to select DVMT5.0 total graphic memory size used by the internal graphic device. The following options are available:

- 128M
- 256M **Default**
- MAX

➔ **Primary IGFX Boot Display [VBIOS Default]**

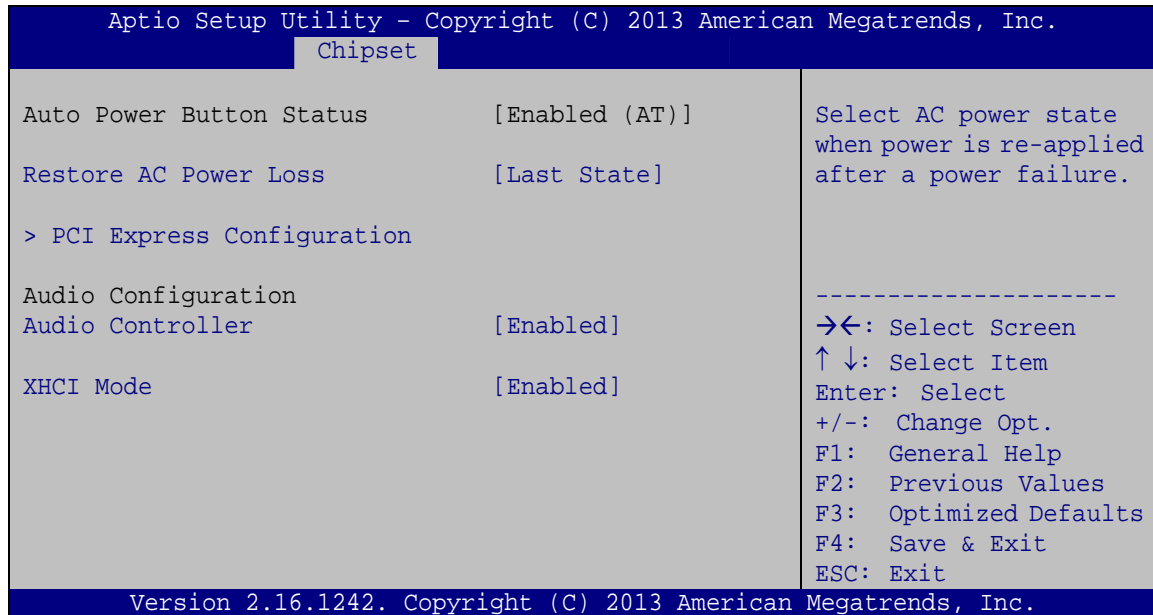
Use the **Primary IGFX Boot Display** option to select the display device used by the system when it boots. Configuration options are listed below.

- VBIOS Default **DEFAULT**
- CRT
- EFP
- LFP
- EFP3
- EFP2
- LFP2

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5.4.2 South Bridge Configuration

Use the **South Bridge** menu (**BIOS Menu 17**) to configure the south bridge chipset.



BIOS Menu 17: PCH-IO Configuration

➔ Restore AC Power Loss [Last State]

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

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

➔ Audio Controller [Enabled]

Use the **Audio Controller** BIOS option to enable or disable the High Definition Audio controller.

- ➔ **Disabled** The High Definition Audio controller is disabled.



➔ **Enabled** **DEFAULT** The High Definition Audio controller is enabled.

➔ **XHCI Mode [Enabled]**

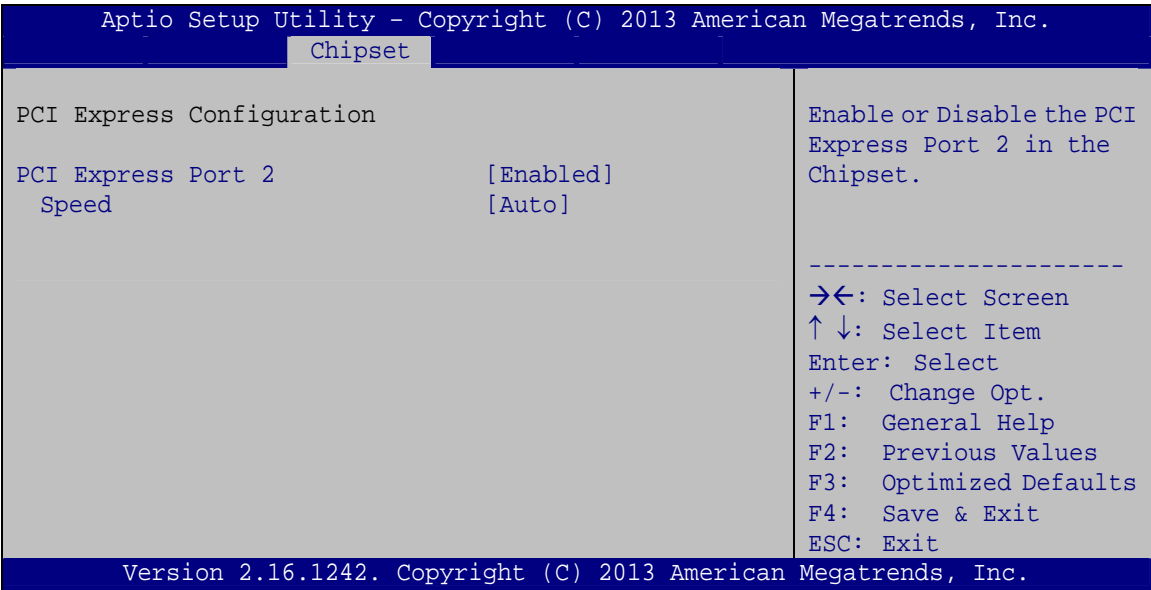
Use the **XHCI Mode** BIOS option to configure the USB xHCI (USB 3.0) controller.

➔ **Enabled** **DEFAULT** Enable the xHCI controller. USB 3.0 ports behave as USB 3.0 ports.

➔ **Disabled** Disable the xHCI controller.

5.4.2.1 PCI Express Configuration

Use the **PCI Express Configuration** menu (**BIOS Menu 18**) to select the support type of the PCI Express or PCIe Mini slots.



BIOS Menu 18: PCI Express Configuration

➔ **PCI Express Port 2 [Enabled]**

Use the **PCI Express Port 2** option to enable or disable the PCI Express slot on the baseboard.

➔ **Enabled** **DEFAULT** The PCI Express slot is enabled.



ICE-BT-T10 COM Express Module

➔ **Disabled** The PCI Express slot is disabled.

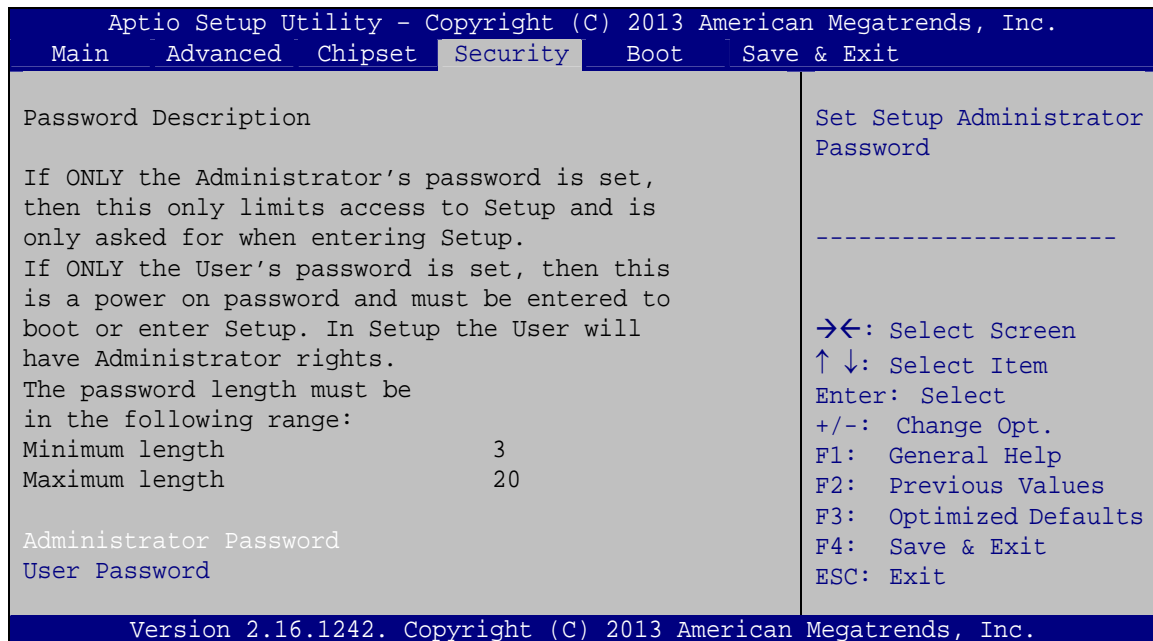
➔ **PCIe Speed**

Use PCIe Speed option to select the speed type of the PCI Express slots. The following options are available:

- Auto **Default**
- Gen1
- Gen2

5.5 Security

Use the **Security** menu (**BIOS Menu 19**) to set system and user passwords.



BIOS Menu 19: Security

➔ **Administrator Password**

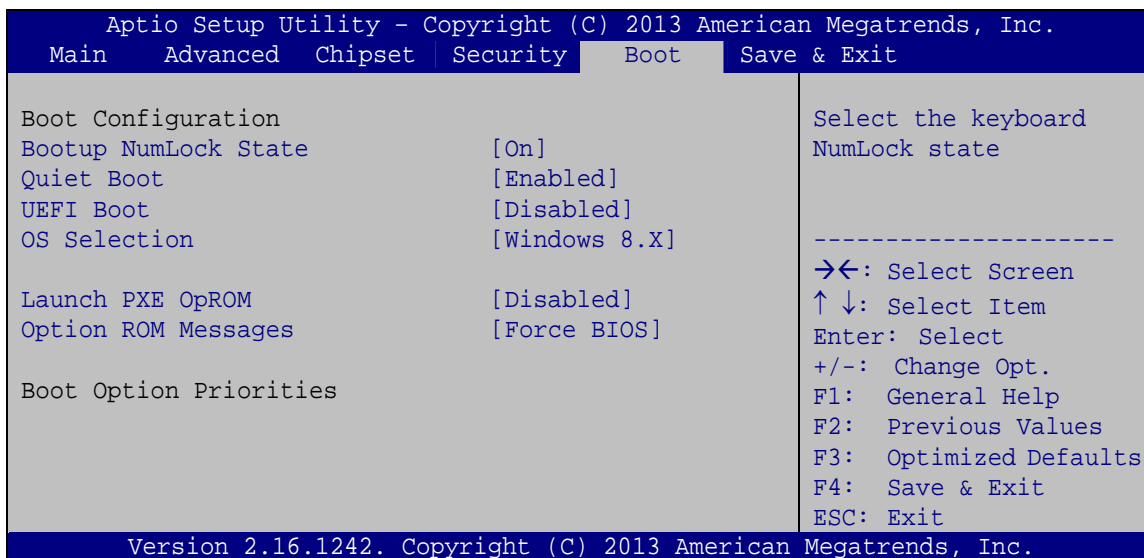
Use the **Administrator Password** to set or change an administrator password.

➔ **User Password**

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

5.6 Boot

Use the **Boot menu (BIOS Menu 20)** to configure system boot options.



BIOS Menu 20: Boot

➔ Bootup NumLock State [On]

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

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

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→ Quiet Boot [Enabled]

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

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

→ UEFI Boot [Disabled]

Use the **UEFI Boot** BIOS option to allow the system to boot from the UEFI devices.

- **Enabled** Enables to boot from the UEFI devices.
- **Disabled** **DEFAULT** Disables to boot from the UEFI devices.

→ OS Selection [Windows 8.X]

Use the **OS Selection** option to select an operating system for the system.

- Windows 8.X **DEFAULT**
- Android
- Windows 7

→ Launch PXE OpROM [Disabled]

Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

- **Disabled** **DEFAULT** Ignore all PXE Option ROMs
- **Enabled** Load PXE Option ROMs.

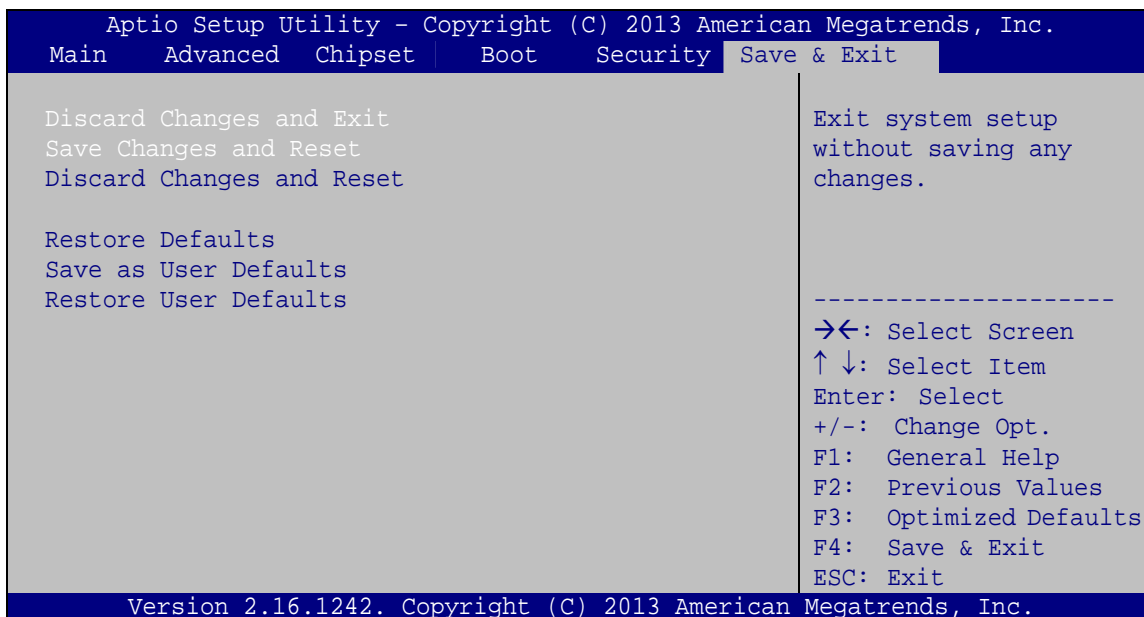
→ Option ROM Messages [Force BIOS]

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

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

5.7 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 21**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 21: Save & Exit

➔ Discard Changes and Exit

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

➔ Save Changes and Reset

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

➔ Discard Changes and Reset

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

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➔ Restore Defaults

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

➔ Save as User Defaults

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

➔ Restore User Defaults

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

Chapter

6

Software Drivers

ICE-BT-T10 COM Express Module

6.1 Available Software Drivers

**NOTE:**

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

The following drivers can be installed on the system:

- Chipset
- Graphics
- LAN

Installation instructions are given below.

6.2 Starting the Driver Program

To access the driver installation programs, please do the following.

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

**NOTE:**

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

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



Figure 6-1: Start Up Screen

Step 3: Click ICE-BT-T10.

Step 4: The list of drivers in **Figure 6-2** appears.



Figure 6-2: Drivers

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6.3 Chipset Driver Installation

To install the chipset driver, please do the following.

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

Step 2: Click “**1-Bay Trail SOC**” and select the folder which corresponds to the operating system.



NOTE:

The remainder of this installation assumes Windows 8 as the operating system.

Step 3: Locate the setup file (infinst_autol_9.4.4.1006.exe) and double click on it.

Step 4: When the setup files are completely extracted, the **Welcome Screen** in **Figure 6-3** appears. Click **Next** to continue.



Figure 6-3: Chipset Driver Welcome Screen

Step 5: The **License Agreement** in **Figure 6-4** appears.

Step 6: Click **Yes** to accept the agreement and continue.



Figure 6-4: Chipset Driver License Agreement

Step 7: The **Read Me** file in **Figure 6-5** appears.

Step 8: Click **Next** to continue.

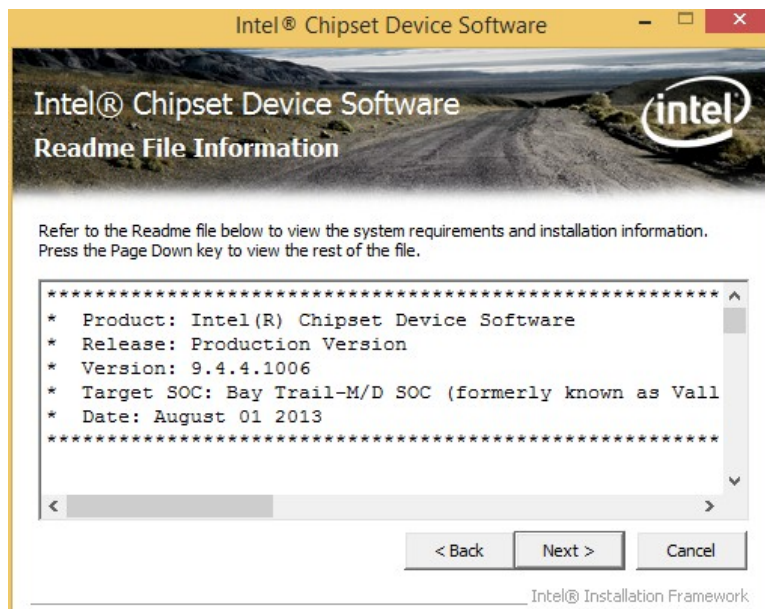


Figure 6-5: Chipset Driver Read Me File

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Step 9: **Setup Operations** are performed as shown in **Figure 6-6**.

Step 10: Once the **Setup Operations** are complete, click **Next** to continue.



Figure 6-6: Chipset Driver Setup Operations

Step 11: The **Finish** screen in **Figure 6-7** appears.

Step 12: Select “**Yes, I want to restart this computer now**” and click **Finish**.



Figure 6-7: Chipset Driver Installation Finish Screen

6.4 Graphics Driver Installation

To install the graphics driver, please do the following.

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

Step 2: Click “**1-Bay Trail SOC**” and select the folder which corresponds to the operating system.



NOTE:

The remainder of this installation assumes Windows 8 as the operating system.

Step 3: Unzip the file called **15.33.7.3366.zip**, and then locate the setup file and double click on it to start the installation. If a 64-bit operating system is installed, please unzip the 15.33.7.64.336.zip file to install the graphics driver.



NOTE:

To install graphics driver on a **32-bit** Windows 7 system, unzip INTEL_EMGD.WIN7_PC_VERSION_36_15_0_1064.7Z.

To install graphics driver on a **64-bit** Windows 7 system, unzip INTEL_EMGD.WIN7_BETA_VERSION_37_15_0_1055.7Z.

Step 4: The **Welcome Screen** in **Figure 6-8** appears.

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

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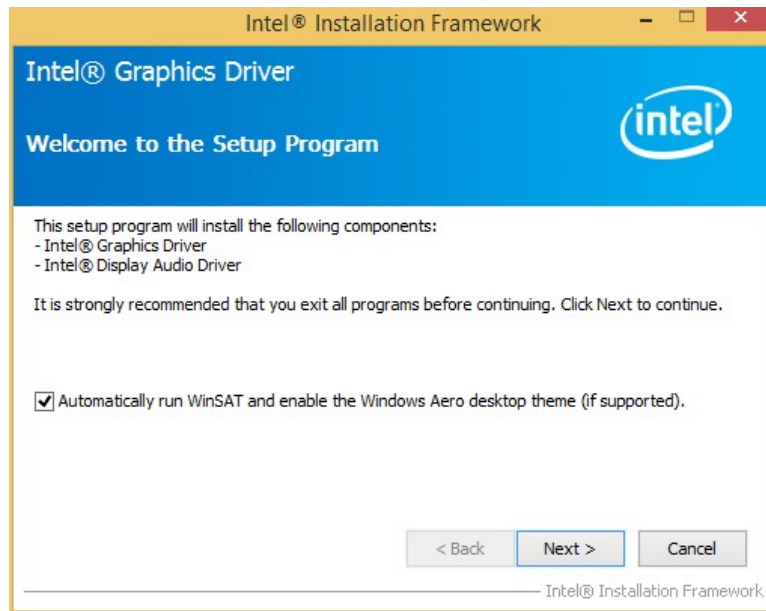


Figure 6-8: Graphics Driver License Agreement

Step 6: The **License Agreement** in **Figure 6-9** appears.

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

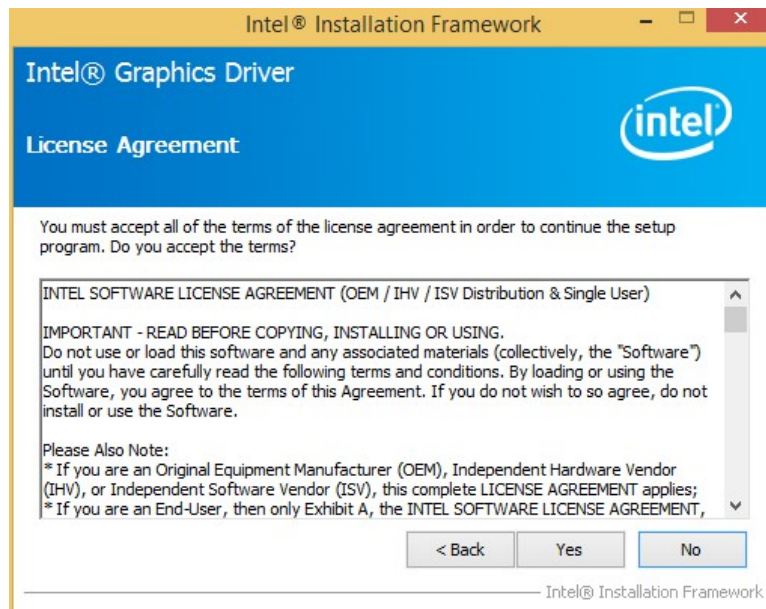


Figure 6-9: Graphics Driver Read Me File

Step 8: The **Read Me** file in **Figure 6-10** appears. Click **Next** to continue.

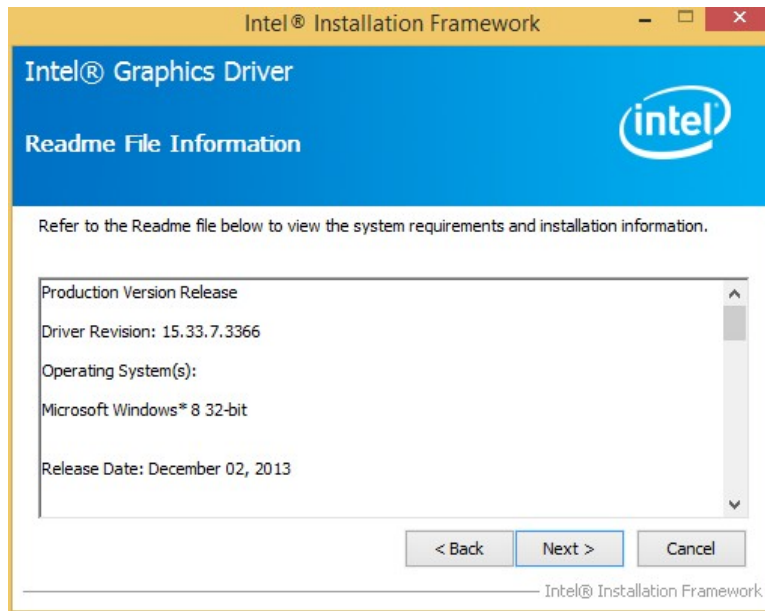


Figure 6-10: Graphics Driver Setup Operations

Step 9: Setup Operations are performed as shown in Figure 6-11.

Step 10: Once the Setup Operations are complete, click **Next** to continue.

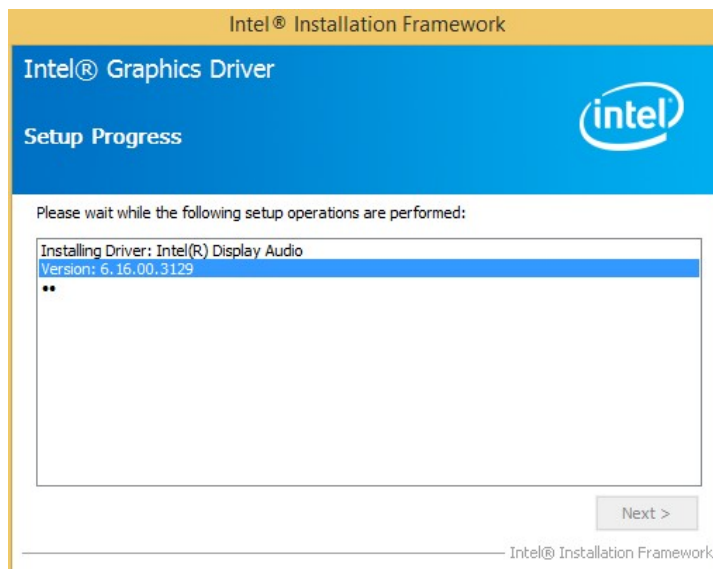


Figure 6-11: Graphics Driver Installation Finish Screen

Step 11: The system starts installing the Graphics Driver.

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

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Step 13: Select “Yes, I want to restart this computer now” and click **Finish**.

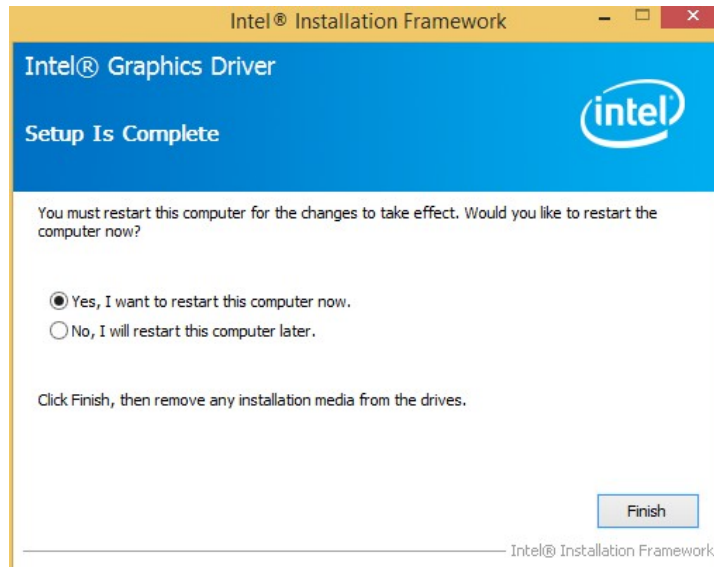


Figure 6-12: Graphics Driver Installation Finish Screen

6.5 LAN Driver Installation

To install the LAN driver, please do the following.

Step 1: Right-click the Computer button from the start menu and select **Properties** (Figure 6-13).

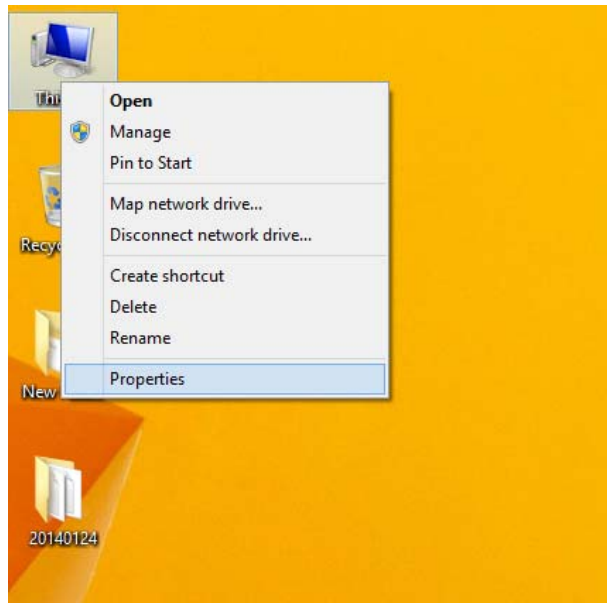


Figure 6-13: Windows Control Panel

Step 2: The system control panel window in **Figure 6-14** appears.

Step 3: Click the Device Manager link (**Figure 6-14**).

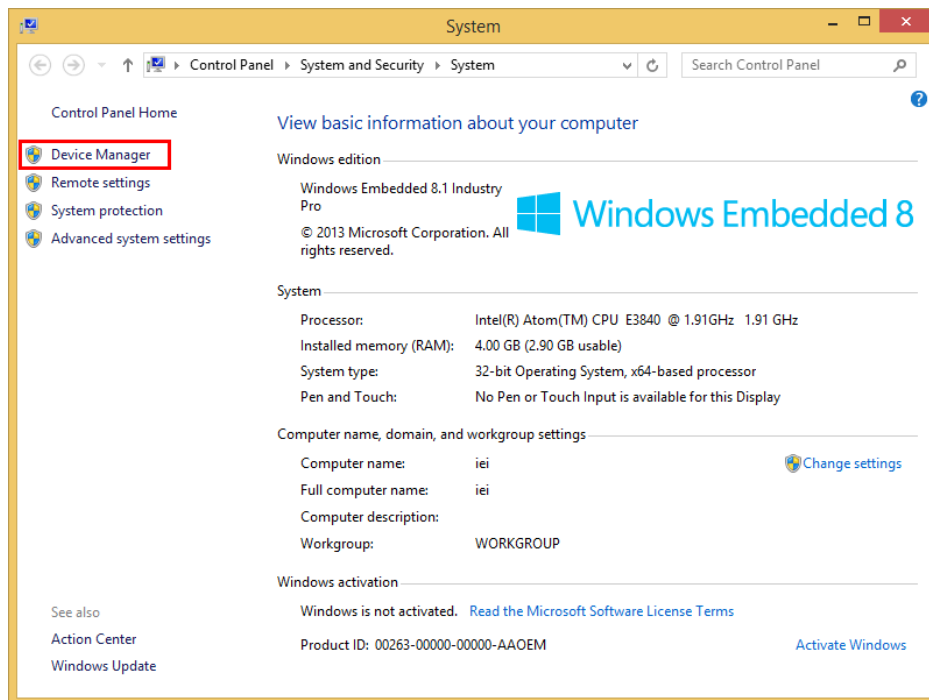


Figure 6-14: System Control Panel

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Step 4: A list of system hardware devices appears (**Figure 6-15**).

Step 5: Right-click the Ethernet Controller that has question marks next to it (this means Windows does not recognize the device).

Step 6: Select **Update Driver Software**.

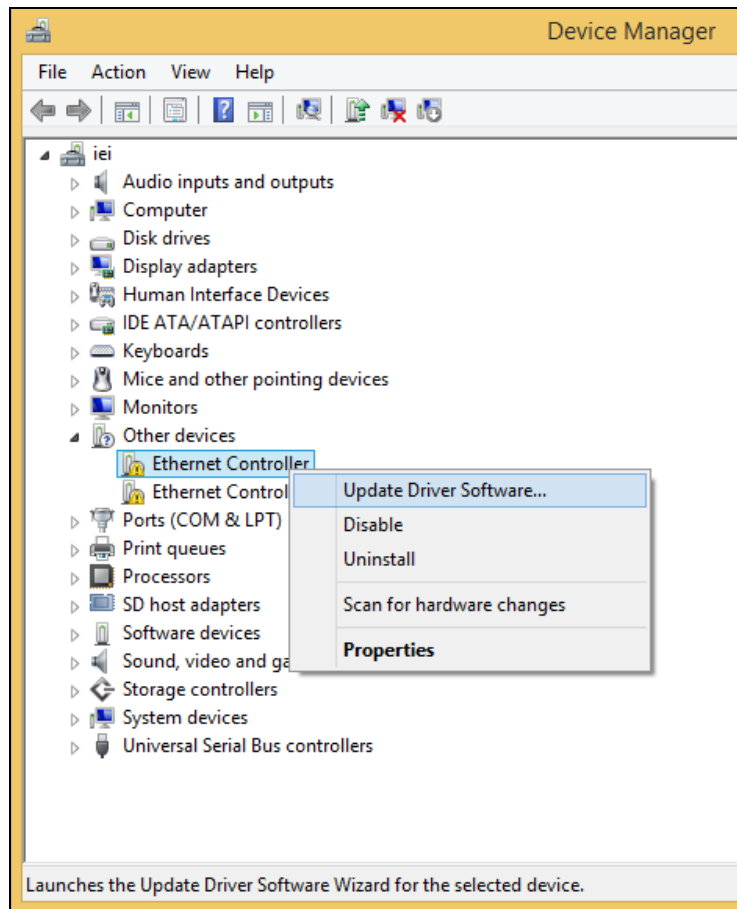


Figure 6-15: Device Manager List

Step 7: The Update Driver Software Window appears (**Figure 6-16**).

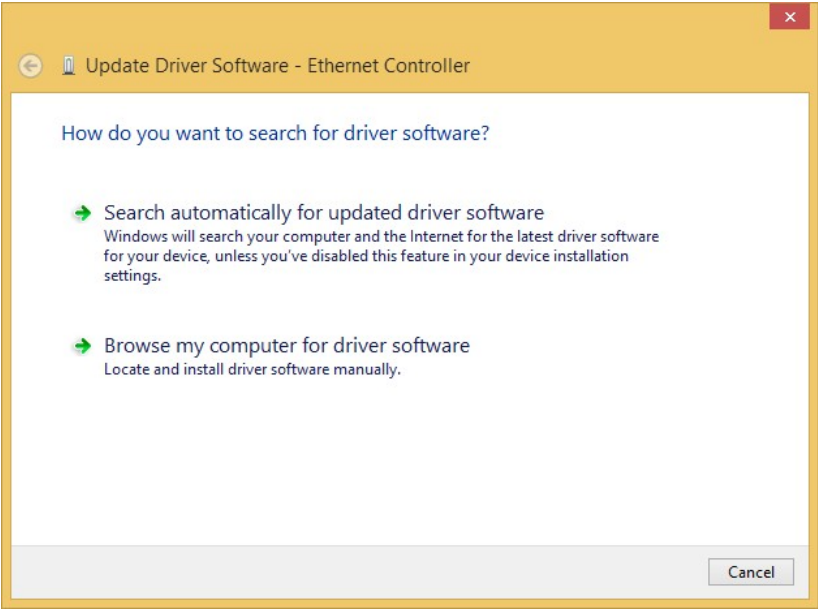


Figure 6-16: Update Driver Software Window

- Step 8:** Select “Browse my computer for driver software” and click **NEXT** to continue.
- Step 9:** Click Browse to select “X:\2-LAN\Intel” directory in the **Locate File** window, where “X:\” is the system CD drive. (Figure 6-17).

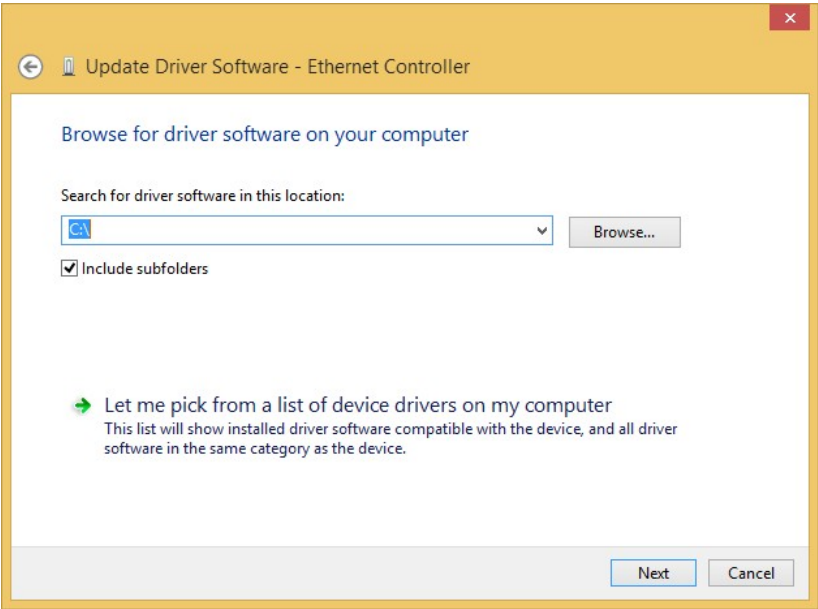


Figure 6-17: Locate Driver Files

- Step 10:** Click **NEXT** to continue.

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Step 11: Driver Installation is performed. When the **Finish** screen appears, click **Close** to exit.

Step 12: Right-click the other Ethernet controller that has question marks next to it as shown in **Figure 6-15**. Repeat **Step 6** – **Step 11** to install the second Ethernet controller driver.

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY



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

FCC WARNING



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

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Appendix

B

BIOS Options

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

System Date [xx/xx/xx]	30
System Time [xx:xx:xx]	30
ACPI Sleep State [S3 (Suspend to RAM)]	32
Serial Port [Enabled]	34
Change Settings [Auto]	34
Serial Port [Enabled]	35
Change Settings [Auto]	35
PC Health Status	36
Fan 1 Smart Fan Control [Auto Mode]	37
Auto mode fan start/off temperature	37
Auto mode fan start PWM	37
Auto mode fan slope PWM	38
Wake system with Fixed Time [Disabled]	38
Console Redirection [Disabled]	39
Terminal Type [ANSI]	40
Bits per second [115200]	40
Data Bits [8]	40
Parity [None]	41
Stop Bits [1]	41
Active Processor Cores [All]	43
Intel Virtualization Technology [Enabled]	43
EIST [Enabled]	43
Serial-ATA (SATA) [Enabled]	44
SATA Mode Selection [IDE]	44
SDIO Access Mode [Auto]	45
USB Devices	46
Legacy USB Support [Enabled]	46
Max TOLUD [Dynamic]	48
Primary Display [Auto]	49
DVMT Pre-Allocated [256M]	49
DVMT Total Gfx Mem [MAX]	50
Primary IGFX Boot Display [VBIOS Default]	50
Restore AC Power Loss [Last State]	51

Audio Controller [Enabled]	51
XHCI Mode [Enabled].....	52
PCI Express Port 2 [Enabled]	52
PCIe Speed	53
Administrator Password	53
User Password	53
Bootup NumLock State [On].....	54
Quiet Boot [Enabled]	55
UEFI Boot [Disabled]	55
OS Selection [Windows 8.X]	55
Launch PXE OpROM [Disabled]	55
Option ROM Messages [Force BIOS].....	55
Discard Changes and Exit.....	56
Save Changes and Reset	56
Discard Changes and Reset	56
Restore Defaults	57
Save as User Defaults	57
Restore User Defaults	57

Appendix

C

Terminology

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

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

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

Appendix

D

Watchdog Timer

**NOTE:**

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

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

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

INT 15H:

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

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

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

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

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**NOTE:**

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

EXAMPLE PROGRAM:

; INITIAL TIMER PERIOD COUNTER

;

W_LOOP:

;

```

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

```

;

; ADD THE APPLICATION PROGRAM HERE

;

```

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

```

```

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

```

;

; EXIT ;

Appendix

E

Hazardous Materials Disclosure

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

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

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

Please refer to the table on the next page.



Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Display	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Printed Circuit Board	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Metal Fasteners	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cable Assembly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fan Assembly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Power Supply Assemblies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Battery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006</p> <p>X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006</p>						



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

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

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