



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

Rev. 1.10 – June 2, 2021



Revision

| Date | Version | Changes |
|------------------|---------|------------------------------------------|
| June 2, 2021 | 1.10 | Updated for R11 version |
| June 29, 2017 | 1.02 | Clarified BIOS specifications |
| 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.

Table of Contents

| | |
|---------------------------------------------|-----------|
| 1 INTRODUCTION..... | 1 |
| 1.1 INTRODUCTION..... | 2 |
| 1.2 MODEL VARIATIONS | 3 |
| 1.3 FEATURES..... | 3 |
| 1.4 BOARD OVERVIEW | 4 |
| 1.5 DIMENSIONS..... | 5 |
| 1.6 DATA FLOW | 7 |
| 1.7 TECHNICAL SPECIFICATIONS | 8 |
| 2 PACKING LIST | 10 |
| 2.1 ANTI-STATIC PRECAUTIONS | 11 |
| 2.2 UNPACKING PRECAUTIONS..... | 11 |
| 2.3 PACKING LIST..... | 12 |
| 2.4 OPTIONAL ITEMS | 13 |
| 3 CONNECTORS | 14 |
| 3.1 PERIPHERAL INTERFACE CONNECTORS..... | 15 |
| 3.1.1 ICE-BT-T10 Layout..... | 15 |
| 3.1.2 Peripheral Interface Connectors | 15 |
| 3.2 INTERNAL PERIPHERAL CONNECTORS | 16 |
| 3.2.1 COM Express Connector | 16 |
| 3.2.2 SPI Flash Connector..... | 20 |
| 4 INSTALLATION | 21 |
| 4.1 ANTI-STATIC PRECAUTIONS | 22 |
| 4.2 INSTALLATION CONSIDERATIONS..... | 22 |
| 4.3 MOUNTING ICE-BT-T10 TO BASEBOARD..... | 24 |
| 5 BIOS | 27 |
| 5.1 INTRODUCTION..... | 28 |
| 5.1.1 Starting Setup..... | 28 |
| 5.1.2 Using Setup | 28 |

| | |
|-----------------------------------------------------------------|-----------|
| <i>5.1.3 Getting Help</i> | 29 |
| <i>5.1.4 Unable to Reboot after Configuration Changes</i> | 29 |
| <i>5.1.5 BIOS Menu Bar</i> | 29 |
| 5.2 MAIN | 30 |
| 5.3 ADVANCED | 31 |
| <i>5.3.1 ACPI Settings</i> | 32 |
| <i>5.3.2 IT8587 Super IO Configuration</i> | 33 |
| <i>5.3.2.1 Serial Port n Configuration</i> | 33 |
| <i>5.3.3 iWDD H/W Monitor</i> | 36 |
| <i>5.3.3.1 Smart Fan Mode Configuration</i> | 37 |
| <i>5.3.4 RTC Wake Settings</i> | 38 |
| <i>5.3.5 Serial Port Console Redirection</i> | 39 |
| <i>5.3.6 CPU Configuration</i> | 42 |
| <i>5.3.7 IDE Configuration</i> | 44 |
| <i>5.3.8 SDIO Configuration</i> | 45 |
| <i>5.3.9 USB Configuration</i> | 46 |
| 5.4 CHIPSET | 47 |
| <i>5.4.1 North Bridge</i> | 48 |
| <i>5.4.1.1 Intel IGD Configuration</i> | 49 |
| <i>5.4.2 South Bridge Configuration</i> | 51 |
| <i>5.4.2.1 PCI Express Configuration</i> | 52 |
| 5.5 SECURITY | 53 |
| 5.6 BOOT | 54 |
| 5.7 SAVE & EXIT | 56 |
| 6 SOFTWARE DRIVERS | 58 |
| <i>6.1 AVAILABLE DRIVERS</i> | 59 |
| <i>6.2 DRIVER DOWNLOAD</i> | 59 |
| A REGULATORY COMPLIANCE | 61 |
| B PRODUCT DISPOSAL | 63 |
| C BIOS OPTIONS | 65 |
| D WATCHDOG TIMER | 68 |
| E HAZARDOUS MATERIALS DISCLOSURE | 71 |

ICE-BT-T10 COM Express Module

| | |
|------------------------------------------|----|
| E.1 ROHS II DIRECTIVE (2015/863/EU)..... | 72 |
| E.2 CHINA ROHS | 73 |

List of Figures

| | |
|-------------------------------------------------------|----|
| Figure 1-1: ICE-BT-T10..... | 2 |
| Figure 1-2: On-board Components and Connectors | 4 |
| Figure 1-3: ICE-BT-T10 Dimensions (mm) | 5 |
| Figure 1-4: ICE-BT-T10 Heatsink Dimensions (mm) | 6 |
| Figure 1-5: Data Flow Diagram..... | 7 |
| Figure 3-1: Connectors (Solder Side)..... | 15 |
| Figure 3-2: COM Express Connector Location..... | 16 |
| Figure 3-3: SPI Flash Connector Location..... | 20 |
| Figure 4-1: Connect the COM Express Connectors..... | 25 |
| Figure 4-2: Secure the Heatsink..... | 26 |
| Figure 6-1: IEI Resource Download Center..... | 59 |

List of Tables

| | |
|--------------------------------------------------------|----|
| Table 1-1: Model Variations | 3 |
| Table 1-2: ICE-BT-T10 Specifications | 9 |
| Table 2-1: Packing List..... | 12 |
| Table 2-2: Optional Items | 13 |
| Table 3-1: Peripheral Interface Connectors | 15 |
| Table 3-2: COM Express Connector Pin Definitions | 20 |
| Table 3-3: SPI Flash Connector Pinouts | 20 |
| Table 5-1: BIOS Navigation Keys | 29 |

BIOS Menus

| | |
|-----------------------------------------------------|----|
| BIOS Menu 1: Main | 30 |
| BIOS Menu 2: Advanced | 31 |
| BIOS Menu 3: ACPI Settings | 32 |
| BIOS Menu 4: IT8587 Super IO Configuration | 33 |
| BIOS Menu 5: Serial Port n Configuration Menu | 33 |
| BIOS Menu 6: iWDD H/W Monitor | 36 |
| BIOS Menu 7: Smar Fan Mode Configuration | 37 |
| BIOS Menu 8: RTC Wake Settings | 38 |
| BIOS Menu 9: Serial Port Console Redirection | 39 |
| BIOS Menu 10: CPU Configuration | 42 |
| BIOS Menu 11: SATA Configuration | 44 |
| BIOS Menu 12: USB Configuration | 45 |
| BIOS Menu 13: USB Configuration | 46 |
| BIOS Menu 14: Chipset | 47 |
| BIOS Menu 15: North Bridge Configuration | 48 |
| BIOS Menu 16: Graphics Configuration | 49 |
| BIOS Menu 17: PCH-IO Configuration | 51 |
| BIOS Menu 18: PCI Express Configuration | 52 |
| BIOS Menu 19: Security | 53 |
| BIOS Menu 20: Boot | 54 |
| BIOS Menu 21: Save & Exit | 56 |

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 3.2 Gen 1 (5Gb/s), 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.

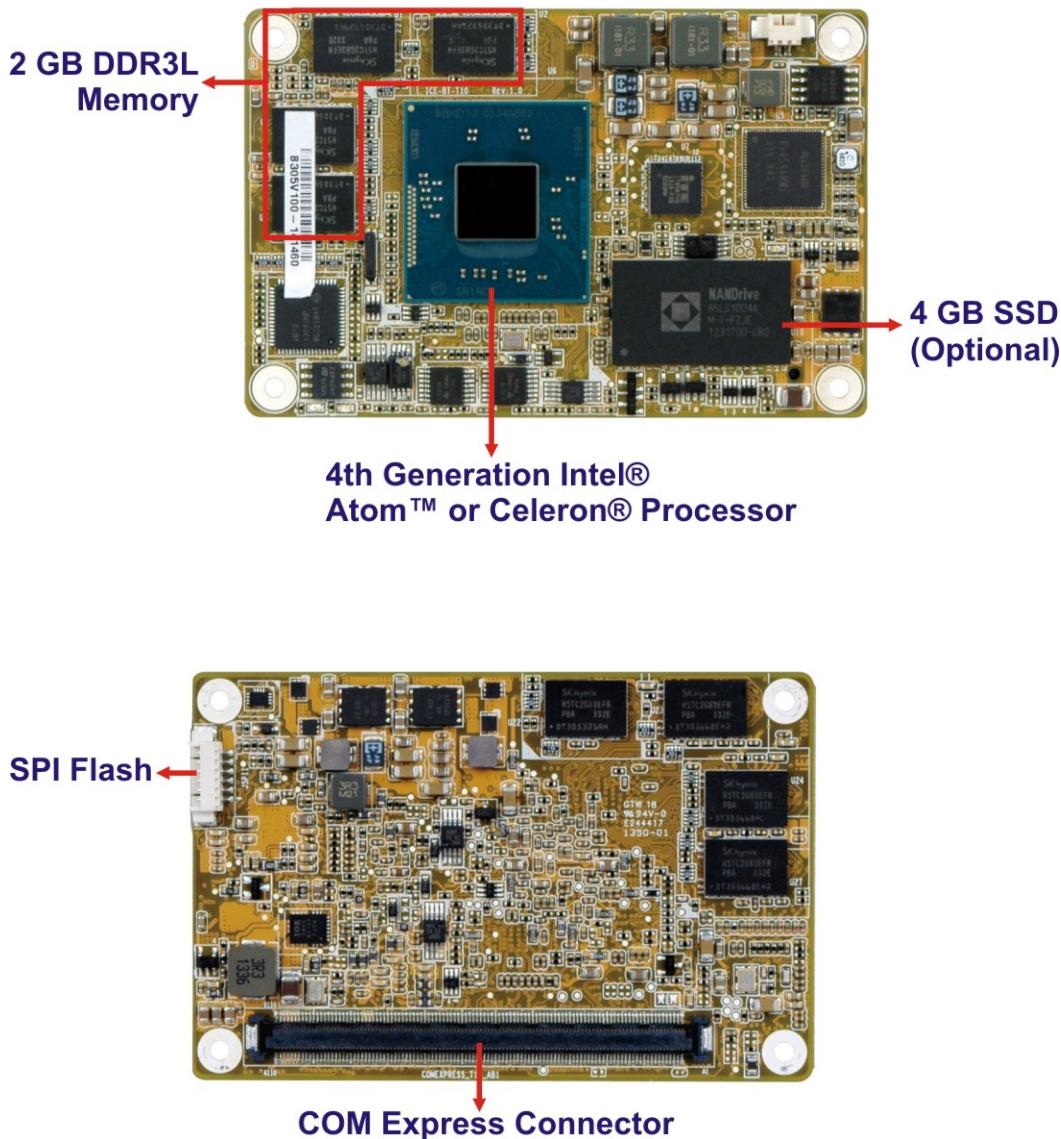


Figure 1-2: On-board Components and Connectors

ICE-BT-T10 COM Express Module**1.5 Dimensions**

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

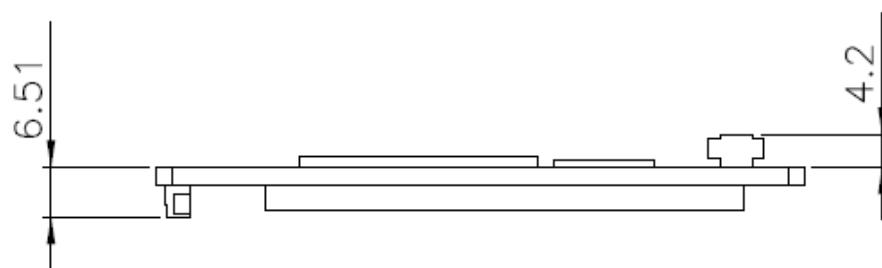
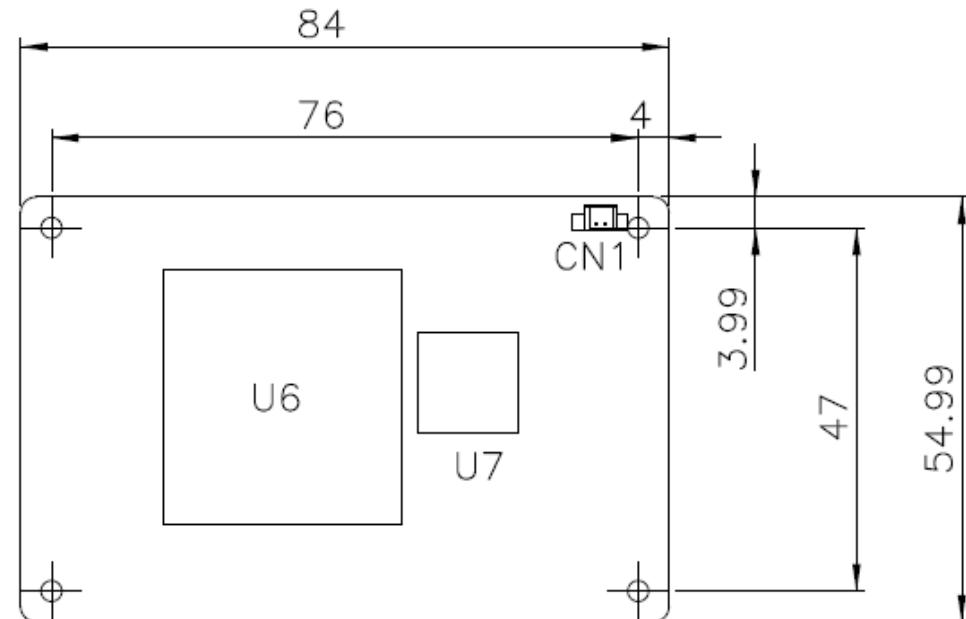


Figure 1-3: ICE-BT-T10 Dimensions (mm)

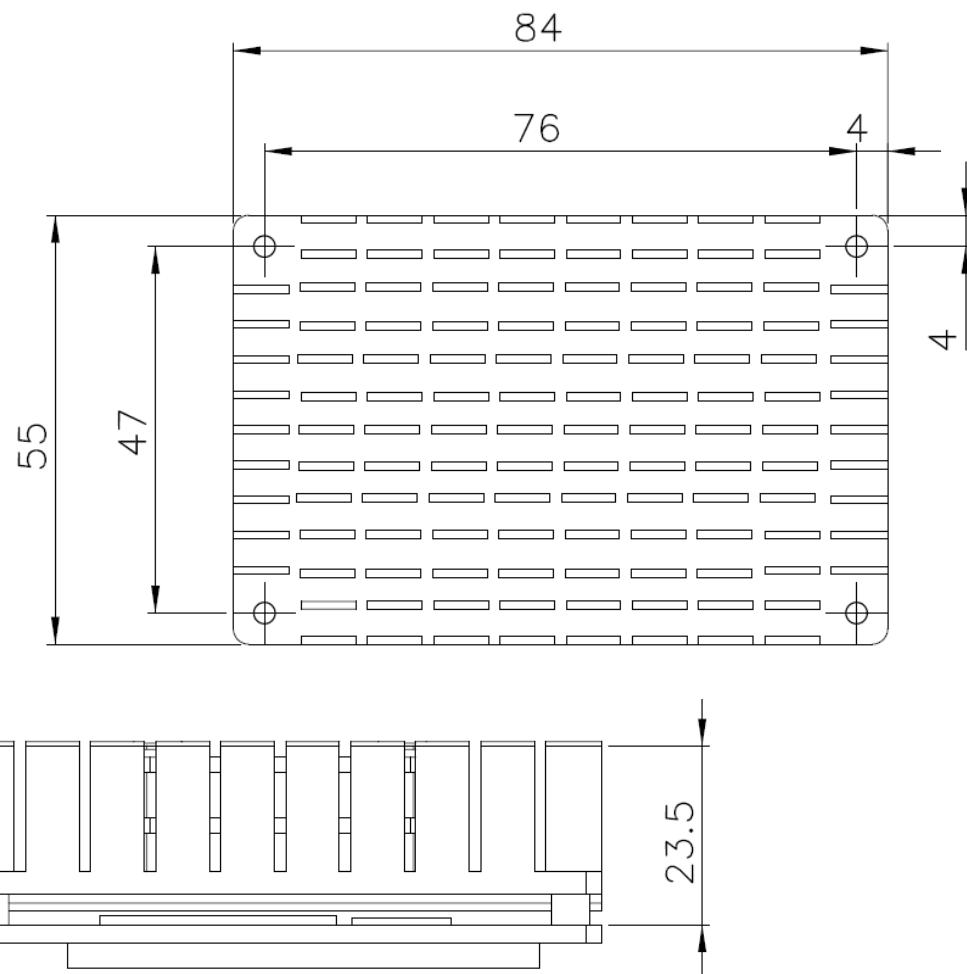


Figure 1-4: ICE-BT-T10 Heatsink Dimensions (mm)

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.

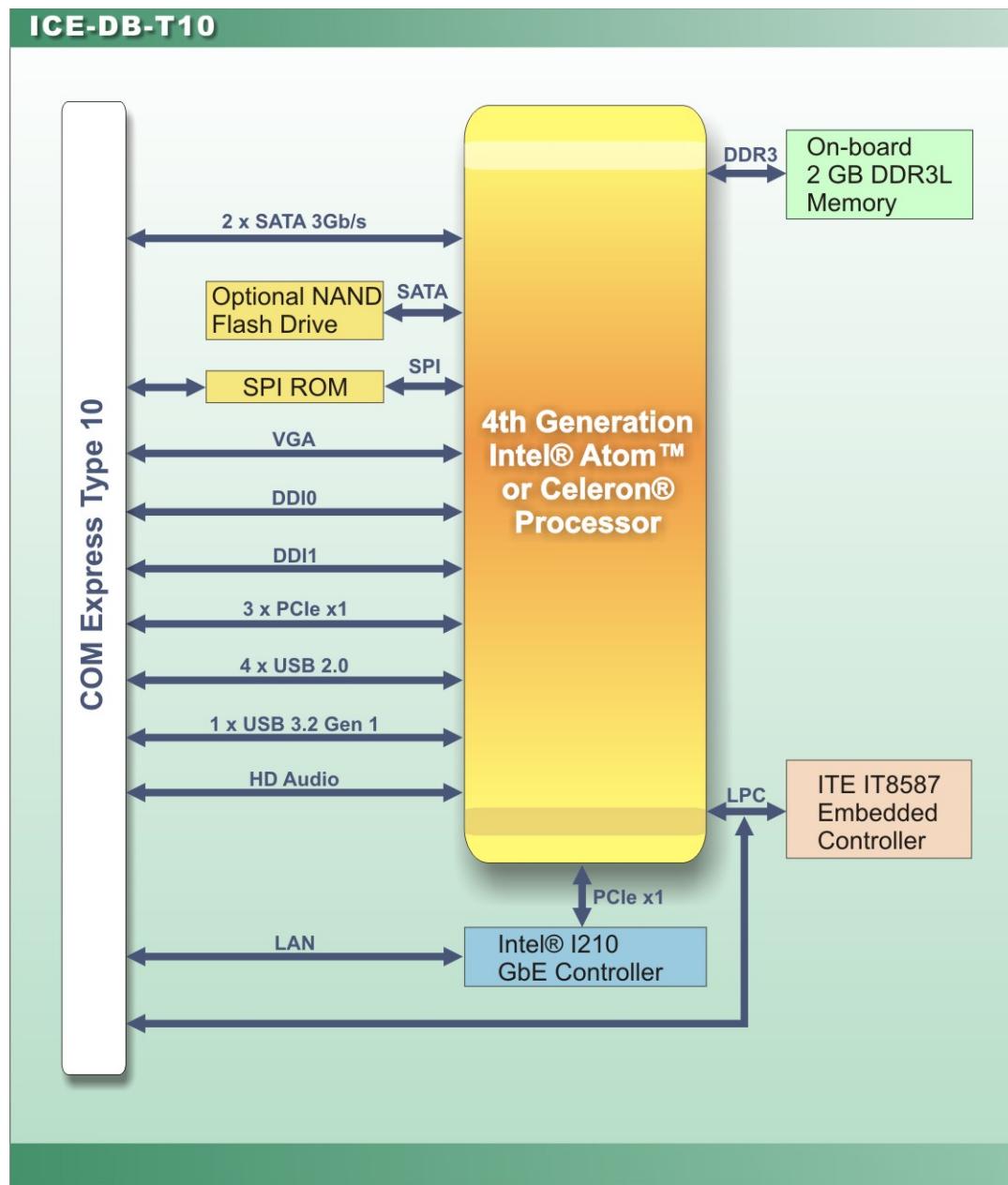


Figure 1-5: Data Flow Diagram

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 <ul style="list-style-type: none">▪ Alxx BIOS version is for Bay Trail I model (CPU: E38xx)▪ AMxx BIOS version is for Bay Trail M/D model (CPU: J1900/N2930/N2807) |

ICE-BT-T10 COM Express Module

| | ICE-BT-T10 |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Embedded Controller | ITE IT8587VG-FX |
| Watchdog Timer | Software programmable supports 1~255 sec. system reset |
| 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 3.2 Gen 1 (5Gb/s) 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

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 | Quick Installation Guide | |

Table 2-1: Packing List

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) | A photograph of a green printed circuit board (PCB) with various electronic components, including chips, capacitors, and connectors, mounted on it. |

Table 2-2: Optional Items

Chapter

3

Connectors

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.

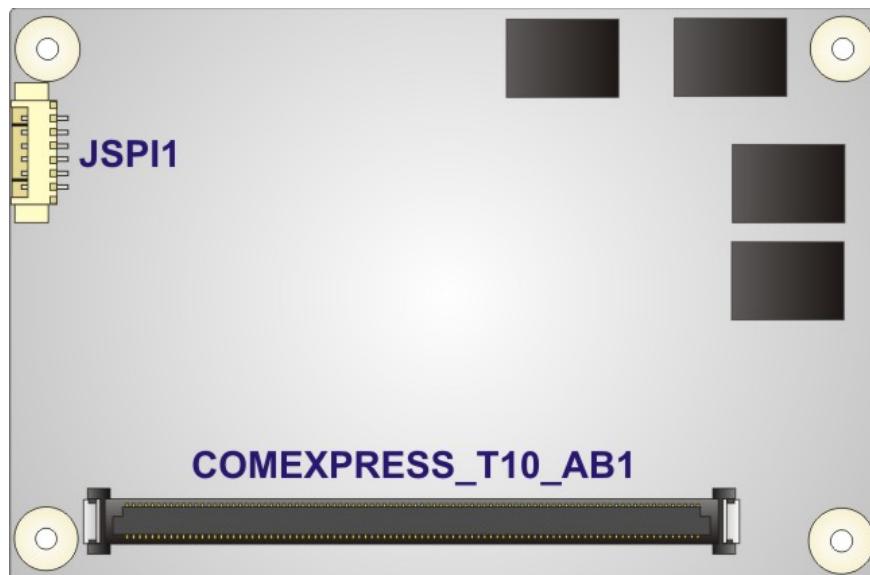


Figure 3-1: Connectors (Solder Side)

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 | JSPI1 |

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.

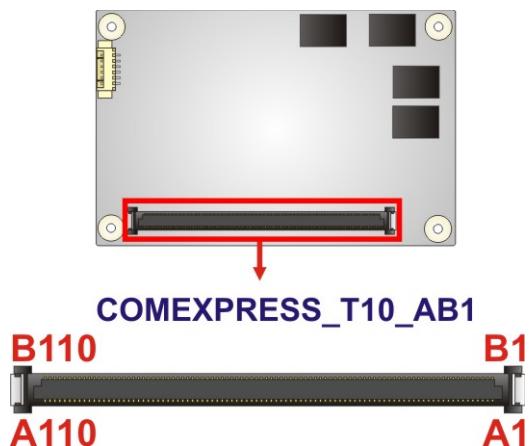


Figure 3-2: COM Express Connector Location

| 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_ADO |
| 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 |

ICE-BT-T10 COM Express Module

| Pin No. | Description | Pin No. | Description |
|---------|---------------|---------|-------------|
| A10 | GBE0_MDI1+ | B10 | LPC_CLK |
| A11 | GND1 | B11 | GND16 |
| A12 | GBE0_MDIO- | B12 | PWRBTN# |
| A13 | GBE0_MDIO+ | 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 | GPIO | 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 |

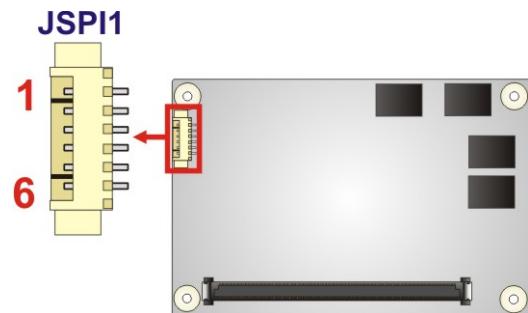
| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| A106 | VCC_12V | B106 | VCC_12V |
| A107 | VCC_12V | B107 | VCC_12V |
| A108 | VCC_12V | B108 | VCC_12V |
| A109 | VCC_12V | B109 | VCC_12V |
| A110 | GND14 | B110 | GND26 |

Table 3-2: COM Express Connector Pin Definitions

3.2.2 SPI Flash Connector

CN Label: JSPI1**CN Type:** 6-pin wafer, p=1.25 mm**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.ieeworld.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).

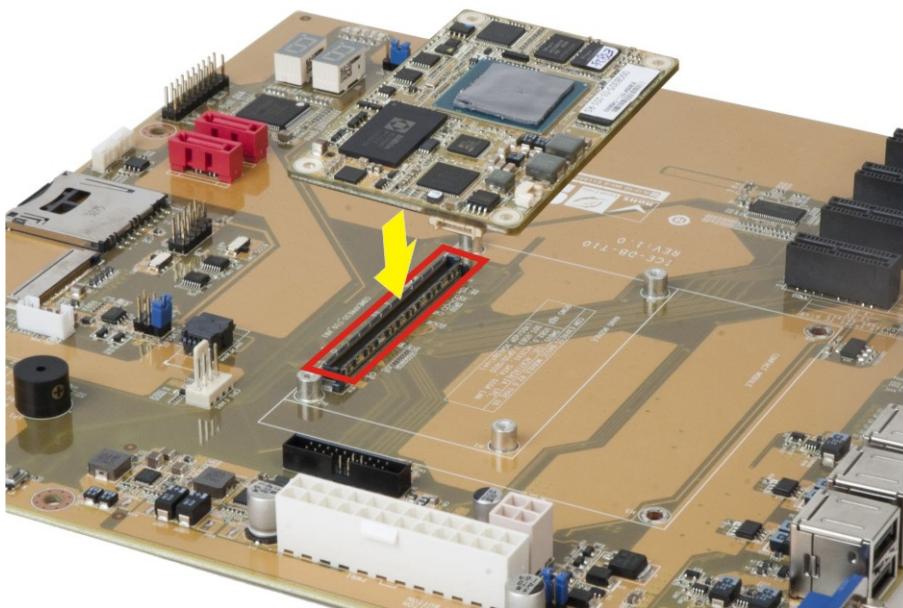
ICE-BT-T10 COM Express Module

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).

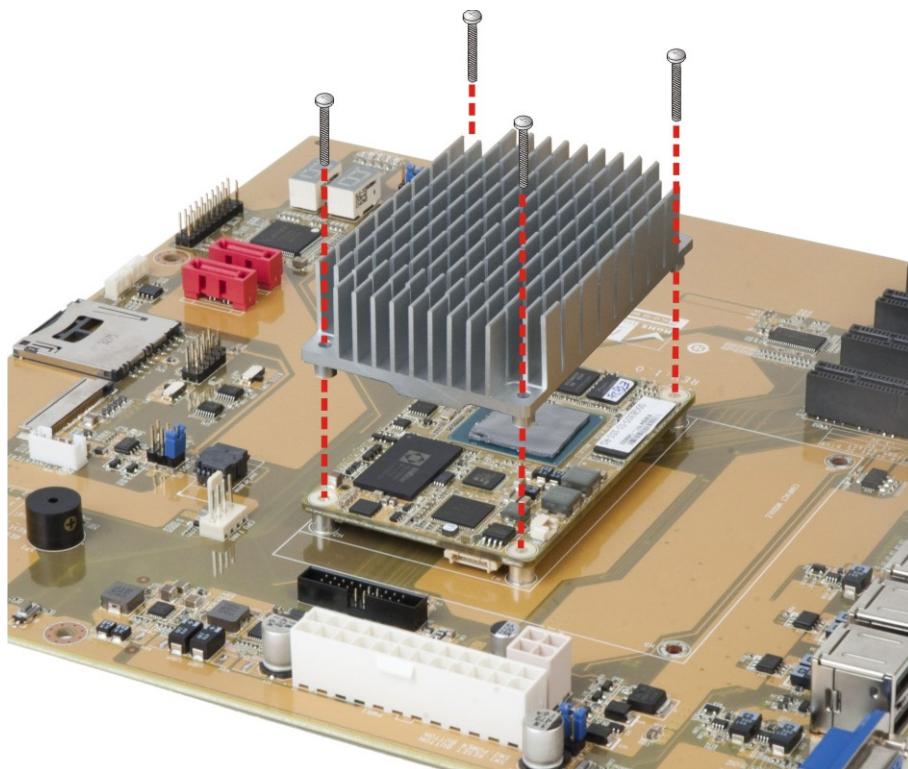


Figure 4-2: Secure the Heatsink

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 |
| BIOS Information | | | |
| 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 | | |
| <i>iwDD Vendor</i> | iEI | | |
| <i>iwDD Version</i> | B305ER10.bin | | |
| CPU Configuration | | | |
| Microcode Patch | 321 | | |
| BayTrial 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

Set the Date. Use Tab to switch between Date elements.

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

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.

ICE-BT-T10 COM Express Module

➔ System Time [xx:xx:xx]

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

5.3 Advanced

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



WARNING:

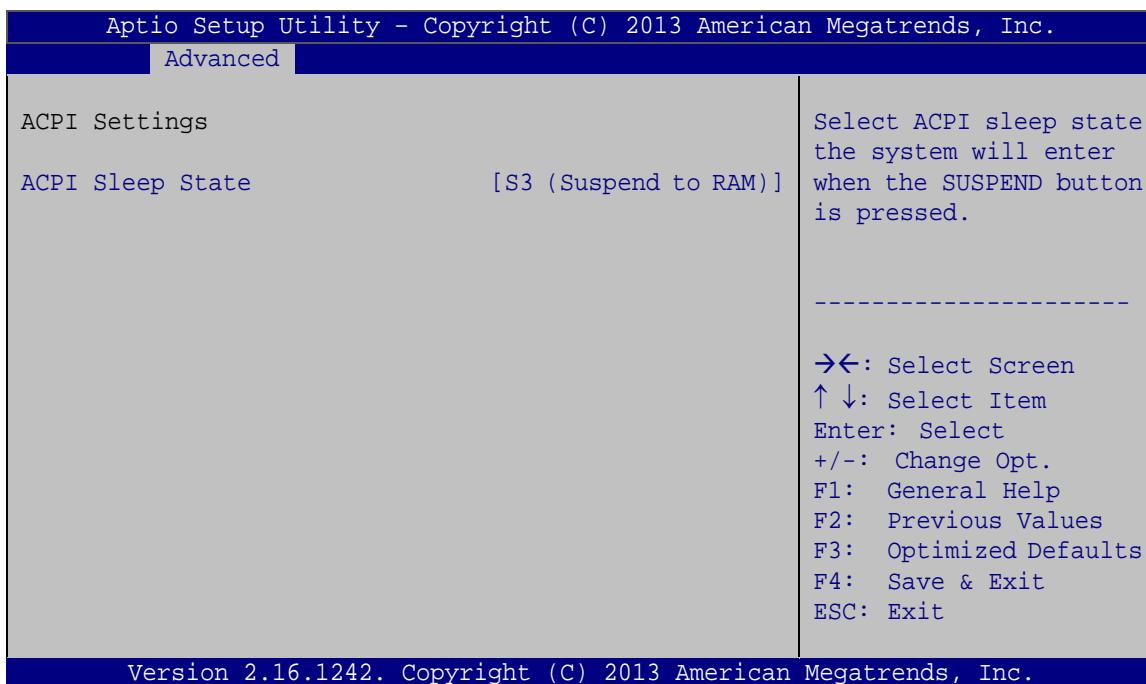
Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

| Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc. | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Main | Advanced |
| > ACPI Settings > IT8587 Super IO Configuration > iWDD H/W Monitor > RTC Wake Settings > Serial Port Console Redirection > CPU Configuration > IDE Configuration > SDIO Configuration > USB Configuration | System ACPI 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 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)]

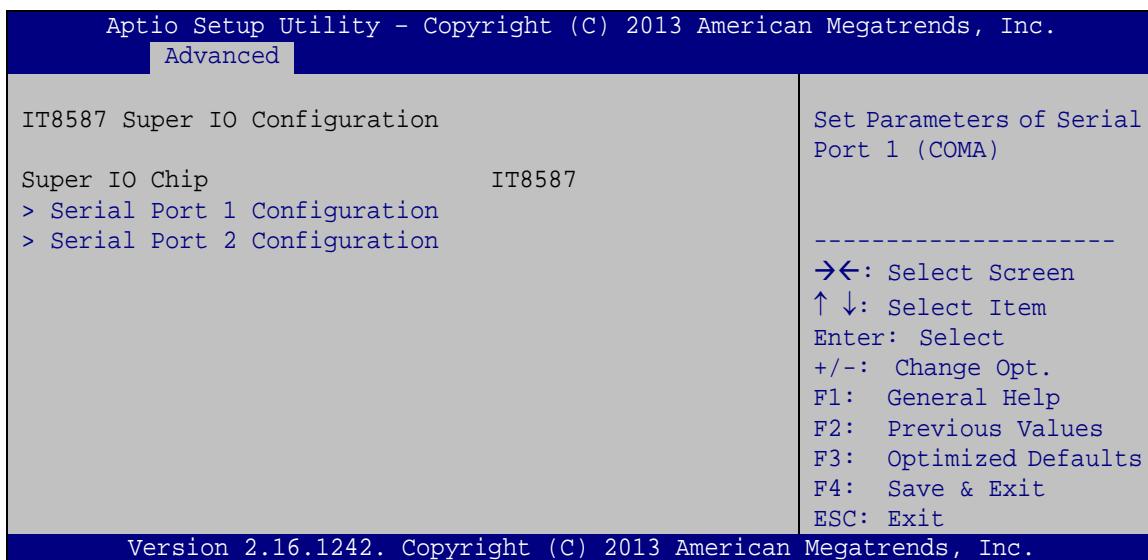
Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

- ➔ **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

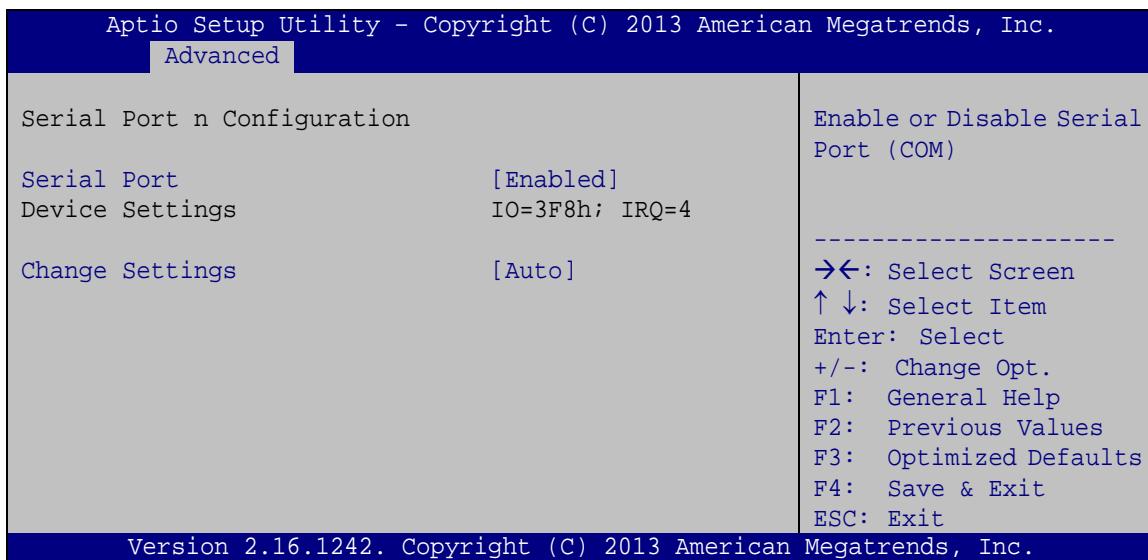
Use the **IT8587 Super IO Configuration** menu (**BIOS Menu 4**) to set or change the configurations for the serial ports.



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

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

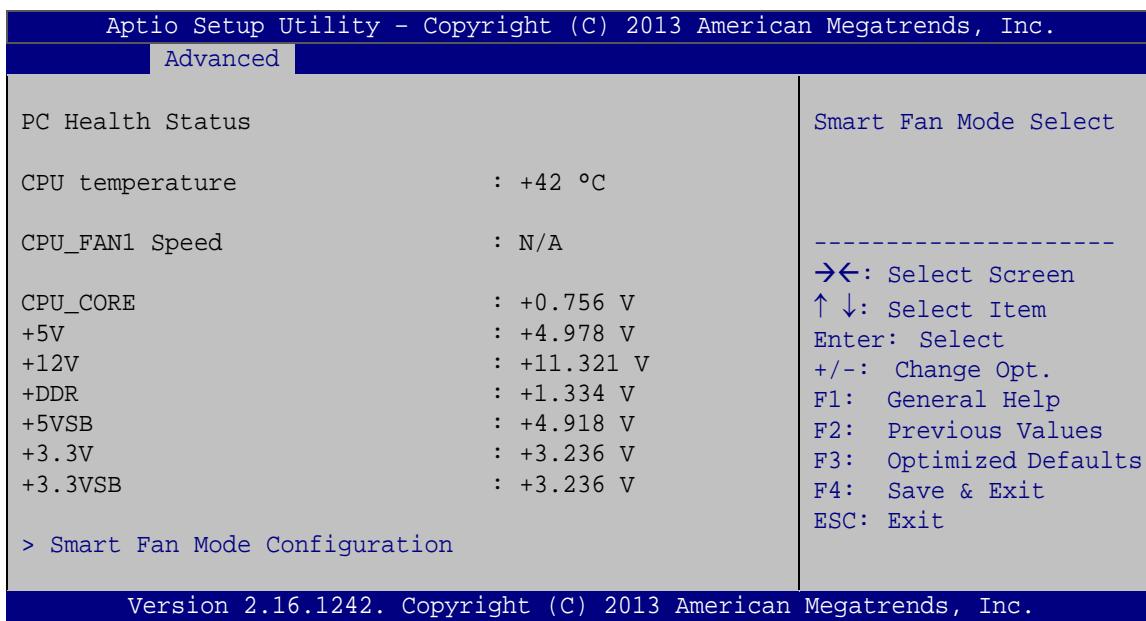
➔ Change Settings [Auto]

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

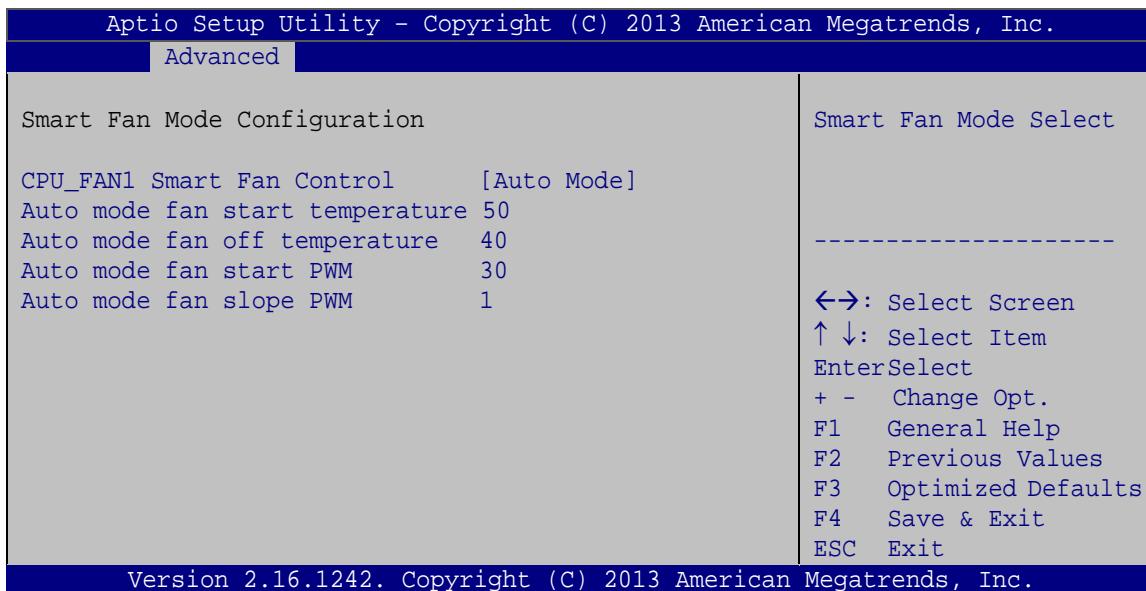
➔ PC Health Status

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

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

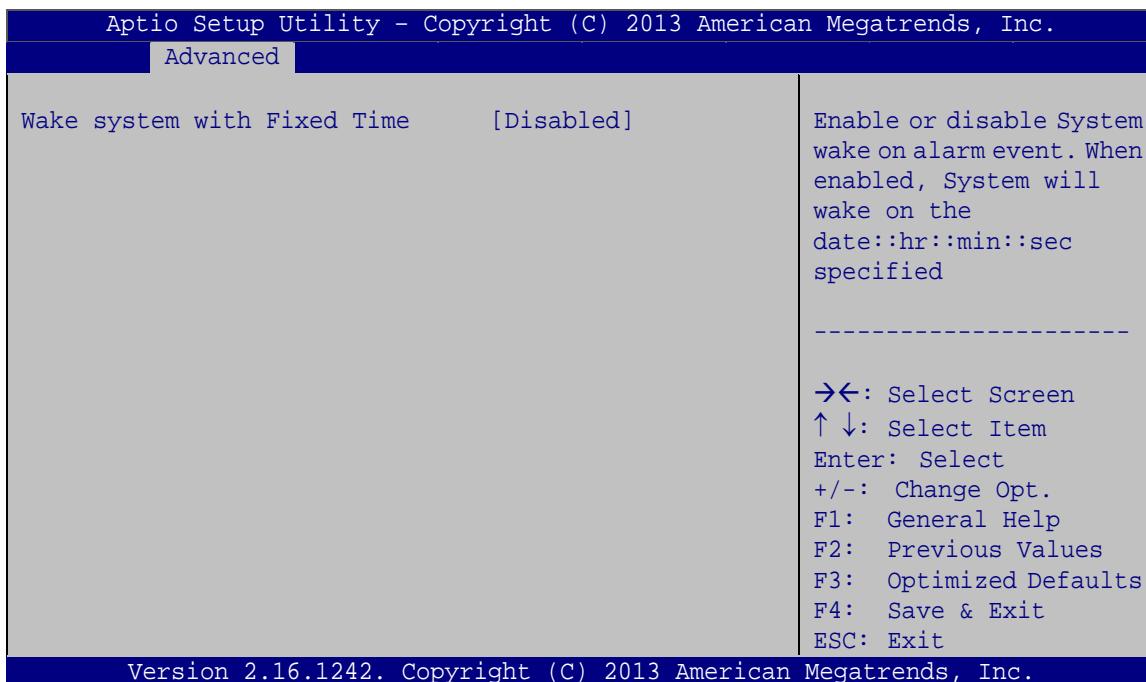
Use the + or – key to change the **Auto mode fan start PWM** value. Enter a decimal number between 1 and 100.

➔ 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 |

ICE-BT-T10 COM Express Module

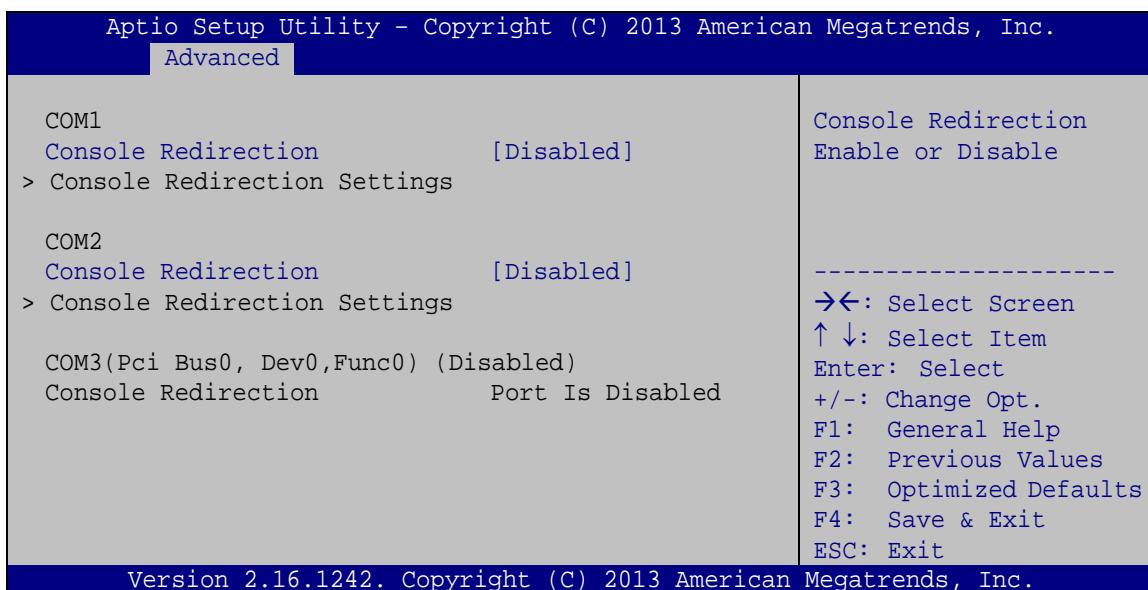
following options appear with values that can be selected:

- 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.

ICE-BT-T10 COM Express Module

- ➔ **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.

| Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc. | |
|--------------------------------------------------------------------|------------------------|
| Advanced | |
| CPU Configuration | |
| Intel(R) Atom(TM) CPU E3825 @ 1.33GHz | |
| CPU Signature | 30673 |
| Microcode Patch | 321 |
| Max CPU Speed | 1330 MHz |
| Min CPU Speed | 533 MHz |
| Processor Cores | 2 |
| Intel HT Technology | Not Supported |
| Intel VT-x Technology | Supported |
| L1 Data Cache | 24 kB x 2 |
| L1 Code Cache | 32 kB x 2 |
| L2 Cache | 1024 kB x 1 |
| L3 Cache | Not Present |
| 64-bit | Supported |
| Active Processor Cores | [All] |
| Intel Virtualization Technology | [Enabled] |
| EIST | [Enabled] |
| ----- | |
| | →←: 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 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.

ICE-BT-T10 COM Express Module

- 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.

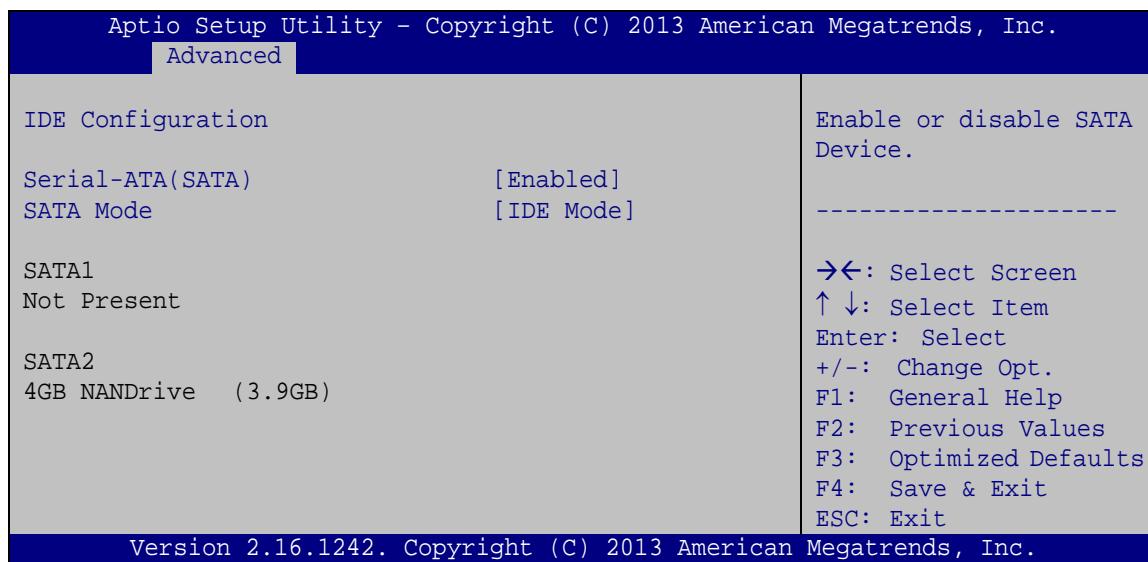
➔ EIST [Enabled]

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

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

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.

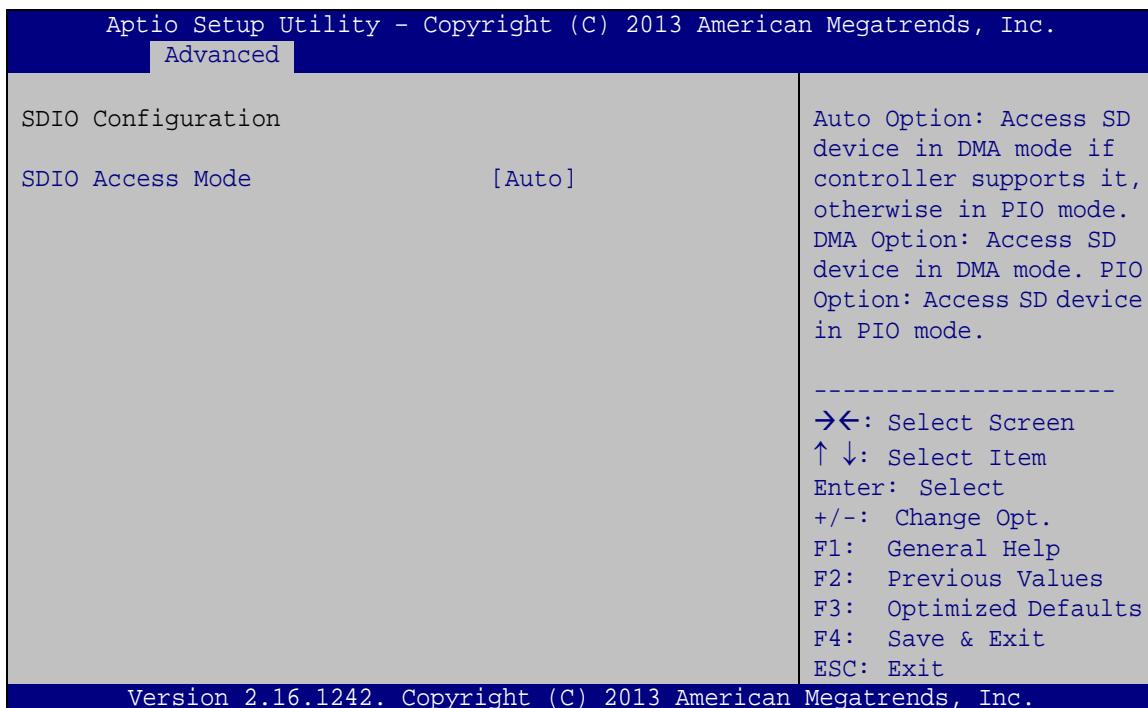
➔ **IDE** **DEFAULT** Configures SATA devices as normal IDE device.

➔ **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

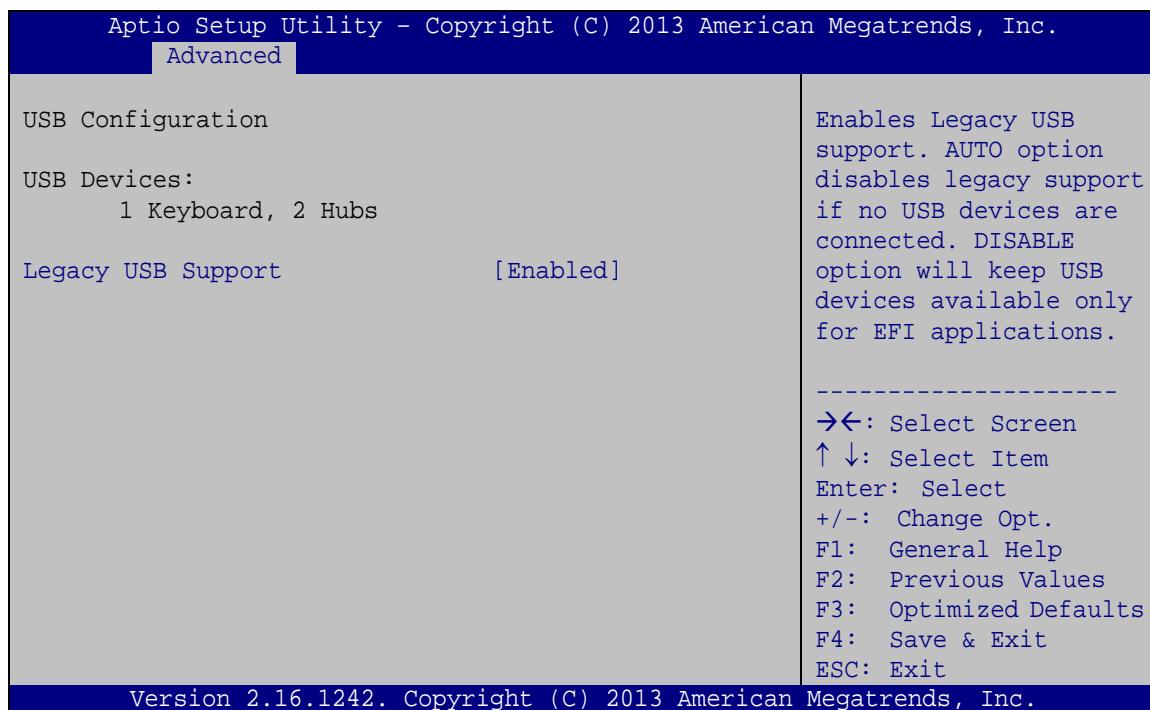
➔ SDIO Access Mode [Auto]

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

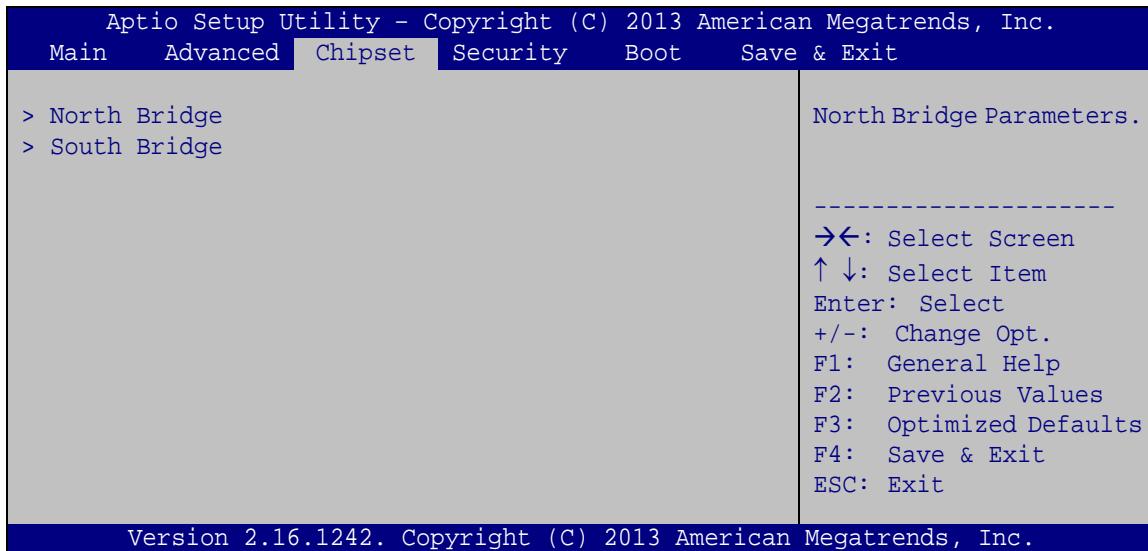
5.4 Chipset

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



WARNING!

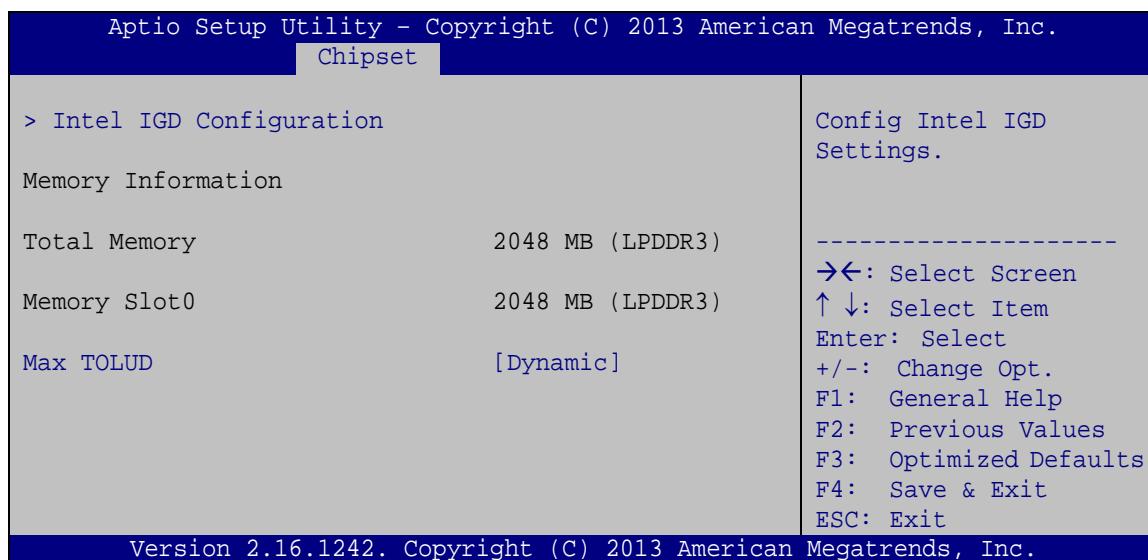
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



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

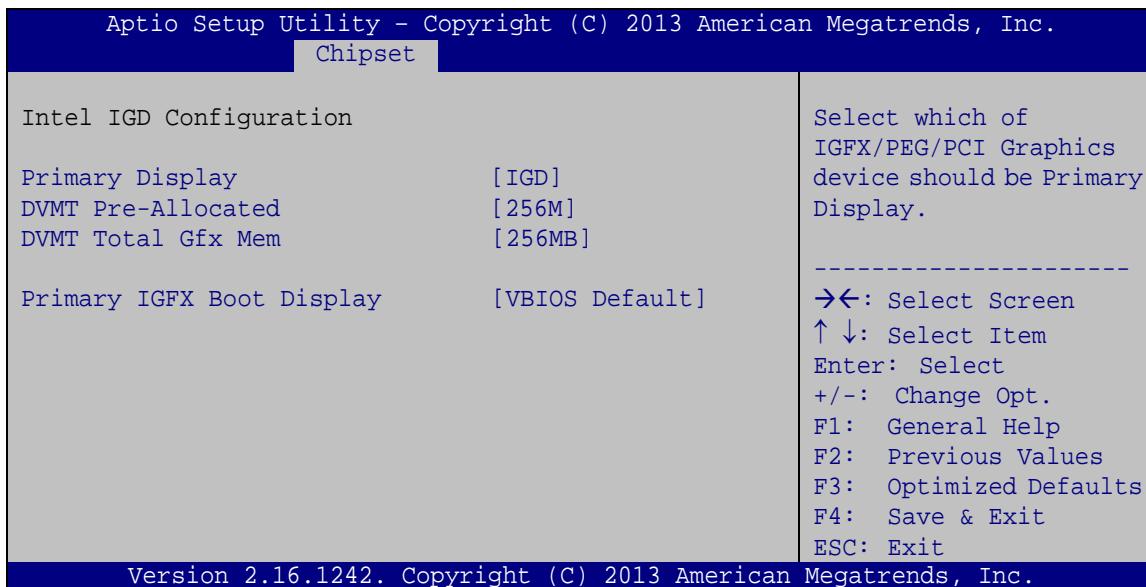
➔ Max TOLUD [Dynamic]

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

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

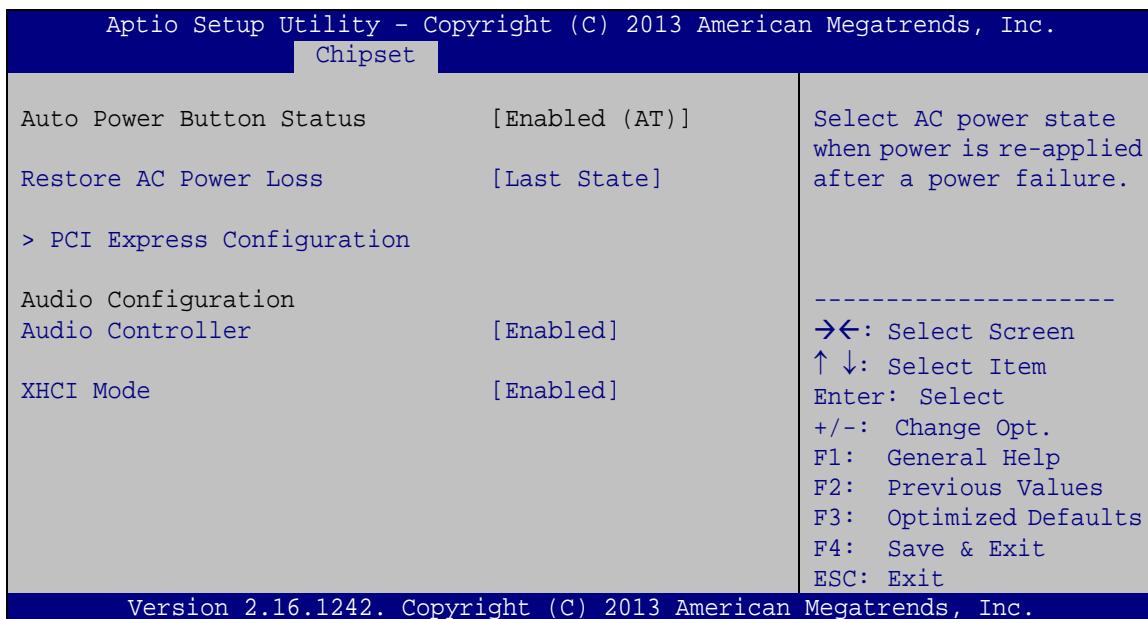
➔ **Primary IGFX Boot Display [VBIOS Default]**

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

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]**

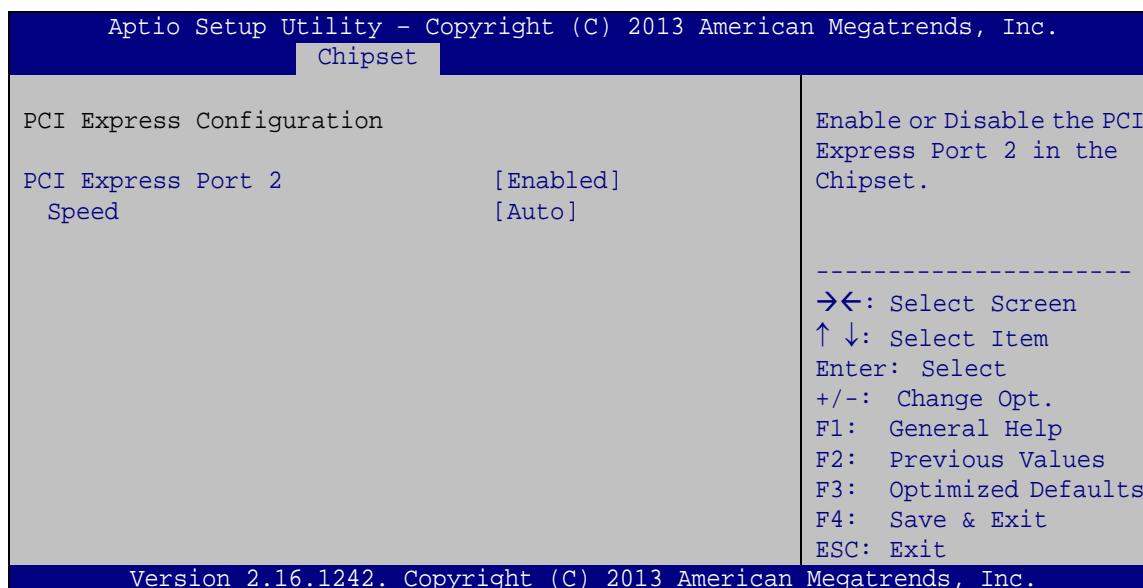
Use the **XHCI Mode** BIOS option to configure the USB xHCI (USB 3.0) controller.

→ **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.

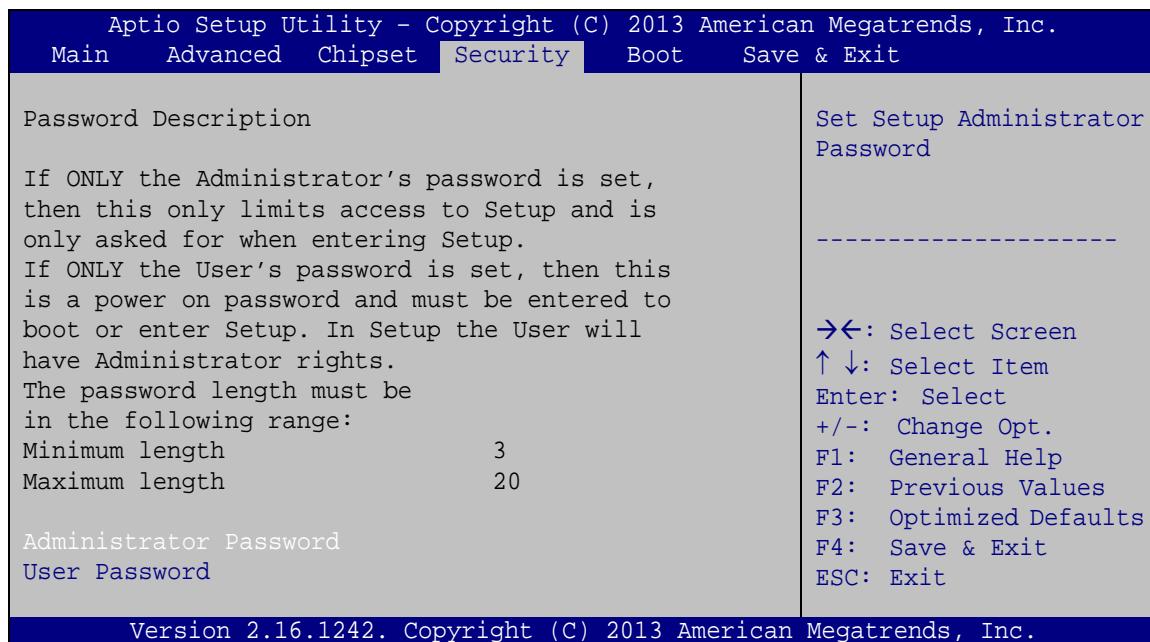
➔ PCIe Speed

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

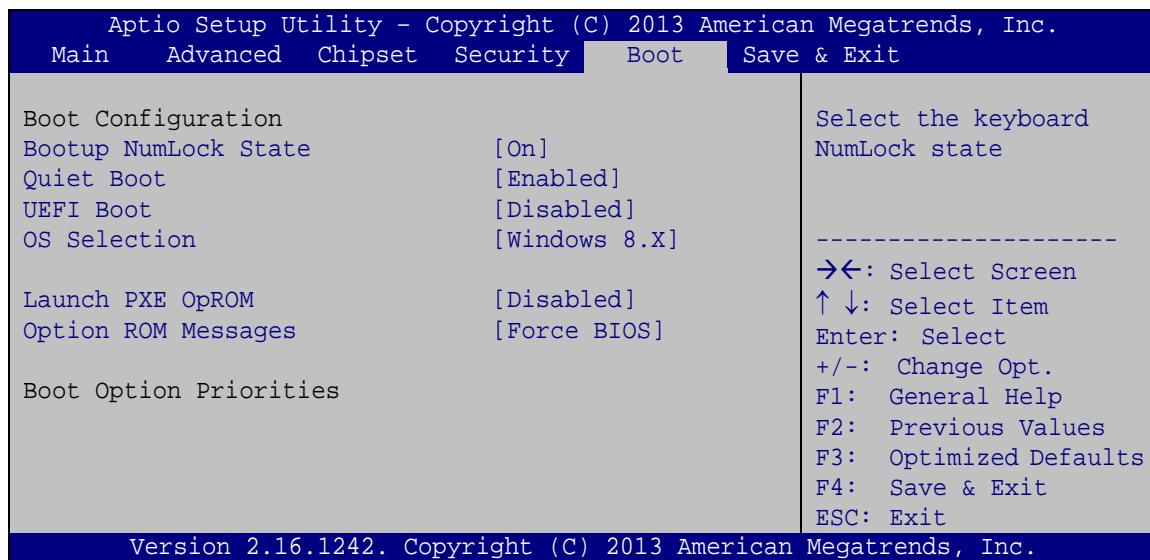
Use the **Administrator Password** to set or change an administrator password.

➔ 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. |

ICE-BT-T10 COM Express Module

→ 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. |

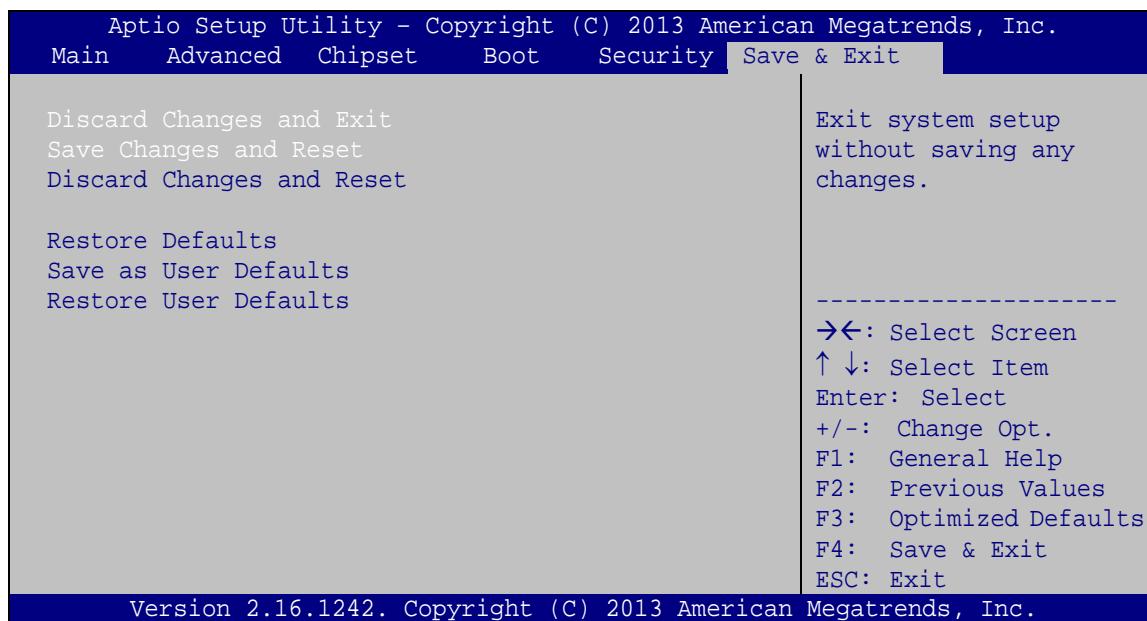
→ Option ROM Messages [Force BIOS]

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

- | | |
|-------------------------------|----------------------------------|
| → Force DEFAULT | Sets display mode to force BIOS. |
| BIOS | |
| → Keep | Sets display mode to current. |
| 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.

ICE-BT-T10 COM Express Module

➔ 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 Drivers

All the drivers for the ICE-BT-T10 are available on IEI Resource Download Center (<https://download.ieeworld.com>). Type ICE-BT-T10 and press Enter to find all the relevant software, utilities, and documentation.

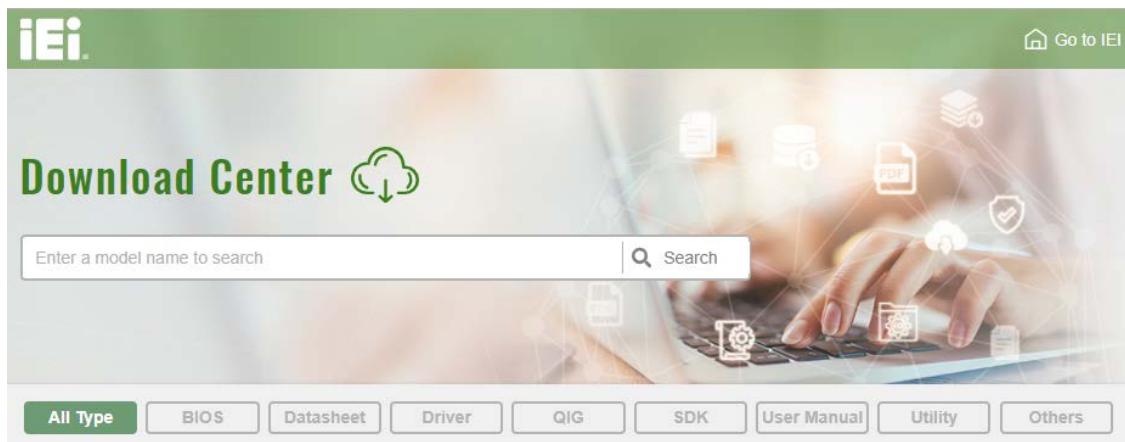
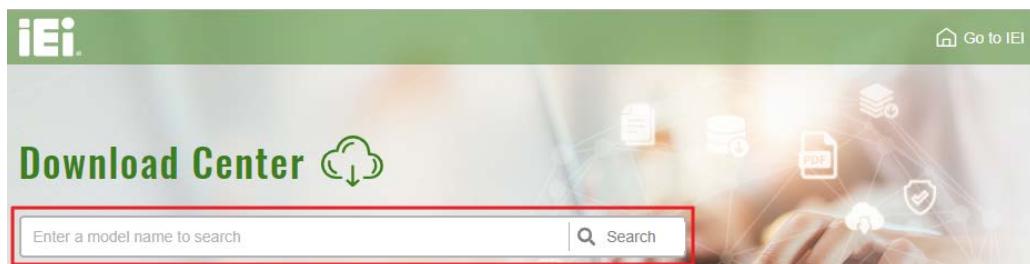


Figure 6-1: IEI Resource Download Center

6.2 Driver Download

To download drivers from IEI Resource Download Center, follow the steps below.

Step 1: Go to <https://download.ieeworld.com>. Type ICE-BT-T10 and press Enter.



Step 2: All product-related software, utilities, and documentation will be listed. You can choose **Driver** to filter the result.

All Type BIOS Datasheet Driver QIG SDK User Manual Utility Others

Keyword: "ICE-BT-T10", Searching Result : 27 Records.

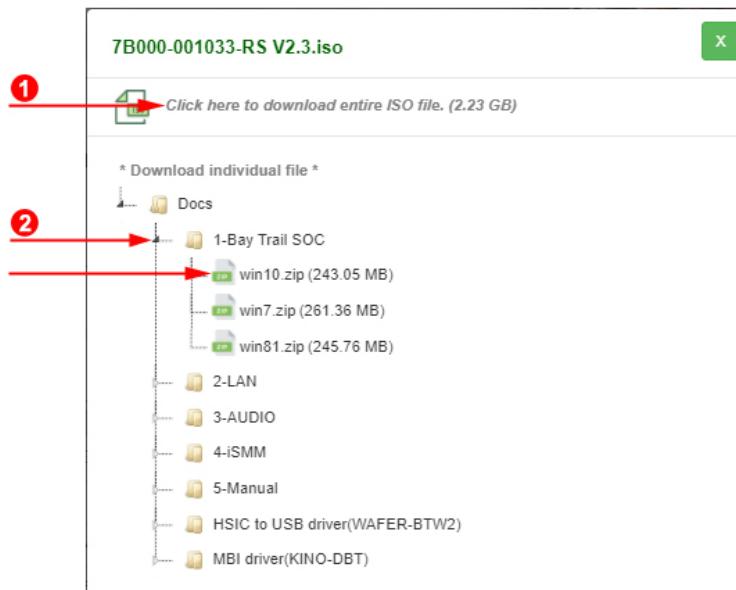
ICE-BT-T10

Embedded Computer ▶ Single Board Computer ▶ ETX / COM EXPRESS / Q

COM Express Rev 2.1 Mini Size Type 10 Module, Intel® 4th Generation Atom™ Processor,

| File Name | Published | Version | File Checksum |
|----------------------------------------------------|------------|---------|----------------------------------|
| 7B000-001033-RS V2.3.iso (2.23 GB) | 2017/10/03 | 2.30 | 3B2DB1F792779A93A8F50DDBC3943E30 |

Step 3: Click the driver file name on the page and you will be prompted with the following window. You can download the entire ISO file (①), or double click an individual item to find its driver file and click the file name to download (②).



NOTE:

To install software from the downloaded ISO image file in Windows 8, 8.1 or 10, double-click the ISO file to mount it as a virtual drive to view its content. On Windows 7 system, an additional tool (such as Virtual CD-ROM Control Panel from Microsoft) is needed to mount the file.

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

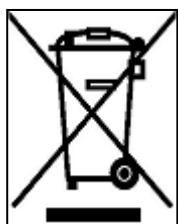
Product Disposal

**CAUTION:**

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

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union – If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union – The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your device, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

Appendix

C

BIOS Options

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

| | |
|---------------------------------------------------|----|
| □ System Date [xx/xx/xx] | 30 |
| □ System Time [xx:xx:xx] | 31 |
| □ 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 |

ICE-BT-T10 COM Express Module

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

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.

**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 RoHS II Directive (2015/863/EU)

The details provided in this appendix are to ensure that the product is compliant with the RoHS II Directive (2015/863/EU). The table below acknowledges the presences of small quantities of certain substances in the product, and is applicable to RoHS II Directive (2015/863/EU).

Please refer to the following table.

| 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) | Bis(2-ethylhexyl) phthalate (DEHP) | Butyl benzyl phthalate (BBP) | Dibutyl phthalate (DBP) | Diisobutyl phthalate (DIBP) |
| Housing | O | O | O | O | O | O | O | O | O | O |
| Display | O | O | O | O | O | O | O | O | O | O |
| Printed Circuit Board | O | O | O | O | O | O | O | O | O | O |
| Metal Fasteners | O | O | O | O | O | O | O | O | O | O |
| Cable Assembly | O | O | O | O | O | O | O | O | O | O |
| Fan Assembly | O | O | O | O | O | O | O | O | O | O |
| Power Supply Assemblies | O | O | O | O | O | O | O | O | O | O |
| Battery | O | O | O | O | O | O | O | O | O | O |
| O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in Directive (EU) 2015/863. 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 Directive (EU) 2015/863. | | | | | | | | | | |

ICE-BT-T10 COM Express Module

E.2 China RoHS

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 | ○ | ○ | ○ | ○ | ○ | ○ |

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11364-2014 與 GB/T26572-2011 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/T11364-2014 與 GB/T26572-2011 标准规定的限量要求。