Industrial Computing
Products and Services

Panel PC's

Industrial PC's

SBC's

Industrial Displays

Electronic Design

dsl
Embedding the future

Why Choose DSL?

- ✓ Lifetime technical support
- ✓ Fully customisable products
- ✓ Product branding (bezel colours + company logos)
- ✓ Free pre-installation of OS and your software

Our Services

- ✓ Electronic Design
- ✓ Production Management
- ✓ Assembly and test
- ✓ Bespoke BIOS creation

sales@dsl-ltd.co.uk

or call us on +44 (0)1462 675530

DSL Ltd. | 4 Aylesford Court, Works Road, Letchworth Garden City, Hertfordshire, SG6 1LP

C&T SOLUTION INC.

CE-6BT01

Intel® Atom™ E3800 COM Express Compact Size Type 6 Module

User's Manual
Version 100
December 23, 2014

C&T Solution Inc.
17F-2, No. 700, Zhongzheng Rd., Zhonghe Dist., New Taipei City 235, Taiwan
Tel: +886-2-7731-7888
http://www.candtsolution.com

Preface

Revision History

Rev.	Date	Description
100	23/12/2014	Initial release

Disclaimer

All specifications and information in this User's Manual are believed to be accurate and up to date. C&T Solution Inc. does not guarantee that the contents herein are complete, true, accurate or non-misleading. The information in this document is subject to change without notice and does not represent a commitment on the part of C&T Solution Inc.

C&T Solution Inc. disclaims all warranties, express or implied, including, without limitation, those of merchantability, fitness for a particular purpose with respect to contents of this User's Manual. Users must take full responsibility for the application of the product.

Copyright Notice

All rights reserved. No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or information storage and retrieval systems, without the prior written permission of C&T Solutions Inc.

Copyright © 2014 C&T Solution Inc.

Trademarks Acknowledgment

Intel®, Celeron® and Pentium® are trademarks of Intel Corporation.
Windows® is registered trademark of Microsoft Corporation.
AMI is trademark of American Megatrend Inc.
IBM, XT, AT, PS/2 and Personal System/2 are trademarks of International Business Machines Corporation
All other products and trademarks mentioned in this manual are trademarks of their respective owners.

Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. Please recycle to minimize pollution and ensure environment protection.

Safety Precautions

Before installing and using the equipment, please read the following precautions:

- Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
- The power outlet shall be installed near the equipment and shall be easily accessible.
- Turn off the system power and disconnect the power cord from its source before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the equipment is properly grounded.
- When the power is connected, never open the equipment. The equipment should be opened only by qualified service personnel.
- Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- Disconnect this equipment from the power before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
- Avoid the dusty, humidity and temperature extremes.
- Do not place heavy objects on the equipment.
- If the equipment is not used for long time, disconnect it from the power to avoid being damaged by transient over-voltage.
- The storage temperature shall be above -40°C and below 85°C.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.
- If one of the following situation arises, get the equipment checked be service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment does not work well or it cannot work according the user's manual.
  - The equipment has been dropped and damaged.
  - The equipment has obvious signs of breakage.

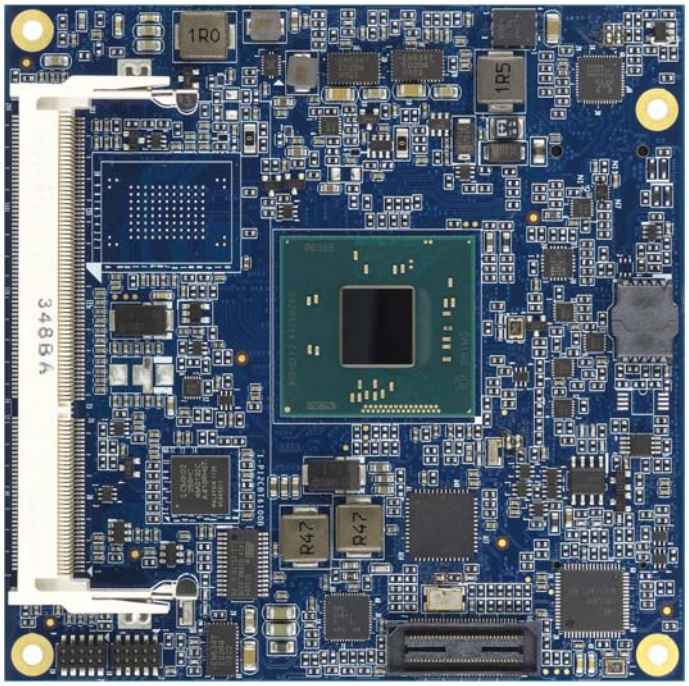
Table of Contents

Preface **2**
Revision History 2
Disclaimer 2
Copyright Notice 2
Trademarks Acknowledgment 3
Environmental Protection Announcement 3
Safety Precautions 4
1. Introduction **8**
1.1 Product Description 8
1.2 Specifications 9
1.3 Block Diagram 12
2. Mechanical Specifications **13**
2.1 Dimensions 13
2.2 Board Layout 15
2.3 Onboard Connectors 16
2.3.1 XPD Debug Connector (CN3) 16
2.3.2 CPLD JTAG Connector (CN4) 17
2.3.3 LPC Debug Connector (CN7) 17
2.4 COM Express Connectors 18
3. Thermal Solutions **21**
3.1 Heat Sink 21
3.1.1 Dimensions 21
3.1.2 Installation 21
3.2 Heat Spreader 23
3.2.1 Dimensions 23
3.2.2 Installation 23
4. Features & Interfaces **25**
4.1 Processor 25
4.2 BIOS 25
4.3 System Memory 25
4.4 Graphics 25
4.4.1 Analog Display Port 26
4.4.2 LVDS 26
4.4.3 Digital Display Interfaces (DDI) 27

4.5 USB 29
4.5.1 USB 2.0 29
4.5.2 USB 3.0 29
4.6 Ethernet 30
4.7 SATA 30
4.8 PCI Express 31
4.9 Audio 31
4.10 LPC 32
4.11 SPI 32
4.12 UART 32
4.13 SMBus 33
4.14 ExpressCard 33
4.15 General Purpose Input Output 33
4.15.1 GPIO Configuration 34
4.15.2 Register Description 34
4.15.3 Psuedo Code 36
4.16 Power and System Management Signals 37
4.17 Thermal Management Signals 37
4.18 Miscellaneous Signals 37
4.19 Watchdog Timer 38
4.19.1 Board Design 38
4.19.2 Psuedo Code 38
5. Driver Installation 40
6. System BIOS 41
6.1 Advanced 42
6.1.1 ACPI Settings 43
6.1.2 F81801 Super IO Configuration 44
6.1.3 W83627DHG Super IO Configuration 45
6.1.4 W83627DHG Hardware Monitor1 46
6.1.5 NCT7802 Hardware Monitor 47
6.1.6 Serial Port Console Redirection 48
6.1.7 CPU Configuration 49
6.1.8 SATA Configuration 50
6.1.9 Miscellaneous Configuration 51
6.1.10 LPSS & SCC Configuration 52
6.1.11 Network Stack Configuration 53
6.1.12 CSM Configuration 53
6.1.13 Trusted Computing 54

6.1.14 USB Configuration 55
6.1.15 Security Configuration..... 56
6.2 Chipset 57
6.2.1 Northbridge Configuration..... 58
6.2.2 Southbridge Configuration 61
6.3 Security.....64
6.3.1 Secure Boot Menu 65
6.4 Boot 66
6.5 Save and Exit 67
7. Address Map 68
7.1 I/O Port Address Map 68
7.2 Interrupt Controller (IRQ) Map 69
7.3 Memory Map.....76

1. Introduction



1.1 Product Description

The CE-6BT01 is a COM Express® form factor module in Compact Size with Type 6 pinout and features the Intel® Atom™ Processor E3800 Series (codename "Bay Trail") in FCBGA1170 package on 22nm process technology in a single chip solution. Two 204-pin SODIMM sockets are for dual channel DDR3L 1333MHz memory with maximum capacity of up to 8GB. The Intel HD graphics controller integrated within the processor supports two independent displays (VGA, DDI, or LVDS).

The CE-6BT01 is based on the COM Express® specification and features a standardized connector layout that carries a specified set of signals. The Type 6 pin-out connectors support DDI/LVDS/VGA, SATA, HD audio, Gigabit Ethernet, PCIe and USB 3.0. This computer-on-module provides the core system functions and requires a carrier board to bring out I/O to form a complete system. To accommodate a variety of OEM/ODM requirements, the COM Express module with a carrier board is the best cost-effective solution and reduces development time.

1.2 Specifications

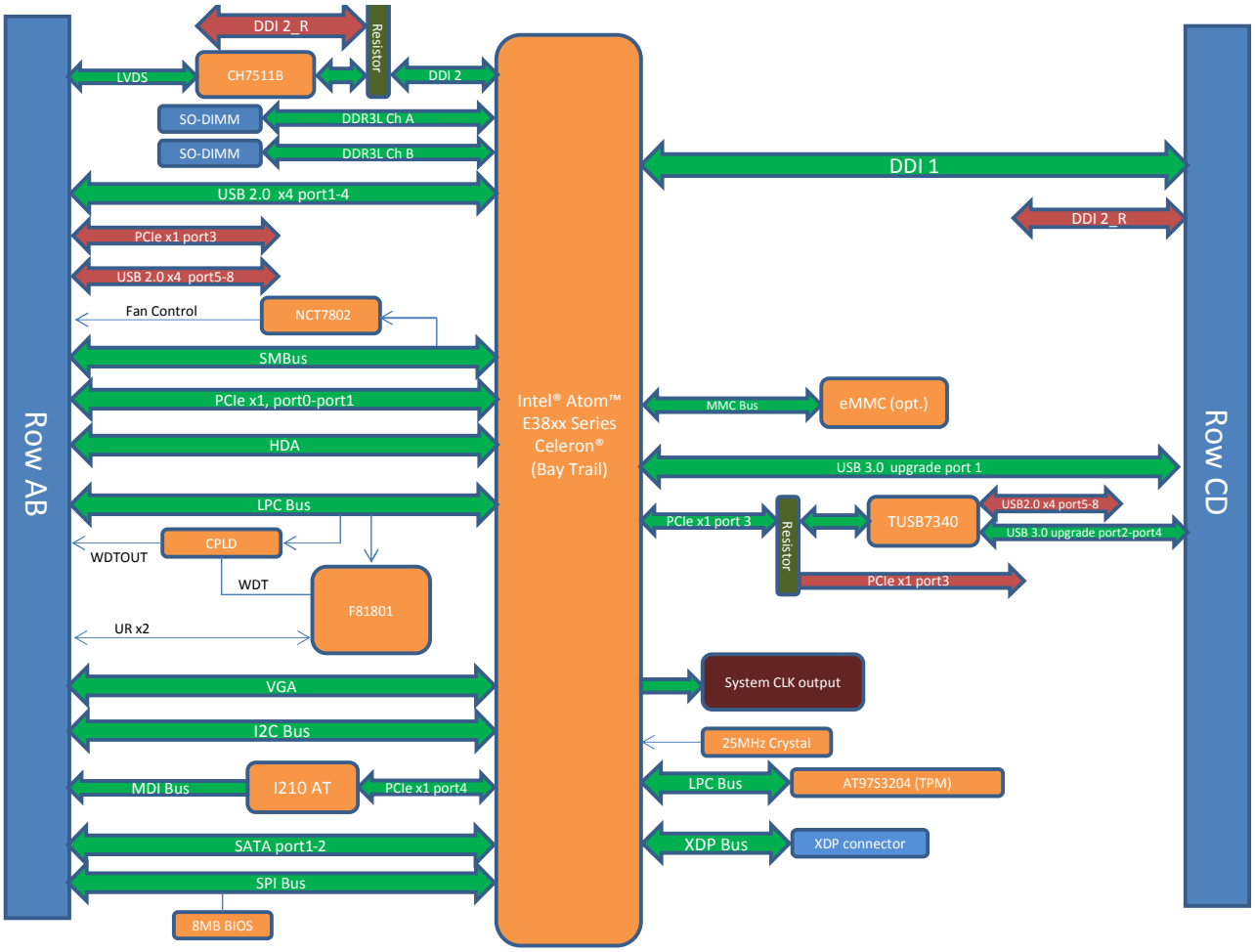
- **CPU**

  Intel® Atom™ Processor E3800 Series, FCBGA1170 package
  - Atom™ E3845: 4-core, 1.91GHz, TDP 10W
  - Atom™ E3827: 2-core, 1.75GHz. TDP 8W
  - Atom™ E3825: 2-core, 1.75GHz. TDP 6W
  - Atom™ E3815: 1-core, 1.46GHz, TDP 5W
  - Celeron® N2930: 4-core, 1.86GHz, TDP 7W
  - Celeron® N2807: 2-core, 1.58GHz, TDP 4.3W
  - Celeron® J1900: 4-core, 2.00GHz, TDP 10W
- **System Memory**
  - Two 204-pin DDR3L SODIMM sockets
  - 1333MHz, non-ECC unbuffered
  - Data transfer rates up to 1333MT/s
  - Up to 8GB
- **BIOS**
  - AMI uEFI BIOS
  - 8MB SPI flash ROM
- **TPM**
  - TPM 1.2 support
- **Graphics**
  - Intel® HD Graphics Gen 7 integrated in CPU
  - 1x VGA, resolution up to 2560x1600@60Hz
  - 2x DDI interfaces
    - 1st DDI port reserved for DP/eDP/HDMI/DVI
    - 2nd DDI port for DP/eDP/HDMI/DVI or LVDS
  - eDP to LVDS (optional)
    - Realtek RTD2136R
    - 2-channel 24-bit LVDS
- **Ethernet**
  - One Intel® I210AT GbE Controller
  - 10/100/1000BASE-TX Ethernet
  - WOL/PXE support
- **USB**
  - TI TUSB7340 USB 3.0 xHCI Host Controller
  - 4x USB 3.0 ports
  - 4x USB 2.0 ports

- **Audio**
  - Integrated in Bay Trail SOC
  - HD audio codec
- **Storage**
  - eMMC onboard (optional)
- **COM Express Type 6 Row A/B I/O**
  - 1x 2-ch 24-bit LVDS (optional)
  - 1x VGA
  - 2x SATA 3Gb/s ports
  - 8x USB 2.0 ports (ports 1-4 from Intel SOC, ports 5-8 from TI TUSB7340)
  - 1x HD audio interface
  - 1x LPC interface
  - 1x GbE
  - 2x PCIe x1 ports
  - 2x UART ports
  - 1x SMBus
  - 1x SPI interface
  - 1x I2C interface
  - 1x 8-bit DIO (4-bit input, 4-bit output)
  - 2x Fan control signals
  - 1x Reset signal
  - 1x Power-on button signal
  - 1x Watchdog Timer
- **COM Express Type 6 Row C/D I/O**
  - DDI1, DDI2 (optional)
  - 4x USB 3.0 ports upgrade signals (port 1 from Intel SOC, ports 2-4 from TI TUSB7340)
- **Watchdog Timer**
  - H/W Reset, 1-255 steps
  - 1 sec. or 1min. increments
- **Hardware Monitor**
  - CPU core/IO power
  - Memory power
- **Debug**
  - 1x 60-pin XDP connector

- **Form Factor**
  - COM Express Type 6, Compact Size, 95mm x 95mm
- **Power**
  - AT/ATX mode supported
  - AT mode:
    - V_{in}: +5V to +19V
  - ATX mode:
    - V_{in}: +5V to +19V
    - $V_{standby}$: +5VSB
- **Operating Temp.**
  - ACPI 5.0 compliant
- **Storage Temp.**
  - CE-6BT01: 0°C to 60°C
  - CE-6BT01r: -20°C to 70°C
  - CE-6BT01e: -40°C to 85°C
- **Operating Humidity**
  - 10% to 90% relative humidity, non-condensing
- **Certifications**
  - CE
  - FCC Class A

1.3 Block Diagram

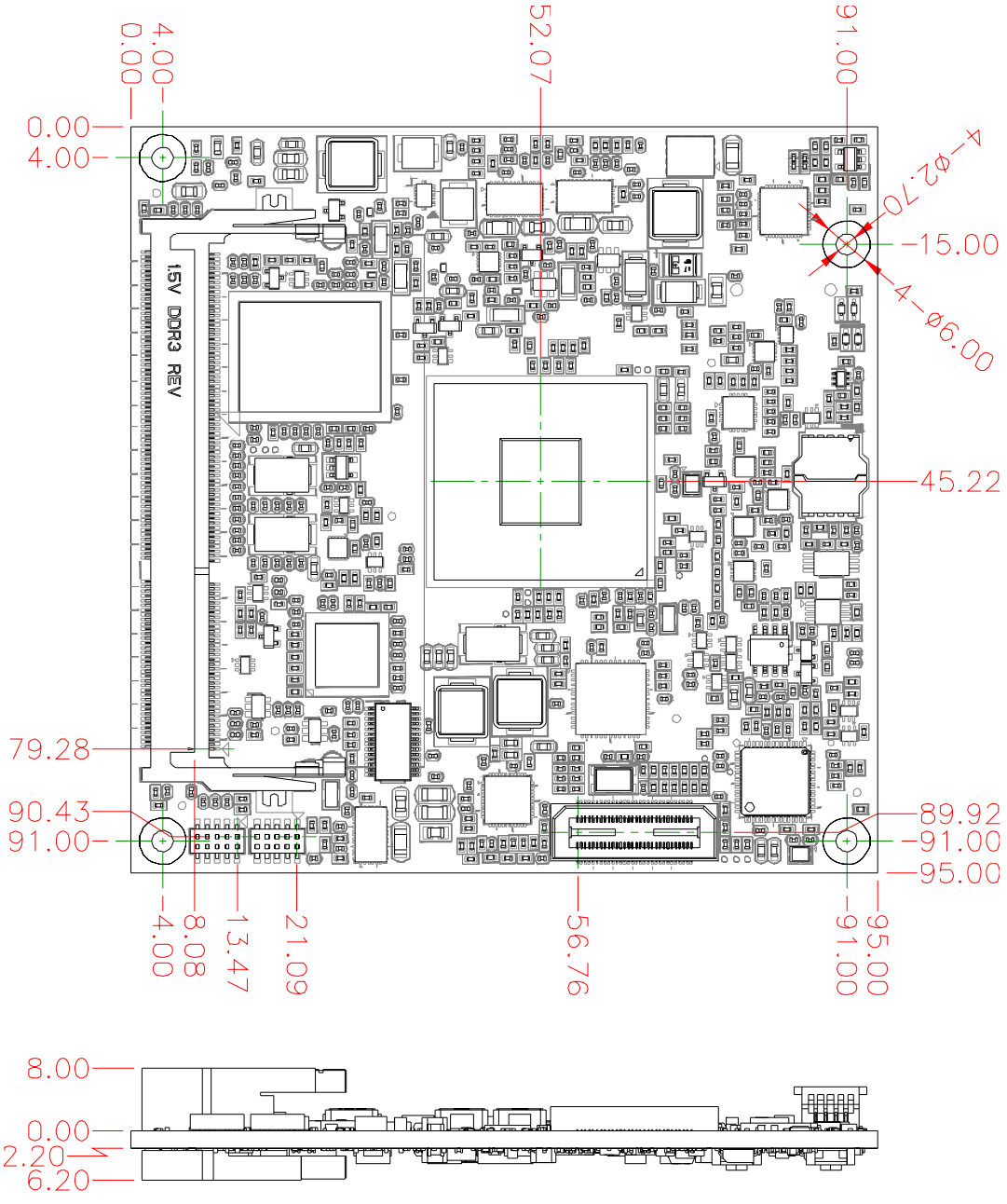


2. Mechanical Specifications

The CE-6BT01 is a 95mm x 95mm COM Express Compact Size module. The mounting holes shown in the drawing below are for stacking the module with a heat spreader or heat sink and carrier board. The mounting holes are 2.7mm in diameter, and 2.5mm thick mounting hardware shall be used.

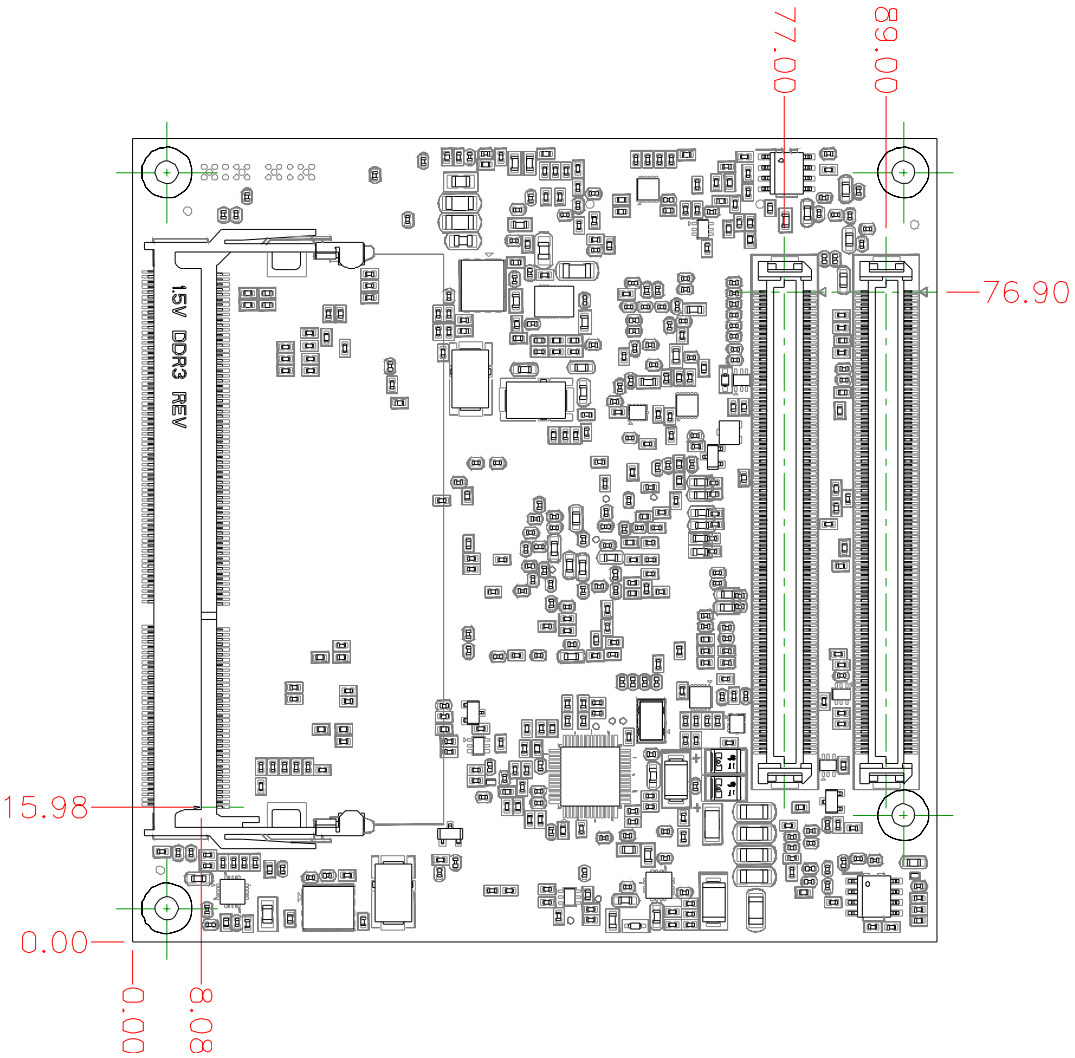
2.1 Dimensions

Top View



Units: mm

Bottom View

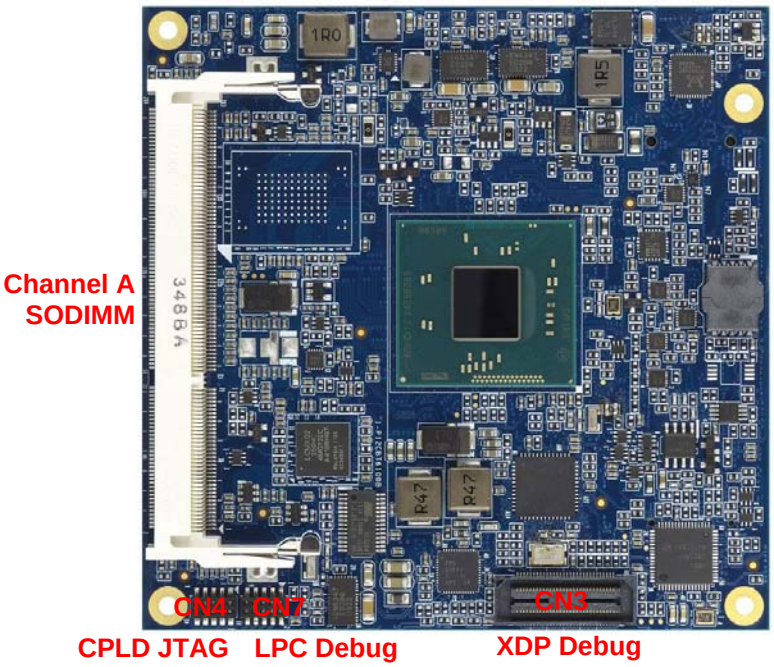


Units: mm

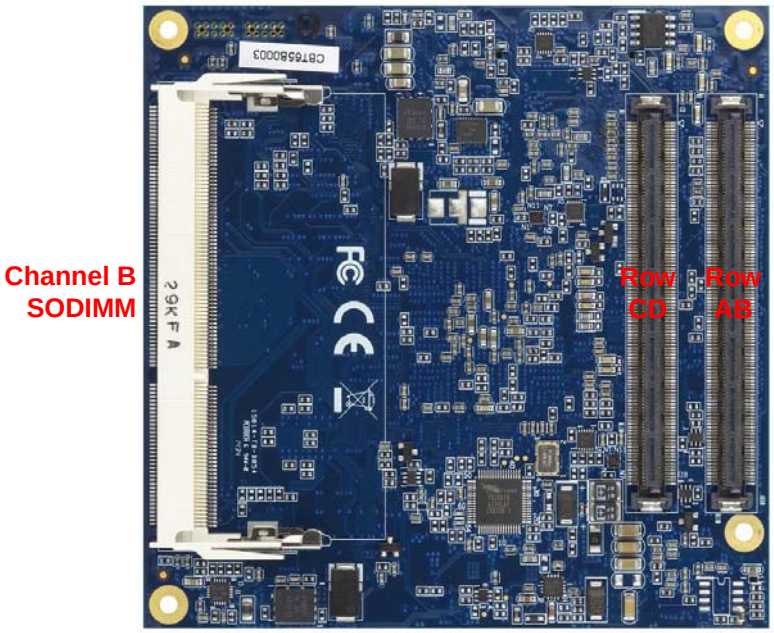
2.2 Board Layout

The 204-pin SODIMM connectors are mounted on both top and bottom sides of the module. Both COM Express AB/CD connectors are mounted on the bottom side of the module.

Top View



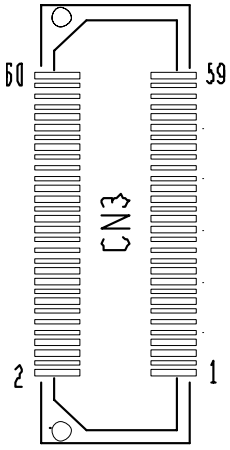
Bottom View



2.3 Onboard Connectors

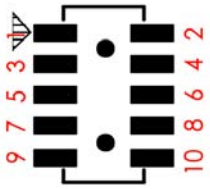
2.3.1 XPD Debug Connector (CN3)

Pin	Signal	Pin	Signal
1	GND	2	GND
3	PREQ	4	MCSI_GPIO_0
5	PRDY	6	GPIO_S5_22
7	GND	8	GND
9	GPIO_S5_23	10	MCSI_GPIO_1
11	GPIO_S5_24	12	MCSI_GPIO_2
13	GND	14	GND
15	GPIO_S5_25	16	MCSI_GPIO_3
17	GPIO_S5_26	18	MCSI_GPIO_4
19	GND	20	GND
21	NC	22	NC
23	NC	24	NC
25	GND	26	GND
27	GPIO_S5_27	28	MCSI_GPIO_5
29	GPIO_S5_28	30	MCSI_GPIO_6
31	GND	32	GND
33	GPIO_S5_29	34	MCSI_GPIO_7
35	GPIO_S5_30	36	MCSI_GPIO_8
37	GND	38	GND
39	RSMRST_L	40	NC
41	PWRBTN-L	42	NC
43	1.8V_SUSPEND	44	1.8V_SYSTEM
45	SYS_PWROK	46	PLTRST_L
47	XDP_RTEST_L	48	SYS_RST_L
49	GND	50	GND
51	SMBDATA	52	XDP_TDO
53	SMBCLK	54	XDP_TRST
55	NC	56	XDP_TDI
57	XDP_TCK	58	XDP_TMS
59	GND	60	NC



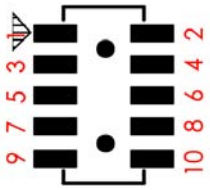
2.3.2 CPLD JTAG Connector (CN4)

Pin	Signal	Pin	Signal
1	+3.3V	2	GND
3	TDO	4	GND
5	TDI	6	GND
7	TMS	8	GND
9	TCK	10	GND



2.3.3 LPC Debug Connector (CN7)

Pin	Signal	Pin	Signal
1	GND	2	+3.3V
3	LPC_AD3	4	BIOS_DIS0-L
5	LPC_AD2	6	RESET
7	LPC_AD1	8	CLOCK
9	LPC_AD0	10	FRAME



2.4 COM Express Connectors

The CE-6BT01 is connected to the carrier board via two 220-pin connectors. Each connector contains two rows of signals. CN5 consists of Row A and Row B; and CN6 consists of Row C and Row D. Their pinouts are as shown in the table below.

Pin	Row A	Row B	Row C	Row D
1	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
2	GBE0_MDI3-	GBE0_ACT#	GND	GND
3	GBE0_MDI3+	LPC_FRAME#	USB_SSRX0-	USB_SSTX0-
4	GBE0_LINK100#	LPC_AD0	USB_SSRX0+	USB_SSTX0+
5	GBE0_LINK1000#	LPC_AD1	GND	GND
6	GBE0_MDI2-	LPC_AD2	USB_SSRX1-	USB_SSTX1-
7	GBE0_MDI2+	LPC_AD3	USB_SSRX1+	USB_SSTX1+
8	GBE0_LINK#	LPC_DRQ0#	GND	GND
9	GBE0_MDI1-	LPC_DRQ1#	USB_SSRX2-	USB_SSTX2-
10	GBE0_MDI1+	LPC_CLK	USB_SSRX2+	USB_SSTX2+
11	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
12	GBE0_MDI0-	PWRBTN#-	USB_SSRX3-	USB_SSTX3-
13	GBE0_MDI0+	SMB_CK	USB_SSRX3+	USB_SSTX3+
14	GBE0_CTREF	SMB_DAT	GND	GND
15	SUS_S3#	SMB_ALERT#	DDI1_PAIR6+	DDI1_CTRLCLK_AUX+
16	SATA0_TX+	SATA1_TX+	DDI1_PAIR6-	DDI1_CTRLDATA_AUX-
17	SATA0_TX-	SATA1_TX-	NC	NC
18	SUS_S4#	SUS_STAT#	NC	NC
19	SATA0_RX+	SATA1_RX+	PCIE6_RX+	PCIE6_TX+
20	SATA0_RX-	SATA1_RX-	PCIE6_RX-	PCIE6_TX-
21	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
22	SATA2_TX+	SATA3_TX+	NC	NC
23	SATA2_TX-	SATA3_TX-	NC	NC
24	SUS_S5#	PWR_OK	DDI1_HPD	NC
25	SATA2_RX+	SATA3_RX+	DDI1_PAIR4+	NC
26	SATA2_RX-	SATA3_RX-	DDI1_PAIR4-	DDI1_PAIR0+
27	BATLOW#	WDT	NC	DDI1_PAIR0-
28	(S)ATA_ACT#	AC/HAD_SDIN2	NC	NC
29	AC/HDA_SYNC	AC/HAD_SDIN1	DDI1_PAIR5+	DDI1_PAIR1+
30	AC/HAD_RST#	AC/HAD_SDIN0	DDI1_PAIR5-	DDI1_PAIR1-
31	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
32	AC/HDA_BITCLK	SPKR	DDI2_CTRLCLK_AUX+	DDI1_PAIR2+

Pin	Row A	Row B	Row C	Row D
33	AC/HAD_SDOUT	I2C_CK	DDI2_CTRLDATA_AUX-	DDI1_PAIR2-
34	BIOS_DIS0#	I2C_DAT	DDI2_DDC_AUX_SEL	DDI1_DDC_AUX_SEL
35	THRMTRIP#	THRM#	NC	NC
36	USB6-	USB7-	DDI3_CTRLCLK_AUX+	DDI1_PAIR3+
37	USB6+	USB7+	DDI3_CTRLDATA_AUX-	DDI1_PAIR3-
38	USB_6_7_OC#	USB_4_5_OC#	DDI3_DDC_AUX_SEL	NC
39	USB4-	USB5-	DDI3_PAIR0+	DDI2_PAIR0+
40	USB4+	USB5+	DDI3_PAIR0-	DDI2_PAIR0-
41	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
42	USB2-	USB3-	DDI3_PAIR1+	DDI2_PAIR1+
43	USB2+	USB3+	DDI3_PAIR1-	DDI2_PAIR1-
44	USB_2_3_OC#	USB_0_1_OC#	DDI3_HPD	DDI2_HPD
45	USB0-	USB1-	NC	NC
46	USB0+	USB1+	DDI3_PAIR2+	DDI2_PAIR2+
47	VCC_RTC	EXCD1_PERST#	DDI3_PAIR2-	DDI2_PAIR2-
48	EXCD0_PERST#	EXCD1_CPPE#	NC	NC
49	EXCD0_CPPE#	SYS_RESET#	DDI3_PAIR3+	DDI2_PAIR3+
50	LPC_SERIRQ	CB_RESET#	DDI3_PAIR3-	DDI2_PAIR3-
51	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
52	PCIE5_TX+	PCIE5_RX+	PEG_RX0+	PEG_TX0+
53	PCIE5_TX-	PCIE5_RX-	PEG_RX0-	PEG_TX0-
54	GPI0	GPO1	TYPE0#	PEG_LANE_RV#
55	PCIE4_TX+	PCIE4_RX+	PEG_RX1+	PEG_TX1+
56	PCIE4_TX-	PCIE4_RX-	PEG_RX1-	PEG_TX1-
57	GND	GPO2	NC	GND
58	PCIE3_TX+	PCIE3_RX+	PEG_RX2+	PEG_TX2+
59	PCIE3_TX-	PCIE3_RX-	PEG_RX2-	PEG_TX2-
60	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
61	PCIE2_TX+	PCIE2_RX+	PEG_RX3+	PEG_TX3+
62	PCIE2_TX-	PCIE2_RX-	PEG_RX3-	PEG_TX3-
63	GPI1	GPO3	NC	NC
64	PCIE1_TX+	PCIE1_RX+	NC	NC
65	PCIE1_TX-	PCIE1_RX-	PEG_RX4+	PEG_TX4+
66	GND	WAKE0#	PEG_RX4-	PEG_TX4-
67	GPI2	WAKE1#	NC	GND
68	PCIE0_TX+	PCIE0_RX+	PEG_RX5+	PEG_TX5+
69	PCIE0_TX-	PCIE0_RX-	PEG_RX5-	PEG_TX5-
70	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
71	LVDS_A0+	LVDS_B0+	PEG_RX6+	PEG_TX6+

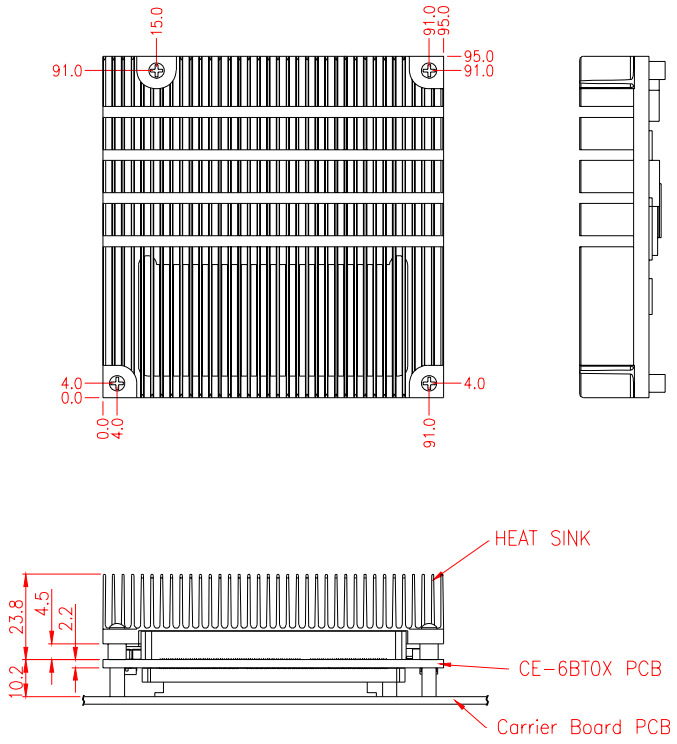
Pin	Row A	Row B	Row C	Row D
72	LVDS_A0-	LVDS_B0-	PEG_RX6-	PEG_TX6-
73	LVDS_A1+	LVDS_B1+	GND	GND
74	LVDS_A1-	LVDS_B1-	PEG_RX7+	PEG_TX7+
75	LVDS_A2+	LVDS_B2+	PEG_RX7-	PEG_TX7-
76	LVDS_A2-	LVDS_B2-	GND	GND
77	LVDS_VDD_EN	LVDS_B3+	NC	NC
78	LVDS_A3+	LVDS_B3-	PEG_RX8+	PEG_TX8+
79	LVDS_A3-	LVDS_BKLT_EN	PEG_RX8-	PEG_TX8-
80	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
81	LVDS_A_CK+	LVDS_B_CK+	PEG_RX9+	PEG_TX9+
82	LVDS_A_CK-	LVDS_B_CK-	PEG_RX9-	PEG_TX9-
83	LVDS_I2C_CK	LVDS_BKLT_CTRL	NC	NC
84	LVDS_I2C_DAT	VCC_5V_SBY	GND	GND
85	GPI3	VCC_5V_SBY	PEG_RX10+	PEG_TX10+
86	NC	VCC_5V_SBY	PEG_RX10-	PEG_TX10-
87	NC	VCC_5V_SBY	GND	GND
88	PCIE_CK_REF0+	BIOS_DIS1#	PEG_RX11+	PEG_TX11+
89	PCIE_CK_REF0-	VGA_RED	PEG_RX11-	PEG_TX11-
90	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
91	SPI_POWER	VGA_GRN	PEG_RX12+	PEG_TX12+
92	SPI_MISO	VGA_BLU	PEG_RX12-	PEG_TX12-
93	GPO0	VGA_HSYNC	GND	GND
94	SPI_CLK	VGA_VSYNC	PEG_RX13+	PEG_TX13+
95	SPI_MOSI	VGA_I2C_CK	PEG_RX13-	PEG_TX13-
96	TPM_PP	VGA_I2C_DAT	GND	GND
97	NC	SPI_CS#	NC	NC
98	SER0_TX	NC	PEG_RX14+	PEG_TX14+
99	SER0_RX	NC	PEG_RX14-	PEG_TX14-
100	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
101	SER1_TX	FAN_PWMOUT	PEG_RX15+	PEG_TX15+
102	SER1_RX	FAN_TACHIN	PEG_RX15-	PEG_TX15-
103	LID#	SLEEP#	GND	GND
104	VCC_12V	VCC_12V	VCC_12V	VCC_12V
105	VCC_12V	VCC_12V	VCC_12V	VCC_12V
106	VCC_12V	VCC_12V	VCC_12V	VCC_12V
107	VCC_12V	VCC_12V	VCC_12V	VCC_12V
108	VCC_12V	VCC_12V	VCC_12V	VCC_12V
109	VCC_12V	VCC_12V	VCC_12V	VCC_12V
110	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)

3. Thermal Solutions

There are two thermal solutions for the CE-6BT01 COM Express Module to dissipate heat. A heat sink or heat spreader can be used, and the procedures for assembling the module with the carrier board for each solution are similar.

3.1 Heat Sink

3.1.1 Dimensions



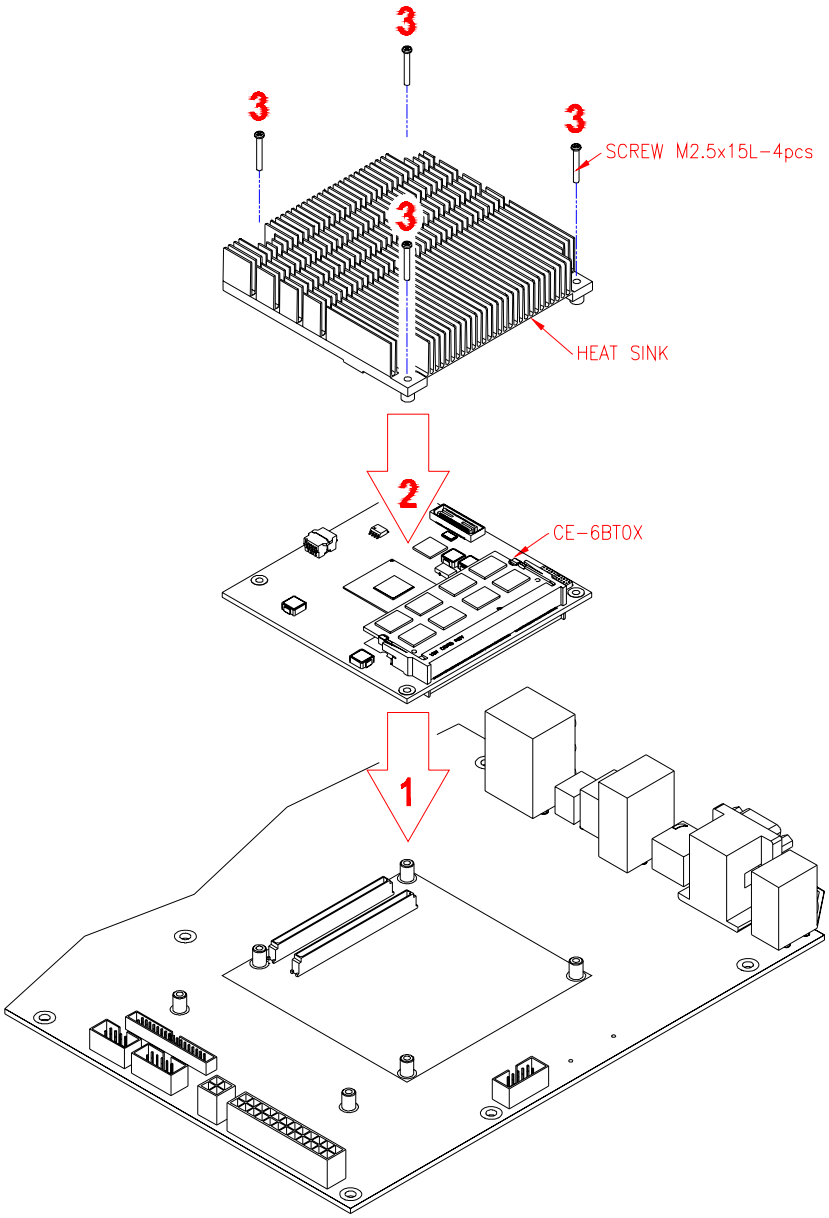
Units: mm

3.1.2 Installation

Step 1: Align the COM Express connectors on the module with the corresponding connectors on the carrier board. Make sure the four holes at the corners of the module line up with the corresponding standoffs on the carrier board. Press down on the module until it is properly seated on the carrier board.

Step 2: Place the fan sink on top of the module.

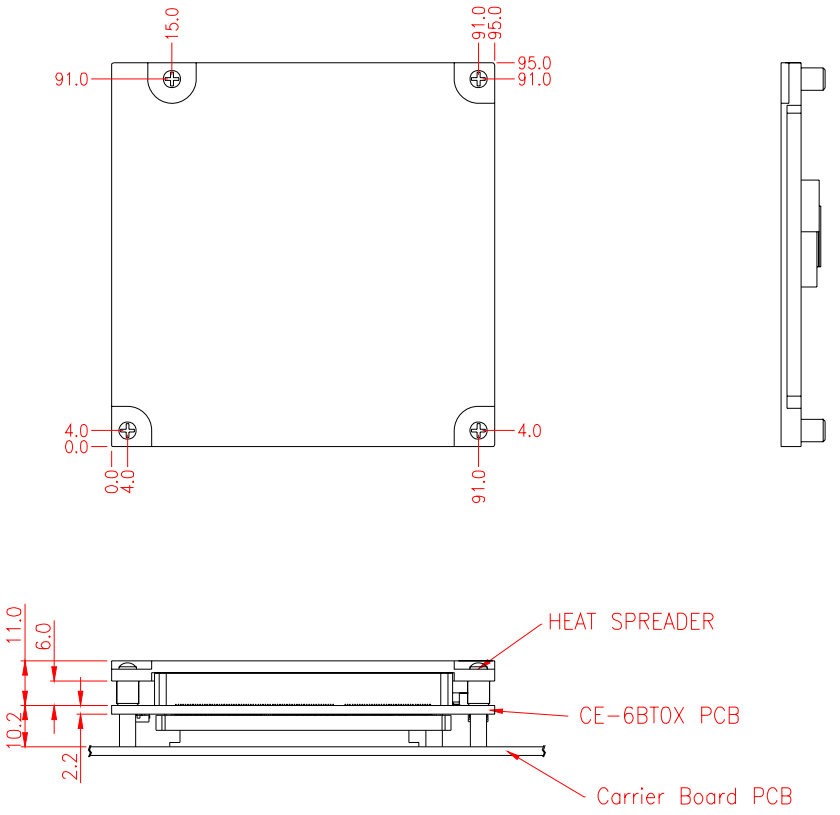
Step 3: Use four screws (M2.5x15L) to secure the fan sink to the carrier board through the corresponding holes on the module.



3.2 Heat Spreader

A heat spreader is designed for the CE-6BT01 to dissipate heat. All heat generating components are thermally connected to the heat spreader in order to avoid hot spots.

3.2.1 Dimensions



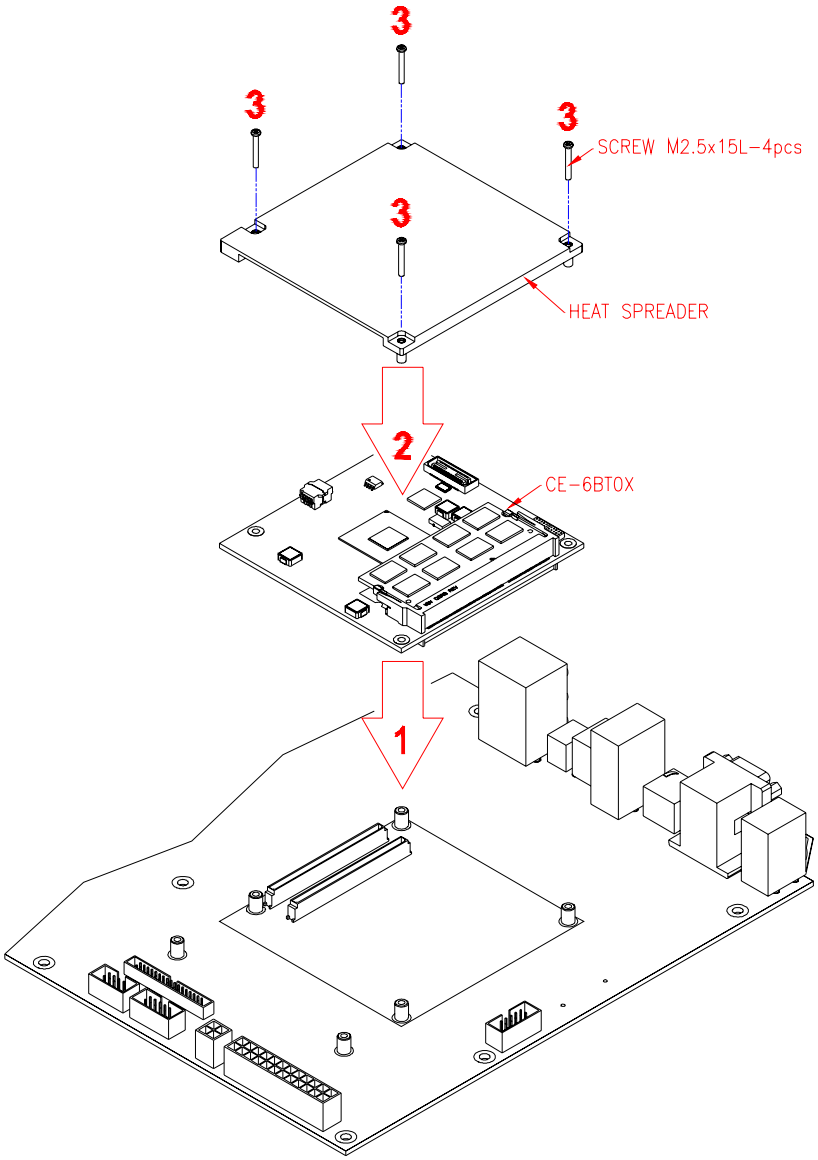
Units: mm

3.2.2 Installation

Step 1: Align the COM Express connectors on the module with the corresponding connectors on the carrier board. Make sure the four holes at the corners of the module line up with the corresponding standoffs on the carrier board. Press down on the module until it is properly seated on the carrier board.

Step 2: Place the heat spreader on top of the module.

Step 3: Use four screws (M2.5x15L) to secure the heat sink with the carrier board through the corresponding holes on the module.



4. Features & Interfaces

4.1 Processor

The CE-6BT01 supports the Intel® Atom™ processor E3800 Series which utilizes 22nm process technology with 3-D Tri-Gate transistors to deliver significant improvement in computational performance and energy-efficiency. Based on a new micro-architecture, the processor is designed for a one-chip platform. This system-on-chip (SoC) solution platform brings enhanced graphics, greater performance, lower cost, easier validation, and improved x-y footprint to a broad range of intelligent systems. The processor includes an Integrated Display Engine, Processor Graphics and Integrated Memory Controller.

4.2 BIOS

AMI uEFI BIOS on 8MB SPI Flash ROM is used on the CE-6BT01.

4.3 System Memory

The Integrated Memory Controller (IMC) of the processor supports single channel, non-ECC, unbuffered DDR3L-1333 memory up to 8GB with data transfer rates up to 1333MT/s.

4.4 Graphics

The graphics is integrated in the processor and based on Intel® HD Graphics Gen 7, enabling substantial gains in performance and lower power consumption.

- DirectX 11 support
- OpenGL 4.0 support
- Graphics Base Frequency: 542 MHz
- Graphics Max Dynamic Frequency: 792 MHz
- Full HD video playback
- Maximum resolution of 2560x1600@60Hz

Graphics outputs are as follows:

DDI port: DisplayPort 1.2, 2560x1600@60Hz; HDMI 1.4,1080p@60Hz
VGA: 1600x1200@60Hz (SKU dependent)
LVDS: 2048x1536

4.4.1 Analog Display Port

The VGA port is used for boot, safe mode, legacy games, etc. It can be changed by an application without OS/driver notification, due to legacy requirements.

Signal	I/O	Description
VGA_RED	O	Red Analog Video Output: This signal is a VGA Analog video output from the internal color palette DAC.
VGA_GREEN	O	Green Analog Video Output: This signal is a VGA Analog video output from the internal color palette DAC.
VGA_BLUE	O	Blue Analog Video Output: This signal is a VGA Analog video output from the internal color palette DAC.
VGA_HSYNC	O	VGA Horizontal Synchronization: This signal is used as the horizontal sync (polarity is programmable) or “sync interval”.
VGA_VSYNC	O	VGA Vertical Synchronization: This signal is used as the horizontal sync (polarity is programmable) or “sync interval”.
VGA_I2C_CLK	I/O	VGA DDC Clock: EDID support for an external VGA display.
VGA_I2C_DATA	I/O	VGA DDC Data: EDID support for an external VGA display.

4.4.2 LVDS

Each of the two LVDS transmitter channels consist of 4 data pairs and a clock pair. The LVDS data pair is used to transfer pixel data as well as the LCD timing control signals.

Signal	I/O	Description
LVDS_A/B[3:0]+	O	Differential data output
LVDS_A/B[3:0]-	O	Differential data output
LVDS_A/B_CLK+	O	Differential clock output - positive
LVDS_A/B_CLK-	O	Differential clock output - negative
LVDS_VDD_EN	O	LVDS panel power enable

Signal	I/O	Description
LVDS_BKLT_EN	O	Panel backlight enable control
LVDS_BKLT_CTR	O	Panel backlight brightness control
LVDS_I2C_CLK	I/O	LVDS flat panel I2C clock for EDID read and control.
LVDS_I2C_DATA	I/O	LVDS flat panel I2C data for EDID read and control.

4.4.3 Digital Display Interfaces (DDI)

The processor supports two Digital Display Interfaces that can be configured as DisplayPort, HDMI or DVI.

Signal	I/O	Description
DDI[1:2]_PAIR[0:3]+ DDI[1:2]_PAIR[0:3]-	O	DDI 1 to 2 Pair[0:3] differential pairs
DDI[1:2]_DDC_AUX_SEL	I	Selects the function of DDI[1:2]_CTRLCLK_AUX+ and DDI[1:2]_CTRLDATA_AUX-. This pin shall have a 1M pull-down to logic ground on the Module. If this input is floating the AUX pair is used for the DP AUX+/- signals. If pulled-high the AUX pair contains the CTRLCLK and CTRLDATA signals.
DDI[1:2]_CTRLCLK_AUX+	I/O	DP AUX+ function if DDI[1:2]_DDC_AUX_SEL is no connect
	I/O	HDMI/DVI I2C CTRLCLK if DDI[1:2]_DDC_AUX_SEL is pulled high
DDI[1:2]_CTRLDATA_AUX-	I/O	DP AUX- function if DDI[1:2]_DDC_AUX_SEL is not connected
	I/O	HDMI/DVI I2C CTRLDATA if DDI[1:2]_DDC_AUX_SEL is pulled high
DDI[1:2]_HPD	I	DDI Hot-Plug Detect

DDI Pin Definitions

	Signal	Pin	eDP/DP	HDMI/DVI
DDI1	DDI1_PAIR0+	D26	DP1_LANE0+	TMDS1_DATA2+
	DDI1_PAIR0-	D27	DP1_LANE0-	TMDS1_DATA2-
	DDI1_PAIR1+	D29	DP1_LANE1+	TMDS1_DATA1+
	DDI1_PAIR1-	D30	DP1_LANE1-	TMDS1_DATA1-
	DDI1_PAIR2+	D32	DP1_LANE2+	TMDS1_DATA0+
	DDI1_PAIR2-	D33	DP1_LANE2-	TMDS1_DATA0-
	DDI1_PAIR3+	D36	DP1_LANE3+	TMDS1_CLK+
	DDI1_PAIR3-	D37	DP1_LANE3-	TMDS1_CLK-
	DDI1_CTRLCLK_AUX+	D15	DP1_AUX+	TMDS1_SCL
	DDI1_CTRLDATA_AUX-	D16	DP1_AUX-	TMDS1_SDA
	DDI1_DDC_AUX_SEL	D34	CONFIG1 (pull down to GND)	Pull up to 5V
	DDI1_HPD (3.3V active high signal)	C24		

	Signal	Pin	DP	HDMI/DVI
DDI2	DDI2_PAIR0+	D39	DP2_LANE0+	TMDS2_DATA2+
	DDI2_PAIR0-	D40	DP2_LANE0-	TMDS2_DATA2-
	DDI2_PAIR1+	D42	DP2_LANE1+	TMDS2_DATA1+
	DDI2_PAIR1-	D43	DP2_LANE1-	TMDS2_DATA1-
	DDI2_PAIR2+	D46	DP2_LANE2+	TMDS2_DATA0+
	DDI2_PAIR2-	D47	DP2_LANE2-	TMDS2_DATA0-
	DDI2_PAIR3+	D49	DP2_LANE3+	TMDS2_CLK+
	DDI2_PAIR3-	D50	DP2_LANE3-	TMDS2_CLK-
	DDI2_CTRLCLK_AUX+	C32	DP2_AUX+	HDMI2_SCL
	DDI2_CTRLDATA_AUX-	C33	DP2_AUX-	HDMI2_SDA
	DDI2_DDC_AUX_SEL	C34	CONFIG1 (pull down to GND)	Pull up to 5V
	DDI2_HPD (3.3V active high signal)	D44		

4.4.3.1 High Definition Multimedia Interface (HDMI)

The HDMI port is provided for transmitting uncompressed digital audio and video signals to television sets, projectors and other video displays.

4.4.3.2 Digital Video Interface (DVI)

The DDI ports can be configured to drive DVI-D. DVI uses TMDS for transmitting data from the transmitter to the receiver, which is similar to the HDMI protocol but the audio and CEC. When a system has support for DVI-I port, then either VGA or the DVI-D through a single DVI-I connector can be driven but not both simultaneously.

HDMI Signal	I/O	Description
TMDS[1:2]_CLK+ TMDS[1:2]_CLK-	O	HDMI/DVI TMDS Clock differential pair
TMDS[1:2]_DATA[0:2]+ TMDS[1:2]_DATA[0:2]-	O	HDMI/DVI TMDS lanes 0, 1 and 2 differential pairs
HDMI[1:2]_SCL	I/O	HDMI/DVI I2C control clock
HDMI[1:2]_SDA	I/O	HDMI/DVI I2C control data

4.4.3.3 Display Port (DP)

The DisplayPort output is a digital communication interface that utilized differential signaling to achieve a high bandwidth bus interface designed to support connections between PCs and monitors, projectors, and TV displays.

4.5 USB

The Intel® SOC USB Host Controller (xHCI,EHCI) supports:

- One super speed (SS) port on xHCI,
- Four Full Speed(FS)/High Speed(HS) ports on xHCI or EHCI.
- Two High Speed (HS) High Speed Inter-Chip (HSIC) ports on xHCI.

The Ti TUSB7340 USB 3.0 xHCI Host Controller supports an additional 3 USB 3.0 ports.

4.5.1 USB 2.0

Each USB 2.0 port supports USB 1.1 and 2.0 compliant devices.

Signal	I/O	Description
USB[0:7]+ USB[0:7]-	I/O	USB differential pairs, channels 0 through 7
USB_0_1_OC#	I	USB over-current sense, USB 0 and 1. A pull-up for this line shall be present on the Module. An open drain driver from a USB current monitor on the Carrier Board may drive this line low. Do not pull this line high on the Carrier Board.
USB_2_3_OC#	I	USB over-current sense, USB 2 and 3. A pull-up for this line shall be present on the Module. An open drain driver from a USB current monitor on the Carrier Board may drive this line low. Do not pull this line high on the Carrier Board.
USB_4_5_OC#	I	USB over-current sense, USB 4 and 5. A pull-up for this line shall be present on the Module. An open drain driver from a USB current monitor on the Carrier Board may drive this line low. Do not pull this line high on the Carrier Board.
USB_6_7_OC#	I	USB over-current sense, USB 6 and 7. A pull-up for this line shall be present on the Module. An open drain driver from a USB current monitor on the Carrier Board may drive this line low. Do not pull this line high on the Carrier Board.

4.5.2 USB 3.0

Signal	I/O	Description
USB_SSRX[0:3]+ USB_SSRX[0:3]-	I	USB differential pairs, channels 0 through 3, receive Data/Address/Command signals
USB_SSTX[0:3]+ USB_SSTX[0:3]-	O	USB differential pairs, channels 0 through 3, transmit Data/Address/Command signals

4.6 Ethernet

The CE-6BT01 features an Intel® I210 AT Ethernet Controller, which is connected to one PCIe x1, and provides a 10/100/1000Mb/s interface.

Signal	I/O	Description
GBE0_MDI[0:3]+ GBE0_MDI[0:3]-	I/O	Gigabit Ethernet Controller 0: Media Dependent Interface Differential Pairs 0, 1, 2, 3. The MDI can operate in 1000, 100 and 10 Mbit/sec modes. Some pairs are unused in some modes, per the following: 1000BASE-T / 100BASE-TX / 10BASE-T MDI[0]+/- / B1_DA+/- / TX+/- / TX+/- MDI[1]+/- / B1_DB+/- / RX+/- / RX+/- MDI[2]+/- / B1_DC+/- MDI[3]+/- / B1_DD+/-
GBE0_ACT#	OD	Gigabit Ethernet Controller 0 activity indicator, active low
GBE0_LINK#	OD	Gigabit Ethernet Controller 0 link indicator, active low
GBE0_LINK100#	OD	Gigabit Ethernet Controller 0 100 Mbit/sec link indicator, active low
GBE0_LINK1000#	OD	Gigabit Ethernet Controller 0 1000 Mbit/sec link indicator, active low
GBE0_CTREF	REF	Reference voltage for Carrier Board Ethernet channel 0 magnetics center tap. The reference voltage is 3.3V.

4.7 SATA

The SOC has one integrated SATA host controller that supports independent DMA operation and data transfer rates of up to 3.0 Gb/s.

Signal	I/O	Description
SATA[0..1]_TX+ SATA[0..1]_TX-	O	Serial ATA Port 0~1 transmit differential pair
SATA[0..1]_RX+ SATA[0..1]_RX-	I	Serial ATA Port 0~1 receive differential pair
(S)ATA_ACT#	OC	ATA (parallel and serial) activity indicator, active low

4.8 PCI Express

There are four one-lane PCI Express ports provided by the SOC, but one of the ports is used for Ethernet and the other one of ports is used for PCIe to USB function chip. The ports are compliant to the PCI Express 2.0 specification running at 5 Gb/s.

Signal	I/O	Description
PCIE[0:3]_TX+ PCIE[0:3]_TX-	O	PCI Express Differential transmit Pairs 0 through 6
PCIE[0:3]_RX+ PCIE[0:3]_RX-	I	PCI Express Differential receive Pairs 0 through 6
PCIE_CK_REF0+ PCIE_CK_REF0-	O	Reference clock output for all PCI Express and PCI Express Graphics lanes

4.9 Audio

The processor also integrates dedicated an HD audio controller to drive audio on integrated digital display interfaces, such as HDMI and DisplayPort. The HD audio controller on the PCH would continue to support down codecs, and so on. The processor Mini HD audio controller supports two High Definition Audio streams simultaneously on any of the three digital ports.

Signal	I/O	Description
AC/HDA_RST#	O	Reset output to CODEC, active low
AC/HDA_SYNC	O	Sample-synchronization signal to the CODEC(s)
AC/HDA_BITCLK	O	Serial data clock generated by the external CODEC(s)
AC/HDA_SDOUT	O	Serial TDM data output to the CODEC
AC/HDA_SDIN[2:0]	I/O	Serial TDM data input from up to 3 CODECs

4.10 LPC

The LPC interface provides legacy I/O support on a carrier board via a Super I/O and system management devices.

Signal	I/O	Description
LPC_AD[3:0]	I/O	LPC multiplexed address, command and data
LPC_FRAME#	O	LPC frame indicates the start of an LPC cycle
LPC_DRQ[0:1]#	I	LPC serial DMA request input
LPC_SERIRQ	I/O	LPC serial interrupt
LPC_CLK	O	LPC clock output – 33MHz nominal

4.11 SPI

The Serial Peripheral Interface (SPI) is a 4-pin interface that supports SPI-compatible flash devices. The SPI flash device can be up to 8MB (64Mb).

Signal	I/O	Description
SPI_CS#	O	Chip select for Carrier Board SPI - may be sourced from chipset SPI0 or SPI1
SPI_MISO	I	Data in to Module from Carrier SPI
SPI_MISI	O	Data out from Module to Carrier SPI
SPI_CLK	O	Clock from Module to Carrier SPI
SPI_POWER	O	Power supply for Carrier Board SPI – sourced from Module – nominally 3.3V. The Module shall provide a minimum of 100mA on SPI_POWER. Carriers shall use less than 100ma of SPI_POWER. SPI_POWER shall only be used to power SPI devices on the Carrier Board.

4.12 UART

The CE-6BT01 module supports two serial RX/TX ports.

Signal	I/O	Description
SER[0:1]_TX	O	UART transmitter
SER[0:1]_RX	I	UART receiver

4.13 SMBus

The SMBus port is specified for system management functions. It is used on the module to manage system function such as reading the DRAM SPD EEPROM and setting clock synthesizer parameters. If the SMBus is used on the carrier board, great care must be taken that no conflicts with the on-module SMBus devices occur. It may be useful for implementation of standards such as Smart Battery on the carrier board. The maximum capacitance on the carrier board shall not exceed 100pF.

Signal	I/O	Description
SMB_CK	I/OD	System Management Bus bidirectional clock line
SMB_DAT	I/OD	System Management Bus bidirectional data line
SMB_ALERT#	I	System Management Bus Alert – active low input can be used to generate an SMI# (System Management Interrupt) or to wake the system.

4.14 ExpressCard

ExpressCard is a small form factor expansion card that uses PCI Express or USB as the interface. It is similar in concept and scope to CardBus. The CE-6BT01 supports two Express Card interfaces.

Signal	I/O	Description
EXCD[0:1]_CPPE#	I	PCI ExpressCard: PCI Express capable card request, active low, one per card
EXCD[0:1]_PERST#	O	PCI ExpressCard: reset, active low, one per card

4.15 General Purpose Input Output

GPI and GPO pins may be implemented as GPIO. GPI and GPO pins may be implemented as SDIO.

Signal	I/O	Description
GPO[0:3]	O	General purpose output pins. Upon a hardware reset, these outputs should be low.
GPI[0:3]	I	General purpose input pins. Pulled high internally on the Module.

4.15.1 GPIO Configuration

The output pin default setting is HIGH.

Pin #	GPIO#	Default Configuration
B63	GPIO7	**GPO3**
B57	GPIO6	**GPO2**
B54	GPIO5	**GPO1**
A93	GPIO4	**GPO0**
A85	GPIO3	**GPI3**
A67	GPIO2	**GPI2**
A63	GPIO1	**GPI1**
A54	GPIO0	**GPI0**

The GPIO function, provided by the SOC can be accessed through GPIO Base Address Register (GPIOBASE). This address is at memory-mapped IOs. The configuration on CE-6BT01 is described as below.

Register	Address
GPIOBASE Base Address	0x1C00

The memory I/O read/write function is used to access and configure the GPIO. Through the memory I/O read or write command, the current status of GPIO can configure each pin to input or output.

4.15.2 Register Description

4.15.2.1 GPIO Use Select

- GPIO Use Select Register 1

*1. (Offset **GPIOBASE+0x00**)*

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
						GPIO0	

2. *(Offset **GPIOBASE+0x02**)*

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	GPIO4	GPIO3				GPIO2	GPIO1

■ GPIO Use Select Register 2

1. *(Offset **GPIOBASE+0x30**)*

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
			GPIO7	GPIO6	GPIO5		

Note:

Bit X = 0 means Native Function

Bit X = 1 means GPIO Function

4.15.2.2 GPIO Input/Output Select

■ GPIO Input/Output Select Register 1

*1. (Offset **GPIOBASE+0x04**)*

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
						GPIO0	

*2. (Offset **GPIOBASE+0x06**)*

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	GPIO4	GPIO3				GPIO2	GPIO1

■ GPIO Input/Output Select Register 2

1. (Offset GPIOBASE+0x34)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
			GPIO7	GPIO6	GPIO5		

Note:

Bit X = 0 means Output Pin

Bit X = 1 means Input Pin

4.15.2.3 GPIO Level for Input or Output

If **Pin X** configures as **output** pin, you can decide its output value (0 or 1).
If it is programmed as an input, this register reflects the state of the input signal.

■ GPIO Level for Input or Output Register 1

1. (Offset GPIOBASE+0x0C)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
						GPIO0	

2. (Offset GPIOBASE+0x0E)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	GPIO4	GPIO3				GPIO2	GPIO1

- GPIO Level for Input or Output Register 2

1. (Offset GPIOBASE+0x38)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
			GPIO7	GPIO6	GPIO5		

4.15.2.4 GPIO Signal Invert Register

It will invert the polarity of the Input Port register data.

1. (Offset GPIOBASE+0x2C)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
						GPIO0	

2. (Offset GPIOBASE+0x2E)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	GPIO4	GPIO3				GPIO2	GPIO1

Note:

Bit X = 0 means Polarity is retained

Bit X = 1 means Polarity is inverted

GPIO4~GPIO7 cannot be set to inverted.

4.15.3 Psuedo Code

Example 1: *Change GPIO2 from input to output*

```
Step1: ByteData = ReadIOByte(0x506)     //Read current setting from configuration
                                        //Register
Step2: ByteData = ByteData | 0xFD        //Set Bit1 to 0. It means output
Step3: WriteIOByte(0x506, ByteData)     //Write back to configuration register
```

Example 2: *Set GPIO7 to output LOW*

```
Step1: ByteData = ReadIOByte(0x538)     //Read current setting from Output Port
                                        //Register
Step2: ByteData =ByteData & 0xEF        //Set Bit4 to 0. It means output low
Step3: WriteIOByte(0x538, ByteData)     //Write back to Output Port Register
```

4.16 Power and System Management Signals

Signal	I/O	Description
SUS_S3#	O	Indicates system is suspended to RAM state. Active low output.
SUS_S4#	O	Indicates system is suspended to Disk state. Active low output.
SUS_S5#	O	Indicates system is in Soft Off state.
SUS_STAT#	O	Indicates imminent suspend operation.
PWRBTN#	I	Power button to bring system out of S5 (soft off), active on rising edge.
PWR_OK	I	Power OK from main power supply
BATLOW#	I	Indicates that external battery is low.
SYS_RESET#	I	Reset button input. Active low input.
CB_RESET#	O	Carrier Board Reset. Active low input.
WAKE0#	I	PCI Express wake up signal.
WAKE1#	I	General purpose wake up signal.
VCC_RTC	I	RTC External Battery
LID#	I	LID switch
SLEEP#	I	Sleep Button
FAN_PWMOUT	O	FAN PWM out
FAN_TACHIN	I	Fan Tacho in

4.17 Thermal Management Signals

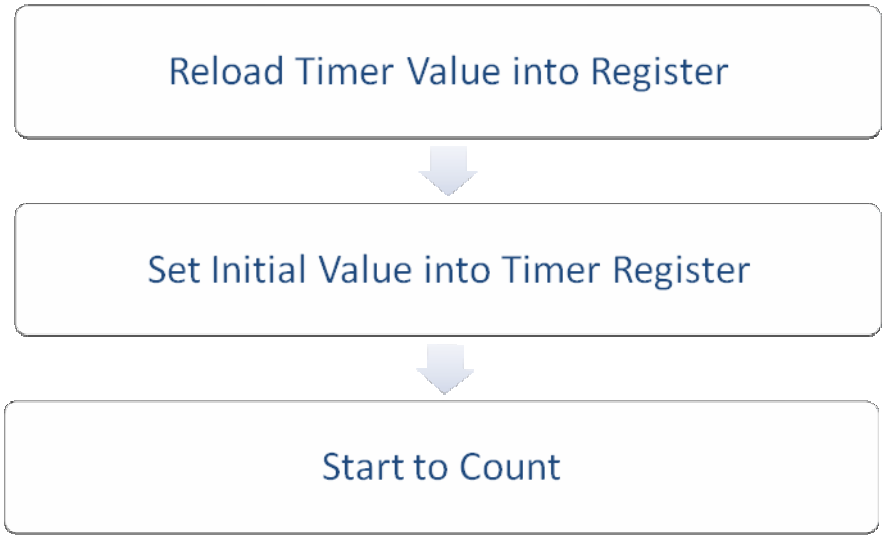
Signal	I/O	Description
THRMTRIP#	O	Active low output indicating that the CPU has entered thermal shutdown.
THRM#	I	Input from off-module temp sensor indicating and over-temp situation.

4.18 Miscellaneous Signals

Signal	I/O	Description
I2C_CK	O	General purpose I2C port clock output
I2C_DAT	I/O	General purpose I2C port data I/O lin
WDT	O	Indicator for Watchdog Timeout
SPKR	O	Output for audio enunciator-the “speaker” in PC-AT systems
BIOS_DIS0# BIOS_DIS1#	I	Selection straps to determine the BIOS boot device. The Carrier should only float these or pull them low, please refer to the table below for strapping option of BIOS disable signals.

BIOS_ DIS1#	BIOS_ DIS0#	Chipset SPI CS1# Destination	Chipset SPI CS0# Destination	Carrier SPI_CS#	SPI Descriptor	BIOS Entry	Ref Line
1	1	Module	Module	High	Module	SPI0/SPI1	0
1	0	Module	Module	High	Module	Carrier FWH	1
0	1	Module	Carrier	SPI0	Carrier	SPI0/SPI1	2
0	0	Carrier	Module	SPI1	Module	SPI1/SPI1	3

4.19 Watchdog Timer



4.19.1 Board Design

The Watchdog Timer (WDT) is implemented by Fintek F81801 Super IO.

Register	Address
WDT Base Address	0xA00

4.19.2 Psuedo Code

■ *Set WDT Time Unit (Second Unit)*

```
Step1: ByteData = ReadIOByte(0xA05)          //Read current setting
Step2: ByteData = ByteData & 0xF7            //Set time unit to "second"
Step3: WriteIOByte(0xA05, ByteData)          //Write back
```

■ *Set WDT Time Value*

```
Step1: WriteIOByte(0xA06, Time)          //Set watch dog time value
```

■ *Enable WDT*

```
■ Step1: ByteData = ReadIOByte(0xA05)      //Read current setting
■ Step2: ByteData = ByteData | 0x20        //Enable WDT
■ Step3: WriteIOByte(0xA05, ByteData)      //Write back
```

5. Driver Installation

The drivers for the CE-6BT01 can be found on the driver DVD included with the system.

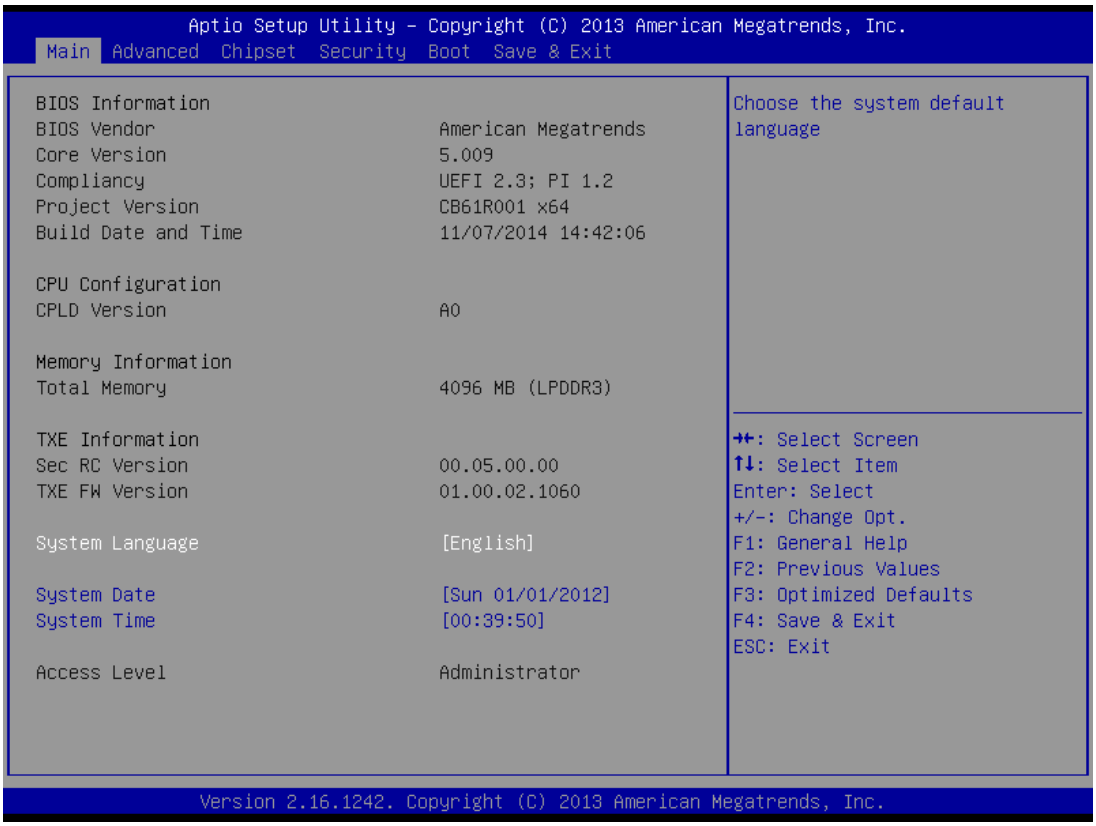
Install the following drivers in the order listed.

1. Chipset
2. Graphics
3. Audio
4. LAN
5. Intel Sideband Fabric Device (Intel MBI)
6. GPIO
7. Intel Trusted Execution Engine (Intel TXE)
8. I^2C
9. USB 3.0

6. System BIOS

The system BIOS software is stored on EEPROM. The BIOS provides an interface to modify the configuration. When the battery is removed, all the parameters will be reset.

Turn on the computer and press <DEL> or <F2> to enter the setup screens.

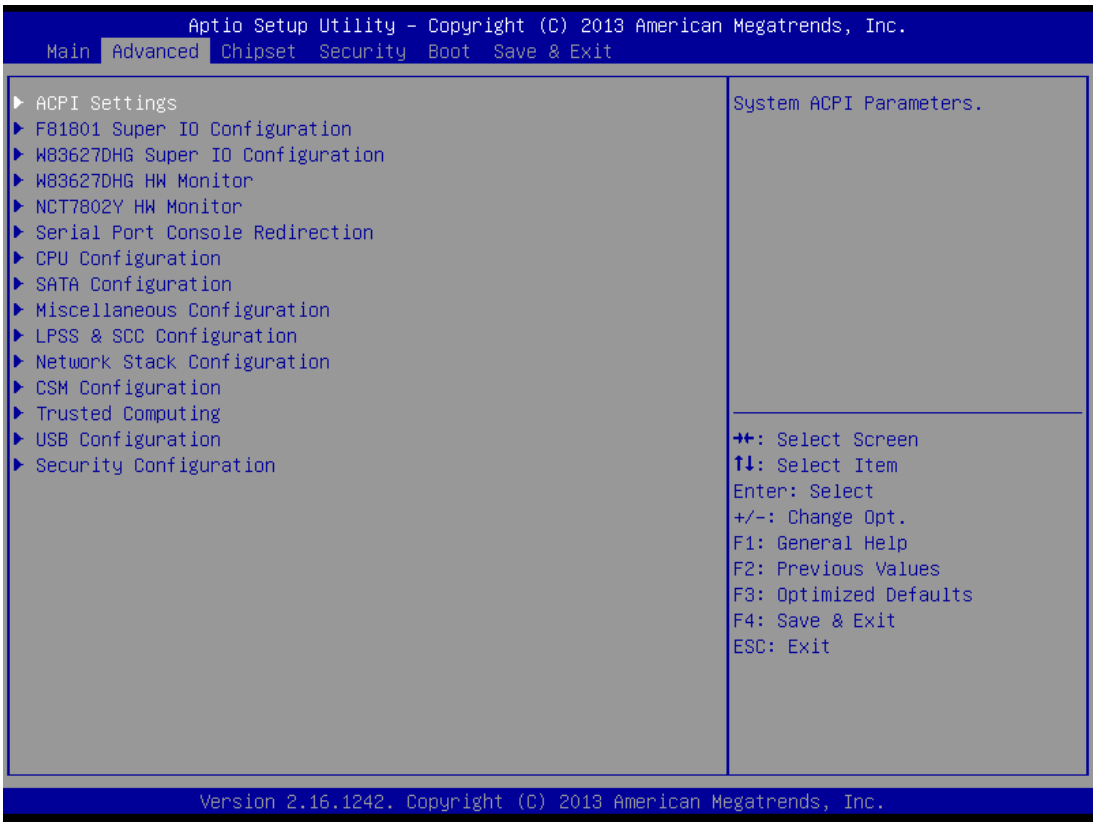


System Date: MM/DD/YYYY

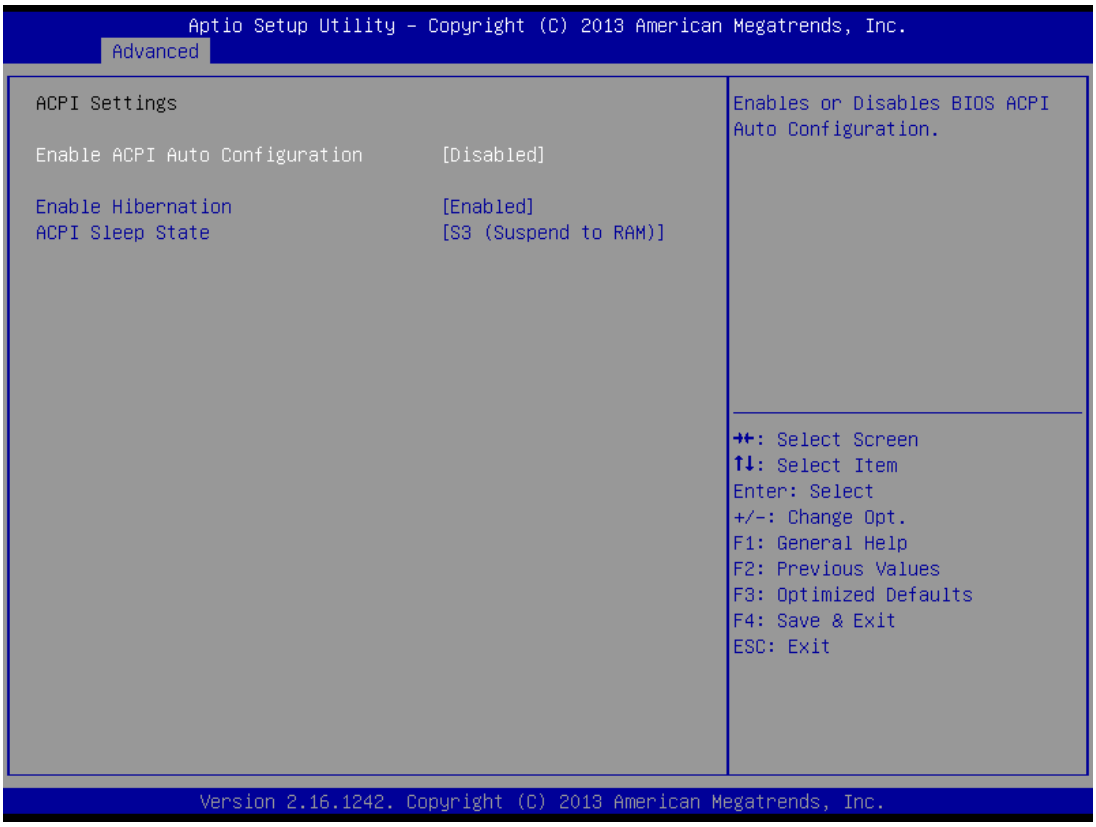
System Time: HH:MM:SS

Use Tab to switch between Date and Time elements.

6.1 Advanced


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Main Advanced Chipset Security Boot Save & Exit
ACPI Settings
F81801 Super IO Configuration
W83627DHG Super IO Configuration
W83627DHG HW Monitor
NCT7802Y HW Monitor
Serial Port Console Redirection
CPU Configuration
SATA Configuration
Miscellaneous Configuration
LPSS & SCC Configuration
Network Stack Configuration
CSM Configuration
Trusted Computing
USB Configuration
Security 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.

6.1.1 ACPI Settings



Enable ACPI Auto Configuration: Enables or disables BIOS ACPI Auto Configuration.

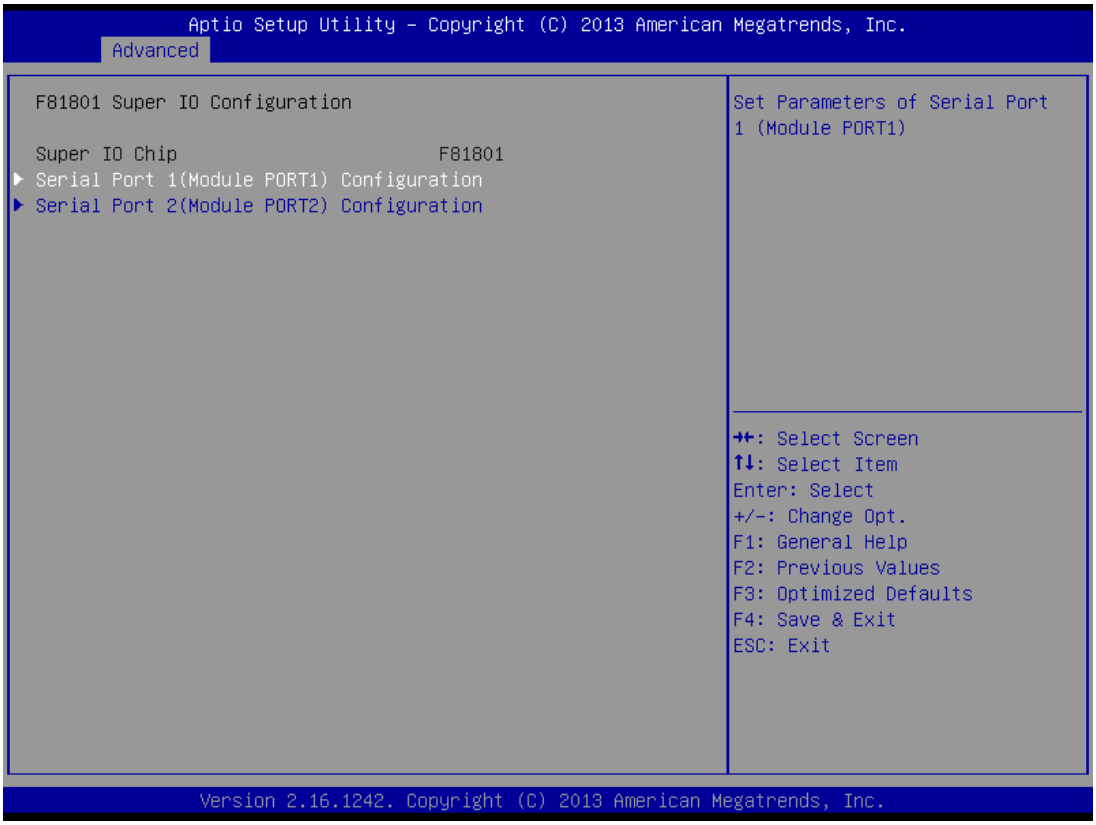
Enable Hibernation: Enable or Disable system ability to Hibernate.

ACPI Sleep state: Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed. Options: Suspend Disable, S3 (Suspend to RAM).

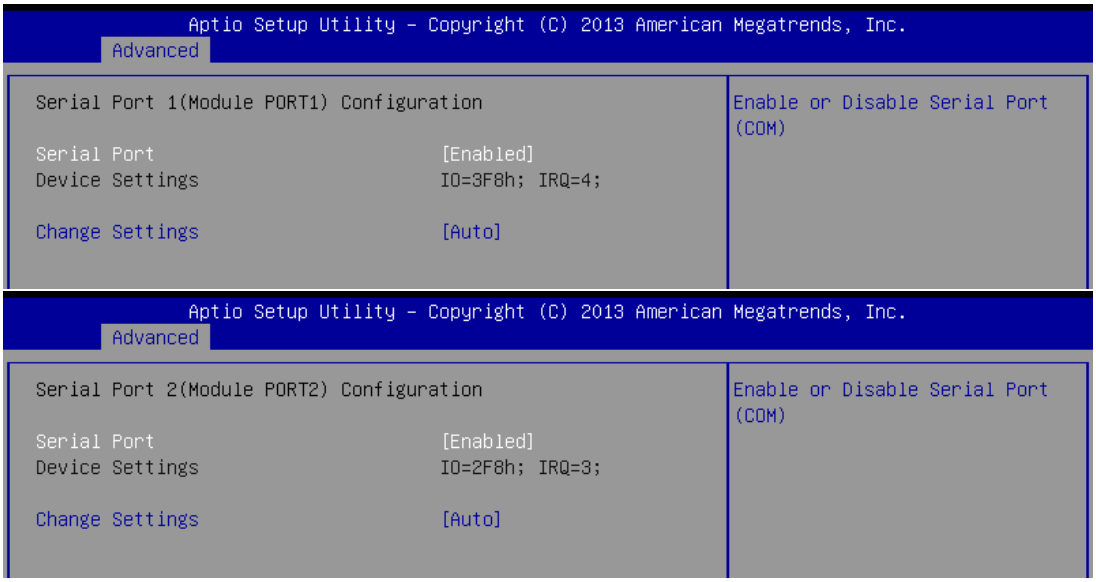
.

6.1.2 F81801 Super IO Configuration

The F81801 Super IO is on the CE-6BT01 module. Enable/disable and configure the module serial ports.

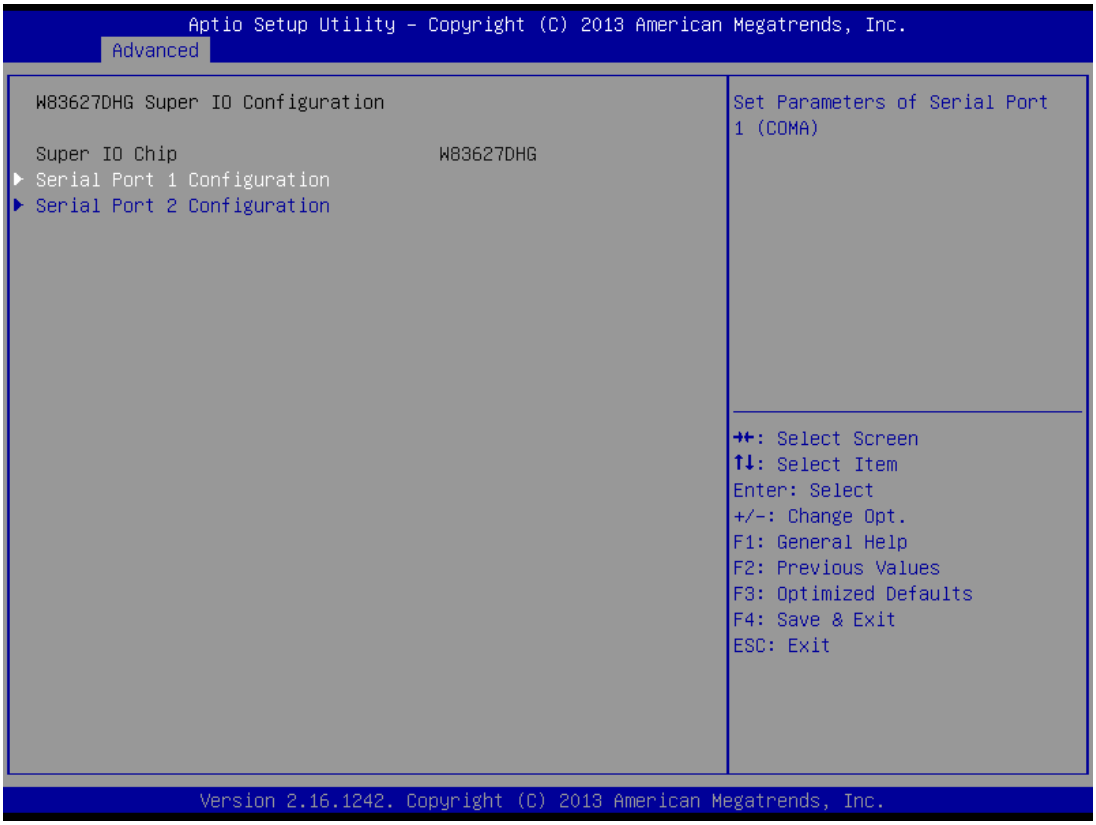


6.1.2.1 Serial Port 1/2 Configuration

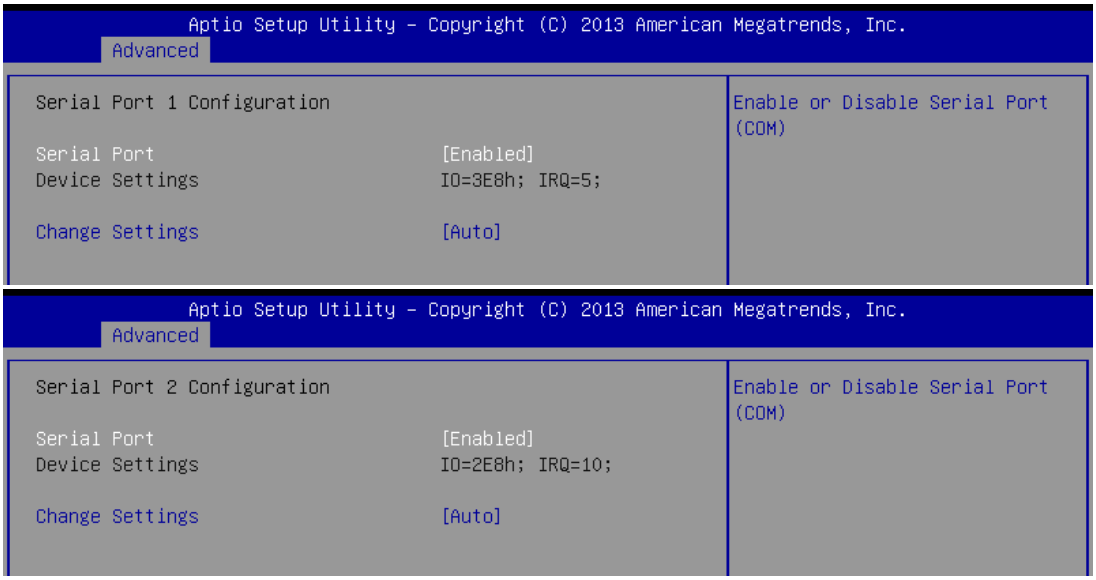


6.1.3 W83627DHG Super IO Configuration

The W83627DHG Super IO is on the CT-BT601 carrier board. Enable/disable and configure the module serial ports.

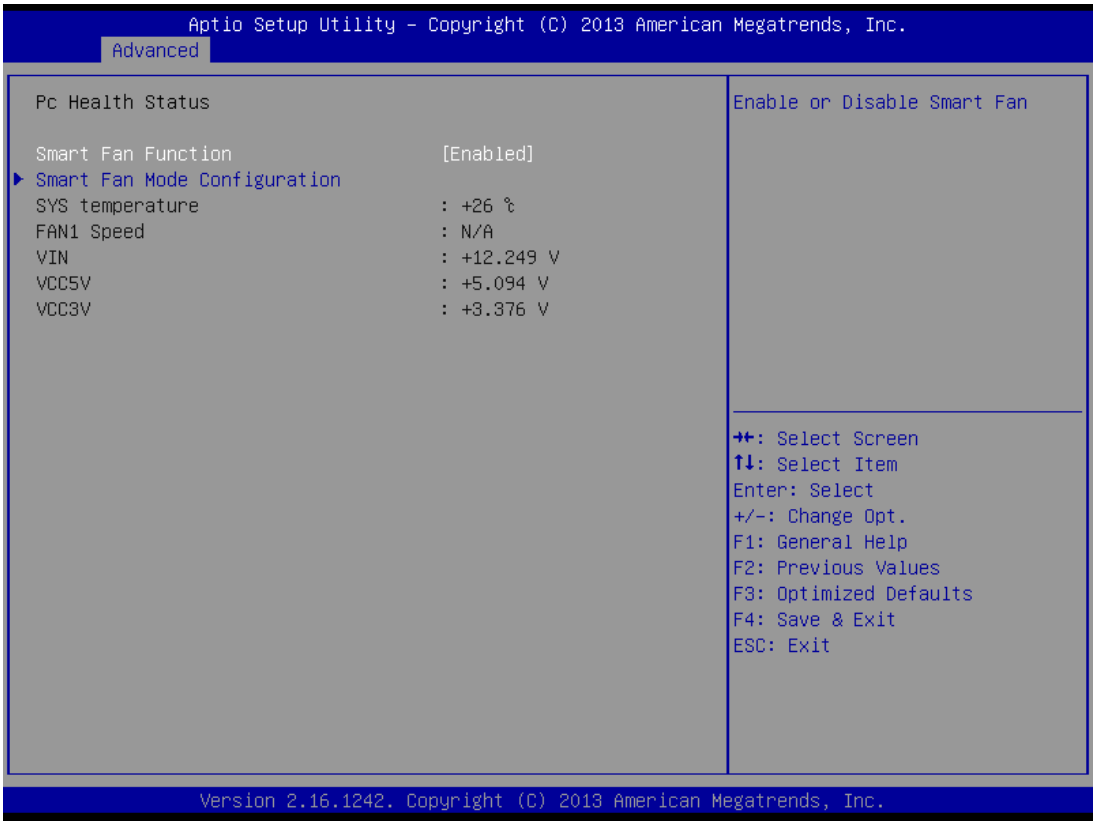


6.1.3.1 Serial Port 1/2 Configuration



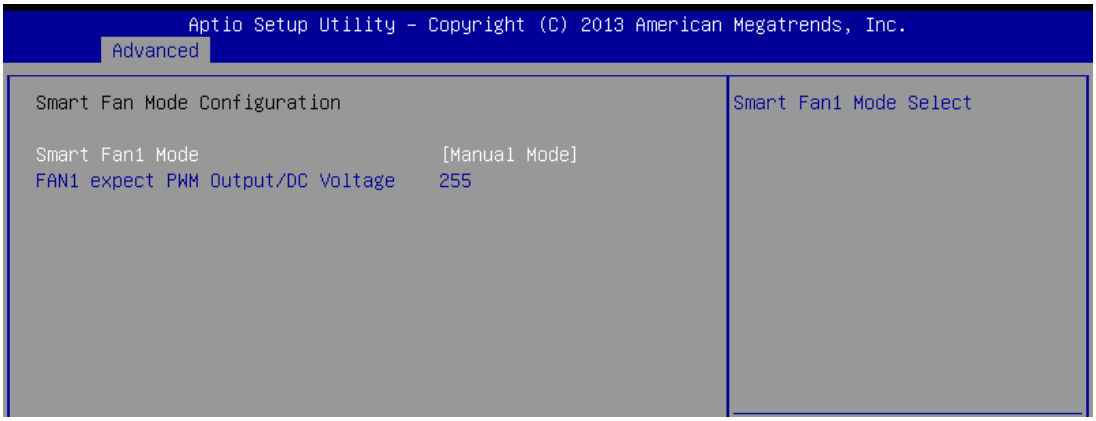
6.1.4 W83627DHG Hardware Monitor1

The W83627DHG Super IO is on the CT-BT601 carrier board. Temperatures and voltages reported are from the carrier board.



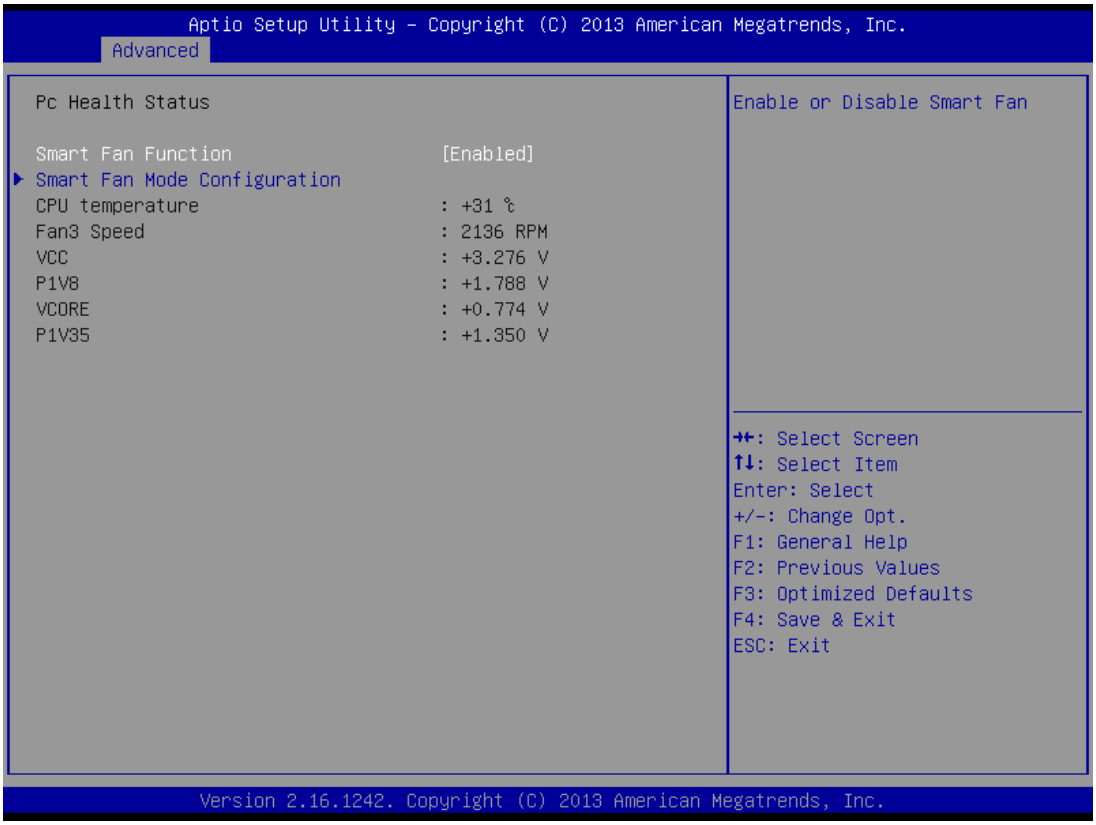
6.1.4.1 Smart Fan1 Mode Configuration

Smart Fan1 is controlled by the W83627DHG Super IO on the CT-BT601 carrier board.



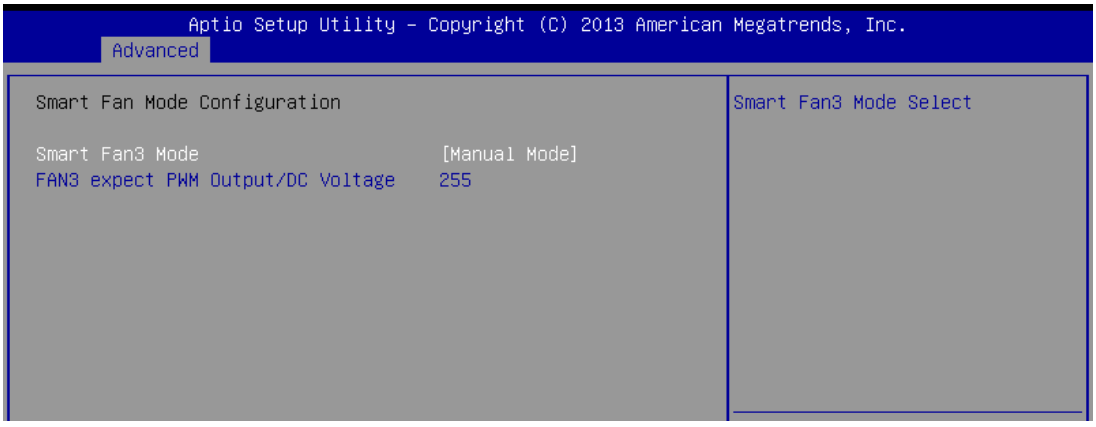
6.1.5 NCT7802 Hardware Monitor

The NCT7802 Super IO is on the CE-6BT01 module. Temperatures and voltages reported are from the module.



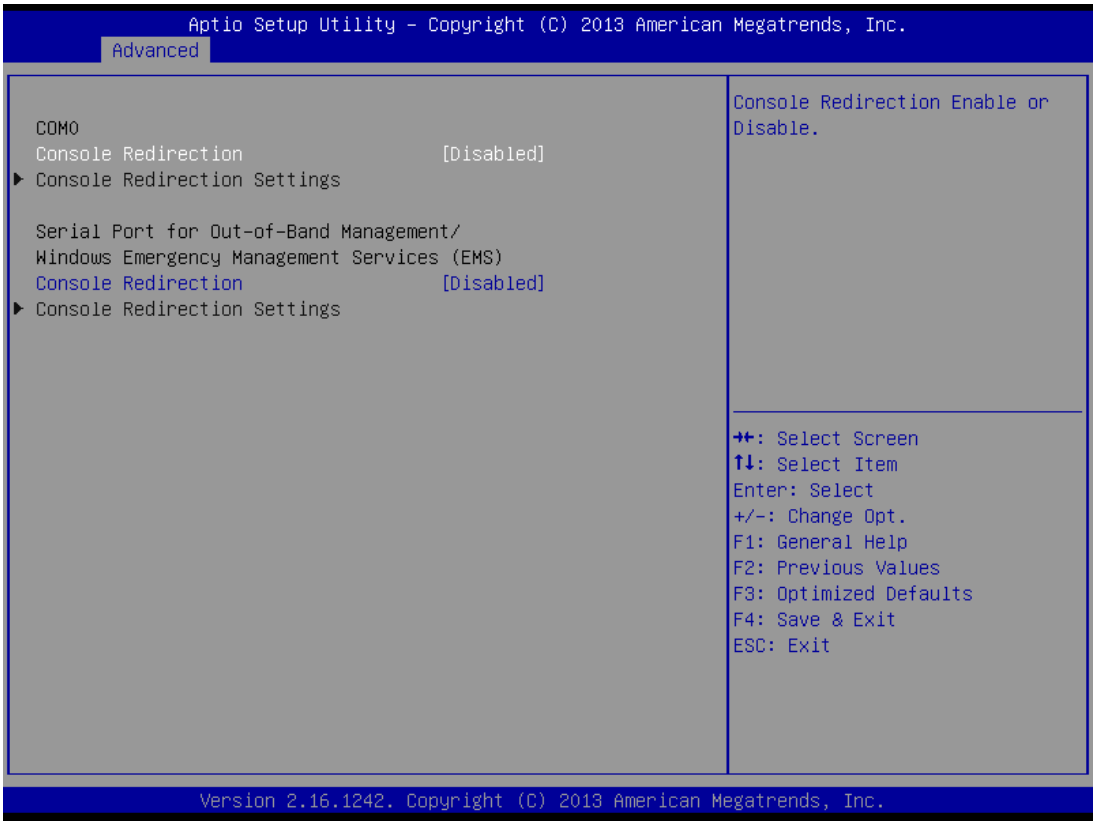
6.1.5.1 Smart Fan3 Mode Configuration

Smart Fan3 is controlled by the NCT7802 Super IO on the CE-6BT01 module.

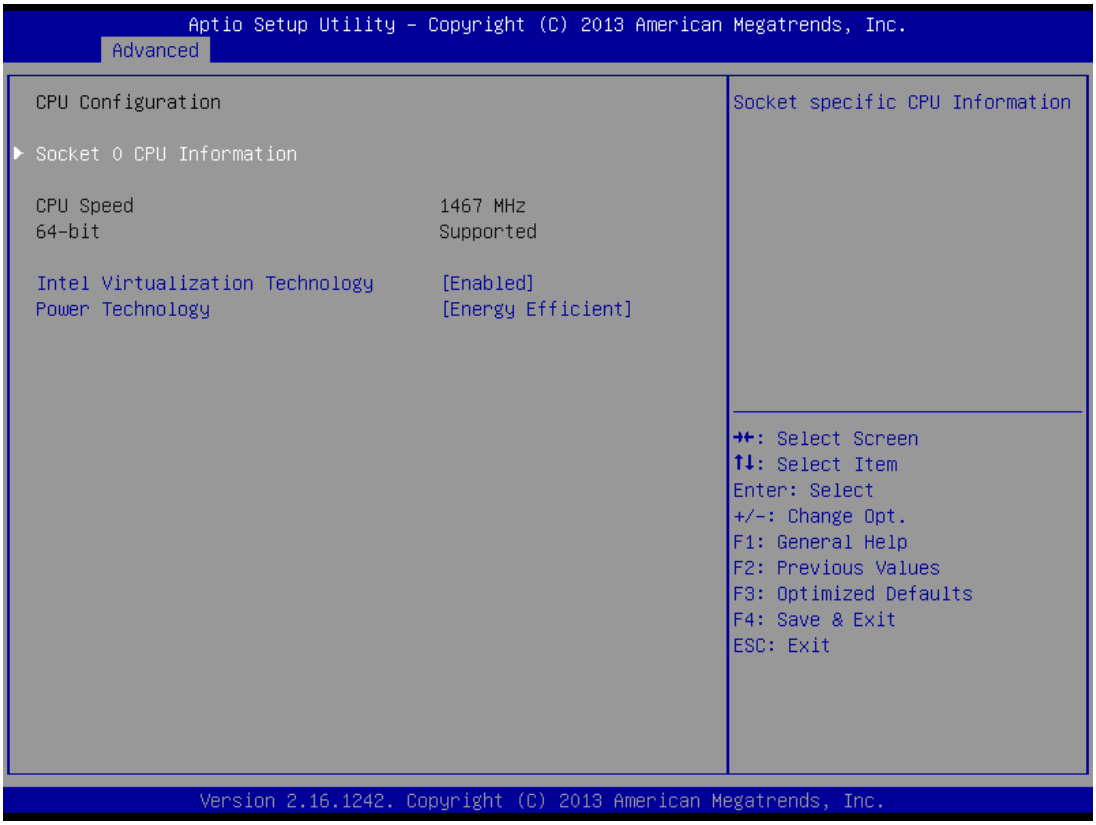


6.1.6 Serial Port Console Redirection

Serial port console redirection settings.



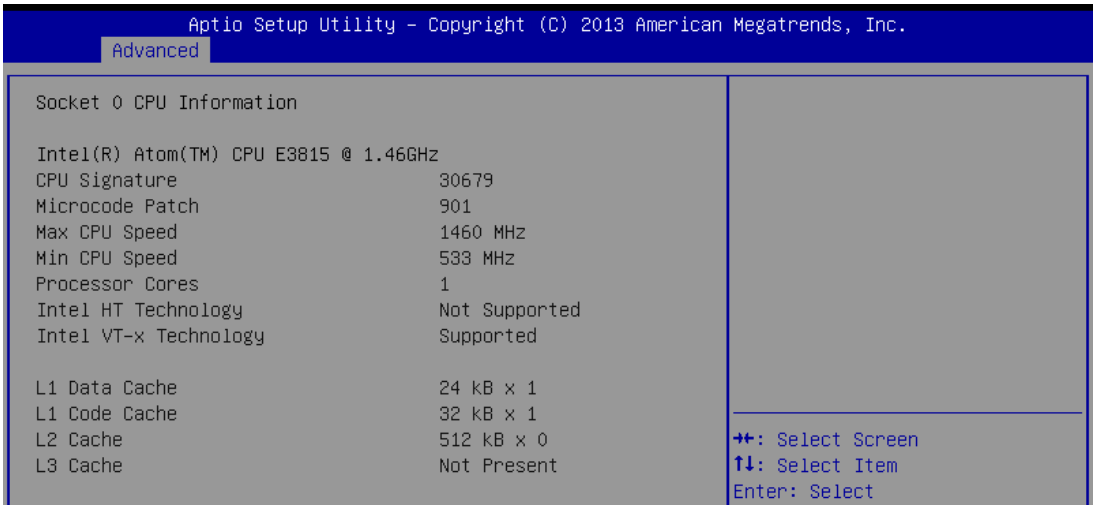
6.1.7 CPU Configuration



Intel Virtualization Technology: When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology

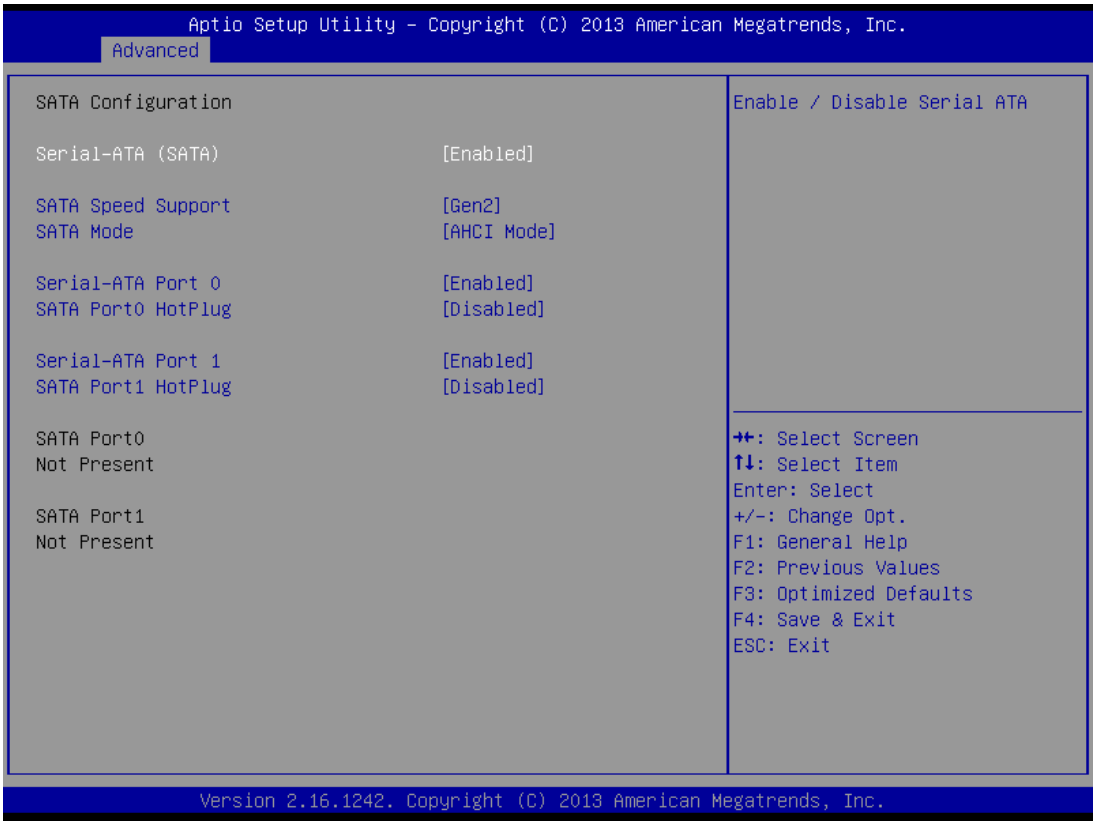
Power Technology: Configure the power management features.

6.1.7.1 CPU Information



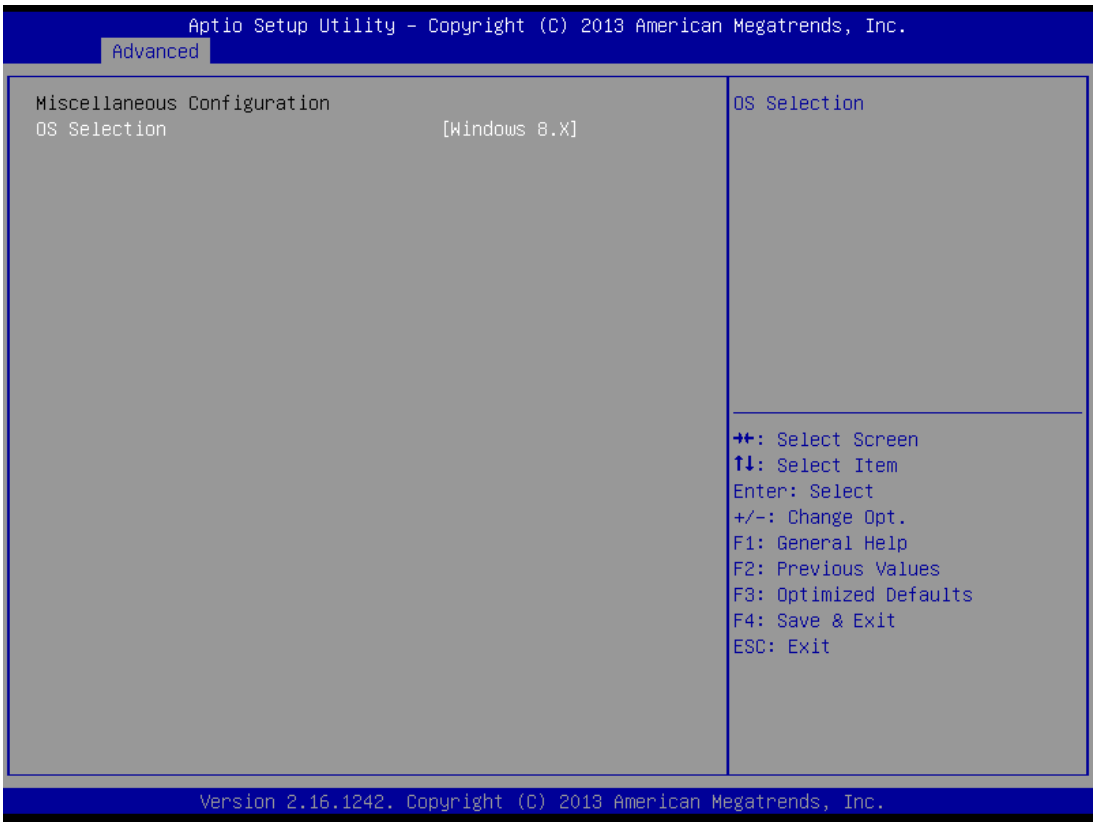
6.1.8 SATA Configuration

The BIOS automatically detects the presence of SATA device and the hardware installed in the SATA ports will be showed in the configuration. Each port can be enabled or disabled individually.



SATA Speed Support: Options: Gen 1, Gen 2.
SATA Mode: Select IDE or AHCI Mode
SATA Port Hot Plug: Enable/disable the port as Hot Pluggable.

6.1.9 Miscellaneous Configuration

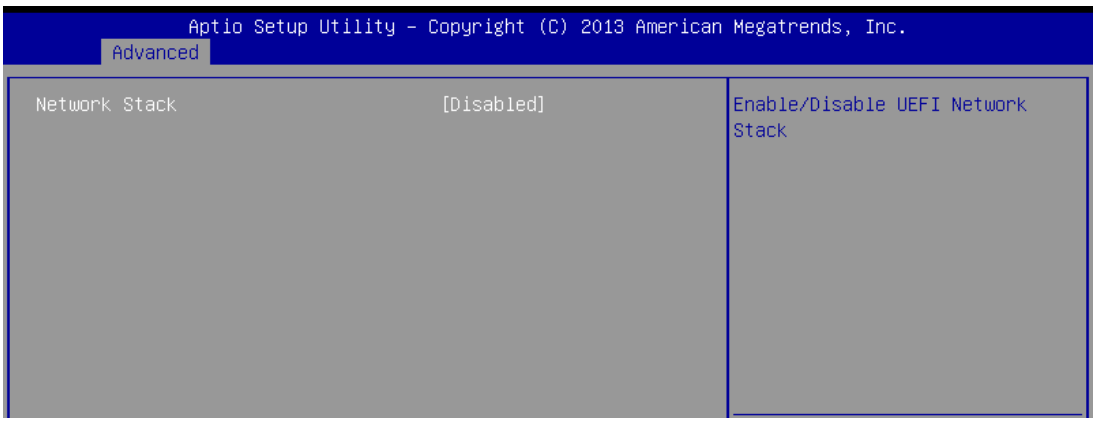


OS Selection: Select the OS.

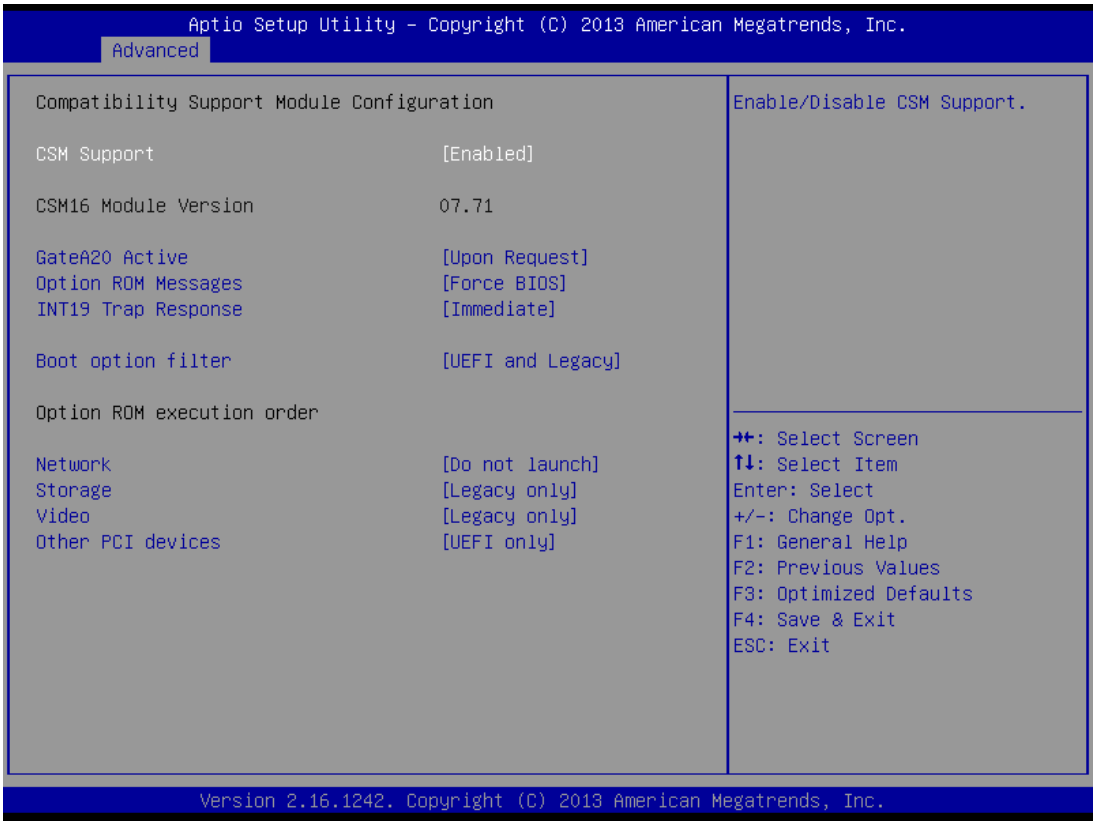
6.1.10 SCC Configuration

SCC eMMC Secure Erase: Options: Disabled, Enabled.

6.1.11 Network Stack Configuration



6.1.12 CSM Configuration



GateA20 Active:

[Upon Request] – GA20 can be disabled using BIOS services.

[Always] – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

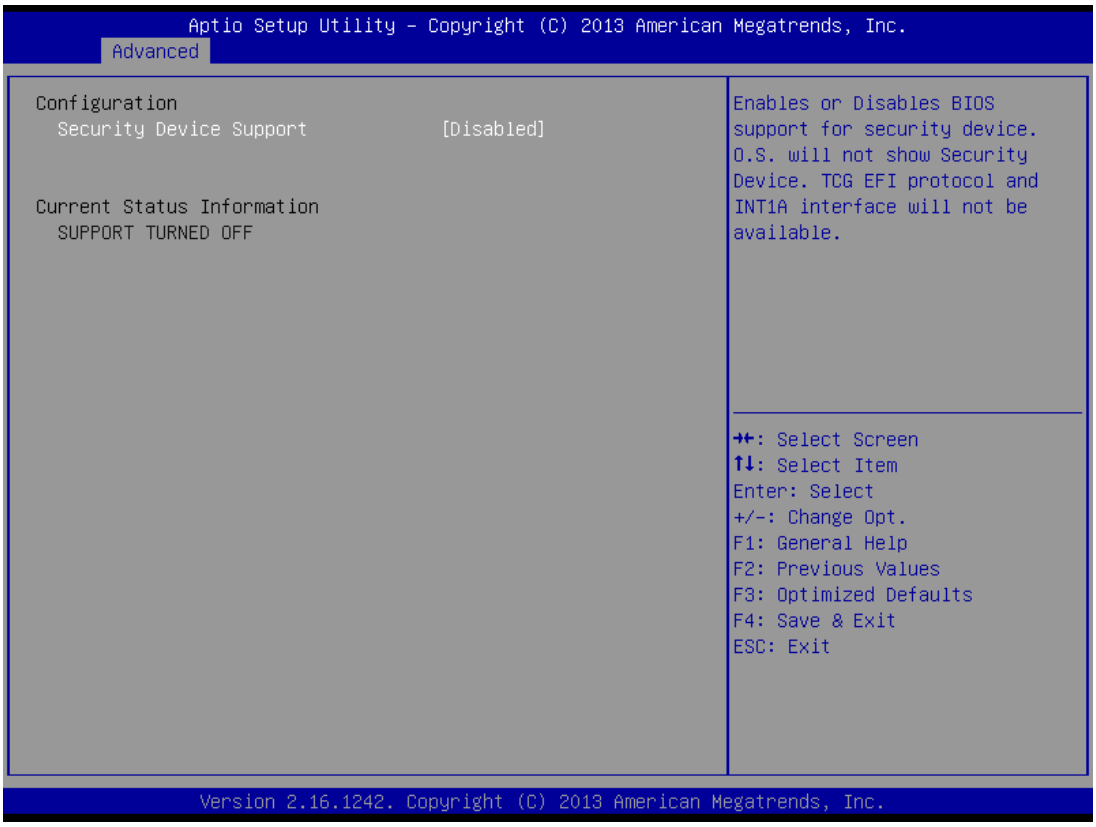
Option ROM Message: Set display mode [Force BIOS] or [Keep Current] for Option ROM.

INT19 Trap Response: BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE – execute the trap right away; POSTPONED – execute the traps during legacy boot.

Boot option filter: This option controls what devices system can boot to [UEFI and Legacy], [Legacy only] or [UEFI only].

Option ROM Execution Order: Controls the execution Option ROM, [Do not launch], [UEFI only] or [Legacy only].

6.1.13 Trusted Computing



6.1.14 USB Configuration

Legacy USB Support: Auto option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications.

XHCI Hand-off: This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

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

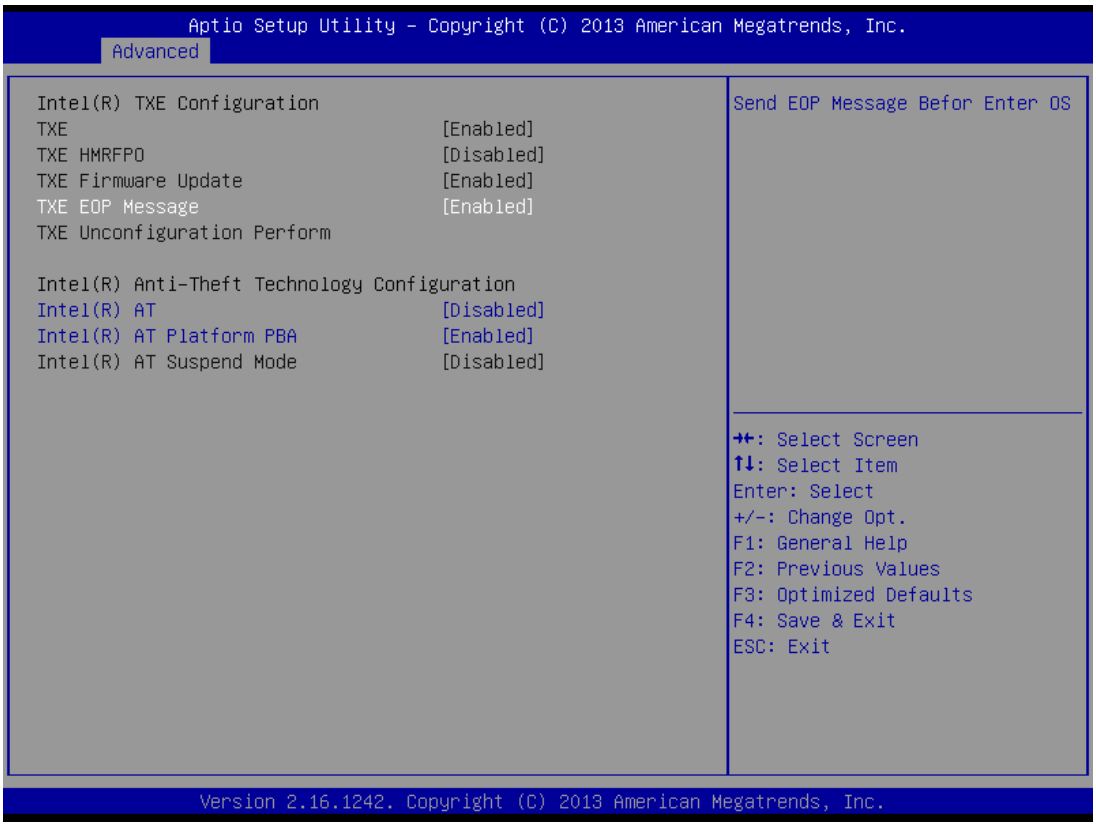
USB Mass Storage Driver Support: Enable/Disable USB Mass Storage Driver Support.

USB transfer time-out: The time-out value for Control, Bulk, and Interrupt transfers.

Device reset time-out: USB mass storage device Start Unit command time-out.

Device power-up delay: Maximum time the device will take before it properly reports itself to the Host Controller. “Auto” uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

6.1.15 Security Configuration

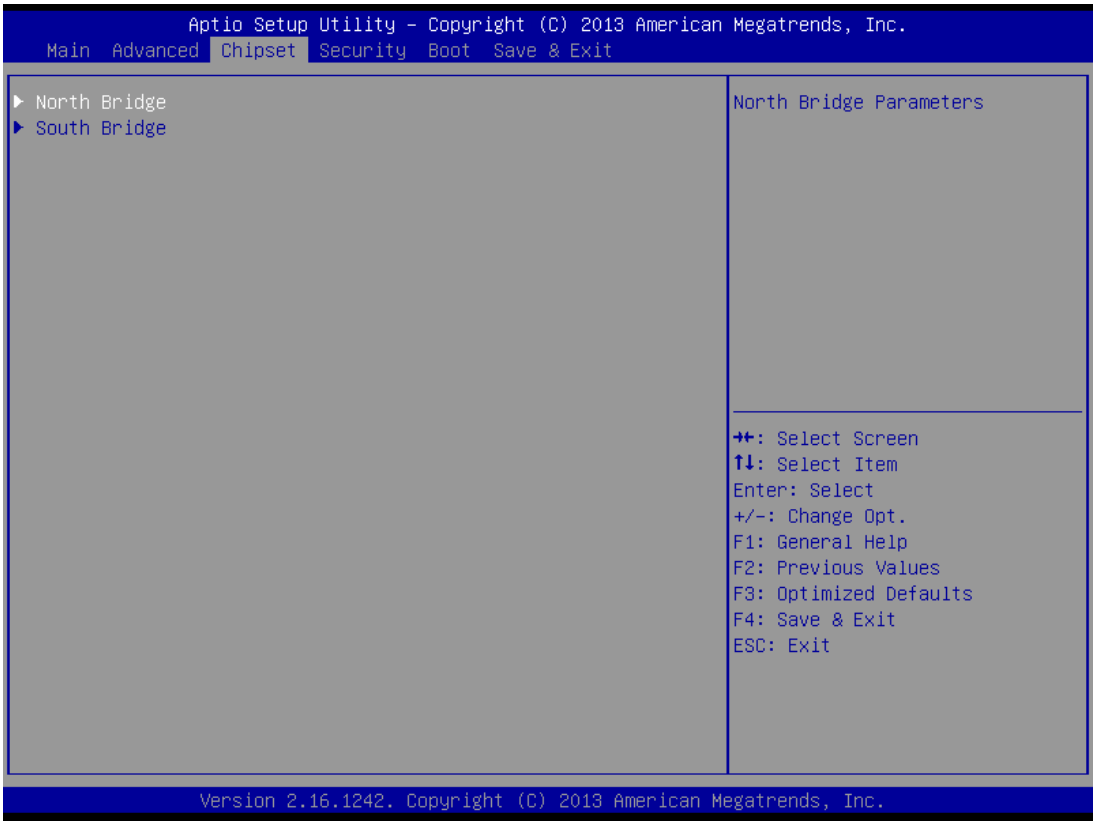


TXE EOP Message: Send EOP Message Before Enter OS.

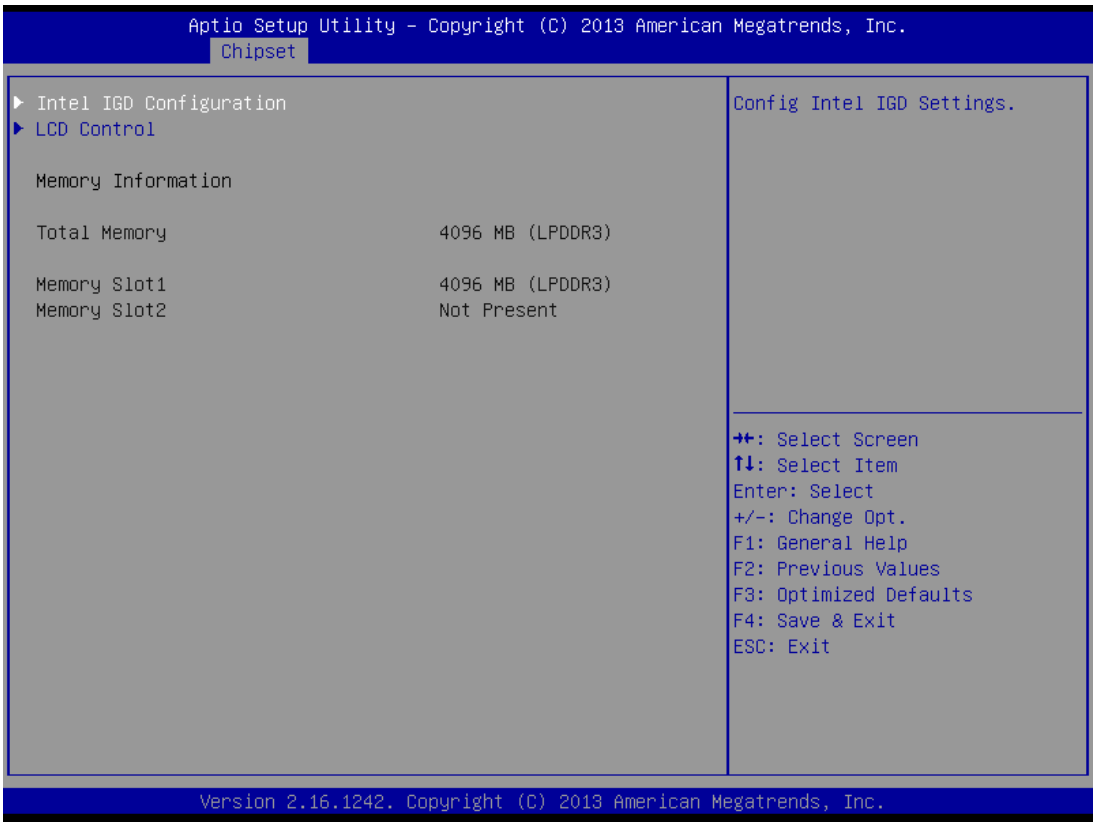
Intel® AT: Enable/Disable BIOS AT Code from Running.

Intel® AT Platform PBA: Enable/Disable BIOS AT Code from Running.

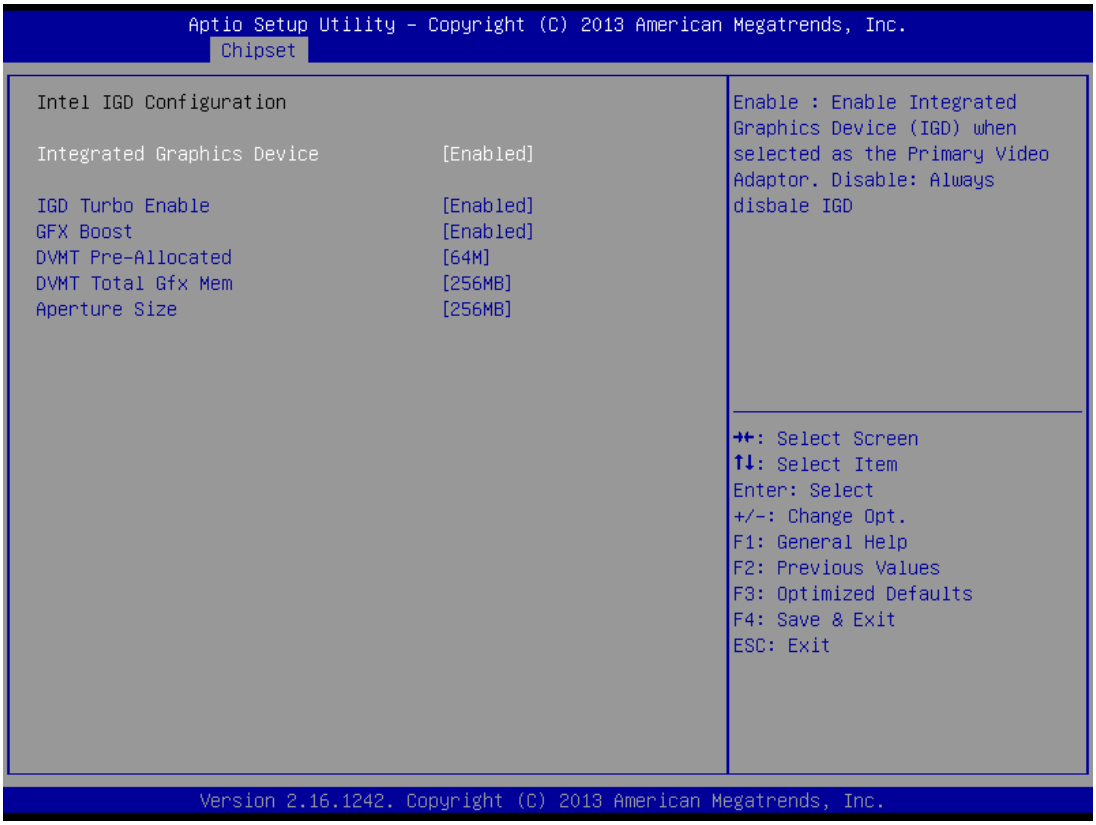
6.2 Chipset


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.

6.2.1 Northbridge Configuration



6.2.1.1 Intel IGD Configuration



Integrated Graphics Device: Enable: Enable Integrated Graphics Device (IGD) when selected as the Primary Video Adaptor. Disable: Always disable IGD.

IGD Turbo Enable: Enable/Disable: IGD Turbo.

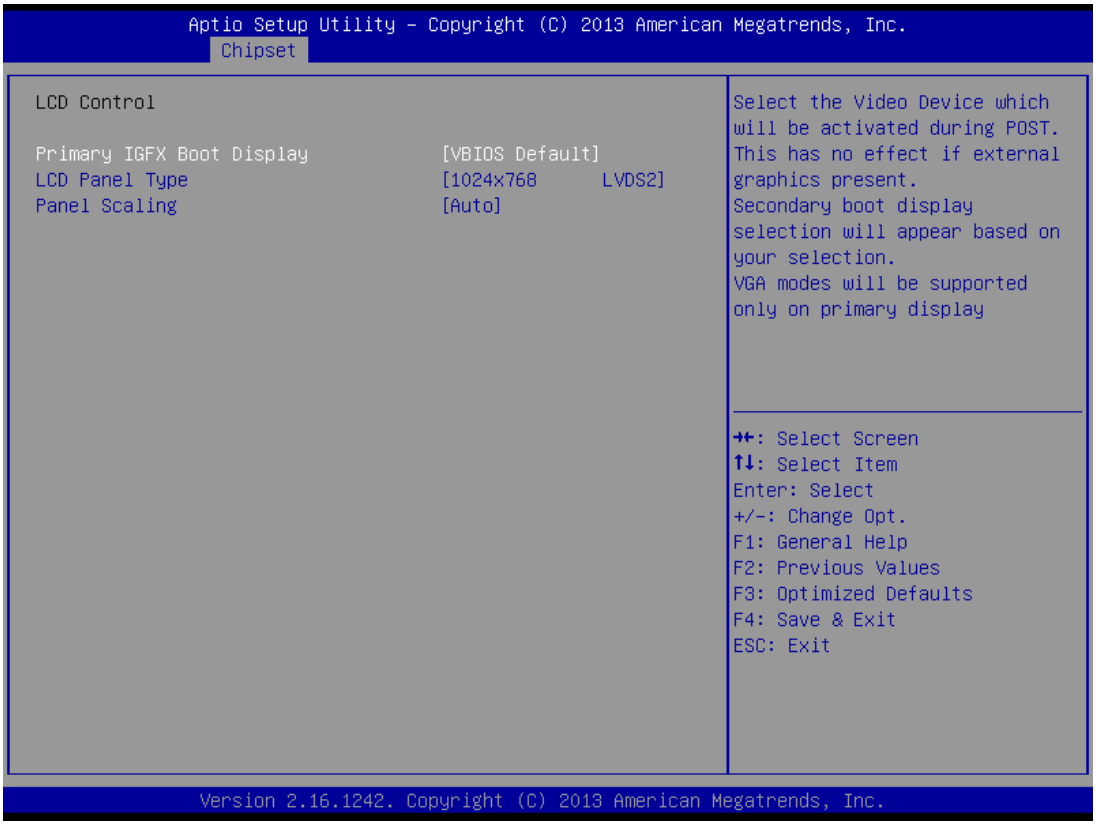
GFX Boost: Enable/Disable GFX Boost.

DVMT Pre-Allocated: Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

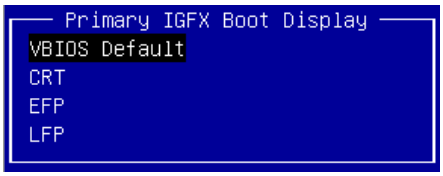
DVMT Total Gfx Mem: Select DVMT 5.0 Total Graphics Memory size used by the Internal Graphics Device.

Aperture Size: Select the Aperture Size.

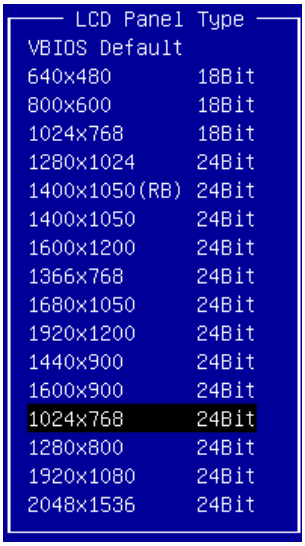
6.2.1.2 LCD Control



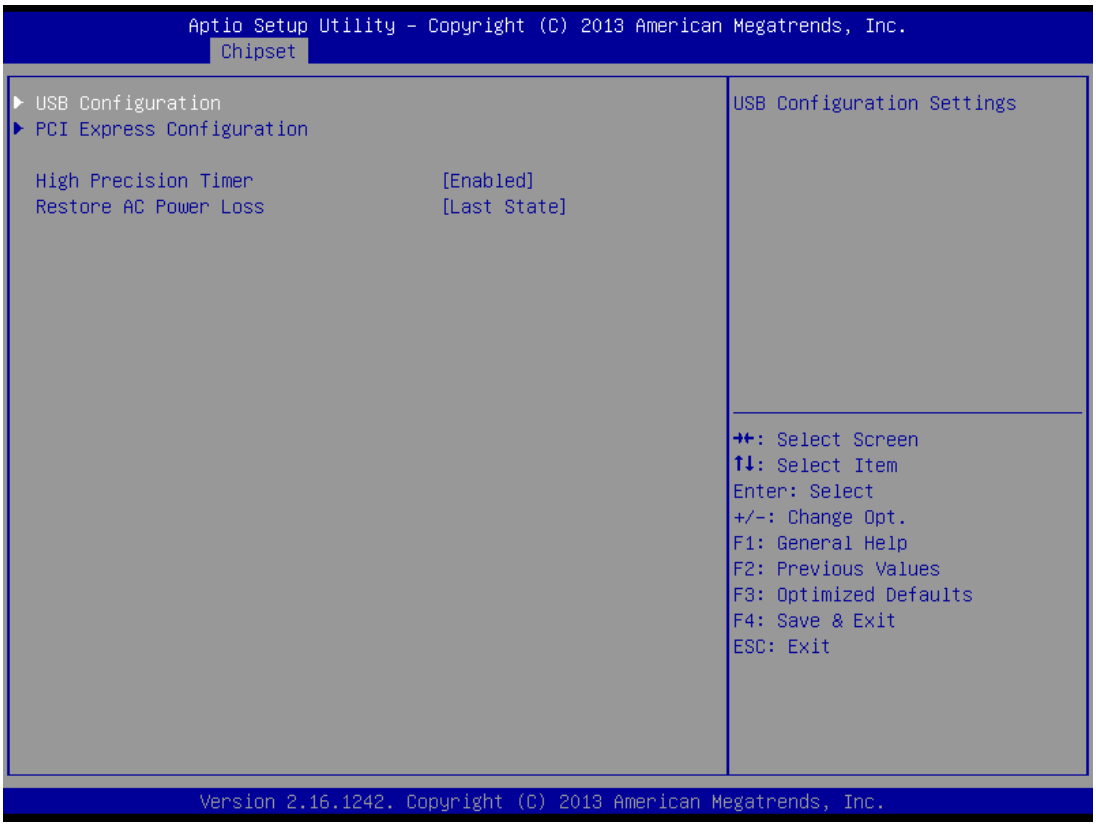
Primary IGFX Boot Display: Default setting is “VBIOS Default”. “CRT” is VGA, “EFP” is DisplayPort, “LFP” is LVDS.



LCD Panel Type: Default setting is “1024x768 24-bit”.

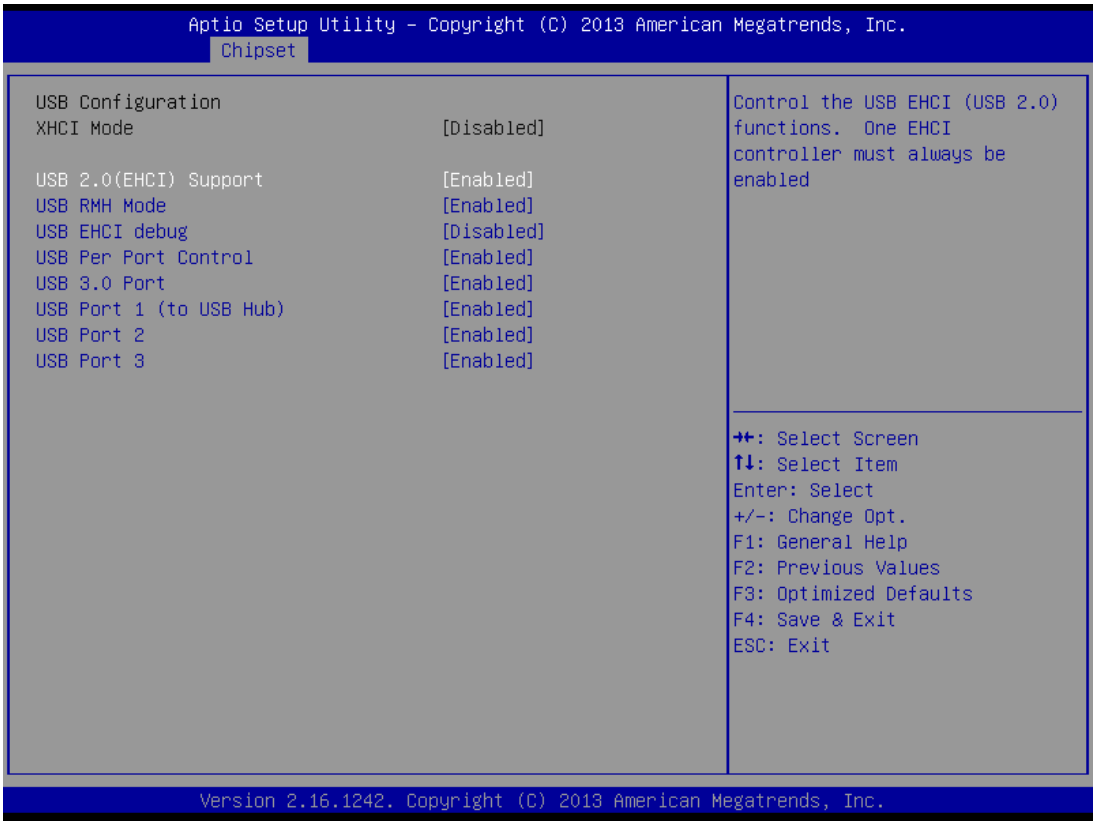


6.2.2 Southbridge Configuration

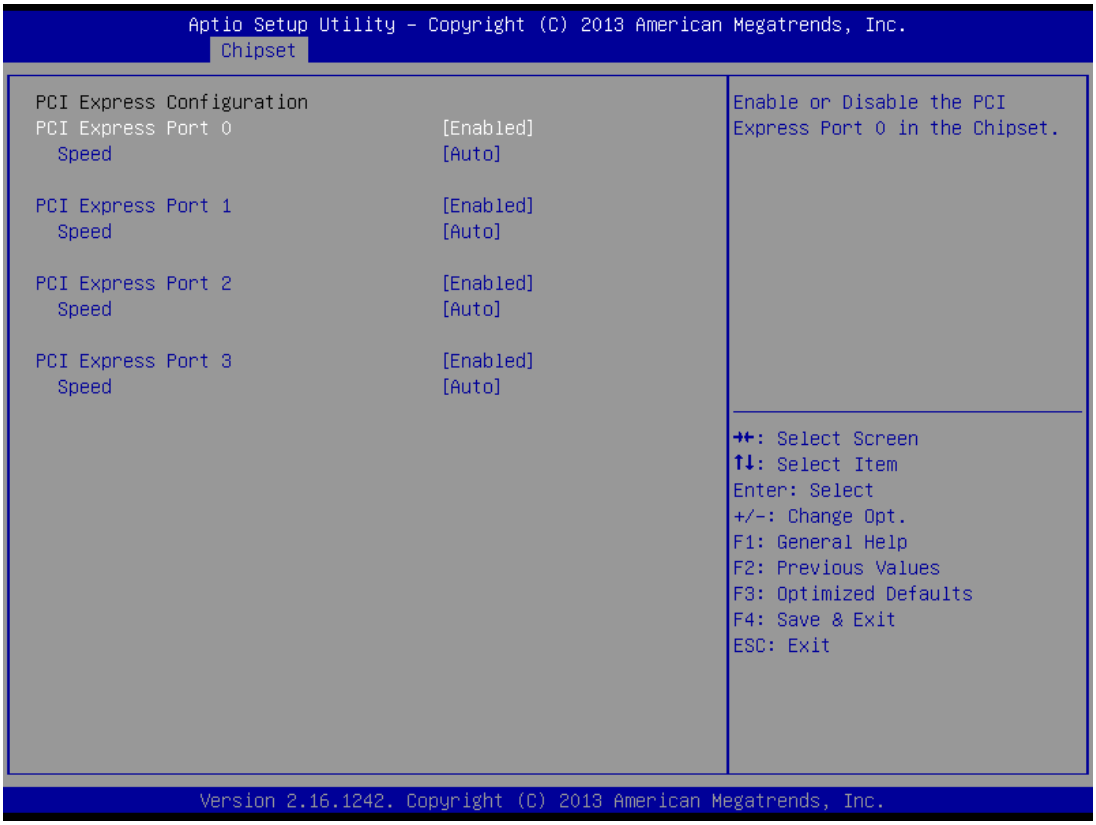


High Precision Timer: Enable or Disable the High Precision Event Timer.
Restore AC Power Loss: Select AC power state when power is re-applied after a power failure.

6.2.2.1 USB Configuration



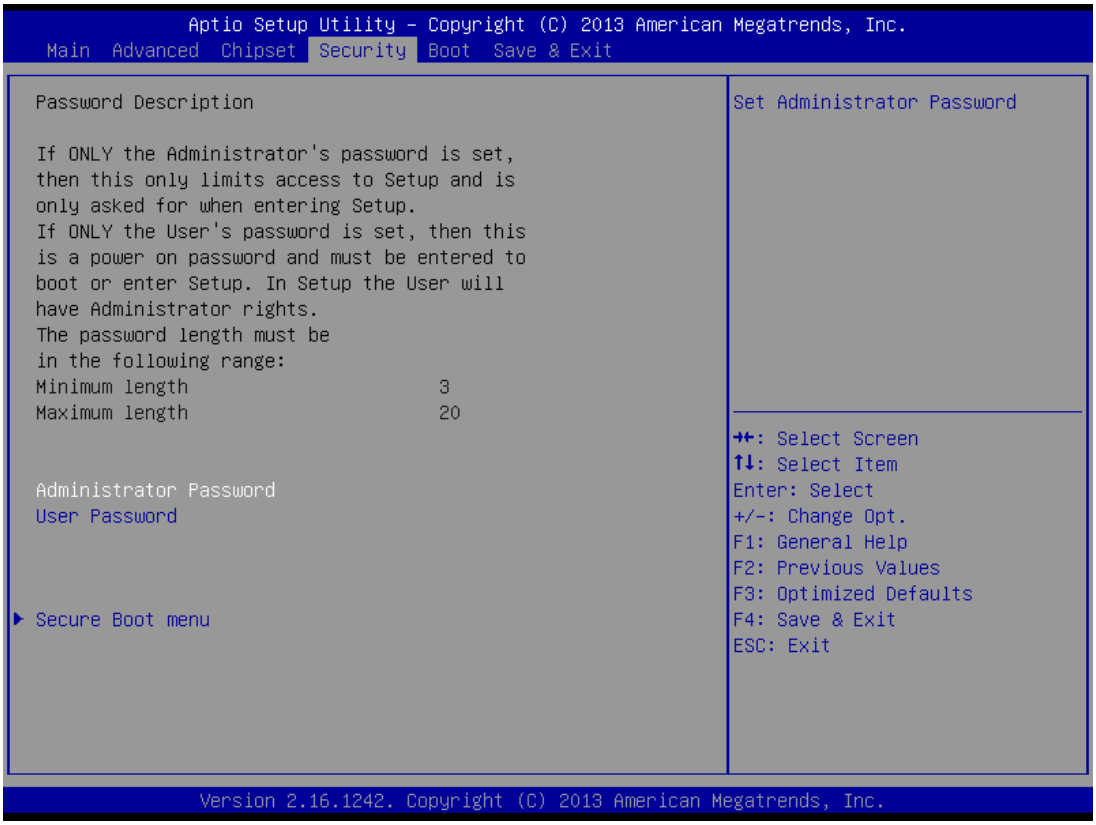
6.2.2.2 PCI Express Configuration



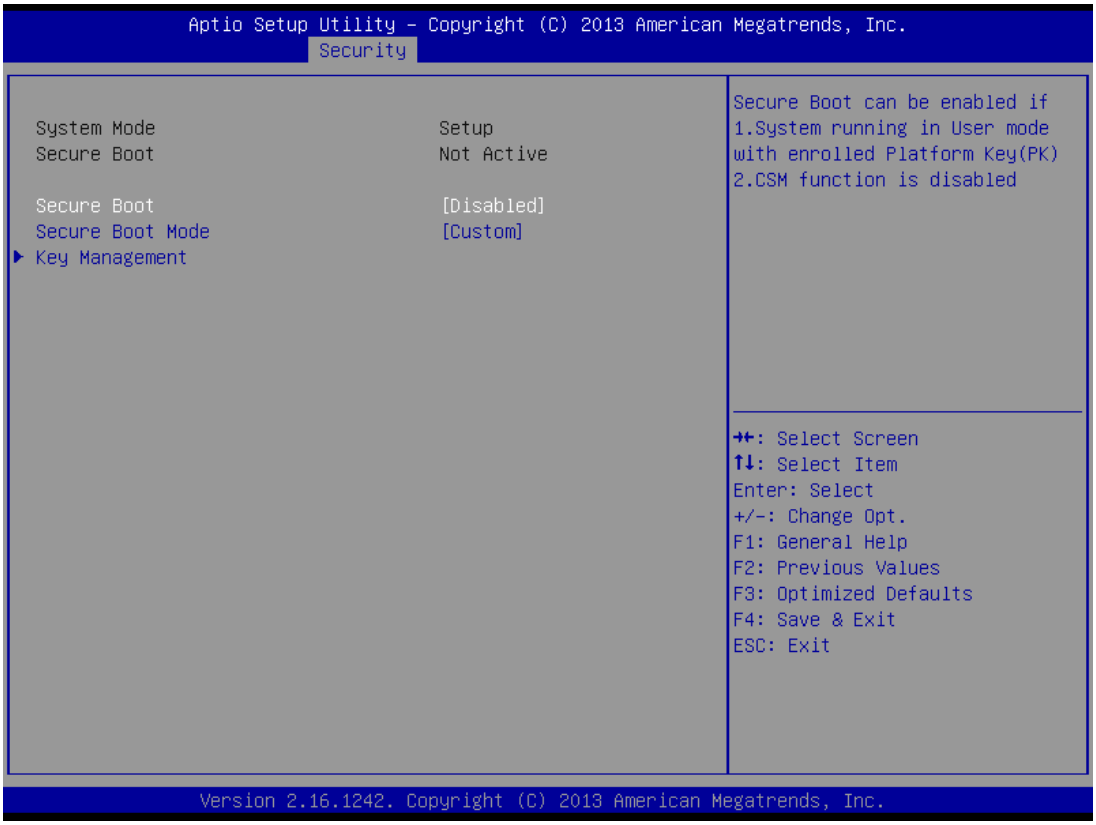
6.3 Security

Administrator's and User's passwords could be set.

If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup, the user will have administrator rights. The minimum length of the password is 3 and the maximum length is 20.

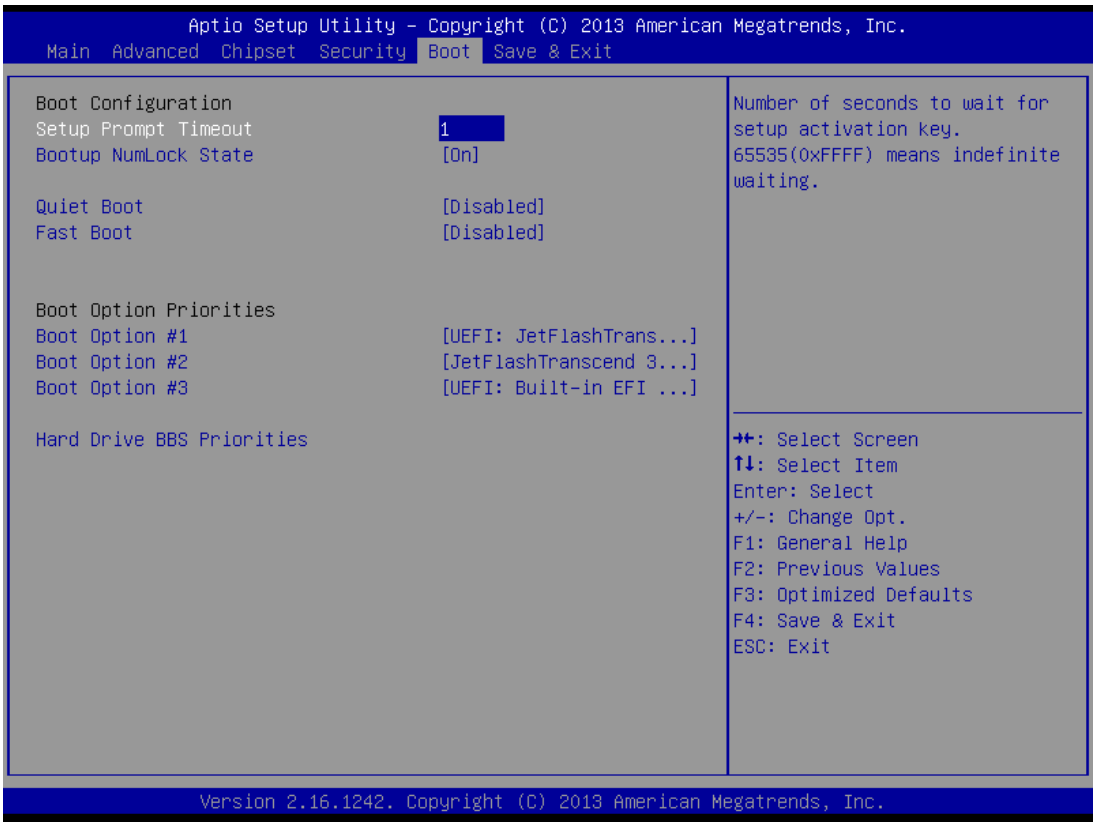


6.3.1 Secure Boot Menu



Secure Boot: Secure Boot can be enabled if the System running in User mode with enrolled Platform Key (PK) and CSM function is disabled.
Secure Boot Mode: Secure Boot mode selector. ‘Custom’ Mode enables users to change Image Execution policy and manage Secure Boot Keys.

6.4 Boot



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

Bootup NumLock State: Select [Enable] or [Disable] for the keyboard NumLock state.

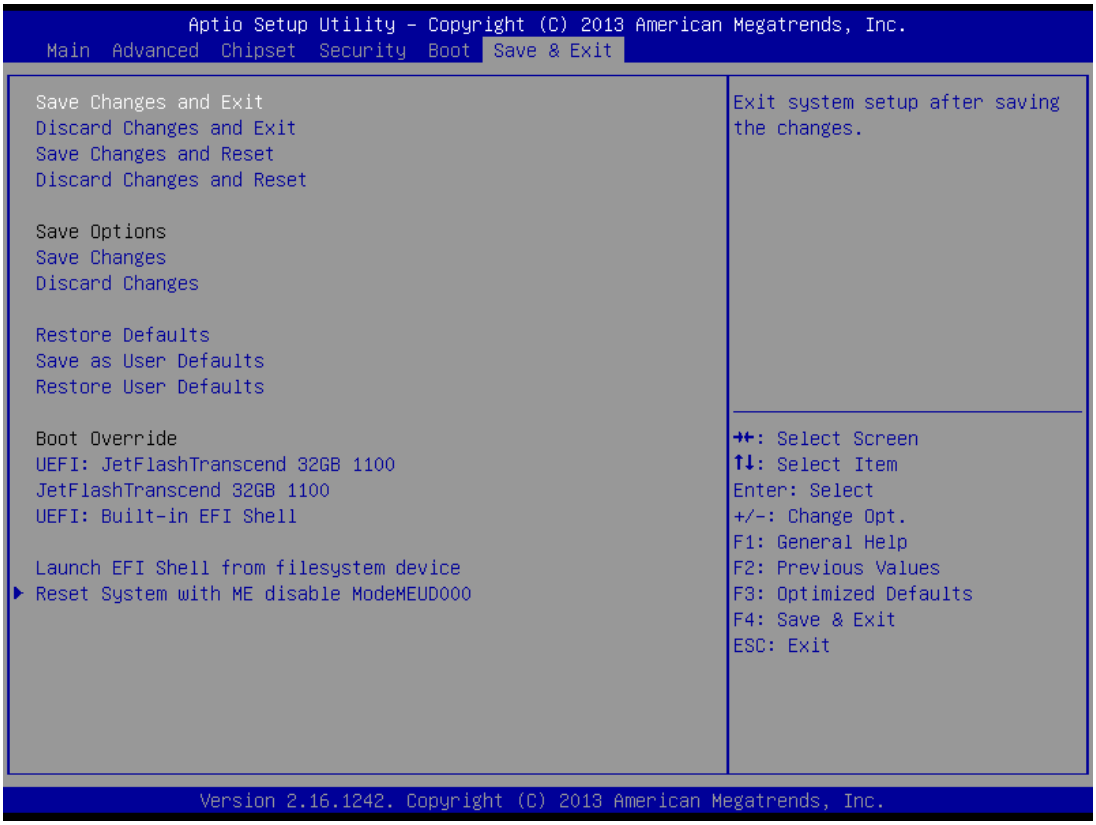
Quiet Boot: Enables or disables Quiet Boot option.

Fast Boot: Enables or disables Fast Boot option.

Boot Option Priorities: Set the system boot order.

Hard Drive BBS Priorities: Set the order of the legacy devices in this group.

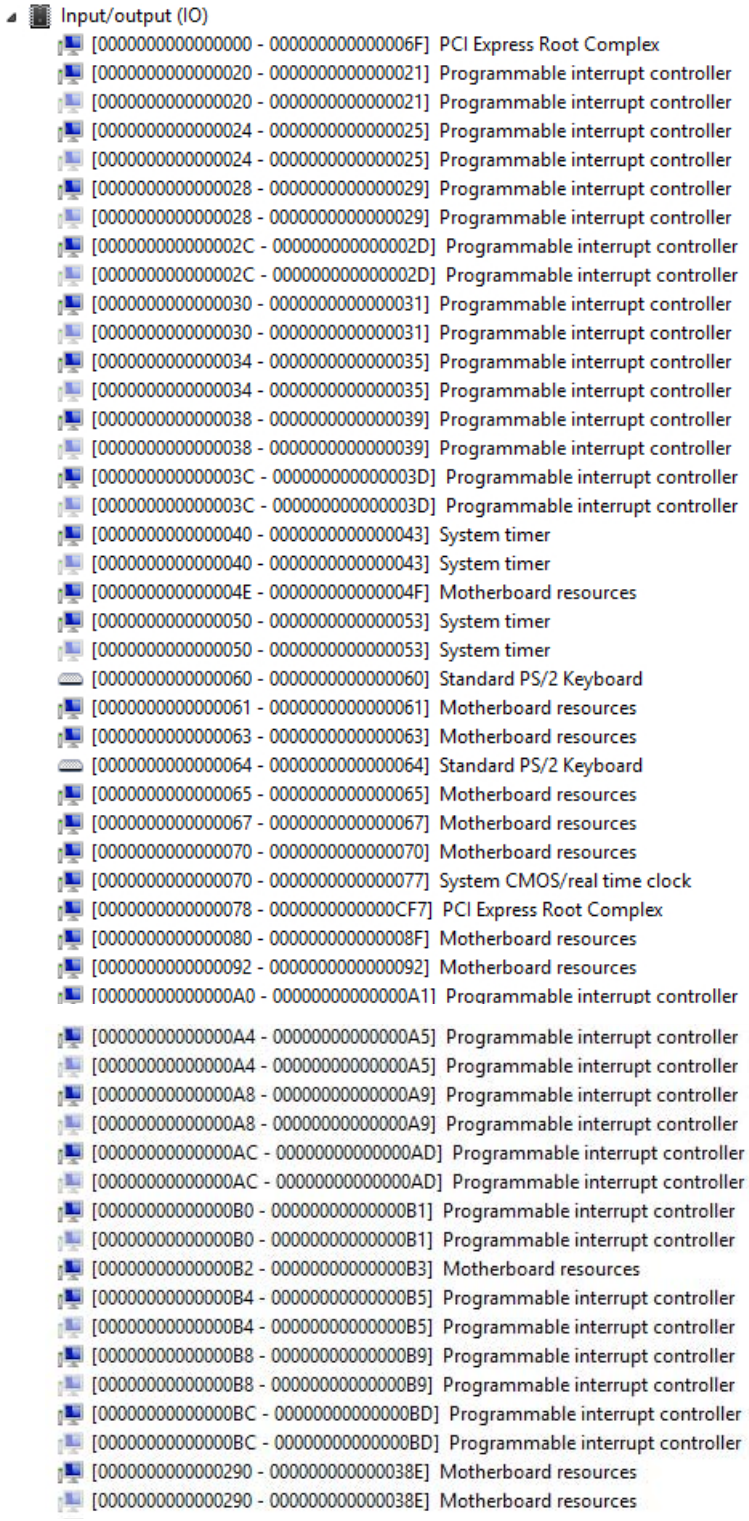
6.5 Save and Exit



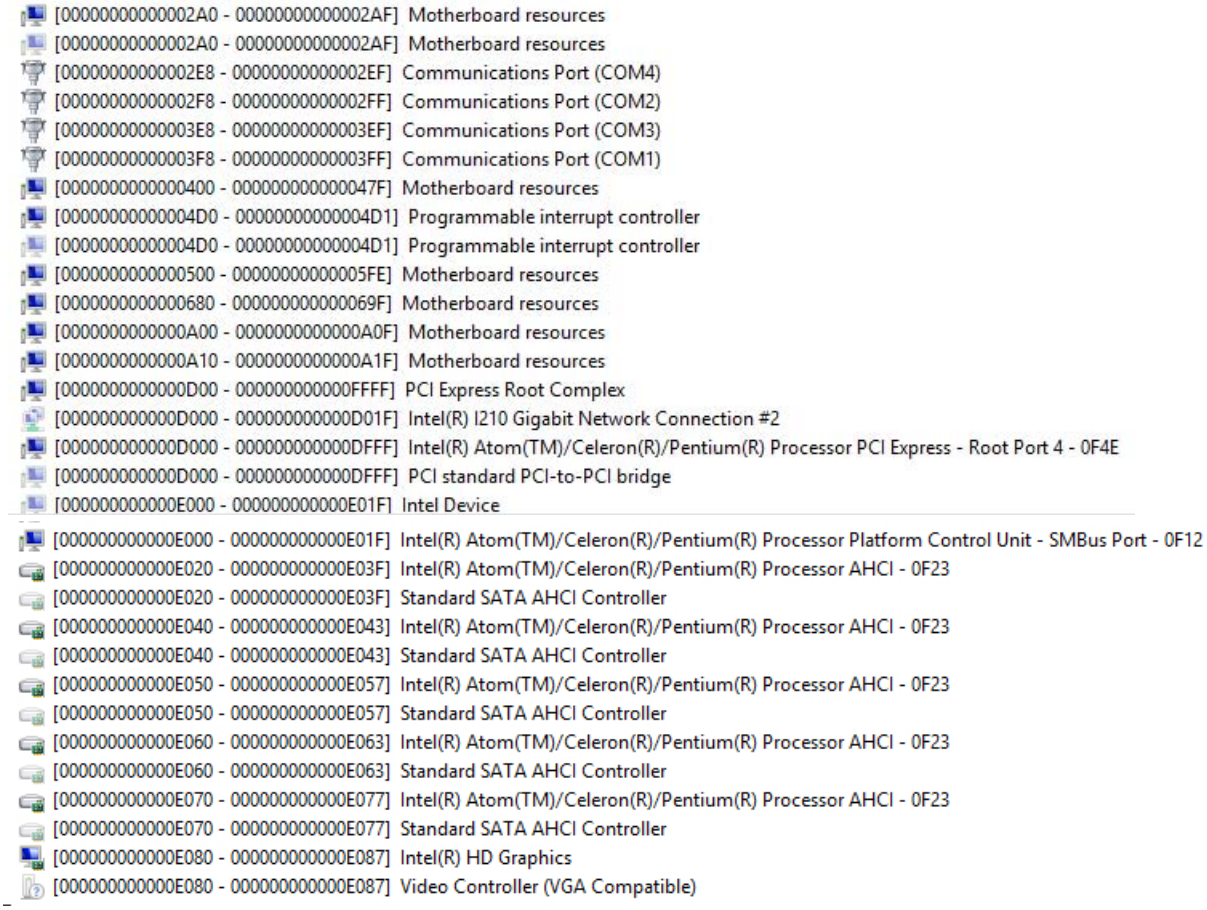
7. Address Map

7.1 I/O Port Address Map

The assignments of the I/O port addresses for the CE-6BT01 under Windows® 7 Ultimate 64-bit are shown below.

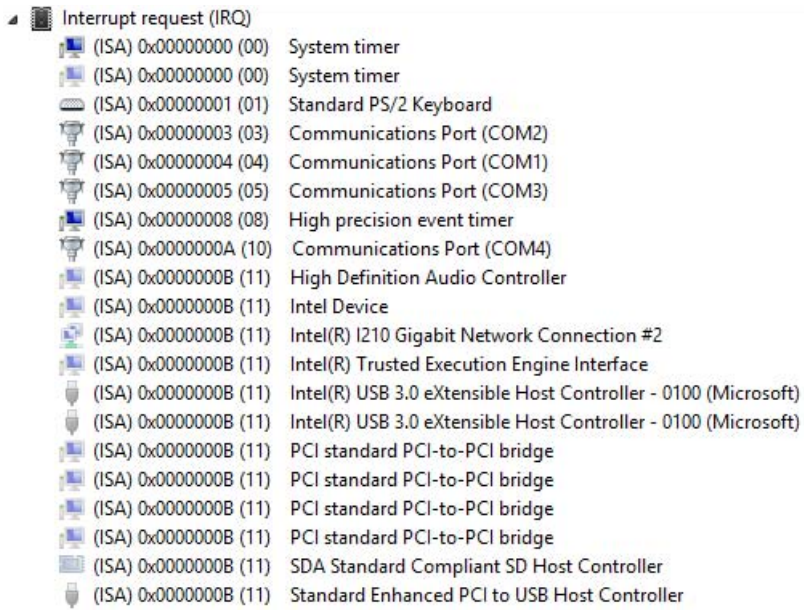


I/O Port Address Map (cont'd)



7.2 Interrupt Controller (IRQ) Map

The interrupt controller map for the CE-6BT01 under Windows® 7 Ultimate 64-bit is shown below.



Interrupt Controller (IRQ) Map (cont'd)

(ISA) 0x0000000B (11) Standard SATA AHCI Controller
(ISA) 0x0000000B (11) Texas Instruments USB 3.0 eXtensible Host Controller - 0096 (Microsoft)
(ISA) 0x0000000B (11) Video Controller (VGA Compatible)
(ISA) 0x0000000C (12) Microsoft PS/2 Mouse
(ISA) 0x00000020 (32) I2C Controller
(ISA) 0x0000002B (43) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Serial IO (SIO) - DMA - 9C60
(ISA) 0x0000002D (45) Intel SD Host Controller
(ISA) 0x0000002E (46) Intel SD Host Controller
(ISA) 0x00000030 (48) GPIO Controller
(ISA) 0x00000031 (49) GPIO Controller
(ISA) 0x00000032 (50) GPIO Controller
(ISA) 0x00000051 (81) Microsoft ACPI-Compliant System
(ISA) 0x00000052 (82) Microsoft ACPI-Compliant System
(ISA) 0x00000053 (83) Microsoft ACPI-Compliant System
(ISA) 0x00000054 (84) Microsoft ACPI-Compliant System
(ISA) 0x00000055 (85) Microsoft ACPI-Compliant System
(ISA) 0x00000056 (86) Microsoft ACPI-Compliant System
(ISA) 0x00000057 (87) Microsoft ACPI-Compliant System
(ISA) 0x00000058 (88) Microsoft ACPI-Compliant System
(ISA) 0x00000059 (89) Microsoft ACPI-Compliant System
(ISA) 0x0000005A (90) Microsoft ACPI-Compliant System
(ISA) 0x0000005B (91) Microsoft ACPI-Compliant System
(ISA) 0x0000005C (92) Microsoft ACPI-Compliant System
(ISA) 0x0000005D (93) Microsoft ACPI-Compliant System
(ISA) 0x0000005E (94) Microsoft ACPI-Compliant System
(ISA) 0x0000005F (95) Microsoft ACPI-Compliant System
(ISA) 0x00000060 (96) Microsoft ACPI-Compliant System
(ISA) 0x00000061 (97) Microsoft ACPI-Compliant System
(ISA) 0x00000062 (98) Microsoft ACPI-Compliant System
(ISA) 0x00000063 (99) Microsoft ACPI-Compliant System
(ISA) 0x00000064 (100) Microsoft ACPI-Compliant System
(ISA) 0x00000065 (101) Microsoft ACPI-Compliant System
(ISA) 0x00000066 (102) Microsoft ACPI-Compliant System
(ISA) 0x00000067 (103) Microsoft ACPI-Compliant System
(ISA) 0x00000068 (104) Microsoft ACPI-Compliant System
(ISA) 0x00000069 (105) Microsoft ACPI-Compliant System
(ISA) 0x0000006A (106) Microsoft ACPI-Compliant System
(ISA) 0x0000006B (107) Microsoft ACPI-Compliant System
(ISA) 0x0000006C (108) Microsoft ACPI-Compliant System
(ISA) 0x0000006D (109) Microsoft ACPI-Compliant System
(ISA) 0x0000006E (110) Microsoft ACPI-Compliant System
(ISA) 0x0000006F (111) Microsoft ACPI-Compliant System
(ISA) 0x00000070 (112) Microsoft ACPI-Compliant System
(ISA) 0x00000071 (113) Microsoft ACPI-Compliant System
(ISA) 0x00000072 (114) Microsoft ACPI-Compliant System
(ISA) 0x00000073 (115) Microsoft ACPI-Compliant System
(ISA) 0x00000074 (116) Microsoft ACPI-Compliant System
(ISA) 0x00000075 (117) Microsoft ACPI-Compliant System
(ISA) 0x00000076 (118) Microsoft ACPI-Compliant System
(ISA) 0x00000077 (119) Microsoft ACPI-Compliant System
(ISA) 0x00000078 (120) Microsoft ACPI-Compliant System
(ISA) 0x00000079 (121) Microsoft ACPI-Compliant System
(ISA) 0x0000007A (122) Microsoft ACPI-Compliant System
(ISA) 0x0000007B (123) Microsoft ACPI-Compliant System
(ISA) 0x0000007C (124) Microsoft ACPI-Compliant System
(ISA) 0x0000007D (125) Microsoft ACPI-Compliant System
(ISA) 0x0000007E (126) Microsoft ACPI-Compliant System
(ISA) 0x0000007F (127) Microsoft ACPI-Compliant System
(ISA) 0x00000080 (128) Microsoft ACPI-Compliant System
(ISA) 0x00000081 (129) Microsoft ACPI-Compliant System

Interrupt Controller (IRQ) Map (cont'd)

(ISA) 0x00000082 (130) Microsoft ACPI-Compliant System
(ISA) 0x00000083 (131) Microsoft ACPI-Compliant System
(ISA) 0x00000084 (132) Microsoft ACPI-Compliant System
(ISA) 0x00000085 (133) Microsoft ACPI-Compliant System
(ISA) 0x00000086 (134) Microsoft ACPI-Compliant System
(ISA) 0x00000087 (135) Microsoft ACPI-Compliant System
(ISA) 0x00000088 (136) Microsoft ACPI-Compliant System
(ISA) 0x00000089 (137) Microsoft ACPI-Compliant System
(ISA) 0x0000008A (138) Microsoft ACPI-Compliant System
(ISA) 0x0000008B (139) Microsoft ACPI-Compliant System
(ISA) 0x0000008C (140) Microsoft ACPI-Compliant System
(ISA) 0x0000008D (141) Microsoft ACPI-Compliant System
(ISA) 0x0000008E (142) Microsoft ACPI-Compliant System
(ISA) 0x0000008F (143) Microsoft ACPI-Compliant System
(ISA) 0x00000090 (144) Microsoft ACPI-Compliant System
(ISA) 0x00000091 (145) Microsoft ACPI-Compliant System
(ISA) 0x00000092 (146) Microsoft ACPI-Compliant System
(ISA) 0x00000093 (147) Microsoft ACPI-Compliant System
(ISA) 0x00000094 (148) Microsoft ACPI-Compliant System
(ISA) 0x00000095 (149) Microsoft ACPI-Compliant System
(ISA) 0x00000096 (150) Microsoft ACPI-Compliant System
(ISA) 0x00000097 (151) Microsoft ACPI-Compliant System
(ISA) 0x00000098 (152) Microsoft ACPI-Compliant System
(ISA) 0x00000099 (153) Microsoft ACPI-Compliant System

(ISA) 0x0000009A (154) Microsoft ACPI-Compliant System
(ISA) 0x0000009B (155) Microsoft ACPI-Compliant System
(ISA) 0x0000009C (156) Microsoft ACPI-Compliant System
(ISA) 0x0000009D (157) Microsoft ACPI-Compliant System
(ISA) 0x0000009E (158) Microsoft ACPI-Compliant System
(ISA) 0x0000009F (159) Microsoft ACPI-Compliant System
(ISA) 0x000000A0 (160) Microsoft ACPI-Compliant System
(ISA) 0x000000A1 (161) Microsoft ACPI-Compliant System
(ISA) 0x000000A2 (162) Microsoft ACPI-Compliant System
(ISA) 0x000000A3 (163) Microsoft ACPI-Compliant System
(ISA) 0x000000A4 (164) Microsoft ACPI-Compliant System
(ISA) 0x000000A5 (165) Microsoft ACPI-Compliant System
(ISA) 0x000000A6 (166) Microsoft ACPI-Compliant System
(ISA) 0x000000A7 (167) Microsoft ACPI-Compliant System
(ISA) 0x000000A8 (168) Microsoft ACPI-Compliant System
(ISA) 0x000000A9 (169) Microsoft ACPI-Compliant System
(ISA) 0x000000AA (170) Microsoft ACPI-Compliant System
(ISA) 0x000000AB (171) Microsoft ACPI-Compliant System
(ISA) 0x000000AC (172) Microsoft ACPI-Compliant System
(ISA) 0x000000AD (173) Microsoft ACPI-Compliant System
(ISA) 0x000000AE (174) Microsoft ACPI-Compliant System
(ISA) 0x000000AF (175) Microsoft ACPI-Compliant System
(ISA) 0x000000B0 (176) Microsoft ACPI-Compliant System
(ISA) 0x000000B1 (177) Microsoft ACPI-Compliant System
(ISA) 0x000000B2 (178) Microsoft ACPI-Compliant System
(ISA) 0x000000B3 (179) Microsoft ACPI-Compliant System
(ISA) 0x000000B4 (180) Microsoft ACPI-Compliant System
(ISA) 0x000000B5 (181) Microsoft ACPI-Compliant System
(ISA) 0x000000B6 (182) Microsoft ACPI-Compliant System
(ISA) 0x000000B7 (183) Microsoft ACPI-Compliant System
(ISA) 0x000000B8 (184) Microsoft ACPI-Compliant System
(ISA) 0x000000B9 (185) Microsoft ACPI-Compliant System
(ISA) 0x000000BA (186) Microsoft ACPI-Compliant System
(ISA) 0x000000BB (187) Microsoft ACPI-Compliant System
(ISA) 0x000000BC (188) Microsoft ACPI-Compliant System

Interrupt Controller (IRQ) Map (cont'd)

(ISA) 0x000000BD (189) Microsoft ACPI-Compliant System
(ISA) 0x000000BE (190) Microsoft ACPI-Compliant System
(ISA) 0x000000BF (191) Microsoft ACPI-Compliant System
(ISA) 0x00000100 (256) Microsoft ACPI-Compliant System
(ISA) 0x00000101 (257) Microsoft ACPI-Compliant System
(ISA) 0x00000102 (258) Microsoft ACPI-Compliant System
(ISA) 0x00000103 (259) Microsoft ACPI-Compliant System
(ISA) 0x00000104 (260) Microsoft ACPI-Compliant System
(ISA) 0x00000105 (261) Microsoft ACPI-Compliant System
(ISA) 0x00000106 (262) Microsoft ACPI-Compliant System
(ISA) 0x00000107 (263) Microsoft ACPI-Compliant System
(ISA) 0x00000108 (264) Microsoft ACPI-Compliant System
(ISA) 0x00000109 (265) Microsoft ACPI-Compliant System
(ISA) 0x0000010A (266) Microsoft ACPI-Compliant System
(ISA) 0x0000010B (267) Microsoft ACPI-Compliant System
(ISA) 0x0000010C (268) Microsoft ACPI-Compliant System
(ISA) 0x0000010D (269) Microsoft ACPI-Compliant System
(ISA) 0x0000010E (270) Microsoft ACPI-Compliant System
(ISA) 0x0000010F (271) Microsoft ACPI-Compliant System
(ISA) 0x00000110 (272) Microsoft ACPI-Compliant System
(ISA) 0x00000111 (273) Microsoft ACPI-Compliant System
(ISA) 0x00000112 (274) Microsoft ACPI-Compliant System
(ISA) 0x00000113 (275) Microsoft ACPI-Compliant System
(ISA) 0x00000114 (276) Microsoft ACPI-Compliant System
(ISA) 0x00000115 (277) Microsoft ACPI-Compliant System
(ISA) 0x00000116 (278) Microsoft ACPI-Compliant System
(ISA) 0x00000117 (279) Microsoft ACPI-Compliant System
(ISA) 0x00000118 (280) Microsoft ACPI-Compliant System
(ISA) 0x00000119 (281) Microsoft ACPI-Compliant System
(ISA) 0x0000011A (282) Microsoft ACPI-Compliant System
(ISA) 0x0000011B (283) Microsoft ACPI-Compliant System
(ISA) 0x0000011C (284) Microsoft ACPI-Compliant System
(ISA) 0x0000011D (285) Microsoft ACPI-Compliant System
(ISA) 0x0000011E (286) Microsoft ACPI-Compliant System
(ISA) 0x0000011F (287) Microsoft ACPI-Compliant System
(ISA) 0x00000120 (288) Microsoft ACPI-Compliant System
(ISA) 0x00000121 (289) Microsoft ACPI-Compliant System
(ISA) 0x00000122 (290) Microsoft ACPI-Compliant System
(ISA) 0x00000123 (291) Microsoft ACPI-Compliant System
(ISA) 0x00000124 (292) Microsoft ACPI-Compliant System
(ISA) 0x00000125 (293) Microsoft ACPI-Compliant System
(ISA) 0x00000126 (294) Microsoft ACPI-Compliant System
(ISA) 0x00000127 (295) Microsoft ACPI-Compliant System
(ISA) 0x00000128 (296) Microsoft ACPI-Compliant System
(ISA) 0x00000129 (297) Microsoft ACPI-Compliant System
(ISA) 0x0000012A (298) Microsoft ACPI-Compliant System
(ISA) 0x0000012B (299) Microsoft ACPI-Compliant System
(ISA) 0x0000012C (300) Microsoft ACPI-Compliant System
(ISA) 0x0000012D (301) Microsoft ACPI-Compliant System
(ISA) 0x0000012E (302) Microsoft ACPI-Compliant System
(ISA) 0x0000012F (303) Microsoft ACPI-Compliant System
(ISA) 0x00000130 (304) Microsoft ACPI-Compliant System
(ISA) 0x00000131 (305) Microsoft ACPI-Compliant System
(ISA) 0x00000132 (306) Microsoft ACPI-Compliant System
(ISA) 0x00000133 (307) Microsoft ACPI-Compliant System
(ISA) 0x00000134 (308) Microsoft ACPI-Compliant System
(ISA) 0x00000135 (309) Microsoft ACPI-Compliant System
(ISA) 0x00000136 (310) Microsoft ACPI-Compliant System
(ISA) 0x00000137 (311) Microsoft ACPI-Compliant System
(ISA) 0x00000138 (312) Microsoft ACPI-Compliant System
(ISA) 0x00000139 (313) Microsoft ACPI-Compliant System

Interrupt Controller (IRQ) Map (cont'd)

(ISA) 0x0000013A (314) Microsoft ACPI-Compliant System
(ISA) 0x0000013B (315) Microsoft ACPI-Compliant System
(ISA) 0x0000013C (316) Microsoft ACPI-Compliant System
(ISA) 0x0000013D (317) Microsoft ACPI-Compliant System
(ISA) 0x0000013E (318) Microsoft ACPI-Compliant System
(ISA) 0x0000013F (319) Microsoft ACPI-Compliant System
(ISA) 0x00000140 (320) Microsoft ACPI-Compliant System
(ISA) 0x00000141 (321) Microsoft ACPI-Compliant System
(ISA) 0x00000142 (322) Microsoft ACPI-Compliant System
(ISA) 0x00000143 (323) Microsoft ACPI-Compliant System
(ISA) 0x00000144 (324) Microsoft ACPI-Compliant System
(ISA) 0x00000145 (325) Microsoft ACPI-Compliant System
(ISA) 0x00000146 (326) Microsoft ACPI-Compliant System
(ISA) 0x00000147 (327) Microsoft ACPI-Compliant System
(ISA) 0x00000148 (328) Microsoft ACPI-Compliant System
(ISA) 0x00000149 (329) Microsoft ACPI-Compliant System
(ISA) 0x0000014A (330) Microsoft ACPI-Compliant System
(ISA) 0x0000014B (331) Microsoft ACPI-Compliant System
(ISA) 0x0000014C (332) Microsoft ACPI-Compliant System
(ISA) 0x0000014D (333) Microsoft ACPI-Compliant System
(ISA) 0x0000014E (334) Microsoft ACPI-Compliant System
(ISA) 0x0000014F (335) Microsoft ACPI-Compliant System
(ISA) 0x00000150 (336) Microsoft ACPI-Compliant System
(ISA) 0x00000151 (337) Microsoft ACPI-Compliant System
(ISA) 0x00000152 (338) Microsoft ACPI-Compliant System
(ISA) 0x00000153 (339) Microsoft ACPI-Compliant System
(ISA) 0x00000154 (340) Microsoft ACPI-Compliant System
(ISA) 0x00000155 (341) Microsoft ACPI-Compliant System
(ISA) 0x00000156 (342) Microsoft ACPI-Compliant System
(ISA) 0x00000157 (343) Microsoft ACPI-Compliant System
(ISA) 0x00000158 (344) Microsoft ACPI-Compliant System
(ISA) 0x00000159 (345) Microsoft ACPI-Compliant System
(ISA) 0x0000015A (346) Microsoft ACPI-Compliant System
(ISA) 0x0000015B (347) Microsoft ACPI-Compliant System
(ISA) 0x0000015C (348) Microsoft ACPI-Compliant System
(ISA) 0x0000015D (349) Microsoft ACPI-Compliant System
(ISA) 0x0000015E (350) Microsoft ACPI-Compliant System
(ISA) 0x0000015F (351) Microsoft ACPI-Compliant System
(ISA) 0x00000160 (352) Microsoft ACPI-Compliant System
(ISA) 0x00000161 (353) Microsoft ACPI-Compliant System
(ISA) 0x00000162 (354) Microsoft ACPI-Compliant System
(ISA) 0x00000163 (355) Microsoft ACPI-Compliant System
(ISA) 0x00000164 (356) Microsoft ACPI-Compliant System
(ISA) 0x00000165 (357) Microsoft ACPI-Compliant System
(ISA) 0x00000166 (358) Microsoft ACPI-Compliant System
(ISA) 0x00000167 (359) Microsoft ACPI-Compliant System
(ISA) 0x00000168 (360) Microsoft ACPI-Compliant System
(ISA) 0x00000169 (361) Microsoft ACPI-Compliant System
(ISA) 0x0000016A (362) Microsoft ACPI-Compliant System
(ISA) 0x0000016B (363) Microsoft ACPI-Compliant System
(ISA) 0x0000016C (364) Microsoft ACPI-Compliant System
(ISA) 0x0000016D (365) Microsoft ACPI-Compliant System
(ISA) 0x0000016E (366) Microsoft ACPI-Compliant System
(ISA) 0x0000016F (367) Microsoft ACPI-Compliant System
(ISA) 0x00000170 (368) Microsoft ACPI-Compliant System
(ISA) 0x00000171 (369) Microsoft ACPI-Compliant System
(ISA) 0x00000172 (370) Microsoft ACPI-Compliant System
(ISA) 0x00000173 (371) Microsoft ACPI-Compliant System
(ISA) 0x00000174 (372) Microsoft ACPI-Compliant System

Interrupt Controller (IRQ) Map (cont'd)

(ISA) 0x00000175 (373) Microsoft ACPI-Compliant System
(ISA) 0x00000176 (374) Microsoft ACPI-Compliant System
(ISA) 0x00000177 (375) Microsoft ACPI-Compliant System
(ISA) 0x00000178 (376) Microsoft ACPI-Compliant System
(ISA) 0x00000179 (377) Microsoft ACPI-Compliant System
(ISA) 0x0000017A (378) Microsoft ACPI-Compliant System
(ISA) 0x0000017B (379) Microsoft ACPI-Compliant System
(ISA) 0x0000017C (380) Microsoft ACPI-Compliant System
(ISA) 0x0000017D (381) Microsoft ACPI-Compliant System
(ISA) 0x0000017E (382) Microsoft ACPI-Compliant System
(ISA) 0x0000017F (383) Microsoft ACPI-Compliant System
(ISA) 0x00000180 (384) Microsoft ACPI-Compliant System
(ISA) 0x00000181 (385) Microsoft ACPI-Compliant System
(ISA) 0x00000182 (386) Microsoft ACPI-Compliant System
(ISA) 0x00000183 (387) Microsoft ACPI-Compliant System
(ISA) 0x00000184 (388) Microsoft ACPI-Compliant System
(ISA) 0x00000185 (389) Microsoft ACPI-Compliant System
(ISA) 0x00000186 (390) Microsoft ACPI-Compliant System
(ISA) 0x00000187 (391) Microsoft ACPI-Compliant System
(ISA) 0x00000188 (392) Microsoft ACPI-Compliant System
(ISA) 0x00000189 (393) Microsoft ACPI-Compliant System
(ISA) 0x0000018A (394) Microsoft ACPI-Compliant System
(ISA) 0x0000018B (395) Microsoft ACPI-Compliant System
(ISA) 0x0000018C (396) Microsoft ACPI-Compliant System
(ISA) 0x0000018D (397) Microsoft ACPI-Compliant System
(ISA) 0x0000018E (398) Microsoft ACPI-Compliant System
(ISA) 0x0000018F (399) Microsoft ACPI-Compliant System
(ISA) 0x00000190 (400) Microsoft ACPI-Compliant System
(ISA) 0x00000191 (401) Microsoft ACPI-Compliant System
(ISA) 0x00000192 (402) Microsoft ACPI-Compliant System
(ISA) 0x00000193 (403) Microsoft ACPI-Compliant System
(ISA) 0x00000194 (404) Microsoft ACPI-Compliant System
(ISA) 0x00000195 (405) Microsoft ACPI-Compliant System
(ISA) 0x00000196 (406) Microsoft ACPI-Compliant System
(ISA) 0x00000197 (407) Microsoft ACPI-Compliant System
(ISA) 0x00000198 (408) Microsoft ACPI-Compliant System
(ISA) 0x00000199 (409) Microsoft ACPI-Compliant System
(ISA) 0x0000019A (410) Microsoft ACPI-Compliant System
(ISA) 0x0000019B (411) Microsoft ACPI-Compliant System
(ISA) 0x0000019C (412) Microsoft ACPI-Compliant System
(ISA) 0x0000019D (413) Microsoft ACPI-Compliant System
(ISA) 0x0000019E (414) Microsoft ACPI-Compliant System
(ISA) 0x0000019F (415) Microsoft ACPI-Compliant System
(ISA) 0x000001A0 (416) Microsoft ACPI-Compliant System
(ISA) 0x000001A1 (417) Microsoft ACPI-Compliant System
(ISA) 0x000001A2 (418) Microsoft ACPI-Compliant System
(ISA) 0x000001A3 (419) Microsoft ACPI-Compliant System
(ISA) 0x000001A4 (420) Microsoft ACPI-Compliant System
(ISA) 0x000001A5 (421) Microsoft ACPI-Compliant System
(ISA) 0x000001A6 (422) Microsoft ACPI-Compliant System
(ISA) 0x000001A7 (423) Microsoft ACPI-Compliant System
(ISA) 0x000001A8 (424) Microsoft ACPI-Compliant System
(ISA) 0x000001A9 (425) Microsoft ACPI-Compliant System
(ISA) 0x000001AA (426) Microsoft ACPI-Compliant System
(ISA) 0x000001AB (427) Microsoft ACPI-Compliant System
(ISA) 0x000001AC (428) Microsoft ACPI-Compliant System
(ISA) 0x000001AD (429) Microsoft ACPI-Compliant System
(ISA) 0x000001AE (430) Microsoft ACPI-Compliant System
(ISA) 0x000001AF (431) Microsoft ACPI-Compliant System
(ISA) 0x000001B0 (432) Microsoft ACPI-Compliant System

Interrupt Controller (IRQ) Map (cont'd)

(ISA) 0x000001B1 (433) Microsoft ACPI-Compliant System
(ISA) 0x000001B2 (434) Microsoft ACPI-Compliant System
(ISA) 0x000001B3 (435) Microsoft ACPI-Compliant System
(ISA) 0x000001B4 (436) Microsoft ACPI-Compliant System
(ISA) 0x000001B5 (437) Microsoft ACPI-Compliant System
(ISA) 0x000001B6 (438) Microsoft ACPI-Compliant System
(ISA) 0x000001B7 (439) Microsoft ACPI-Compliant System
(ISA) 0x000001B8 (440) Microsoft ACPI-Compliant System
(ISA) 0x000001B9 (441) Microsoft ACPI-Compliant System
(ISA) 0x000001BA (442) Microsoft ACPI-Compliant System
(ISA) 0x000001BB (443) Microsoft ACPI-Compliant System
(ISA) 0x000001BC (444) Microsoft ACPI-Compliant System
(ISA) 0x000001BD (445) Microsoft ACPI-Compliant System
(ISA) 0x000001BE (446) Microsoft ACPI-Compliant System
(ISA) 0x000001BF (447) Microsoft ACPI-Compliant System
(ISA) 0x000001C0 (448) Microsoft ACPI-Compliant System
(ISA) 0x000001C1 (449) Microsoft ACPI-Compliant System
(ISA) 0x000001C2 (450) Microsoft ACPI-Compliant System
(ISA) 0x000001C3 (451) Microsoft ACPI-Compliant System
(ISA) 0x000001C4 (452) Microsoft ACPI-Compliant System
(ISA) 0x000001C5 (453) Microsoft ACPI-Compliant System
(ISA) 0x000001C6 (454) Microsoft ACPI-Compliant System
(ISA) 0x000001C7 (455) Microsoft ACPI-Compliant System
(ISA) 0x000001C8 (456) Microsoft ACPI-Compliant System
(ISA) 0x000001C9 (457) Microsoft ACPI-Compliant System
(ISA) 0x000001CA (458) Microsoft ACPI-Compliant System
(ISA) 0x000001CB (459) Microsoft ACPI-Compliant System
(ISA) 0x000001CC (460) Microsoft ACPI-Compliant System
(ISA) 0x000001CD (461) Microsoft ACPI-Compliant System

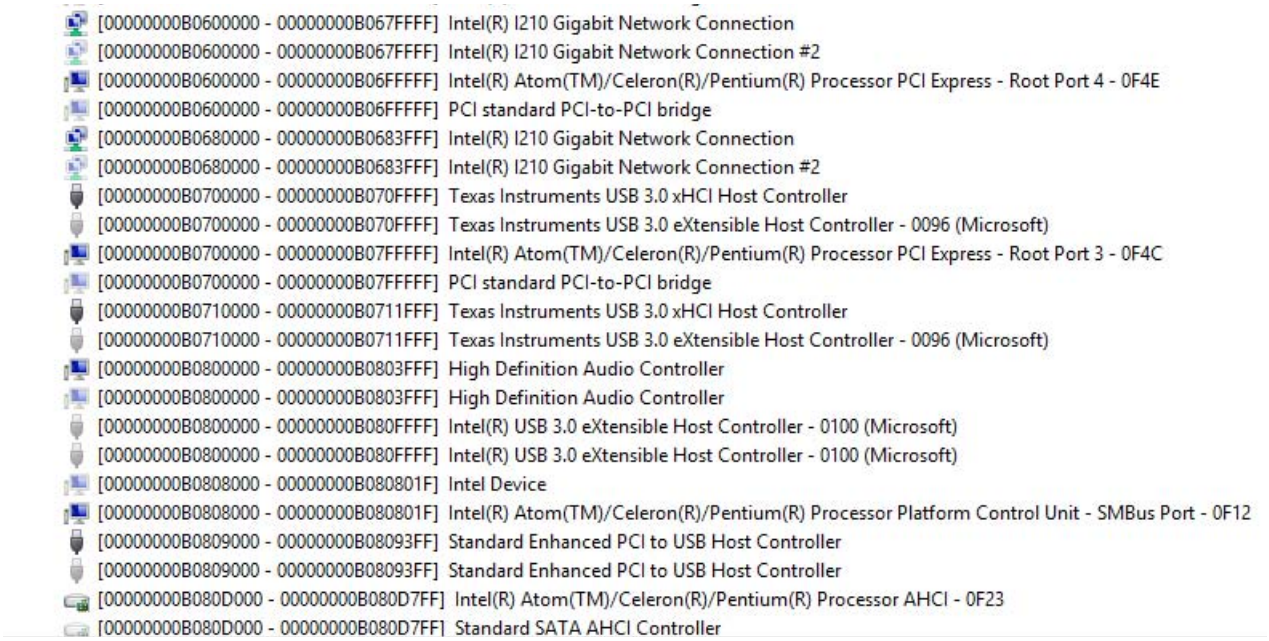
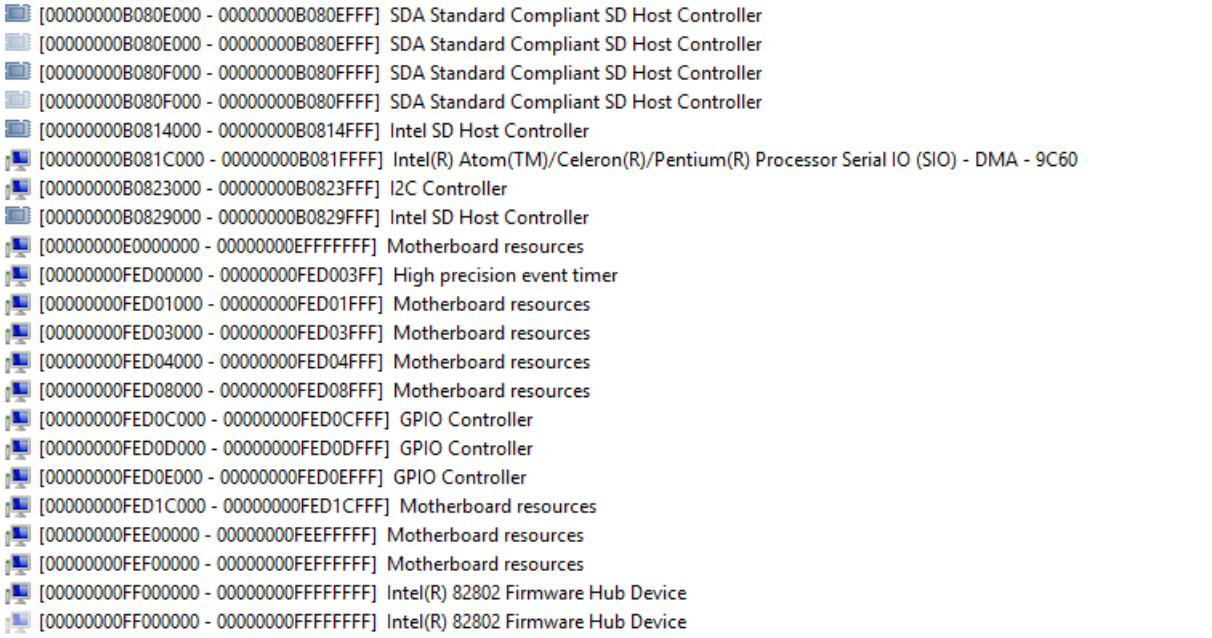
(ISA) 0x000001CE (462) Microsoft ACPI-Compliant System
(ISA) 0x000001CF (463) Microsoft ACPI-Compliant System
(ISA) 0x000001D0 (464) Microsoft ACPI-Compliant System
(ISA) 0x000001D1 (465) Microsoft ACPI-Compliant System
(ISA) 0x000001D2 (466) Microsoft ACPI-Compliant System
(ISA) 0x000001D3 (467) Microsoft ACPI-Compliant System
(ISA) 0x000001D4 (468) Microsoft ACPI-Compliant System
(ISA) 0x000001D5 (469) Microsoft ACPI-Compliant System
(ISA) 0x000001D6 (470) Microsoft ACPI-Compliant System
(ISA) 0x000001D7 (471) Microsoft ACPI-Compliant System
(ISA) 0x000001D8 (472) Microsoft ACPI-Compliant System
(ISA) 0x000001D9 (473) Microsoft ACPI-Compliant System
(ISA) 0x000001DA (474) Microsoft ACPI-Compliant System
(ISA) 0x000001DB (475) Microsoft ACPI-Compliant System
(ISA) 0x000001DC (476) Microsoft ACPI-Compliant System
(ISA) 0x000001DD (477) Microsoft ACPI-Compliant System
(ISA) 0x000001DE (478) Microsoft ACPI-Compliant System
(ISA) 0x000001DF (479) Microsoft ACPI-Compliant System
(ISA) 0x000001E0 (480) Microsoft ACPI-Compliant System
(ISA) 0x000001E1 (481) Microsoft ACPI-Compliant System
(ISA) 0x000001E2 (482) Microsoft ACPI-Compliant System
(ISA) 0x000001E3 (483) Microsoft ACPI-Compliant System
(ISA) 0x000001E4 (484) Microsoft ACPI-Compliant System
(ISA) 0x000001E5 (485) Microsoft ACPI-Compliant System
(ISA) 0x000001E6 (486) Microsoft ACPI-Compliant System
(ISA) 0x000001E7 (487) Microsoft ACPI-Compliant System
(ISA) 0x000001E8 (488) Microsoft ACPI-Compliant System
(ISA) 0x000001E9 (489) Microsoft ACPI-Compliant System
(ISA) 0x000001EA (490) Microsoft ACPI-Compliant System
(ISA) 0x000001EB (491) Microsoft ACPI-Compliant System
(ISA) 0x000001EC (492) Microsoft ACPI-Compliant System

Interrupt Controller (IRQ) Map (cont'd)

(ISA) 0x000001ED (493) Microsoft ACPI-Compliant System
(ISA) 0x000001EE (494) Microsoft ACPI-Compliant System
(ISA) 0x000001EF (495) Microsoft ACPI-Compliant System
(ISA) 0x000001F0 (496) Microsoft ACPI-Compliant System
(ISA) 0x000001F1 (497) Microsoft ACPI-Compliant System
(ISA) 0x000001F2 (498) Microsoft ACPI-Compliant System
(ISA) 0x000001F3 (499) Microsoft ACPI-Compliant System
(ISA) 0x000001F4 (500) Microsoft ACPI-Compliant System
(ISA) 0x000001F5 (501) Microsoft ACPI-Compliant System
(ISA) 0x000001F6 (502) Microsoft ACPI-Compliant System
(ISA) 0x000001F7 (503) Microsoft ACPI-Compliant System
(ISA) 0x000001F8 (504) Microsoft ACPI-Compliant System
(ISA) 0x000001F9 (505) Microsoft ACPI-Compliant System
(ISA) 0x000001FA (506) Microsoft ACPI-Compliant System
(ISA) 0x000001FB (507) Microsoft ACPI-Compliant System
(ISA) 0x000001FC (508) Microsoft ACPI-Compliant System
(ISA) 0x000001FD (509) Microsoft ACPI-Compliant System
(ISA) 0x000001FE (510) Microsoft ACPI-Compliant System
(ISA) 0x000001FF (511) Microsoft ACPI-Compliant System
(PCI) 0x0000000B (11) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
(PCI) 0x00000010 (16) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
(PCI) 0x00000011 (17) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 2 - 0F4A
(PCI) 0x00000012 (18) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 3 - 0F4C
(PCI) 0x00000012 (18) SDA Standard Compliant SD Host Controller
(PCI) 0x00000013 (19) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
(PCI) 0x00000013 (19) Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 4 - 0F4E
(PCI) 0x00000016 (22) High Definition Audio Controller
(PCI) 0x00000017 (23) Standard Enhanced PCI to USB Host Controller
(PCI) 0xFFFFFFF6 (-10) Intel(R) I210 Gigabit Network Connection
(PCI) 0xFFFFFFF7 (-9) Intel(R) I210 Gigabit Network Connection
(PCI) 0xFFFFFFF8 (-8) Intel(R) I210 Gigabit Network Connection
(PCI) 0xFFFFFFF9 (-7) Intel(R) I210 Gigabit Network Connection
(PCI) 0xFFFFFFFA (-6) Intel(R) I210 Gigabit Network Connection
(PCI) 0xFFFFFFFB (-5) Intel(R) I210 Gigabit Network Connection
(PCI) 0xFFFFFFFC (-4) Texas Instruments USB 3.0 xHCI Host Controller
(PCI) 0xFFFFFFFD (-3) Intel(R) Trusted Execution Engine Interface
(PCI) 0xFFFFFFFE (-2) Intel(R) HD Graphics

7.3 Memory Map

The memory map of DRAM for the CE-6BT01 under Windows® 7 Ultimate 64-bit is shown below.

Memory
[00000000000A0000 - 00000000000BFFFF] PCI Express Root Complex
[00000000000C0000 - 00000000000DFFFF] PCI Express Root Complex
[00000000000E0000 - 00000000000FFFFF] PCI Express Root Complex
[00000000A0000000 - 00000000AFFFFFFF] Intel(R) HD Graphics
[00000000A0000000 - 00000000AFFFFFFF] Video Controller (VGA Compatible)
[00000000A0000000 - 00000000B0813FFE] PCI Express Root Complex
[00000000B0000000 - 00000000B03FFFFF] Intel(R) HD Graphics
[00000000B0000000 - 00000000B03FFFFF] Video Controller (VGA Compatible)
[00000000B0400000 - 00000000B04FFFFF] Intel(R) Trusted Execution Engine Interface
[00000000B0400000 - 00000000B04FFFFF] Intel(R) Trusted Execution Engine Interface
[00000000B0500000 - 00000000B05FFFFF] Intel(R) Trusted Execution Engine Interface
[00000000B0500000 - 00000000B05FFFFF] Intel(R) Trusted Execution Engine Interface

Memory Map (cont'd)