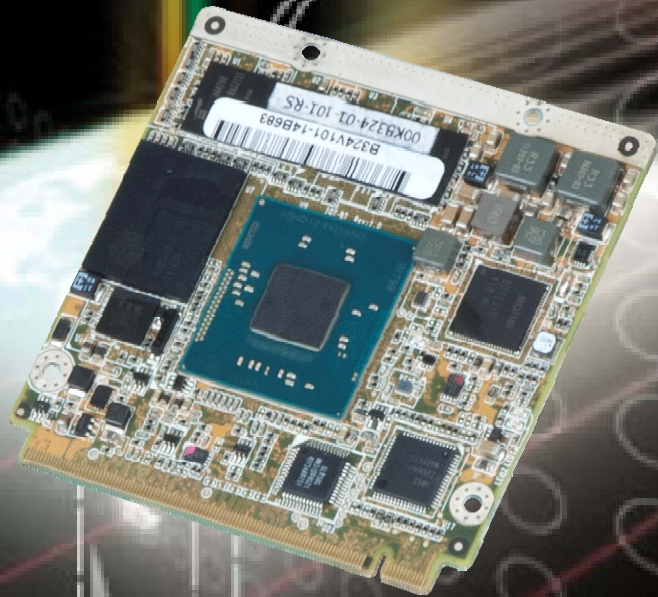




**MODEL:
iQ7-BT**

**Qseven® Rev. 2.0 Module with
22nm Intel® Atom™/Celeron® Processor,
2 GB/4 GB DDR3L, and RoHS Compliant**

User Manual

Revision

Date	Version	Changes
March 23, 2015	1.00	Initial release

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Chapter

1

Introduction

1.1 Introduction

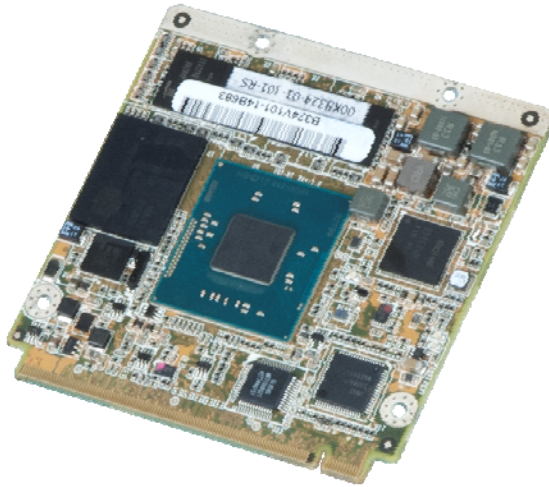


Figure 1-1: iQ7-BT

The iQ7-BT Qseven® module provides the main processing chips and is connected to a compatible Qseven® baseboard. The iQ7-BT is preinstalled with 4th generation Intel® Atom™ or Celeron® processor. The Qseven® standard allows the Qseven® baseboard to be designed, while leaving the choice of processor till the later stages of design. The iQ7-BT provides a low power option with the full range of modern I/O options. The iQ7-BT embedded module is designed for flexible integration by system developers into customized platform devices.

1.2 Features

Some of the iQ7-BT Qseven module features are listed below:

- Complies with Qseven® Rev. 2.0 form factor
- Supports 22nm Intel® Atom™ or Celeron® processor
- 2 GB/4 GB 1066/1333 MHz DDR3L soldered memory
- Optional 2 GB – 64 GB soldered SSD
- Supports dual independent display via LVDS, DisplayPort or HDMI
- Supports USB 3.0, SATA 3Gb/s and GbE
- Supports wide operating temperature (-40°C ~ 85°C)
- RoHS compliant

iQ7-BT Qseven Module

1.3 Model Variations

There are several models of the iQ7-BT series. The model variations are listed in **Table 1-1**.

Model	On-board SoC	Operating Temp.
Standard		
iQ7-BT-E38251	Intel® Atom™ processor E3825 (1.33 GHz, dual-core, 1 MB cache, 6 W TDP)	-20°C ~ 60°C
iQ7-BT-E38251W2	Intel® Atom™ processor E3825 (1.33 GHz, dual-core, 1 MB cache, 6 W TDP)	-40°C ~ 85°C
iQ7-BT-E38451	Intel® Atom™ processor E3845 (1.91 GHz, quad-core, 2 MB cache, 10 W TDP)	-20°C ~ 60°C
iQ7-BT-E38451W2	Intel® Atom™ processor E3845 (1.91 GHz, quad-core, 2 MB cache, 10 W TDP)	-40°C ~ 85°C
By Request (MOQ: 100 pcs/lot)		
iQ7-BT-E38151	Intel® Atom™ processor E3815 (1.46 GHz, single-core, 512 KB cache, 5 W TDP)	-20°C ~ 60°C
iQ7-BT-E38151W2		-40°C ~ 85°C
iQ7-BT-E38261	Intel® Atom™ processor E3826 (1.46 GHz, dual-core, 1 MB cache, 7 W TDP)	-20°C ~ 60°C
iQ7-BT-E38261W2		-40°C ~ 85°C
iQ7-BT-E38271	Intel® Atom™ processor E3827 (1.75 GHz, dual-core, 1 MB cache, 8 W TDP)	-20°C ~ 60°C
iQ7-BT-E38271W2		-40°C ~ 85°C
iQ7-BT-J19001	Intel® Celeron® processor J1900 (2 GHz, quad-core, 2 MB cache, 10 W TDP)	-20°C ~ 60°C
iQ7-BT-N28071	Intel® Celeron® processor N2807 (1.58 GHz, dual-core, 2 MB cache, 4.3 W TDP)	-20°C ~ 60°C
iQ7-BT-N29301	Intel® Celeron® processor N2930 (1.83 GHz, quad-core, 2 MB cache, 7.5 W TDP)	-20°C ~ 60°C

Table 1-1: Model Variations

1.4 Board Overview

The on-board components and connector of the iQ7-BT are shown in the figures below.

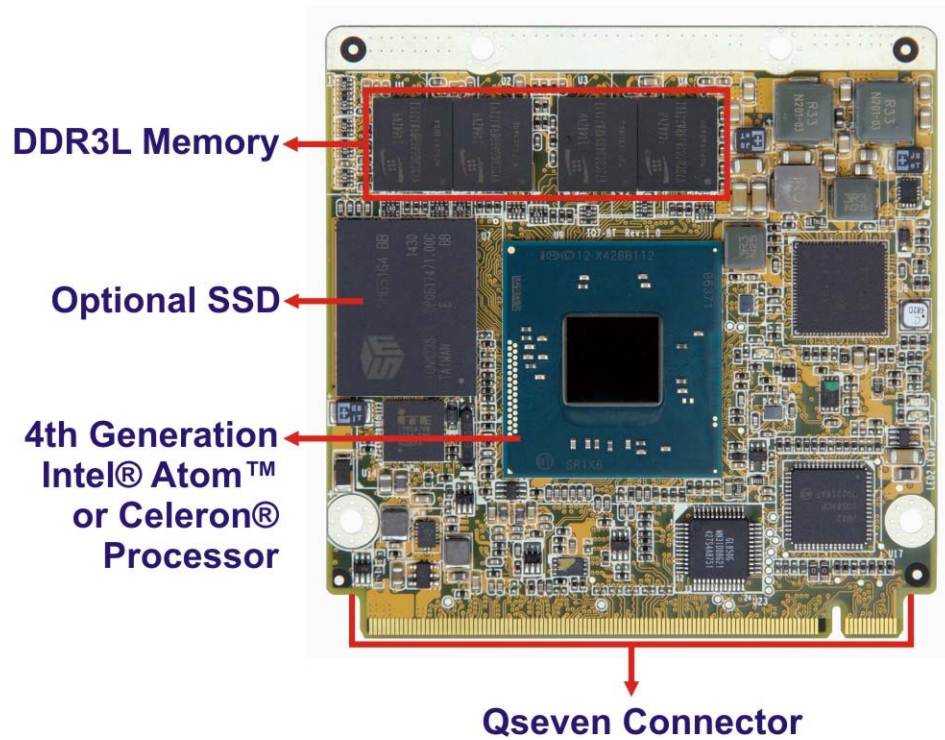


Figure 1-2: On-board Components and Connectors

iQ7-BT Qseven Module

1.5 Dimensions

The main dimensions of the iQ7-BT are shown in the diagram below.

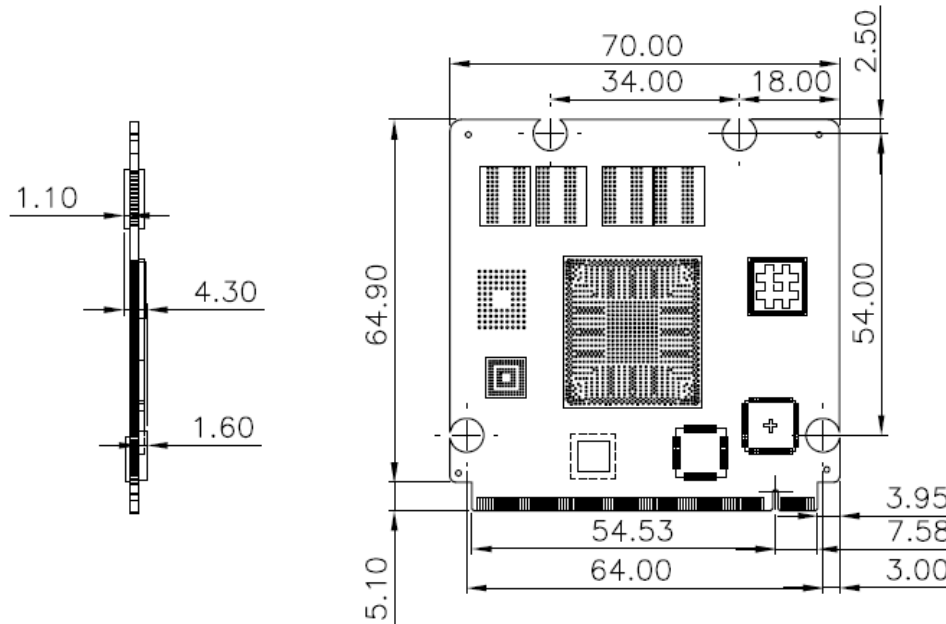


Figure 1-3: iQ7-BT Dimensions (mm)

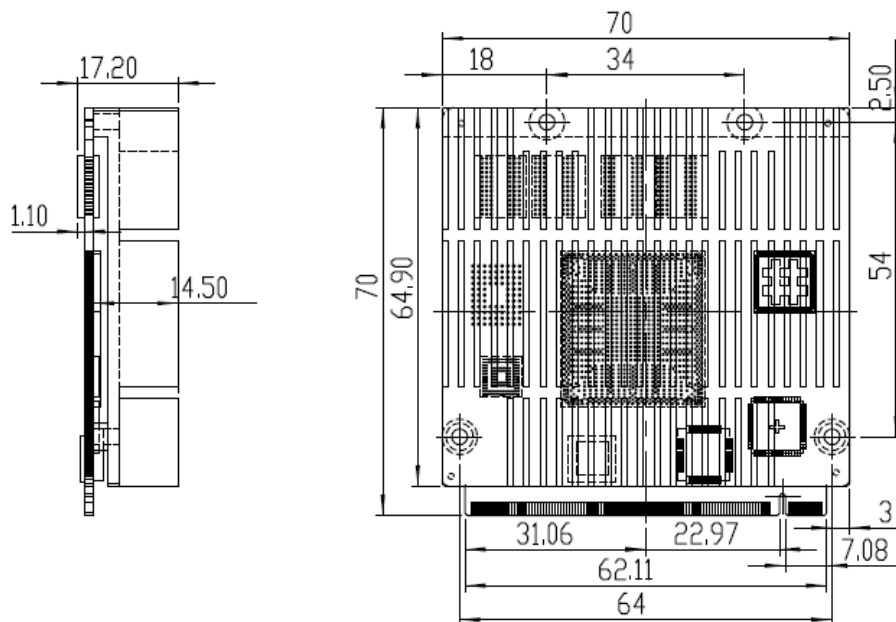


Figure 1-4: iQ7-BT Dimensions with Heatsink (mm)

1.6 Data Flow

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

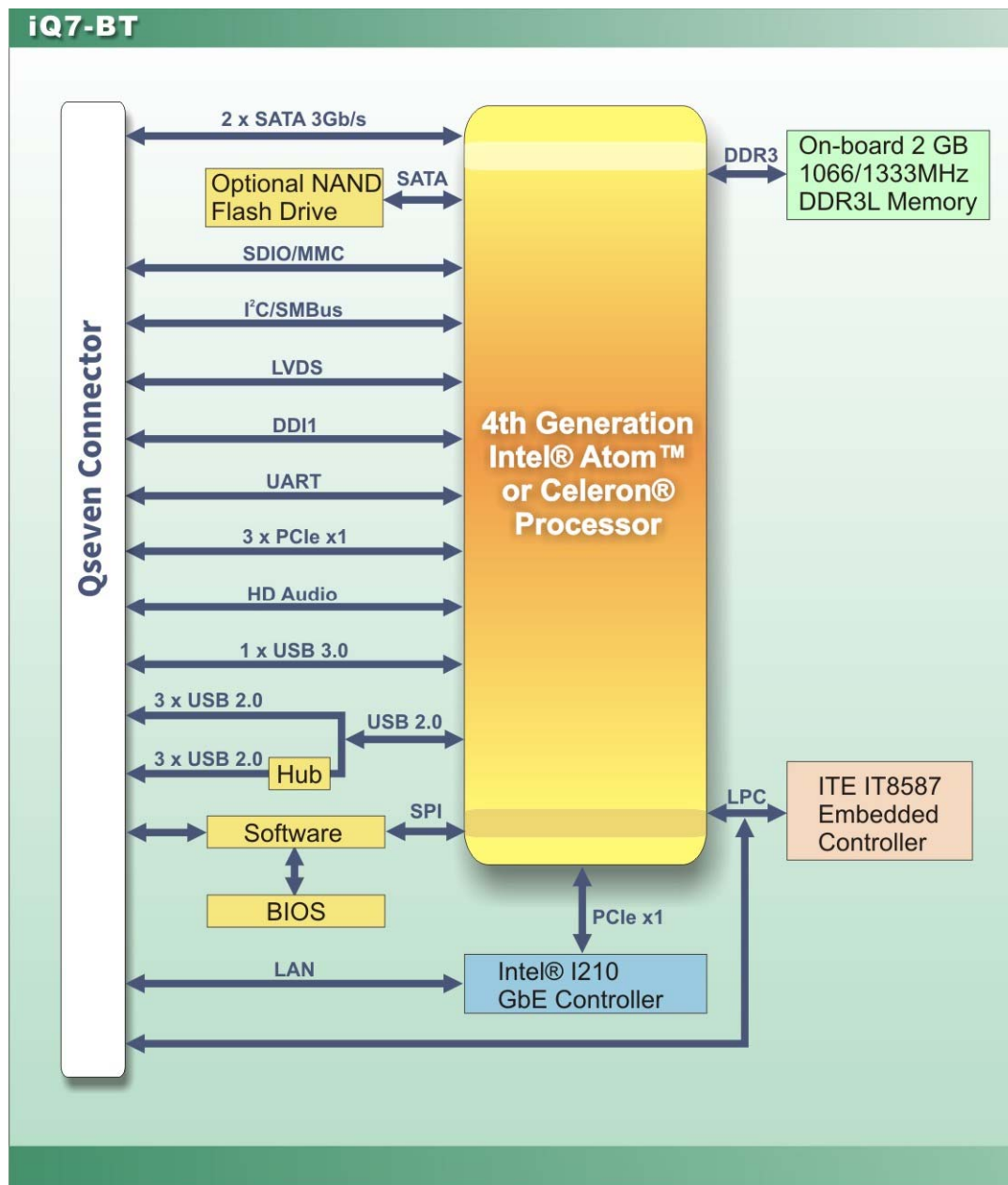


Figure 1-5: Data Flow Diagram

iQ7-BT Qseven Module

1.7 Technical Specifications

The iQ7-BT technical specifications are listed below.

	iQ7-BT
Form Factor	Qseven® Rev. 2.0
On-board SoC	▪ Standard ○ Intel® Atom™ processor E3825 (1.33 GHz, dual-core, 1 MB cache, 6 W TDP) ○ Intel® Atom™ processor E3845 (1.91 GHz, quad-core, 2 MB cache, 10 W TDP) ▪ By request (MOQ: 100 pcs/lot) ○ Intel® Atom™ processor E3815 (1.46 GHz, single-core, 512 KB cache, 5 W TDP) ○ Intel® Atom™ processor E3826 (1.46 GHz, dual-core, 1 MB cache, 7 W TDP) ○ Intel® Atom™ processor E3827 (1.75 GHz, dual-core, 1 MB cache, 8 W TDP) ○ Celeron® processor J1900 (2 GHz, quad-core, 2 MB cache, 10 W TDP) ○ Intel® Celeron® processor N2930 (1.83 GHz, quad-core, 2 MB cache, 7.5 W TDP) ○ Intel® Celeron® processor N2807 (1.58 GHz, dual-core, 2 MB cache, 4.5 W TDP)
Memory	2 GB 1066/1333 MHz DDR3L soldered memory (up to 4 GB)
Graphics Engine	Intel® HD Graphics Gen 7 with four execution units Supports DirectX 11.1, OpenGL 4.2 and OpenCL 1.2
Ethernet	Intel® I210 Ethernet Controller
BIOS	UEFI BIOS
Embedded Controller	ITE IT8528E/FX
Watchdog Timer	Software programmable supports 1~255 sec. system reset

	iQ7-BT
Storage	Two SATA 3Gb/s (signal to baseboard) Optional 2 GB – 64 GB soldered SSD (SATA port 2)
Display (signal to baseboard)	Supports dual independent display One 18/24-bit dual-channel LVDS by CH7511B DP to LVDS converter (up to 1920x1200@60 Hz) One DDI (DP: up to 2560 x 1600; HDMI: up to 1920 x 1080)
Expansions (signal to baseboard)	Three PCIe x1
I/O Interfaces (signal to baseboard)	Six USB 2.0 One USB 3.0 One RS-232 HD Audio 8-bit SDIO 2.0 SMBus I ² C LPC SPI
Power Consumption	3.3 V @ 0.1 A, 5 V @ 0.13 A, 12 V @ 1.35 A, 5 VSB @ 0.12 A (1.91 GHz Intel® Atom™ E3845 CPU with 2 GB 1333 MHz DDR3L memory)
Operating Temperature	-20°C ~ 60°C -40°C ~ 85°C (W2 models)
Storage Temperature	-30°C ~ 70°C
Operating Humidity	5% ~ 95% (non-condensing)
Dimensions	70 mm x 70 mm
Weight (GW/NW)	300 g/150 g

Table 1-2: iQ7-BT 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 iQ7-BT 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.

iQ7-BT Qseven Module

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 iQ7-BT was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The iQ7-BT is shipped with the following components:

Quantity	Item and Part Number	Image
1	iQ7-BT Qseven Module	
1	Heatsink	
1	Utility CD	
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 Qseven modules (P/N: iQ7-DB-MATX-R10)	

Table 2-2: Optional Items

Chapter

3

Installation

3.1 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the installation of the iQ7-BT may result in permanent damage to the iQ7-BT and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the iQ7-BT. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the iQ7-BT 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 iQ7-BT, place it on an anti-static pad. This reduces the possibility of ESD damaging the iQ7-BT.
- ***Only handle the edges of the PCB:*** When handling the PCB, hold the PCB by the edges.

3.2 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.

iQ7-BT Qseven 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 iQ7-BT 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 iQ7-BT 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 iQ7-BT off:
 - When working with the iQ7-BT, 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 iQ7-BT **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.

3.3 Qseven Connector Pinouts

- CN Label: J_GF1
- CN Type: 230-pin Qseven connector
- CN Location: See **Figure 3-1**
- CN Pinouts: See **Table 3-1**

The standard Qseven connector location and pinouts are shown below.

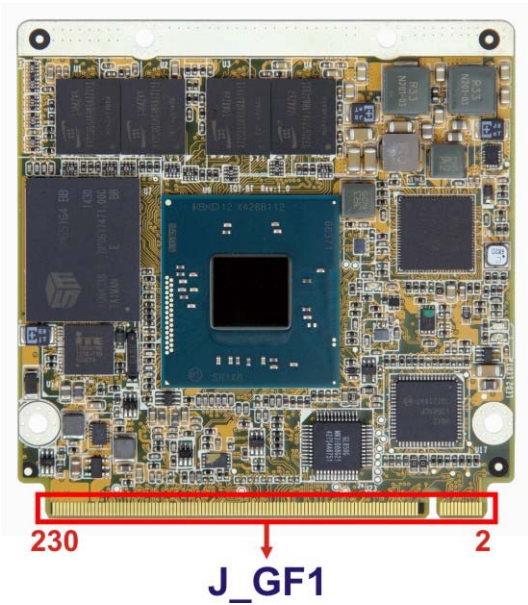


Figure 3-1: Qseven Connector Location

Pin No.	Description	Pin No.	Description
1	GND	2	GND
3	TRD1N3	4	TRD1N2
5	TRD1P3	6	TRD1P2
7	L1_100-	8	L1_1000-
9	TRD1N1	10	TRD1N0
11	TRD1P1	12	TRD1P0
13	N/A	14	L1_LINK_ACT-
15	N/A	16	PM_SLP_S4#
17	PCIE_WAKE#	18	PM_SLP_S3#
19	PM_SUS_STAT#	20	PANSWIN#

iQ7-BT Qseven Module

Pin No.	Description	Pin No.	Description
21	SLEEP#	22	LID#
23	GND	24	GND
25	GND	26	PWGIN
27	BATLOW#	28	PM_SYSRST_R#
29	SATA_TXP0	30	SATA_TXP1
31	SATA_TXN0	32	SATA_TXN1
33	SATALED#	34	GND
35	SATA_RXP0	36	SATA_RXP1
37	SATA_RXN0	38	SATA_RXN1
39	GND	40	GND
41	BIOS_DISO#	42	SDIO_CLK
43	SDIO_CD_N	44	N/A
45	SDIO_CMD	46	N/A
47	SDIO_PWR_N	48	SDIO_D1
49	SDIO_D0	50	SDIO_D3
51	SDIO_D2	52	N/A
53	N/A	54	N/A
55	N/A	56	AT_ATX#DET
57	GND	58	GND
59	HDA_SYNC	60	SMB_CLK
61	HDA_RST#	62	SMB_DATA
63	HDA_BCLK	64	SMBALERT#
65	HDA_SDI	66	EC_CLK
67	HDA_SDO	68	EC_DATA
69	N/A	70	TP
71	N/A	72	EC_WDTRST#
73	GND	74	GND
75	USB3_TXD_N	76	USB3RXD_N
77	USB3_TXD_P	78	USB3RXD_P
79	GL852_OC2#	80	GL852_OC3#
81	USB3- _GL850	82	USB2- _GL850
83	USB3+ _GL850	84	USB2+ _GL850

Pin No.	Description	Pin No.	Description
85	GL852_OC1#	86	USB_OC#_0_1_R
87	USB1-_GL850	88	USB_PN2-
89	USB1+_GL850	90	USB_PP2+
91	N/A	92	N/A
93	USB_PN1-	94	USB_PN0-
95	USB_PP1+	96	USB_PP0+
97	GND	98	GND
99	LVDS_A0+	100	LVDS_B0+
101	LVDS_A0-	102	LVDS_B0-
103	LVDS_A1+	104	LVDS_B1+
105	LVDS_A1-	106	LVDS_B1-
107	LVDS_A2+	108	LVDS_B2+
109	LVDS_A2-	110	LVDS_B2-
111	LVDS_PPEN	112	LVDS_BLEN
113	LVDS_A3+	114	LVDS_B3+
115	LVDS_A3-	116	LVDS_B3-
117	GND	118	GND
119	LVDS_A_CLK+	120	LVDS_B_CLK+
121	LVDS_A_CLK-	122	LVDS_B_CLK-
123	LVDS_BLT_CTRL	124	N/A
125	N/A	126	N/A
127	N/A	128	N/A
129	N/A	130	N/A
131	TMDS_TXP3	132	EC_DCD
133	TMDS_TXN3	134	EC_DSR
135	GND	136	GND
137	TMDS_TXP1	138	DDI1_AUXP_R
139	TMDS_TXN1	140	DDI1_AUXN_R
141	GND	142	GND
143	TMDS_TXP0	144	EC_RI
145	TMDS_TXN0	146	EC_DTR
147	GND	148	GND

iQ7-BT Qseven Module

Pin No.	Description	Pin No.	Description
149	TMD5_TXP2	150	DDI1_CTRLDATA
151	TMD5_TXN2	152	DDI1_CTRLCLK
153	DDI1_HPD	154	LVDS_DC
155	CLK_PCIE0_P	156	PCIE_WAKE#
157	CLK_PCIE0_N	158	BUF_PLT_RST#
159	GND	160	GND
161	N/A	162	N/A
163	N/A	164	N/A
165	GND	166	GND
167	PCIE_TXP2	168	PCIE_RXP2
169	PCIE_TXN2	170	PCIE_RXN2
171	SOC_TX	172	SOC_RTS
173	PCIE_TXP1	174	PCIE_RXP1
175	PCIE_TXN1	176	PCIE_RXN1
177	SOC_RX	178	SOC_CTS
179	PCIE_TXP0	180	PCIE_RXP0
181	PCIE_TXN0	182	PCIE_RXN0
183	GND	184	GND
185	LPC_AD0	186	LPC_AD1
187	LPC_AD2	188	LPC_AD2
189	LPC_CLK33M	190	LPC_FRAME#
191	INT_SERIRQ	192	TP
193	+VBAT	194	SOC_SPKR
195	FANIO1_EC	196	FANOUT1_EC
197	GND	198	GND
199	SPI_SI_R	200	SPI_CS#_R
201	SPI_SO_R	202	N/A
203	SPI_CLK_R	204	N/A
205	+5V_SBY	206	+V5_SBY
207	N/A	208	N/A
209	N/A	210	N/A
211	+V5S	212	+V5S

Pin No.	Description	Pin No.	Description
213	+V5S	214	+V5S
215	+V5S	216	+V5S
217	+V5S	218	+V5S
219	+V5S	220	+V5S
221	+V5S	222	+V5S
223	+V5S	224	+V5S
225	+V5S	226	+V5S
227	+V5S	228	+V5S
229	+V5S	230	+V5S

Table 3-1: Qseven Connector Pin Definitions

3.4 Mounting iQ7-BT to Baseboard



NOTE:

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



WARNING:

Never run the Qseven 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 iQ7-BT to maintain proper operating temperatures. Make sure to maintain the heatsink temperature under 60°C (or 85°C for W2 models) in operation.

iQ7-BT Qseven Module



NOTE:

The **TXE** BIOS option (refer to **Section 4.3.10**) must be disabled when the user needs to flash BIOS in the following situations:

1. Flash the BIOS of the baseboard (IQ7-DB-MATX).
2. Flash the BIOS of the newly installed iQ7-BT module.

Follow the steps below to install the iQ7-BT to the optional baseboard.

Step 1: Align the Qseven connector on the edge of the iQ7-BT with the corresponding socket on the baseboard. Slide the iQ7-BT into the socket at an angle of about 20°. (Figure 3-2).

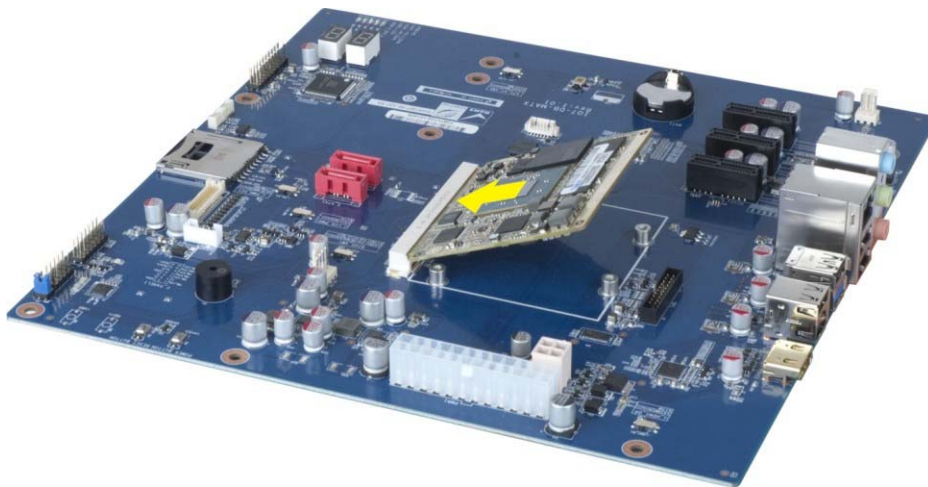


Figure 3-2: Connect the Qseven Connectors

Step 2: Ensure a thermal pad is placed on the CPU of the iQ7-BT.

Step 3: Place the heatsink on the iQ7-BT, aligning the retention screw holes and gently pushing the heatsink down.

Step 4: Secure the heatsink to the iQ7-BT and the baseboard with the supplied retention screws (Figure 3-3).

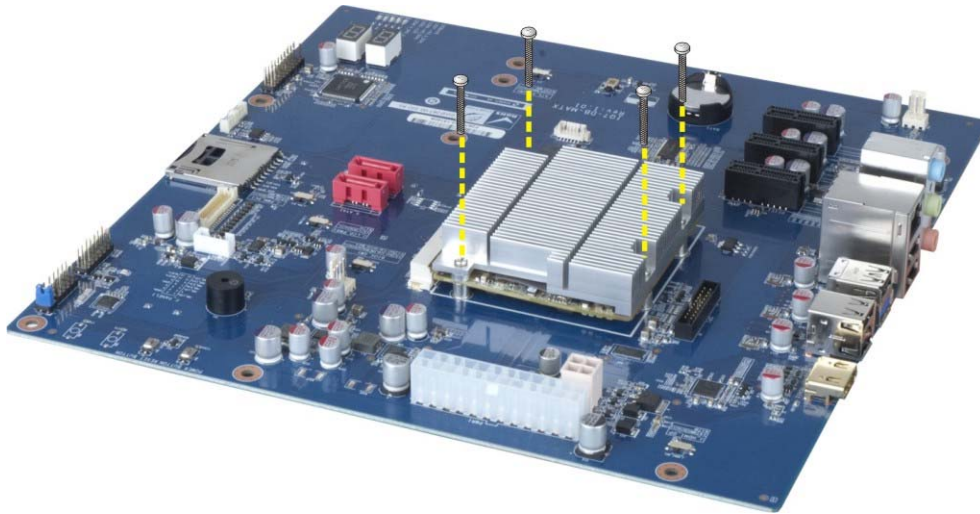


Figure 3-3: Secure the Heatsink

3.5 Software Installation



NOTE:

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

3.5.1 Starting the Driver Program

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

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



NOTE:

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

Step 2: The driver main menu appears (Figure 3-4).

iQ7-BT Qseven Module



Figure 3-4: Start Up Screen

Step 3: Click iQ7-BT.

Step 4: The list of drivers in **Figure 3-5** appears.



Figure 3-5: Drivers

3.5.2 Available Software Drivers

All the drivers for the iQ7-BT are on the utility CD that came with the system. The utility CD contains drivers for Windows 7 and Windows 8 operating systems. Please select the corresponding drivers for the system.

The following drivers can be installed on the **Windows 7** operating system:

- Bay Trail SOC
 - Chipset
 - Graphics
 - I/O driver
 - TXE
 - USB 3.0
- LAN – Intel
- Audio



NOTE:

The Intel TXE requires that Microsoft's "Kernel-Mode Driver Framework (KMDF) version 1.11 update for Windows 7" is installed first. If the KMDF is not installed, either error 37 or error 28 may appear on the Intel TXE device in Device Manager.

Click the following link to download the KMDF version 1.11 update for Windows 7:

<http://www.microsoft.com/en-us/download/details.aspx?id=38423>

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The following drivers can be installed on the **Windows 8** operating system:

- Bay Trail SOC
 - Chipset
 - Graphics
 - I/O driver
 - TXE
- LAN – Intel
- Audio

Chapter

4

BIOS

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4.1 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.

4.1.1 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.

4.1.2 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

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 4-1: BIOS Navigation Keys

4.1.3 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.

4.1.4 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.

4.1.5 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.
- Security – Sets User and Supervisor Passwords.
- Boot – Changes the system boot configuration.
- 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.

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4.2 Main

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

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

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Main	Advanced	Chipset Security Boot Save & Exit
BIOS Information		Set the Date. Use Tab to switch between Date elements.
BIOS Vendor	American Megatrends	
Core Version	5.009	
Compliance	UEFI 2.3; PI 1.2	
Project Version	B324AI12.ROM	
Build Date and Time	03/05/2015 09:50:32	
iWDD Vendor	iEi	
iWDD Version	B324ER11.bin	
CPU Configuration		
Microcode Patch	901	
BayTrail SoC	Unknown	
Memory Information		
Total Memory	4096 MB (LPDDR3)	-----
GOP Information		
Intel(R) GOP Driver	[N/A]	→←: Select Screen
		↑ ↓: Select Item
TXE Information		Enter: Select
Sec RC Version	00.05.00.00	+/-: Change Opt.
TXE FW Version	01.00.02.1060	F1: General Help
		F2: Previous Values
System Date	[Fri 01/01/2010]	F3: Optimized Defaults
System Time	[15:10:27]	F4: Save & Exit
		ESC: Exit
Access Level	Administrator	
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.		

BIOS Menu 1: Main

The System Overview field also has two user configurable fields:

➔ **System Date [xx/xx/xx]**

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

➔ **System Time [xx:xx:xx]**

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

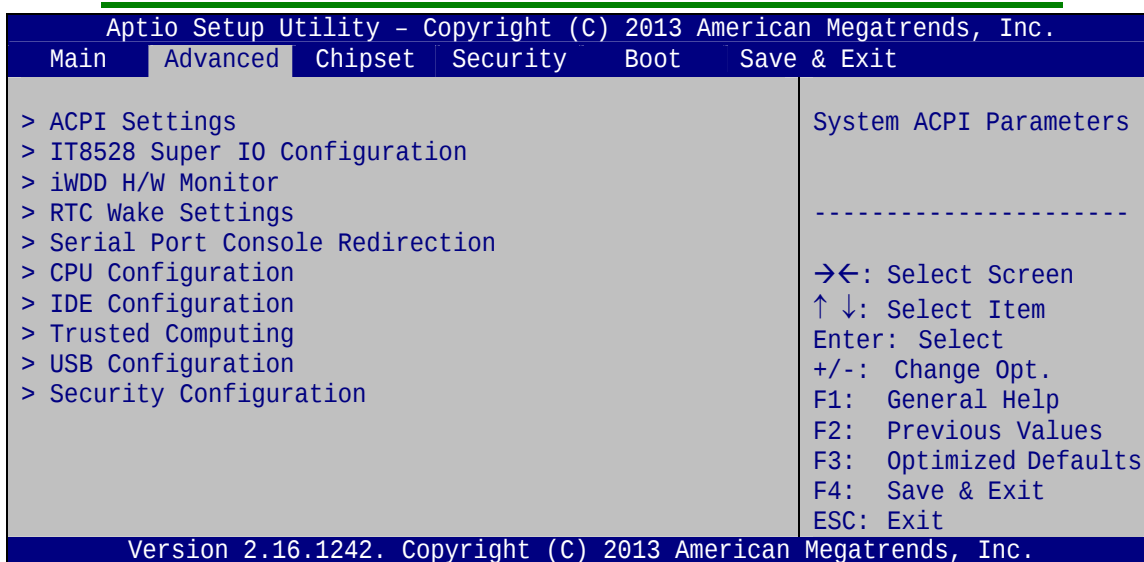
4.3 Advanced

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



WARNING:

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

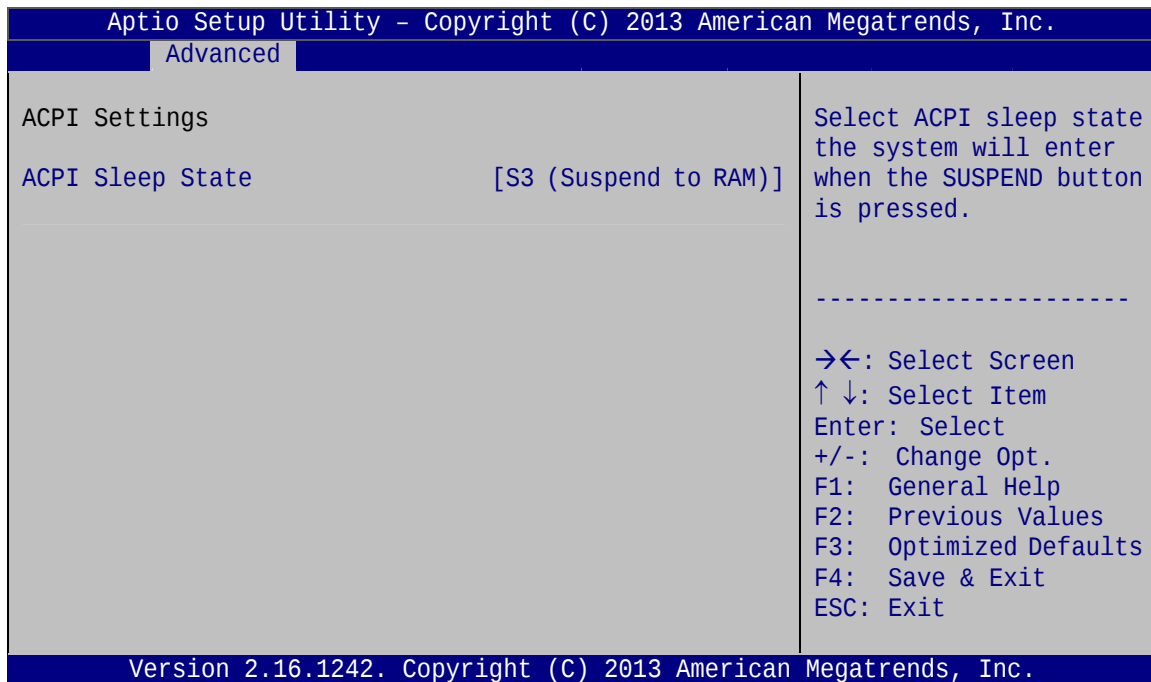


BIOS Menu 2: Advanced

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4.3.1 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)]**

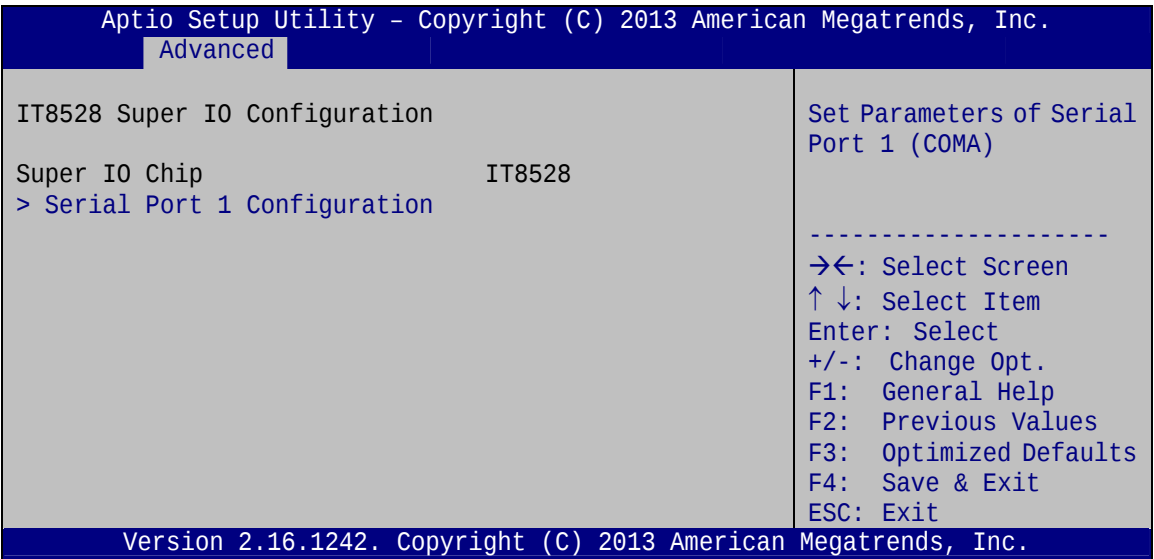
Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

- ➔ **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.



4.3.2 IT8528 Super IO Configuration

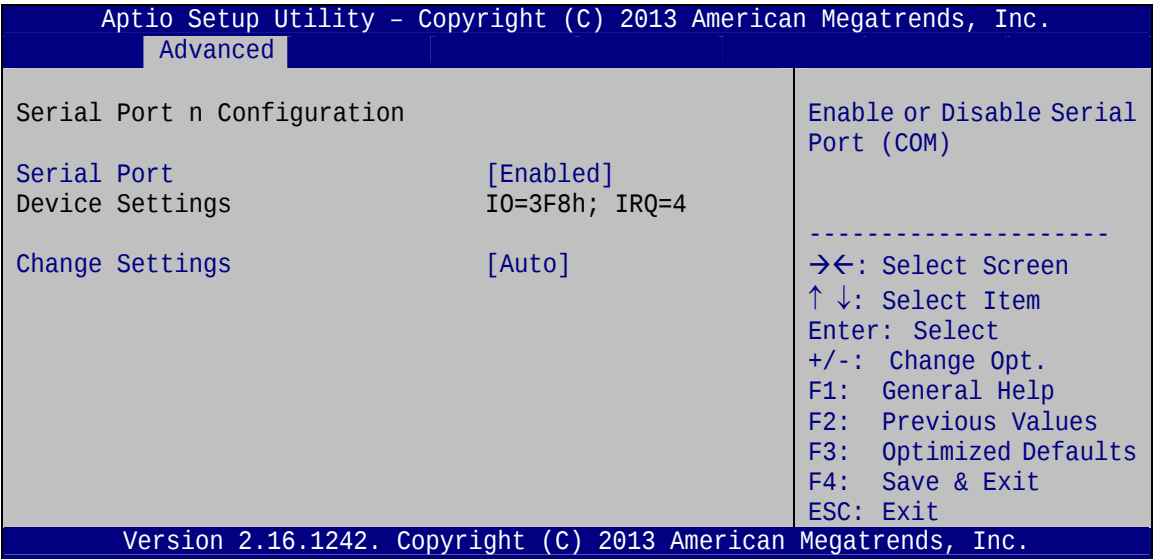
Use the **IT8528 Super IO Configuration** menu (**BIOS Menu 4**) to set or change the configurations for the serial ports.



BIOS Menu 4: IT8528 Super IO Configuration

4.3.2.1 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



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4.3.2.1.1 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 |

4.3.3 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.

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Advanced		
PC Health Status		Smart Fan Mode Select
CPU temperature	: +60 °C	
CPU_FAN1 Speed	: N/A	-----
CPU_CORE	: +0.944 V	→←: Select Screen
+5V	: +5.102 V	↑↓: Select Item
+DDR	: +1.354 V	Enter: Select
+5VSB	: +5.096 V	+/-: Change Opt.
+3.3V	: +3.290 V	F1: General Help
+3.3VSB	: +3.201 V	F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
> Smart Fan Mode Configuration		
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.		

BIOS Menu 6: iWDD H/W Monitor

➔ PC Health Status

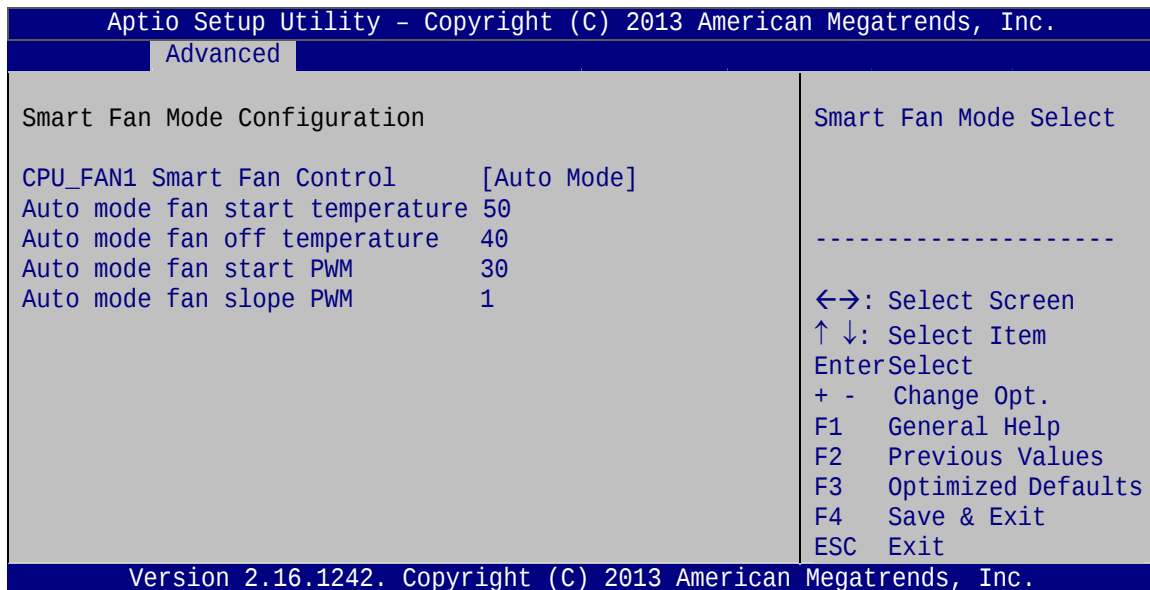
The following system parameters and values are shown. The system parameters that are monitored are:

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

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4.3.3.1 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

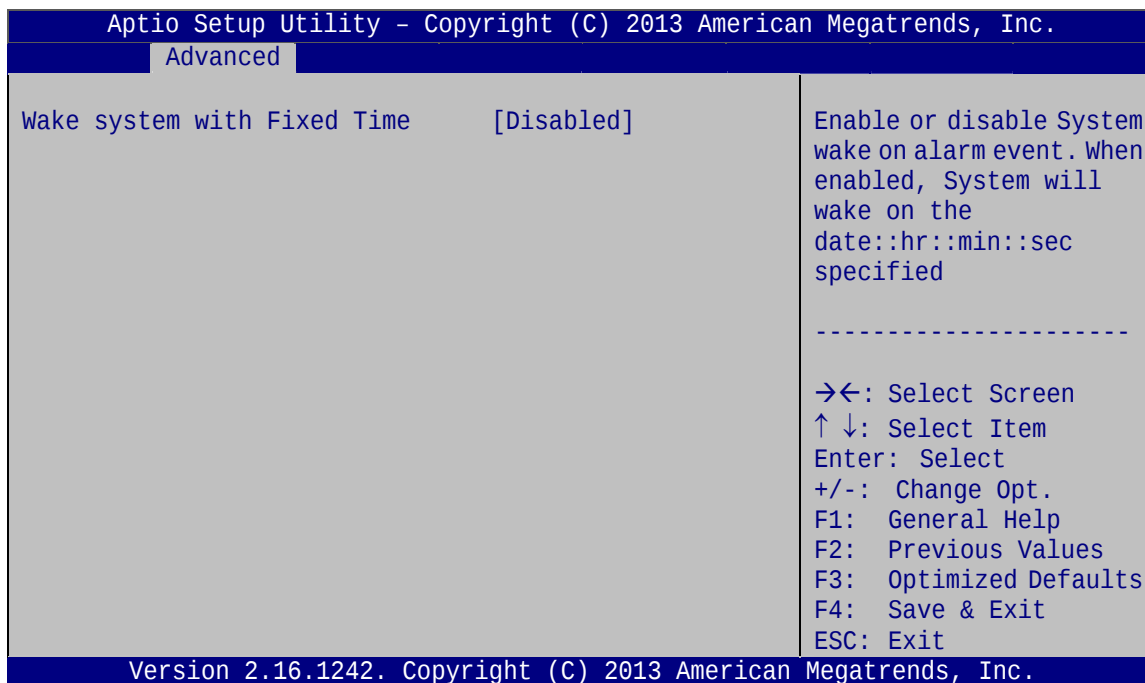
Use the + or – key to change the **Auto mode fan start PWM** value. Enter a decimal number between 1 and 100.

➔ 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.

4.3.4 RTC Wake Settings

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



BIOS Menu 8: RTC Wake Settings

➔ Wake system with Fixed Time [Disabled]

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

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

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following options appear with values that can be selected:

Wake up every day

Wake up date

Wake up hour

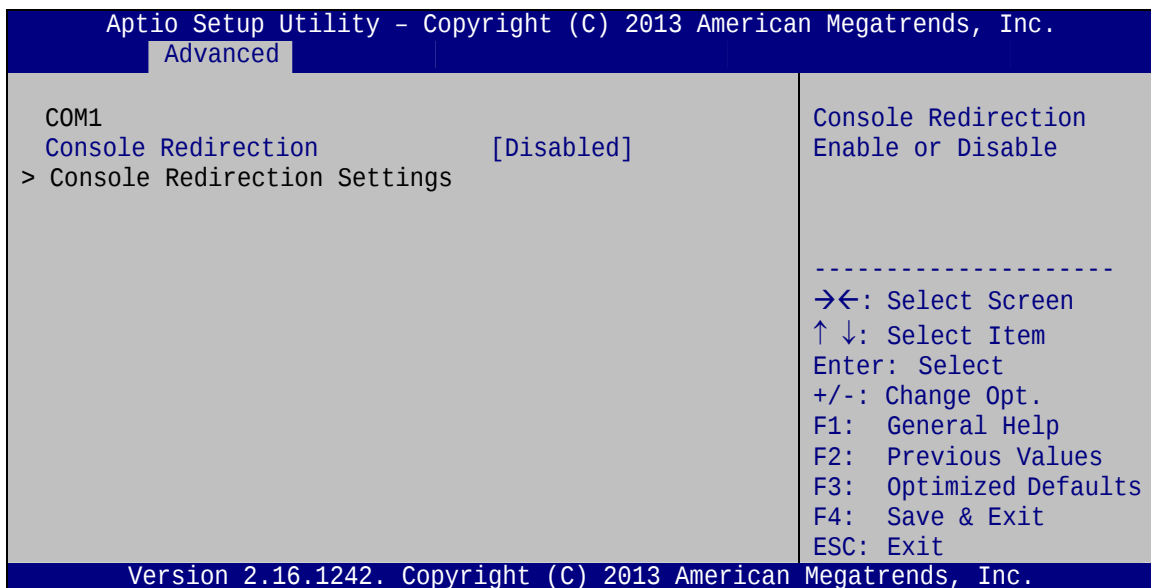
Wake up minute

Wake up second

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

4.3.5 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.



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➔ Data Bits [8]

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

- | | | | |
|---|---|---------|--------------------------|
| ➔ | 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. |

4.3.6 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		Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.
Intel(R) Atom(TM) CPU E3827 @ 1.74GHz		
CPU Signature	30679	
Microcode Patch	901	
Max CPU Speed	1740 MHz	
Min CPU Speed	500 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	
Intel Virtualization Technology	[Disabled]	
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.

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

➔ **Intel Virtualization Technology [Disabled]**

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 | DEFAULT | Disables Intel Virtualization Technology. |
| ➔ | Enabled | | Enables Intel Virtualization Technology. |

➔ **EIST [Enabled]**

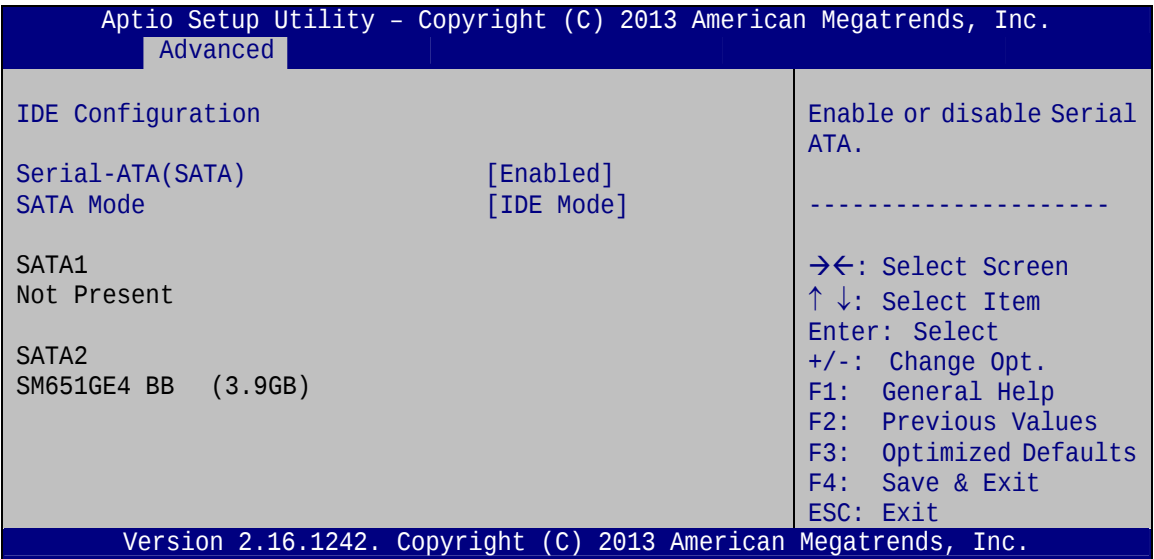
Use the **EIST** option to enable or disable Enhanced Intel SpeedStep® Techonology (EIST).

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



4.3.7 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: IDE 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 Mode]

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

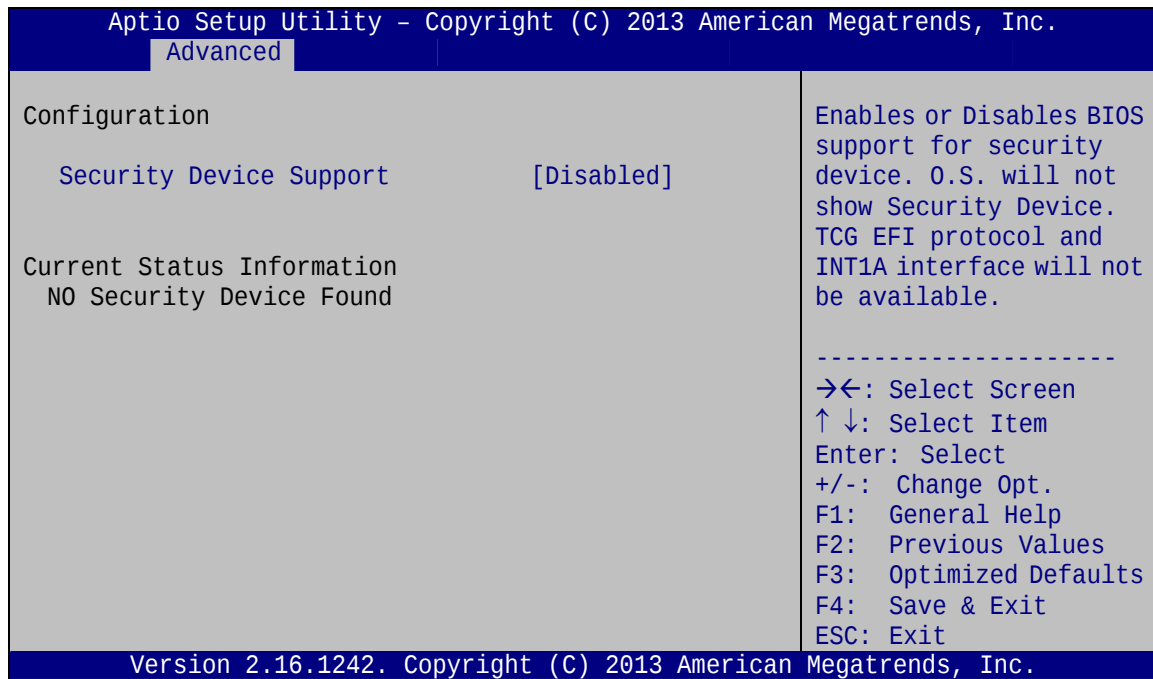
- ➔ **IDE Mode** **DEFAULT** Configures SATA devices as normal IDE device.
- ➔ **AHCI Mode** Configures SATA devices as AHCI device.



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4.3.8 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 12**) to configure settings related to security device.

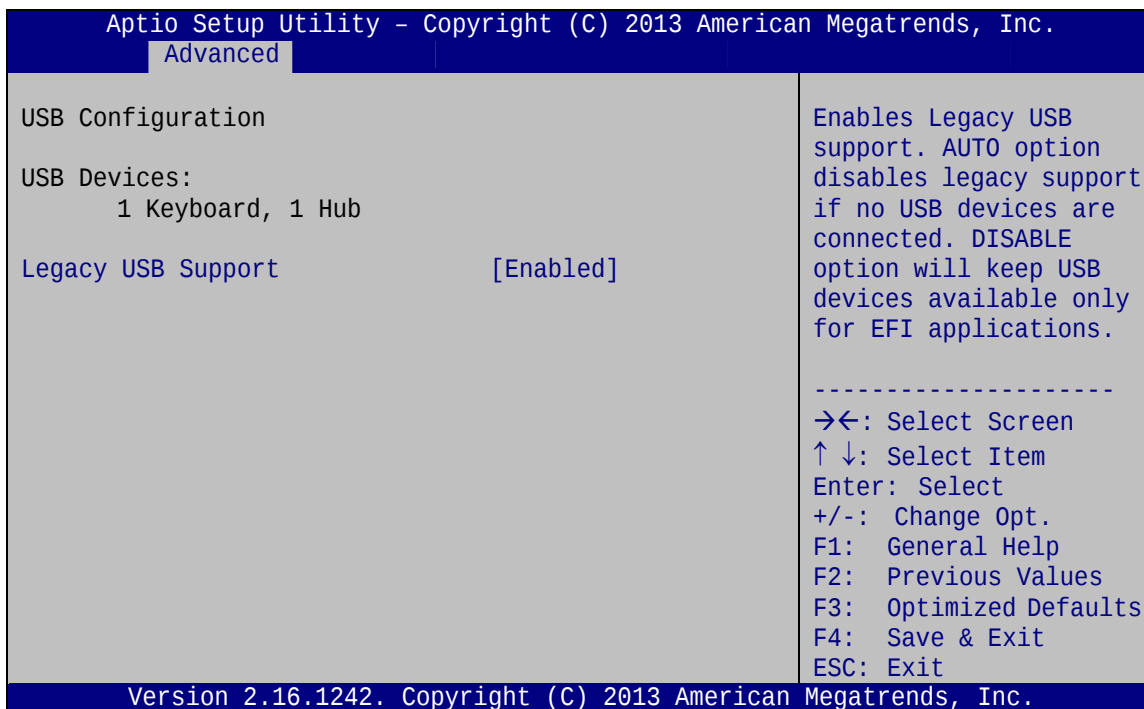
**BIOS Menu 12: Trusted Computing**➔ **Security Device Support [Disabled]**

Use the **Security Device Support** option to configure support for the security device.

- ➔ **Disabled** **DEFAULT** Security device support is disabled.
- ➔ **Enabled** Security device support is enabled.

4.3.9 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

➔ Legacy USB Support [Enabled]

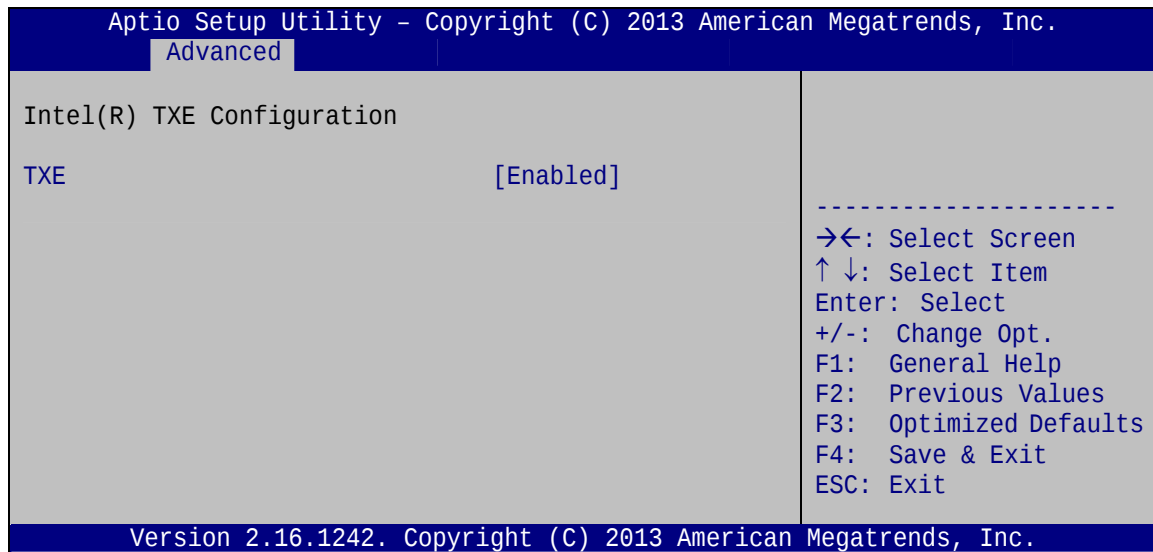
Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, 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
- ➔ **Disabled** Legacy USB support disabled
- ➔ **Auto** Legacy USB support disabled if no USB devices are connected

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4.3.10 Security Configuration

Use the **Security Configuration** menu (**BIOS Menu 14**) to configure Intel® Trusted Execution Engine (TXE).

**BIOS Menu 14: Security Configuration**➔ **TXE [Enabled]**

Use the **TXE** BIOS option to enable or disable Intel® Trusted Execution Engine.

- ➔ **Enabled** **DEFAULT** Intel® Trusted Execution Engine (TXE) enabled
- ➔ **Disabled** Intel® Trusted Execution Engine (TXE) disabled

**NOTE:**

The **TXE** option must be disabled when the user needs to flash BIOS in the following situations:

1. Flash the BIOS of the baseboard (IQ7-DB-MATX).
2. Flash the BIOS of the newly installed iQ7-BT module.

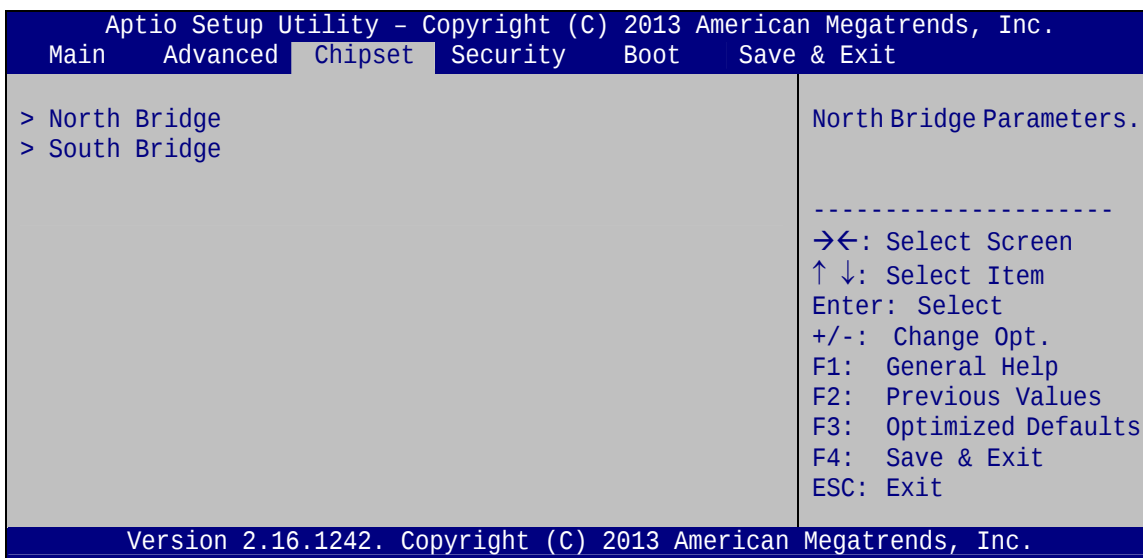
4.4 Chipset

Use the **Chipset** menu (**BIOS Menu 15**) 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.

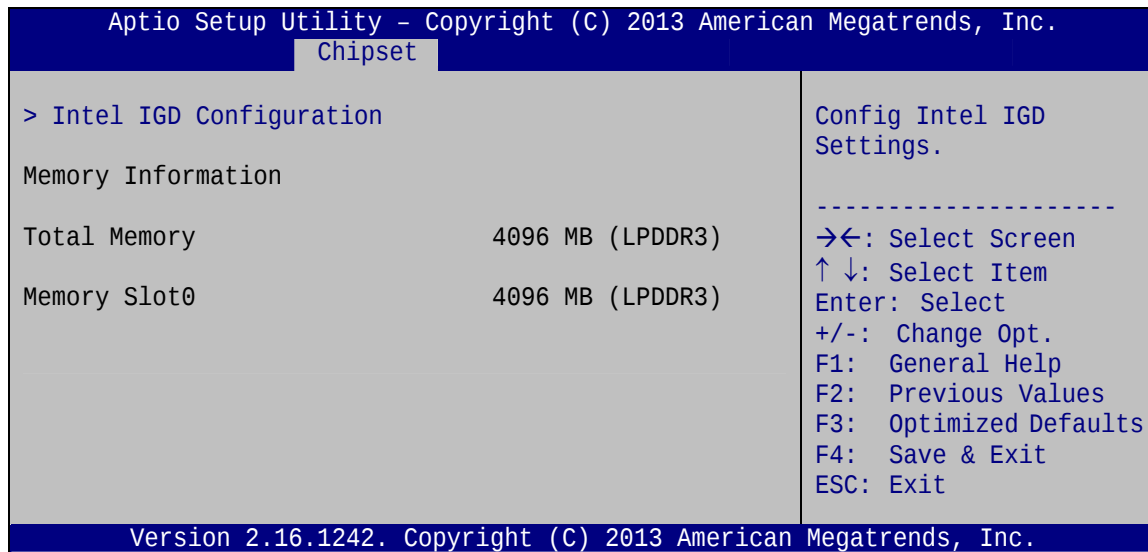


BIOS Menu 15: Chipset

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4.4.1 North Bridge

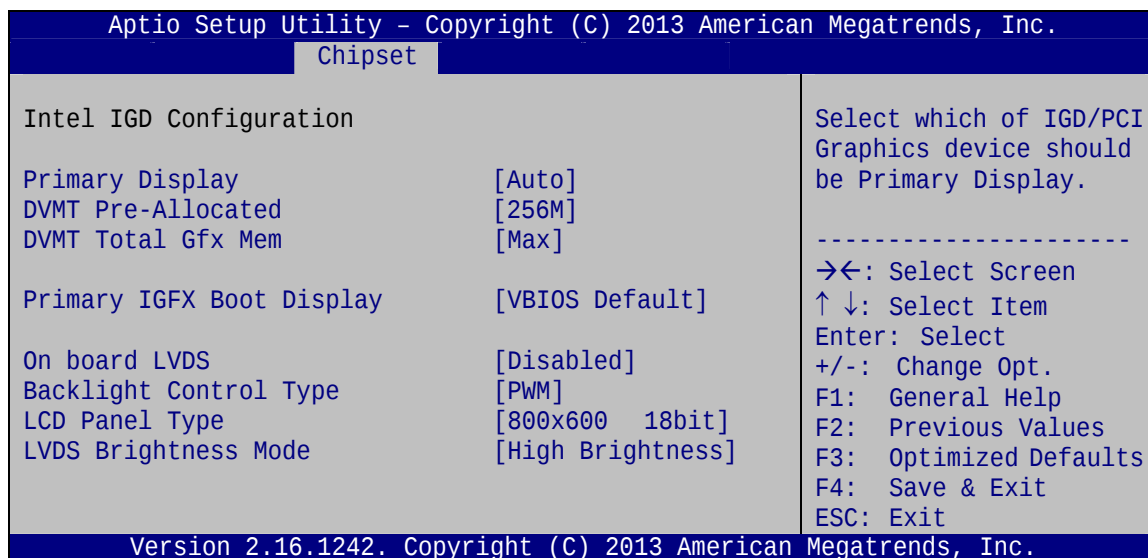
Use the **North Bridge** menu (**BIOS Menu 16**) to configure the north bridge parameters.



BIOS Menu 16: North Bridge

4.4.1.1 Intel IGD Configuration

Use the **Intel IGD Configuration** submenu (**BIOS Menu 17**) to configure the graphics settings.



BIOS Menu 17: Intel IGD Configuration

➔ Primary Display [Auto]

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

- Auto **Default**
- IGD
- 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
- MAX **Default**

➔ 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**
- EFP
- LFP

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➔ On board LVDS [Disabled]

Use the **On board LVDS** option to disable or enable the LVDS function.

- ➔ **Disabled** **DEFAULT** LVDS function is disabled.
- ➔ **Enabled** LVDS function is enabled.

➔ Backlight Control Type [PWM]

Use the **Backlight Control Type** option to select the backlight controlling type.
Configuration options are listed below.

- PWM **DEFAULT**
- DC

➔ LCD Panel Type [800x600 18bit]

Use the **LCD Panel Type** option to select the type of flat panel connected to the system.
Configuration options are listed below.

- 800x600 18bit **DEFAULT**
- 1024x768 18bit
- 1024x768 24bit
- 1280x768 18bit
- 1280x800 18bit
- 1280x960 18bit
- 1280x1024 24bit
- 1366x768 18bit
- 1366x768 24bit
- 1440x900 24bit
- 1440x1050 24bit
- 1600x900 24bit
- 1680x1050 24bit
- 1600x1200 24bit
- 1920x1080 24bit
- 1920x1200 24bit

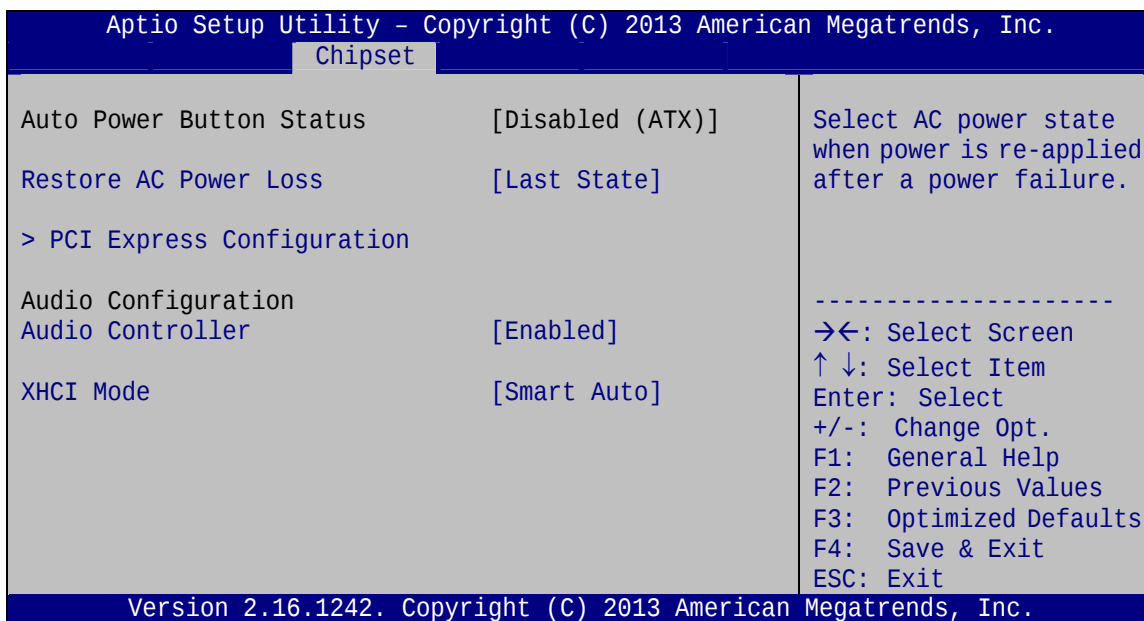
➔ **LVDS Brightness Mode**

Use the **LVDS Brightness Mode** option to select the LVDS screen brightness. Configuration options are listed below.

- Low Brightness
- High Brightness **DEFAULT**

4.4.2 South Bridge Configuration

Use the **South Bridge** menu (**BIOS Menu 18**) to configure the south bridge chipset.



BIOS Menu 18: South Bridge

➔ **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

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- ➔ **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]**

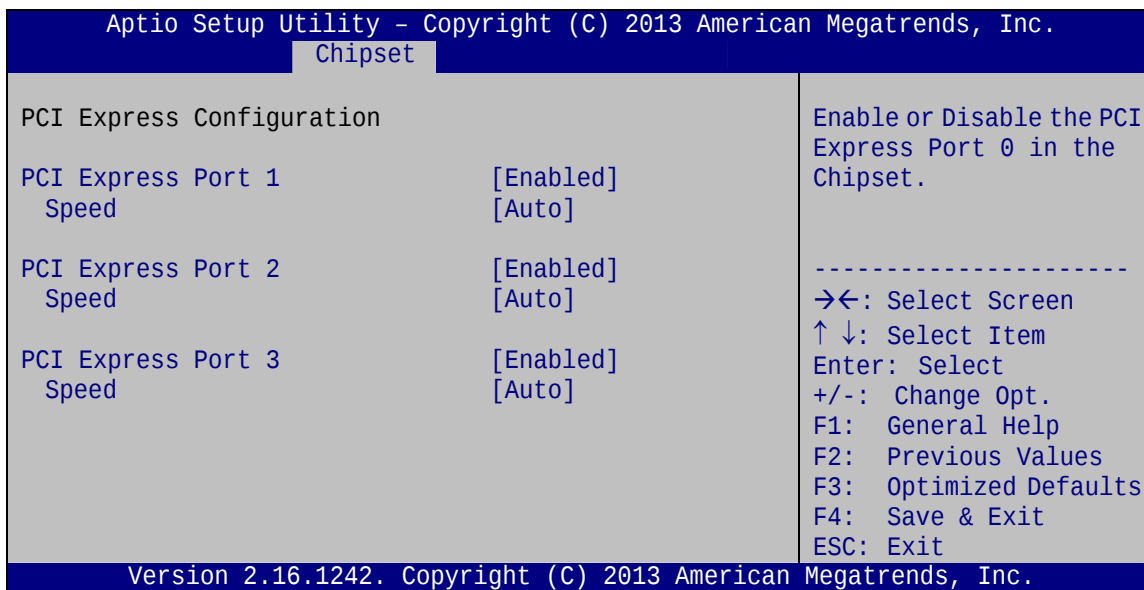
Use the **XHCI Mode** BIOS option to configure the USB xHCI (USB 3.0) controller.

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

- ➔ **Smart** **DEFAULT** Allow the use of USB 3.0 devices prior to OS boot. USB
Auto 3.0 ports function as USB 3.0 ports even during a reboot.

4.4.2.1 PCI Express Configuration

Use the **PCI Express Configuration** menu (**BIOS Menu 19**) to select the support type of the PCI Express or PCIe Mini slots.



BIOS Menu 19: PCI Express Configuration

➔ PCI Express Port n [Enabled]

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

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

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

➔ Speed [Auto]

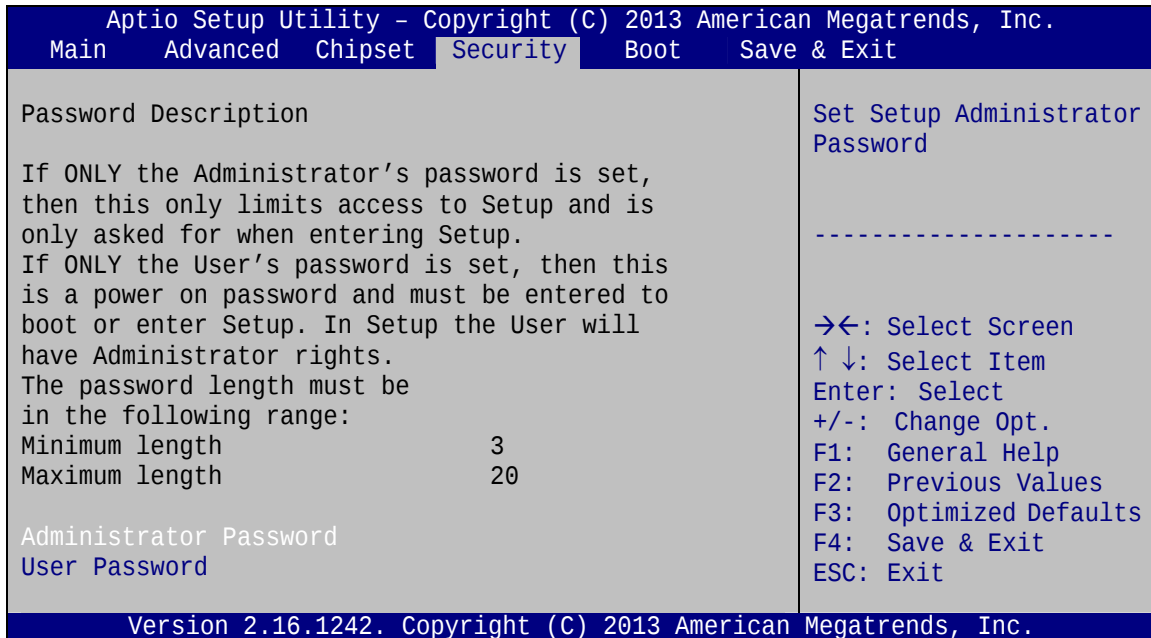
Use the **Speed** option to select the speed type of the PCI Express slots. The following options are available:

- Auto **Default**
- Gen2
- Gen1

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4.5 Security

Use the **Security** menu (**BIOS Menu 20**) to set system and user passwords.



BIOS Menu 20: Security

➔ Administrator Password

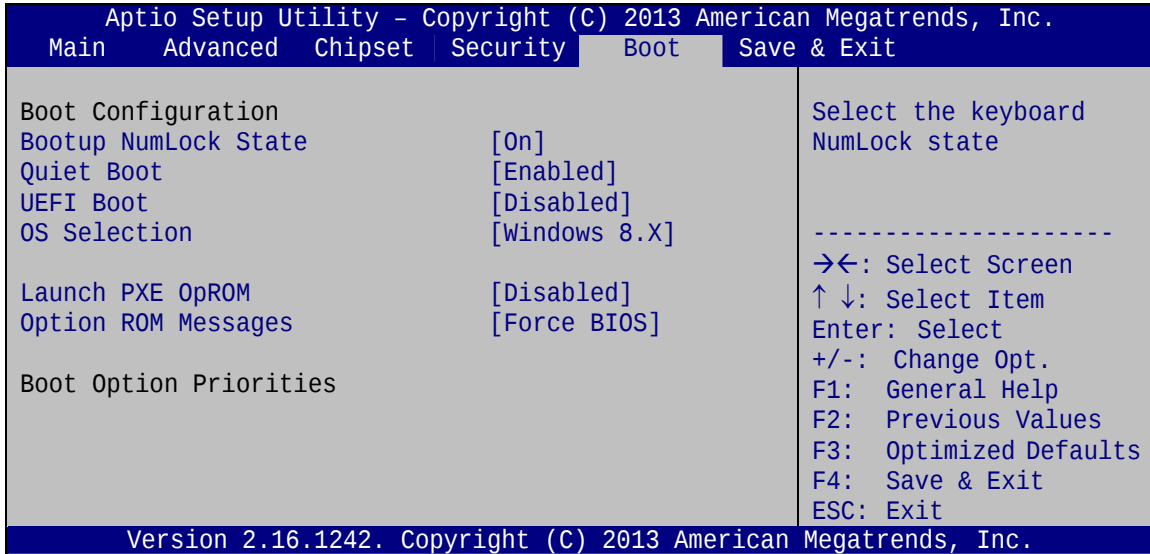
Use the **Administrator Password** to set or change an administrator password.

➔ User Password

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

4.6 Boot

Use the **Boot menu (BIOS Menu 21)** to configure system boot options.



BIOS Menu 21: Boot

➔ Bootup NumLock State [On]

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

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

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→ Quiet Boot [Enabled]

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

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

→ UEFI Boot [Disabled]

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

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

→ OS Selection [Windows 8.X]

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

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

→ Launch PXE OpROM [Disabled]

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

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

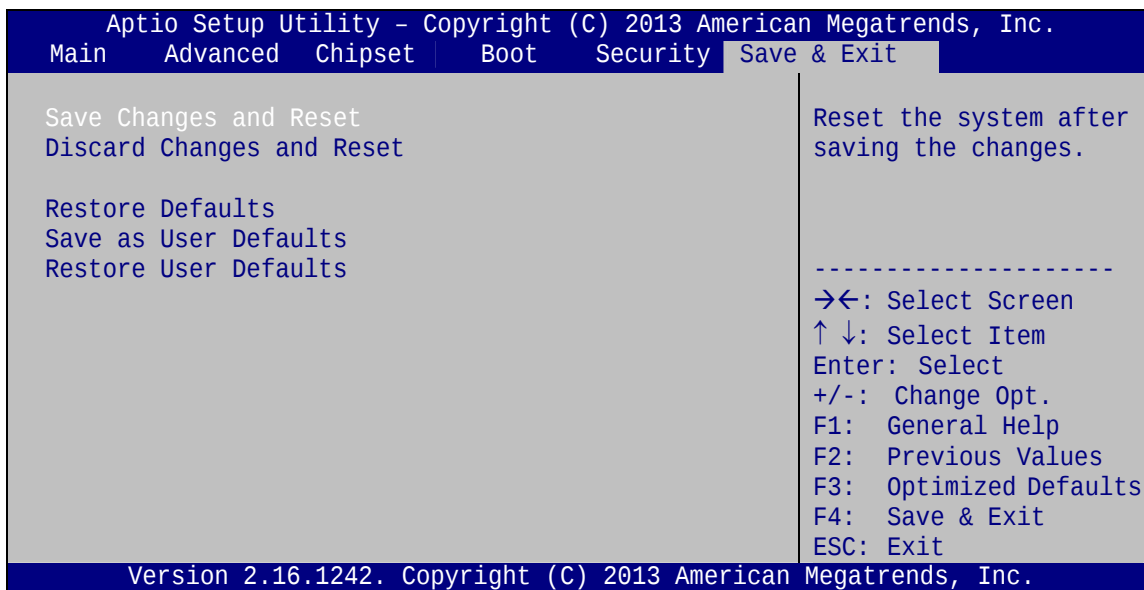
→ Option ROM Messages [Force BIOS]

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

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

4.7 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 22**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 22: Save & Exit

➔ 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.

➔ 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.

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➔ Restore User Defaults

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

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY



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

FCC WARNING



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

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

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

Appendix

B

BIOS Options

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

System Date [xx/xx/xx]	29
System Time [xx:xx:xx]	29
ACPI Sleep State [S3 (Suspend to RAM)]	31
Serial Port [Enabled]	33
Change Settings [Auto]	33
PC Health Status	34
Fan 1 Smart Fan Control [Auto Mode]	35
Auto mode fan start/off temperature	35
Auto mode fan start PWM	35
Auto mode fan slope PWM	36
Wake system with Fixed Time [Disabled]	36
Console Redirection [Disabled]	38
Terminal Type [ANSI]	38
Bits per second [115200]	38
Data Bits [8]	39
Parity [None]	39
Stop Bits [1]	39
Intel Virtualization Technology [Disabled]	41
EIST [Enabled]	41
Serial-ATA (SATA) [Enabled]	42
SATA Mode Selection [IDE Mode]	42
Security Device Support [Disabled]	43
Legacy USB Support [Enabled]	44
TXE [Enabled]	45
Primary Display [Auto]	48
DVMT Pre-Allocated [256M]	48
DVMT Total Gfx Mem [Max]	48
Primary IGFX Boot Display [VBIOS Default]	48
On board LVDS [Disabled]	49
Backlight Control Type [PWM]	49
LCD Panel Type [800x600 18bit]	49
LVDS Brightness Mode	50
Restore AC Power Loss [Last State]	50

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

Appendix

C

Terminology

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

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

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

Appendix

D

Watchdog Timer

**NOTE:**

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

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

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

INT 15H:

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

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

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

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

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**NOTE:**

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

EXAMPLE PROGRAM:

; INITIAL TIMER PERIOD COUNTER

;

W_LOOP:

;

```

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

```

;

; ADD THE APPLICATION PROGRAM HERE

;

```

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

```

```

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

```

;

; EXIT ;

Appendix

E

Hazardous Materials Disclosure

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

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

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

Please refer to the table on the next page.

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

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

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

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