

User Manual

## MIC-3329

3U CompactPCI Intel®  
Quad-Core Atom™ Processor  
Blade with ECC support

**ADVANTECH**

*Enabling an Intelligent Planet*

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5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

# Declaration of Conformity

## CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

## FCC Class A

Note: 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.

## FM

This equipment has passed the FM certification. According to the National Fire Protection Association, work sites are classified into different classes, divisions and groups, based on hazard considerations. This equipment is compliant with the specifications of Class I, Division 2, Groups A, B, C and D indoor hazards.

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1. Visit the Advantech website at <http://support.advantech.com> where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
  - Product name and serial number
  - Description of your peripheral attachments
  - Description of your software (operating system, version, application software, etc.)
  - A complete description of the problem
  - The exact wording of any error messages

---

## Warnings, Cautions and Notes

**Warning!** Warnings indicate conditions, which if not observed, can cause personal injury!



**Caution!** Cautions are included to help you avoid damaging hardware or losing data. e.g.



*There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

**Note!** Notes provide optional additional information.



## Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: [support@advan-tech.com](mailto:support@advan-tech.com)

## Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- MIC-3329 all-in-one single board computer (CPU heatsink) x1
- SATA Daughter board for SATA bracket (Assembled) x 1
- HDD screws x 4 or CFAST screw x 1 (Accessories)
- Warranty certificate document x1, China Rohs List document x1 (Accessories)
- Safety Warnings: CE, FCC class A

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

## Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by 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 you cannot get it to work according to the user's manual.
  - The equipment has been dropped and damaged.
  - The equipment has obvious signs of breakage.
15. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.**
16. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

**DISCLAIMER:** This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

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## Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power, or electrostatic discharge, as you connect a jumper or install a card may damage sensitive electronic components.

## We Appreciate Your Input

Please let us know of any aspect of this product, including the manual, which could use improvement or correction. We appreciate your valuable input in helping make our products better

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# Chapter 1

## Hardware Configuration

This chapter describes how to  
configure MIC-3329 hardware.

## 1.1 Introduction

Advantech MIC-3329 Series uses the latest Intel® 22 nm Atom™ technology to provide significant performance and power efficiencies.

MIC-3329 series are 3U CompactPCI® processor blades, with dual-quad E3826/E3827 and quad-core E3845 Atom™ SOC processors, with up to 4GB soldered DDR3L-1333 ECC memory. They are available in single and dual slot width form factors, to offer various I/O functionality by XTM (8HP) and rear I/O extensions. Front panel I/O on the single slot (4HP) provides 2 x RJ45 GbE ports (switchable with RIO 4HP), 1 x VGA port (switchable with RIO 4HP), 1 x USB2.0 port and 1 x USB3.0 port. Front panel I/O on the second layer provides XTM-1 2 x COM ports (RS232/422/485), 1 x PS/2 KB/MS and 1 x audio ports or XTM-2: 2 X-Code GbE ports, 1xDB9 COM ports (RS232/422/485). There are three types of storage devices available, such as on board 8GB SSD flash, Cfast and 2.5" SATA connector.

MIC-3329 provides an ideal solution for transportation, railway, and factory automation applications. With its robust board layout and thermal efficiency, it meets or exceeds EN50155 and EN50121-4; it provides a very low processor TDP of 8W/10W, and its low power consumption and industrial SOC features make it a perfect fit for all fanless system applications.

### Ordering Information

	Front/Rear Panel										
	4HP					8HP XTM					
	RJ45 LAN (1)	USB2.0	USB3.0	VGA(2)	CPU	M12 LAN	COM	Audio	PS/2	SATA Conn.	Cfast Socket(3)
P/N List	Front Board										
MIC-3329A1-D2E	2	1	1	1	E3826	2	1	NA	NA	1	1
MIC-3329C1-D2E	2	1	1	1	E3845	2	1	NA	NA	1	1
MIC-3329B1-D1E	2	1	1	1	E3827	NA	2	1	1	1	NA
MIC-3329C1-D1E	2	1	1	1	E3845	NA	2	1	1	1	NA
P/N List	RIO Board										
MIC-3329R1-D1E	2	2	NA	1	NA	NA	2	NA	NA	NA	1

**Note!** (1)(2): 2xLAN and 1xVGA are switchable between front and RIO board



(3): MIC-3329R1-D1E Cfast socket is only active in MIC-3329B1-D1E/MIC-3329C1-D1E

## 1.2 Specifications

### 1.2.1 CompactPCI Bus Interface

The MIC-3329 is compliant with PICMG 2.0 Rev. 3.0. It supports a 32-bit / 33 MHz PCI bus for up to 8 CompactPCI slots. The MIC-3329 is hot-swap compliant (PICMG 2.1). The board can be configured as a system master or a drone board. In drone mode, it only draws power from the CompactPCI backplane and is not active on the Compact-PCI bus.

### 1.2.2 CPU

The MIC-3329 supports the 22nm technology quad-core Intel® Atom™ E3845 and dual-core Intel® Atom™ E3827/E3826 SOC processors with clock frequencies up to 1.91GHz. Supported processors are listed in the table below. Forced airflow cooling is required.

Intel CPU Model NO.	Cores	Freq.	CPU architecture	Memory	L2 Cache	CPU TDP
E3845	4	1.91 GHz	22nm	DDR3L 1333	2 MB	10W
E3827	2	1.75 GHz	22nm	DDR3L 1333	1 MB	8W
E3826	2	1.46GHz	Baytrail (22nm)	DDR3L 1066	1 MB	7W

### 1.2.3 BIOS

Dual 8Mb SPI flash contains a board-specific BIOS (from AMI) designed to meet industrial and embedded system requirements.

### 1.2.4 Memory

The MIC-3329 has up to 4 GB onboard soldered DDR3L memory with ECC support. Default SKU is 4GB on board, if you have any 2GB cost-effective SKU request, please contact you local salesperson for more information.

### 1.2.5 Ethernet and VGA

The MIC-3329 uses two Intel® I210AT controllers to provide 10/100/1000 Mbps Ethernet connectivity. These are mutually exclusive and can be either:

- Front I/O (RJ-45)
- Rear I/O (Rear Transition Module)

User can access LAN1/LAN2 and VGA via front panel or rear panel by setting an on-board switch.

### 1.2.6 Storage Interface

The MIC-3329 supports two SATA II interfaces. XTM-1 supports 2.5" SATA, XTM-2 supports 2.5" SATA and Cfast. 8G on board NAND flash is not a standard SKU, but is available by customer request.

## 1.2.7 Serial Interface

Four serial ports from LPC UART controller, two DB9 COM1/COM2 ports (RS-232/422 interface) are provided on the front panel. Another two COM ports (RS-232/422/485 interface) are routed to the rear I/O module as a DB9 port via the J2 connector.





## 1.2.8 USB Port

Three USB 2.0 compliant ports are provided. One USB3.0 and one USB2.0 port are routed to front panel connectors; two USB2.0 ports are routed to the rear I/O through the J2 connector.

## 1.2.9 LEDs

Four LEDs are provided on the front panel as follows:

**Table 1.1: LED Indicator for the MIC-3329**

Function	Color	Indicator	LED Status
Hotswap LED	Blue	The board can be safely removed from system when blue LED is on	
HDD LED	Yellow	HDD is active	
Power LED	Green	Power is provided to the board.	
Master/Drone mode LED	Green	LED On-> "Master" mode. LED Off-> "Drone" mode.	

## 1.2.10 Watchdog Timer

An onboard watchdog timer provides system reset capabilities via software control. The programmable time interval is from 1 to 255 seconds.

## 1.2.11 Optional Rear I/O Modules

The MIC-3329R is the rear I/O module, reserved for the MIC-3329 extension. It offers a wide variety of I/O features, such as two USB2.0 and two DB9 COM ports. Rear I/O module key features are shown below:

**Table 1.2: MIC-3329 RIO Configurations**

	Rear Panel					
	LAN(1)	VGA(1)	COM	USB2.0	Slot width	Conn.
MIC-3329R1-D1E	2	1	2	2	2	J2

**Note!** LAN port and VGA port may be switched to front panel I/O ports via hardware switch.



## 1.2.12 Mechanical and Environmental Specifications

- **Operating temperature:** -40 ~ 70 °C (-40 °F ~ 158 °F)

**Note!** *The operating temperature range of the MIC-3329 depends on the installed processor and the airflow through the chassis. For extended temperature products please contact your Advantech representative.*



- **Storage Temperature:** -40 ~ 85 °C (-40 ~ 185 °F)
- **Humidity:** 95% @ 40 °C (non-condensing)
- **Humidity (Non-operating):** 95% @ 60 °C (non-condensing)
- **Vibration:** 5 ~ 100Hz, 2.0 Grms with CFast/SSD (without on-board 2.5" SATA HDD)
- **Vibration (Non-operating):** 5 ~ 500Hz, 2 Grms
- **Shock:** 10 G (without on-board 2.5" SATA HDD), 11ms
- **Shock (Non-operating):** 30 G, 11ms (On dual slot SKU)
- **Board size:**  
3U/2 slot width (8HP): 100 x 160 x 40 mm
- **Weight:**  
3U/2 slot width (Front Board 8HP): 0.3 kg (bare board)  
3U/2 slot width (Rear Board 8HP): 0.4 kg (bare board)

## 1.2.13 CompactPCI Mechanical Design

MIC-3329 series is assembled with an aluminium CPU heatsink.

## 1.2.14 CompactPCI Bridge

The MIC-3329 uses a Pericom PI7C9 universal bridge as a gateway to an intelligent subsystem. When configured as a system controller, the bridge acts as a standard, transparent PCI Express to PCI/PCI-X bridge. As a peripheral controller it allows the local MIC-3329 processor to configure and control the onboard local subsystem independently from the CompactPCI bus host processor. The MIC-3329 local PCI subsystem is presented to the CompactPCI bus host as a single CompactPCI device. When the MIC-3329 is in drone mode, the Pericom PI7C9 is electrically isolated from the CompactPCI bus. The MIC-3329 receives power from the backplane, and supports the rear I/O. The Pericom PI7C9 PCI bridge offers the following features:

- **PCI Interface**  
Full compliance with the PCI Local Bus Specification, Revision 3.0; operations are transparent.
- Supports forward bridging
- 32-bit, 33MHz asynchronous operation
- Provides two level arbitration support for 7 x PCI bus masters
- 16-bit address decode for VGA
- Usable in CompactPCI system slot

For further detail, please consult the Pericom PI7C9 data book.

## 1.2.15 I/O Connectivity

For MIC-3329, the front panel I/O is provided with two RJ-45 Gigabit Ethernet ports, two DB9 COM ports, one USB 2.0 port, one USB 3.0 port, one VGA port, 1 audio port and 1 PS/2 port. Onboard I/O consists of two SATA channels, one is for the 2.5" on board SATA connector or Cfast socket, the other one is for on board NAND flash or is routed to rear transition module as RIO onboard cfast socket. Rear I/O connectivity is available via the following CompactPCI connectors:

- J2: two Gigabit Ethernet LAN ports, two USB2.0 ports, one VGA port on 4HP, two COM ports on the XTM of RTM.

## 1.2.16 XTM Connectors (Extension Module)

MIC-3329 is extended by a XTM board with two COM ports, one PS/2, one KB/MS port and one onboard SATA or Cfast connector.

## 1.2.17 LPC UART Controller

One UART controller F81216 is available for four UART interfaces.

## 1.2.18 RTC and Battery

The RTC module uses a CR2032(3 V, 210 mA) battery to maintain system date and time.

## 1.3 Functional Block Diagram

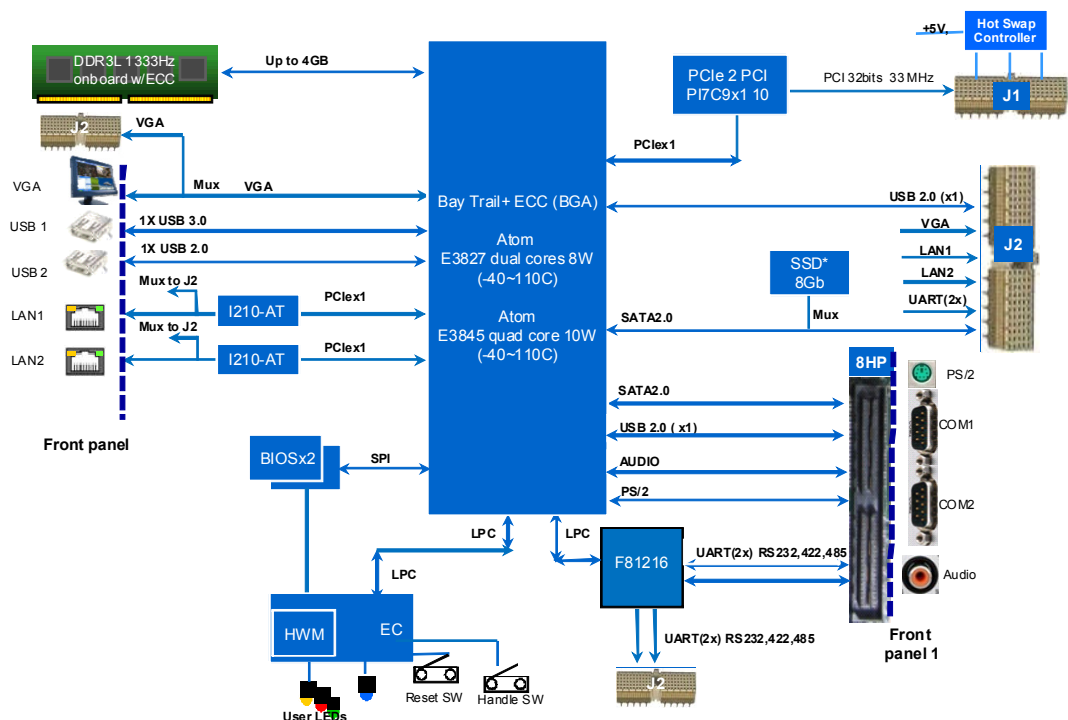
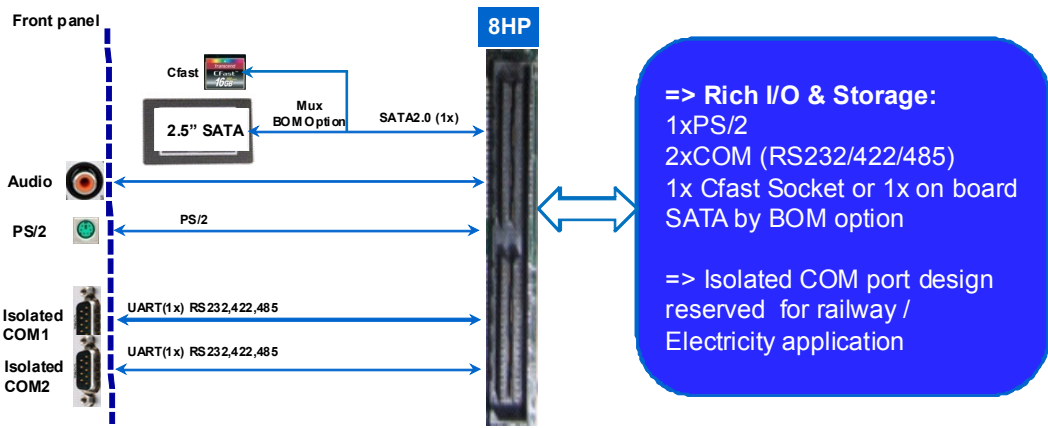
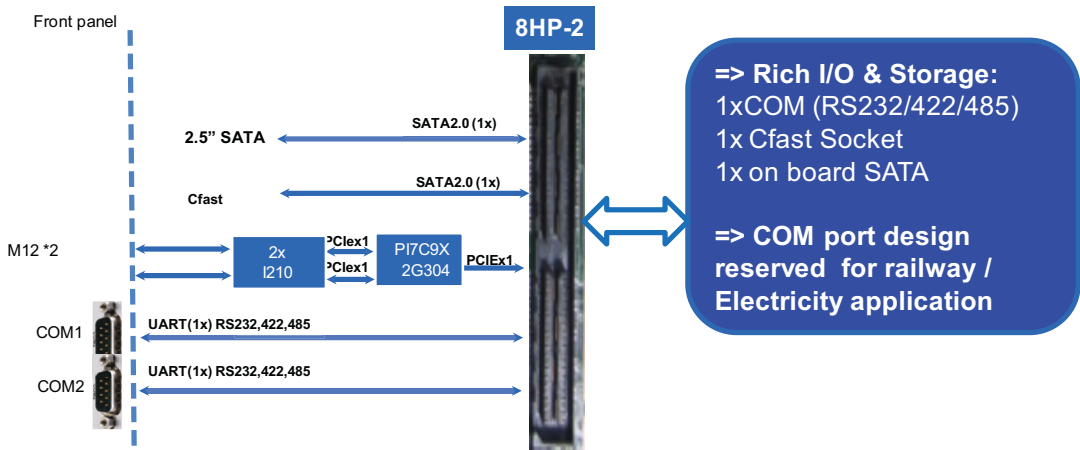


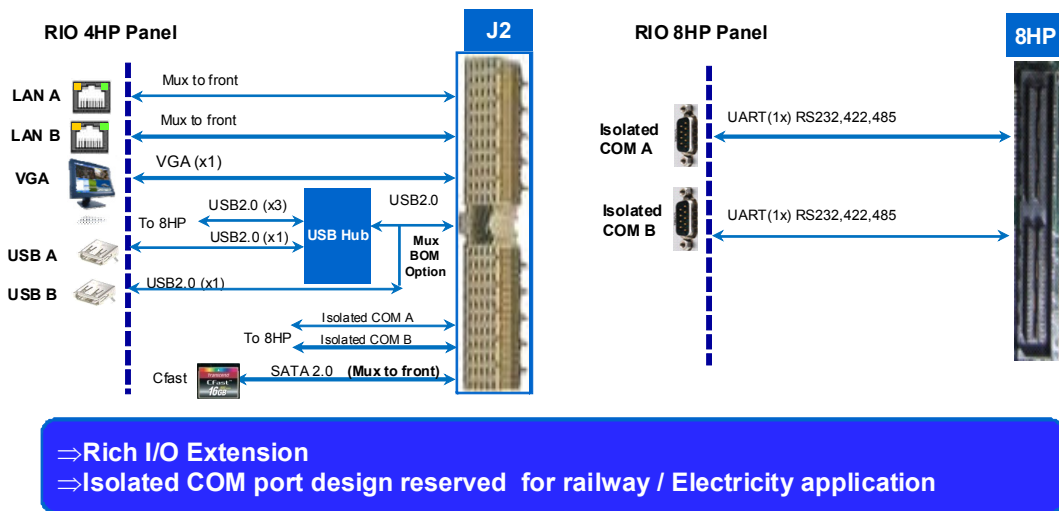
Figure 1.1 MIC-3329 Front 4HP Function Block Diagram



**Figure 1.2 MIC-3329 Front 8HP XTM Function Block Diagram**



**Figure 1.3 MIC-3329 Front 8HP XTM-2 Functional block diagram**



**Figure 1.4 MIC-3329 RIO 4HP and XTM Function Block Diagram**

## 1.4 Jumpers and Switches

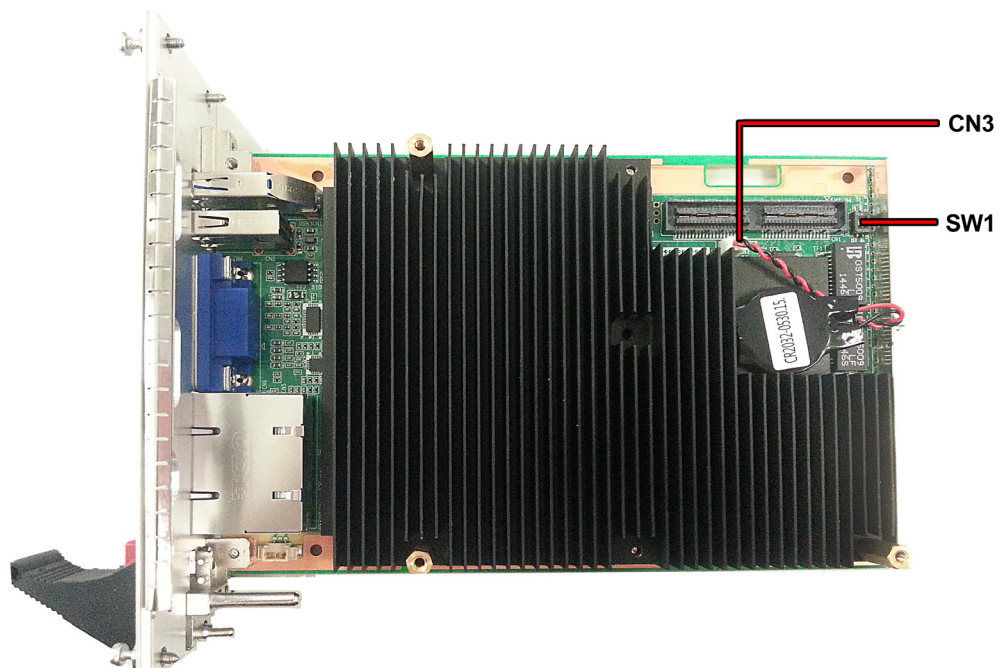
Table 1.4 lists the jumper and switch functions. Refer to this section carefully before changing the jumper and switch settings on your MIC-3329 board.

Figures 1.4 through 1.6 illustrate jumper and switch locations.

The MIC-3329 provides a system reset button on the front panel, it resets all payload and application-related circuitry.

**Table 1.3: MIC-3329 Switch Descriptions**

Board	Position	Description	Default Setting
MIC-3329 Front 4HP Board	CN3	Battery pin head	
	SW1	DIP Switch for setting LAN1/2 and VGA as front or rear	Front VGA/LAN1 LAN2
MIC-3329 Front 8HP XTM Board	SW3/SW4	DIP Switch for COM 232/422/485 setting (4 code for SP338)	Default setting RS232; RS422/RS485 setting refer to silkscreen on PCB top side
	SW5/SW6/ SW7/SW8	Control COM workable or not	Always setting "ON", refer to PCB bottom side
MIC-3329 RIO 8HP XTM Board	SW3/SW4	DIP Switch for COM 232/422/485 setting (4 code for SP338)	Default setting RS232; RS422/RS485 setting refer to silkscreen on PCB top side



**Figure 1.5 MIC-3329 Front 4HP Board Jumper Locations**



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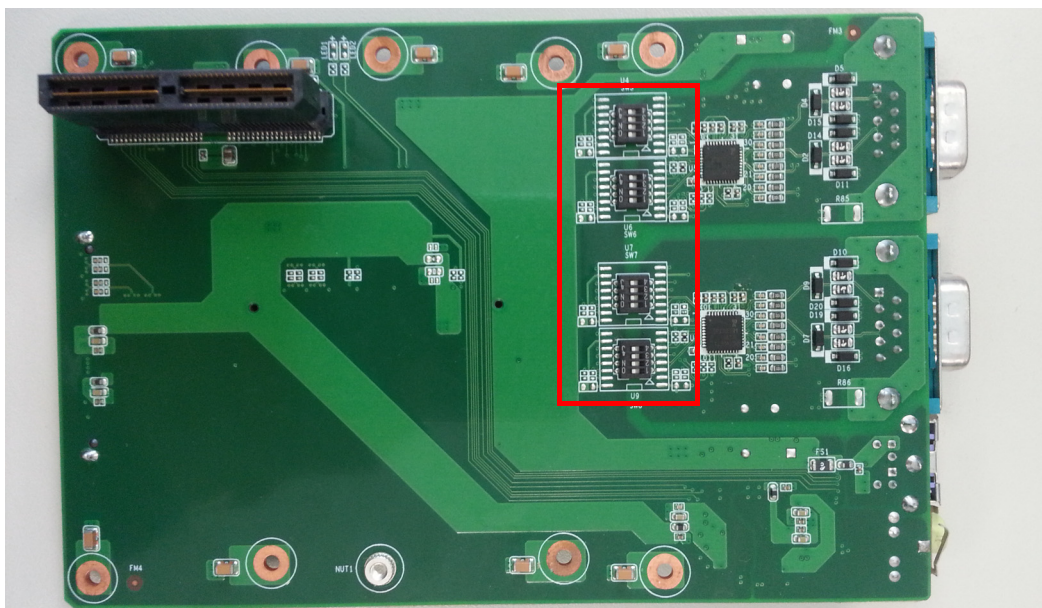
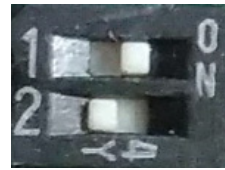
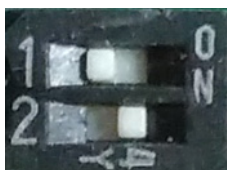
**MIC-3329 Front 4HP Board SW1 Setting**

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Front LAN1/2&VGA(Default):  
 1 set to "OFF" is Front VGA  
 2 set to "ON" is Front LAN1/2

Rear LAN1/2&VGA:  
 1 set to "ON" is Rear VGA  
 2 set to "OFF" is Rear LAN1/2

---



**Figure 1.6 MIC-3329 Front 8HP XTM Board Jumper Locations**

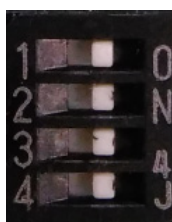
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**MIC-3329 Front 8HP XTM Board SW5, SW6, SW7, SW8,Setting**

---

Control COM workable, always set to "ON"

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**MIC-3329 Front 8HP XTM Board SW3, SW4 Setting**

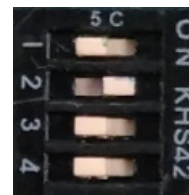
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RS232 (default)  
 1 set to "ON"

RS422  
 1 set to "ON",  
 2 set to "ON"

RS485  
 2 set to "ON"

---



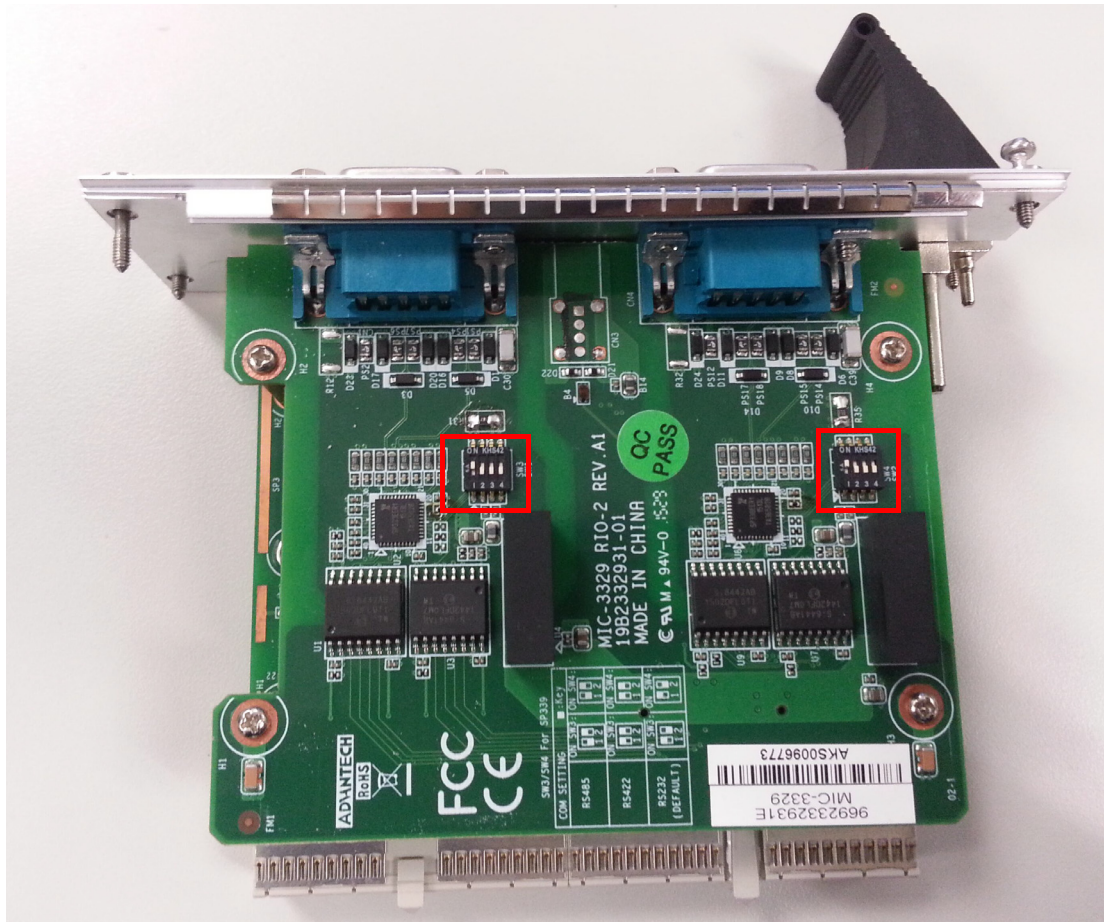


Figure 1.7 MIC-3329 Rear 8HP XTM Board Jumper Locations

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**MIC-3329 Front 8HP XTM Board SW3, SW4 Setting**

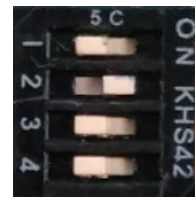
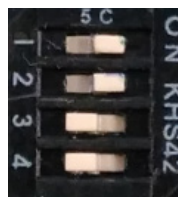
---

SW3, SW4 RS232(Default)  
1 set to "ON"

SW3, SW4 RS422  
1 set to "ON"  
2 set to "ON"

SW3, SW4 RS485  
2 set to "ON"

---



**1.4.1 Clear CMOS (JP2)**

This jumper is used to erase CMOS data. MIC-3329 Clear CMOS can erase “user password and time” information only since we implement CMOS backup mechanism in case of user data loss when battery power is exhausted.

## 1.5 Connector Definitions

Table 1.5 and Table 1.6 list the functions of each connector of MIC-3329 and its RIO, Figures 1.7 and 1.8 illustrate connector locations.

**Table 1.4: MIC-3329 Connector Descriptions**

Number	Function
J1/J2	Primary CompactPCI bus
CN1	Board to board connector on 4HP
CN7	Board to board connector on XTM
CN3	SATA2.0 on board connector on XTM



**Figure 1.8 MIC-3329 Front Panel**





Figure 1.9 MIC-3329 8HP Oblique View

**Table 1.5: MIC-3329 RIO Connector Descriptions**

	<b>Number</b>	<b>Function</b>
<b>MIC-3329R1-D1E</b>	RJ1/RJ2	Rear I/O transition
	CN3	Cfast connector
	CN5 CN6	Board to board connector

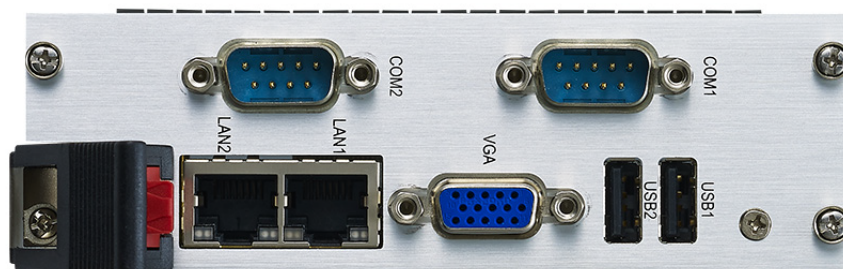


Figure 1.10 MIC-3329 RIO Front Panel Ports

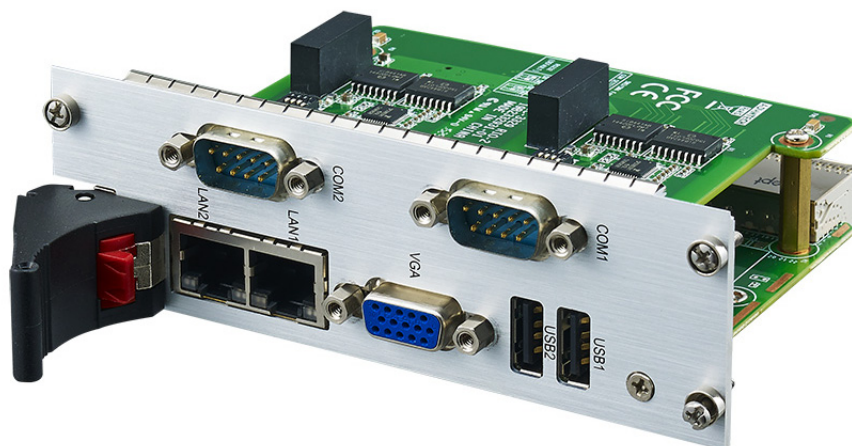


Figure 1.11 MIC-3329 RIO 8HP Oblique View

## 1.6 Safety Precautions

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electric shock, always disconnect the power from your CompactPCI chassis before you work on it. Don't touch any components on the CPU board or other boards while the CompactPCI chassis is powered.
- Disconnect power before making any configuration changes. The sudden rush of power (static discharge) as you connect a jumper or install a board may damage sensitive electronic components.
- Always ground yourself to remove any static charge before you touch your CPU board. Be particularly careful not to touch the chip connectors.
- Modern integrated electronic devices, especially CPUs and memory chips, are extremely sensitive to static electric discharges and fields. Keep the board in its antistatic packaging when it is not installed in the chassis, and place it on a static dissipative mat when you are working with it. Wear a grounding wrist strap for continuous protection.

## 1.7 Installation Steps

The MIC-3329 contains electro-statically sensitive devices. Please discharge your body and clothing before touching the assembly. Do not touch components or connector pins. We recommend that you perform assembly at an anti-static workbench.

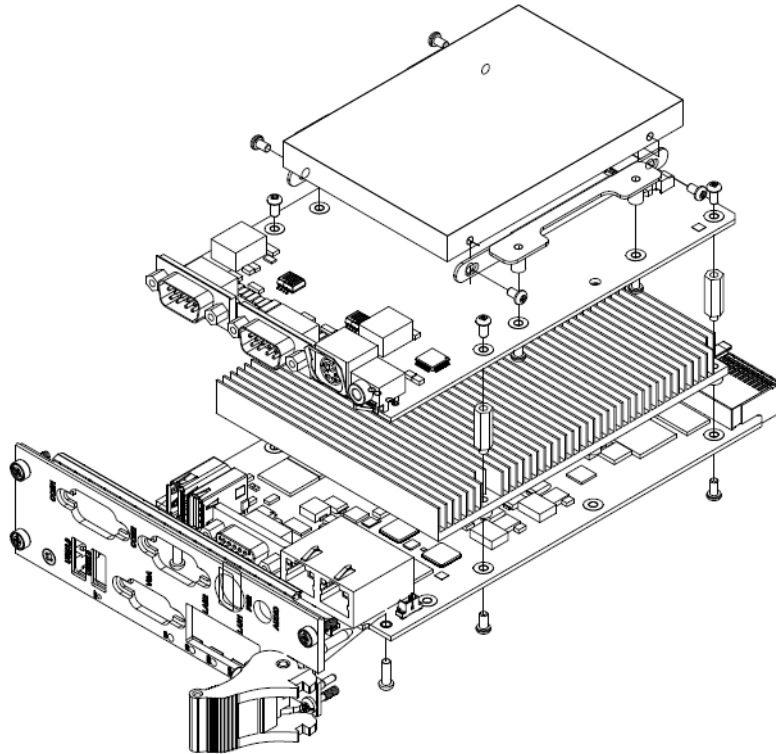


Figure 1.12 Complete Assembly of MIC-3329 Dual Slot with SATA HDD

## 1.8 Software Support

Windows 7, Windows 8.1, and Linux CentOS 6.6 have been tested on the MIC-3329. Please contact your local sales representative for details on support for other operating systems.

# Chapter 2

## AMI BIOS Setup

This chapter describes how to configure the AMI BIOS.

## 2.1 Introduction

The AMI BIOS has been customized and integrated into many industrial and embedded motherboards for decades. This section describes the BIOS which has been specifically adapted to the MIC-3329. With the AMI BIOS Setup Utility, you can modify BIOS settings and control the special features of the MIC-3329. The Setup program uses a number of menus for making changes and turning special features on or off. This chapter describes the basic navigation of the MIC-3329 setup screens.



**Figure 2.1 Setup Program Initial Screen**

The BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS so it retains the setup information when the power is turned off.



## 2.2 BIOS Setup

The MIC-3329 Series system has AMI BIOS built in, with a CMOS SETUP utility that allows users to configure required settings or to activate certain system features. The CMOS SETUP saves the configuration in the CMOS RAM of the motherboard. When the power is turned off, the battery on the board supplies the necessary power to preserve the CMOS RAM. But there is CMOS backup mechanism in MIC-3329 to protect user's personal setting, which allows final BIOS setup information is reserved always except "date/time and user password" when remove CMOS battery or "erase only password" by clear jumper.

When the power is turned on, immediately press the <Del> button during the BIOS POST (Power On Self Test) to access the CMOS SETUP screen.

Control Keys	
< → > < ← >:	Select screen
<↑><↓>:	Select item
<Enter>:	Select
<Esc>	Main Menu - Quit, without saving changes to CMOS Sub Menu - Exit current page and return to Main Menu
<Page Up/+>	Increase the numeric value or make changes
<Page Down/->	Decrease the numeric value or make changes
<F1>	General help, for Setup Sub Menu
<F2>	Previous values
<F3>	Optimized defaults
<F4>	Save and exit

### 2.2.1 Entering Setup

Turn on the computer, and there should be a POST (Power-On Self Test) screen that shows the BIOS supporting the CPU, immediately press <DEL> or <F2> to enter Setup.

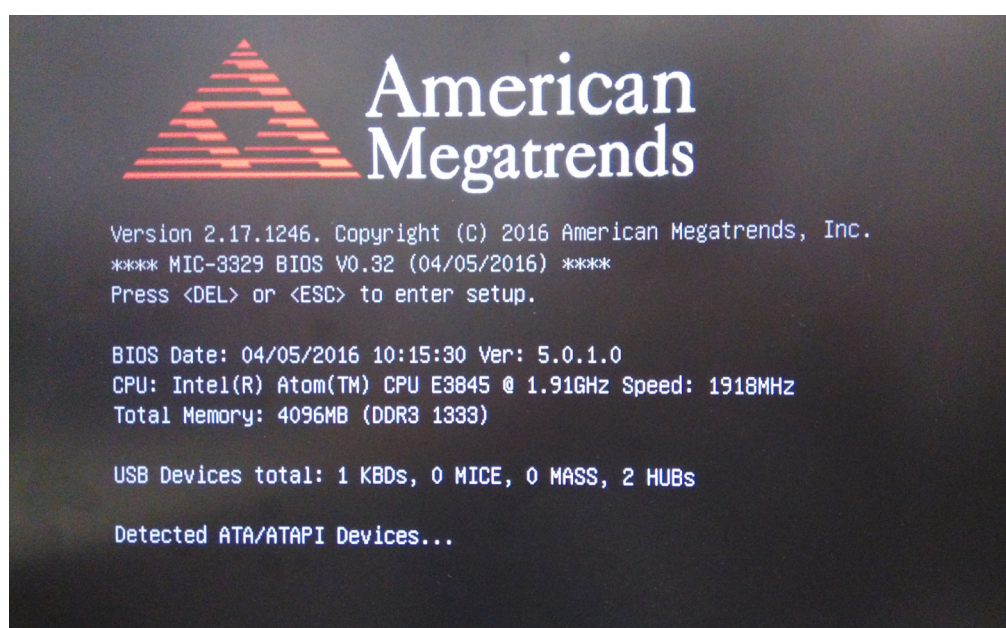
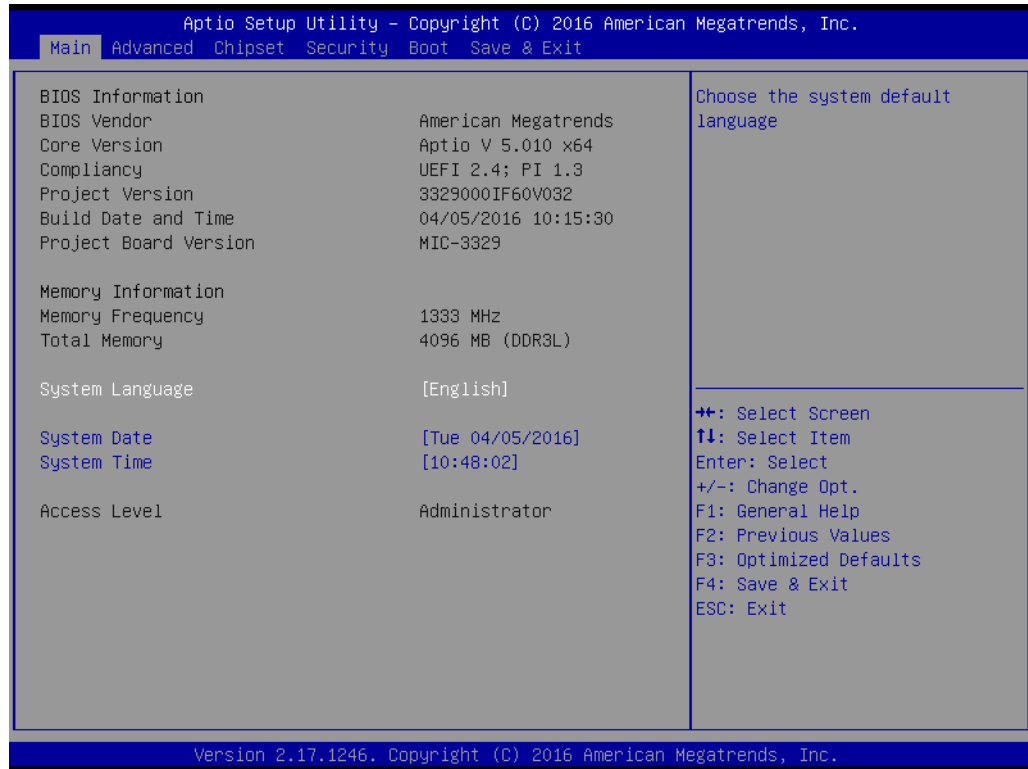


Figure 2.2 Press <DEL> or <F2> to Run Setup

## 2.2.2 Main Setup

When you first enter the BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. Two main setup options are described in this section. The main BIOS setup screen is shown below.



**Figure 2.3 Main Setup Screen**

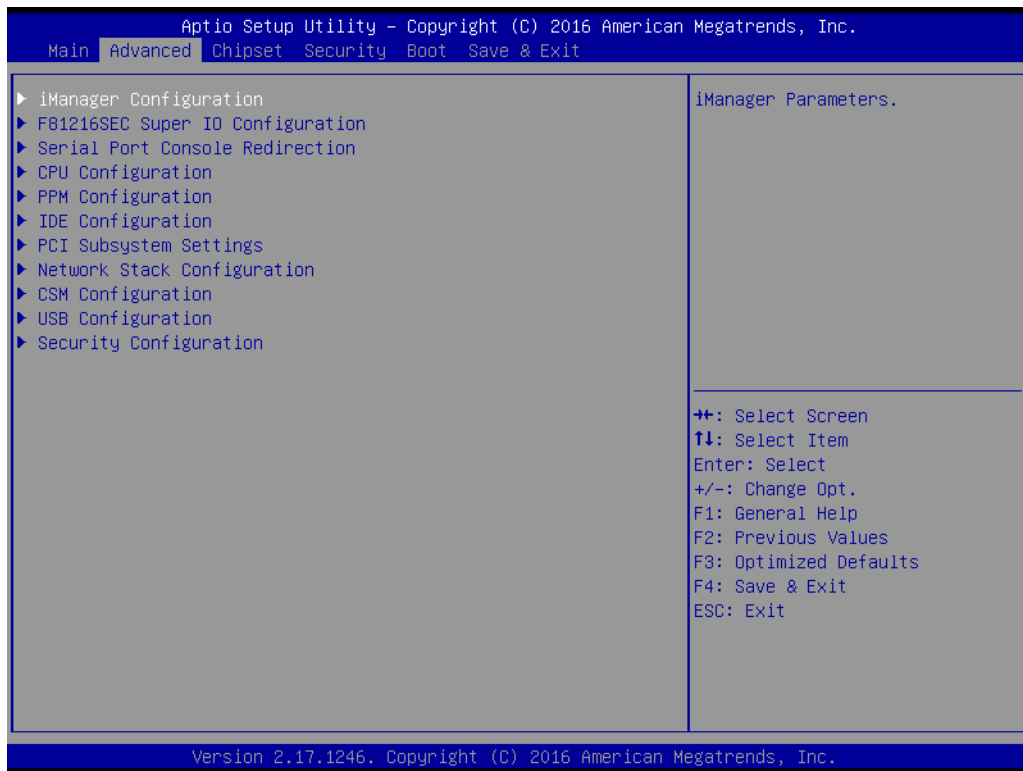
The main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured, while the options in blue can. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

### ■ System Time/System Date

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

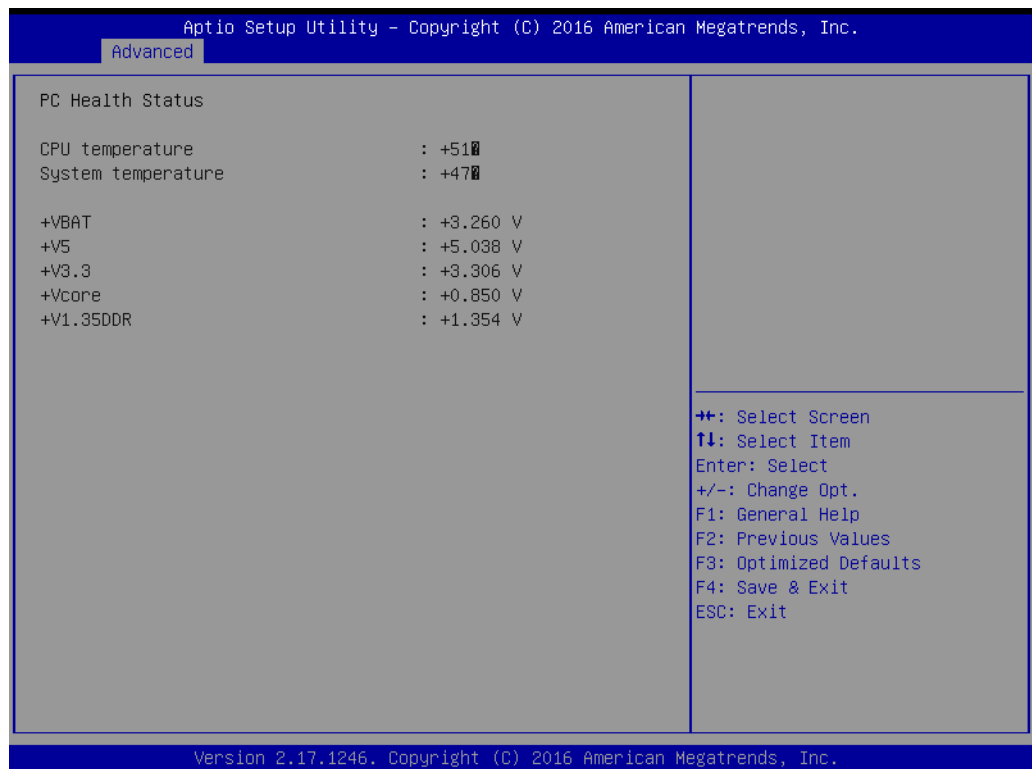
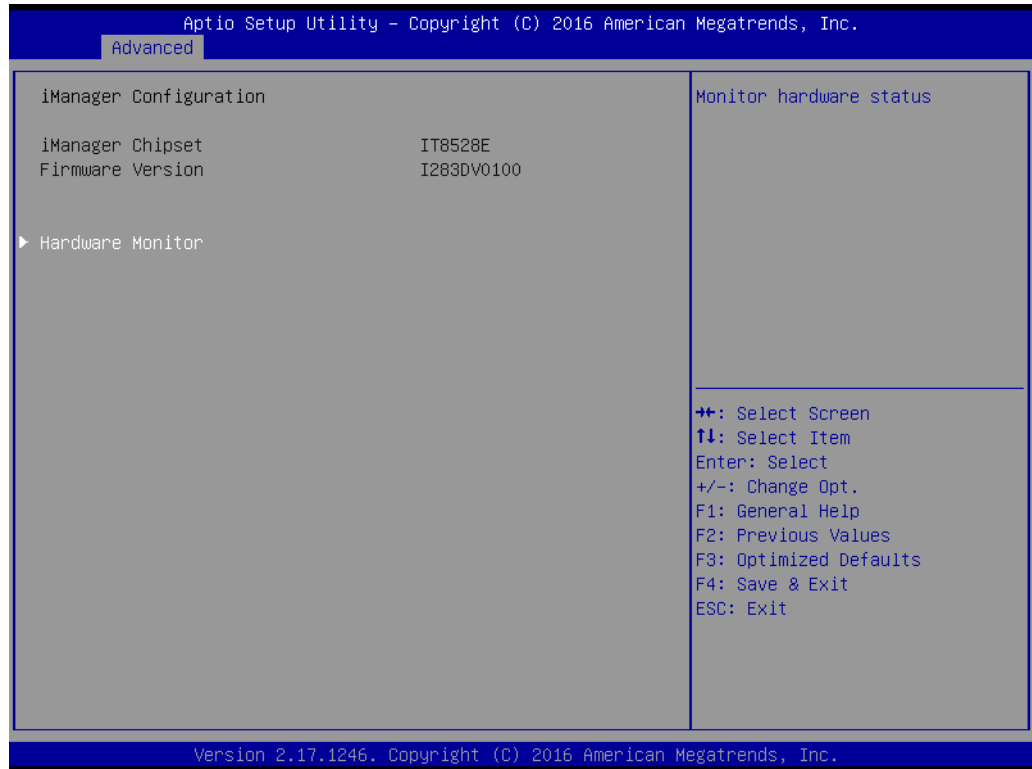
### 2.2.3 Advanced BIOS Features Setup

Select the Advanced tab from the MIC-3329 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.



**Figure 2.4 Advanced BIOS Features Setup Screen**

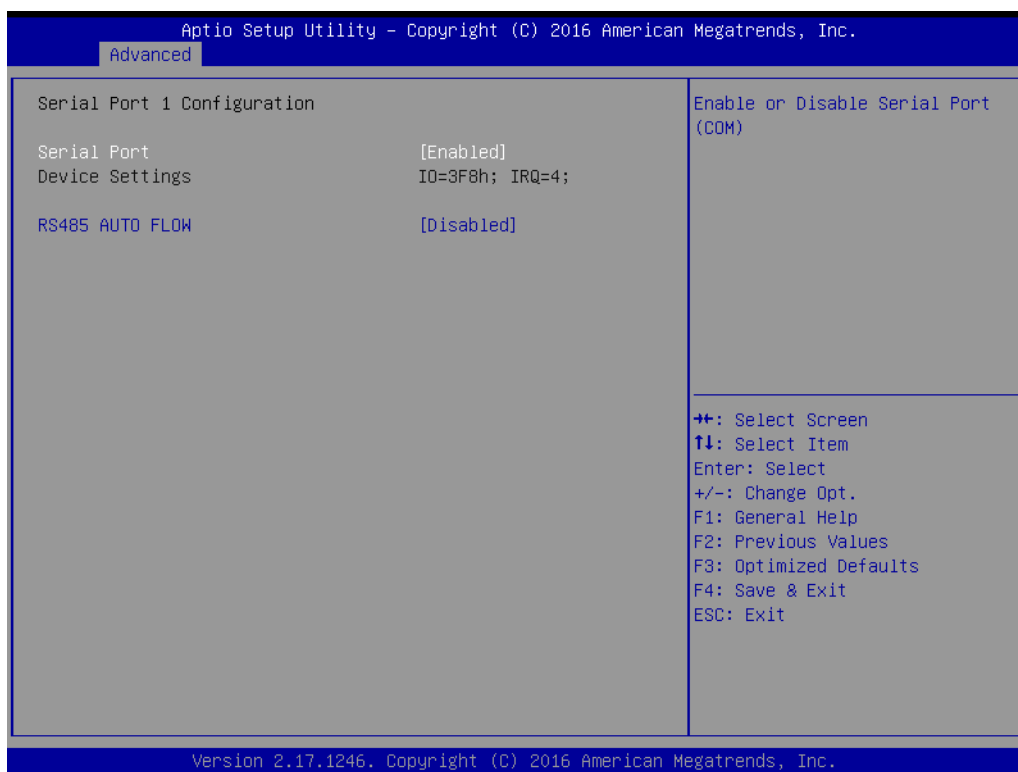
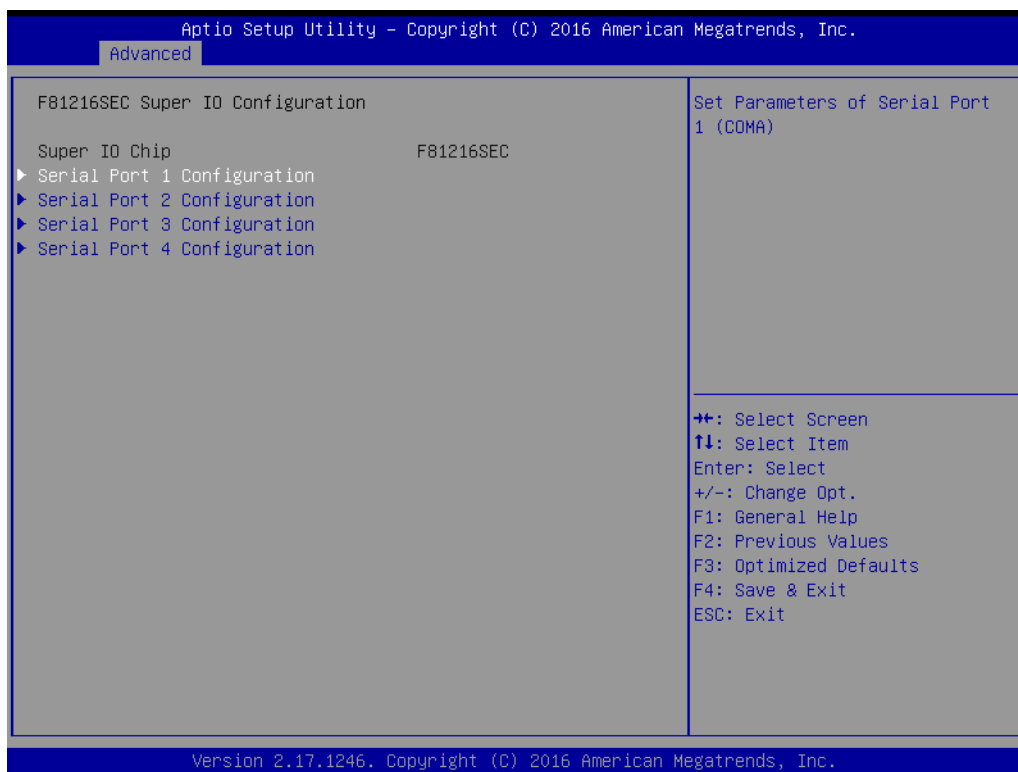
### 2.2.3.1 iManager Configuration



**Figure 2.5 H/W Monitor PC Health Status**

System temperature, CPU temperature and voltage status are available under PC Health Status.

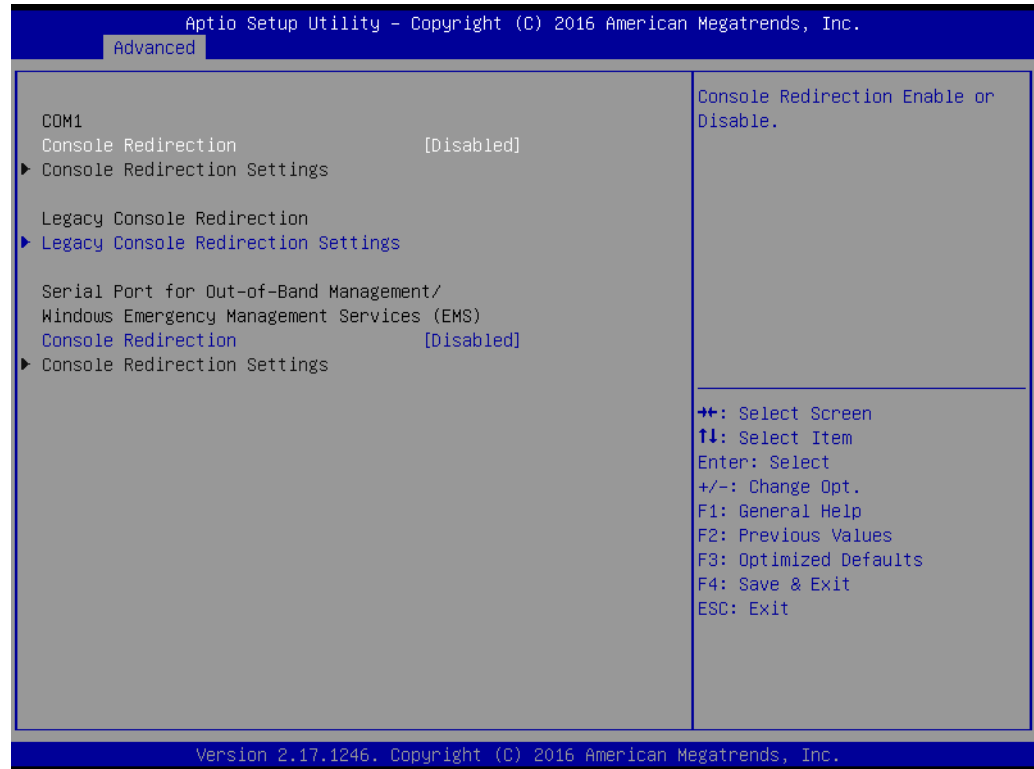
### 2.2.3.2 F81216SEC Super IO configuration



**Figure 2.6 Super IO Configuration**

- **Serial Port 1/2/3/4 Configuration**  
For serial ports 1/2/3/4, IRQ/IO assignments can be selected by users.
- **R485 auto flow**  
Enable/disable R485 AUTO FLOW function.

### 2.2.3.3 Serial Port Console Redirection

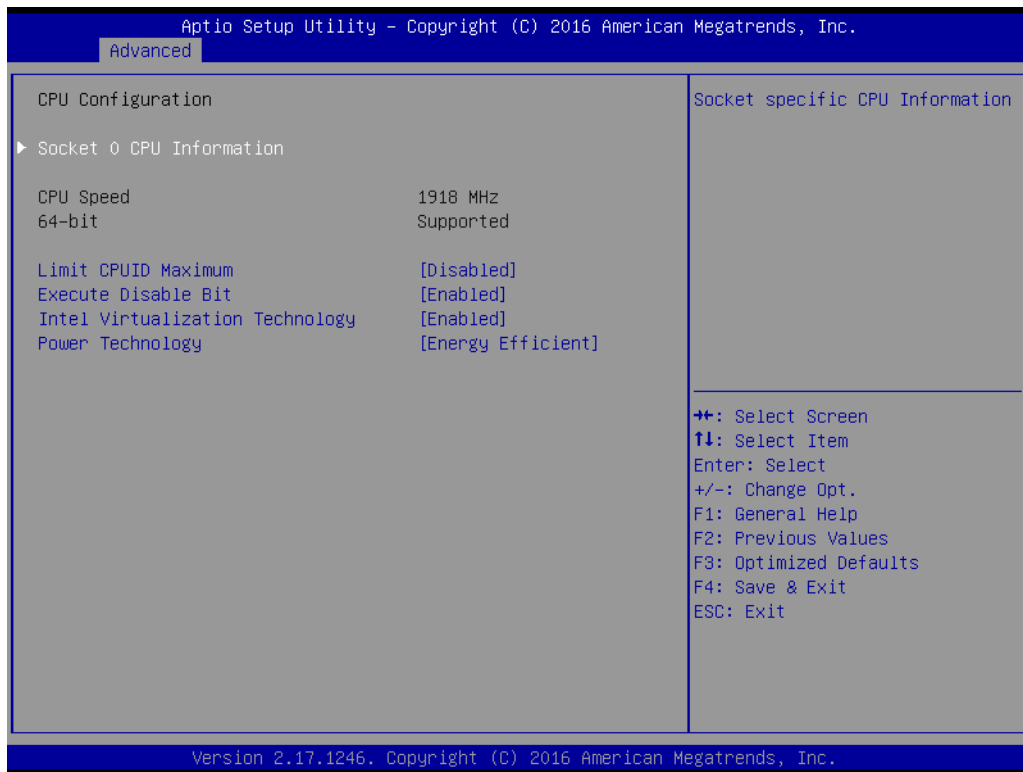


**Figure 2.7 Serial Port Console Redirection**

■ **Console Redirection**

This item allows users to enable or disable console redirection or Microsoft Windows Emergency Management Services (EMS).

### 2.2.3.4 CPU configuration



**Figure 2.8 CPU configuration**

- **Limit CPUID Maximum**  
Set CPUID maximum value.
- **Execute Disable Bit**  
Enable or disable the No-Execution page protection technology.
- **Power Technology**  
Allows users to adjust CPU power related parameters.

### 2.2.3.5 PPM configuration

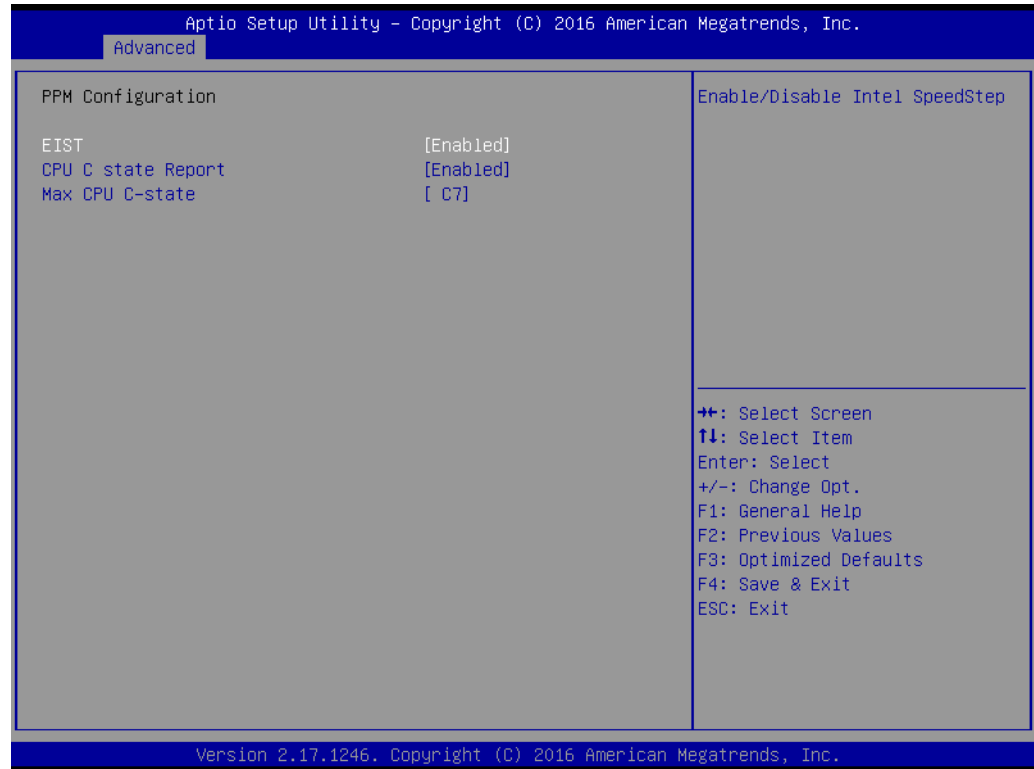
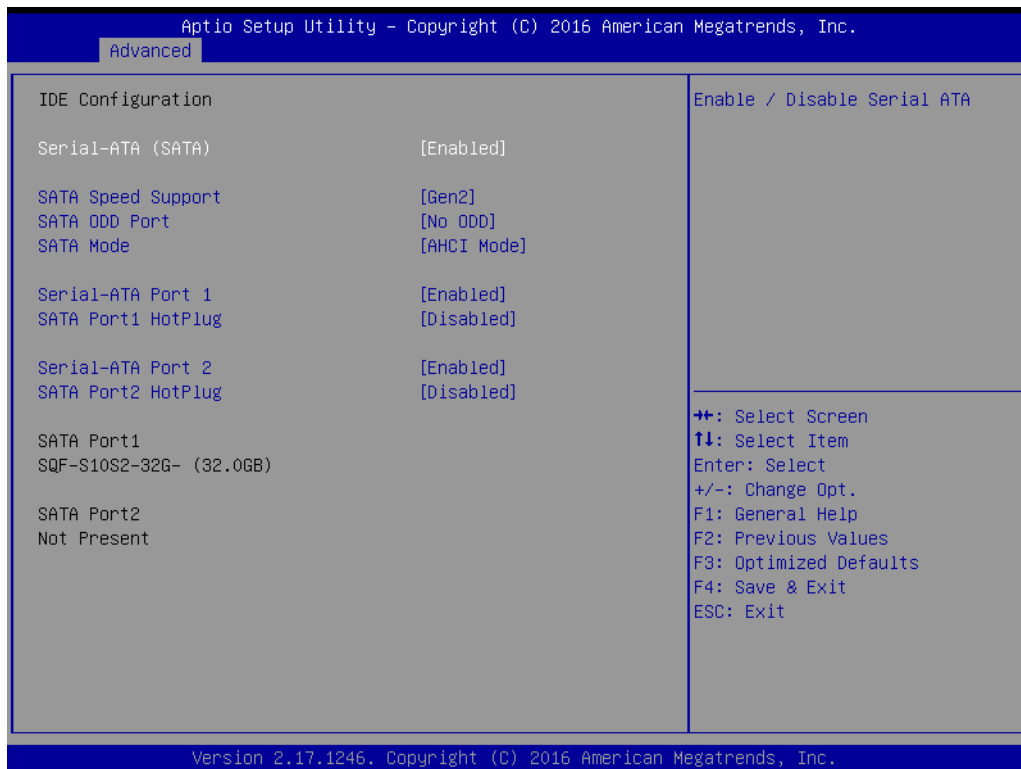


Figure 2.9 PPM configuration

- **EIST**  
It allows you to enable/disable Intel speedstep.
- **CPU C state report**  
It allows you to enable/disable CPU C state report to the OS.
- **Max CPU C-state**  
This option controls Max C state that the processor will support.



### 2.2.3.6 IDE configuration



**Figure 2.10 IDE configuration**

- **SATA mode**  
This can be configured as Disable, IDE or AHCI mode.
- **Disable**  
Disable the SATA function.
- **IDE mode**  
Set to [IDE mode] when you want to use the serial ATA hard disk drives as Parallel ATA physical storage devices.
- **AHCI mode**  
Set to [AHCI mode] when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced serial ATA features that increase storage performance on random workloads by allowing the drive to internally optimize the order of commands.

### 2.2.3.7 PCI Subsystem Settings

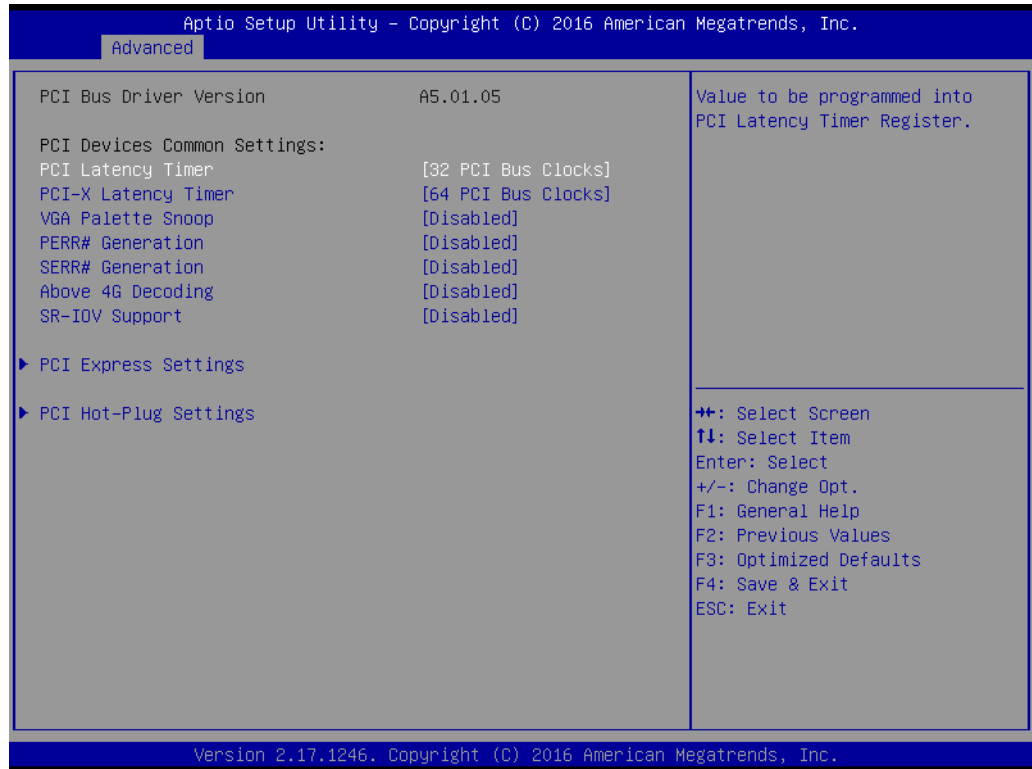


Figure 2.11 PCI Setting

- **PCI Latency Timer**  
Value to be programmed into PCI Latency Timer Register.
- **PCI Express Settings**  
Set Maximum Payload of PCI Express Device or allow System BIOS to select the value.

### 2.2.3.8 Network Stack configuration



**Figure 2.12 Network Stack configuration**

- **Network Stack**

This option allows users to enable or disable the Network Stack function. The default setting is "Disabled".

### 2.2.3.9 CSM configuration

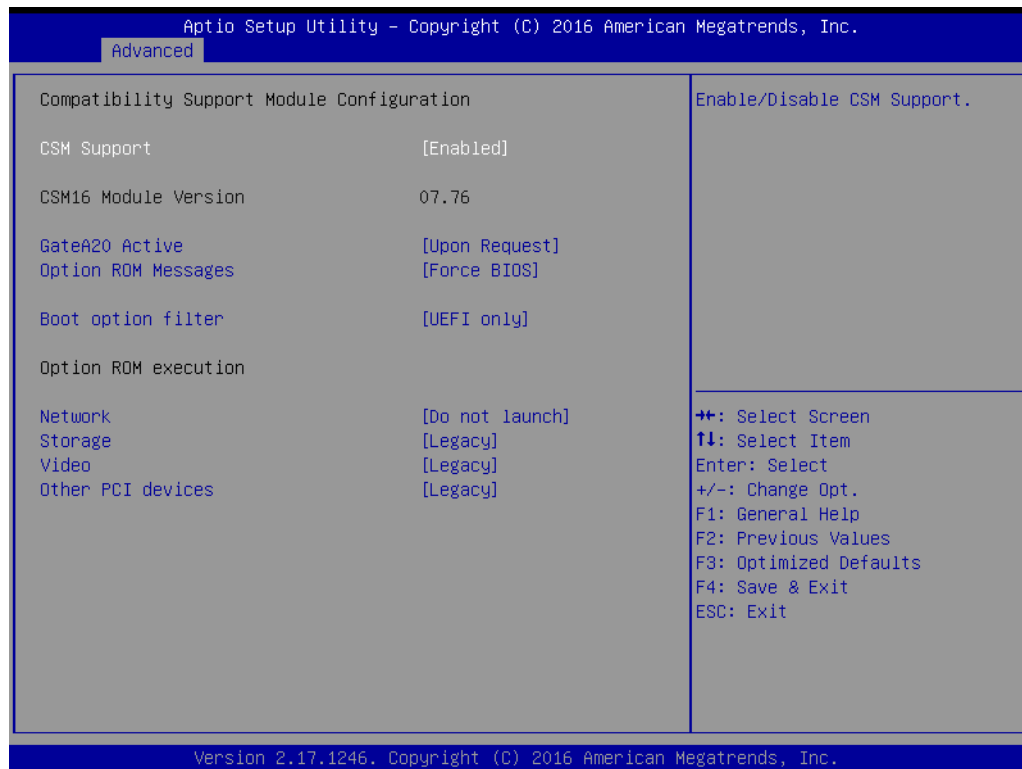


Figure 2.13 CSM configuration

- **CSM Support**  
Enable/Disable CSM Support.
- **GateA20 Active**  
This item is useful when RT code is executed above 1MB. When this is set as "UPON REQUEST", GA20 can be disabled using BIOS services. When it's set as "Always", it does not allow disabling GA20.
- **Option ROM Messages**  
Set display mode for Option ROM.
- **Boot option filter**  
This option controls Legacy/UEFI ROMs priority.
- **Network**  
Controls the execution of UEFI and Legacy PXE OpROM.
- **Storage**  
Controls the execution of UEFI and Legacy Storage OpROM.
- **Video**  
Controls the execution of UEFI and Legacy Video OpROM.
- **Other PCI devices**  
Determines OpROM execution policy for devices other than Network, Storage, or Video.

### 2.2.3.10 USB Configuration

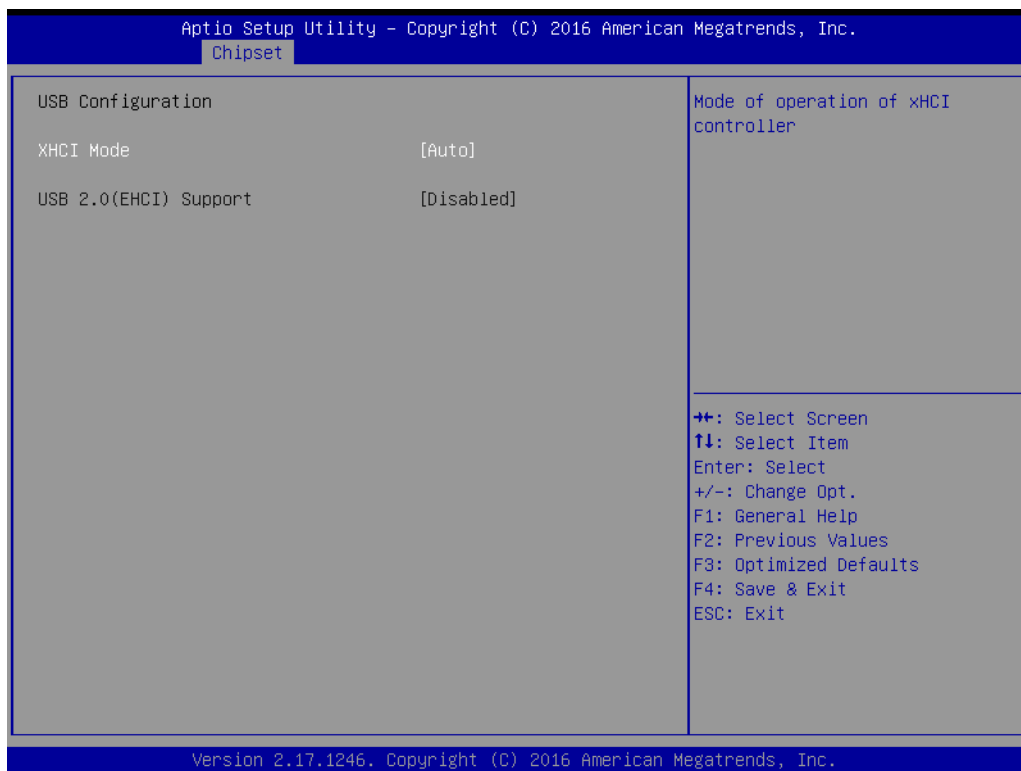
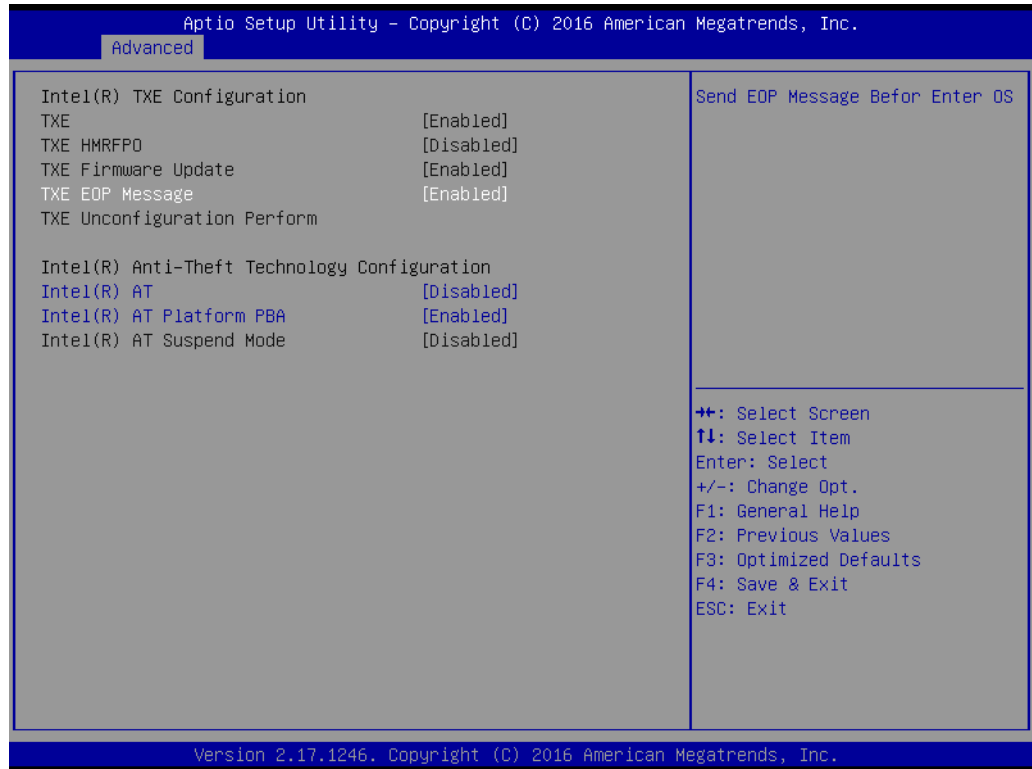


Figure 2.14 USB configuration

- **XHCI Mode**  
Select XHCI controller mode.

## 2.2.3.11 Security Configuration



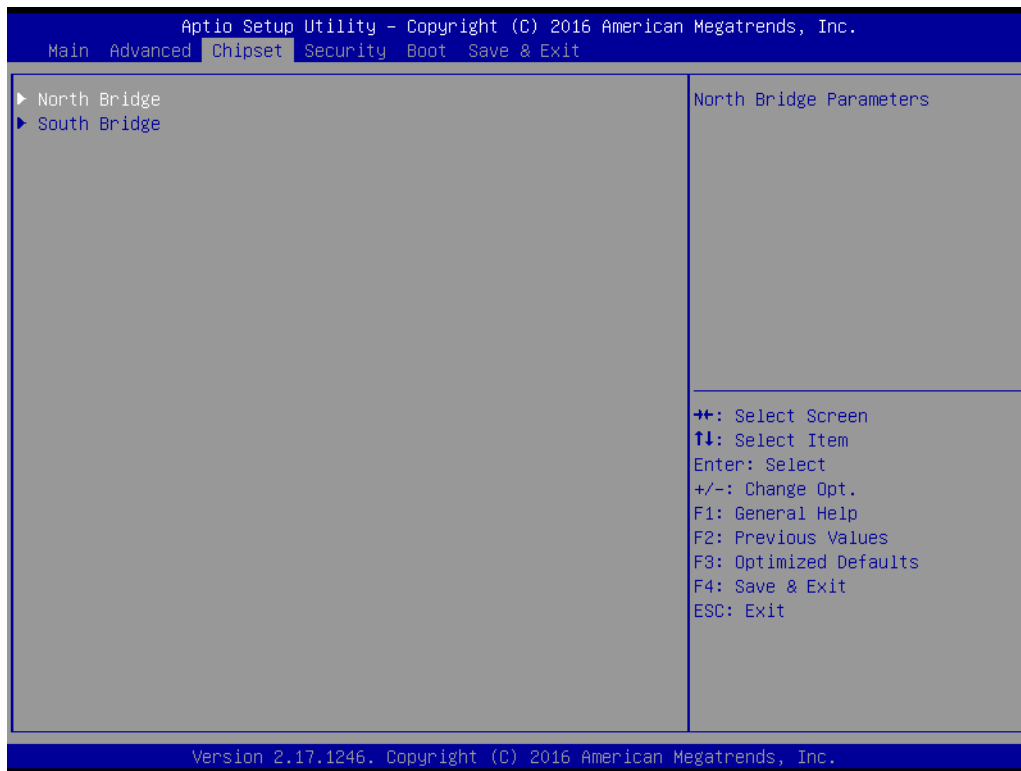
**Figure 2.15 Security configuration**

Intel(R) Anti-Theft Technology Configuration.

- **TXE EOP Message**  
Send EOP message before launching OS.
- **Intel(R) AT**  
Enable/Disable BIOS AT Code from Running.
- **Intel(R) AT Platform PBA**  
Enable/Disable BIOS AT Code from Running.

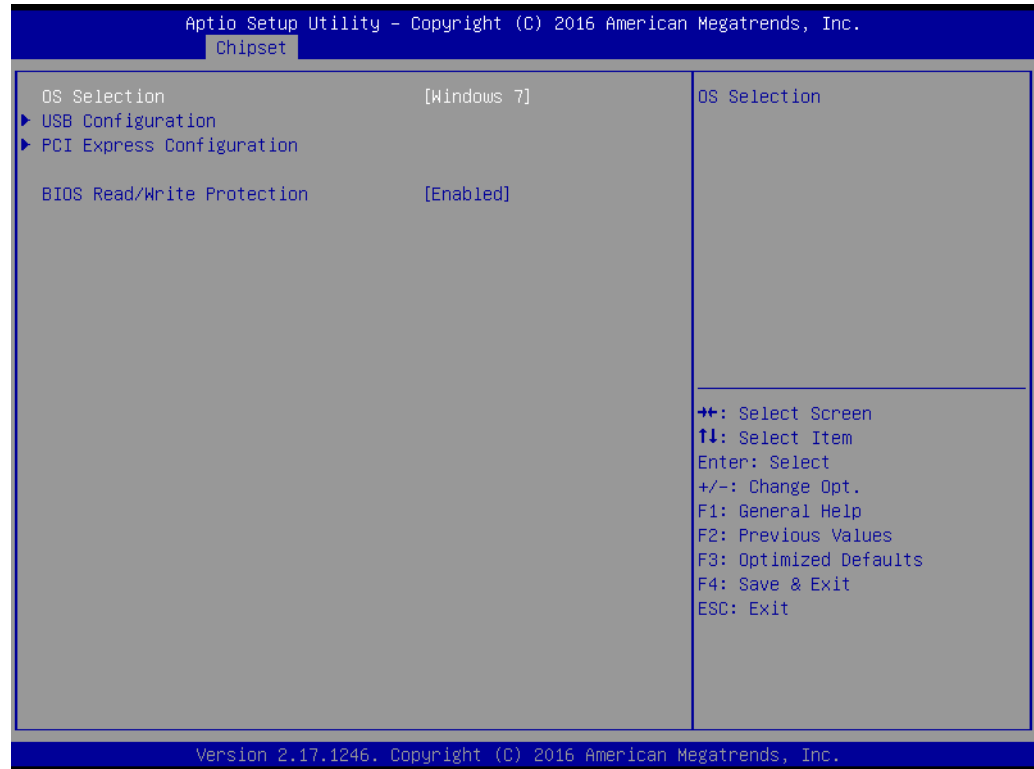
## 2.2.4 Chipset Configuration Setting

Select the Chipset tab from the BIOS setup screen to enter the Chipset Setup screen. Users can select either item in the left frame of the screen to go to the sub menu for that item. Users can display a Chipset Setup option by highlighting it using the <Arrow> keys. All Chipset Setup options are described in this section. The Chipset Setup screens are shown below. The sub menus are described on the following pages.



**Figure 2.16 Chipset Setup Screen**

## 2.2.4.1 South Bridge

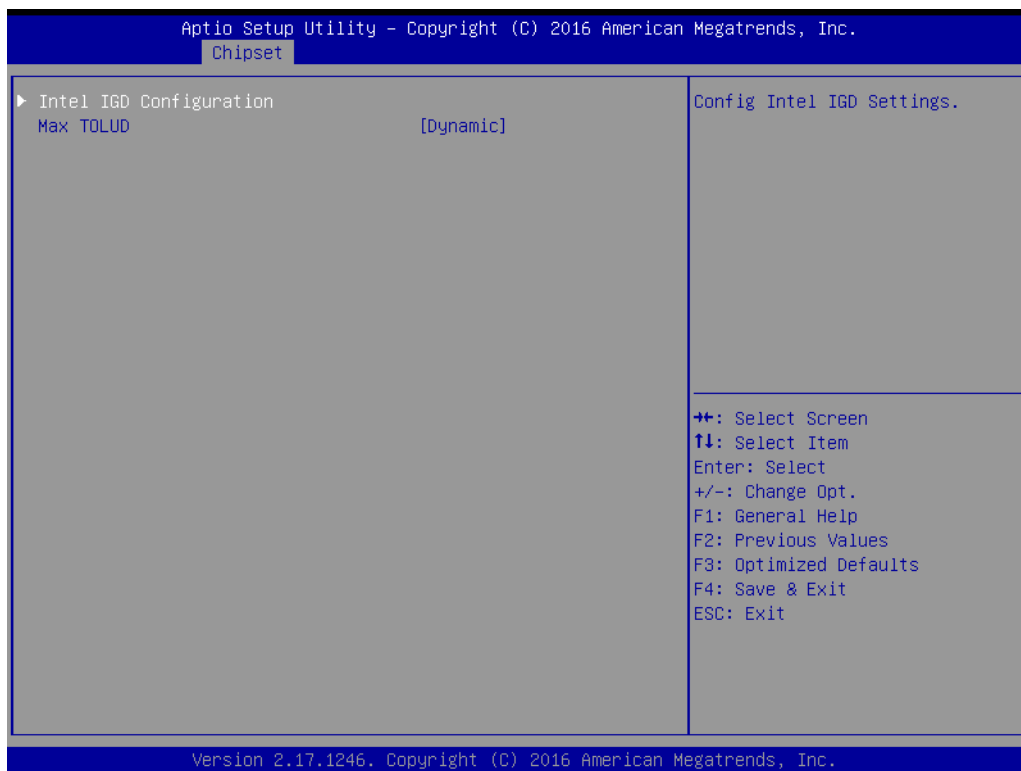


**Figure 2.17 South Bridge Configuration**

- **OS Selection**  
You should check this item before installing an OS.
- **PCI Express Configuration**  
Enable/disable PCIE port select PCIe speed.

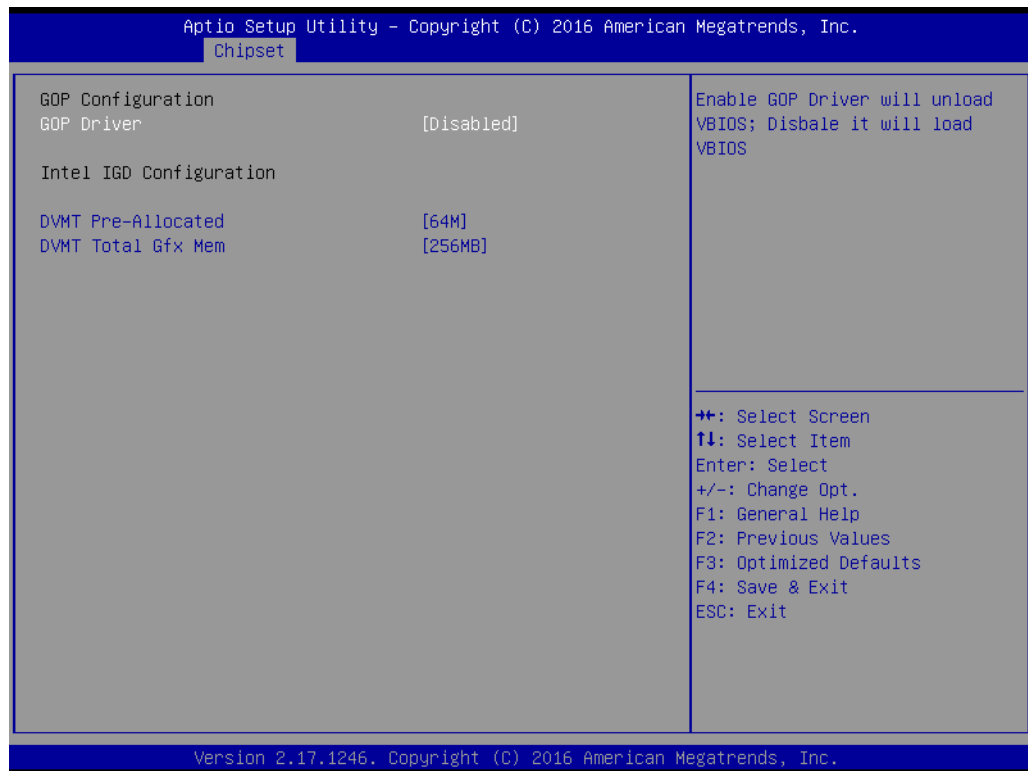


### 2.2.4.2 North Bridge



**Figure 2.18 North Bridge Configuration**

- **Intel IGD configuration**  
Configure IGD Setting.
- **Max TOLUD**  
select maximum value of TOLUD.



**Figure 2.19 Intel IGD configuration**

- **GOP configuration**  
Enable/disable GOP driver.
- **Intel IGD Configuration**  
Select DVMT 5.0 Pre-Allocated (fixed) Graphics Memory size or Total Graphic Memory size used by the internal graphics device.

## 2.2.5 Boot Settings

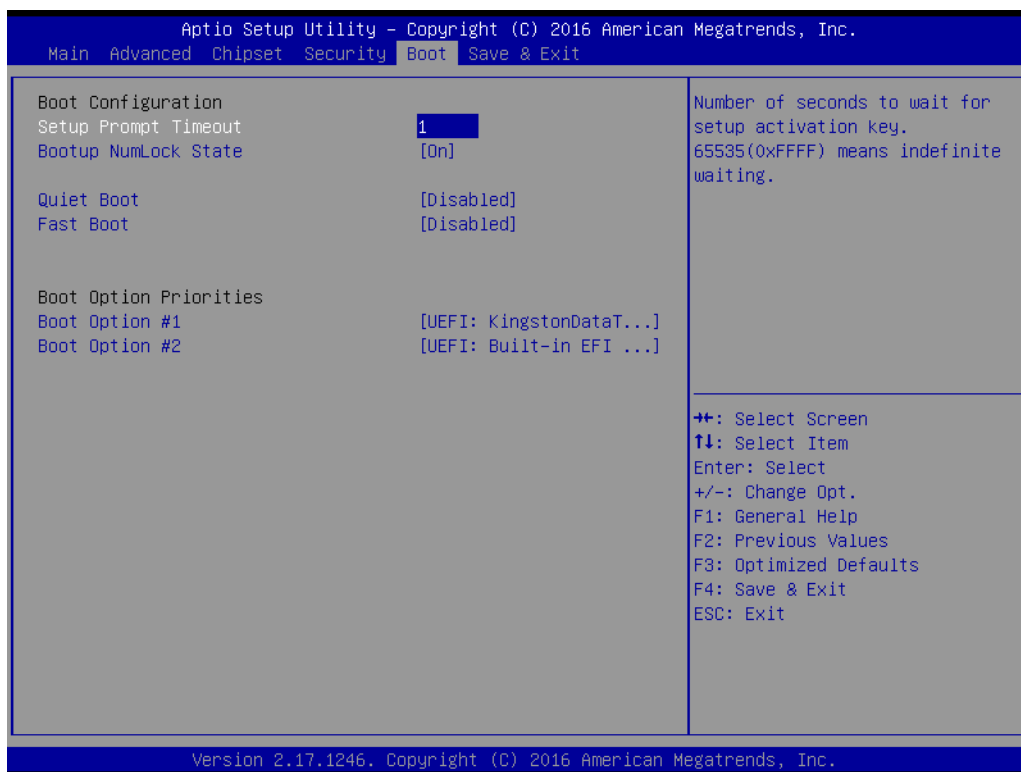


Figure 2.20 Boot Settings

- **Setup Prompt Timeout**  
Number of seconds to wait for setup activation key. (65535 means indefinite wait.)
- **Bootup NumLock State**  
Set NumLock key default state when the system boots up.
- **Quiet Boot**  
If this option is set to Disabled, the BIOS displays normal POST messages. If enabled, an OEM Logo is shown instead of POST messages.
- **Fast Boot**  
This item allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
- **Boot Option Priorities**  
The option shows you the boot priority of devices.
- **Hard Drive BBS Priorities**  
Set boot device priority sequence from available hard disk drives.

## 2.2.6 Security Settings

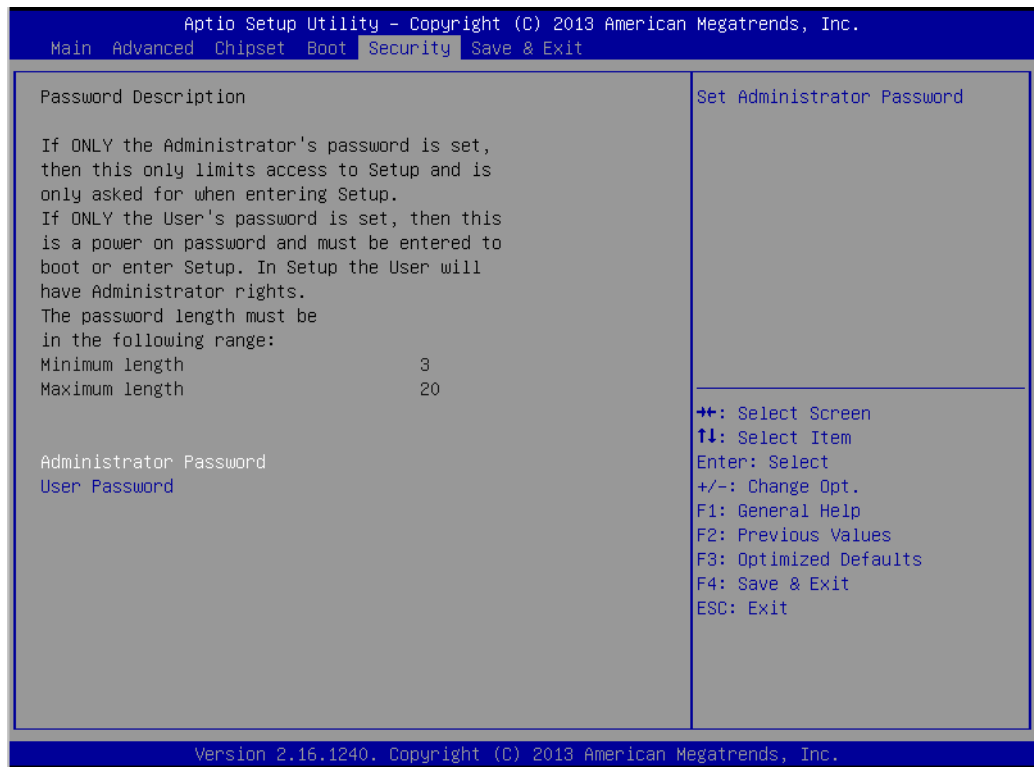
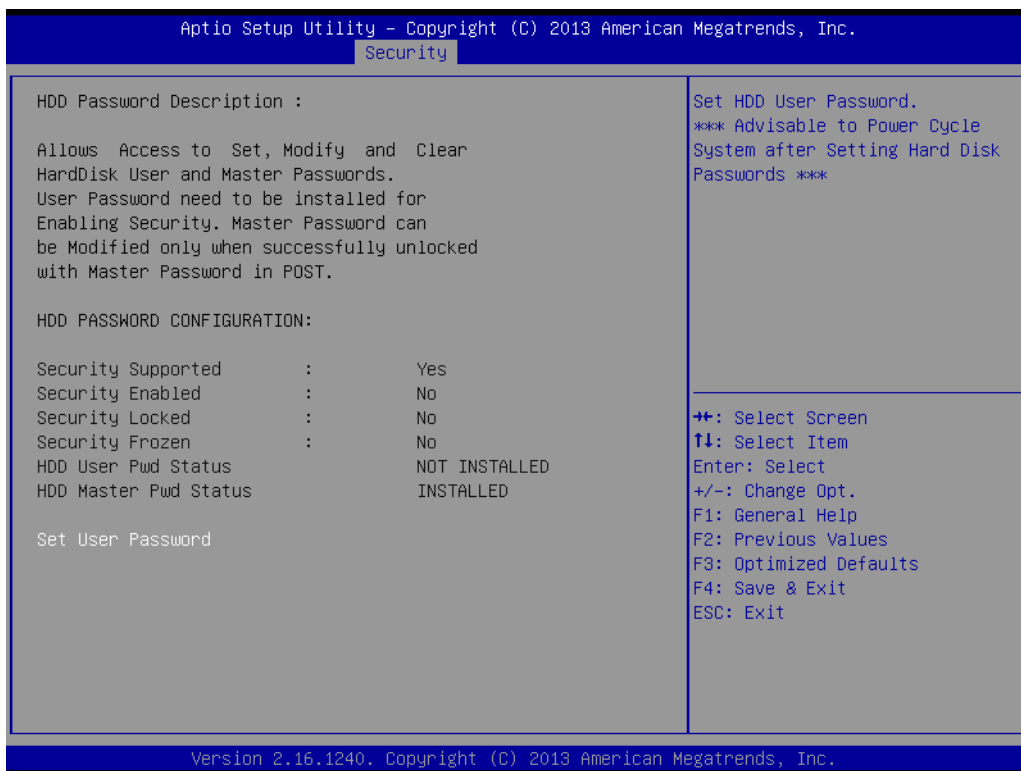


Figure 2.21 Security Settings

- **Administrator Password**  
Select this option and press <ENTER> to access the sub menu, and then type in desired password. Sets the Administrator password.
- **User Password**  
Select this option and press <ENTER> to access the sub menu, and then type in desired password. Sets the User Password.

## ■ HDD Security Configuration



**Figure 2.22 HDD Security Configuration**

### ■ Set User Password

Select this option and press <ENTER> to access the sub menu, and then type in desired password. Sets the HDD User Password.

## 2.2.7 Save and Exit Configuration

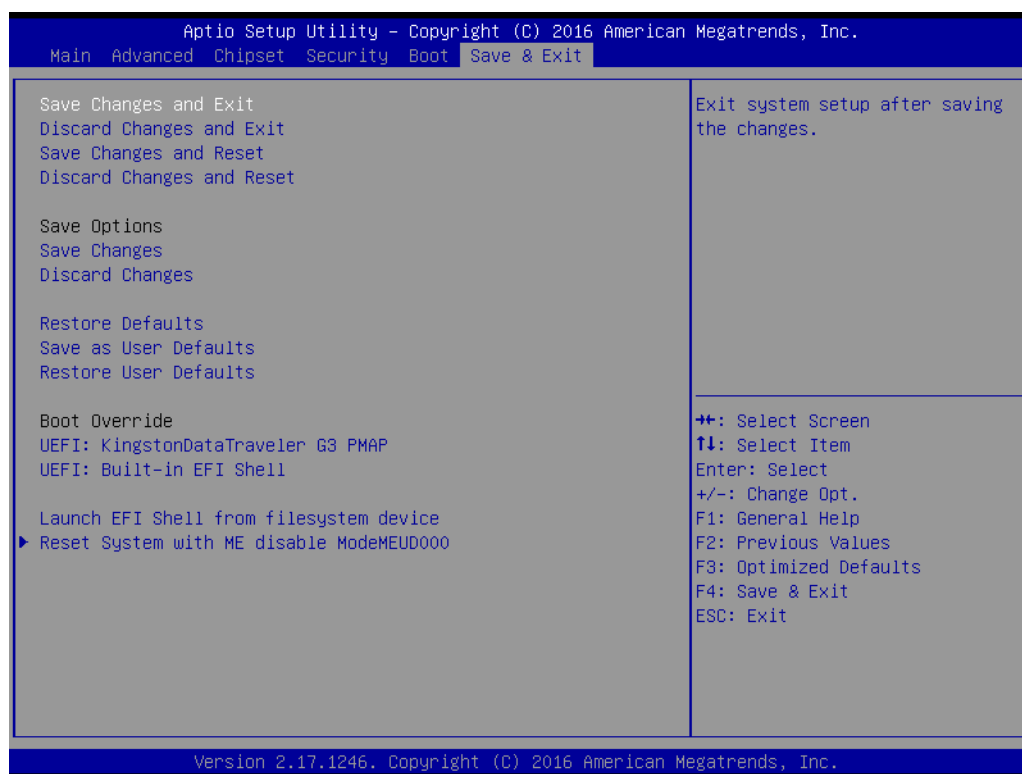


Figure 2.23 Save and Exit

### ■ Save changes and Exit

When system configuration is completed, select this option to save changes, exit BIOS setup menu and reboot the computer with all new system configuration parameters in effect.

1. Select Exit Saving Changes from the Exit menu and press <Enter>. The following message appears: Save Configuration Changes and Exit Now? [Yes] [No]
2. Select [Yes] or [No].

### ■ Discard changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration.

1. Select Exit Discarding Changes from the Exit menu and press <Enter>. The following message appears: Discard Changes and Exit Setup Now? [Yes] [No]
2. Select Yes to discard changes and exit. Discard Changes: Select Discard Changes from the Exit menu and press <Enter>.

### ■ Save Changes and Reset

1. Select this option to save the changes and reboot the computer to take effect on all system configuration parameters. Select this option the following message appears: Save Configuration and Reset? [Yes] [No]
2. Select Yes or No.

### ■ Discard Changes and Reset

1. Select "Discard Changes and Reset" and press <Enter>. The following message appears: Reset without saving? [Yes] [No]
2. Select Yes to discard changes and reset.

- **Save Options**  
Select this option to save or discard the changes.
- **Restore Defaults**  
The BIOS automatically configures all setup items to optimal settings when users select this option. Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the defaults if the user's computer is experiencing system configuration problems. But when it is appropriate, select Restore Defaults from the Exit menu and press <Enter>.
- **Save as User Default**  
Save all current settings as a user default.
- **Restore User Default**  
Restore all settings to user default values.
- **Boot Override**  
This option shows the boot device options.
- **Launch EFI Shell from file system device**  
Attempts to Launch EFI Shell application (Shell.efi) from one of the available file system devices.
- **Reset System with ME disable Mode MEUD000**  
ME will run in temporarily disabled mode. Will be ignored if ME Ignition FW MEUD001.





# Appendix **A**

## Pin Assignments

This appendix describes pin assignments.

## A.1 J1 Connector

Table A.1: J1 Compact PCI Pin Definitions											
A01	+5V <sub>HOT</sub>	B01	NC	C01	TRST#	D01	NC	E01	+5V <sub>HOT</sub>	F01	GND
A02	TCK	B02	+5V <sub>HOT</sub>	C02	TMS	D02	TDO	E02	TDI	F02	GND
A03	INTA#	B03	INTB#	C03	INTC#	D03	+5V <sub>HOT</sub>	E03	INTD#	F03	GND
A04	NC	B04	HEALTHY#	C04	CPCI_VIO	D04	INTP	E04	INTS	F04	GND
A05	NC	B05	NC	C05	PCI_RST#	D05	GND	E05	GNT#0	F05	GND
A06	REQ#0	B06	PCI_Present#	C06	NC	D06	CLK0	E06	AD31	F06	GND
A07	AD30	B07	AD29	C07	AD28	D07	GND	E07	AD27	F07	GND
A08	AD26	B08	GND	C08	CPCI_VIO	D08	AD25	E08	AD24	F08	GND
A09	CBE3#	B09	IDSEL	C09	AD23	D09	GND	E09	AD22	F09	GND
A10	AD21	B10	GND	C10	NC	D10	AD20	E10	AD19	F10	GND
A11	AD18	B11	AD17	C11	AD16	D11	GND	E11	CBE2#	F11	GND
KEY										F12	NC
										F13	GND
										F14	NC
A15	NC	B15	FRAME#	C15	IRDY#	D15	BD_SEL#	E15	TRDY#	F15	GND
A16	DEV-SEL#	B16	PCIX-CAP	C16	CPCI_VIO	D16	STOP#	E16	LOCK#	F16	GND
A17	NC	B17	IPMB0_SCL	C17	IPMB0_SDA	D17	GND	E17	PERR#	F17	GND
A18	SERR#	B18	GND	C18	NC	D18	PAR	E18	CBE1#	F18	GND
A19	NC	B19	AD15	C19	AD14	D19	GND	E19	AD13	F19	GND
A20	AD12	B20	GND	C20	CPCI_VIO	D20	AD11	E20	AD10	F20	GND
A21	NC	B21	AD9	C21	AD8	D21	M66EN	E21	CBE0#	F21	GND
A22	AD7	B22	GND	C22	NC	D22	AD6	E22	AD5	F22	GND
A23	NC	B23	AD4	C23	AD3	D23	+5V <sub>HOT</sub>	E23	AD2	F23	GND
A24	AD1	B24	+5V <sub>HOT</sub>	C24	CPCI_VIO	D24	AD0	E24	ACK64#	F24	GND
A25	+5V <sub>HOT</sub>	B25	REQ64#	C25	ENUM#	D25	NC	E25	+5V <sub>HOT</sub>	F25	GND

**Note!** NC: No Connection.



## A.2 J2 Connector

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A01	CLK1	B01	GND	C01	REQ#1	D01	GNT#1	E01	REQ#2	F01	GND
A02	CLK2	B02	CLK3	C02	SYSEN#	D02	GNT#2	E02	REQ#3	F02	GND
A03	CLK4	B03	GND	C03	GNT#3	D03	REQ#4	E03	GNT#4	F03	GND
A04	CPCI_VIO	B04	SIO_SP I_CLK_ 3.3	C04	LAN1_LIN K1000#	D04	NC	E04	UART4_ DCD#	F04	GND
A05	REAR_ DDC_D AT	B05	GND/ 64EN#	C05	NC	D05	UART4_ RXD	E05	UART4_ DSR#	F05	GND
A06	REAR_ DDC_C LK	B06	MDIA3+	C06	MDIA3-	D06	GND	E06	UART4_ RTS#	F06	GND
A07	REAR_ RED	B07	GND	C07	VCC5	D07	UART4_ CTS#	E07	UART4_ TXD	F07	GND
A08	REAR_ HSYNC	B08	MDIA2+	C08	MDIA2-	D08	GND	E08	UART4_ DTR#	F08	GND
A09	REAR_ VSYNC	B09	GND	C09	REAR_GR EEN	D09	UART3_ DCD#	E09	UART4_ RI#	F09	GND
A10	LAN1_L INK100 #	B10	MDIA1-	C10	USB3_P-	D10	GND	E10	UART3_ DSR#	F10	GND
A11	MDIA1+	B11	GND	C11	SATA0_R X+	D11	UART3_ RTS#	E11	UART3_ RXD	F11	GND
A12	LAN1_L INK- ACT#	B12	MDIA0-	C12	USB3_P+	D12	SATA0_R X-	E12	UART3_ TXD	F12	GND
A13	MDIA0+	B13	GND	C13	SATA0_TX -	D13	UART3_ DTR#	E13	UART3_ CTS#	F13	GND
A14	MDIB0-	B14	SIO_SP I_MISO _3.3	C14	SIO_SPI_ CS_3.3	D14	SATA0_T X-	E14	UART3_ RI#	F14	GND
A15	REAR_ BLUE	B15	NC	C15	FAL#	D15	REQ#5	E15	GNT#5	F15	GND
A16	MDIB0+	B16	SIO_SP I_MOSI _3.3	C16	DEG#	D16	GND	E16	LAN2_LI NK1000 #	F16	GND
A17	MDIB1-	B17	GND	C17	PRST#	D17	REQ#6	E17	GNT#6	F17	GND
A18	MDIB1+	B18	MDIB2+	C18	MDIB2-	D18	GND	E18	3.3V	F18	GND
A19	NC	B19	GND	C19	SMB_SDA	D19	SMB_SC L	E19	ALERT#	F19	GND
A20	CLK5	B20	NC	C20	LAN2_LIN K100#	D20	GND	E20	NC	F20	GND
A21	CLK6	B21	GND	C21	MDIB3+	D21	MDIB3-	E21	LAN2_LI NK- ACT#	F21	GND
A22	GA4	B22	GA3	C22	GA2	D22	GA1	E22	GA0	F22	GND

---

**Note!** *NC: No Connection.*



# Appendix **B**

## Programming the Watchdog Timer

This appendix describes how to program the watchdog timer.





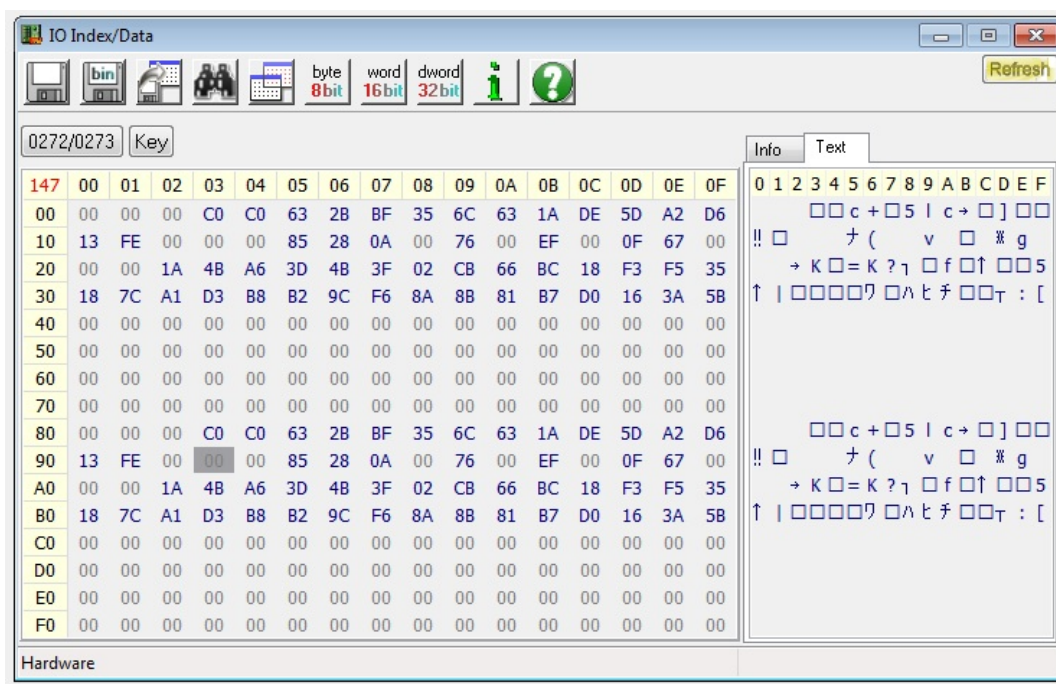
Register Address : **IO address 93h**  
 Register Name : **Watchdog Count Value**  
 Default Value: 00  
 Attribute : Read/Write

Bit	Description	Access
7-0	Watchdog Count Value (unit: determined by IO address 94h)	RW

Register Address : **IO address 94h**  
 Register Name : **Watchdog Function**  
 Default Value: 00  
 Attribute : Read/Write

Bit	Description	Access
7-0	Watchdog Enable and unit type. Value list: 0x1 – Enable unit 250ms. 0x2 – Enable unit 1 sec Other - reserved	RW

**Method 2:** Using RW tool under Windows OS, select “IO index/Data”, input “272” in “Index port”, input “273” in “Data port” as shown in the picture.:



**Note!** Offset 93h is “Watchdog Count Value”, offset 94h is “Watchdog Enable and unit type” as shown.







# Appendix **C**

## Embedded Controller

This appendix describes EC configuration.

## C.1 Features

- Power Sequence
- Hot-Swap: Hot insertion and removal
- LPC Bus: Provides LPC Bus access
- Watchdog
- 2x SPI Cross-Switch: Dedicated SPI cross-switch for BIOS
- Debug Message: Boot time POST message

## C.2 I/O Registers

The Advantech MIC-3329 EC communicates with main I/O. The LPC bus connects the Intel® LPC signals. The Debug Port Unit is used to decode POST codes. The watchdog is used to detect BIOS ready signals or recover BIOS code from redundant BIOS flash. The hot-swap out-of-service LED control unit is used to control the blue LED during hot-insert and hot-remove. The other signals in the miscellaneous unit are for interfacing with corresponding I/O interface signals.

**Table C.1: LPC I/O Register Addresses**

Address	I/O Type	Description
0x80h	W	Port 80 Display

Other registers are accessed by ISA I/O, index port 0x272, data port 0x273.

**Table C.2: LPC I/O Register Addresses**

Address	I/O Type	Description
0x90h~0x91h	R	Manufacture ID
0x92h	R/W	Dual BIOS switch display
0x93h~0x94h	R/W	Watchdog Register
0x95h~0x96h	R	EC Device ID
0x97h	R	EC Chip Revision ID
0x98h	R/W	GPO2 LED Control Register
0x99h	R	Power Status
0x9Ah	R	GA Status
0x9Bh	R	GPIO Input Status
0x9Ch	R/W	GPIO Output Value
0x9Dh	R/W	GPIO Input/Output Settings
0x9Eh	R	Port 80h Status
0x9Fh	R/W	GPO1 LED Control

# Appendix **D**

Glossary

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## D.1 Glossary

AACPI: Advanced Configuration and Power Interface  
CPU: Central Processing Unit  
CPCI: CompactPCI  
DMA: Direct Memory Access  
DRAM: Dynamic Random Access Memory  
ECC: Error Checking and Correction  
EEPROM: Electrically Erasable Programmable Read-Only Memory  
EMC: Electro Magnetic Compatibility  
ESD: Electro Static Discharge  
HDD: Hard Disk Drive  
HW: HardWare  
I/O: Input/Output  
IC: Integrated Circuit  
LED: Light Emitting Diode  
LPC: Low Pin Count  
LV: Low Voltage  
MAC: Medium Access Control  
OS: Operating System  
PCB: Printed Wiring Board  
PCI: Peripheral Component Interconnect  
PCIe: Peripheral Component Interconnect Express  
PHY: Physical layer Interface  
RIO: Rear Input/Output  
RS-232: An Interface specified by Electronic Industries Alliance  
RTC: Real Time Clock  
RTM: Rear Transition Module  
SBC: Single Board Computer  
SDRAM: Synchronous DRAM  
SFP: Small Form-factor Pluggable  
SPD: Serial Presence Detect  
SPI: Serial Peripheral Interface  
SSD: Solid State Disk  
SW: SoftWare  
ULV: Ultra Low Voltage  
XMC: PCIe interface mezzanine card  
XTM: Extension Module



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