

FabiaTech Corporation

IPC Solution

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**Small Cube System**  
**Fanless Series**  
**FX5639/FX5639L**  
**User' Manual**

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Part Number: FX5639

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- ❑ A list of your name, address, telephone, facsimile number, or email address where you may be reached during the day
- ❑ Description of you peripheral attachments
- ❑ Description of your software (operating system, version, application software, etc.) and BIOS configuration
- ❑ Description of the symptoms (Extract wording any message)

For updated BIOS, drivers, manuals, or product information, please visit us at [www.fabiatech.com](http://www.fabiatech.com)

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## Chapter 1 Introducing the FX5639 System

### Overview

The FX5639 is an embedded system with Intel® Celeron® Braswell low-power CPU module inside. This user's manual provides information on the physical features, installation, and BIOS setup of the FX5639.

Built to unleash the total potential of the Intel® Celeron® N3160 Quad-Core Processor, Able to support 1.6 GHz CPU, this system supports two 10/100/1000M Base -TX LAN ports, one PCIe Mini Card connector for Wireless/GPRS modules, four USB 2.0 and three USB 3.0 ports, Audio, GPIO, and two So-DIMM socket supports up to 8GB DDR3 RAM, free expansion PCI or PCIE slot, DP, HDMI and VGA ports.

Each FX5639 has six serial ports and parallel port for I/O communications. Four RS-232 ports and two RS232/RS422/RS485 port are available; the two RS232 and two RS232/ RS422/ RS485 with DB9 on the rear I/O and other two RS232 and parallel ports need use the system board to rear panel bracket option cable.

The FX5639 is perfect for ATM machines, KIOSK, point-of-sales/point-of- information, gaming and infotainment, measurement technology, lotteries, banking and Thin Client and small Embedded Control.

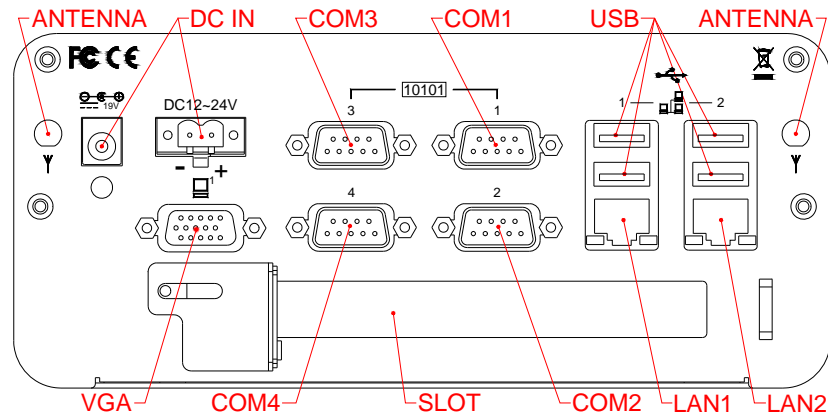
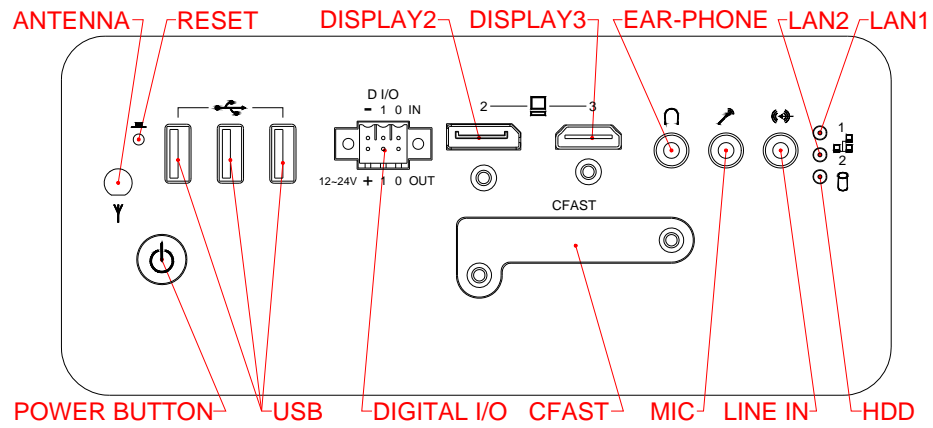
## Series Comparison Table

Model	FX5639	FX5639L
System Processor	Intel® Celeron® N3160 (Braswell)	
Clock Speed	1.6GHZ	
Cache	2M/L2	
Burst Frequency	2.24 GHZ	
Graphics Display	VGA/HDMI/DP	
Memory 204 Pin-DIMM*2	DDR3L-1333 4GB / 8GB (Max.)	
Storage	One CFAST Socket	
	One 2.5' SATA HDD Connector	
USB 2.0 / 3.0	Four / Three	
Audio	Ear-Phone/Line-In And MIC-In	
RJ45 LAN port (10/100/1000 Mbps)	Two Realtek RTL8111F	
Multi I/O	Two RS232 and Two RS232/RS422/RS485	
	Internal Two RS232 and One Parallel	
GPIO	Two- In/Two-Out	
PCIe Mini Card Socket	One	
SIM Card Socket	One	
Watchdog Timer	Yes	
Half size mini PCIE Module Adapter kits (OPI)	<a href="#">AK1006</a> PN:0606010028G	
Wall Mounting Kit (OPI)	<a href="#">FX5636K1</a> P/N:0606010027G	
One PCI & PCIE Riser Card Kit (OPI)	-	<a href="#">FB4745</a> P/N: 0120010004R
One/Two PCI Bus Riser Card Kit (OPI)	<a href="#">FB4705</a> P/N:0153000001G	<a href="#">FB4730</a> P/N: 0153010001G
One/Two PCIE Bus Riser Card Kit (OPI)	<a href="#">FB4744</a> P/N: 0120010003R	-
Operating Temperature	- 20~+ 55°C (4~131°F)	
Storage Temperature	- 30~+70°C (-22~158°F)	
Dimensions (Unit: mm)	190(W) x 240(D) X 82(H)	190(W) x 240(D) X 105(H)

Note: OPI (Option Item)

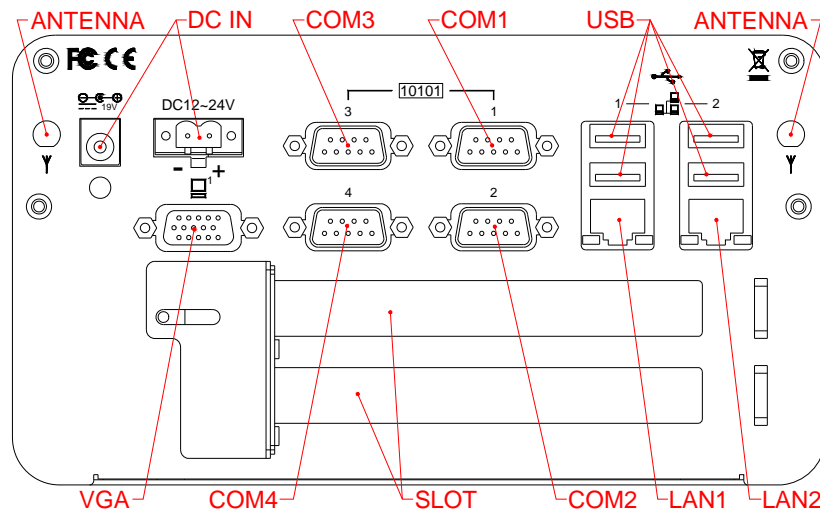
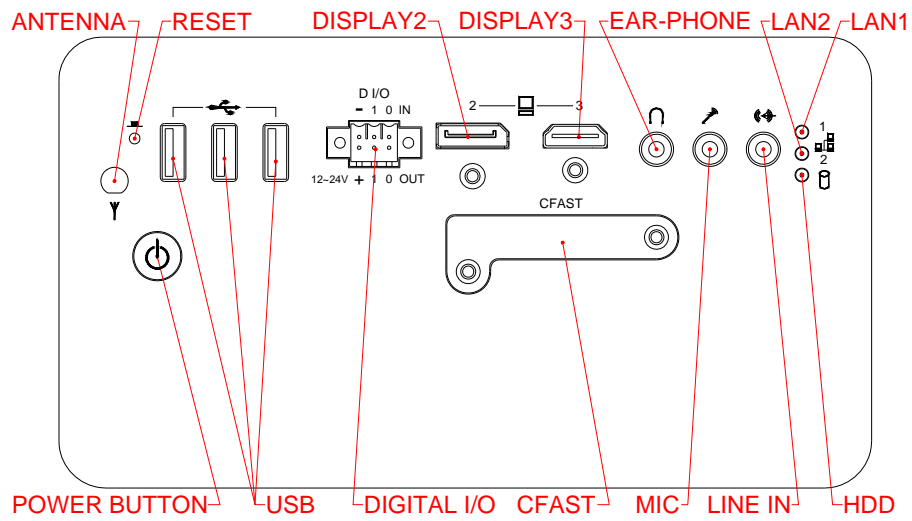
## Layout

➤ a. FX5639





➤ b. FX5639L



## Specifications

### ❑ ***Processor Board –***

Intel® Celeron® Braswell N3160 Quad-Core Soc 1.6GHZ (Burst- 2.24GHz)  
Low Power Processor with 4GB DDR3L-RAM.

### ❑ ***I/O Outlets –***

Two 10/100/1000 base-TX Ethernet LAN ports

Three USB 3.0 (front side) and four USB 2.0 (rear side) ports

Two RS-232 and Two RS-232/RS422/RS485 port with DB9

One HDMI, one DP Port and one VGA display connector with DB15

Three audio connectors for Earphone, Line-In and Microphone-in

Two-In and two-out GPIO with terminal block

One PCIE Mini card socket modules, especially for WLAN/GPRS module

One free PCI or PCIe slot for add-on PCI/PCIe card

One DC-In jack connector/terminal block with power push button switches

### ❑ ***LED Indicator –***

One power LED, One HD/CFAST access LED, and two LAN-Link LED

### ❑ ***Storage Bay-***

CFAST Compact Flash socket for CFAST Compact Flash modules

One 2.5" SATA hard disk space

### ❑ ***Power requirement –***

+12 ~ +24V DC, 2.82A maximum (1.22A typical) with 19V input voltage

### ***Dimensions -***

FX5639 - 190mm (W) x 240mm (D) x 82mm (H)

FX5639L - 190mm (W) x 240mm (D) x 105mm (H)

## Packing List

Upon receiving the package, verify the following things. Should any of the mentioned happens, contact us for immediate service.

- Unpack and inspect the FX5639 package for possible damage that may occur during the delivery process.
- Verify the accessories in the package according to the packing list and see if there is anything missing or incorrect package is included.
- If the cable(s) you use to install the FX5639 is not supplied from us, please make sure the specification of the cable(s) is compatible with the FX5639 system.

**Note:** after you install the FX5639, it is recommended that you keep the diskette or CD that contains drivers and document files, and keep the document copies, or unused cables in the carton for future use.

The following lists the accessories that may be included in your FX5639 package. Some accessories are option items that are only shipped upon order.

- One FX5639x embedded system.
- One AC to DC power adapter and 1 AC power cord.
- One 3-pin and one 6-pin apartable terminal block.
- One pack for HDD/riser card/mini card installation fixed screws (2/2/2).
- Four rubber stands with 4 fixed screws.
- One compact disc includes software utility and manual.

Option Items for All FX5639x:

- AK1006- Half size mini PCIe module adapter kits. (PN: 0606010028G)
- FX5636K1- Wall mounting Kit (P/N:0606010027G)
- One Serial and parallel port interface cable with bracket. (PN:7001000014G)
- Two serial ports interface cable with bracket.(PN:7001000093G)

Option Items for FX5639:

- FB4705- 1 Slot (32bit) PCI riser card. (PN: 0153000001G)
- FB4744- 1 Slot PCIE riser card. (PN: 0120010003R)

Option Items for FX5639L:

- FB4730- 2 Slot (32bit) PCI riser card. (PN: 0153010001G)
- FB4745- 1 Slot 32bit PCI + 1 slot PCIE riser card. (PN: 0120010004R)



## Chapter 2 Hardware Installation

This chapter introduces the system connectors & jumper settings, and guides you to apply them for field application.

### Before Installation

Before you install the system, make sure you follow the following descriptions.

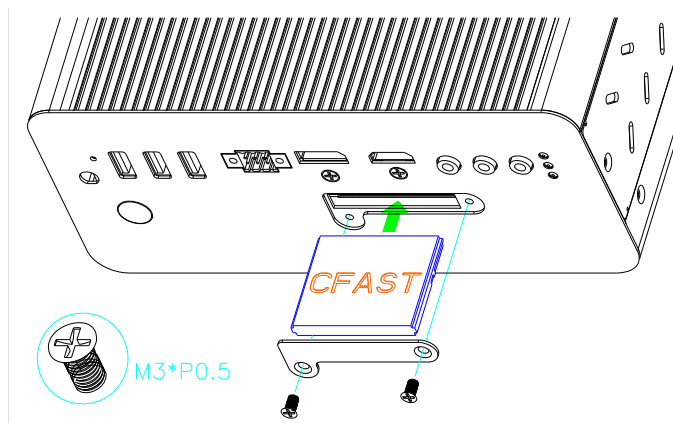
1. Before removing the cover, shut down the operation System and disconnect power switch to off and unplug AC-to DC Adapter cable.
2. Install or unplug any connector, CFAST, Mini-Card , and hard disk be sure that the power is disconnected or power switch to off from the system. If not, this may damage the system.
3. The ESD (Electricity Static Discharge) may be created from human body that touches the board. It may do damage to the board circuit.

□ **To install Hardware- remove the bottom cover**

If you are installing following hardware items, you can remove the bottom cover. They include SATA 2.5" HDD inside, mini PCIE WLAN or GPRS module, PCI or PCIE Riser card kit, PCI or PCIE expansion card and DDR3L-RAM module to the FX5639. (Please see the spots circled.)

**a. Installing CFAST Compact Flash**

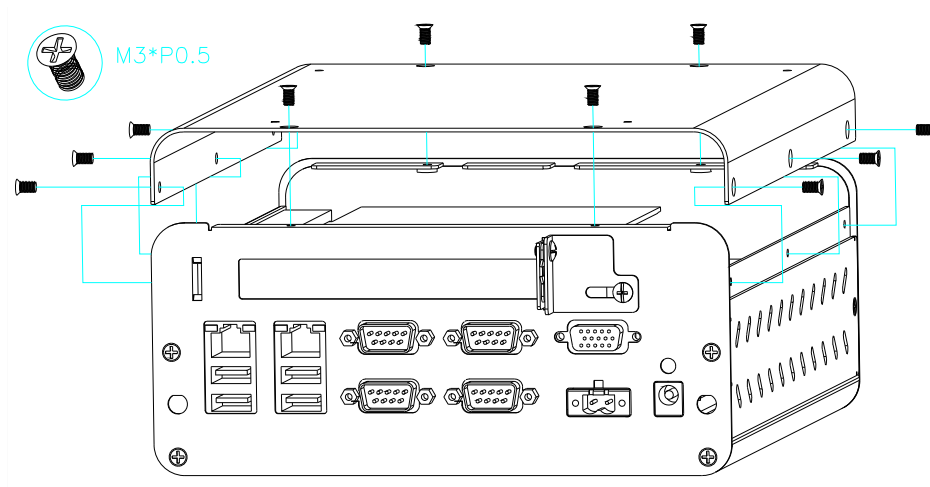
Use a cross-head screwdriver to remove screws that secure the front cover.



**Note:** The CFAST Compact Flash socket supports CFAST Compact Flash Modules.

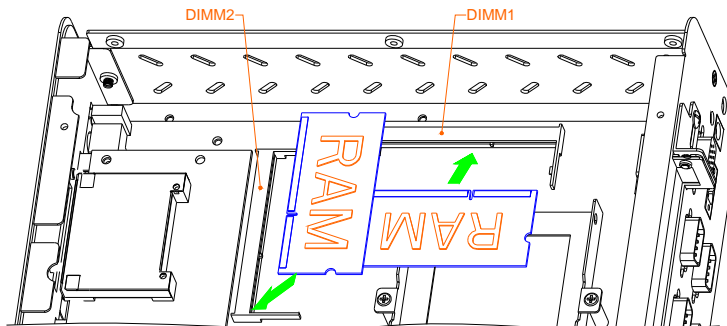
**b. Unscrew Bottom cover**

Use a cross-head screwdriver to remove 10 screws that secure the bottom cover.



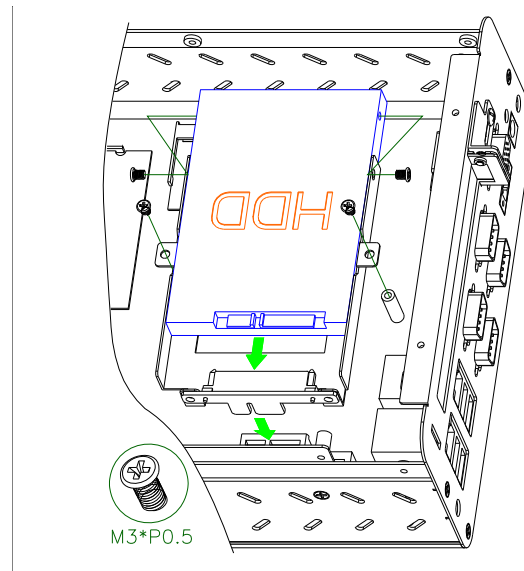
### c. Installing Memory

If you may extend additional memory to system, see as following figure. The So-DIMM socket supports 2GB to 4GB (Max. 8GB) of DDR3L RAM modules. Installing memory module to DIMM1 socket, when only one memory module. We recommend that installing dual channel (DIMM1 & DIMM2) RAM module made by the same part number and manufacturer.



### d. Installing Hard Disk

Faster Screws up the Hard disk device to HDD metal frame before plug to the SATA connector then insert to SATA slot and screws up metal frame to system. See following figure.



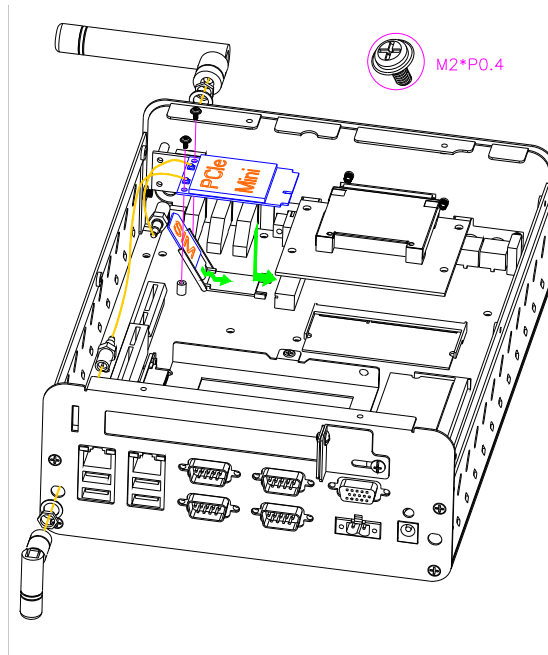
**Note:** Use caution when handling the hard disk to prevent damage to SATA connector as you inserted hard disk. Be careful with the orientation when installing connectors.



### e. Installing PCIe Mini Card Module

FX5639x supports PCIe mini card socket; you may extend additional PCIe mini card module and SIM card to system. Connect to the antenna cable from rear and front side antenna holes to GPRS or Wireless LAN module and install the SIM card for GPRS. See following figures.

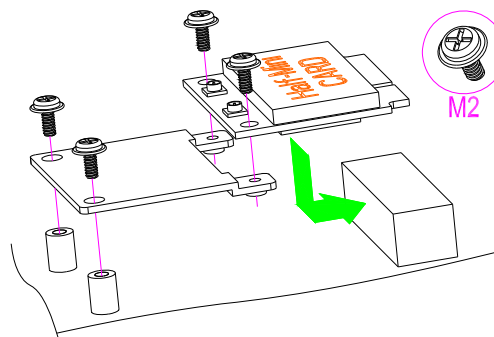
#### ◇ e1. Installing PCIe Mini Card and SIM card



**Note:**

1. When installing PCIe GPRS Mini card on FX5639 system these is need the installing the SIM Card to system board.
2. Open the cover with SIM socket then insert SIM card into the SIM card hold. Make sure that the SIM card is properly inserted and that golden contact area on the card is facing downwards.

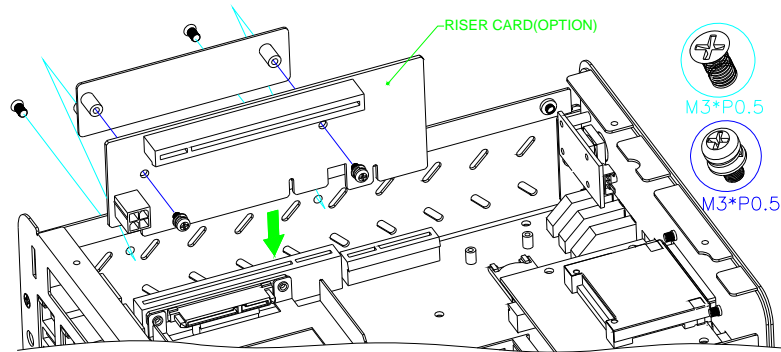
#### ◇ e2. Installing Half Size Mini PCIe module kit (Option)



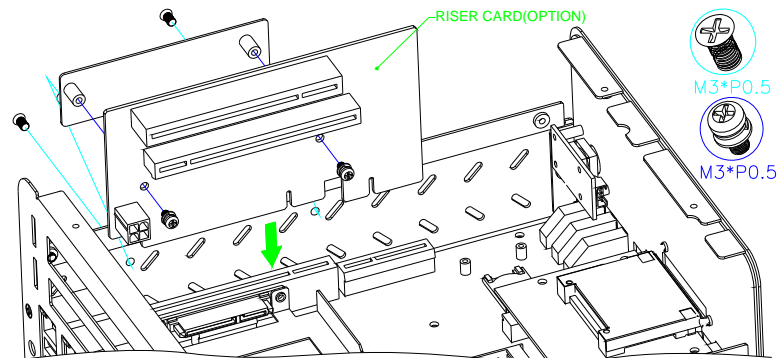
**f. Installing PCI or PCIE Riser Card kit (Option) - for Expansion Card**

FX5639 and FX5639L provides FB4705 kit- 1 slot PCI bus, FB4744 kit -1 slot PCIE bus, FB4745 kit- 1 slot PCI and 1 slot PCIE bus, FB4730 kit -2 slot PCI bus, If you are installing the riser card kit for Expansion PCIE hardware, you can remove the bottom cover. The following figure will guide you how to install riser card kit inside the FX5639/L., See following figures.

◇ **f1. Installing FB4705 or FB4744 kit- PCI or PCIE Riser Card**



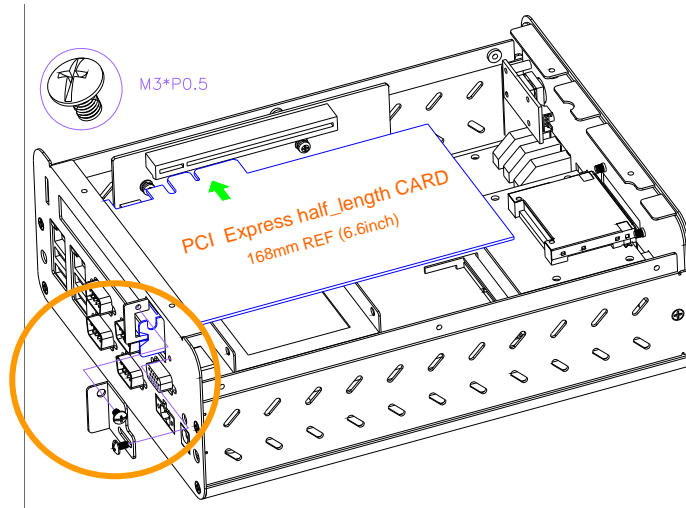
◇ **f2. Installing FB4730, or FB4745 - 2PCI, or PCI+PCIE Riser Card**



**g. To installing Expansion Card – PCI/PCIE Card**

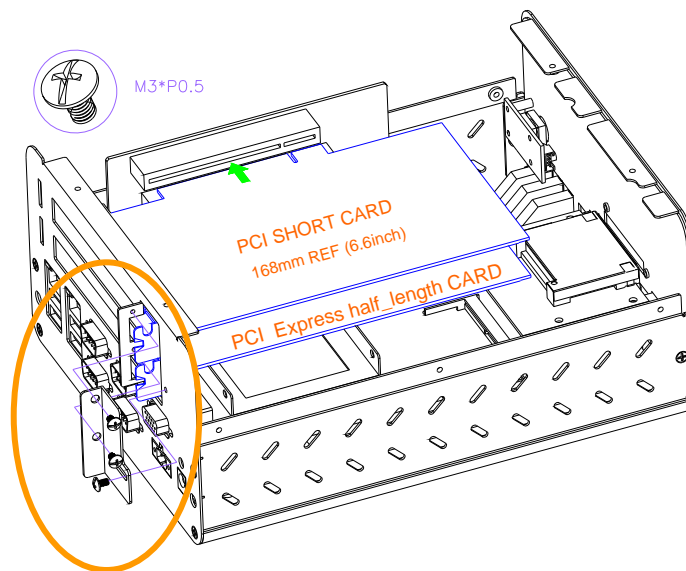
If you are installing Expansion PCI or PCIE hardware interface card, you can remove the bottom side cover. The following figure will guide you how to install PCI/PCIE interface card inside the FX5639 system and screw the L-Type Metal on the PCI/PCIE card Bracket and expansion card holder. (Please see the spots circled.)

✧ **g1. Installing PCI or PCIE Expansion Card- for FX5639**



**Note:** 1. The PCI Slot supports +3.3V/+5V/+12V (1A)/-12V (500mA).  
 2. The PCIE bus supports x1/x2 lanes via PCIE X16 slot.

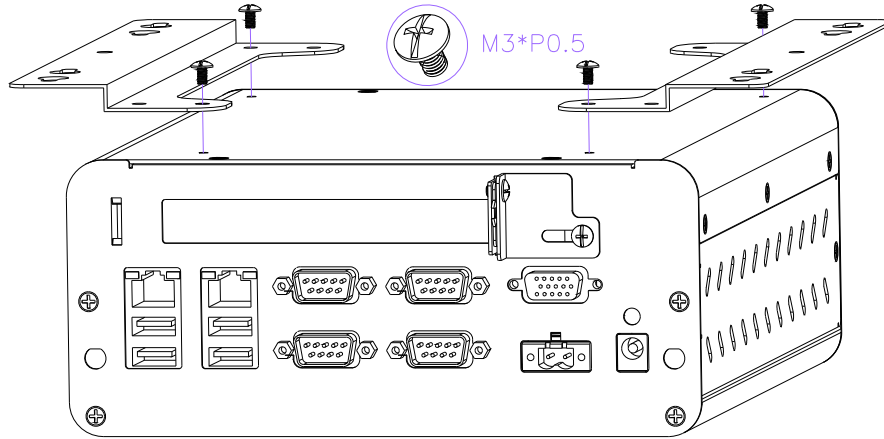
✧ **g2. Installing PCI and PCIE Expansion Card- for FX5639L**



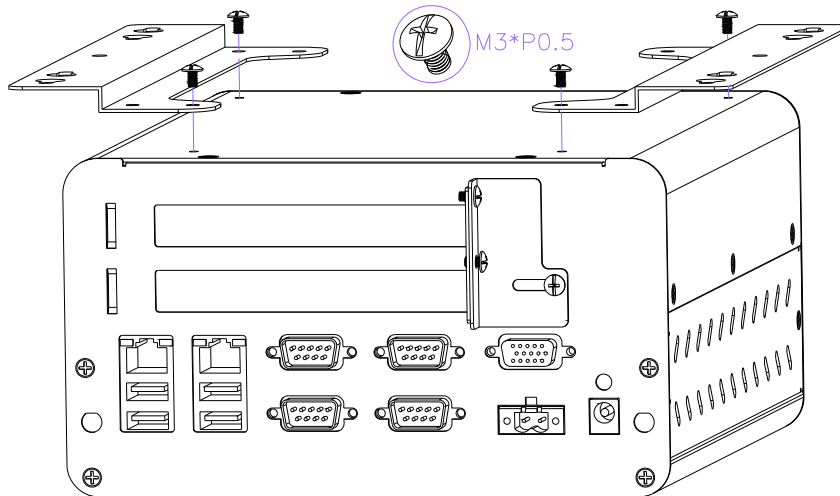
### h. Installing the FX5636K1 -Wall Mounting

Please refer to the down side figure for installing the FX5639/FX5636L with universal fixers.

h1.FX5639

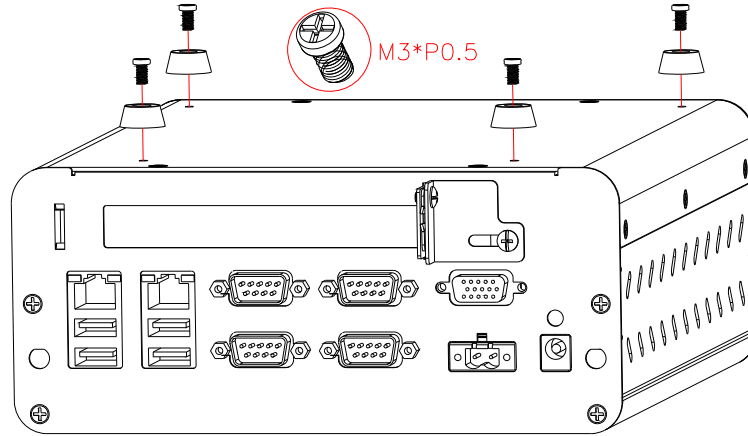


h2.FX5639L

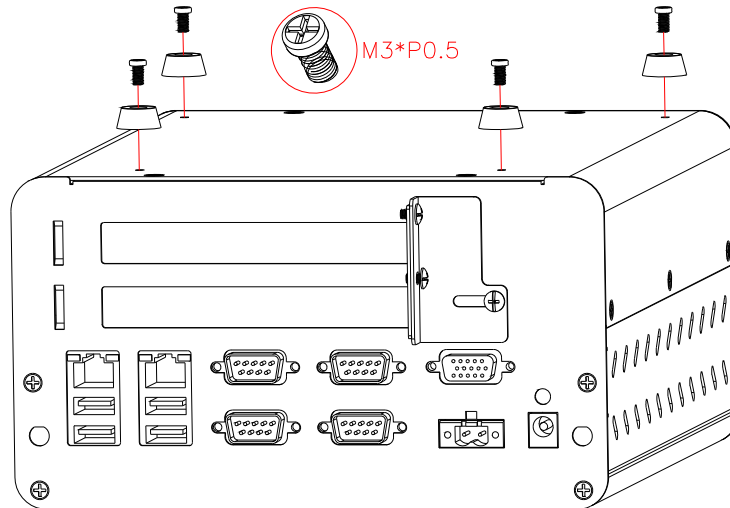


### i. Installing the Rubber Feet

i1.FX5639

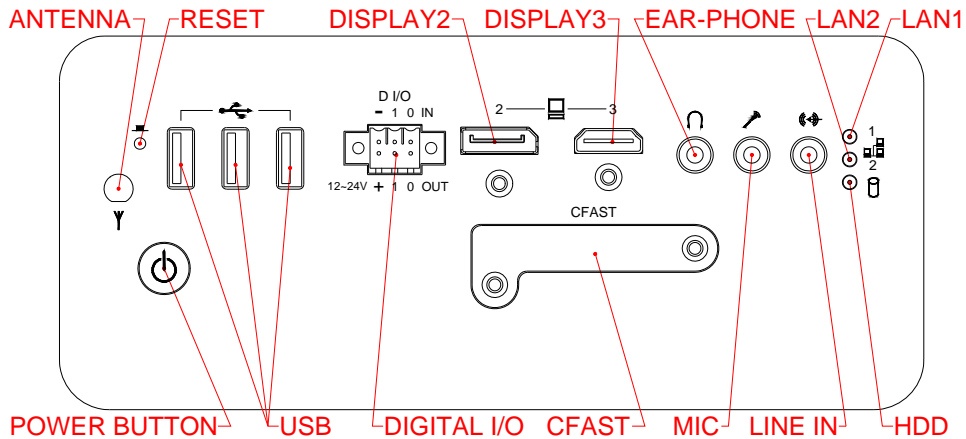


i2.FX5639L



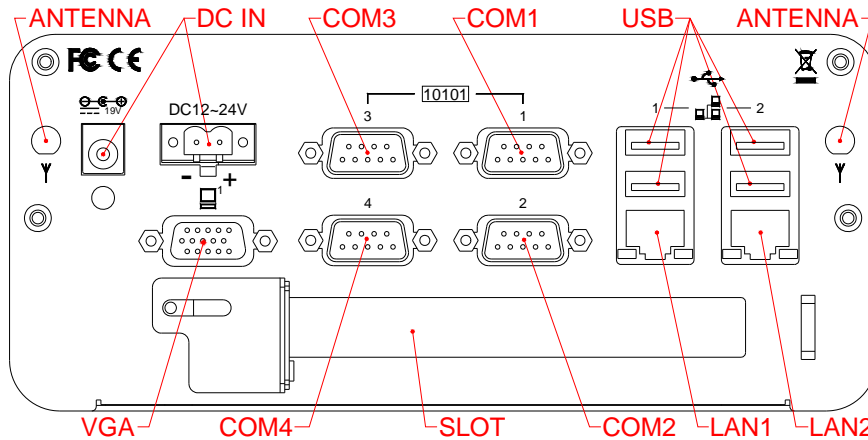
□ **LED Indicators (On the Front Panel)**

The Power Button and HDD LED's have two distinctive statuses: Off for inactive operation and blinking light for activity. And the 2 LED's for LAN ports. The LAN1 and LAN2 LED's (Green) indicate on-line/access status of LAN1 and LAN2 respectively.

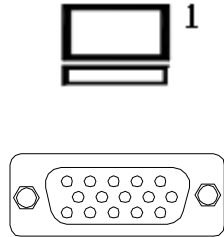


□ **I/O Peripheral Connectors**

View from the back side, If you are connecting the monitor, LAN, audio, COM and USB to the FX5639. See following figure and a side pictures.

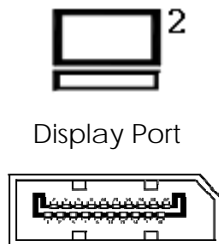


1. Connecting the VGA port

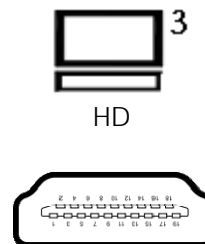


DB15	Signal
1	Red
2	Green
3	Blue
13	Hsync
14	Vsync
12	DDC Data
15	DDC Clock
5 & 10	Digital Ground
6,7,8	Analog Ground
Others	Not Used

2. Connecting the Display port



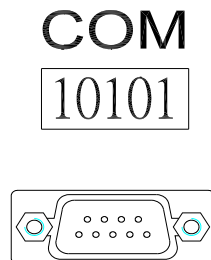
Display Port



HD

3. Connecting the COM ports

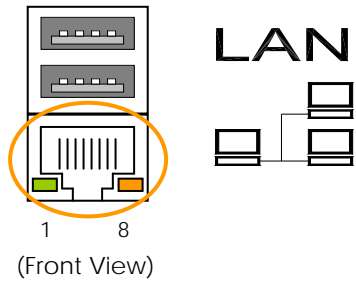
The DB9 COM3/4 is standard RS232 serials port, and the DB9-COM1/2 is designed for multiple proposes. The COM1/2 can select RS232/RS422/RS485 by [BIOS CMOS](#) setting. The following tables show the signal connections of these connectors.



DB-9	RS-232 Signal	RS-422	RS-485
1	-DCD	TX-	485-
6	-DSR		
2	RXD	TX+	485+
7	-RTS		
3	-TXD	RX+	
8	-CTS		
4	-DTR	RX-	
9	-RI		
5	Ground		
Case	Case Ground		

#### 4. Connecting the LAN ports

The RJ45 connector with 2 LED's for LAN. The right side LED (orange) indicates data is being accessed and the left side LED (green) indicates on-line status. (On indicates on-line and off indicates off-line)

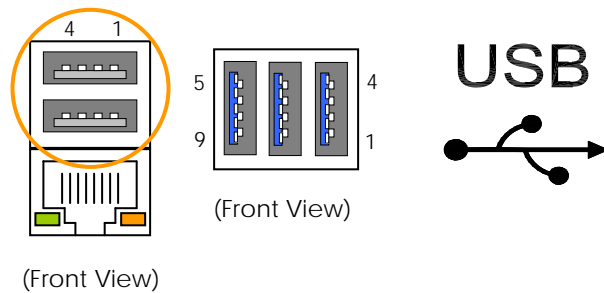


The following lists the pin assignment of RJ45.

LAN1/LAN2	Signal	LAN1/LAN2	Signal
1	TPTX+	5	TPTX1-
2	TPTX -	6	TPRX -
3	TPRX+	7	TPRX1+
4	TPTX1+	8	TPRX1-

#### 5. Connecting the USB Ports

The system supports a six port USB connector. Any USB device can be attached to USB ports as plug-and-play function is supported. The front side port USB #1/2/3 can support USB2.0/3.0, and rear side USB # 4/5 and USB # 6/7 support USB 2.0.



USB	Signal
Pin 1	USBV
Pin 2	USBD- (V2.0)
Pin 3	USBD+ (V2.0)
Pin 4	USBG
Pin 5	StdA_SSRX-(V3.0)
Pin 6	StdA_SSRX+(V3.0)
Pin 7	USBG (V3.0)
Pin 8	StdA_SSTX-(V3.0)
Pin 9	StdA_SSTX+(V3.0)

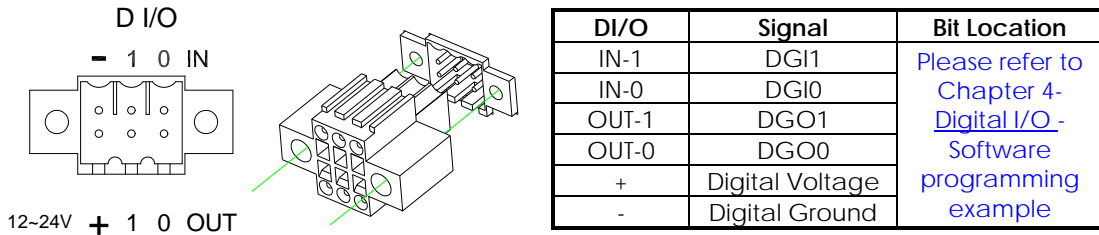
#### 6. Connecting the Audio Ear-Phone/ Mic In/ Line- In





## 7. Digital I/O Connector

The system provides 2-in and 2-out isolated digital I/O, output port is an open collector, you will need connections external voltage of Digital (+) and digital (-) connector.

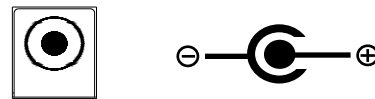
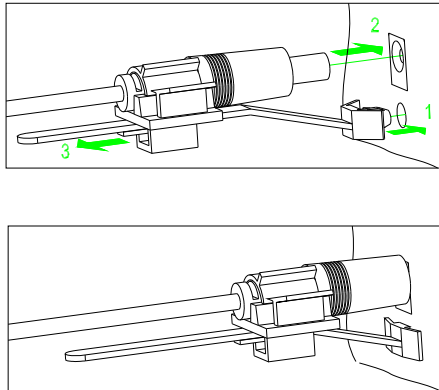


**Note:** Digital inputs accept DC12-24V Signal with isolated input. Digital outputs are active-low open collector output, and can drive up to 60V/400mA maximum.

□ **Connecting the DC Power and Power Button**

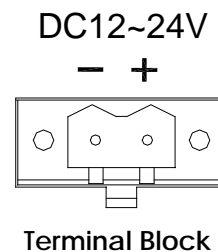
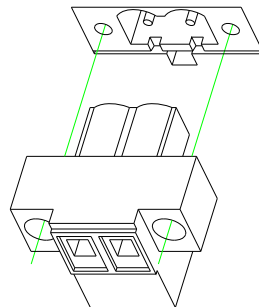
Power is supplied through an external AC/DC power adapter or power DC In. Check the technical specification section for information about AC/DC power input voltage. See following figure and a side pictures.

1. DC-Power Jack: External AC/DC power adapter plug into DC-jack (2) and use the cable mount to fix hole (1), then pull at cable(3).



DC +12V~+24V, 65VA minimum

2. DC Power Connector: Use external 2-pin apartable terminal block.



3. Power Button & Reset Push Button: Pushing the Power button once will switch the FX5639 on and off, And Reset push button is switcher for system reset; Push and release the button will cause hard ware reset of FX5639 and restart system booting.



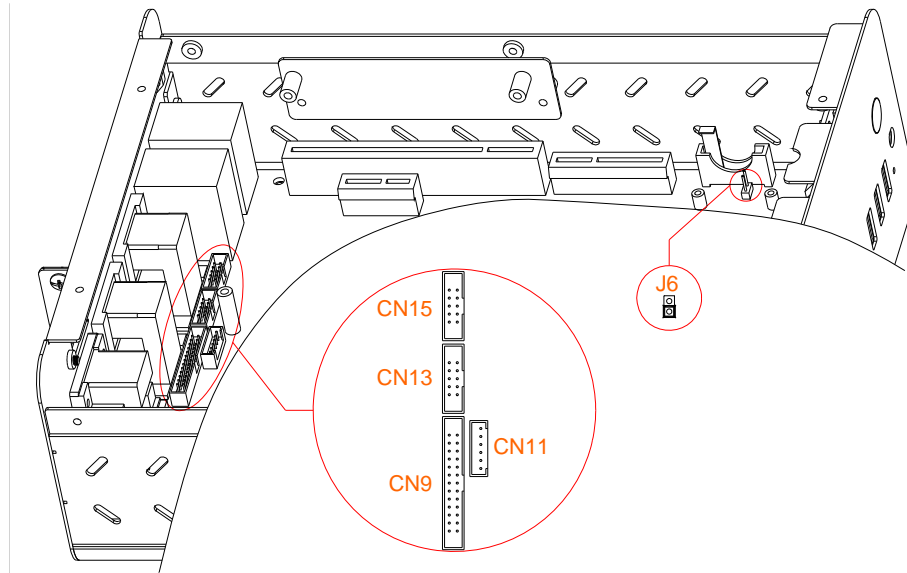
Power button: On/Off



Reset Push Button: Restart

□ **Internal Connector and Jumper Setting**

The CN13- COM5 and CN15- COM6 are RS232 Serial ports, CN9 is Parallel port; those RS232, parallel connectors by use the option interface cable to transfer DB9, and DB25 with bracket on the system board inside the FX5639/L, and J6 is used to select clear CMOS data.



**a. J6: Clear CMOS Setting**

You can use J6 to clear CMOS data. The CMOS stores information like system date, time, boot up device, password, IRQ... which are set up with the BIOS. To clear the CMOS, set J6 to close and then open before system powers off. The default setting is opened.

J6



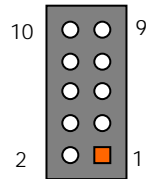
Factory Preset



Clear CMOS Data

**b. CN13/CN15: COM5 & COM6 RS232 Serial Ports Header (2.0mm)**

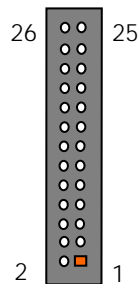
The CN13 and CN15 is 10-pin 2.0mm header; use the serial port adapter cables (Option) are used to transfer 10-pin IDC connector into standard DB9 connectors.



DB-9	CN13/CN15	RS-232
1	1	-DCD
6	2	-DSR
2	3	RXD
7	4	-RTS
3	5	-TXD
8	6	-CTS
4	7	-DTR
9	8	-RI
5	9	Ground
Metal	10	Case Ground

**c. CN9: Parallel Port Header (2.0mm)**

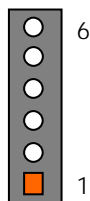
The CN9 is 26-pin 2.0mm header; use the printer interface cable to transfer 26-pin connector into standard DB25 connector.



CN9	DB-25	Signal	CN9	DB-25	Signal
1	1	-STROBE	2	14	-AUTO FORM FEED
3	2	DATA 0	4	15	-ERROR
5	3	DATA 1	6	16	-INITIALIZE
7	4	DATA 2	8	17	-PRINTER SELECT IN
9	5	DATA 3	10	18	Ground
11	6	DATA 4	12	19	Ground
13	7	DATA 5	14	20	Ground
15	8	DATA 6	16	21	Ground
17	9	DATA 7	18	22	Ground
19	10	-ACKNOWLEDGE	20	23	Ground
21	11	BUSY	22	24	Ground
23	12	PAPER	24	25	Ground
25	13	PRINTER SELECT	26	--	No Used

**d. CN11: Keyboard/Mouse Connector (2.0mm)**

CN11 is a 6-pin 2.0mm JST connector, use the KB/MS adapter cables (Option) you can attach standard PS/2 type keyboard and mouse.



PIN	Signal
1	Mouse Data
2	Keyboard Data
3	Ground
4	VCC
5	Mouse Clock
6	Keyboard Clock



## Chapter 3 BIOS Setup

This chapter describes the BIOS setup.

### Overview

BIOS are a program located on a Flash memory chip on a circuit board. It is used to initialize and set up the I/O peripherals and interface cards of the system, which includes time, date, hard disk drive, the internal bus and connected devices such as the video display, diskette drive, and the keyboard. This program will not be lost when you turn off the system.

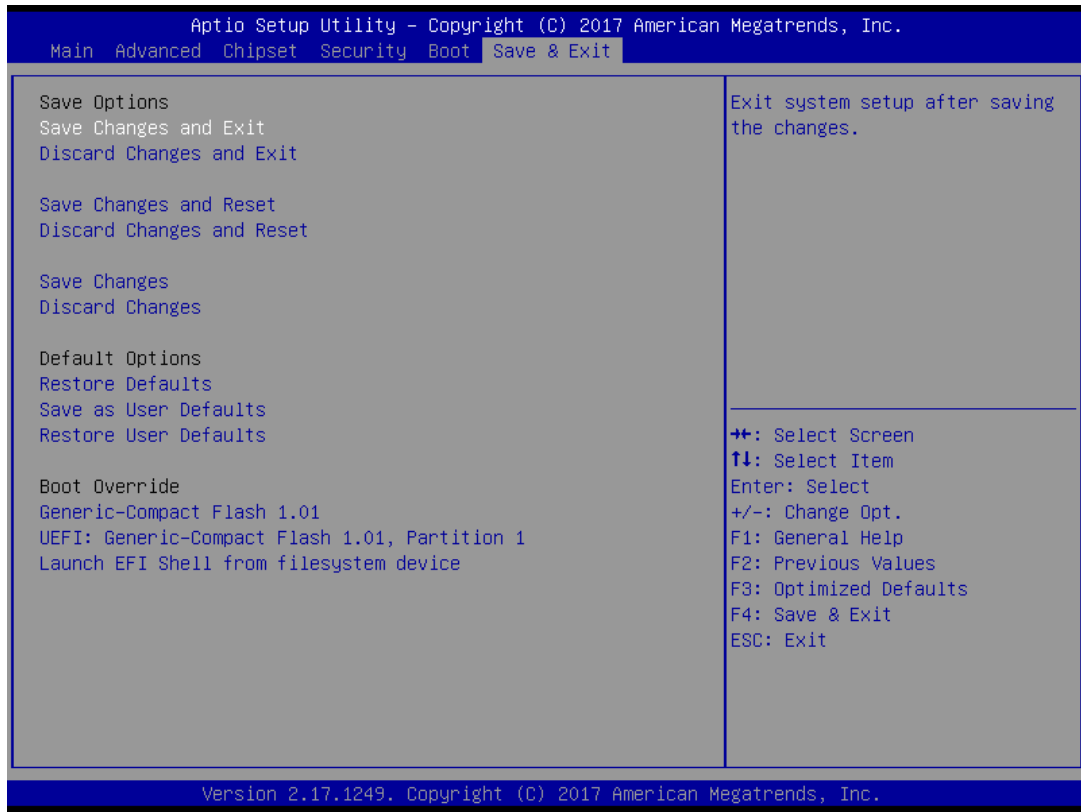
The BIOS provides a menu-driven interface to the console subsystem. The console subsystem contains special software, called firmware that interacts directly with the hardware components and facilitates interaction between the system hardware and the operating system.

The BIOS default values ensure that the system will function at its normal capability. In the worst situation the user may have corrupted the original settings set by the manufacturer.

All the changes you make will be saved in the system RAM and will not be lost after power-off.

When you start the system, the BIOS will perform a self-diagnostics test called Power On Self Test (POST) for all the attached devices, accessories, and the system. Press the [Del] key to enter the BIOS Setup program, and then the main menu will show on the screen.

**Note:** Change the parameters when you fully understand their functions and subsequence.



□ **BIOS Functions**

On the menu, you can perform the following functions

1. Main
2. Advanced
  - ACPI Settings
  - IT8786 Super IO Configuration
  - Hardware Monitor
  - Serial Port Console Redirection
  - CPU Configuration
  - Thermal Configuration
  - SATA Configuration
  - Network Stack Configuration
  - CSM Configuration
  - USB Configuration
  - Security Configuration
3. Chipset
  - North Bridge
  - South Bridge
4. Security
5. Boot
6. Save & Exit

□ **Keyboard Convention**

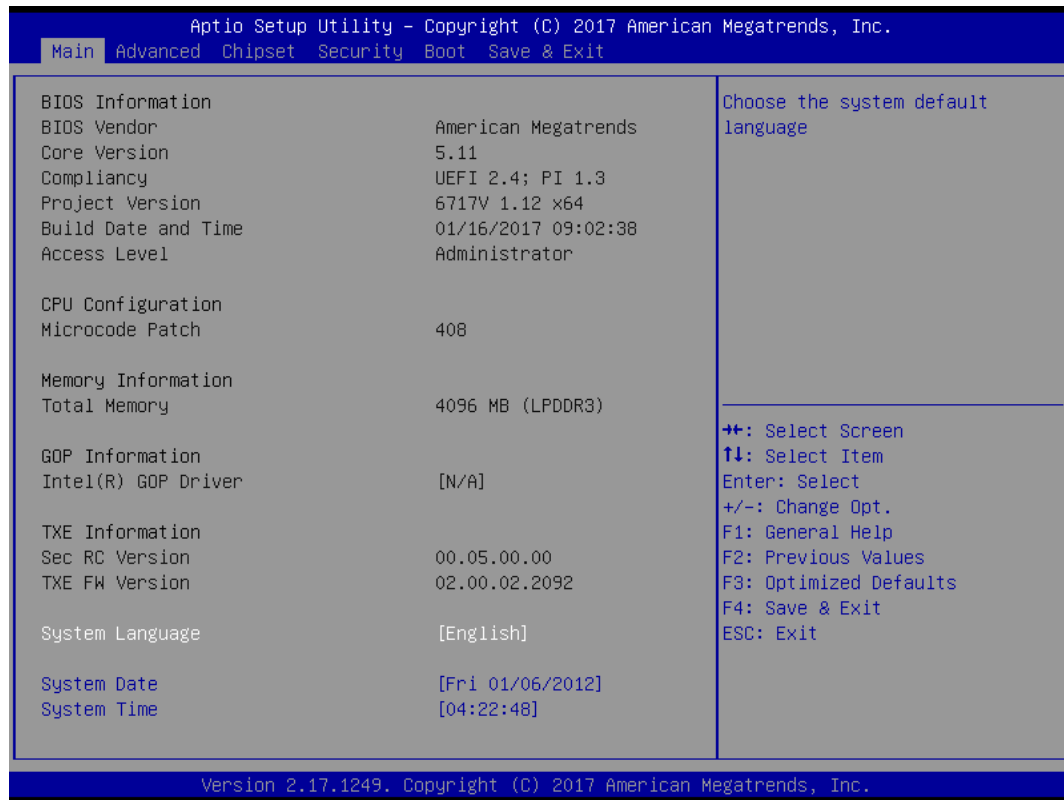
On the BIOS, the following keys can be used to operate and manage the menu:

Key	Function
[↑][↓]	The Up and Down keys allow you to select item.
[←][→]	The Left and Right keys allow you to select screen.
[Enter]	The Enter key allows the user to select an option to edit its value or access a sub menu.
[+]/[-]	The Plus and Minus keys allow you to change the field value of a particular setup item.
[F1]	General Help.
[F2]	Previous Values.
[F3]	Optimized Defaults.
[F4]	Save current configuration and exit.
[ESC]	To exit the current menu or message.



## Main Setup

This section describes BIOS version information and basic system hardware configuration. If the CPU board is already installed in a working system, you will not need to select this option anymore.



### System Date & Time Setup

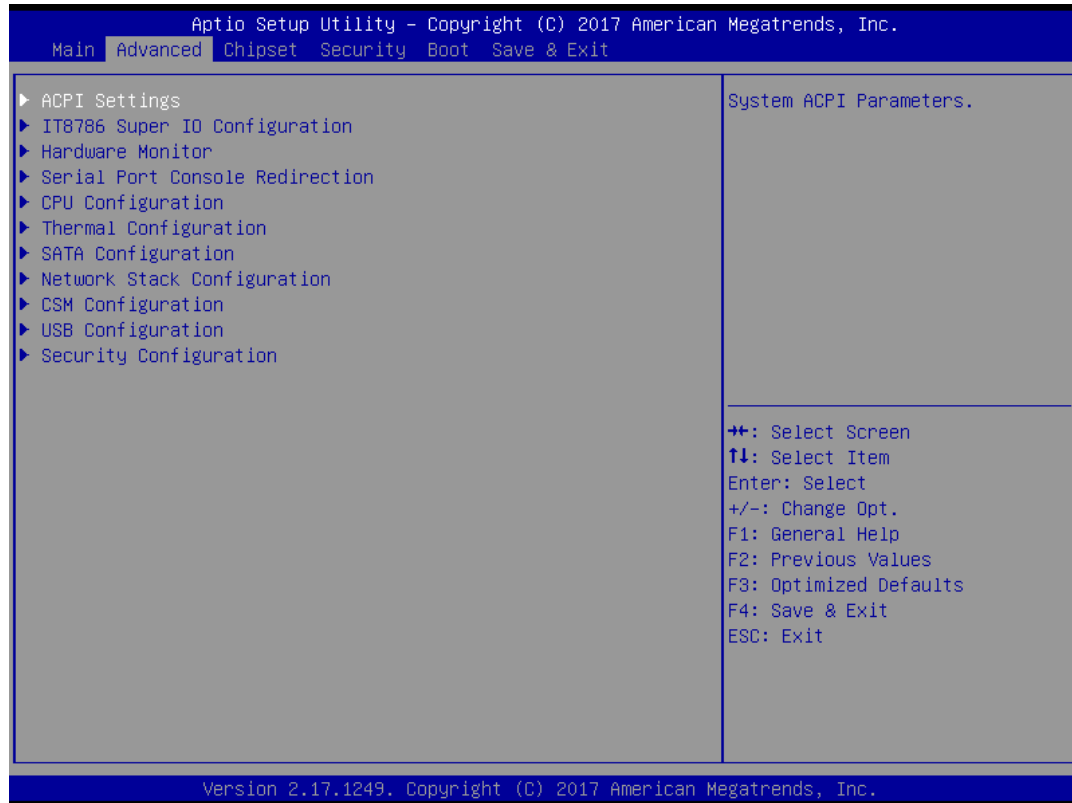
Highlight the <Date> field and then press the [+]/ [-] keys or enter new values to set the current date. Follow the month, day and year format.

Highlight the <Time> field and then press the [+]/ [-] keys or enter new values to set the current date. Follow the hour, minute and second format.

The user can bypass the date and time prompts by creating an AUTOEXEC.BAT file. For information on how to create this file, please refer to the MS-DOS manual.

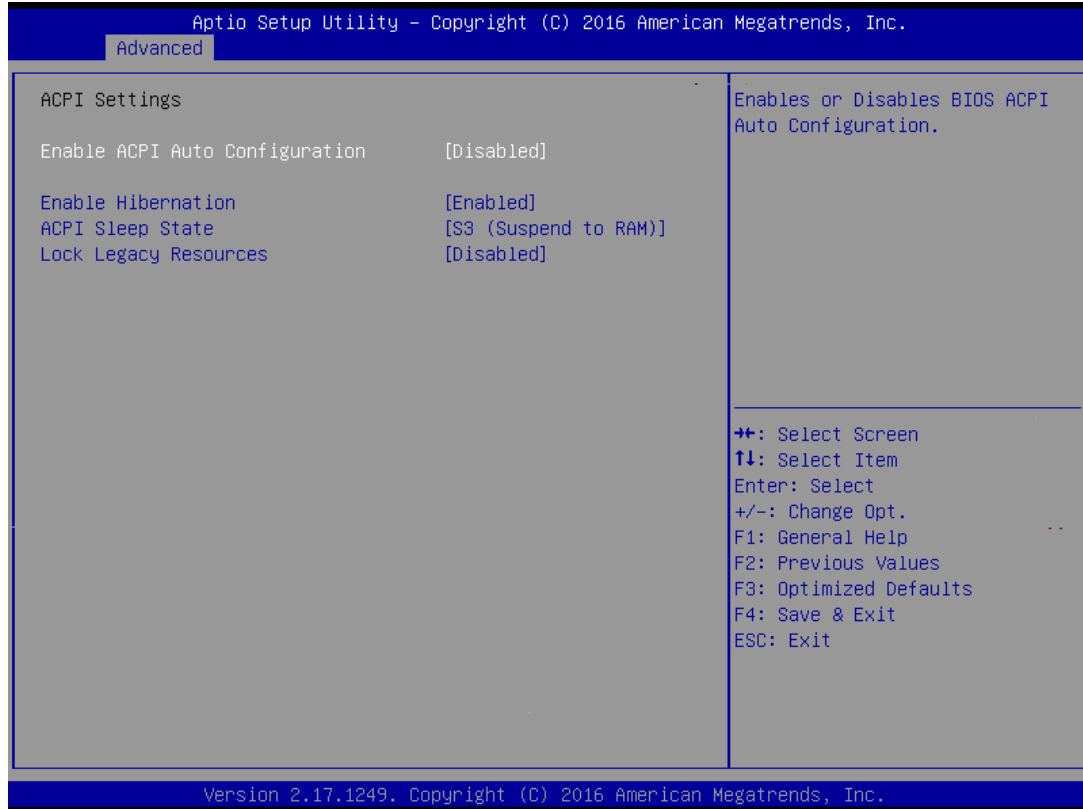
## Advanced Setup

Select the Advanced tab from the 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 USB 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



□ **ACPI settings**

This field specifies allow you set this value to utilize the ACPI (Advanced Configuration and Power Interface) specification.



**Enable ACPI Auto Configuration**

This item allows users to enable or disable BIOS ACPI Auto configuration.

**Available Options:** Disabled, Enabled

**Default setting:** Disabled

**Enable Hibernation**

This item allows users to enable or disable system ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

**Available Options:** Disabled, Enabled

**Default setting:** Enabled

**ACPI Sleep State**

This item allows users to select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

**Available Options:** Suspend Disabled and S3 (Suspend to RAM)

**Default setting:** S3 (Suspend to RAM)

**Lock Legacy Resource**

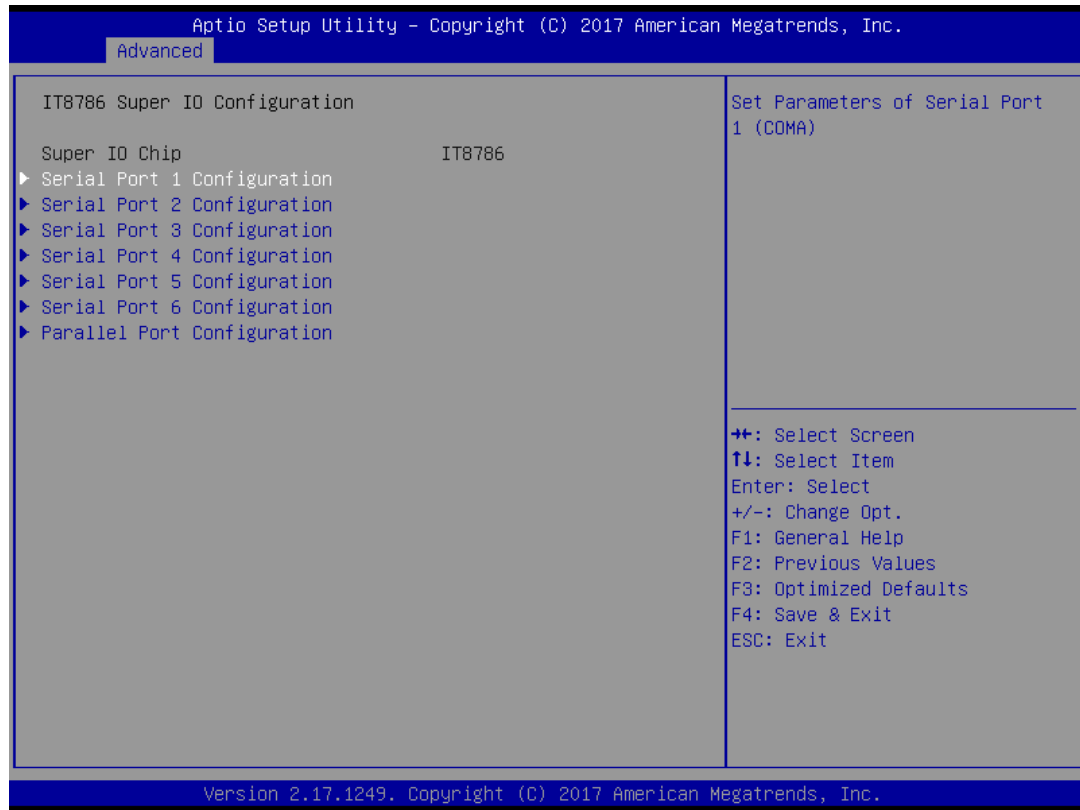
This item allows users to enable or disable Lock of Legacy Resources.

**Available Options:** Disabled, Enabled

**Default setting:** Disabled

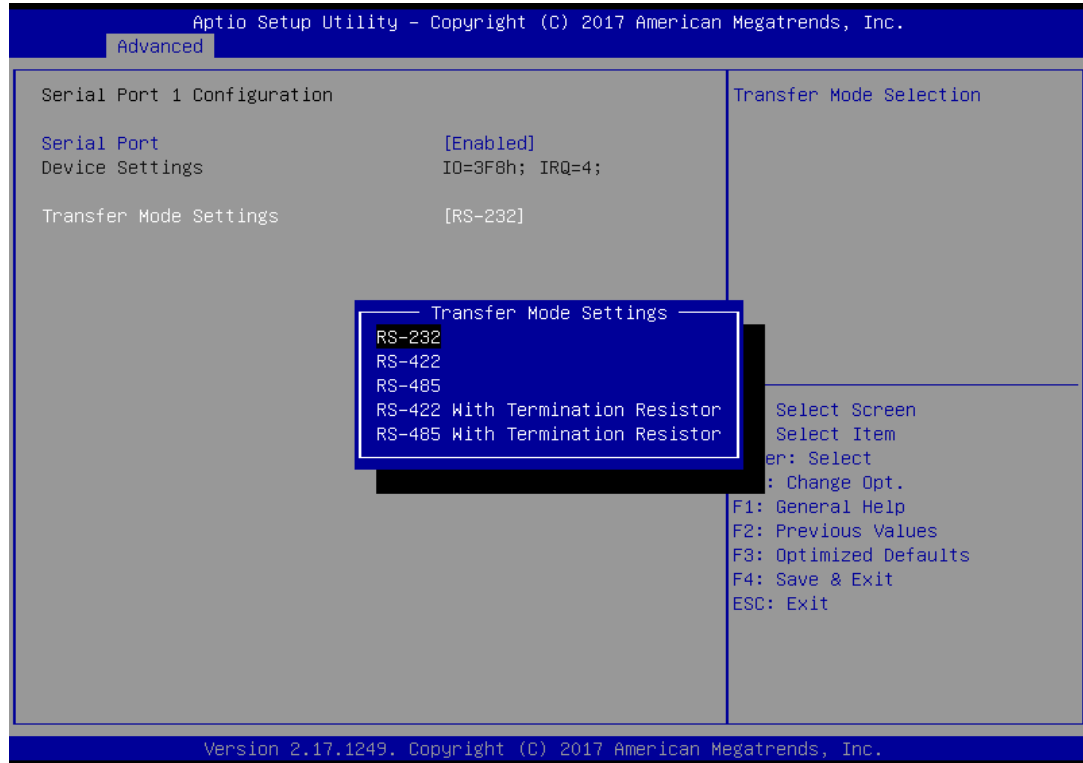
## □ IT8786 Super IO Configuration

This section describes the function of Super I/O settings.



## Serial Port 1/2 Configuration

These fields select the I/O port address for Serial port 1/2.



### ✧ *Serial Port*

This item allows users to select the enable or disable Serial port.

**Available Options:** Enabled, and Disabled.

**Default setting:** Enabled

Device Setting COM1-3F8/IRQ4/COM2-2F8/IRQ3

### COM1/2 Port Set Select

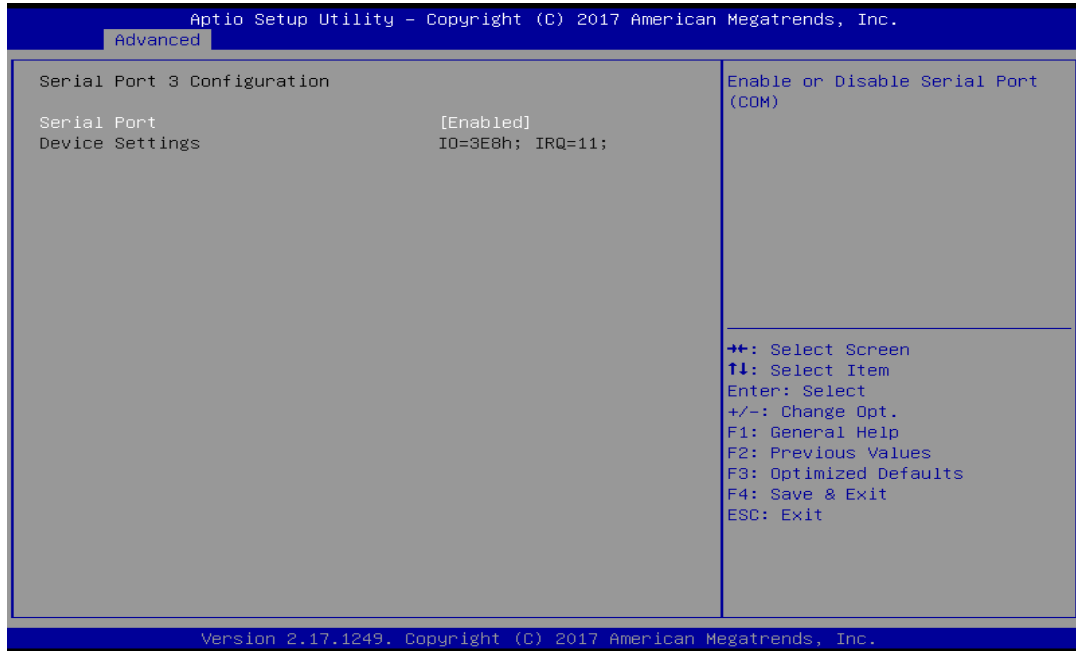
This item allows users can select RS-232, RS-422 and RS-485 of select COM1.

**Available Options:** RS-232, RS-422, RS485, RS232 with Terminal Resistor and RS485 with Terminal Resistor

**Default setting:** RS-232

## Serial Port 3/4 Configuration

These fields select the I/O port address for Serial port 3/4.



### ✧ *Serial Port*

This item allows users to select the enable or disable Serial port.

**Available Options:** Enabled, and Disabled.

**Default setting:** Enabled

Device Setting COM3-3E8/IRQ11/COM4-2E8/IRQ10

## Serial Port 5/6 Configuration

These fields select the I/O port address for Serial port 5/6 (Option RS232 Interface Cable with bracket).



### ✧ *Serial Port*

This item allows users to select the enable or disable Serial port.

**Available Options:** Enabled, and Disabled.

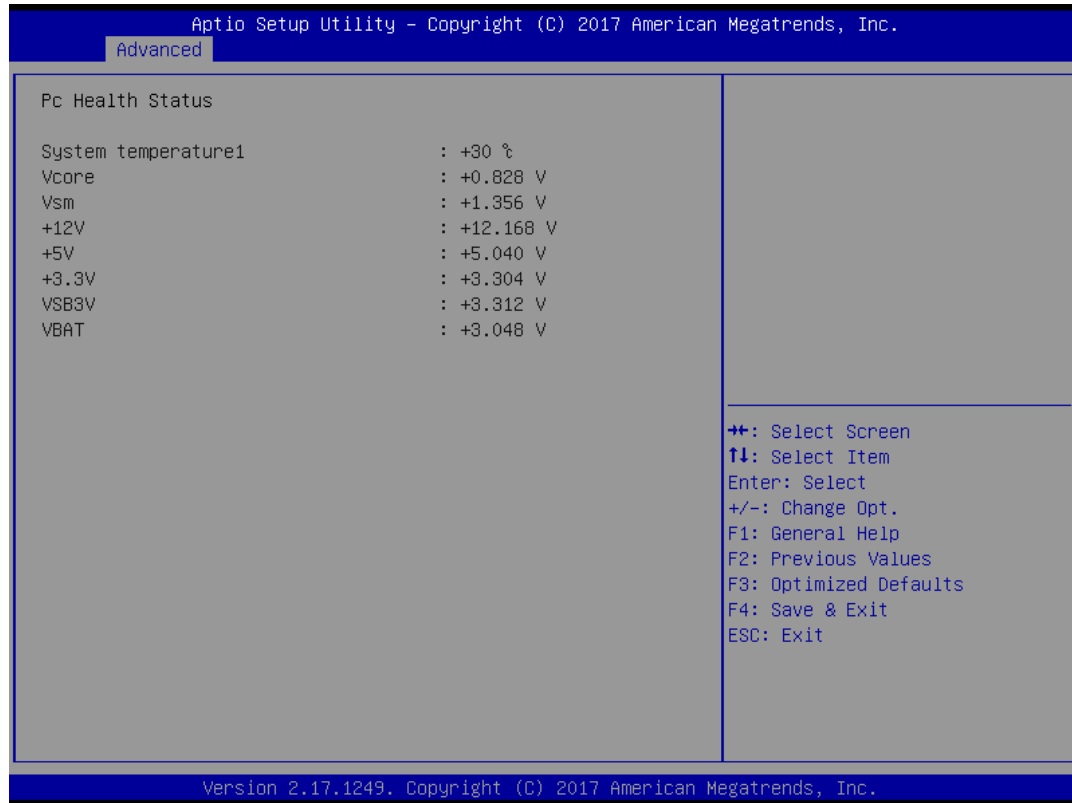
**Default setting:** Enabled

Device Setting COM5-3E0/IRQ11/COM6-2E0/IRQ10



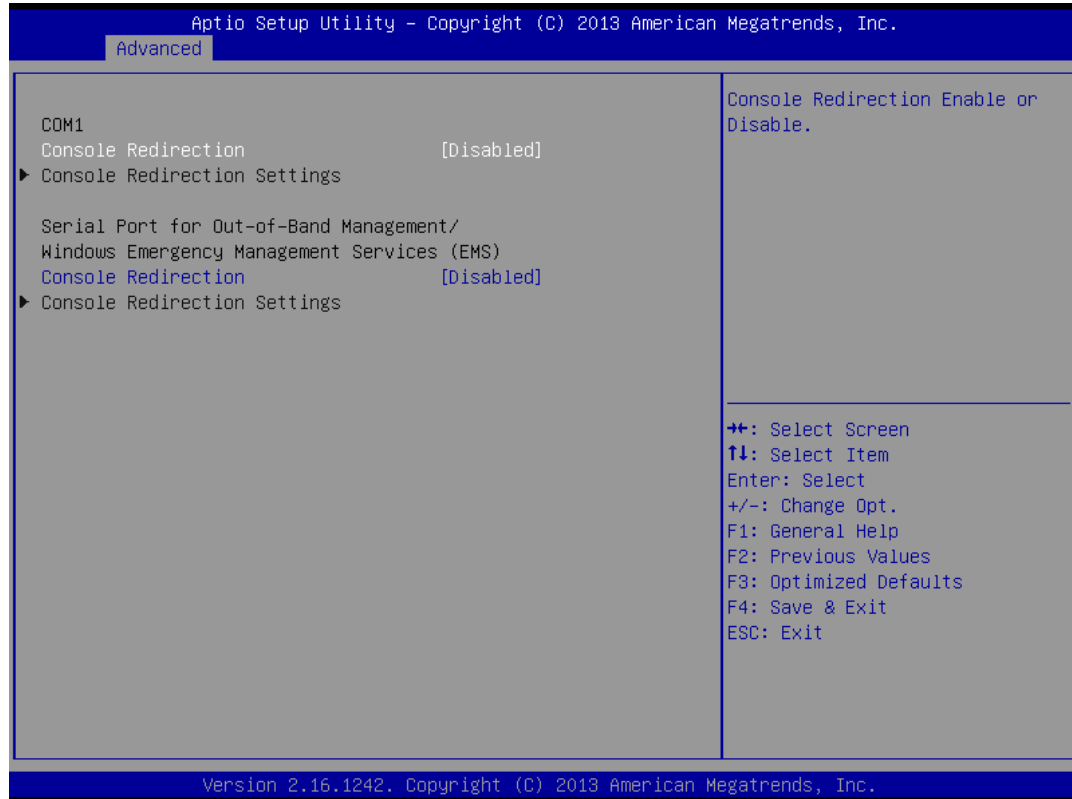
□ **Hardware Monitor Configuration**

On the Hardware Monitor Setup screen, you can monitor the system, +3.3V voltage, and VBAT voltage...



□ **Serial Port Console Redirection**

This option turns on console redirection support in the BIOS and is the default setting. The remote access feature requires the use of the COM1 connector located at the rear panel of the FX5639.



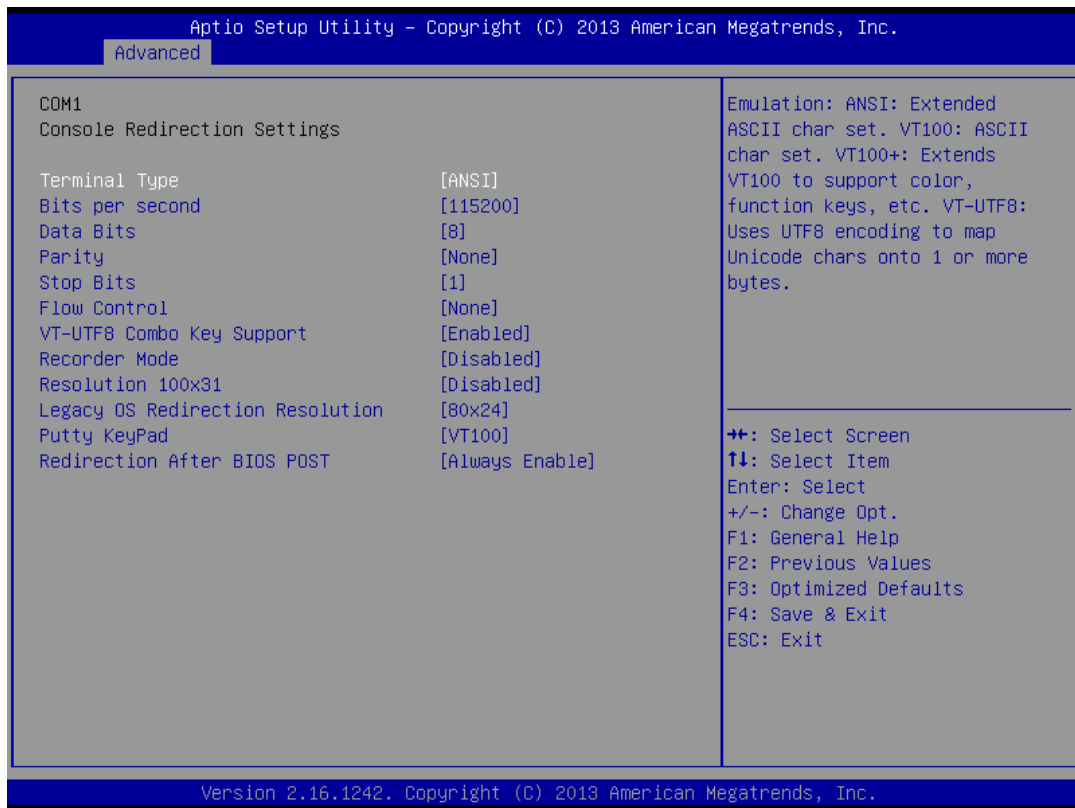
**COM1 - Console Redirection**

This field is select console redirection Enable or disable.

**Available Options:** Enabled, and Disabled

**Default setting:** Disabled

✧ **Console Redirection Setting**



**Terminal Type**

This field is selecting the target terminal type.

**Available Options:** VT100, vt100+, VT-UTFB, and PC\_ANS1

**Default setting:** VT100

**Bits per Second**

This field is select Serial ports can use baud rate. Just keep in mind that speed must match terminal setting.

**Available Options:** 9600, 19200, 57600, and 115200

**Default setting:** 115200

**Data Bit**

This field is select Serial ports can use data bit. Just keep in mind that the data bits must match terminal setting.

**Available Options:** 7 Bots, and 8 Bits

**Default setting:** 8 Bits

### **Parity**

This field is select Serial ports can use parity mode. Just keep in mind parity must match terminal setting.

**Available Options:** None, Even, Mark, and Space

**Default setting:** None

### **Stop Bit**

This field is select Serial ports can use any mode. Just keep in mind that the bits per second and stop bits must match terminal setting.

**Available Options:** 1 Bit, and 2 Bit

**Default setting:** 1 Bit

### **Flow Control**

This field is Serial ports can use flow control for console redirection.

**Available Options:** None, and Hardware RTS/CTS

**Default setting:** None

### **VT-UTF8 Combo Key Support**

This field is select VT-UTF8 combination key support for ANSI/VT100 terminals.

**Available Options:** Enabled and Disabled

**Default setting:** Enabled

### **Recorder Mode**

On this mode enabled only text will be sent. This is to capture Terminal data.

**Available Options:** Enabled and Disabled

**Default setting:** Disabled

### **Resolution 100x31**

This item is select Enables or disables extended terminal resolution

**Available Options:** Enabled and Disabled

**Default setting:** Disabled

### **Legacy OS Redirection Resolution**

On Legacy OS, the Number of Rows and Columns supported redirection

**Available Options:** 80x24, and 80x25

**Default setting:** 80x24

### **Putty Keypad**

This item is select Function Key and Keypad on Putty

**Available Options:** VT100, LINUX, XTERMR6, SCO, ESCN and VT400

**Default setting:** VT100

### **Redirection After BIOS Post**

These fields is select redirection is active during post and during boot loader or always active or off active. (Some Oss may not work if set to Always)

**Available Options:** Boot Loader and Always Enable

**Default setting:** Always Enable

### Console Redirection (OBM/EMS)

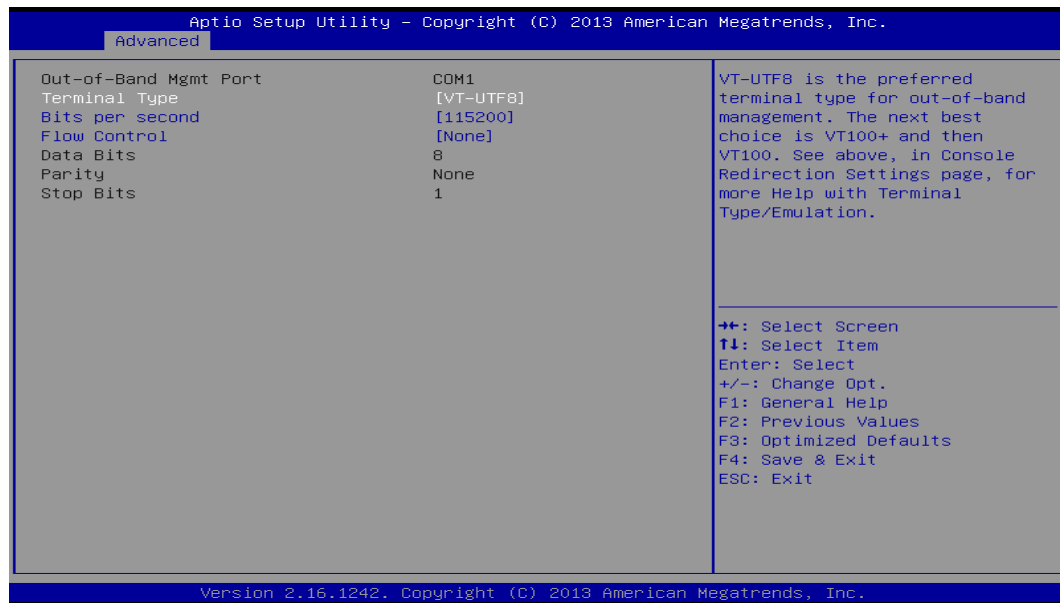
This field is select console redirection Enable or disable. Serial Port for Out-of-Band Management/ Windows Emergency Management Services (EMS)

**Available Options:** Enabled and Disabled

**Default setting:** Disabled

#### ✧ *Console Redirection Setting – Out of Band Mgmt Port*

Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.



### Terminal Type

This field is Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes..

**Available Options:** VT100, vt100+, VT-UTFB, and PC\_ANSI

**Default setting:** VT100

### Bits per Second

This field is select Serial ports can use baud rate. Just keep in mind that speed must match terminal setting.

**Available Options:** 9600, 19200, 57600, and 115200

**Default setting:** 115200

### **Flow Control**

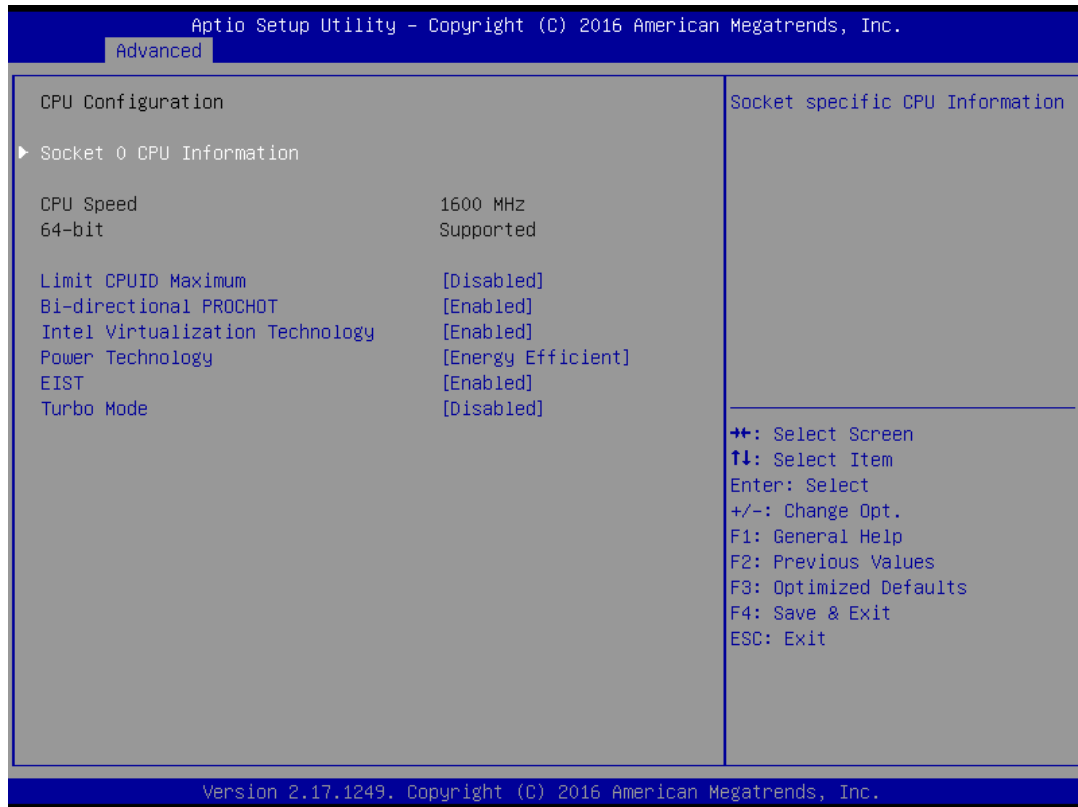
The flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

**Available Options:** None, Hardware RTS/CTS, and Software Xon/Xoff

**Default setting:** None

□ **CPU Configuration**

You can use this screen to select options for the CPU information. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.



**Limit CPUID Maximum**

This field allows users to enable or disable limit CPUID maximum, to disable this item when Windows XP.

**Available Options:** Disabled, and Enabled

**Default setting:** Disabled

**Bi-directional PROCHOT**

This field allows users to enable or disable the Bi-directional PROCHOT, when a processor thermal sensor trips (either core), the PROCHOT# will be driven. If bi-direction is enabled, external agents can drive PROCHOT# to throttle the processor

**Available Options:** Disabled, and Enabled

**Default setting:** Enabled



### Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vander pool Technology.

**Available Options:** Disabled, and Enabled

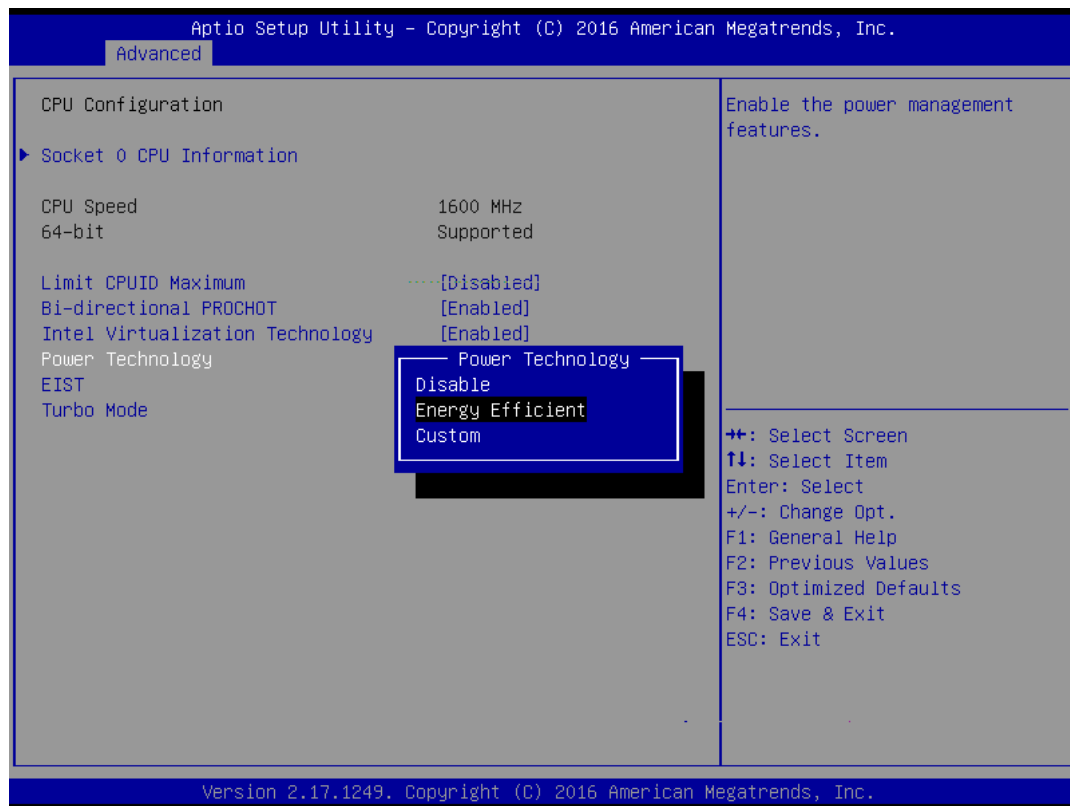
**Default setting:** Enabled

### Power Technology

This field allows the users to enable or disable the Power Manager feature.

**Available Options:** Disabled, Energy Efficient and Customer

**Default setting:** Energy Efficient



### ✧ *EIST*

This field allows users to enable or disable Intel Speed Step.

**Available Options:** Disabled, and Enabled

**Default setting:** Enabled

✧ *Turbo Model*

This field allows users to enable or disable Turbo Mode.

**Available Options:** Disabled, and Enabled

**Default setting:** Enabled

✧ *P-STATE Coordination*

This field allows users to enable or disable P-STATE Coordination Type.

**Available Options:** HW\_ALL, SOFT\_ALL, SW\_ANY

**Default setting:** HW\_ALL

✧ *Package C STATE limit*

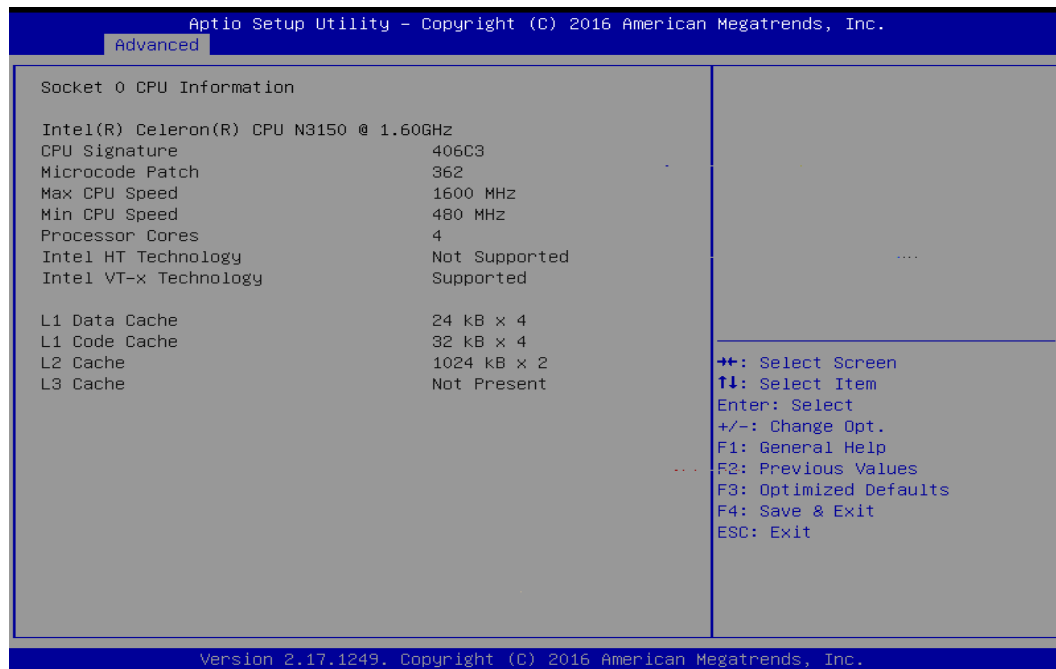
This field allows users to select CPU C state.

**Available Options:** C1, C3, C6 and C7

**Default setting:** C7

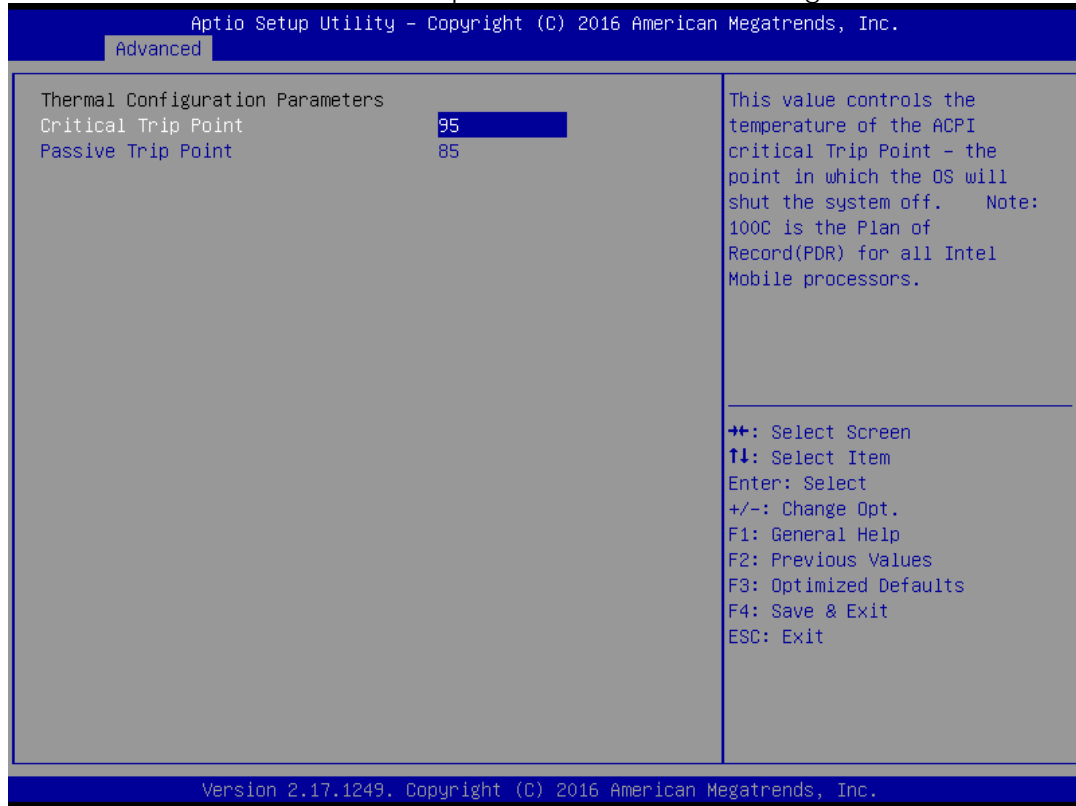
**Socket CPU 0 information**

Display CPU Information, like CPU speed and L1/L2 cache and support function.



□ **Thermal Configuration Parameters**

You can use this screen to select options for the Thermal Configuration.



**Critical Trip Point**

This value controls the temperature of the ACPI critical Trip Point - the point in which the OS will shut the system off.

Note: 100C is the Plan of Record (PDR) for all Intel Mobile processors.

**Default setting:** 95

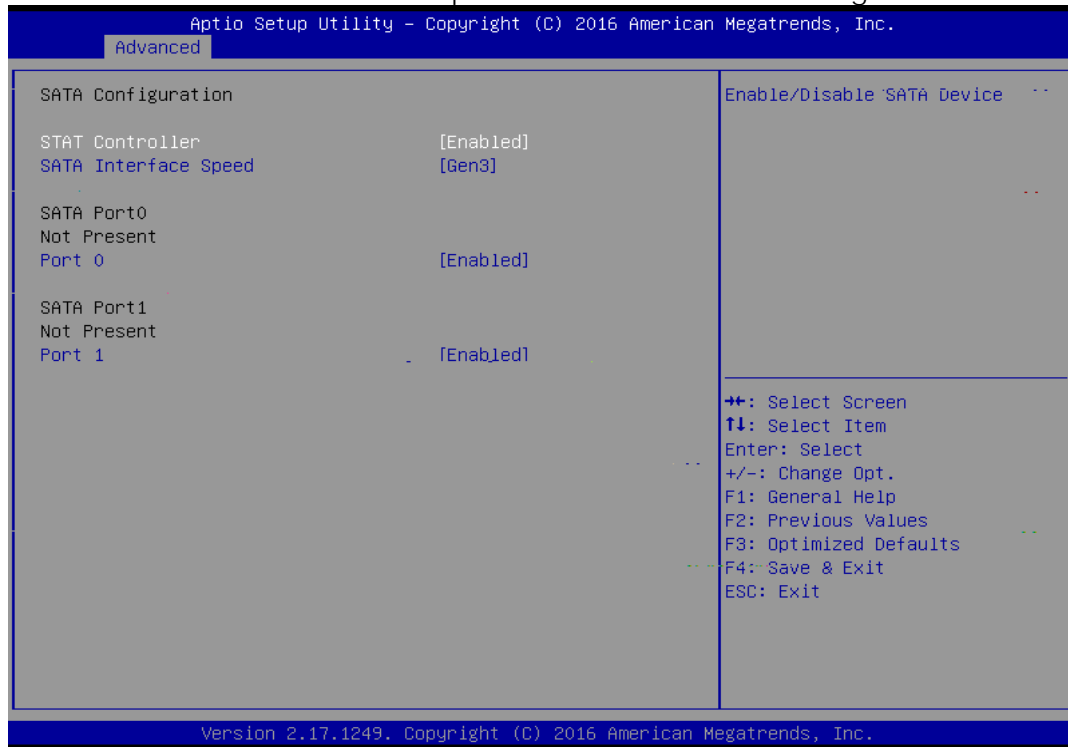
**Passive Trip Point**

This value controls the temperature of the ACPI critical Trip Point - the point in which the OS will begin throttling the processor.

**Default setting:** 85

□ **SATA Configuration**

You can use this screen to select options for the IDE devices Configuration.



**SATA Controller**

This item allows users to enable or disable SATA Controller.

**Available Options:** Disabled, and Enabled

**Default setting:** Enabled

**SATA Interface Speed**

This item allows users can select SATA speed.

**Available Options:** Gen1, Gen2, and Gen3

**Default setting:** Gen3

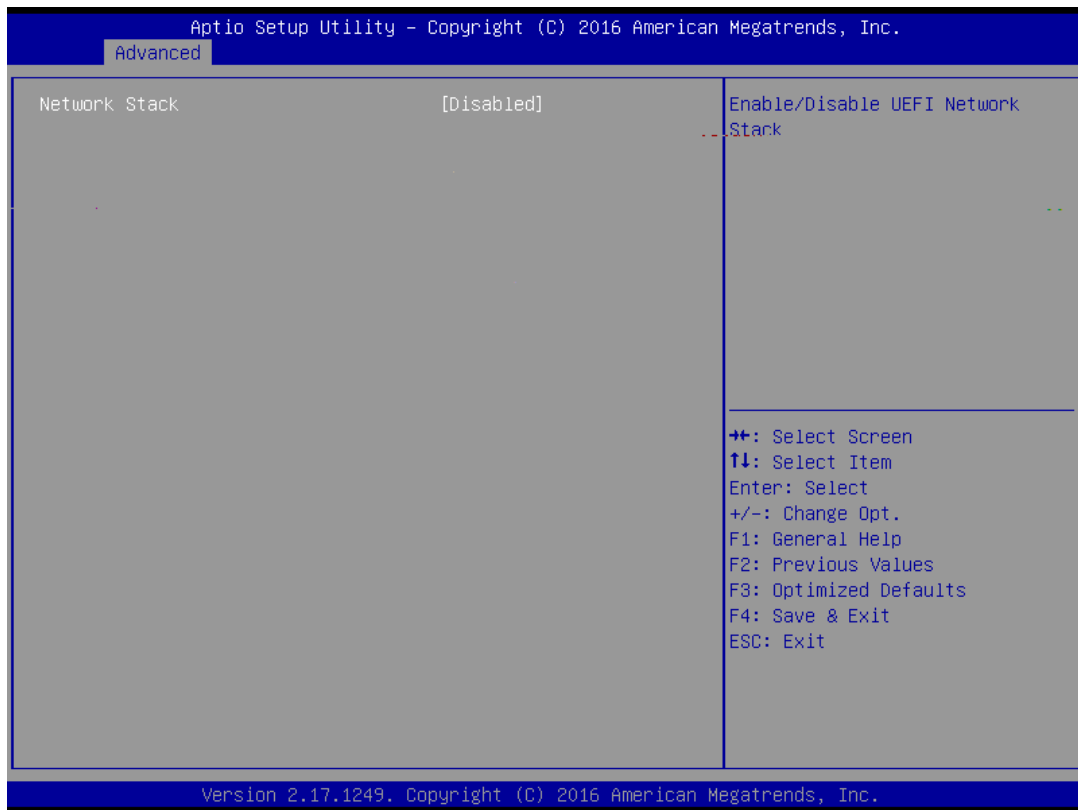
**SATA Port0/Port1**

The system CFast socket corresponding SATA port 0, SATA port 1 is SATA HDD, this item allows users to enable or disable SATA port 0 or SATA port1.

**Available Options:** Disabled, and Enabled

**Default setting:** Enabled

□ **Network Stack Configuration**



**Network Stack**

This field specifies the PXE boot ROM of the onboard LAN chip.

**Available Options:** Disabled, and Enabled

**Default setting:** Disabled

**IPV4/IPV6 Support**

This field specifies the Enable Ipv4 or Ipv6 PXE Boot Support.

**Available Options:** Disabled, and Enabled

**Default setting:** Enabled

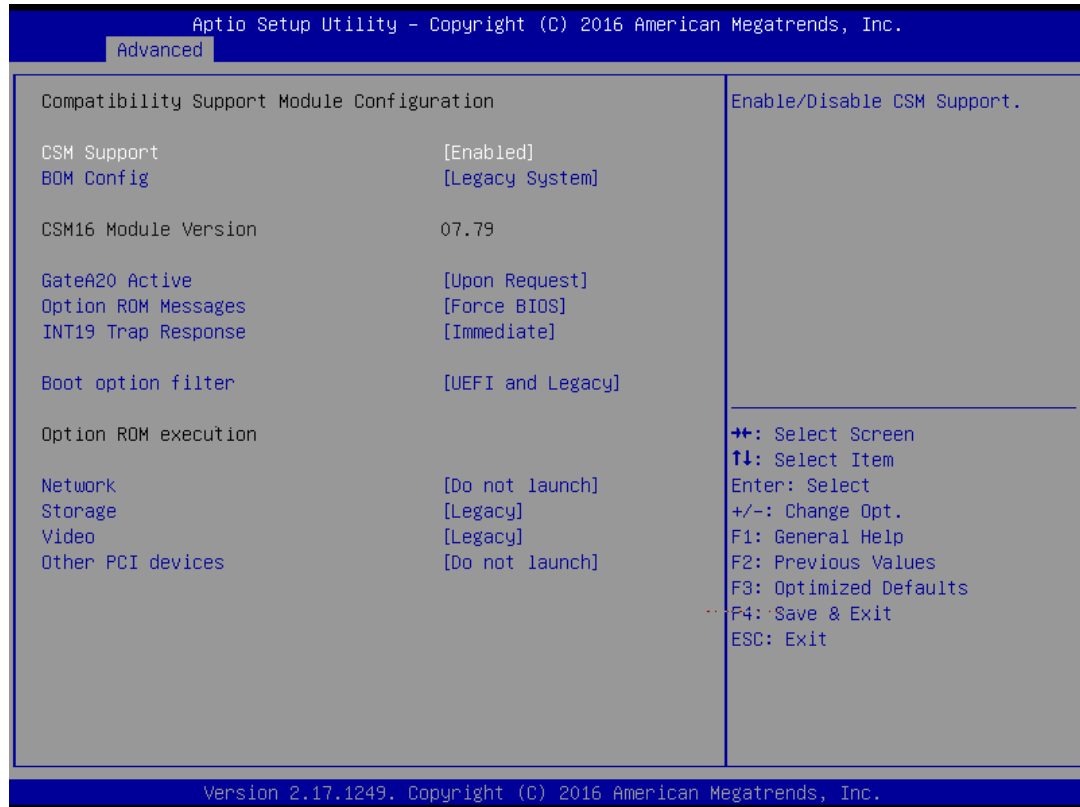
**PXE boot wait time**

This field specifies the Wait time to press ESC key to abort the PXE boot.

**Default setting:** 0

## □ CSM Configuration

The CSM (Compatibility Support Module) is Option ROM Execution, boot options filter, etc.



### CSM Support

This item allows users to enable or disable CSM.

**Available Options:** Disabled, and Enabled

**Default setting:** Enabled

### Boot Option Filter

This option controls Legacy/UEFI ROMs priority.

**Available Options:** UEFI and Legacy, Legacy only, and UEFI only

**Default setting:** UEFI and Legacy

### **GateA20 Active**

UPON REQUEST - GA20 can be disabled using BIOS services. ALWAYS - do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

**Available Options:** UPON REQUEST, and ALWAYS

**Default setting:** UPON REQUEST

### **Option ROM Message**

Set display mode for Option ROM

**Available Options:** Force BIOS, and Keep Current

**Default setting:** Force BIOS

### **INT19 Trap Response**

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

**Available Options:** Immediate, and Postponed

**Default setting:** Immediate

### **Network**

Controls the execution of UEFI and Legacy PXE OpROM

**Available Options:** Do not Launch, Legacy only, and UEFI only

**Default setting:** UEFI only

### **Video**

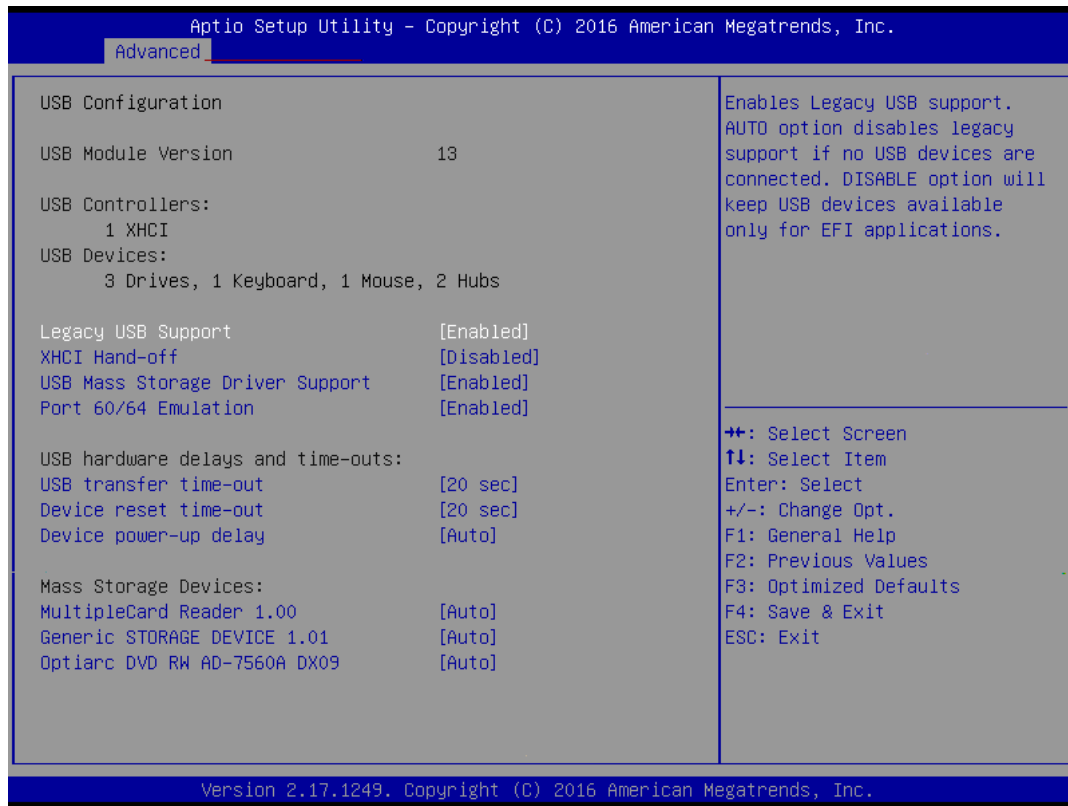
Controls the execution of UEFI and Legacy Video opROM

**Available Options:** Do not Launch, Legacy only, and UEFI only

**Default setting:** Legacy only

□ **USB Configuration**

You can use this screen to select options for the USB Configuration.



**Legacy USB Support**

Legacy USB Support refers to the USB mouse and USB keyboard support. Normally if this option is not enabled; any attached USB mouse or USB keyboard will 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 drivers loaded on the system. Set this value to Enabled or Disabled the Legacy USB Support.

**Available Options:** Disabled, Auto, and Enabled

**Default setting:** Enabled

**XHCI Hand-Off**

This is a workaround for OS without XHCI Hand-Off support. The XHCI ownership change should claim by XHCI driver.

**Available Options:** Disabled, and Enabled

**Default setting:** Enabled



### **USB Mass Storage Driver Support**

Mass storage device emulation type. If the emulation FDD, recommended formatted as FAT32 format.

**Available Options:** Disabled, and Enabled

**Default setting:** Enabled

### **USB transfer time-out**

The time-out value for control, bulk, and interrupt transfers.

**Available Options:** 1 sec, 5 sec, 10 sec, and 20 sec

**Default setting:** 20 sec

### **Device reset time-out**

USB mass storage device start unit command time-out.

**Available Options:** 10 sec, 20 sec, 30 sec, and 40 sec

**Default setting:** 20 sec

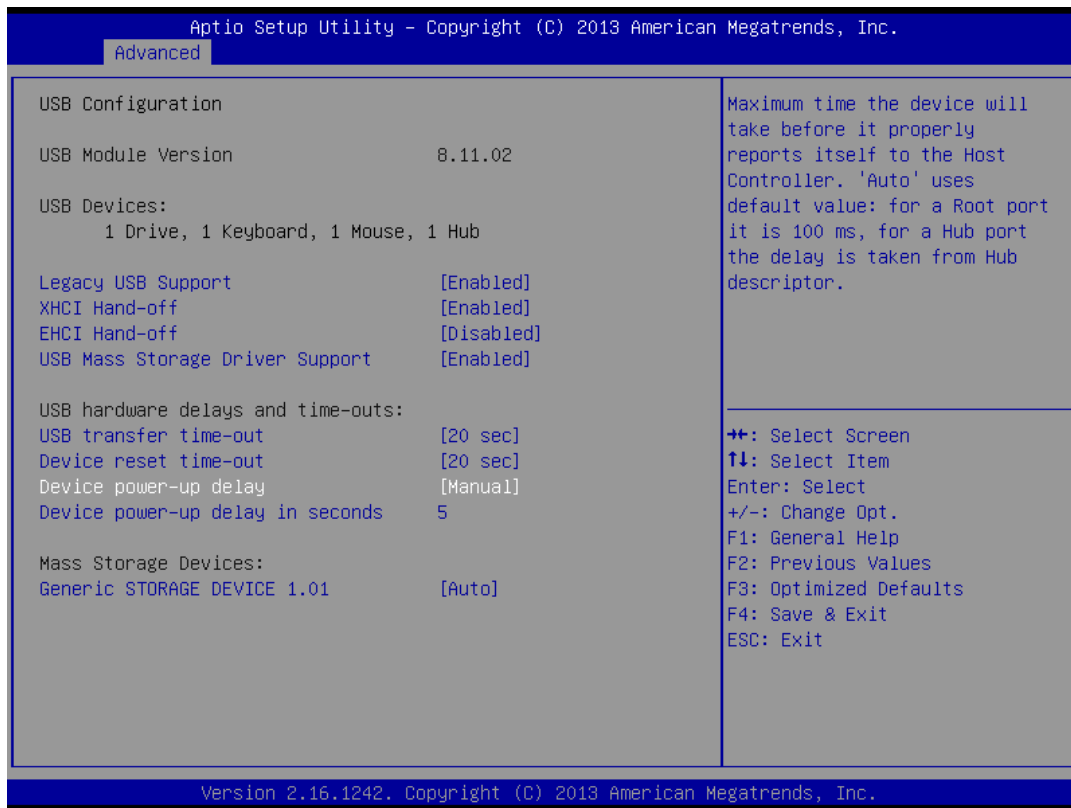
### **Device power-up delay**

Maximum time the device will take before it properly reports itself to the Host controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is take from Hub descriptor.

**Available Options:** Auto, and manual

**Default setting:** Auto

**Device power-up delay > Select "Manual"**



✧ ***Device Power-Up delay in second***

Delay range is 1..40 seconds, in one second increments

**Available Options:** 1, 5, 10, 20, 30, and 40 Sec

**Default setting:** 5 Sec

**Generic Storage Device 1.01**

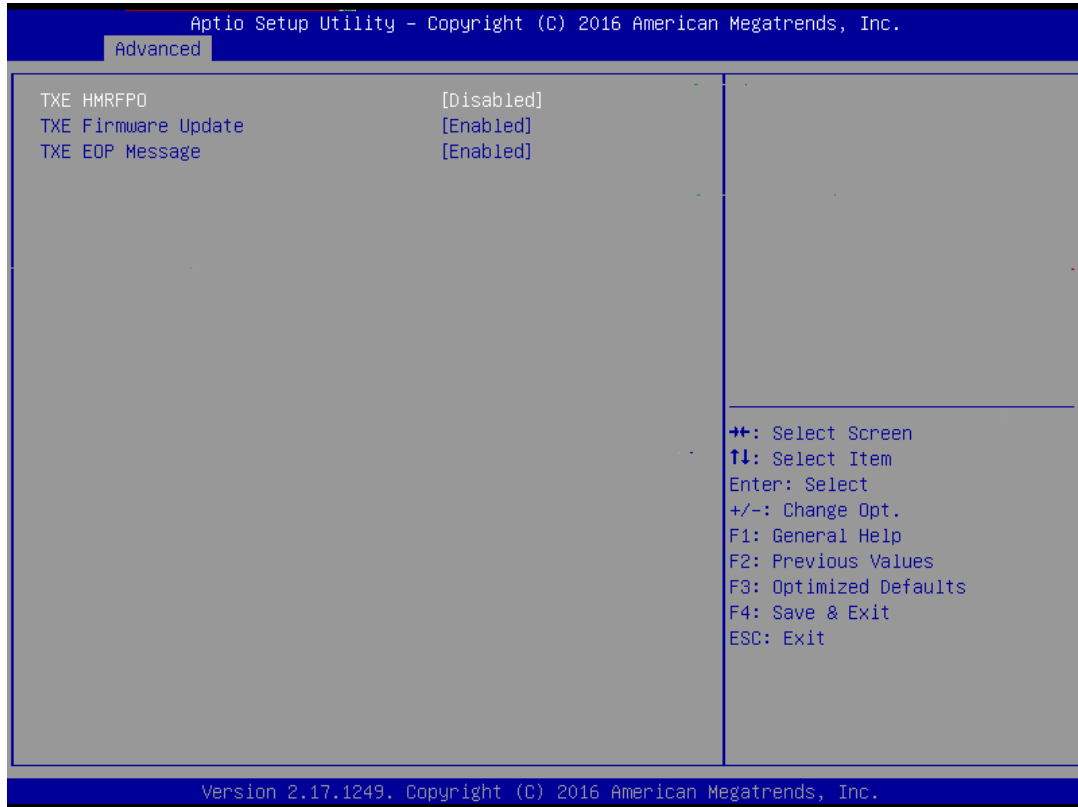
Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.

**Available Options:** Auto, Floppy, Forced FDD, Hard Disk, and CD-ROM

**Default setting:** Auto

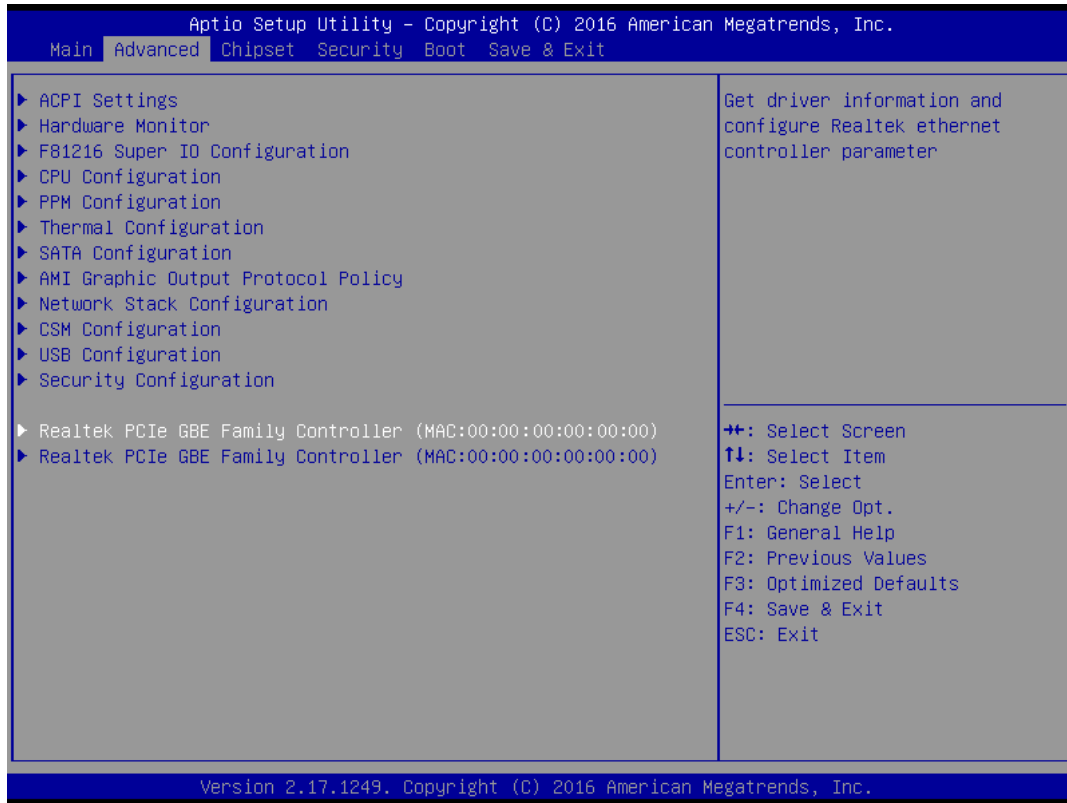
□ **Security Configuration**

You can use this screen to select TXE Configuration.



❑ **Realtek PCIe GBE Family Controller (MAC)**

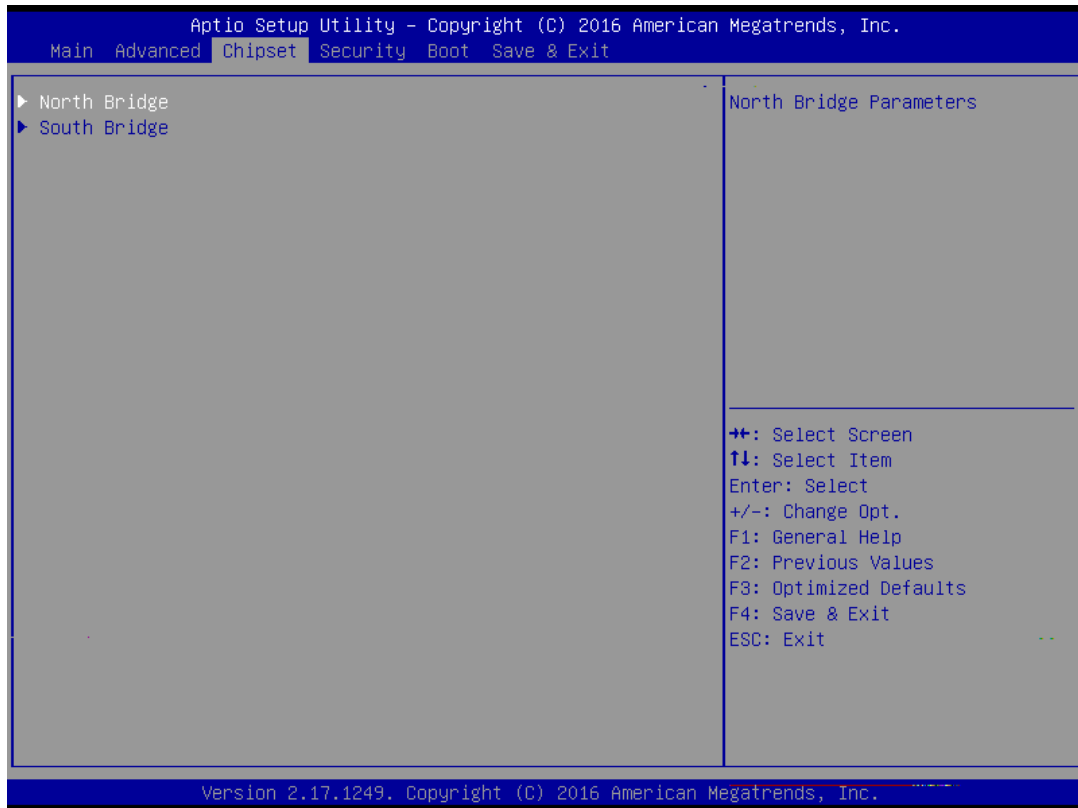
On the LAN Information screen, you can see the LAN Chipset information, when setting the [Launch PXE OpROM Policy](#) to UEFI Only of CSM Boot.



## Chipset

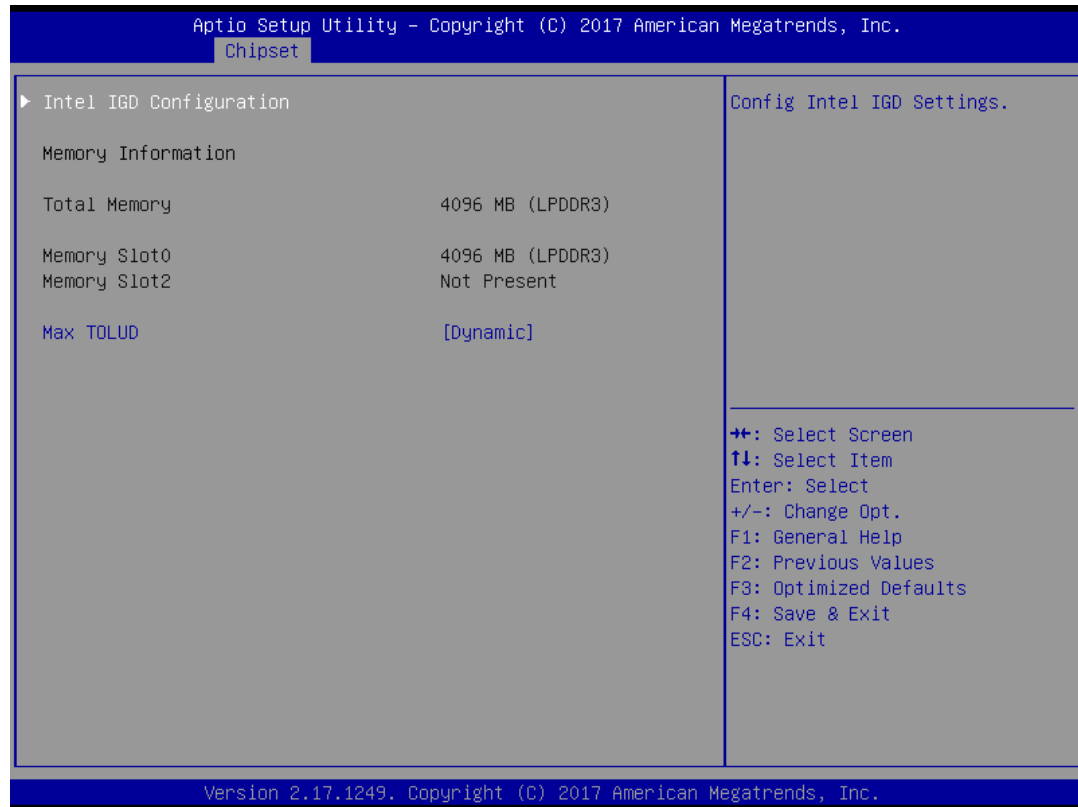
This section describes the configuration of the board's chipset features.

- North Bridge
- South Bridge



## □ North Bridge

You can use this screen to select options for the North Bridge Configuration. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.



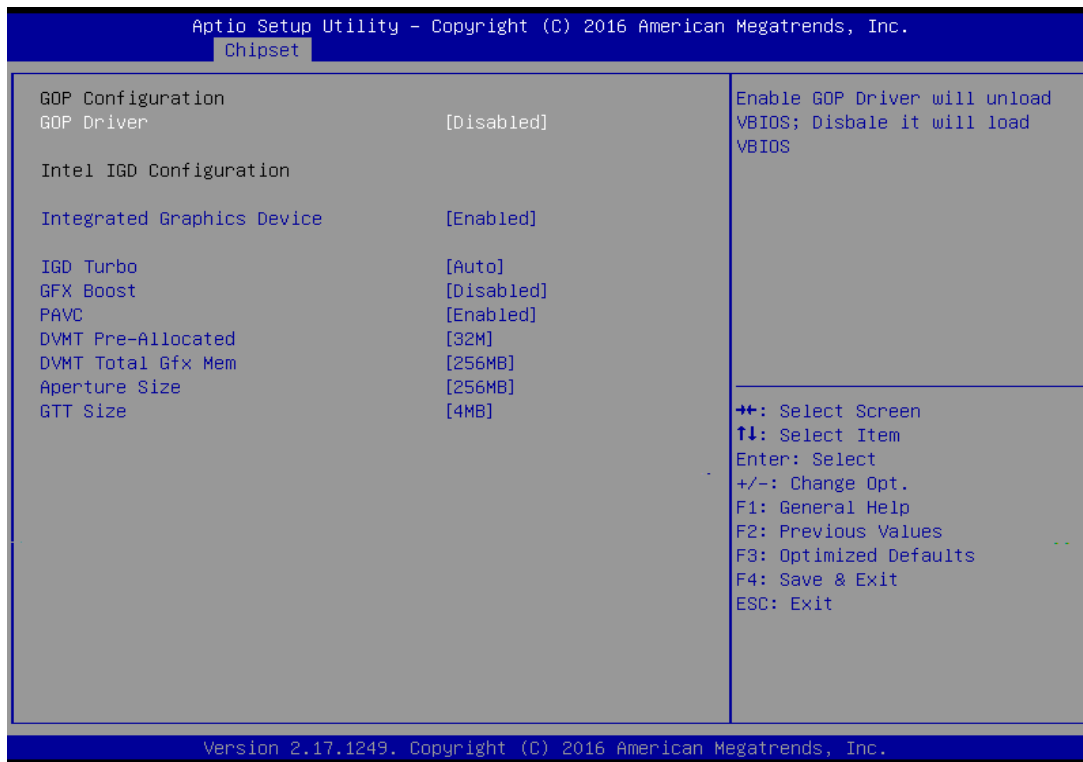
### Max TOLUD

This field is Max value of TOLUD; Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.

**Available Options:** Dynamic, 2GB, 2.25GB, 2.5GB, and 2.75GB

**Default setting:** Dynamic

## Intel IGD Configuration



### ✧ *GOP Configuration > GOP Driver*

The Item is Enable GOP Driver will unload VBIOS; Disable it will load VBIOS.

**Available Options:** Disabled, and Enabled

**Default setting:** Enabled

### ✧ *Integrated Graphics Device*

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

**Available Options:** Disabled, and Enabled

**Default setting:** Enabled

### ✧ *IGD Turbo*

Select the IGD Turbo feature, if Auto selected, IGD Turbo will only be enabled when SOC stepping is B0 or above.

**Available Options:** Disabled, Auto, and Enabled

**Default setting:** Auto

✧ ***GFX Boost***

The Item is can Select Enable/Disable GFX Boost.

**Available Options:** Disabled, and Enabled

**Default setting:** Disabled

✧ ***PAVC***

The Item is can Select Enable/Disable Protected Audio Video Control.

**Available Options:** Disabled, and Enabled

**Default setting:** Disabled

✧ ***DVMT Pre- Allocated***

The Item is select DVMT 5.0 Pre-Allocated (Fixed) graphics memory size used by the internal graphics device.

**Available Options:** 32MB, 64MB, 96MB, 128MB, 160MB, 192MB, 224MB, 256MB, 288MB, 320MB, 352MB, 384MB, 416MB, 448MB, 480MB, and 512MB

**Default setting:** 32 MB

✧ ***DVMT Total GFX Mem***

This field specifies allows you to select the maximum amount of graphics memory of DVMT 5.0 to be shared with the system memory.

**Available Options:** 128MB, 256MB, and MAX

**Default setting:** 256 MB

✧ ***Aperture Size***

This field specifies allows you to select the aperture size.

**Available Options:** 128MB, 256MB, and 512MB

**Default setting:** 256 MB

✧ ***GTT Size***

This field specifies allows you to select the GTT size.

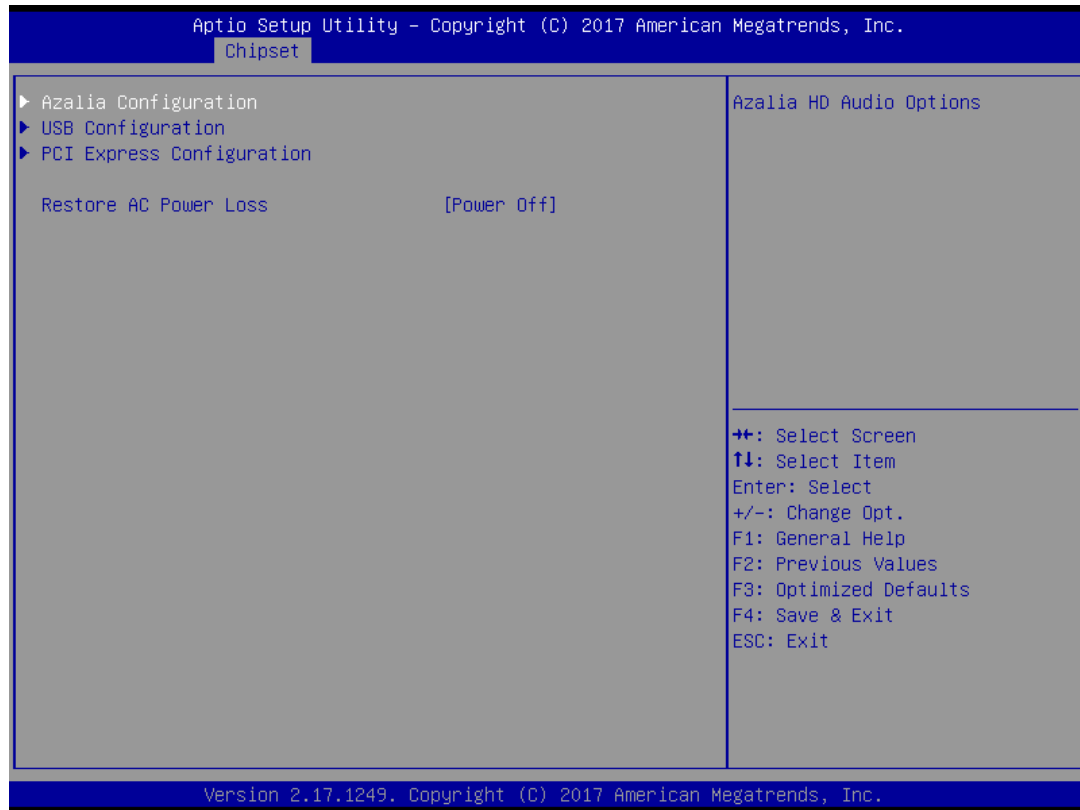
**Available Options:** 2MB, 4MB, and 8MB

**Default setting:** 4 MB



❑ **South Bridge**

You can use this screen to select options for the South Bridge Configuration. South Bridge is a chipset on the motherboard that controls the USB, LAN port, and audio function.



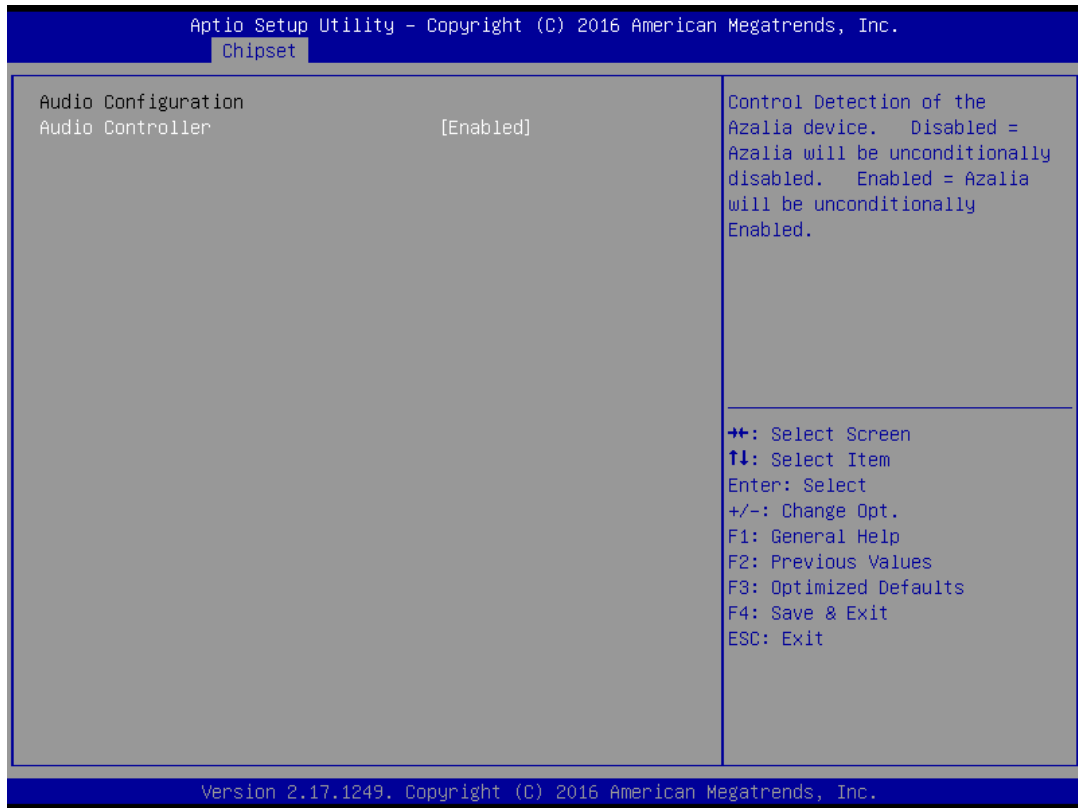
**Restore AC Power Lose**

This field specifies the option controls how the PC will behave once power is restored following a power outage (or other unexpected or ungraceful shutdown). The "Last State" option returns the PC to the state in effect at the time the power outage or shutdown occurred. Assign this option the "Power On" value to reboot automatically; assign the "Power Off" value to leave the machine powered down.

**Available Options:** Power Off, Power On, and Last State

**Default setting:** Last State

## Azalia HD Audio



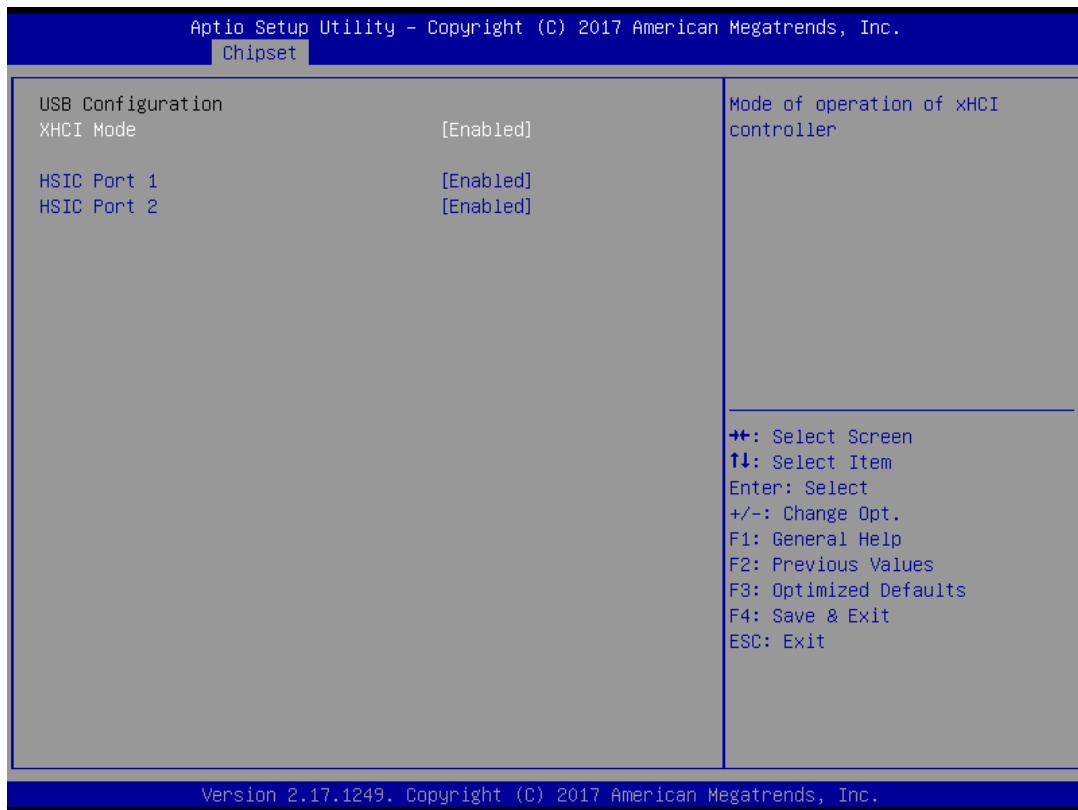
### ✧ *Audio Controller*

This item allows users to enable or disable Azalia Controller.

**Available Options:** Disabled, and Enabled

**Default setting:** Enabled

## USB Configuration



### ✧ *XHCI Mode*

The item XHCI (eXtensible Host Controller Interface) is a workaround for specification for Universal Serial Bus 3.0 support. If an "OS Selection" selected is windows 8, the "USB.2.0 (EHCI) support would be set to Disabled. (For Windows 8.x)

**Available Options:** Disabled, Auto, Smart Auto, and Enabled

**Default setting:** Disabled

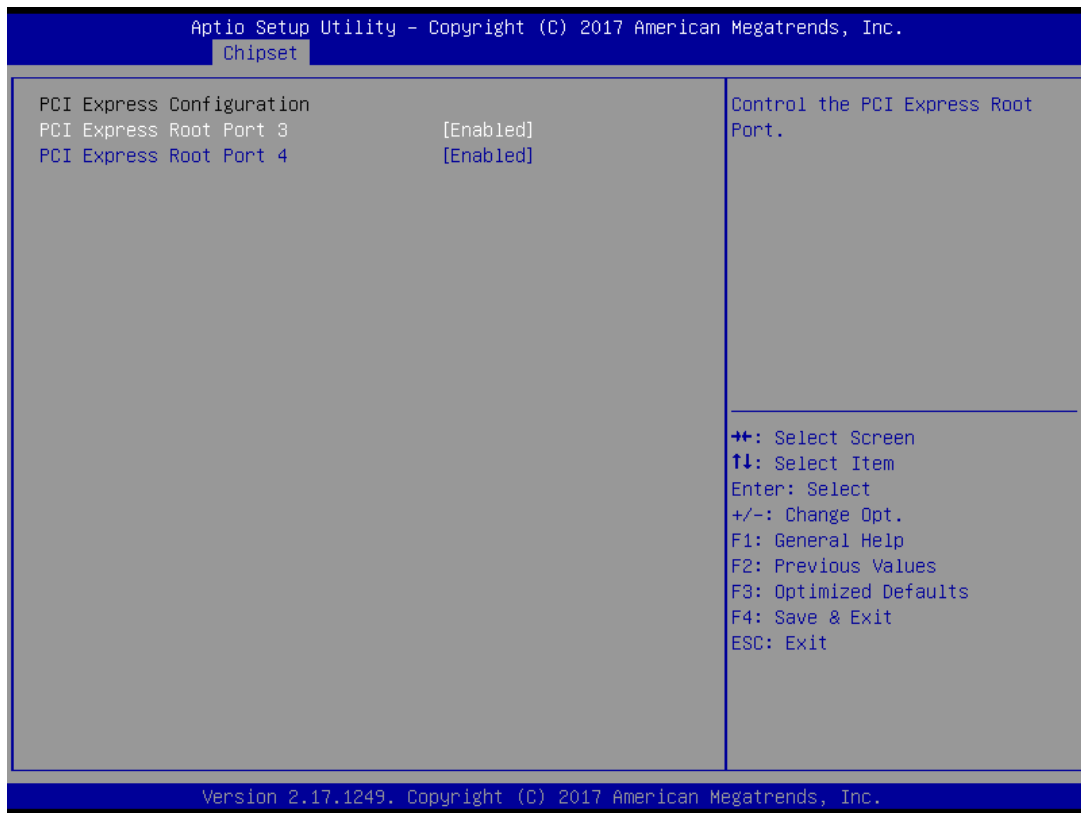
### ✧ *HSIC Port 1 /2*

The item allows users to enable or disable HSIC Controller.

**Available Options:** Disabled, and Enabled

**Default setting:** Enabled

## PCI Express Configuration



### ✧ *PCI Express Port 3/4*

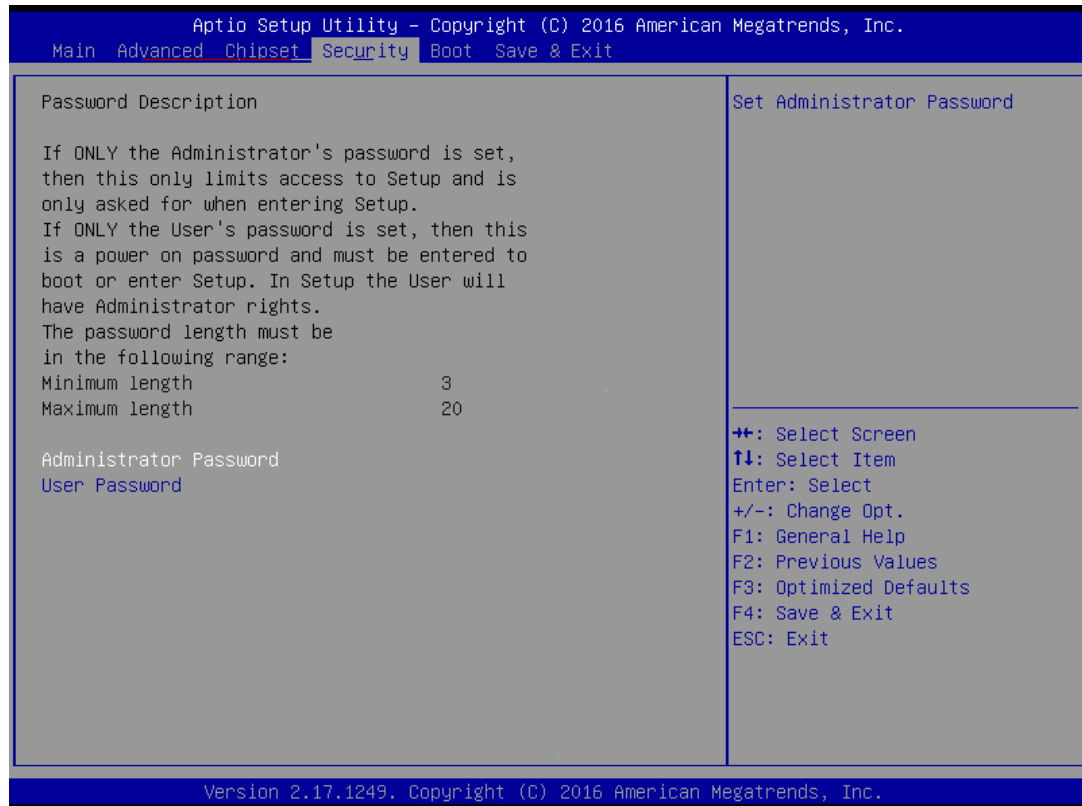
The PCI Express Root Port 3/4 item, allows users to enable or disable on PCIe Express Bus signals.

**Available Options:** Disabled, and Enabled

**Default setting:** Enabled

## Security

Security Setup provides both Administrator and User password. If you use both passwords, the Administrator password must be set first. The system can be configured so that all users must enter a password every time the system boots or when Setup is executed, using either the Administrator password or User password. The Administrator and User passwords activate two different levels of password security. If you select password support, you are prompted for a three to twenty character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain NVRAM and reconfigure.



### Administrator/User Password

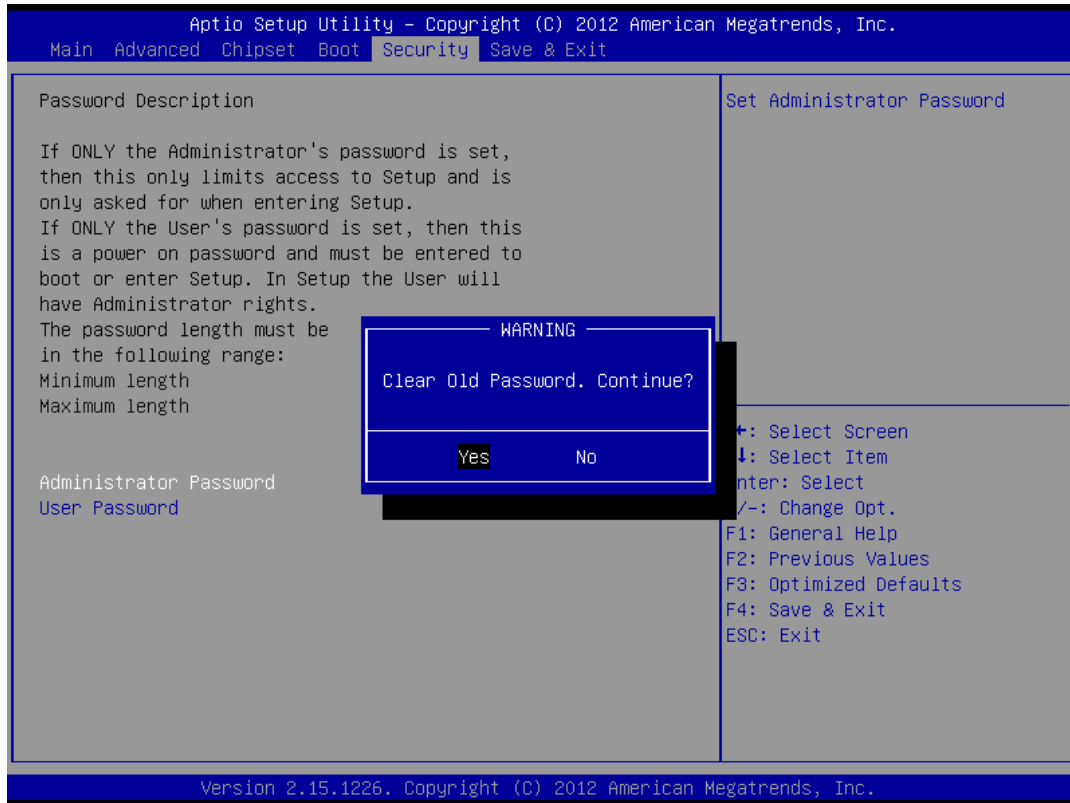
Select Administrator/User Password item, press <Enter> and type new password (up to 3 character length) and confirm new password. The screen does not display the characters entered.

#### ❖ *Change Administrator/User Password*

Select Administrator/user password item, press <Enter> and type current password, at the next dialog type new password and confirm new password.

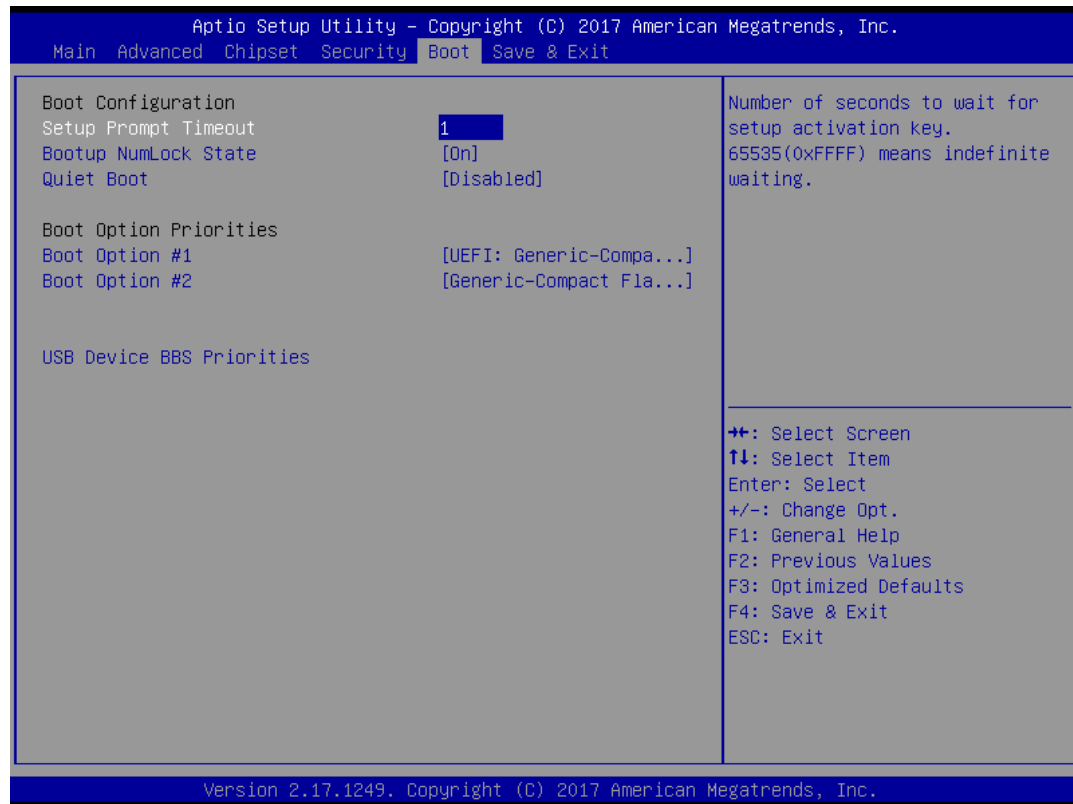
❖ **Clear Old Password**

Select Administrator/user password item, press <Enter> and type current password, at the next dialog press <Enter> to Clear Old Password.



## Boot

Select the *Boot* tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the <Arrow> keys. All Boot Setup options are described in this section.



### Setup Prompt Timeout

This item allows users to select the number of seconds to wait for setup activation key.

**Available Options:** 1~65535

**Default setting:** 1

### Bootup NumLock State

This field is used to activate the Num Lock function upon system boot. If the setting is on, after a boot, the Num Lock light is lit, and user can use the number key.

**Available Options:** On, and Off

**Default setting:** On

### Quiet Boot

This item allows users to enable or disable Quiet boot option. If Enable, an OEM LOGO is shown instead of POST messages.

**Available Options:** Disabled, and Enabled

**Default setting:** Disabled

### Fast Boot

This field is used to activate the fast boot function of the system. When set to Enabled, boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

**Available Options:** Disabled, Enabled

**Default setting:** Disabled

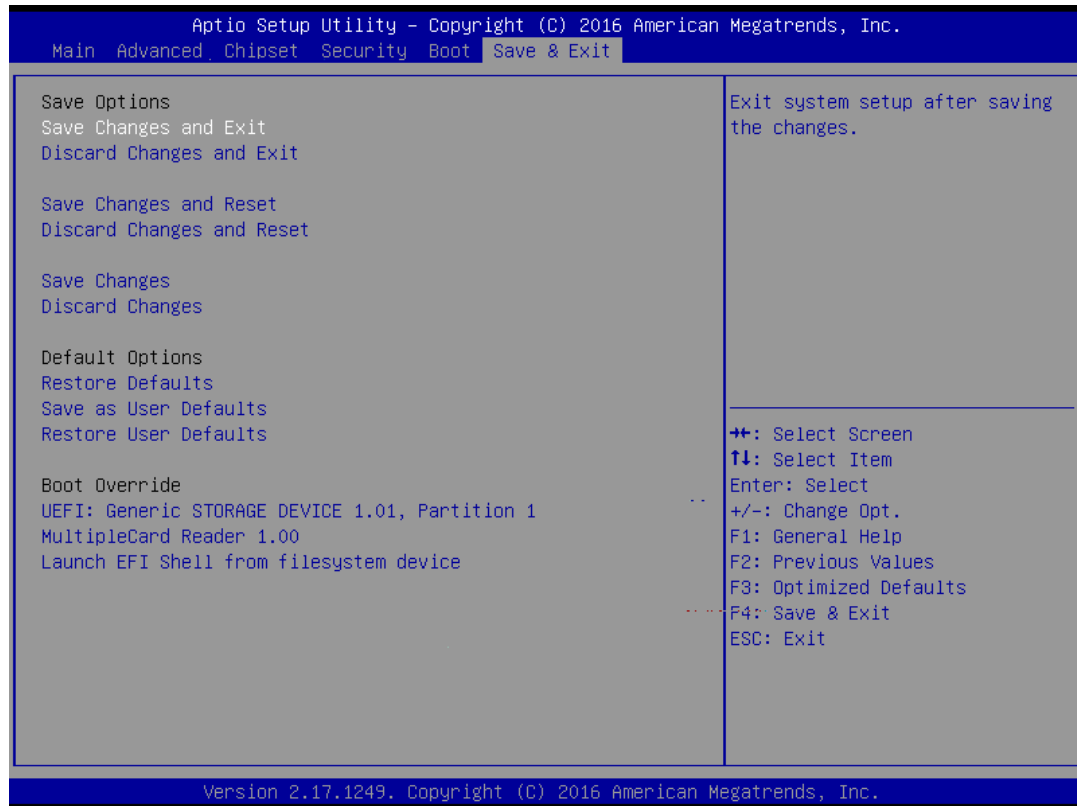
### Boot Option Priorities

This item allows users to set boot device priority. Set the boot device options to determine the sequence in which the system checks which device to boot from. The settings are Hard Driver BBS Priorities (*Removable Storage Dev., Hard Drive*), and CD/DVD ROM Driver BBS Priorities (*USB CDROM*).

**Note:** When you select a boot Option category from the boot menu, a list of devices in that category appears. For example, if the system has hard disk drives and USB storage connected, then the list will show all hard disk drives attached.



## Save & Exit



### Save Changes and Exit

When you have completed the system configuration changes, select this option to save the changes and Exit, so the new system configuration parameters can take effect.

### Discard Changes and Exit

Select this option to quit without making any modifications to the system configuration.

### Save Changes and Reset

When you have completed the system configuration changes, select this option to save the changes and reboot the system, so the new system configuration parameters can take effect. The following window will appear after selecting the 'Save Changes and Reset' option selected. Reset the system after saving the changes.

### **Discard Changes and Reset**

Select this option to reboot the system without saving the changes done in the setup configuration.

### **Save Changes**

When you have completed the system configuration changes, select this option to save your system configuration and continue. For some of the options it required to reset the system to take effect..

### **Discard Changes**

When you have completed the system configuration changes, select this option to undo the previous changes.

### **Restore Defaults**

Restore/Load Default values for all the setup options.

### **Save as User Defaults**

Save the changes done so far as User Defaults.

### **Restore User Defaults**

Restore the User Defaults to all the setup option.



## Chapter 4 Software Installation

The enclosed DVD diskette includes FX5639 VGA, System, Audio, LAN and USB driver. To install and configure your system, you need to perform the following steps.

**Note:** The Windows 7 installation media does not include native driver support for USB 3.0- XHCI driver, so during installation, when you get to the screen to select your preferred language, a keyboard or mouse connected to a USB 3.0 port does not respond. Please reference "[USB3.0 Driver Windows7 X86/X64](#)" and see the Readme describes method to resolve the problem.

### System Driver

#### □ WIN 7/8.1/10 -32/-64 Driver

Step 1: To install the Braswell driver, insert the CD ROM into the CD ROM device, and enter DRIVER>SysChip>Braswell>.

Step 2: Execute SetupChipset.exe file.

Step 3: The screen shows the SETUP type. Press any key to enter the main menu.

Step 4: As the setup is completed, the system will generate the message as follows.

Yes, I want to restart my computer now. Installation is done.

No, I will restart my computer later.

System must be restart then complete the installation.

## VGA Driver

### □ WIN 7/8.1/10 -32/-64 Driver

Step 1: To install the VGA driver, insert the CD ROM into the CD ROM device, and enter DRIVER>VGA>Braswell>WIN32> or >WIN64>.

Step 2: Execute Setup.EXE file.

Step 3: The screen shows the SETUP type. Press any key to enter the main menu.

Step 4: As the setup is completed, the system will generate the message as follows.

Yes, I want to restart my computer now. Installation is done.

No, I will restart my computer later.

System must be restart then complete the installation.

**Note:** In the DRIVER>VGA>Braswell>WIN32 or >WIN64 directory, a Readme.txt file is included to provide installation information.

## Audio Driver

### □ WIN 7/8.1/10 X86/X64 Driver

Step 1: To install the AUDIO driver, insert the CD ROM into the CD ROM device, and enter DRIVER>AUDIO>ALC888\_R270>Windows.

Step 2: Execute Setup.exe file.

Step 3: The screen shows the SETUP type. Press any key to enter the main menu.

Step 4: As the setup is completed, the system will generate the message as follows.

Yes, I want to restart my computer now. Installation is done!

No, I will restart my computer later.

System must be restart then complete the installation.

## LAN Driver (RTL 8111F)

### □ WIN 7 Driver X86/X64 Driver

Step 1: To install the LAN driver, insert the CD ROM into the CD ROM device, and enter DRIVER>LAN>RTL8111F>WIN7. If your system is not equipped with a CD ROM device, copy the LAN driver from the CD ROM to CF.

Step 2: Execute setup.exe file.

## USB 3.0 Driver

### □ WIN7 X86/X64 Driver

The ECHI Controller is removed from Intel® Pentium/Celeron® Processor N3000 Family. This may affect Windows\*7 installation using USB media as Windows\*7 doesn't have a native support xHCI driver.

<https://downloadcenter.intel.com/download/25476/Windows-7-USB-3-0-Creator-Utility>

**Note:** In the DRIVER> USB>Braswell >WIN7 directory, a win7-usb3.0-creator-readme-v3.pdf file is included to provide installation WIN7 image information.

## TXE Driver

### □ WIN7/8.1/10 X86/X64 Driver

- Step 1: To install the TXE driver, insert the CD ROM into the CD ROM device, and enter DRIVER>TXE>Braswell>.
- Step 2: Execute SETUPTXE.exe file.
- Step 3: The screen shows the SETUP type. Press any key to enter the main menu.
- Step 4: As the setup is completed, the system will generate the message as follows.
- Read License Agreement and click "Yes" to proceed.
- Review Readme File Information and click "Next" to proceed.
- When the "Setup Progress" is complete click "Next" to proceed.
- Lastly, the "Setup Complete" screen appears so click "Finish" to restart your computer.

## EFI BIOS Flash Utility

In the <UTILITY> directory, there is the **fpt64\_281.zip** EFI BIOS flash tool (Include fpt64\_281.efi and fparts.txt file), Follow these steps to upgrade BIOS:

- Step 1: Uncompress the **fpt64\_281.zip** BIOS flash tool and copy new BIOS file to the root directory of USB-Stick.
- Step 2: Press [F11] after system start-up to enter Boot Menu, Select **UEFI: Jetxxx** (USB-Stick).



- Step 3: Using the **"map"** shell command will list device mapping table. To change the current file system to the mapped fs0 file system: **"fs0:"** (Select to USB stick removable storage, if only plug USB Stick, use **"fs0"** shell command)

```
Shell> map
Device mapping table
  fs0 :Removable HardDisk - Alias hd17b0e0c0b blk0
      PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x1,0x0)/USB(0x4,0x0)/USB(0x2,0x0)/HD
x403947)
  blk0 :Removable HardDisk - Alias hd17b0e0c0b fs0
      PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x1,0x0)/USB(0x4,0x0)/USB(0x2,0x0)/HD
x403947)
  blk1 :Removable BlockDevice - Alias (null)
      PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x1,0x0)/USB(0x4,0x0)/USB(0x2,0x0)
  hd17b0e0c0b :Removable HardDisk - Alias fs0 blk0
      PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x1,0x0)/USB(0x4,0x0)/USB(0x2,
,0x3F,0x403947)
Shell> _
```

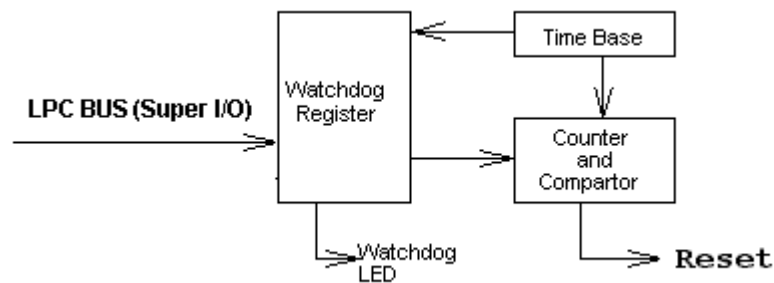
- Step 4: Use the **"fpt64\_281 -f xxxxxVxx.bin"** program to update the new BIOS.
- Step 5: Power off the system or use "reset" shell command, when BIOS update is successful the message will show **"FPT Operation Passed"**.
- Step 6: Restores BIOS default, when updates the BIOS and reboots the system at the first time.



## Watchdog Timer

This section describes how to use the Watchdog Timer, including disabled, enabled, and trigger functions.

The FX5639 is equipped with a programmable time-out period watchdog timer. You can use your own program to Enabled the watchdog timer. Once you have enabled the watchdog timer, the program should trigger the I/O every time before the timer times out. If your program fails to trigger or disable this timer before it times out, e.g. because of a system hang-up, it will generate a reset signal to reset the system. The time-out period can be programmed to be set from 1 to 255 seconds or minutes.



The CD includes a Watch Dog demo file. In the WATCHDOG/ ITE8786 /TURBOC: Library and Test Program written in Turbo C++

The WATCHDOG includes a demonstration program established for users who would like to configure the Watchdog timer by themselves.

□ **Watchdog Timer Setting**

The watchdog timer is a circuit that may be used from your program software to detect system crashes or hang-ups. The watchdog timer is automatically disabled after reset.

Once you have enabled the watchdog timer, your program must trigger the watchdog timer every time before it times out. After you trigger the watchdog timer, it will be set to non-zero value to watchdog counter and start to count down again. If your program fails to trigger the watchdog timer before time-out, it will generate a reset pulse to reset the system.

The factor of the watchdog timer time-out constant is approximately 1 second. The period for the watchdog timer time-out is between 1 to FFFF timer factors.

If you want to reset your system when watchdog times out, the following table listed the relation of timer factors between time-out periods.

Time Factor	Time-Out Period (Seconds)	Time-Out Period (Minutes)
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
"	"	"
"	"	"
"	"	"
FFFF	FFFF	FFFF

#### ❑ Watchdog Timer Enabled

To enable the watchdog timer, you have to output a byte of timer factor to the watchdog register whose address is 2eh and data port is 2fH. The following is a Demo program, which demonstrates how to enable the watchdog timer and set the time-out period at 28 seconds.

```
-----  
; Enter the extended function mode  
-----  
outputb(0x2e,0x87); // Enter to extended function mode  
outputb(0x2e,0x01);  
outputb(0x2e,0x55);  
outputb(0x2e,0x55);  
-----  
; Logical device 7, configuration registers Index 72h-Bit 7, 73H (LSB)/74H (MSB)  
-----  
outputb(0x2e,0x72); // Index 72h- Time and Watchdog Register  
outputb(0x2f,0xc0); // Set Bit 7 is 1: Second and Bit6: Enabled Watchdog.  
//outputb(0x2f,0x40); // Set Bit 7 is 0: Minute.  
  
outputb(0x2e,0x74); // Set Timer Value counter1 0100~FF00 (MSB)  
outputb(0x2f,0x00);  
  
outputb(0x2e,0x73); // Set Timer Value counter0 0001~00FF (LSB)  
outputb(0x2f,0x28); // Set timeout interval as 28seconds and start counting  
-----  
; Exit the extended function mode  
-----  
outputb(0x2e,0x02); // Set Timer Value counter0 0001~00FF (LSB)  
outputb(0x2f,0x02); // Set timeout interval as 28seconds and start counting
```

#### ❑ Watchdog Timer Trigger

After you enable the watchdog timer, your program must write the same factor as enabling to the watchdog register at least once every time-out period to its previous setting. You can change the time-out period by writing another timer factor to the watchdog register at any time, and you must trigger the watchdog before the new time-out period in next trigger.

#### ❑ Watchdog Timer Disabled

To disable the watchdog timer, simply write a 00H to the watchdog register.

```
-----  
; Logical device 7, configuration registers Index 72h Bit 6  
-----  
outputb(0x2e,0x72); // Index 72h- Time and Watchdog Register  
outputb(0x2f,0x80); // Set Bit6 to 0 Disabled Watchdog.
```

## Digital I/O (GPIO) programming

The following is a Demo program, which demonstrates how to read and write the data of GPIO.

```
-----  
; Configuration the Digital IO port is A03h-(GPO) Bit6, Bit7/ A05h-(GPI) Bit 1, Bit 2.  
; A03h-Bit6/Bit7 (GPO-0 ~ GPO-1, Write data)  
;     When set to a "1", respective GPO port is programmed as 'High'.  
;     When set to a "0", respective GPO port is programmed as 'Low'.  
; A05h-Bit1/ Bit2 (GPI-0 ~ GP1-1, Read data)  
;     Its respective bit only read.  
-----  
outportb(0xA03, 0x040);           //Set GPO-0 (Bit6) TO ACTIVE.  
//outportb(0xA03, 0x80);         //Set GPO-1 (Bit7) TO ACTIVE.  
//outportb(0xA03, 0xc0);         //Set GPO-1/2(Bit6/7) TO ACTIVE.  
  
Ctemp = inportb(0xA05); //read GPI-0 (Bit-1) ~ GPI-1(Bit-2) value"  
printf("GPI(Input)= %x ",Ctemp);
```



## Chapter 5 Technical Reference

This section outlines the errors that may occur when you operate the system, and also gives you the suggestions on solving the problems.

Topic include:

- Technical Reference
- Dimension

### Technical Reference

#### □ Physical and Environmental

Temperature: Operating - 20°C ~ 55°C

Relative humidity 5 % to 95 % non-condensing

DC-AC adapter

Input AC Voltage Range: 100V~240V/1A, 50Hz ~60Hz

Output DC Voltage: 19V/3.42A Maximal

Surface Temperature of Chassis :

5°C to 45°C (W/HDD)/-20°C to 55°C (W W.T SSD/CFAST card only)

□ **Serial Ports**

The ACEs (Asynchronous Communication Elements ACE1 to ACE2) are used to convert parallel data to a serial format on the transmit side and convert serial data to parallel on the receiver side. The serial format, in order of transmission and reception, is a start bit, followed by five to eight data bits, a parity bit (if programmed) and one, one and half (five-bit format only) or two stop bits. The ACEs are capable of handling divisors of 1 to 65535, and produce a 16x clock for driving the internal transmitter logic.

Provisions are also included to use this 16x clock to drive the receiver logic, also included in the ACE a completed MODEM control capability, and a processor interrupt system that may be software tailored to the computing time required to handle the communications link.

The following table is a summary of each ACE accessible register

DLAB	Port Address	Register
0	Base + 0	Receiver buffer (read)
		Transmitter holding register (write)
0	Base + 1	Interrupt enable
X	Base + 2	Interrupt identification (read only)
X	Base + 3	Line control
X	Base + 4	MODEM control
X	Base + 5	Line status
X	Base + 6	MODEM status
X	Base + 7	Scratched register
1	Base + 0	Divisor latch (least significant byte)
1	Base + 1	Divisor latch (most significant byte)

**Receiver Buffer Register (RBR)**

Bit 0-7: Received data byte (Read Only)

**Transmitter Holding Register (THR)**

Bit 0-7: Transmitter holding data byte (Write Only)

**Interrupt Enable Register (IER)**

Bit 0: Enable Received Data Available Interrupt (ERBFI)

Bit 1: Enable Transmitter Holding Empty Interrupt (ETBEI)

Bit 2: Enable Receiver Line Status Interrupt (ELSI)

Bit 3: Enable MODEM Status Interrupt (EDSSI)

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

**Interrupt Identification Register (IIR)**

Bit 0: "0" if Interrupt Pending

Bit 1: Interrupt ID Bit 0

Bit 2: Interrupt ID Bit 1

Bit 3: Must be 0

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

**Line Control Register (LCR)**

Bit 0: Word Length Select Bit 0 (WLS0)

Bit 1: Word Length Select Bit 1 (WLS1)

WLS1	WLS0	Word Length
0	0	5 Bits
0	1	6 Bits
1	0	7 Bits
1	1	8 Bits

Bit 2: Number of Stop Bit (STB)

Bit 3: Parity Enable (PEN)

Bit 4: Even Parity Select (EPS)

Bit 5: Stick Parity



Bit 6: Set Break

Bit 7: Divisor Latch Access Bit (DLAB)

**MODEM Control Register (MCR)**

Bit 0: Data Terminal Ready (DTR)

Bit 1: Request to Send (RTS)

Bit 2: Out 1 (OUT 1)

Bit 3: Out 2 (OUT 2)

Bit 4: Loop

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

**Line Status Register (LSR)**

Bit 0: Data Ready (DR)

Bit 1: Overrun Error (OR)

Bit 2: Parity Error (PE)

Bit 3: Framing Error (FE)

Bit 4: Break Interrupt (BI)

Bit 5: Transmitter Holding Register Empty (THRE)

Bit 6: Transmitter Shift Register Empty (TSRE)

Bit 7: Must be 0

**MODEM Status Register (MSR)**

Bit 0: Delta Clear to Send (DCTS)

Bit 1: Delta Data Set Ready (DDSR)

Bit 2: Training Edge Ring Indicator (TERI)

Bit 3: Delta Receive Line Signal Detect (DSLSD)

Bit 4: Clear to Send (CTS)

Bit 5: Data Set Ready (DSR)

Bit 6: Ring Indicator (RI)

Bit 7: Received Line Signal Detect (RSLD)

**Divisor Latch (LS, MS)**

	LS	MS
Bit 0:	Bit 0	Bit 8
Bit 1:	Bit 1	Bit 9
Bit 2:	Bit 2	Bit 10
Bit 3:	Bit 3	Bit 11
Bit 4:	Bit 4	Bit 12
Bit 5:	Bit 5	Bit 13
Bit 6:	Bit 6	Bit 14
Bit 7:	Bit 7	Bit 15

Desired Baud Rate	Divisor Used to Generate 16x Clock
300	384
600	192
1200	96
1800	64
2400	48
3600	32
4800	24
9600	12
14400	8
19200	6
28800	4
38400	3
57600	2
115200	1

□ **Parallel Ports**

**Register Address**

Port Address	Read/Write	Register
Base + 0	Write	Output data
Base + 0	Read	Input data
Base + 1	Read	Printer status buffer
Base + 2	Write	Printer control latch

**Printer Interface Logic**

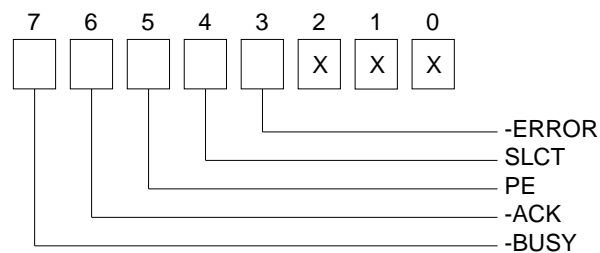
The parallel portion of the Winbond 83627 makes the attachment of various devices that accept eight bits of parallel data at standard TTL level.

**Data Swapper**

The system microprocessor can read the contents of the printer's Data Latch through the Data Swapper by reading the Data Swapper address

**Printer Status Buffer**

The system microprocessor can read the printer status by reading the address of the Printer Status Buffer. The bit definitions are described below:

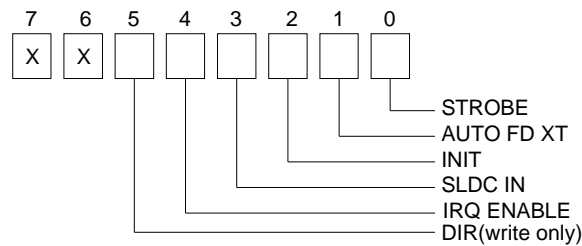


NOTE: X represents not used.

- Bit 7: This signal may become active during data entry, when the printer is off-line during printing, or when the print head is changing position or in an error state. When Bit 7 is active, the printer is busy and cannot accept data.
- Bit 6: This bit represents the current state of the printer's ACK signal. A 0 means the printer has received the character and is ready to accept another. Normally, this signal will be active for approximately 5 microseconds before receiving a BUSY message stops.
- Bit 5: A 1 means the printer has detected the end of the paper.
- Bit 4: A 1 means the printer is selected.
- Bit 3: A 0 means the printer has encountered an error condition.

### Printer Control Latch & Printer Control Swapper

The system microprocessor can read the contents of the printer control latch by reading the address of printer control swapper. Bit definitions are as follows:



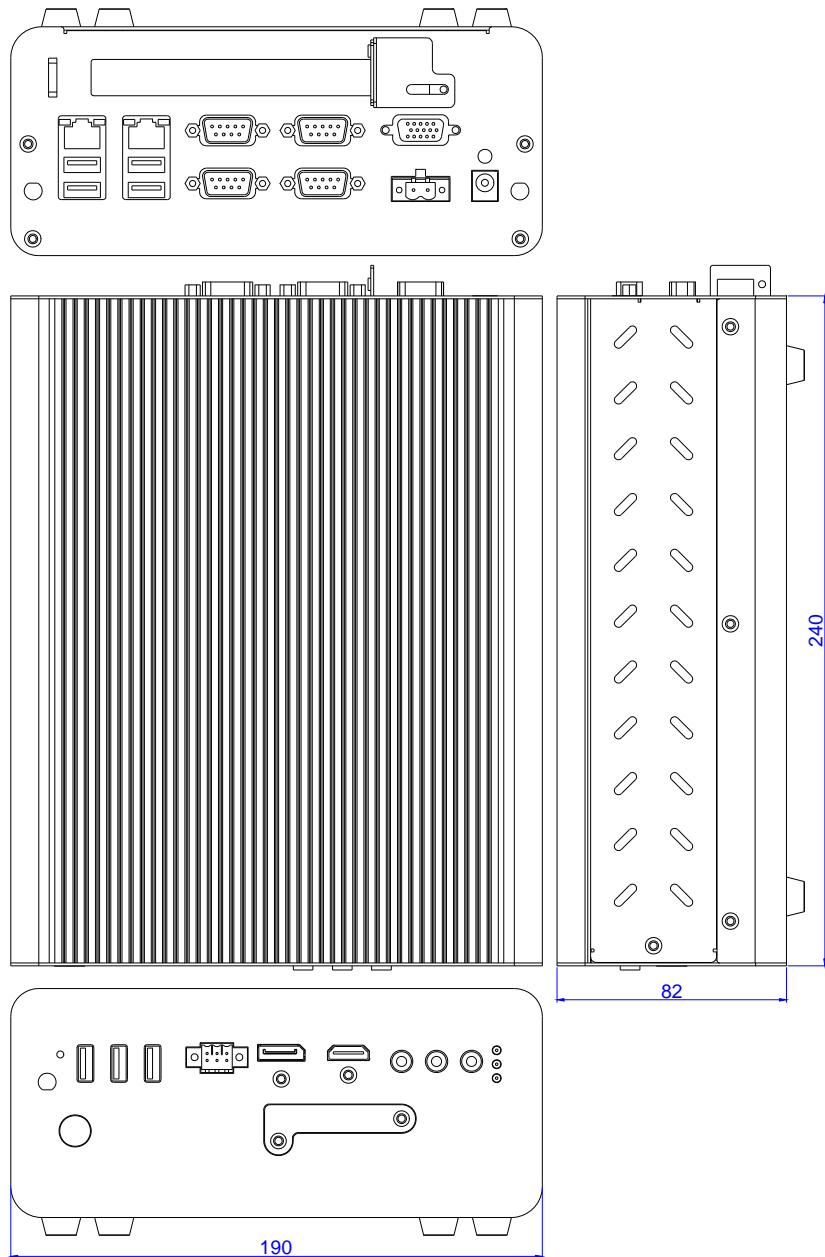
NOTE: X represents not used.

- Bit 5: Direction control bit. When logic 1, the output buffers in the parallel port are disabled allowing data driven from external sources to be read; when logic 0 they work as a printer port. This bit is write-only.
  
- Bit 4: A 1 in this position allows an interrupt to occur when ACK changes from low state to high state.
  
- Bit 3: A 1 in this bit position selects the printer.
  
- Bit 2: A 0 starts the printer (50 microseconds pulse, minimum).
  
- Bit 1: A 1 causes the printer to line-feed after a line is printed.
  
- Bit 0: A 0.5 microsecond minimum highly active pulse clocks data into the printer. Valid data must be present for a minimum of 0.5 microseconds before and after the strobe pulse.

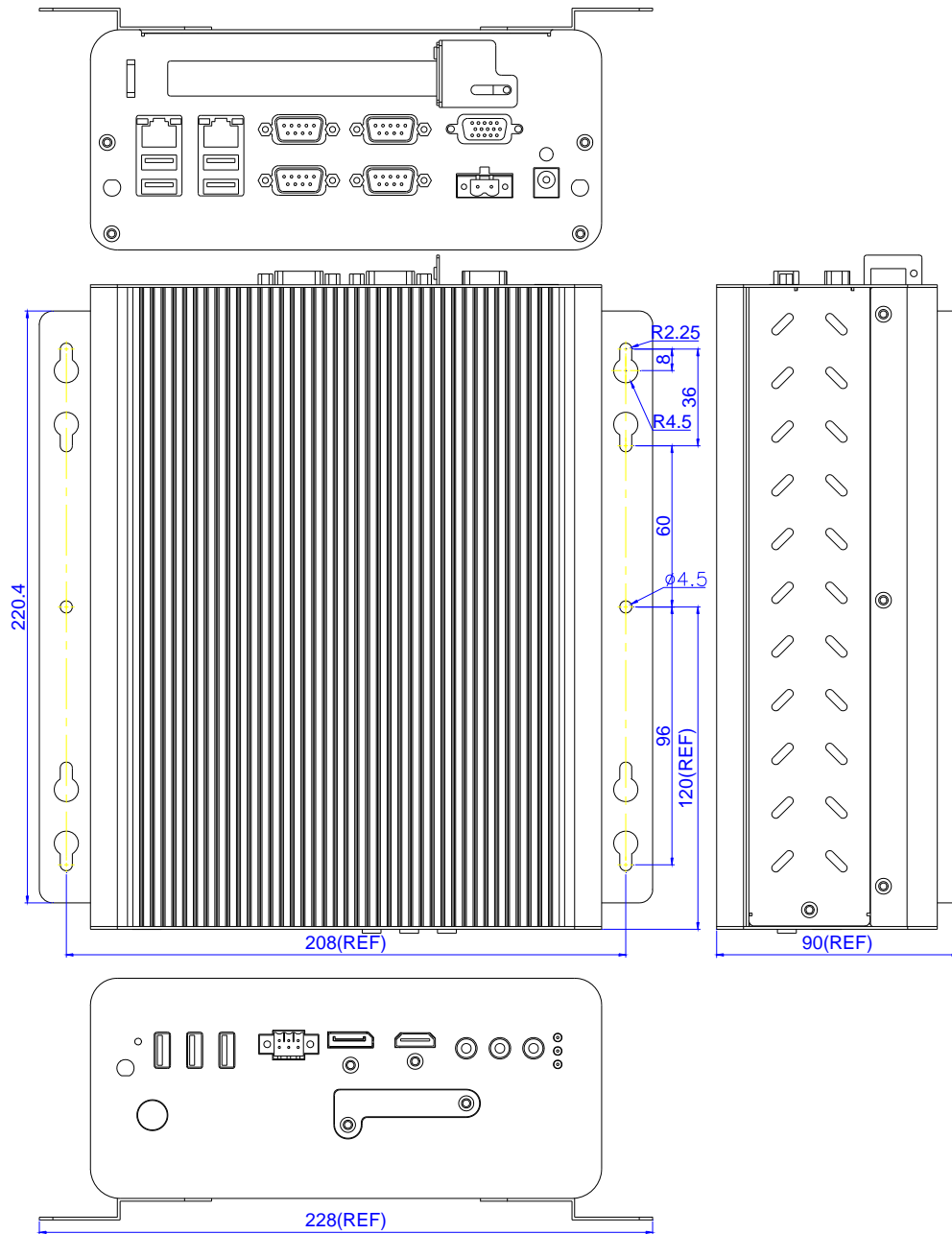
## Appendix

### Dimension

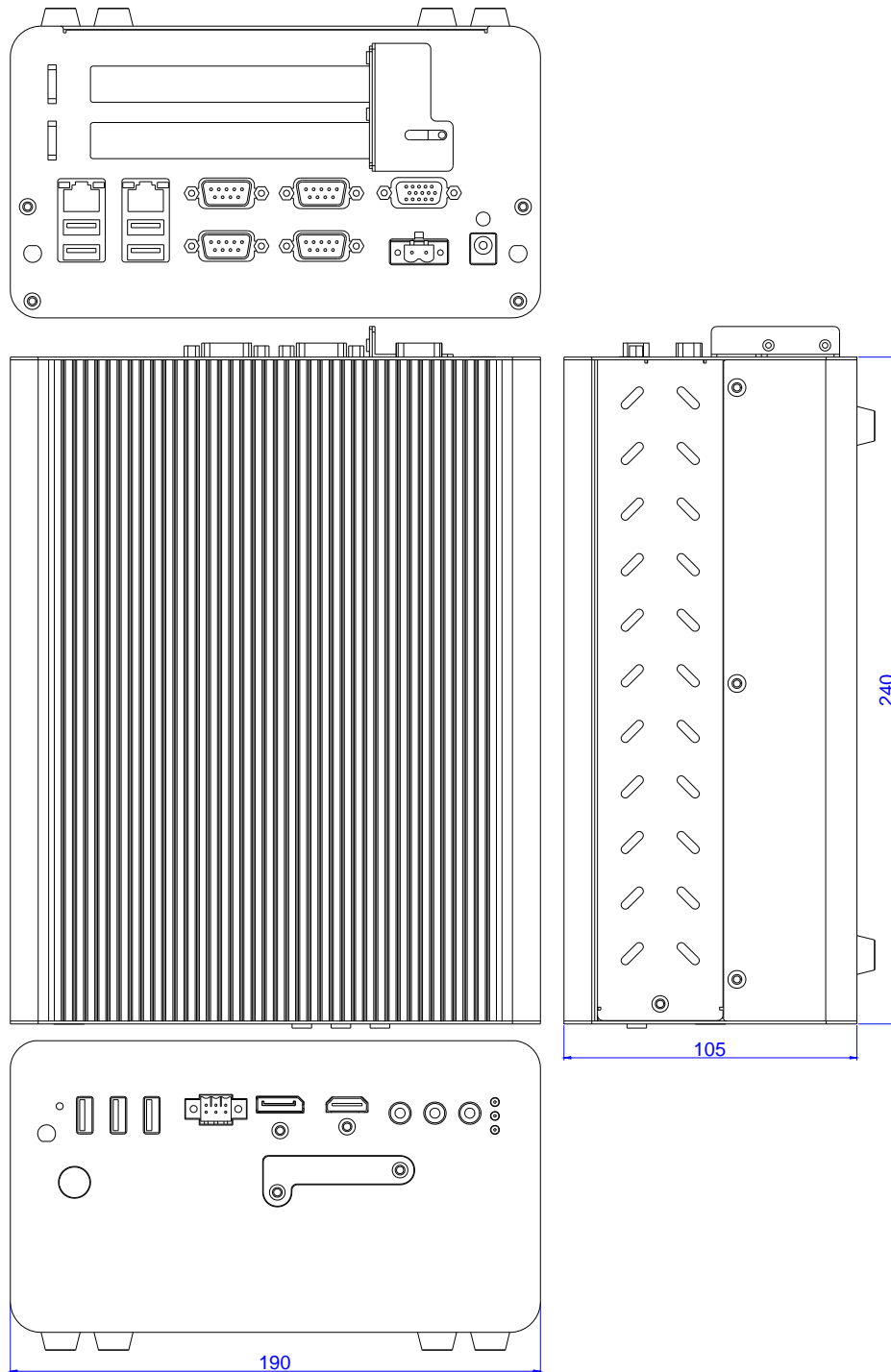
a. FX5639



b. FX5639-FX5636k1 universal fixers



c. FX5639L





d. FX5639L-FX5636k1 universal fixers

