



AXIOMTEK

MANO840

**Intel® Bay Trail SoC CPU
Mini ITX Motherboard**

User's Manual



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CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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Conventions Used in This Manual

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.



Warning

Information to prevent injury to yourself when trying to complete a task.



Caution

Information to prevent damage to the components when trying to complete a task.



Important

Instructions that you **MUST** follow to complete a task.



Note

Tips and additional information to help you complete a task.

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Chapter 1

Introduction



MANO840 is designed with Intel® Celeron™ J1900 SoC for industrial applications that request performance computing and reliable stability. The motherboard has onboard CPU Intel® Celeron™ J1900 Quad core 2.42GHz.

MANO840 has rich I/O connectivity with PS/2, COM port, Dual LAN, USB port and audio jack integrated in a standard 170mm x 170mm Mini ITX form factor. These motherboards also support dual display for LVDS, HDMI and VGA. MANO840 also comes with plenty of connectivity and expansion options. Vertical USB 3.0 port, 8-bit GPIO, two SATA 2.0 ports, PCI-Express Mini Card and PCI-Express x1 slot enable easy integration. 1000/100/10Mbps Ethernet port is also available to deliver high speed networking.

1.1 Features

- Intel® Celeron™ J1900 SoC processor
- 1 DDR3L 1333/1066MHz up to 8GB
- 1 PCI-Express x1 slot
- 1 USB 3.0 and 5 USB 2.0 supported
- 2 SATA 2.0 supported
- 6 COM ports supported
- Dual view display

1.2 Specifications

- **CPU**
 - Intel® Celeron™ J1900 SoC processor.
- **BIOS**
 - AMI 64Mb SPI ROM.
- **System Memory**
 - One 204-pin DDR3L SO-DIMM socket.
 - Maximum up to 8GB DDR3L 1333/1066MHz memory.
- **Onboard Multi I/O**
 - Serial ports: Six RS-232 ports and one RS-232 port with 5V/12V power.
 - One PS/2 keyboard/mouse.
- **Serial ATA**
 - Two SATA 2.0 ports (3Gb/s performance).
- **USB Interface**
 - One USB 3.0 port.
 - Five USB 2.0 ports.
- **Display**
 - One VGA - up to 2560x1600 .
 - One HDMI - up to 1920x1080 .
 - One LVDS – up to 1920x1200 .
- **Ethernet**
 - LAN1 - 1000/100/10Mbps with Realtek RTL8111G GbE LAN.
 - LAN2 - 1000/100/10Mbps with Realtek RTL8111G GbE LAN.
- **Audio**
 - HD audio compliant via Realtek ALC269.
 - MIC-in and line-out.
- **Digital I/O**
 - Eight channels.
- **Expansion Interface**
 - One PCI-Express x1 slot.
 - One PCI-Express Mini Card(support mSATA, share SATA Signal with SATA2 Conn)

- **Hardware Monitoring**
 - Detect CPU/system temperature, voltage and fan speed.
- **Watchdog Timer**
 - 1~255 seconds; up to 255 levels.
- **Power Management**
 - ACPI (Advanced Configuration and Power Interface).
- **Form Factor**
 - Mini ITX form factor.



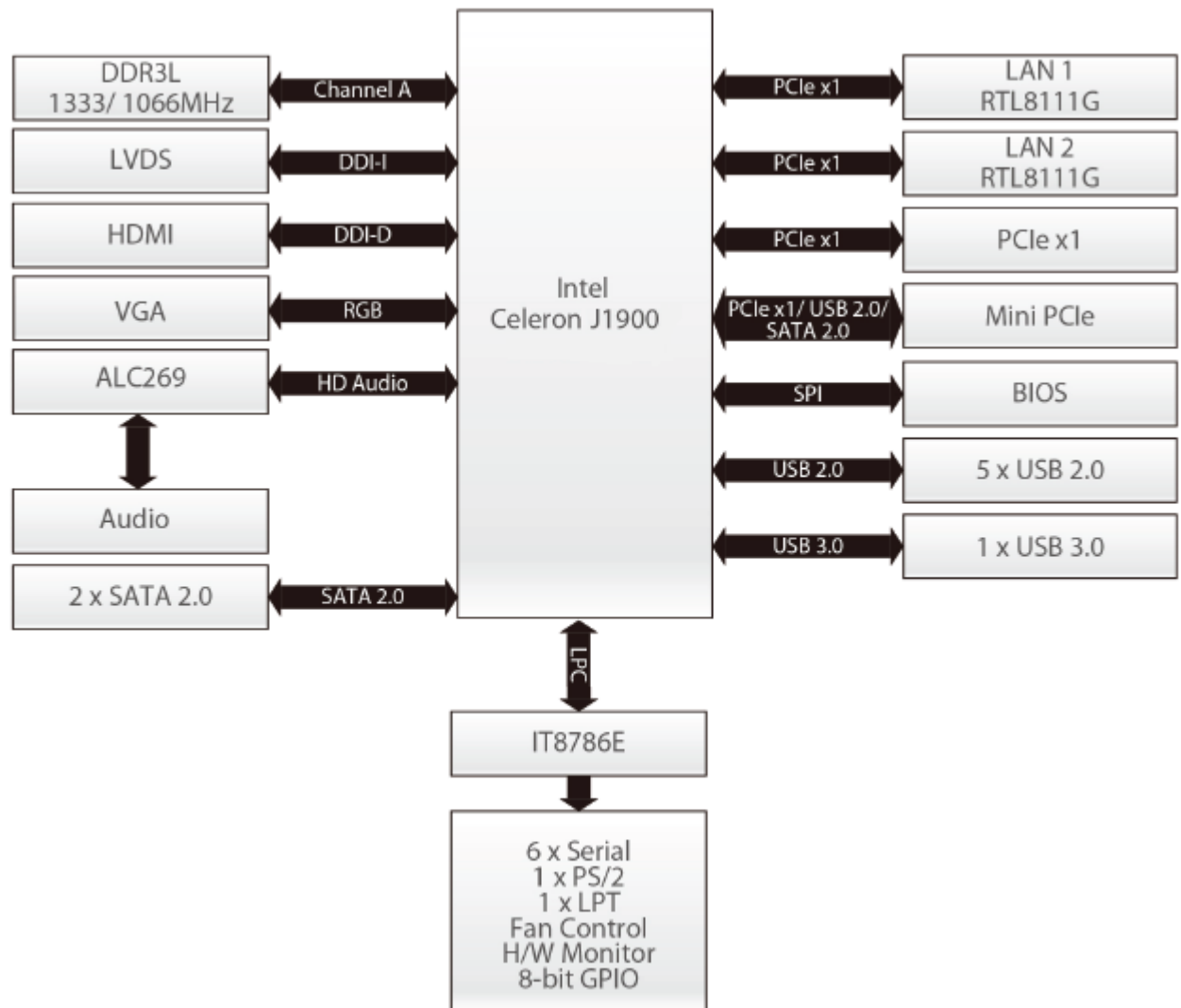
Note

All specifications and images are subject to change without notice.

1.3 Utilities Supported

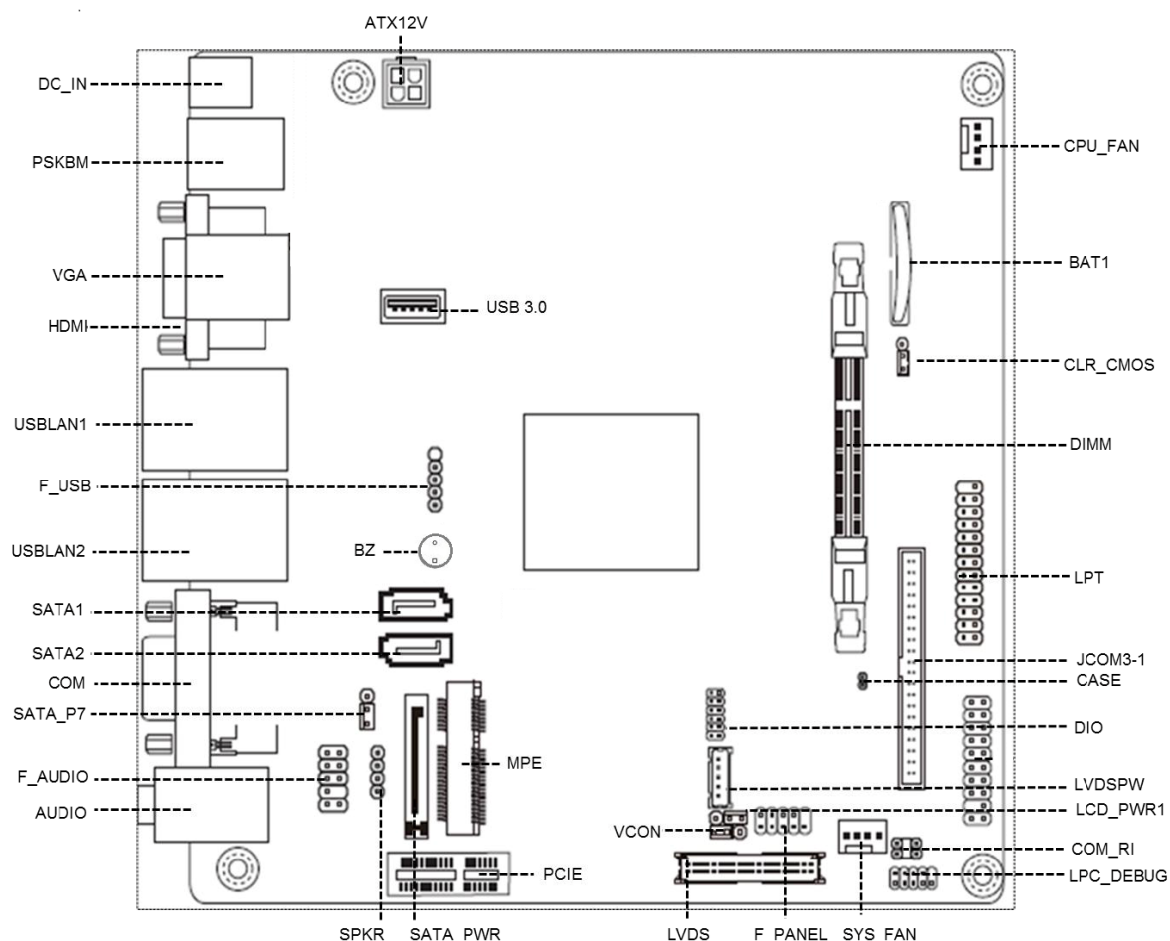
- Chipset driver
- Ethernet driver
- Graphics driver
- Audio driver

1.4 Block Diagram



Chapter 2

2.1 Board Layout

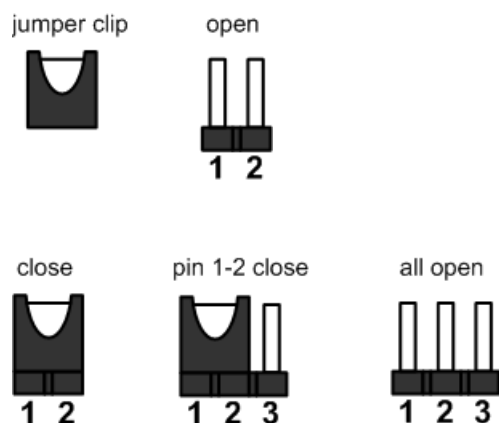


2.2 Rear Panel I/O



2.3 Jumper Settings

Jumper is a small component consisting of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close. And remove jumper clip from 2 jumper pins to open. The following illustration shows how to set up jumper.



Before applying power to MANO840 Series, please make sure all of the jumpers are in factory default position. Below you can find a summary table and onboard default settings.



Note

Once the default jumper setting needs to be changed, please do it under power-off condition.

Jumper	Description	Setting
CLR_CMOS	Clear CMOS Default: Normal Operation	1-2 Close
VCON	VCON Voltage Select Default: Ground	2-3 Close
LCD_PWR1	LVDS Panel Power Select Default: +5V	1-2 Close
COM_RI	COM3 RI/+5V/+12V Select Default: RI	3-4 Close

2.3.1 Clear CMOS (CLR_CMOS)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which includes system setup information such as system passwords.

To erase the RTC RAM:

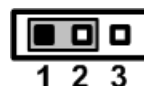
1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper clip from pins 1-2 (default) to pins 2-3. Keep the clip on pins 2-3 for about 5~10 seconds, then move the clip back to pins 1-2.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the key during the boot process and enter BIOS setup to re-enter data.



Caution

Except when clearing the RTC RAM, never remove the clip on this jumper default position. Removing the clip will cause system boot failure!

Function	Setting
Normal operation (Default)	1-2 close
Clear CMOS	2-3 close



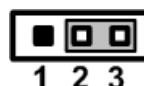
Note

You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

2.3.2 VCON Voltage Select (VCON)

This jumper allows you to select the panel type of LVDS panel.

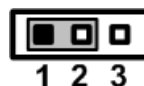
Function	Setting
+3.3	1-2 close
GND(Default)	2-3 close



2.3.3 LVDS Panel Power Select (LCD_PWR1)

This jumper allows you to select the panel power mode of LVDS panel.

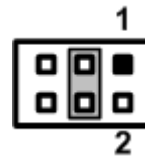
Function	Setting
+5V (Default)	1-2 close
+3.3V	2-3 close



2.3.4 COM3 RI/+5V/+12V Select (COM_RI)

This jumper allows you to select the power mode of COM3 port.

Function	Setting
+12V	1-2 close
RI (Default)	3-4 close
+5V	5-6 close

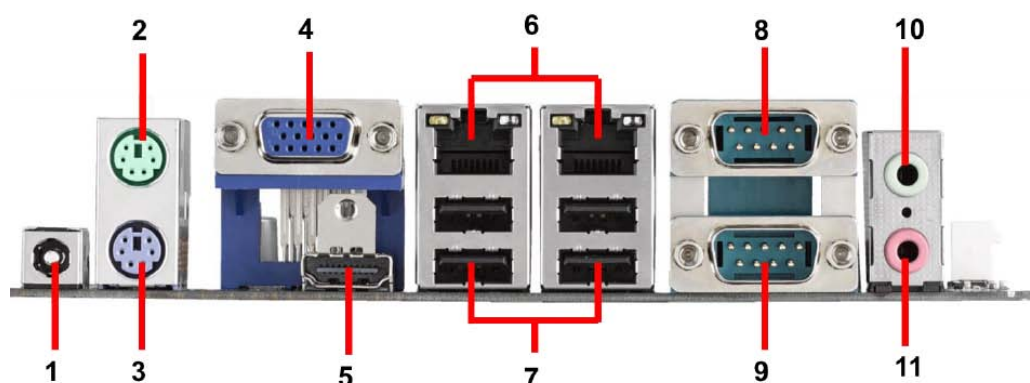


2.4 Connectors

Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows connectors on the hardware.

Connector	Description
DC_IN	12V DC Inlet
PSKBM	PS/2 Keyboard and Mouse Mini Din
HDMI	HDMI Port
VGA	VGA Port
USBLAN1	LAN1 and 2 USB 2.0 Port
USBLAN2	LAN2 and 2 USB 2.0 Port
COM	COM1 and COM2 Ports
AUDIO	Audio Jack
CPU_FAN	CPU Fan Connector
SYS_FAN	System Fan Connector
DIO	Digital I/O Connector
F_PANEL	Front Panel Connector
ATX12V	ATX Power Connector
F_AUDIO	Audio Connector
LVDS	LVDS Connector
LVDSPW	LCD Inverter Connector
SATA_PWR	SATA Power Connector
SPKR	Speaker Connector
SATA1~SATA2	SATA Connectors
F_USB	USB 2.0 Connector
USB3.0	USB 3.0 Connector
JCOM3-1	COM3~COM6 Connector
LPT	Parallel Port Connector
PCIE	PCI-Express x1 Slot
MPE	PCI-Express Mini Card Connector
DIMM	204-pin DDR3L SO-DIMM Socket

2.4.1 Rear Panel Connectors



1. **DC_IN.** This inlet is for 12V DC inlet.
2. **PS/2 mouse port (green).** This port is for a PS/2 mouse.
3. **PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.
4. **VGA port.** This 15-pin VGA port connects to a VGA monitor.
5. **HDMI port.** This 19-pin HDMI 1.3 port connects to a HDMI monitor.
6. **LAN (RJ-45) ports.** Each of these ports allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No link	OFF	10Mbps connection
Yellow	Link	Orange	100Mbps connection
Blinking	Data activity	Green	1Gbps connection

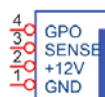
7. **USB 2.0 ports 1~4.** These four 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
8. **Serial connector.** This 9-pin COM1 port is for serial devices.
9. **Serial connector.** This 9-pin COM2 port is for serial devices.
10. **Line-out port (Green).** This port connects a headphone or a speaker.
11. **Microphone port (pink).** This port connects a microphone.

2.4.2 FAN Connectors (CPU_FAN and SYS_FAN)

The fan connectors support cooling fans of 280mA (3.36 W max.) at 4800rpm or a total of 1A~2.22A (26.64W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.

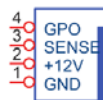
CPU fan interface is available through CPU_FAN, see table below.

Pin	Signal
1	GND
2	+12V
3	SENSE
4	GPO



System fan interface is available through SYS_FAN, see table below.

Pin	Signal
1	GND
2	+12V
3	SENSE
4	GPO



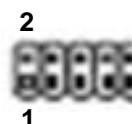
Caution

Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors.

2.4.3 Digital I/O Connector (DIO)

This connector is for GPIO function.

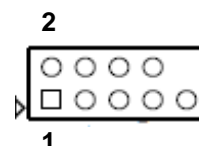
Pin	Signal	Pin	Signal
1	GPIO_S0_SC17_DI	2	GPIO_S0_SC21_DO
3	GPIO_S0_SC18_DI	4	GPIO_S0_SC22_DO
5	GPIO_S0_SC19_DI	6	GPIO_S0_SC23_DO
7	GPIO_S0_SC20_DI	8	GPIO_S0_SC24_DO
9	5VSB	10	GND



2.4.4 Front Panel Connector (F_PANEL)

This connector is for a chassis-mounted front panel I/O module that supports power on/reset switch and HDD/ power LED indicator. The functions are described as follows.

Pin	Signal	Pin	Signal
1	HDDLED+	2	POWERLED+-
3	HDDLED-	4	POWERLED-
5	GND	6	PWSWITCH
7	RESET	8	GND
9	NC		



ATX Power Button/Soft-off Button (Pin 6-8 PWRBT)

This 2-pin connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch and holding it for more than four seconds while the system is ON turns the system OFF.

Reset Button (Pin 5-7 SYS_RST)

This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

Power LED (Pin 2-4 PWRLED)

This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

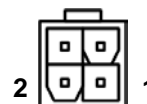
Hard Disk Drive Activity LED (Pin 1-3 HDLED)

This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

2.4.5 ATX Power Connector (ATX12V)

The connector is for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

Pin	Signal	Pin	Signal
1	GND	3	+12V
2	GND	4	+12V

**Note**

- *Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.*
- *Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system.*

2.4.6 Audio Connector (F_AUDIO)

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC '97 (optional) audio standard. Connect one end of the front panel audio I/O module cable to this connector.

Pin	Signal	Pin	Signal
1	MIC2_L	2	AUGND
3	MIC2_R	4	FP_AUD_DETECT
5	HPOUT-R	6	MIC2-JD
7	AUGND	8	NC
9	HPOUT-L	10	HPOUT-JD

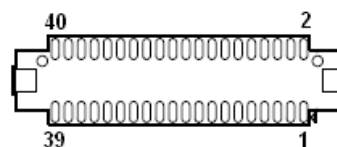
**Important**

For motherboards with the optional HD Audio feature, we recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.

2.4.7 LVDS Connector (LVDS)

The connector is for 24-bit dual channel LVDS panel.

Pin	Signal	Pin	Signal
1	LCD_VDD	2	LCD_VDD
3	GND	4	GND
5	LCD_VDD	6	LCD_VDD
7	TXO0-	8	TXE0-
9	TXO0+	10	TXE0+
11	GND	12	GND
13	TXO1-	14	TXE1-
15	TXO1+	16	TXE1+
17	GND	18	GND
19	TXO2-	20	TXE2-
21	TXO2+	22	TXE2+
23	GND	24	GND
25	TXOC-	26	TXEC-
27	TXOC+	28	TXEC+
29	GND	30	GND
31	DDC_CLK	32	DDC_DATA
33	GND	34	GND
35	TXO3-	36	TXE3-
37	TXO3+	38	TXE3+
39	BKLT_EN	40	VCON



2.4.8 LCD Inverter Connector (LVDS_PW)

The connector is for the control of internal LVDS brightness.

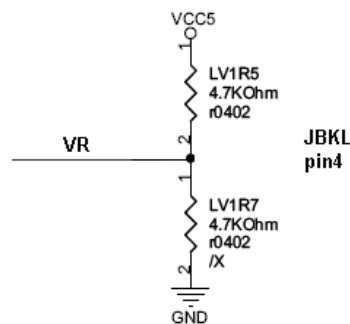
Pin	Signal
1	+12V
2	GND
3	ENBKL
4	PWM
5	+5V



Signal Description:

- PWM**

For inverter with adjustable backlight function, it is possible to control the LCD brightness through the PWM signal.



$$V_{adj} = 0.75V \sim 4.25V$$

(Recommended: 4.7K Ω , >1/16W)

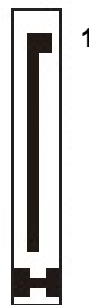
- ENBKL**

LCD backlight ON/OFF control signal.

2.4.9 SATA Power Connector (SATA_PWR)

This connector supports SATA device power.

Pin	Signal
1	3.3V
2	3.3V
3	3.3V
4	GND
5	GND
6	GND
7	5V
8	5V
9	5V
10	GND
11	GND
12	GND
13	12V
14	12V
15	12V



2.4.10 Speaker Connector (SPKR)

This connector supports speaker signal.

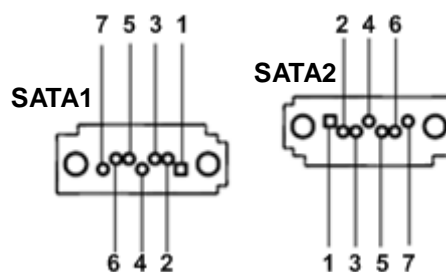
Pin	Signal
1	SPK-LL-
2	SPK-LL+
3	SPK-RR-
4	SPK-RR+



2.4.11 SATA Connectors (SATA1 and SATA2)

These connectors support SATA 2.0 and are for the Serial ATA signal cables for Serial ATA hard disk drives.

Pin	Signal
1	GND
2	SATA_TXP2
3	SATA_TXN2
4	GND
5	SATA_RXN2
6	SATA_RXP2
7	GND



2.4.12 USB 2.0 Connector (F_USB)

This connector is for USB 2.0 port. Connect the optional USB module cable to this connector then install the module to a slot opening at the back of the system chassis. This USB connector complies with USB 2.0 specification that supports up to 480Mbps connection speed.

Pin	Signal
1	PS2_USB
2	USB_DN2_CMK
3	USB_DP2_CMK
4	GND
5	NC



2.4.13 USB 3.0 Connector (USB3.0)

This connector provides USB Rev. 3.0 supporting transmission rate up to 5Gbps and fuse protect.

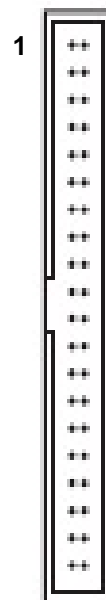
Pin	Signal
1	VCC
2	-DATA1
3	+DATA1
4	GND
5	-SRX1
6	+SRX1
7	GND
8	-STX1
9	+STX1



2.4.14 COM Connector (JCOM3-1)

This connector is for four serial ports (COM3~COM6). Connect the serial port module cable to this connector then install the module to a slot opening at the back of the system chassis.

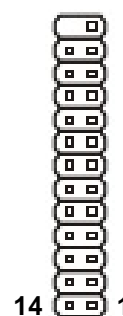
Pin	Signal	Pin	Signal
1	COM3_DCD#	2	COM3_DSR#
3	COM3_RXD	4	COM3_RTS#
5	COM3_TXD	6	COM3_CTS#
7	COM3_DTR#	8	RI3xPOWER
9	GND	10	GND
11	COM4_DCD#	12	COM4_DSR#
13	COM4_RXD	14	COM4_RTS#
15	COM4_TXD	16	COM4_CTS#
17	COM4_DTR#	18	COM4_RI#
19	GND	20	GND
21	COM5_DCD#	22	COM5_DSR#
23	COM5_RXD	24	COM5_RTS#
25	COM5_TXD	26	COM5_CTS#
27	COM5_DTR#	28	COM5_RI#
29	GND	30	GND
31	JDDCD6#	32	COM6_DSR#
33	JRRXD6	34	COM6_RTS#
35	JTTXD6	36	COM6_CTS#
37	JDDTR6#	38	COM6_RI#
39	GND	40	GND



2.4.15 Parallel Port Connector (LPT)

This connector is for parallel port function.

Pin	Signal	Pin	Signal
1	-NSTB	14	-AFD
2	PD0	15	-ERROR
3	PD1	16	-INIT
4	PD2	17	-SLIN
5	PD3	18	GND
6	PD4	19	GND
7	PD5	20	GND
8	PD6	21	GND
9	PD7	22	GND
10	ACK_L	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT	26	NC



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Chapter 3

Hardware Installation

Take note of the following precautions before you install motherboard components or change any motherboard settings.



Caution

- *Unplug the power cord from the wall socket before touching any component.*
- *Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.*
- *Hold components by the edges to avoid touching the ICs on them.*
- *Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that came with the component.*
- *Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.*

3.1 Motherboard Overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it. Refer to the chassis documentation before installing the motherboard.



Warning

Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

3.1.1 Placement Direction

When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

3.1.2 Screw Holes

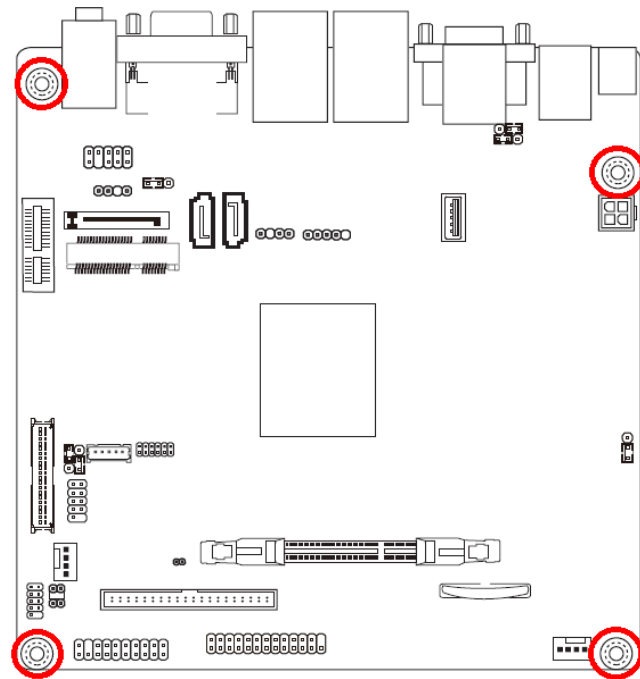
Place four (4) screws into the holes indicated by circles to secure the motherboard to the chassis.



Caution

Do not over-tighten the screws! Doing so can damage the motherboard.

Place this side towards the rear of the chassis.

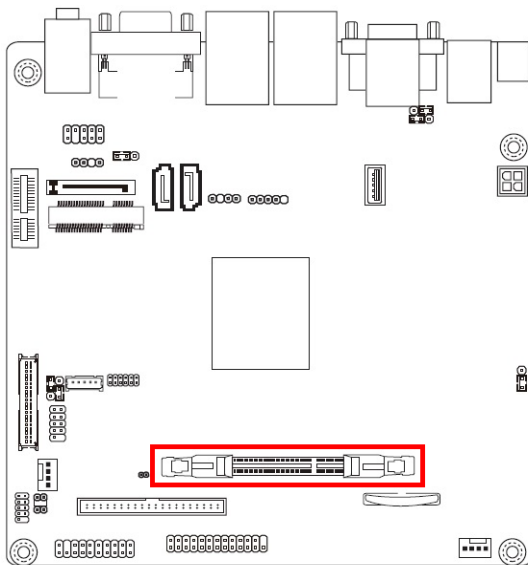


3.2 System Memory

3.2.1 Overview

The motherboard comes with one 204-pin Double Data Rate 3 Low voltage (DDR3L) Small Outline Dual Inline Memory Modules (SO-DIMM) socket.

A DDR3L module has the same physical dimensions as a DDR SO-DIMM but has a 204-pin footprint compared to the 204-pin DDR2 DIMM. DDR3L DIMMs are notched differently to prevent installation on a DDR2 DIMM socket. The following figure illustrates the location of the sockets:



204-pin DDR3L SO-DIMM socket

Channel	Socket
Channel A	DIMM



3.2.2 Memory Configurations

You may install 1GB, 2GB, 4GB and 8GB non-ECC DDR3L SO-DIMM into the SO-DIMM socket using the memory configurations in this section.



Important

- *If you installed over 4GB memory module, the system may detect less than 3GB of total memory because of address space allocation for other critical functions. This limitation applies to Windows 32-bit version operating system since it does not support PAE (Physical Address Extension) mode.*
- *If you install Windows 32-bit version operating system, we recommend that you install less than 3GB of total memory.*
- *Due to CPU limitation, SO-DIMM modules with 128Mb memory chips or double-sided x16 memory chips are not supported in this motherboard.*

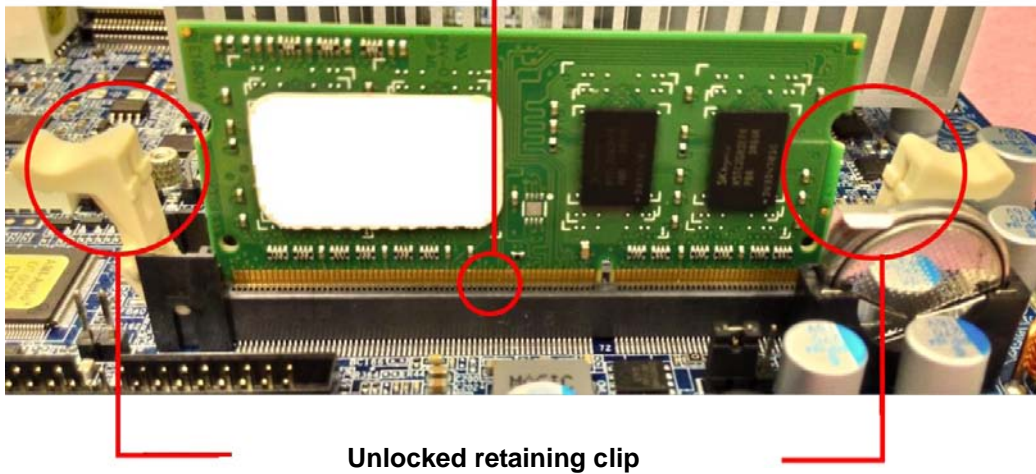
3.3.3 Installing a SO-DIMM

1. Unlock a SO-DIMM socket by pressing the retaining clips outward.

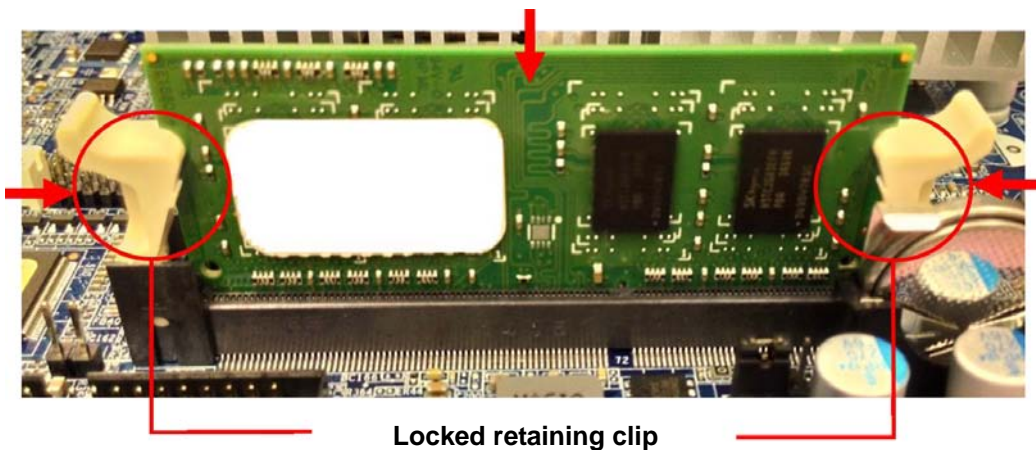


2. Align a SO-DIMM on the socket such that the notch on the SO-DIMM matches the break on the socket.

DDR3L SO-DIMM notch



3. Firmly insert the SO-DIMM into the socket until the retaining clips snap back in place and the SO-DIMM is properly seated.



Important

- A DDR3L SO-DIMM is keyed with a notch so that it fits in only one direction. **DO NOT** force a SO-DIMM into a socket to avoid damaging the SO-DIMM.
- The DDR3L SO-DIMM socket does not support DDR2 SO-DIMM. **DO NOT** install DDR2 SO-DIMM to the DDR3L SO-DIMM socket.

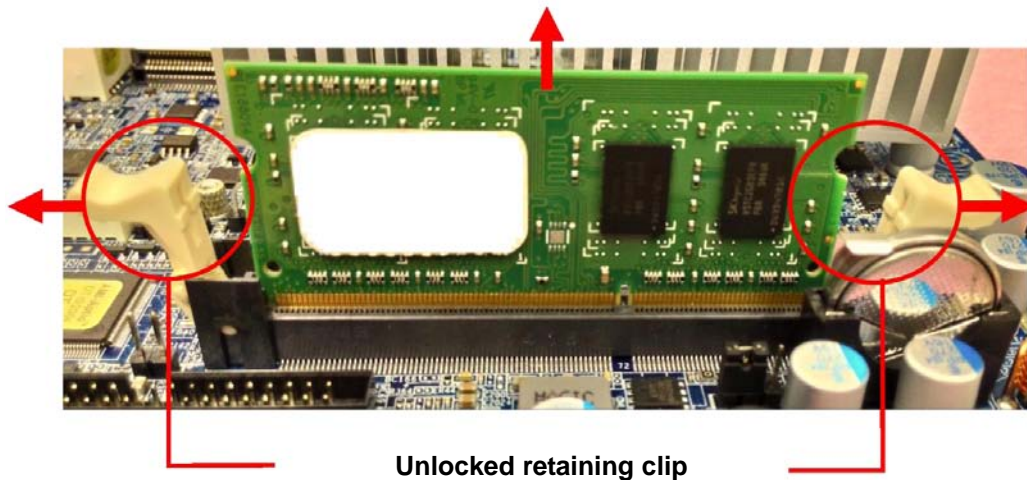


Caution

Make sure to unplug the power supply before adding or removing SO-DIMM or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

3.2.4 Removing a SO-DIMM

1. Simultaneously press the retaining clips downward to unlock the SO-DIMM.
2. Remove the SO-DIMM from the socket.



Note

Support the SO-DIMM lightly with your fingers when pressing the retaining clips. The SO-DIMM might get damaged when it flips out with extra force.

3.3 Expansion Card

In the future, you may need to install expansion cards. The following sub-sections describe the slots and the expansion cards that they support.



Warning

Make sure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

3.3.1 Installing an Expansion Card

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5. Secure the card to the chassis with the screw you removed earlier.
6. Replace the system cover.

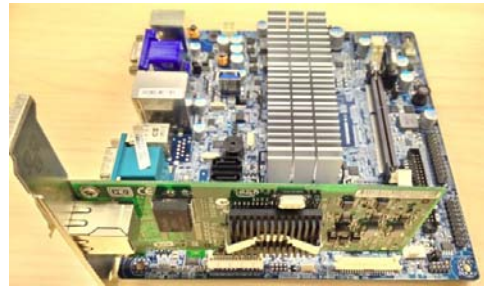
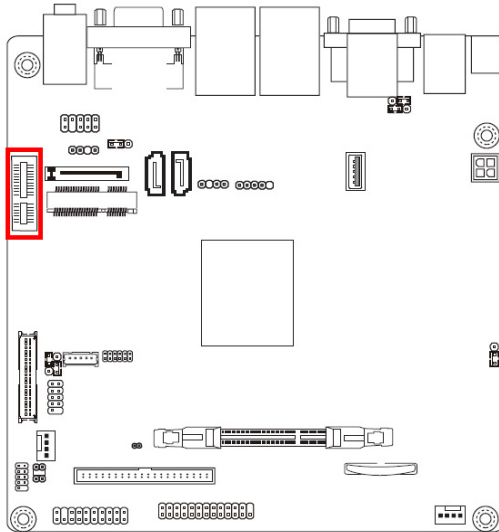
3.3.2 Configuring an Expansion Card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 5 for information on BIOS setup.
2. Assign an IRQ to the card if needed.
3. Install the software drivers for the expansion card.

3.3.3 PCI-Express x1 Slot (PCIE)

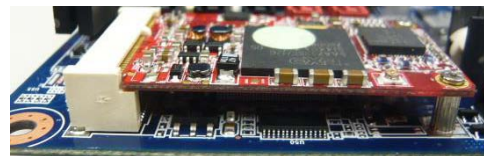
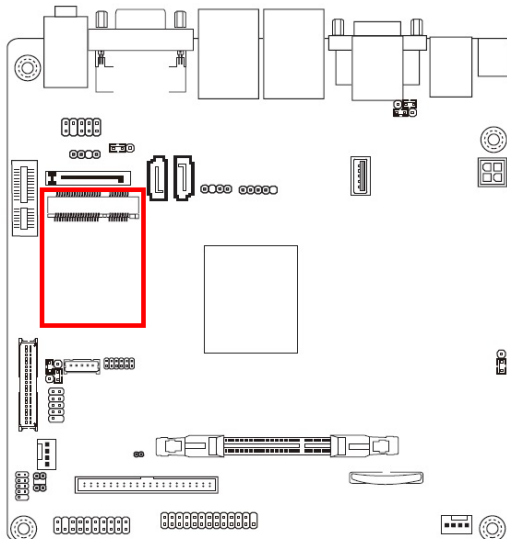
This motherboard supports one PCI-Express x1. The following figure shows a PCI-Express x1 card installed on the PCI-Express x1 slot.



3.3.4 PCI-Express Mini Card Connector

This motherboard has one PCI-Express Mini Card slot which supports SATA/USB2.0/ PCIe signal.

The following figure shows a PCI-Express Mini Card installed on this connector.



Note: SATA2 Conn and mSATA share the same SATA signal, if mSATA is connected, SATA2 Conn will not be available, since mSATA is the first priority.

Chapter 4

Hardware Description

4.1 Microprocessors

The MANO840 Series supports Intel® Celeron™ J1900 SoC processor, which enable your system to operate under Windows® 7, Windows® 8 and Linux environments. The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

4.2 BIOS

The MANO840 Series uses AMI Plug and Play BIOS with a single 64Mb SPI Flash.































4.3 System Memory

The MANO840 Series supports one 204-pin DDR3L SO-DIMM socket for maximum memory capacity up to 8GB DDR3L SDRAMs. The memory module comes in sizes of 1GB, 2GB, 4GB and 8GB.

4.4 I/O Port Address Map

The Intel® Celeron™ J1900 SoC processor communicates via I/O ports. Total 1KB port addresses are available for assigning to other devices via I/O expansion cards.































































▲	Input/output (IO)
▶	[00000000 - 0000006F] PCI Express Root Complex
▶	[00000020 - 00000021] Programmable interrupt controller
▶	[00000024 - 00000025] Programmable interrupt controller
▶	[00000028 - 00000029] Programmable interrupt controller
▶	[0000002C - 0000002D] Programmable interrupt controller
▶	[0000002E - 0000002F] Motherboard resources
▶	[00000030 - 00000031] Programmable interrupt controller
▶	[00000034 - 00000035] Programmable interrupt controller
▶	[00000038 - 00000039] Programmable interrupt controller
▶	[0000003C - 0000003D] Programmable interrupt controller
▶	[00000040 - 00000043] System timer
▶	[0000004E - 0000004F] Motherboard resources
▶	[00000050 - 00000053] System timer
▶	[00000060 - 00000060] Standard PS/2 Keyboard
▶	[00000061 - 00000061] Motherboard resources
▶	[00000063 - 00000063] Motherboard resources
▶	[00000064 - 00000064] Standard PS/2 Keyboard
▶	[00000065 - 00000065] Motherboard resources
▶	[00000067 - 00000067] Motherboard resources
▶	[00000070 - 00000070] Motherboard resources
▶	[00000070 - 00000077] System CMOS/real time clock
▶	[00000078 - 000000CF] PCI Express Root Complex
▶	[00000080 - 0000008F] Motherboard resources
▶	[00000092 - 00000092] Motherboard resources
▶	[000000A0 - 000000A1] Programmable interrupt controller
▶	[000000A4 - 000000A5] Programmable interrupt controller
▶	[000000A8 - 000000A9] Programmable interrupt controller
▶	[000000AC - 000000AD] Programmable interrupt controller
▶	[000000B0 - 000000B1] Programmable interrupt controller
▶	[000000B2 - 000000B3] Motherboard resources
▶	[000000B4 - 000000B5] Programmable interrupt controller
▶	[000000B8 - 000000B9] Programmable interrupt controller





















































	[000000BC - 000000BD] Programmable interrupt controller
	[000002E0 - 000002E7] Nuvoton Communications Port (COM5)
	[000002E8 - 000002EF] Nuvoton Communications Port (COM4)
	[000002F0 - 000002F7] Nuvoton Communications Port (COM6)
	[000002F8 - 000002FF] Nuvoton Communications Port (COM2)
	[00000378 - 0000037F] Printer Port (LPT1)
	[000003B0 - 000003BB] Intel(R) HD Graphics
	[000003C0 - 000003DF] Intel(R) HD Graphics
	[000003E8 - 000003EF] Nuvoton Communications Port (COM3)
	[000003F8 - 000003FF] Nuvoton Communications Port (COM1)
	[00000400 - 0000047F] Motherboard resources
	[000004D0 - 000004D1] Programmable interrupt controller
	[00000500 - 000005FE] Motherboard resources
	[00000600 - 0000061F] Motherboard resources
	[00000680 - 0000069F] Motherboard resources
	[00000A00 - 00000A2F] Motherboard resources
	[00000A30 - 00000A3F] Motherboard resources
	[00000A40 - 00000A4F] Motherboard resources
	[00000D00 - 0000FFFF] PCI Express Root Complex
	[0000D000 - 0000D0FF] Realtek PCIe GBE Family Controller #2
	[0000D000 - 0000DFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 4 - 0F4E
	[0000E000 - 0000E0FF] Realtek PCIe GBE Family Controller
	[0000E000 - 0000EFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 3 - 0F4C
	[0000F000 - 0000F01F] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
	[0000F020 - 0000F03F] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[0000F040 - 0000F043] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[0000F050 - 0000F057] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[0000F060 - 0000F063] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[0000F070 - 0000F077] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	[0000F080 - 0000F087] Intel(R) HD Graphics































































4.5 Interrupt Controller (IRQ) Map































































The interrupt controller (IRQ) mapping list is shown as follows:































































Interrupt request (IRQ)	
(ISA) 0x00000000 (00)	System timer
(ISA) 0x00000001 (01)	Standard PS/2 Keyboard
(ISA) 0x00000003 (03)	Nuvoton Communications Port (COM2)
(ISA) 0x00000004 (04)	Nuvoton Communications Port (COM1)
(ISA) 0x00000007 (07)	Nuvoton Communications Port (COM3)
(ISA) 0x00000007 (07)	Nuvoton Communications Port (COM4)
(ISA) 0x00000007 (07)	Nuvoton Communications Port (COM5)
(ISA) 0x00000007 (07)	Nuvoton Communications Port (COM6)
(ISA) 0x00000008 (08)	High precision event timer
(ISA) 0x00000051 (81)	Microsoft ACPI-Compliant System
(ISA) 0x00000052 (82)	Microsoft ACPI-Compliant System
(ISA) 0x00000053 (83)	Microsoft ACPI-Compliant System
(ISA) 0x00000054 (84)	Microsoft ACPI-Compliant System
(ISA) 0x00000055 (85)	Microsoft ACPI-Compliant System
(ISA) 0x00000056 (86)	Microsoft ACPI-Compliant System
(ISA) 0x00000057 (87)	Microsoft ACPI-Compliant System
(ISA) 0x00000058 (88)	Microsoft ACPI-Compliant System
(ISA) 0x00000059 (89)	Microsoft ACPI-Compliant System
(ISA) 0x0000005A (90)	Microsoft ACPI-Compliant System
(ISA) 0x0000005B (91)	Microsoft ACPI-Compliant System
(ISA) 0x0000005C (92)	Microsoft ACPI-Compliant System
(ISA) 0x0000005D (93)	Microsoft ACPI-Compliant System
(ISA) 0x0000005E (94)	Microsoft ACPI-Compliant System
(ISA) 0x0000005F (95)	Microsoft ACPI-Compliant System
(ISA) 0x00000060 (96)	Microsoft ACPI-Compliant System
(ISA) 0x00000061 (97)	Microsoft ACPI-Compliant System
(ISA) 0x00000062 (98)	Microsoft ACPI-Compliant System
(ISA) 0x00000063 (99)	Microsoft ACPI-Compliant System
(ISA) 0x00000064 (100)	Microsoft ACPI-Compliant System
(ISA) 0x00000065 (101)	Microsoft ACPI-Compliant System
(ISA) 0x00000066 (102)	Microsoft ACPI-Compliant System
(ISA) 0x00000067 (103)	Microsoft ACPI-Compliant System
(ISA) 0x00000068 (104)	Microsoft ACPI-Compliant System
(ISA) 0x00000069 (105)	Microsoft ACPI-Compliant System
(ISA) 0x0000006A (106)	Microsoft ACPI-Compliant System
(ISA) 0x0000006B (107)	Microsoft ACPI-Compliant System
(ISA) 0x0000006C (108)	Microsoft ACPI-Compliant System
(ISA) 0x0000006D (109)	Microsoft ACPI-Compliant System
(ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
(ISA) 0x0000006F (111)	Microsoft ACPI-Compliant System
(ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System
(ISA) 0x00000071 (113)	Microsoft ACPI-Compliant System
(ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System
(ISA) 0x00000073 (115)	Microsoft ACPI-Compliant System
(ISA) 0x00000074 (116)	Microsoft ACPI-Compliant System
(ISA) 0x00000075 (117)	Microsoft ACPI-Compliant System
(ISA) 0x00000076 (118)	Microsoft ACPI-Compliant System
(ISA) 0x00000077 (119)	Microsoft ACPI-Compliant System
(ISA) 0x00000078 (120)	Microsoft ACPI-Compliant System
(ISA) 0x00000079 (121)	Microsoft ACPI-Compliant System
(ISA) 0x0000007A (122)	Microsoft ACPI-Compliant System
(ISA) 0x0000007B (123)	Microsoft ACPI-Compliant System
(ISA) 0x0000007C (124)	Microsoft ACPI-Compliant System
(ISA) 0x0000007D (125)	Microsoft ACPI-Compliant System
(ISA) 0x0000007E (126)	Microsoft ACPI-Compliant System





























	(ISA) 0x0000007F (127)	Microsoft ACPI-Compliant System
	(ISA) 0x00000080 (128)	Microsoft ACPI-Compliant System
	(ISA) 0x00000081 (129)	Microsoft ACPI-Compliant System
	(ISA) 0x00000082 (130)	Microsoft ACPI-Compliant System
	(ISA) 0x00000083 (131)	Microsoft ACPI-Compliant System
	(ISA) 0x00000084 (132)	Microsoft ACPI-Compliant System
	(ISA) 0x00000085 (133)	Microsoft ACPI-Compliant System
	(ISA) 0x00000086 (134)	Microsoft ACPI-Compliant System
	(ISA) 0x00000087 (135)	Microsoft ACPI-Compliant System
	(ISA) 0x00000088 (136)	Microsoft ACPI-Compliant System
	(ISA) 0x00000089 (137)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008A (138)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008B (139)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008C (140)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008D (141)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008E (142)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008F (143)	Microsoft ACPI-Compliant System
	(ISA) 0x00000090 (144)	Microsoft ACPI-Compliant System
	(ISA) 0x00000091 (145)	Microsoft ACPI-Compliant System
	(ISA) 0x00000092 (146)	Microsoft ACPI-Compliant System
	(ISA) 0x00000093 (147)	Microsoft ACPI-Compliant System
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	(ISA) 0x00000097 (151)	Microsoft ACPI-Compliant System
	(ISA) 0x00000098 (152)	Microsoft ACPI-Compliant System
	(ISA) 0x00000099 (153)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009A (154)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009B (155)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009C (156)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009D (157)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009E (158)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009F (159)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A0 (160)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A1 (161)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A2 (162)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A3 (163)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A4 (164)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A5 (165)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A6 (166)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A7 (167)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A8 (168)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A9 (169)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AA (170)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AB (171)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AC (172)	Microsoft ACPI-Compliant System
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	(ISA) 0x000000AE (174)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AF (175)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B0 (176)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B1 (177)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B2 (178)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B3 (179)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B4 (180)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B5 (181)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B6 (182)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B7 (183)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B8 (184)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B9 (185)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BA (186)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BB (187)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BC (188)	Microsoft ACPI-Compliant System

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

	(ISA) 0x00000131 (305)	Microsoft ACPI-Compliant System
	(ISA) 0x00000132 (306)	Microsoft ACPI-Compliant System
	(ISA) 0x00000133 (307)	Microsoft ACPI-Compliant System
	(ISA) 0x00000134 (308)	Microsoft ACPI-Compliant System
	(ISA) 0x00000135 (309)	Microsoft ACPI-Compliant System
	(ISA) 0x00000136 (310)	Microsoft ACPI-Compliant System
	(ISA) 0x00000137 (311)	Microsoft ACPI-Compliant System
	(ISA) 0x00000138 (312)	Microsoft ACPI-Compliant System
	(ISA) 0x00000139 (313)	Microsoft ACPI-Compliant System
	(ISA) 0x0000013A (314)	Microsoft ACPI-Compliant System
	(ISA) 0x0000013B (315)	Microsoft ACPI-Compliant System
	(ISA) 0x0000013C (316)	Microsoft ACPI-Compliant System
	(ISA) 0x0000013D (317)	Microsoft ACPI-Compliant System
	(ISA) 0x0000013E (318)	Microsoft ACPI-Compliant System
	(ISA) 0x0000013F (319)	Microsoft ACPI-Compliant System
	(ISA) 0x00000140 (320)	Microsoft ACPI-Compliant System
	(ISA) 0x00000141 (321)	Microsoft ACPI-Compliant System
	(ISA) 0x00000142 (322)	Microsoft ACPI-Compliant System
	(ISA) 0x00000143 (323)	Microsoft ACPI-Compliant System
	(ISA) 0x00000144 (324)	Microsoft ACPI-Compliant System
	(ISA) 0x00000145 (325)	Microsoft ACPI-Compliant System
	(ISA) 0x00000146 (326)	Microsoft ACPI-Compliant System
	(ISA) 0x00000147 (327)	Microsoft ACPI-Compliant System
	(ISA) 0x00000148 (328)	Microsoft ACPI-Compliant System
	(ISA) 0x00000149 (329)	Microsoft ACPI-Compliant System
	(ISA) 0x0000014A (330)	Microsoft ACPI-Compliant System
	(ISA) 0x0000014B (331)	Microsoft ACPI-Compliant System
	(ISA) 0x0000014C (332)	Microsoft ACPI-Compliant System
	(ISA) 0x0000014D (333)	Microsoft ACPI-Compliant System
	(ISA) 0x0000014E (334)	Microsoft ACPI-Compliant System
	(ISA) 0x0000014F (335)	Microsoft ACPI-Compliant System
	(ISA) 0x00000150 (336)	Microsoft ACPI-Compliant System
	(ISA) 0x00000151 (337)	Microsoft ACPI-Compliant System
	(ISA) 0x00000152 (338)	Microsoft ACPI-Compliant System
	(ISA) 0x00000153 (339)	Microsoft ACPI-Compliant System
	(ISA) 0x00000154 (340)	Microsoft ACPI-Compliant System
	(ISA) 0x00000155 (341)	Microsoft ACPI-Compliant System
	(ISA) 0x00000156 (342)	Microsoft ACPI-Compliant System
	(ISA) 0x00000157 (343)	Microsoft ACPI-Compliant System
	(ISA) 0x00000158 (344)	Microsoft ACPI-Compliant System
	(ISA) 0x00000159 (345)	Microsoft ACPI-Compliant System
	(ISA) 0x0000015A (346)	Microsoft ACPI-Compliant System
	(ISA) 0x0000015B (347)	Microsoft ACPI-Compliant System
	(ISA) 0x0000015C (348)	Microsoft ACPI-Compliant System
	(ISA) 0x0000015D (349)	Microsoft ACPI-Compliant System
	(ISA) 0x0000015E (350)	Microsoft ACPI-Compliant System
	(ISA) 0x0000015F (351)	Microsoft ACPI-Compliant System
	(ISA) 0x00000160 (352)	Microsoft ACPI-Compliant System
	(ISA) 0x00000161 (353)	Microsoft ACPI-Compliant System
	(ISA) 0x00000162 (354)	Microsoft ACPI-Compliant System
	(ISA) 0x00000163 (355)	Microsoft ACPI-Compliant System
	(ISA) 0x00000164 (356)	Microsoft ACPI-Compliant System
	(ISA) 0x00000165 (357)	Microsoft ACPI-Compliant System
	(ISA) 0x00000166 (358)	Microsoft ACPI-Compliant System
	(ISA) 0x00000167 (359)	Microsoft ACPI-Compliant System
	(ISA) 0x00000168 (360)	Microsoft ACPI-Compliant System
	(ISA) 0x00000169 (361)	Microsoft ACPI-Compliant System
	(ISA) 0x0000016A (362)	Microsoft ACPI-Compliant System
	(ISA) 0x0000016B (363)	Microsoft ACPI-Compliant System
	(ISA) 0x0000016C (364)	Microsoft ACPI-Compliant System
	(ISA) 0x0000016D (365)	Microsoft ACPI-Compliant System
	(ISA) 0x0000016E (366)	Microsoft ACPI-Compliant System

	(ISA) 0x0000016F (367)	Microsoft ACPI-Compliant System
	(ISA) 0x00000170 (368)	Microsoft ACPI-Compliant System
	(ISA) 0x00000171 (369)	Microsoft ACPI-Compliant System
	(ISA) 0x00000172 (370)	Microsoft ACPI-Compliant System
	(ISA) 0x00000173 (371)	Microsoft ACPI-Compliant System
	(ISA) 0x00000174 (372)	Microsoft ACPI-Compliant System
	(ISA) 0x00000175 (373)	Microsoft ACPI-Compliant System
	(ISA) 0x00000176 (374)	Microsoft ACPI-Compliant System
	(ISA) 0x00000177 (375)	Microsoft ACPI-Compliant System
	(ISA) 0x00000178 (376)	Microsoft ACPI-Compliant System
	(ISA) 0x00000179 (377)	Microsoft ACPI-Compliant System
	(ISA) 0x0000017A (378)	Microsoft ACPI-Compliant System
	(ISA) 0x0000017B (379)	Microsoft ACPI-Compliant System
	(ISA) 0x0000017C (380)	Microsoft ACPI-Compliant System
	(ISA) 0x0000017D (381)	Microsoft ACPI-Compliant System
	(ISA) 0x0000017E (382)	Microsoft ACPI-Compliant System
	(ISA) 0x0000017F (383)	Microsoft ACPI-Compliant System
	(ISA) 0x00000180 (384)	Microsoft ACPI-Compliant System
	(ISA) 0x00000181 (385)	Microsoft ACPI-Compliant System
	(ISA) 0x00000182 (386)	Microsoft ACPI-Compliant System
	(ISA) 0x00000183 (387)	Microsoft ACPI-Compliant System
	(ISA) 0x00000184 (388)	Microsoft ACPI-Compliant System
	(ISA) 0x00000185 (389)	Microsoft ACPI-Compliant System
	(ISA) 0x00000186 (390)	Microsoft ACPI-Compliant System
	(ISA) 0x00000187 (391)	Microsoft ACPI-Compliant System
	(ISA) 0x00000188 (392)	Microsoft ACPI-Compliant System
	(ISA) 0x00000189 (393)	Microsoft ACPI-Compliant System
	(ISA) 0x0000018A (394)	Microsoft ACPI-Compliant System
	(ISA) 0x0000018B (395)	Microsoft ACPI-Compliant System
	(ISA) 0x0000018C (396)	Microsoft ACPI-Compliant System
	(ISA) 0x0000018D (397)	Microsoft ACPI-Compliant System
	(ISA) 0x0000018E (398)	Microsoft ACPI-Compliant System
	(ISA) 0x0000018F (399)	Microsoft ACPI-Compliant System
	(ISA) 0x00000190 (400)	Microsoft ACPI-Compliant System
	(ISA) 0x00000191 (401)	Microsoft ACPI-Compliant System
	(ISA) 0x00000192 (402)	Microsoft ACPI-Compliant System
	(ISA) 0x00000193 (403)	Microsoft ACPI-Compliant System
	(ISA) 0x00000194 (404)	Microsoft ACPI-Compliant System
	(ISA) 0x00000195 (405)	Microsoft ACPI-Compliant System
	(ISA) 0x00000196 (406)	Microsoft ACPI-Compliant System
	(ISA) 0x00000197 (407)	Microsoft ACPI-Compliant System
	(ISA) 0x00000198 (408)	Microsoft ACPI-Compliant System
	(ISA) 0x00000199 (409)	Microsoft ACPI-Compliant System
	(ISA) 0x0000019A (410)	Microsoft ACPI-Compliant System
	(ISA) 0x0000019B (411)	Microsoft ACPI-Compliant System
	(ISA) 0x0000019C (412)	Microsoft ACPI-Compliant System
	(ISA) 0x0000019D (413)	Microsoft ACPI-Compliant System
	(ISA) 0x0000019E (414)	Microsoft ACPI-Compliant System
	(ISA) 0x0000019F (415)	Microsoft ACPI-Compliant System
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	(ISA) 0x000001A2 (418)	Microsoft ACPI-Compliant System
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	(ISA) 0x000001A4 (420)	Microsoft ACPI-Compliant System
	(ISA) 0x000001A5 (421)	Microsoft ACPI-Compliant System
	(ISA) 0x000001A6 (422)	Microsoft ACPI-Compliant System
	(ISA) 0x000001A7 (423)	Microsoft ACPI-Compliant System
	(ISA) 0x000001A8 (424)	Microsoft ACPI-Compliant System
	(ISA) 0x000001A9 (425)	Microsoft ACPI-Compliant System
	(ISA) 0x000001AA (426)	Microsoft ACPI-Compliant System
	(ISA) 0x000001AB (427)	Microsoft ACPI-Compliant System
	(ISA) 0x000001AC (428)	Microsoft ACPI-Compliant System

	(ISA) 0x000001AD (429)	Microsoft ACPI-Compliant System
	(ISA) 0x000001AE (430)	Microsoft ACPI-Compliant System
	(ISA) 0x000001AF (431)	Microsoft ACPI-Compliant System
	(ISA) 0x000001B0 (432)	Microsoft ACPI-Compliant System
	(ISA) 0x000001B1 (433)	Microsoft ACPI-Compliant System
	(ISA) 0x000001B2 (434)	Microsoft ACPI-Compliant System
	(ISA) 0x000001B3 (435)	Microsoft ACPI-Compliant System
	(ISA) 0x000001B4 (436)	Microsoft ACPI-Compliant System
	(ISA) 0x000001B5 (437)	Microsoft ACPI-Compliant System
	(ISA) 0x000001B6 (438)	Microsoft ACPI-Compliant System
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	(ISA) 0x000001B7 (439)	Microsoft ACPI-Compliant System
	(ISA) 0x000001B8 (440)	Microsoft ACPI-Compliant System
	(ISA) 0x000001B9 (441)	Microsoft ACPI-Compliant System
	(ISA) 0x000001BA (442)	Microsoft ACPI-Compliant System
	(ISA) 0x000001BB (443)	Microsoft ACPI-Compliant System
	(ISA) 0x000001BC (444)	Microsoft ACPI-Compliant System
	(ISA) 0x000001BD (445)	Microsoft ACPI-Compliant System
	(ISA) 0x000001BE (446)	Microsoft ACPI-Compliant System
	(ISA) 0x000001BF (447)	Microsoft ACPI-Compliant System
	(ISA) 0x000001C0 (448)	Microsoft ACPI-Compliant System
	(ISA) 0x000001C1 (449)	Microsoft ACPI-Compliant System
	(ISA) 0x000001C2 (450)	Microsoft ACPI-Compliant System
	(ISA) 0x000001C3 (451)	Microsoft ACPI-Compliant System
	(ISA) 0x000001C4 (452)	Microsoft ACPI-Compliant System
	(ISA) 0x000001C5 (453)	Microsoft ACPI-Compliant System
	(ISA) 0x000001C6 (454)	Microsoft ACPI-Compliant System
	(ISA) 0x000001C7 (455)	Microsoft ACPI-Compliant System
	(ISA) 0x000001C8 (456)	Microsoft ACPI-Compliant System
	(ISA) 0x000001C9 (457)	Microsoft ACPI-Compliant System
	(ISA) 0x000001CA (458)	Microsoft ACPI-Compliant System
	(ISA) 0x000001CB (459)	Microsoft ACPI-Compliant System
	(ISA) 0x000001CC (460)	Microsoft ACPI-Compliant System
	(ISA) 0x000001CD (461)	Microsoft ACPI-Compliant System
	(ISA) 0x000001CE (462)	Microsoft ACPI-Compliant System
	(ISA) 0x000001CF (463)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D0 (464)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D1 (465)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D2 (466)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D3 (467)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D4 (468)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D5 (469)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D6 (470)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D7 (471)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D8 (472)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D9 (473)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DA (474)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DB (475)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DC (476)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DD (477)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DE (478)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DF (479)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E0 (480)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E1 (481)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E2 (482)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E3 (483)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E4 (484)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E5 (485)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E6 (486)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E7 (487)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E8 (488)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E9 (489)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EA (490)	Microsoft ACPI-Compliant System

	(ISA) 0x000001EB (491)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EC (492)	Microsoft ACPI-Compliant System
	(ISA) 0x000001ED (493)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EE (494)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EF (495)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F0 (496)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F1 (497)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F2 (498)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F3 (499)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F4 (500)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F5 (501)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F6 (502)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F7 (503)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F8 (504)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F9 (505)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FA (506)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FB (507)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FC (508)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FD (509)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FE (510)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FF (511)	Microsoft ACPI-Compliant System
	(PCI) 0x00000006 (06)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
	(PCI) 0x00000010 (16)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 1 - 0F48
	(PCI) 0x00000011 (17)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 2 - 0F4A
	(PCI) 0x00000012 (18)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 3 - 0F4C
	(PCI) 0x00000012 (18)	Realtek PCIe GBE Family Controller
	(PCI) 0x00000013 (19)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
	(PCI) 0x00000013 (19)	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 4 - 0F4E
	(PCI) 0x00000013 (19)	Realtek PCIe GBE Family Controller #2
	(PCI) 0x00000016 (22)	High Definition Audio Controller
	(PCI) 0xFFFFFFFF (-4)	Intel(R) Trusted Execution Engine Interface
	(PCI) 0xFFFFFFFF (-3)	Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
	(PCI) 0xFFFFFFFF (-2)	Intel(R) HD Graphics

4.6 Memory Map

The memory mapping list is shown as follows:

- Memory
 - [000A0000 - 000BFFFF] PCI Express Root Complex
 - [000A0000 - 000BFFFF] Intel(R) HD Graphics
 - [000C0000 - 000DFFFF] PCI Express Root Complex
 - [000E0000 - 000FFFFF] PCI Express Root Complex
 - [C0000000 - D0815FFF] PCI Express Root Complex
 - [C0000000 - CFFFFFFF] Intel(R) HD Graphics
 - [D0000000 - D03FFFFF] Intel(R) HD Graphics
 - [D0400000 - D04FFFFF] Intel(R) Trusted Execution Engine Interface
 - [D0500000 - D05FFFFF] Intel(R) Trusted Execution Engine Interface
 - [D0600000 - D06FFFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 4 - 0F4E
 - [D0600000 - D0603FFF] Realtek PCIe GBE Family Controller #2
 - [D0604000 - D0604FFF] Realtek PCIe GBE Family Controller #2
 - [D0700000 - D07FFFFF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port 3 - 0F4C
 - [D0700000 - D0703FFF] Realtek PCIe GBE Family Controller
 - [D0704000 - D0704FFF] Realtek PCIe GBE Family Controller
 - [D0800000 - D080FFFF] Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft)
 - [D0810000 - D0813FFF] High Definition Audio Controller
 - [D0814000 - D081401F] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
 - [D0815000 - D08157FF] Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
 - [E0000000 - EFFFFFFF] Motherboard resources
 - [E00000D0 - E00000DB] Intel(R) Sideband Fabric Device
 - [FED00000 - FED003FF] High precision event timer
 - [FED01000 - FED01FFF] Motherboard resources
 - [FED03000 - FED03FFF] Motherboard resources
 - [FED04000 - FED04FFF] Motherboard resources
 - [FED08000 - FED08FFF] Motherboard resources
 - [FED0C000 - FED0FFFF] Motherboard resources
 - [FED1C000 - FED1CFFF] Motherboard resources
 - [FEE00000 - FEEFFFFFFF] Motherboard resources
 - [FEF00000 - FEFFFFFFFF] Motherboard resources
 - [FF000000 - FFFFFFFF] Intel(R) 82802 Firmware Hub Device

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Chapter 5

AMI BIOS Setup Utility

The AMI UEFI BIOS provides users with a built-in setup program to modify basic system configuration. All configured parameters are stored in a flash chip to save the setup information whenever the power is turned off. This chapter provides users with detailed description about how to set up basic system configuration through the AMI BIOS setup utility.

5.1 Starting

To enter the setup screens, follow the steps below:

1. Turn on the computer and press the key immediately.
2. After you press the key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.



Note

If your computer cannot boot after making and saving system changes with BIOS setup, you can restore BIOS optimal defaults by setting CLR_CMOS (see section 2.3.1).

It is strongly recommended that you should avoid changing the chipset's defaults. Both AMI and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

5.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.



Note

Some of the navigation keys differ from one screen to another.

Hot Keys	Description
→← Left/Right	The Left and Right <Arrow> keys allow you to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow you to select a setup screen or sub-screen.
Enter	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
F1	The <F1> key allows you to display the General Help screen.
F2	The <F2> key allows you to Load Previous Values.
F3	The <F3> key allows you to Load Optimized Defaults.
F4	The <F4> key allows you to save any changes you have made and exit Setup. Press the <F4> key to save your changes.
Esc	The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving your changes.

5.3 Main Menu

When you first enter the setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is shown below.



BIOS Information

Display the auto-detected BIOS information.

System Date/Time

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.

5.4 Advanced Menu

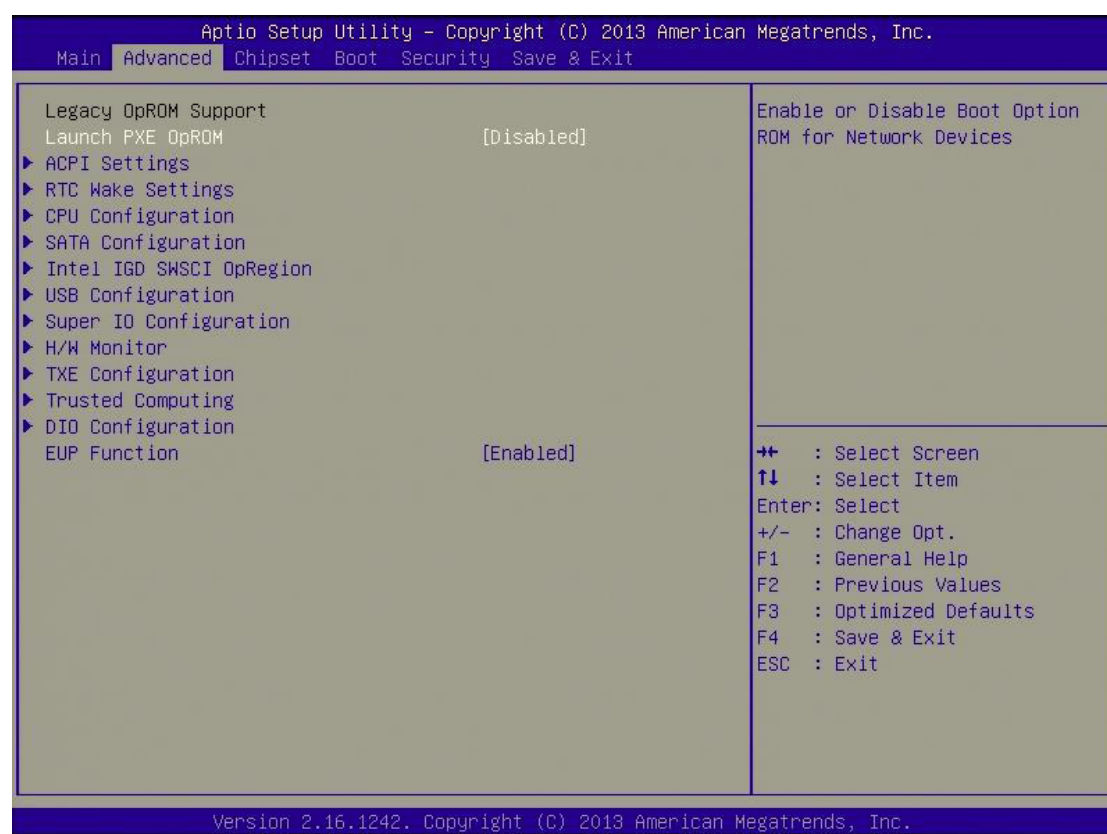
- **Launch PXE OpROM**

Enable or disable the boot ROM function of the onboard LAN chip when the system boots up.

The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

- ▶ ACPI Settings
- ▶ RTC Wake Settings
- ▶ CPU Configuration
- ▶ SATA Configuration
- ▶ Intel IGD SWSCI OpRegion
- ▶ USB Configuration
- ▶ Super IO Configuration
- ▶ H/W Monitor
- ▶ TXE Configuration
- ▶ Trusted Computing
- ▶ DIO Configuration

For items marked with “▶”, please press <Enter> for more options.

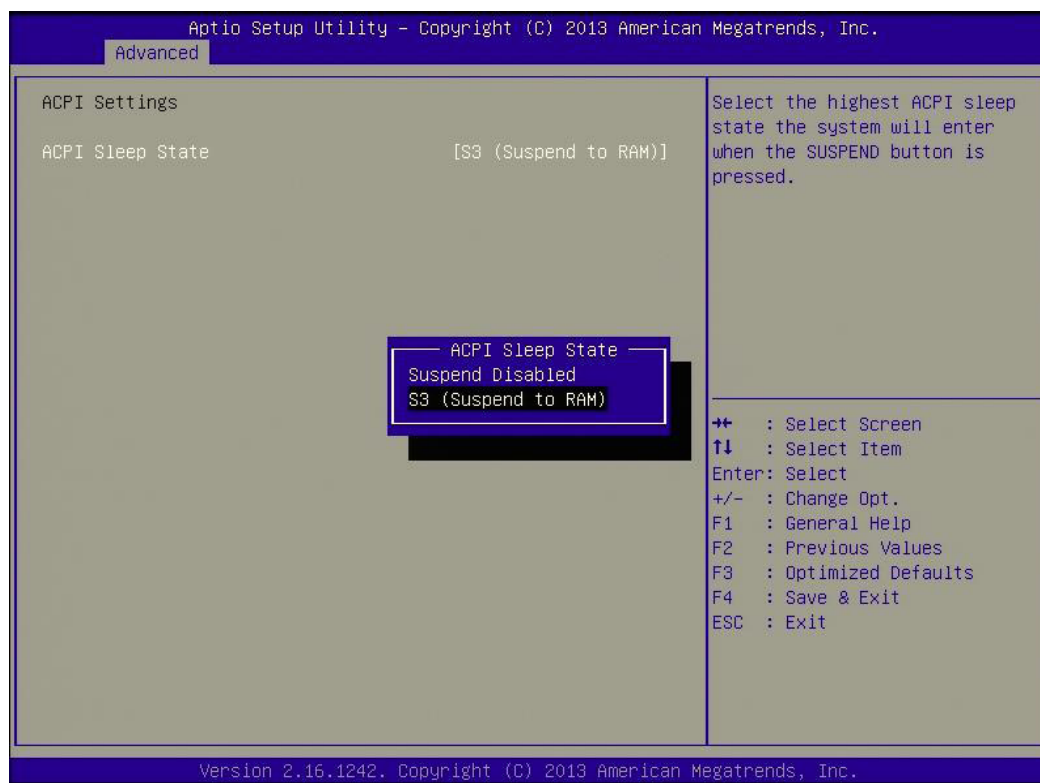


Caution

Take caution when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.

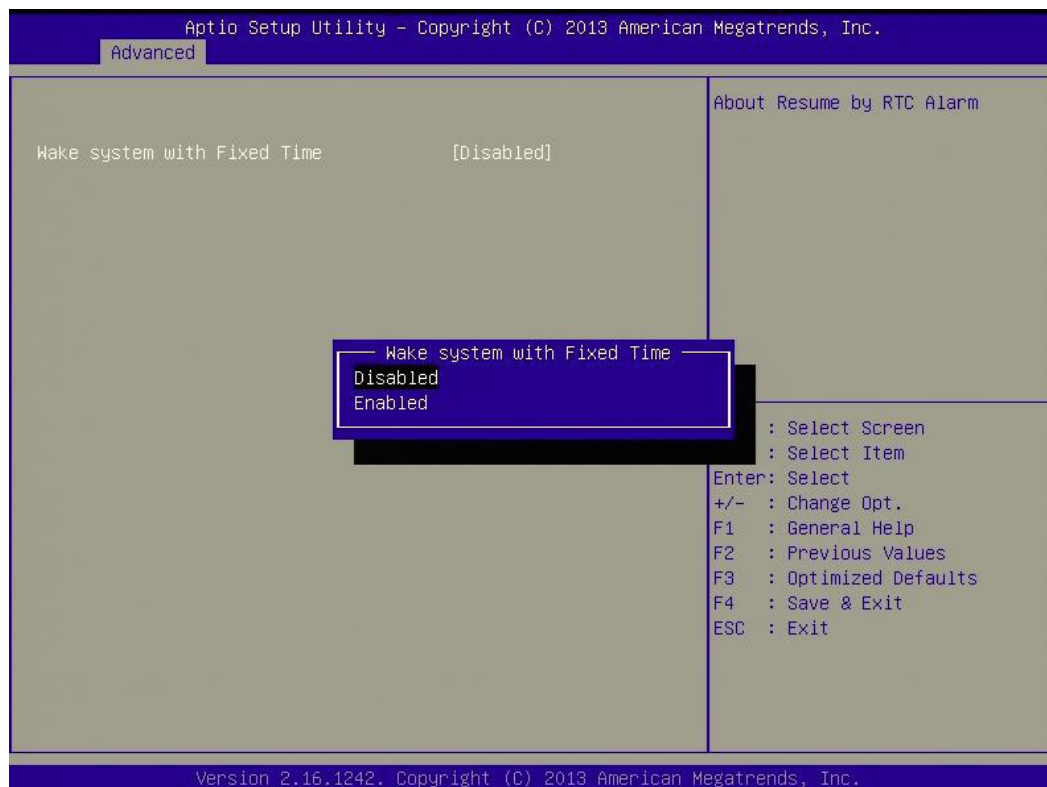
- **ACPI Settings**

You can use this screen to select options for the ACPI configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

**ACPI Sleep State**

Select the highest ACPI sleep state the system will enter when the suspend button is pressed. Configuration options are Suspend Disabled and S3 (Suspend to RAM).

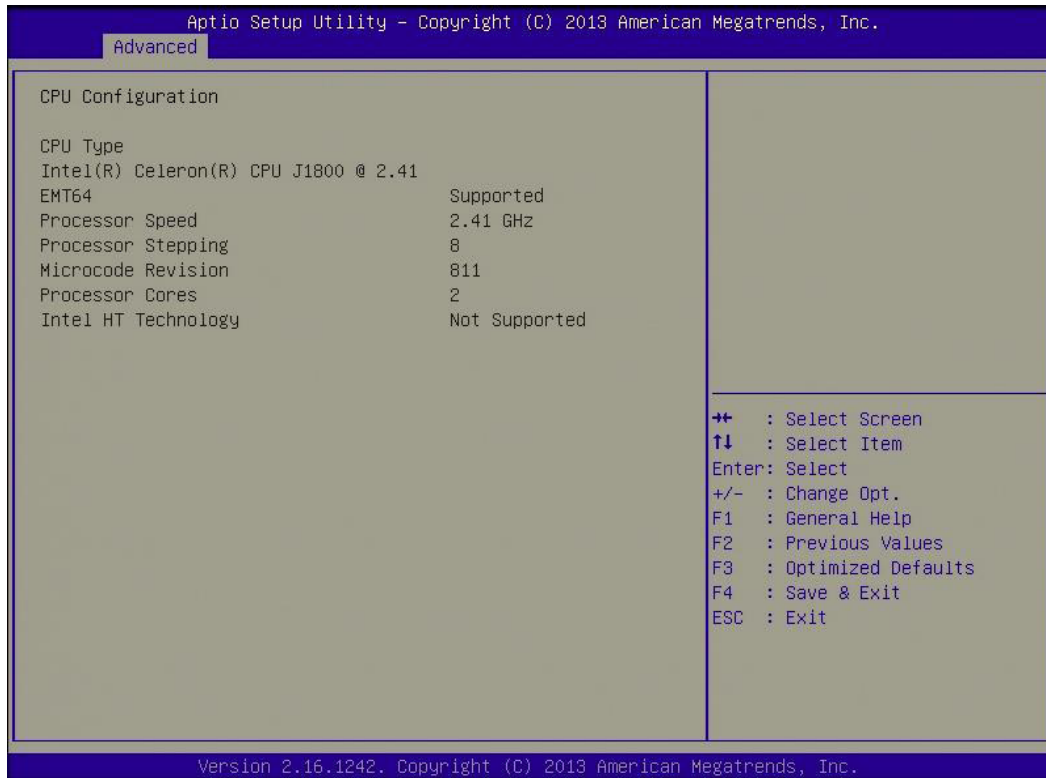
- **RTC Wake Settings**

**Wake system with Fixed Time**

Enable or disable system wake on alarm even. When enabled, system will wake upon the hr/min/sec specified.

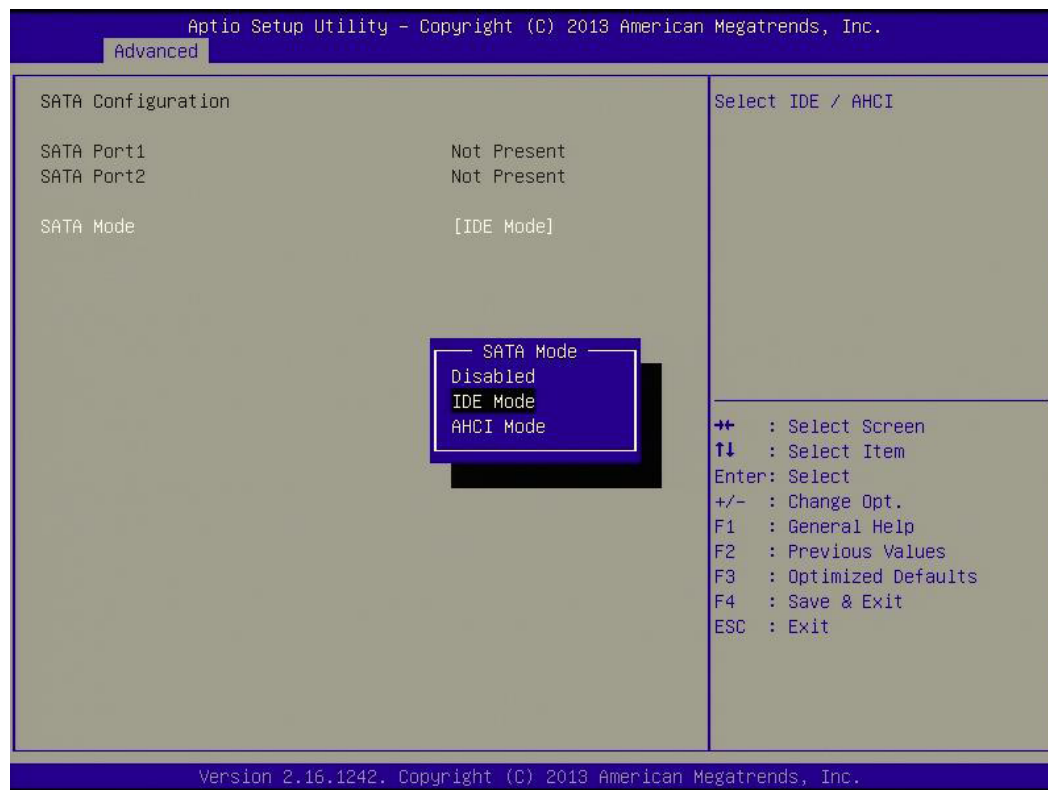
- **CPU Configuration**

This screen shows the CPU information.



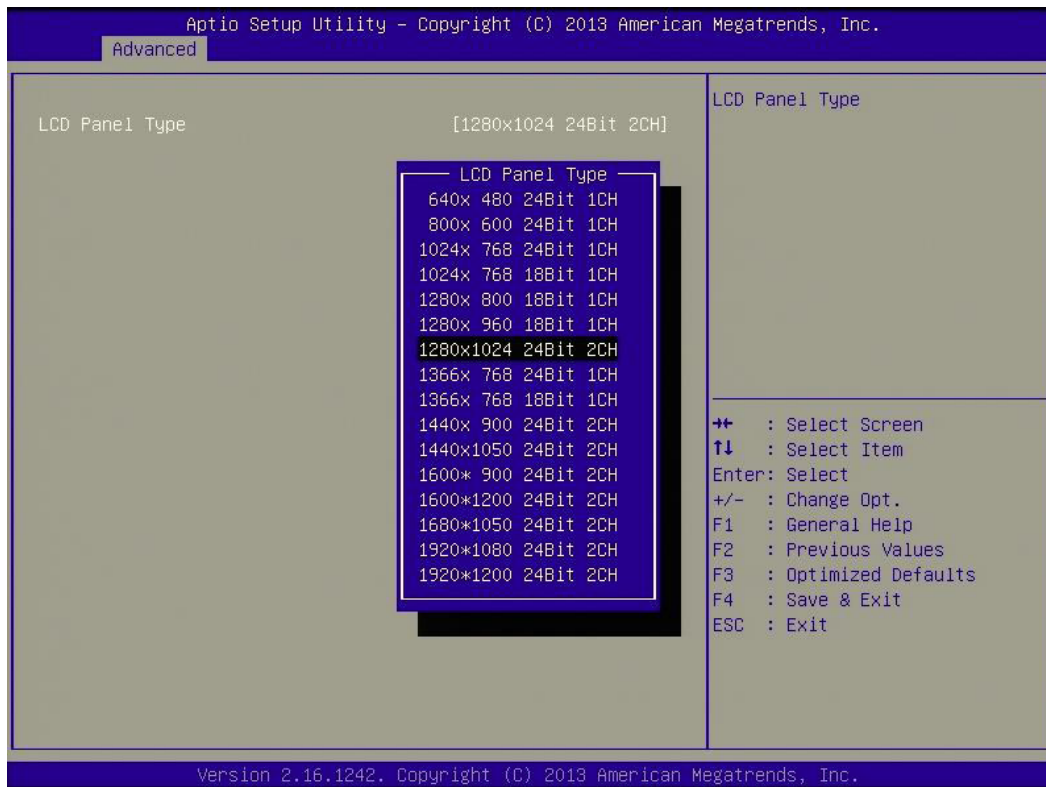
- **SATA Configuration**

In this Configuration menu, you can see the currently installed hardware in the SATA ports. During system boot up, the BIOS automatically detects the presence of SATA devices.

**SATA Mode**

Determine how SATA controller(s) operate. Operation mode options are Disabled, IDE Mode and AHCI Mode.

- Intel IGD SWSCI OpRegion

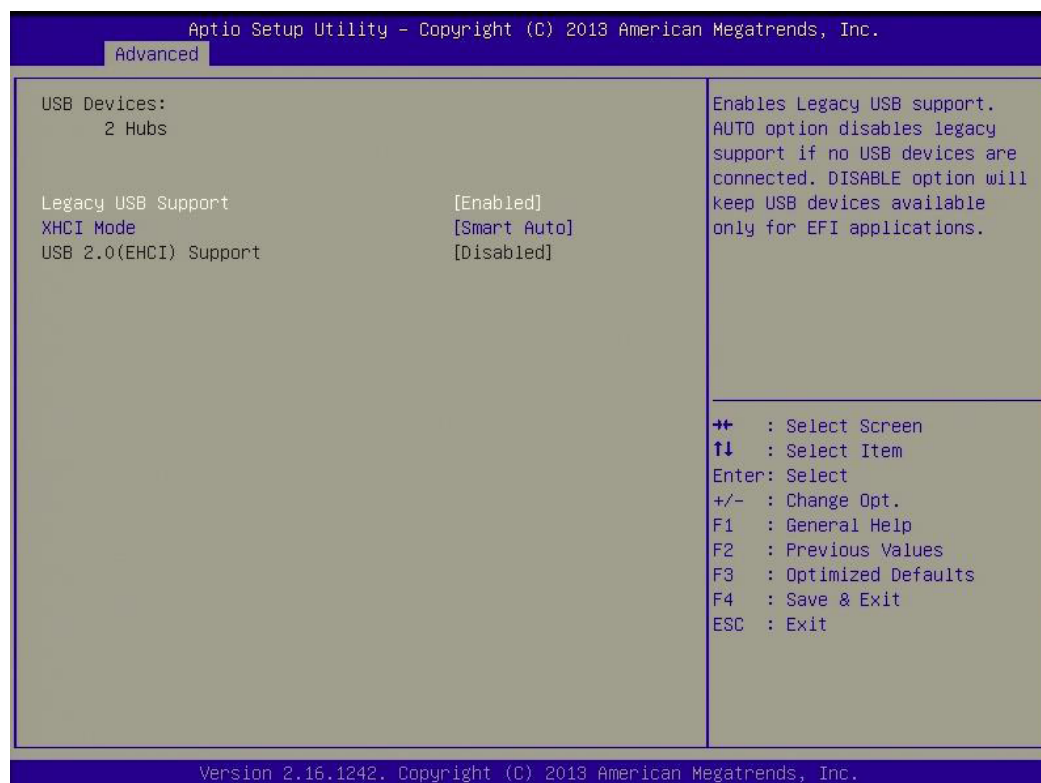


LCD Panel Type

This option allows you to select the type of LCD panel connected to the motherboard's built-in graphics chip.

- USB Configuration**

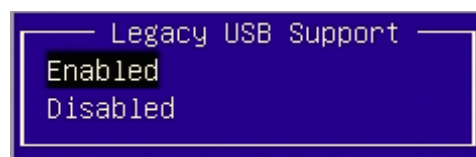
You can use this screen to select options for the USB Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.


USB Devices

Display all detected USB devices.

Legacy USB Support

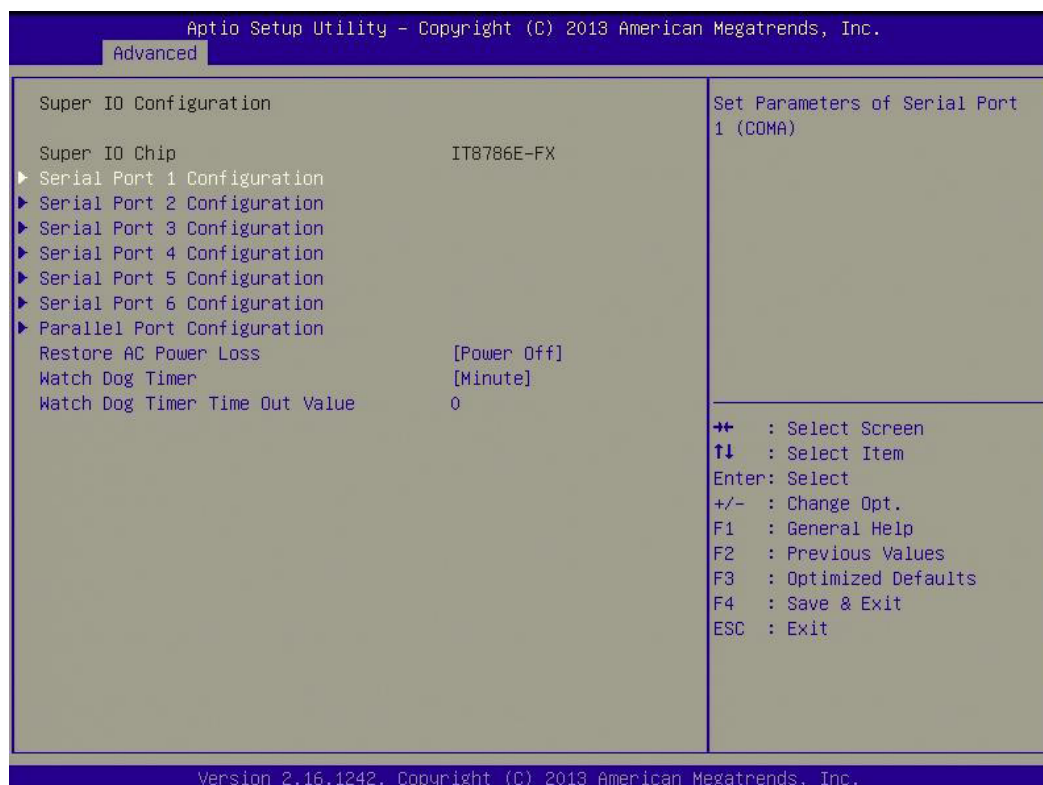
Enable or disable support for USB device on legacy operating system. The default setting is Enabled. Auto option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications.


XHCI Mode

Enable option allow XHCI mode support. Disable option will keep XHCI mode disable. Auto option will auto detect which mode is better. Smart auto option will auto detect the suitable mode for device plugged.

- **Super IO Configuration**

You can use this screen to select options for the Super IO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "►", please press <Enter> for more options.



Serial Port 1~6 Configuration

Set parameters of serial port 1 (COM1) ~ serial port 6 (COM6).

Change settings

Select an optimal setting for super IO device.

Parallel Port Configuration

Set parameters of LPT port.

Change settings

Select an optimal setting for super IO device.

Restore AC Power Loss

Set the state after power loss.

Watch Dog Timer

Select watchdog count mode second/minute.

Watch Dog Timer Time Out Value

Timer will start to count from end of POST. 00 - Time out Disable.

- **H/W Monitor**

Use this screen for Smart Fan configuration and hardware health status monitoring.



This screen displays the temperature of system and CPU, cooling fan speed in RPM and system voltages (CPU VCORE, 5V, 5VSB, 12V and 3.3V).

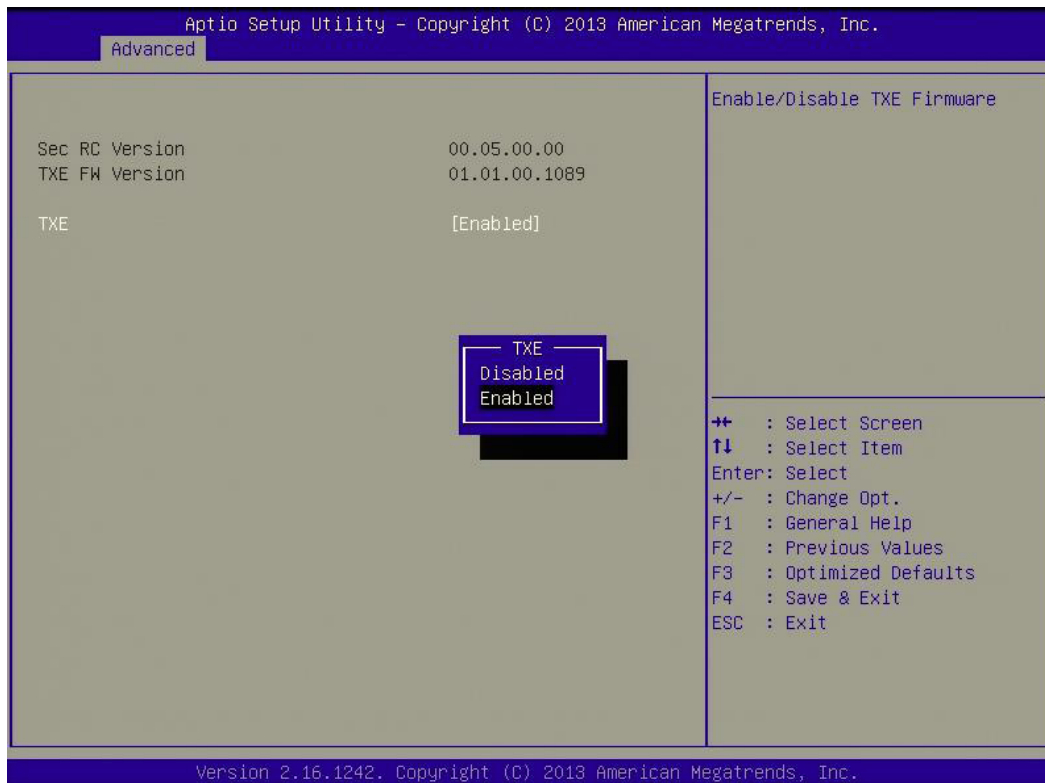
Smart Fan Function

Select CPU fan mode. When this feature is set to automatic the CPU's fan speed will rotate according to the CPU's temperature; the higher the temperature, the faster the speed of rotation.

Smart Fan Mode Configuration

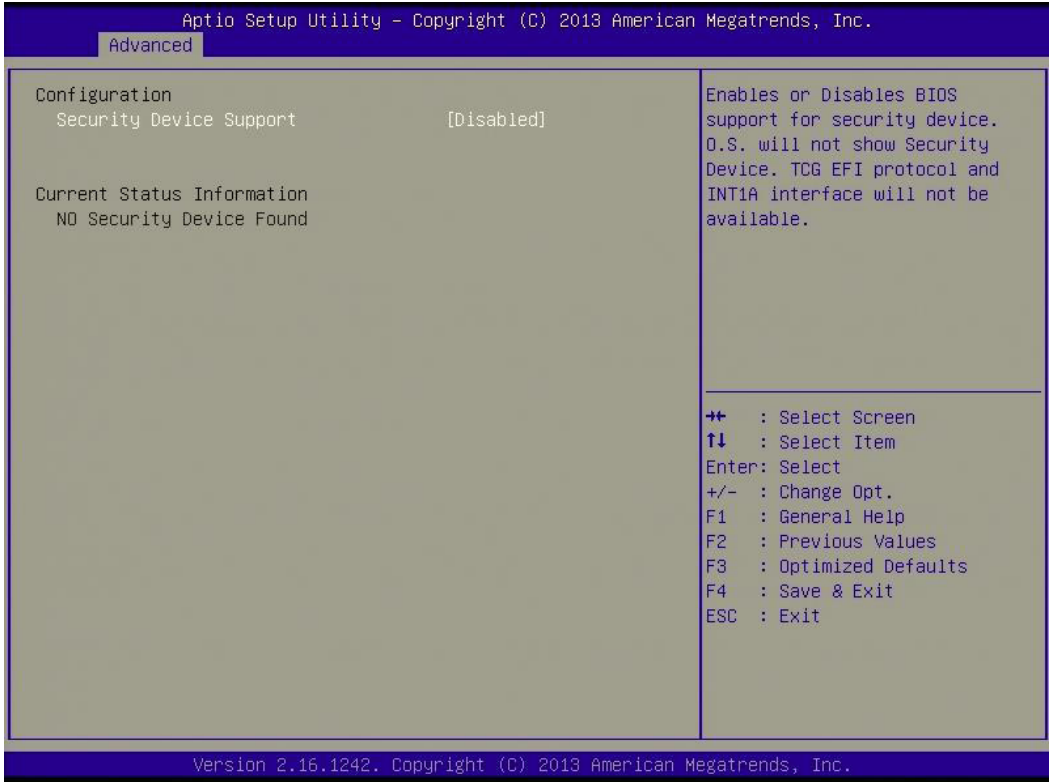
Select Manual mode or Thermal Cruise mode.

- **TXE Configuration**

**TXE**

Enable or disable TXE firmware.

• **Trusted Computing**



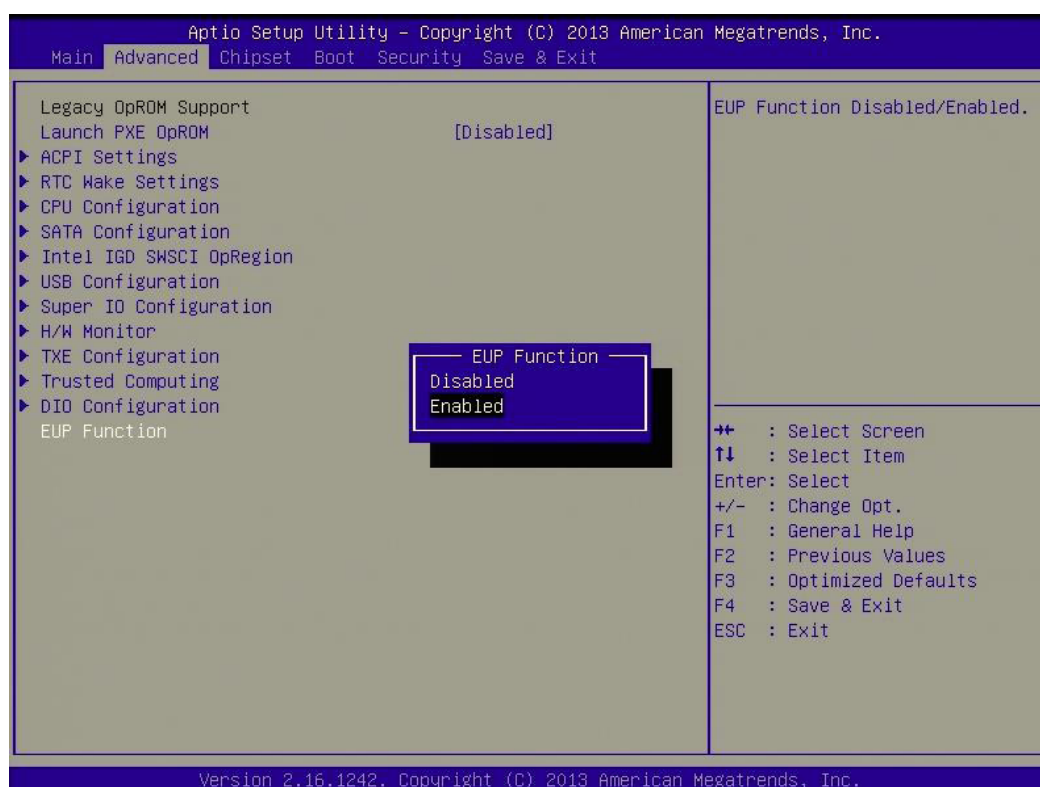
Security Device Support
Enable or disable BIOS support for security device.

- **DIO Configuration**

Allow user to check digital input 1~4 port state and set digital output 5~8 port setting.



- **EUP Function**

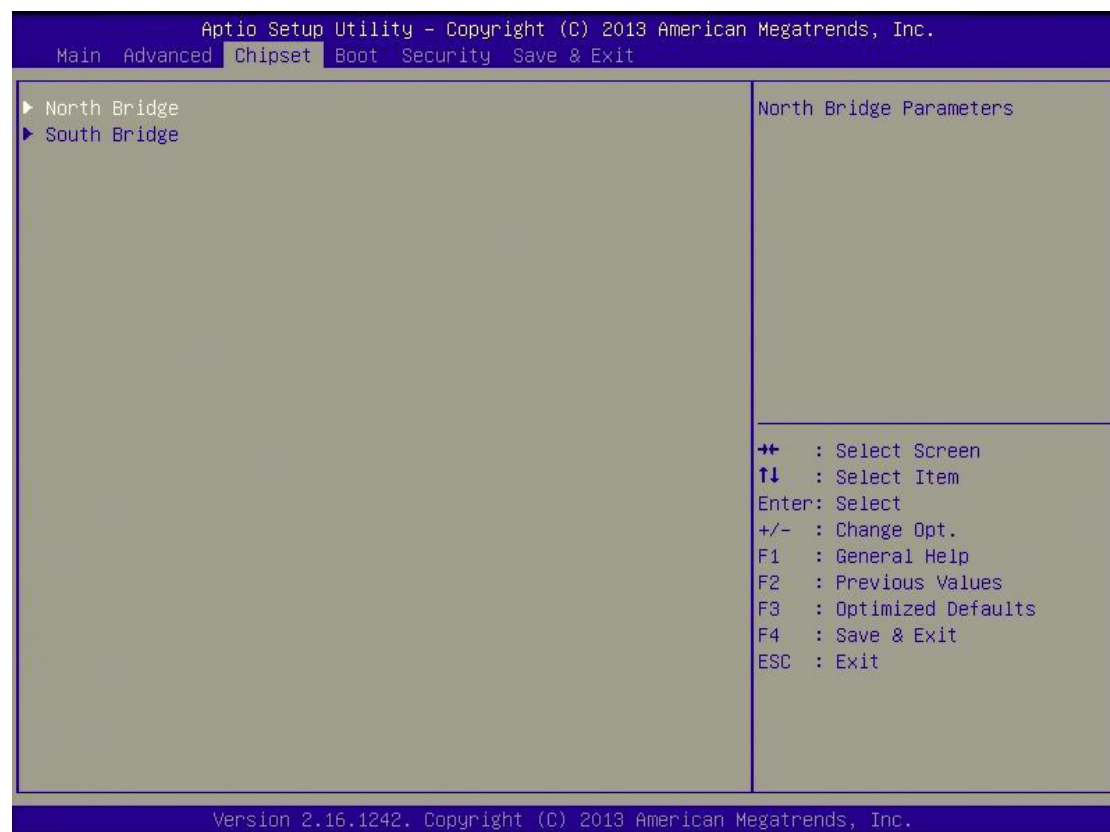


5.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

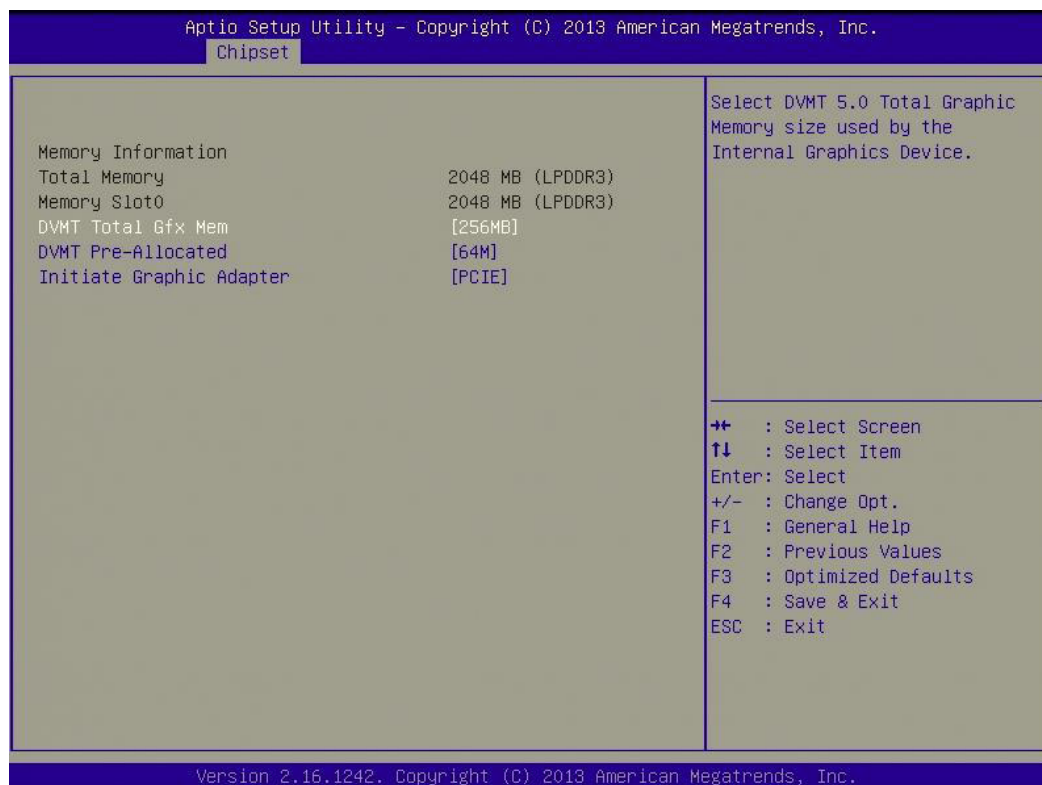
- ▶ North Bridge
- ▶ South Bridge

For items marked with “▶”, please press <Enter> for more options.



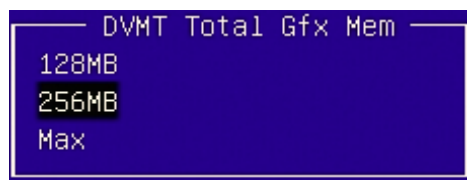
- **North Bridge**

This screen is for North Bridge configuration.



DVMT Total Gfx Mem

When set to Max Mode, the graphics driver will reserve a Max. of system memory as graphics memory, according to system and graphics requirement

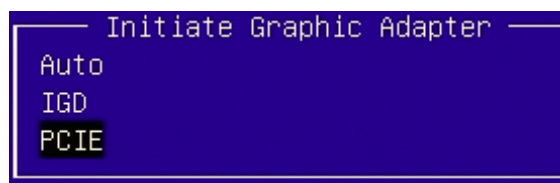


DVMT Pre-Allocated

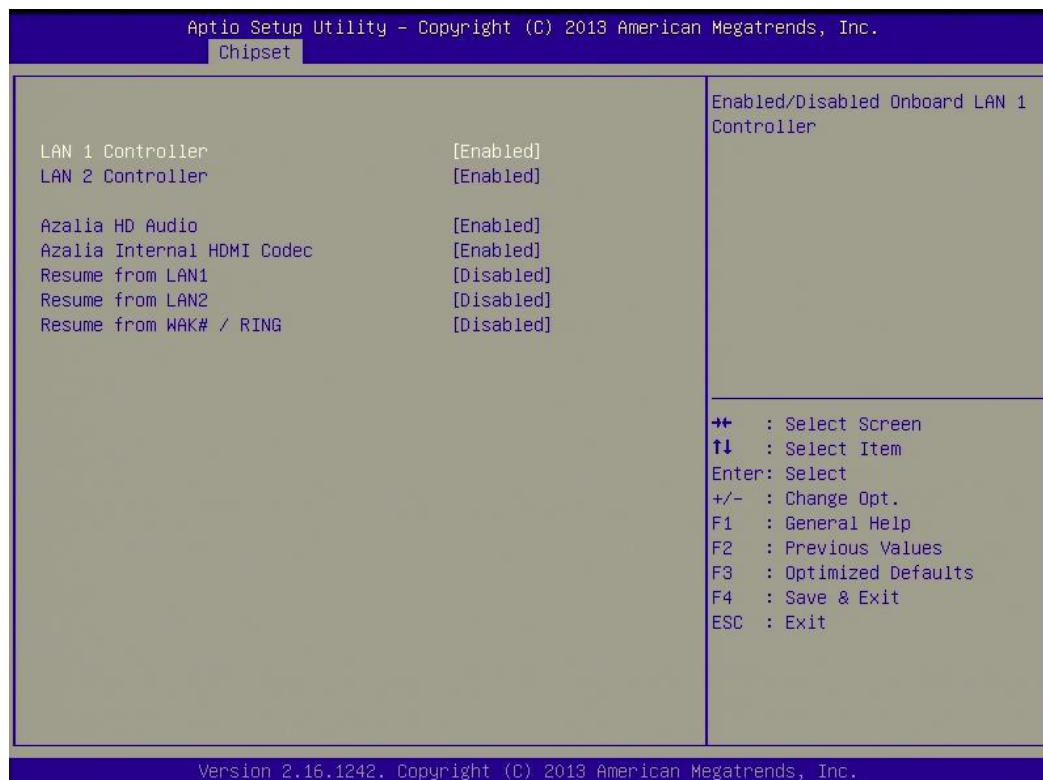
Select DVMT pre-allocated graphics memory size used by the internal graphics device (IGD).

Initiate Graphic Adapter

Set initial graphic adapter.



- **South Bridge**

**LAN 1/2 Controller**

Enable or disable onboard LAN1/LAN2 controller.

Azalia HD Audio

Enable or disable onboard HD Audio controller.

Azalia Internal HDMI Codec

Enable or disable onboard Audio internal HDMI controller.

Resume from LAN1/2

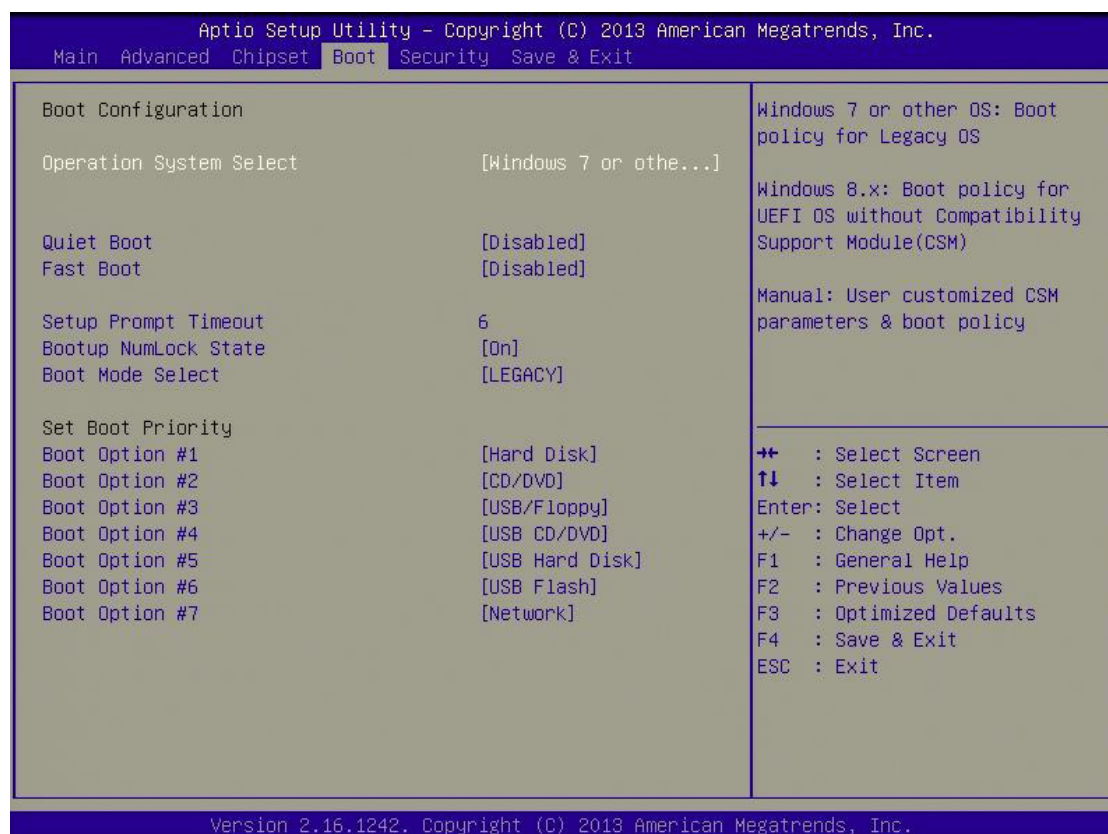
Enable or disable resume from LAN1/LAN2 function.

Resume from WAK# / RING

Enable or disable COM port WAK#/RING function.

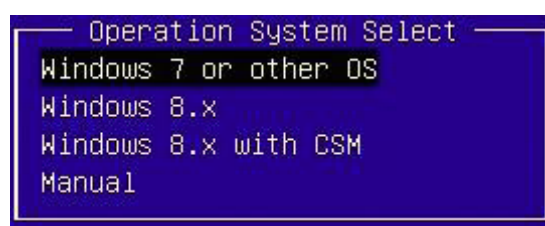
5.6 Boot Menu

The Boot menu allows users to change boot options of the system.



- **Operation System Select**

Select which OS would be installed. Configuration options are Windows 7 or other OS, Windows 8.x, Windows 8.x with CSM and Manual.



- **Quiet Boot**

Enable or disable Quiet Boot mode.

- **Fast Boot**

Enable or disable Fast Boot mode.

- **Setup Prompt Timeout**

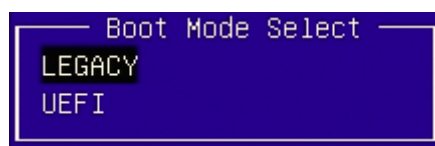
Increasing the value will make the POST take longer; the default setting is 1 second.

- **Bootup NumLock State**

Select the keyboard number lock status.

- **Boot Mode Select**

This item could be set to Legacy or UEFI.



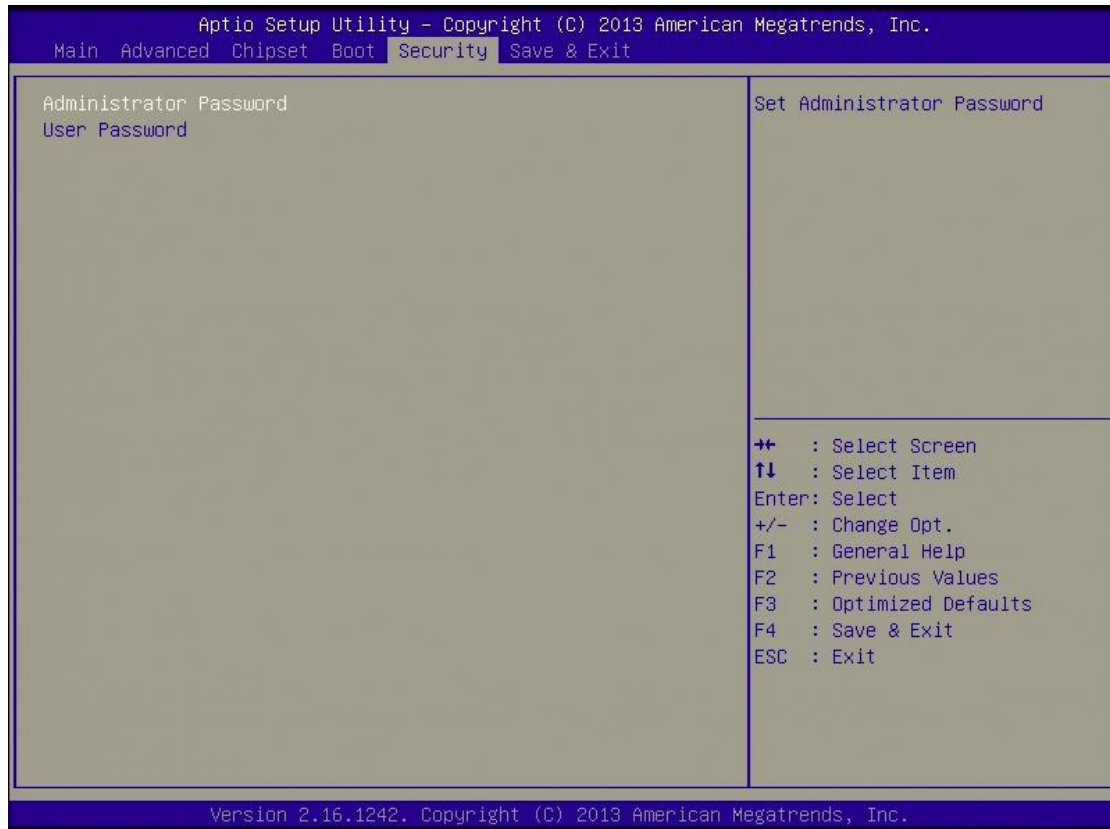
- **Set Boot Priority**

Set boot device priority by BIOS setting.



5.7 Security Menu

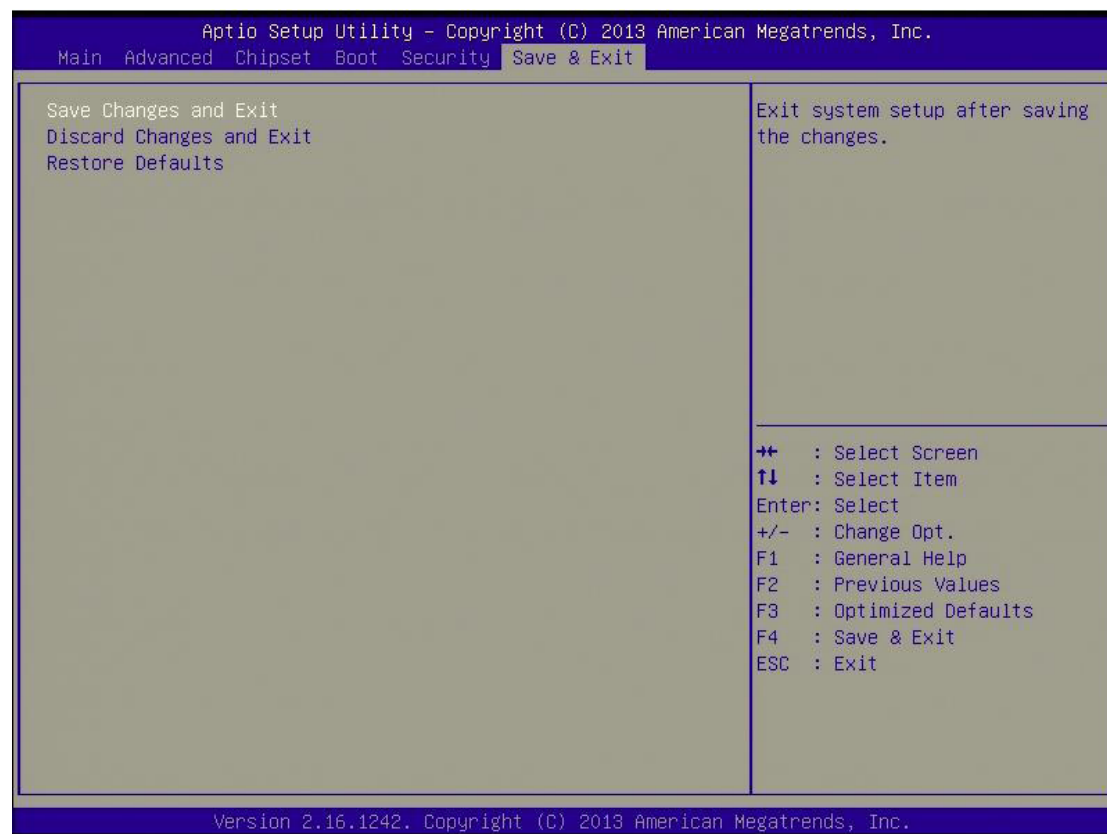
The Security menu allows users to change the security settings for the system.



- **Administrator Password**
Set setup administrator password.
- **User Password**
Set user password.

5.8 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or fail-safe default values.



- **Save Changes and Exit**
Exit system setup after saving the changes.
- **Discard Changes and Exit**
Exit system setup without saving the changes.
- **Restore Defaults**
Restore/load default values for all the setup option.