EPC602D8A
EPC602D8A-V+

User Manual

Version 1.0
Published January 2014

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(2) this device must accept any interference received, including interference that may cause undesired operation.

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The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.
"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

ASRockRack's Website: www.ASRockRack.com

Contact Information

If you need to contact ASRockRack or want to know more about ASRockRack, you're welcome to visit ASRockRack's website at www.ASRockRack.com; or you may contact your dealer for further information.

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Chapter 1 Introduction

Thank you for purchasing ASRockRack ***EPC602D8A/EPC602D8A-V+*** motherboard, a reliable motherboard produced under ASRockRack's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRockRack's commitment to quality and endurance.

In this manual, chapter 1 and 2 contains introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contains the configuration guide to BIOS setup and information of the Support CD.

Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRockRack website without further notice. You may find the latest memory and CPU support lists on ASRockRack website as well. ASRockRack's Website: www.ASRockRack.com

If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.
www.asrock.com/support/index.asp

1.1 Package Contents

- ASRockRack EPC602D8A / EPC602D8A-V+ Motherboard (ATX Form Factor: 12.0-in x 9.6-in, 30.5 cm x 24.4 cm)
- Support CD
- User Manual
- 4 x SATA3 cables (50cm)
- 2 x SATA3 cables (60cm)
- 1 x I/O Shield

If any items are missing or appear damaged, contact your authorized dealer.

English

1.2 Specifications

EPC602D8A / EPC602D8A-V+	
MB Physical Status	
Form Factor	ATX
Dimension	12'' x 9.6'' (30.5 cm x 24.4 cm)
Processor System	
CPU	- Intel® Xeon processor E5-1600/2600/4600 & v2 series - Supports Hyper-Threading Technology
Socket	Single Socket R (LGA2011)
Chipset	Intel® C602
System Memory	
Capacity	- 8 x 240-pin DDR3 DIMM slots - Support up to 256GB DDR3 R/LR DIMM ; 64GB ECC/non-ECC unbuffered UDIMM
Type	- Quad Channel DDR3 memory technology - Supports DDR3 1600/1333/1066 R/LR ECC and UDIMM
Voltage	1.5V, 1.35V
Expansion Slot *(Slot 1 is the closest to the CPU)*	
Slot 1	x8
Slot 2	x16 (x16/x0 or x8/x8 with Slot 1)
Slot 3	x8
Slot 4	x16 (x16/x0 or x8/x8 with Slot 3)
Slot 5	x8 slot with EE x8/x0 or x4/x4 with Slot 6
Slot 6	x8 slot with EE x4
Slot 7	x8 (EEx2 from C602, Gen2)
Storage	
SATA Controller	Intel® C602 : 2 x SATA3 6.0 Gb/s, 8 x SATA2 3.0 Gb/s (4 from SATA ports; the others from mini SAS port), support RAID 0, 1, 5, 10 and Intel® Rapid Storage 3.0, NCQ, AHCI and "Hot Plug" functions
Additional SATA Controller	Marvell SE9172: 2 x SATA3 6.0 Gb/s
Ethernet	
Interface	Gigabit LAN 10/100/1000 Mb/s
LAN Controller	- 2 x Intel® i210 - Supports Wake-On-LAN - Supports Energy Efficient Ethernet 802.3az - Supports Dual LAN with Teaming function - Supports PXE

Management	
BMC Controller	***For EPC602D8A only:*** ASPEED AST2300 ***For EPC602D8A-V+ only:*** N/A
IPMI Dedicated GLAN	***For EPC602D8A Only:*** 1 x Realtek RTL8211E for dedicated management GLAN ***For EPC602D8A-V+ Only:*** N/A
Features	- Watch Dog - NMI
Gracphics	
Controller	***For EPC602D8A only:*** ASPEED AST2300 ***For EPC602D8A-V+ only:*** ASPEED AST1300
VRAM	DDR3 16MB
Output	Supports D-Sub with max. resolution up to 1920x1200 @ 60Hz
Audio	
Audio code	7.1 CH HD Audio with Content Protection (Realtek ALC892 Audio Codec) **To configure 7.1 CH HD Audio, it is required to use an HD front panel audio module and enable the multi-channel audio feature through the audio driver.*
Rear Panel I/O	
VGA Port	1 x D-Sub
USB 2.0 Port	2
USB 3.0 Port	2
Lan Port	- 2 x RJ45 Gigabit Ethernet LAN ports - 1 x RJ45 Dedicated IPMI LAN port - LAN Ports with LED (ACT/LINK LED and SPEED LED)
COM Port	1 (COM1)
Audio	3 Jack
1394 port	1

Internal Connector	
COM Port Header	1 (COM2)
Auxiliary Panel Header	1 (includes chassis intrusion, location button & LED, front LAN LED)
TPM Header	1
Thermal Sensor Header	1
IPMB Header	1
Buzzer	1
Fan Header	5 x 4-pin
ATX Power	1 (24-pin) + 1 (8-pin)
USB 3.0 Header	1 (each supports 2 USB 3.0 ports)
USB 2.0 Header	1 (each supports 2 USB 2.0 ports)
Type A USB 2.0 Port	1
Front Audio panel	1
SPDIF Header	1
1394 Header	1
Front Panel	1
Speaker	1
Dr. Debug with LED	1
System BIOS	
BIOS Type	64Mb AMI UEFI Legal BIOS
BIOS Features	- Plug and Play (PnP) - ACPI 1.1 Compliance Wake Up Events - SMBIOS 2.3.1 Support - DRAM Voltage Multi-adjustment - ASRock Instant Flash
Hardware Monitor	
Temperature	- CPU Temperature Sensing - System Temperature Sensing
Fan	- CPU/Rear/Front Fan Tachometer - CPU Quiet Fan (Allow CPU Fan Speed Auto-Adjust by CPU Temperature) - CPU/Rear/Front Fan Multi-Speed Control
Voltage	Voltage Monitoring: CPU1/2, DRAM1/2, VCCM, VCCSA1/2, 3V/5V/ 12V, +1.05V_PCH, +BAT, 3VSB, 5VSB

Support OS	
OS	Microsoft Windows - Server 2003 (64 bit) - Server 2003 R2 (64 bit) - Server 2008 (32 / 64 bit) - Server 2008 R2 (64 bit) - Server 2012 (64 bit) - Server 2012 R2 (64 bit) Linux - RedHat Enterprise Linux Server 5.9/6.4 (32 / 64 bit) - CentOS 5.9 / 6.4 (32 / 64 bit) - SUSE Enterprise Linux Server 11 SP3 (32 / 64 bit) - FreeBSD 9.1 (32 / 64 bit) - Fedora core 19 (64 bit) - UBuntu 12.04.2 (64 bit) / 12.10 (64 bit) Virtual - VMWare ESXi 5.5
Environment	
Temperature	Operation temperature: 10°C ~ 35°C / Non operation temperature: -40°C ~ 70°C

This motherboard supports Wake from on Board LAN. To use this function, please make sure that the "Wake on Magic Packet from power off state" is enabled in Device Manager > Intel® Ethernet Connection I210 > Power Management. And the "PCI Devices Power On" is enabled in UEFI SETUP UTILITY > Advanced > ACPI Configuration. After that, onboard LAN1&2 can wake up S5 under OS.

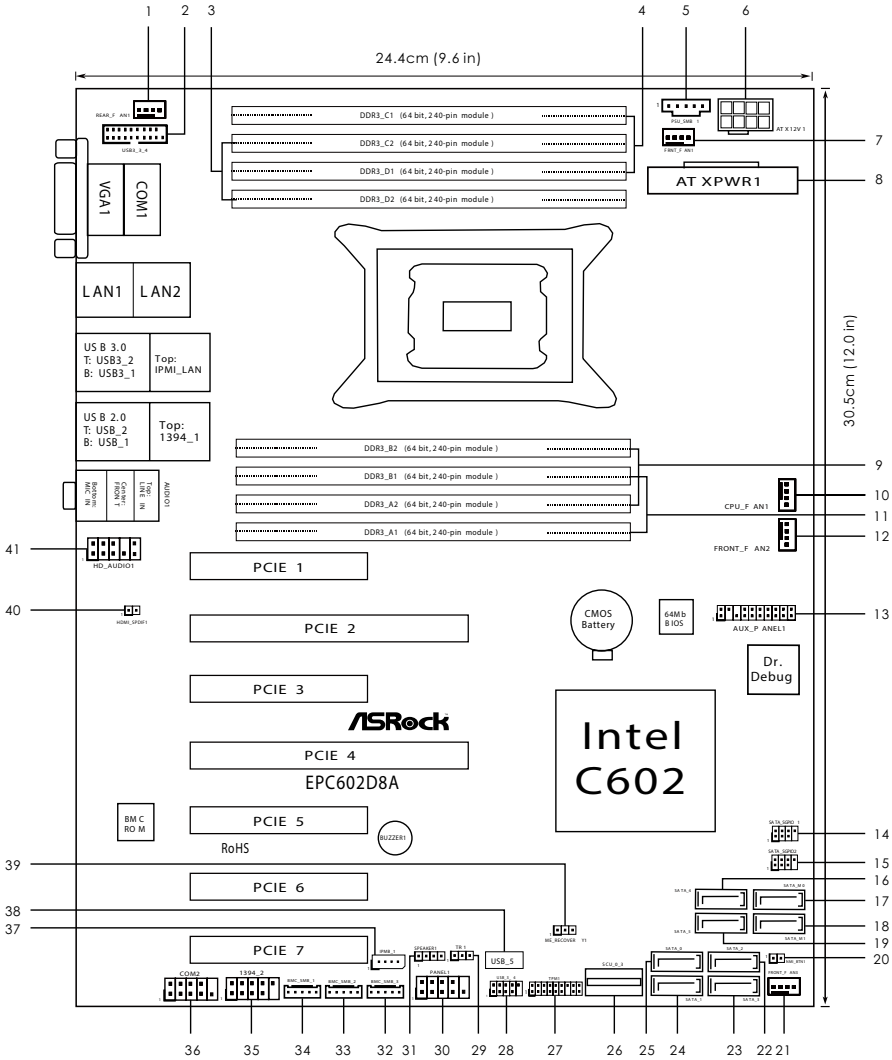
If you install Intel® LAN utility or Marvell SATA utility, this motherboard may fail Windows® Hardware Quality Lab (WHQL) certification tests. If you install the drivers only, it will pass the WHQL tests.

English

1.3 Unique Features

ASRock Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows®. With this utility, you can press the <F6> key during the POST or the <F2> key to enter into the BIOS setup menu to access ASRockRack Instant Flash. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system.

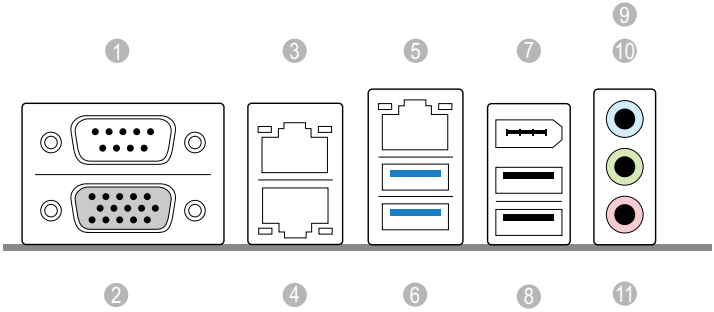
1.4 Motherboard Layout



No.	Description
1	Rear Fan Connector (REAR_FAN1)
2	USB 3.0 Header (USB3_3_4)
3	2 x 240-pin DDR3 DIMM Slots (DDR3_C2, DDR3_D2, White)
4	2 x 240-pin DDR3 DIMM Slots (DDR3_C1, DDR3_D1, Blue)
5	PSU SMBus (PSU_SMB1)
6	ATX 12V Power Connector (ATX12V1)
7	Front Fan Connector (FRONT_FAN1)
8	ATX Power Connector (ATXPWR1)
9	2 x 240-pin DDR3 DIMM Slots (DDR3_A2, DDR3_B2, White)
10	CPU Fan Connector (CPU_FAN1)
11	2 x 240-pin DDR3 DIMM Slots (DDR3_A1, DDR3_B1, Blue)
12	Front Fan Connector (FRONT_FAN2)
13	Auxiliary Panel Header (AUX_PANEL1)
14	SATA SGPIO Connector (SATA_SGPIO1)
15	SATA SGPIO Connector (SATA_SGPIO2)
16	SATA2 Connector (SATA_4), Blue
17	SATA3 Connector (SATA_M0), White
18	SATA3 Connector (SATA_M1), White
19	SATA2 Connector (SATA_5), Blue
20	Non Maskable Interrupt Button (NMI_BTN1)
21	Front Fan Connector (FRONT_FAN3)
22	SATA2 Connector (SATA_2), Blue
23	SATA2 Connector (SATA_3), Blue
24	SATA3 Connector (SATA_1), White
25	SATA3 Connector (SATA_0), White
26	SCU Connector (SCU_0-3)
27	TPM Header (TPM1)
28	USB 2.0 Header (USB_3_4)
29	Thermal Sensor header (TR1)
30	System Panel Header (PANEL1)
31	Speaker Header (SPEAKER1)
32	BMC SMBus Header (BMC_SMB_3)
33	BMC SMBus Header (BMC_SMB_2)

No.	Description
34	BMC SMBus Header (BMC_SMB_1)
35	IEEE 1394 Header (1394_2)
36	COM Port Header (COM2)
37	Intelligent Platform Management Bus header (IPMB_1)
38	Vertical Type A USB 2.0 (USB_5)
39	ME Recovery Jumper (ME_RECOVERY1)
40	HDMI_SPDIF Header (HDMI_SPDIF1)
41	Front Panel Audio Header (HD_AUDIO1)

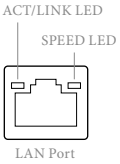
1.5 I/O Panel



No.	Description	No.	Description
1	Serial Port (COM1)	7	IEEE 1394 Port (LAN2)
2	VGA Port (VGA1)	8	USB 2.0 Ports (USB_1-2)
3	LAN RJ-45 Port (LAN2)*	9	Line In (Light Blue)
4	LAN RJ-45 Port (LAN1)*	10	Front Speaker (Lime)
5	LAN RJ-45 Port (IPMI_LAN)**	11	Microphone (Pink)
6	USB 3.0 Ports (USB3_1-2)		

LAN Port LED Indications

*There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.

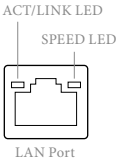


Dedicated IPMI LAN Port LED Indications

Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection
Blinking	Data Activity	Orange	100Mbps connection
On	100Mbps connection	Green	1Gbps connection

English

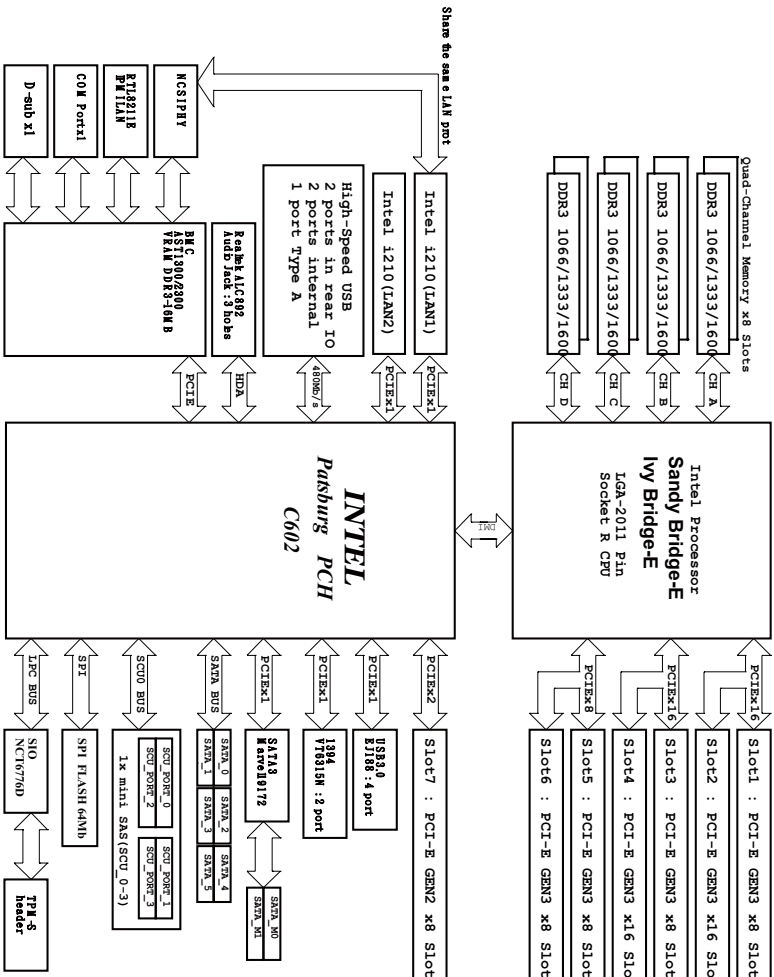
**There are two LEDs on each LAN port. Please refer to the table below for the LAN port LED indications.



LAN Port (LAN1, LAN2) LED Indications

Activity / Link LED		Speed LED	
Status	**Description**	**Status**	**Description**
Off	No Link	Off	10Mbps connection
Blinking	Data Activity	Off	100Mbps connection
On	100Mbps connection	Green	1Gbps connection

1.6 Block Diagram



English

Chapter 2 Installation

This is an ATX form factor (12" x 9.6", 30.5 cm x 24.4 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries to you and damages to motherboard components.

2.1 Screw Holes

Place screws into the holes indicated by circles to secure the motherboard to the chassis.

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

2.2 Pre-installation Precautions

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

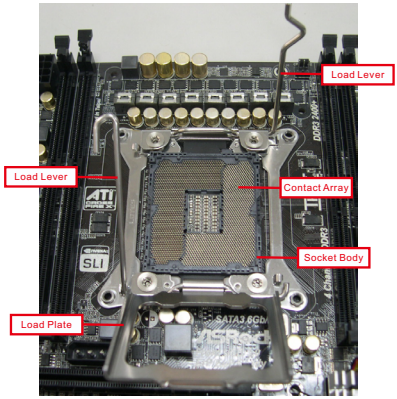
1. Unplug the power cord from the wall socket before touching any components.
2. To avoid damaging the motherboard's components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle the components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that comes with the component.
5. When placing screws into the screw holes to secure the motherboard to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard.

Before you install or remove any component, ensure that the power 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.

2.3 Installing the CPU

For the installation of Intel 2011-Pin CPU, please follow the steps below.

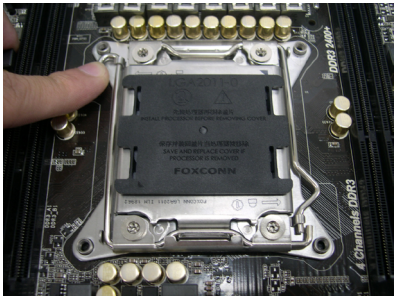
2011-Pin Socket Overview



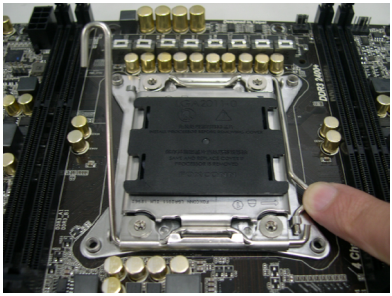
Before you insert the 2011-Pin CPU into the socket, please check if the CPU surface is unclean or if there are any bent pins in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.

Step 1. Open the socket:

Step 1-1.
Disengage the left lever by pressing it down and sliding it out of the hook.

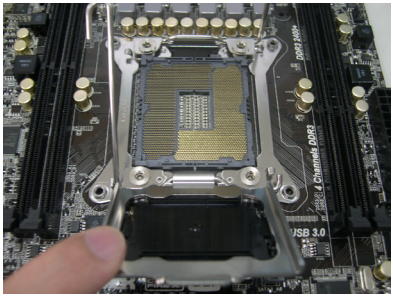


Step 1-2.
Disengage the right lever by pressing it down and sliding it out of the hook.



English

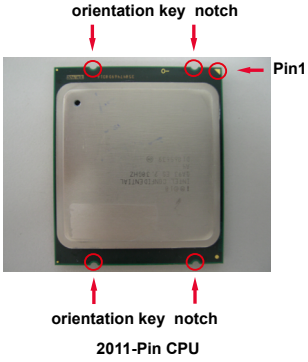
Step 1-3.
Keep the right lever positioned at about 90 degrees in order to flip up the load plate.

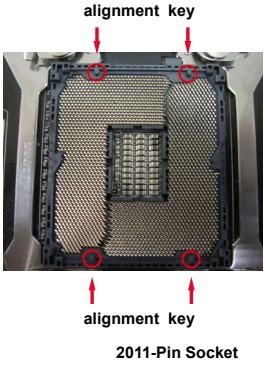


Step 2. Insert the 2011-Pin CPU:

Step 2-1.
Hold the CPU by the edge with the triangle mark(Pin 1) on your upper right corner.

Step 2-2. Locate Pin1 and the two orientation key notches.





For proper inserting, please ensure to match the four orientation key notches of the CPU with the four alignment keys of the socket.

English

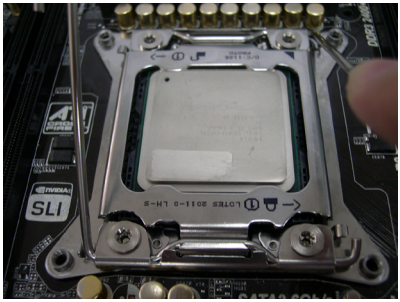
Step 2-3.
Carefully place the CPU into the socket by using a purely vertical motion.

Step 2-4. Verify that the CPU is within the socket and properly mated to the orient keys.

Step 3. Close the socket:

Step 3-1.
Flip the load plate onto the IHS, then the cover will automatically come off by itself.

Step 3-2.
Press down the right load lever, and secure it with the load plate tab under the retention tab.



Step 3-3.
Press down the left load lever, and secure it with the load plate tab under the retention tab.

The cover must be placed if returning the motherboard for after service.

2.4 Installing the CPU Fan and Heatsink

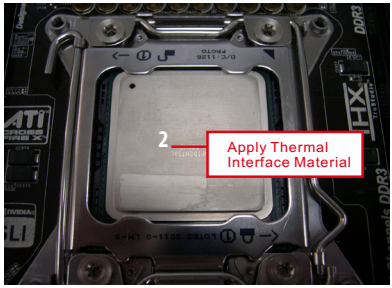
This motherboard is equipped with 2011-Pin socket that supports Intel 2011-Pin CPU. Please adopt the type of heatsink and cooling fan compliant with Intel 2011-Pin CPU to dissipate heat. Before you installed the heatsink, you need to spray thermal interface material between the CPU and the heatsink to improve heat dissipation. Ensure that the CPU and the heatsink are securely fastened and in good contact with each other. Then connect the CPU fan to the CPU_FAN connector.

For proper installation, please kindly refer to the instruction manuals of your CPU fan and heatsink.

Below is an example to illustrate the installation of the heatsink for 2011-Pin CPU.

Step 1.

Apply thermal interface material onto center of IHS on the socket surface.



Step 2.

Place the heatsink onto the socket. Ensure fan cables are oriented on side closest to the CPU fan connector on the motherboard.

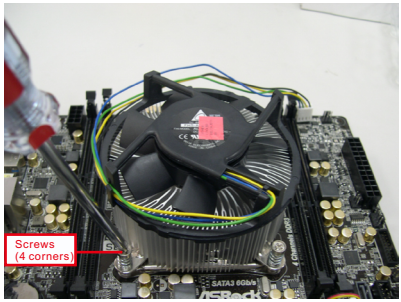
Step 3.

Align screws with the motherboard's holes.

Step 4.

Use a screw driver to install the screws.

**If you don't fasten the screws, the heatsink cannot be secured on the motherboard.*



Step 5.

Connect fan header with the CPU fan connector on the motherboard.

Step 6.

Secure excess cable with tie-wrap to ensure the cable does not interfere with fan operation or contact other components.

2.5 Installation of Memory Modules (DIMM)

This motherboard provides eight 240-pin DDR3 (Double Data Rate 3) DIMM slots, and supports Dual Channel Memory Technology.

1. *For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR3 DIMM pairs.*
2. *It is unable to activate Dual Channel Memory Technology with only one or three memory module installed.*
3. *It is not allowed to install a DDR or DDR2 memory module into a DDR3 slot; otherwise, this motherboard and DIMM may be damaged.*

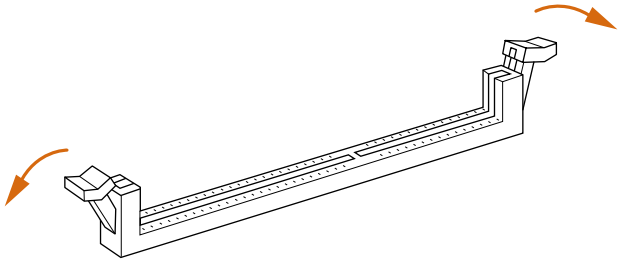
Dual Channel Memory Configuration

Priority	DDR3_A1	DDR3_A2	DDR3_B1	DDR3_B2
1	Populated		Populated	
2	Populated	Populated	Populated	Populated

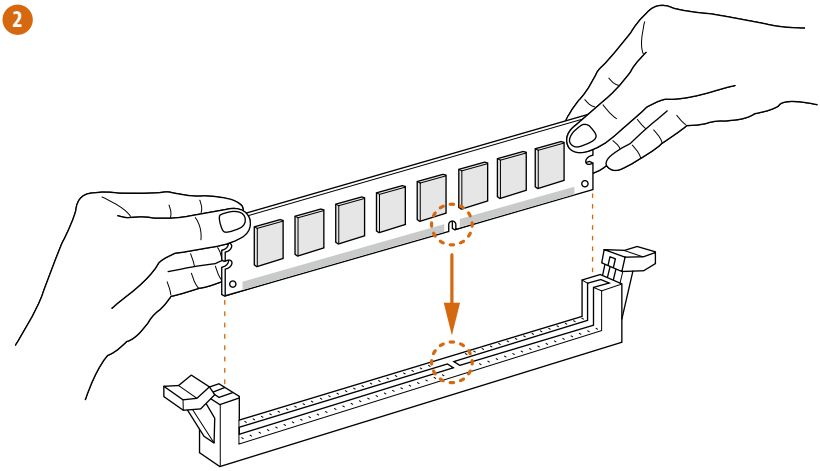
Priority	DDR3_C1	DDR3_C2	DDR3_D1	DDR3_D2
1	Populated		Populated	
2	Populated	Populated	Populated	Populated

The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

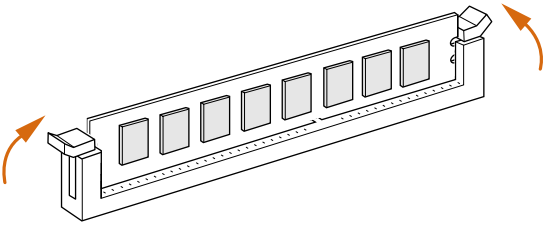
1



2



3



English

2.6 Expansion Slots (PCI and PCI Express Slots)

There are 7 PCI Express slots on this motherboard.

PCIE slot:

PCIE7 (PCIE 2.0 x8 slot, from Intel C602 chipset) is used for PCI Express x2 lane width graphics cards.
PCIE1, PCIE3, PCIE5 and PCIE6 (PCIE 3.0 x8 slot, from CPU) are used for PCI Express x8 lane width graphics cards.
PCIE2 and PCIE4 (PCIE 3.0 x16 slot, from CPU) are used for PCI Express x16 lane width graphics cards.

PCI Express Slot Configuration

	PCIE 1	PCIE 2
Single Graphics Card		x16
Two Graphics Cards	x8	x8

No.	PCIE 3	PCIE 4
Single Graphics Card		x16
Two Graphics Cards	x8	x8

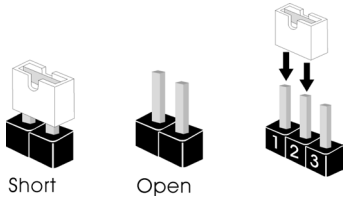
No.	PCIE 5	PCIE 6
Single Graphics Card	x8	
Two Graphics Cards	x4	x4

Installing an expansion card

Step 1. Before installing an expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.
Step 2. Remove the system unit cover (if your motherboard is already installed in a chassis).
Step 3. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.
Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
Step 5. Fasten the card to the chassis with screws.
Step 6. Replace the system cover.

2.7 Jumper Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on the pins, the jumper is “Short”. If no jumper cap is placed on the pins, the jumper is “Open”. The illustration shows a 3-pin jumper whose pin1 and pin2 are “Short” when a jumper cap is placed on these 2 pins.

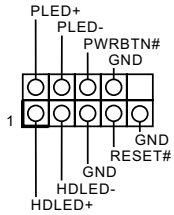


ME Recovery Jumper (3-pin ME_RECOVERY1) (see p.7, No. 39)	 Default	 ME Recovery Mode

2.8 Onboard Headers and Connectors

Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage to the motherboard.

System Panel Header
(9-pin PANEL1)
(see p.7, No. 30)



Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

PWRBTN (Power Switch):
Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.

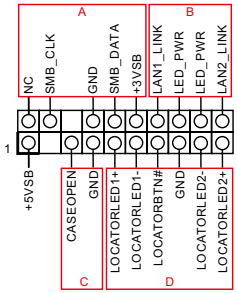
RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

PLED (System Power LED):
Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S1/S3 sleep state. The LED is off when the system is in S4 sleep state or powered off (S5).

HDLED (Hard Drive Activity LED):
Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

Auxiliary Panel Header
(18-pin AUX PANEL_1)
(see p.7, No. 13)



This header supports multiple functions on the front panel, including the front panel SMB, internet status indicator and chassis intrusion pin.

A. Front panel SMBus connecting pin (6-1 pin FPSMB)
This header allows you to connect SMBus (System Management Bus) equipment. It can be used for communication between peripheral equipment in the system, which has slower transmission rates, and power management equipment.

B. Internet status indicator (2-pin LAN1_LED, LAN2_LED)
These two 2-pin headers allow you to use the Gigabit internet indicator cable to connect to the LAN status indicator. When this indicator flickers, it means that the internet is properly connected.

C. Chassis intrusion pin (2-pin CHASSIS)
This header is provided for host computer chassis with chassis intrusion detection designs. In addition, it must also work with external detection equipment, such as a chassis intrusion detection sensor or a microswitch. When this function is activated, if any chassis component movement occurs, the sensor will immediately detect it and send a signal to this header, and the system will then record this chassis intrusion event. The default setting is set to the CASEOPEN and GND pin; this function is off.

D. Locator LED (6-pin LOCATOR)
This header is for the locator switch and LED on the front panel.

Serial ATA2 Connectors
(SATA_2)
(see p.7, No. 22)
(SATA_3)
(see p.7, No. 23)
(SATA_4)
(see p.7, No. 16)
(SATA_5)
(see p.7, No. 19)

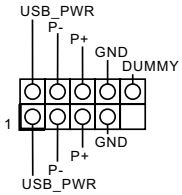
These four SATA2 connectors support SATA data cables for internal storage devices with up to 3.0 Gb/s data transfer rate.

English

Serial ATA3 Connectors
(SATA_M0)
(see p.7, No. 17)
(SATA_M1)
(see p.7, No. 18)
(SATA_0)
(see p.7, No. 25)
(SATA_1)
(see p.7, No. 24)

These four SATA3 connectors support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate.

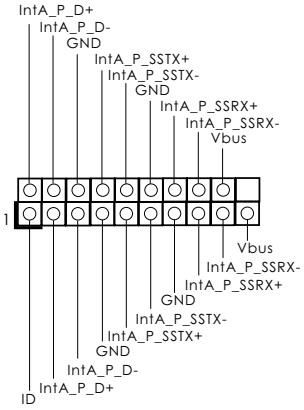
USB 2.0 Header
(9-pin USB_3_4)
(see p.7, No. 28)



Besides two USB 2.0 ports on the I/O panel, there is one header on this motherboard. Each USB 2.0 header can support two ports.

USB 2.0 Connector
(USB_5)
(see p.7, No. 38)

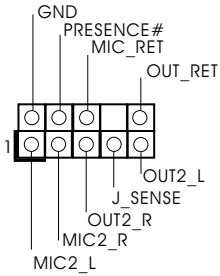
USB 3.0 Header
(19-pin USB3_3_4)
(see p.7, No. 2)



Besides two default USB 3.0 ports on the I/O panel, there is one USB 3.0 header on this motherboard. This USB 3.0 header can support two USB 3.0 ports.

English

Front Panel Audio Header
(9-pin HD_AUDIO1)
(see p.7, No. 41)



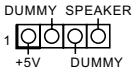
This is an interface for the front panel audio cable that allows convenient connection and control of audio devices.

1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.

2. If you use AC'97 audio panel, please install it to the front panel audio header as below:

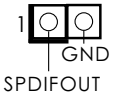
A. Connect Mic_IN (MIC) to MIC2_L.
B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L.
C. Connect Ground (GND) to Ground (GND).
D. MIC_RET and OUT_RET are for HD audio panel only. You don't need to connect them for AC'97 audio panel.

Chassis Speaker Header
(4-pin SPEAKER1)
(see p.7, No. 31)



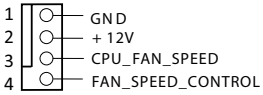
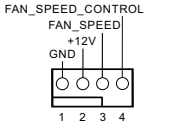
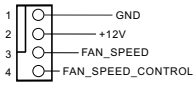
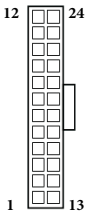
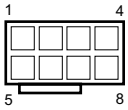
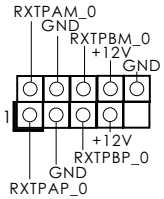
Please connect the chassis speaker to this header.

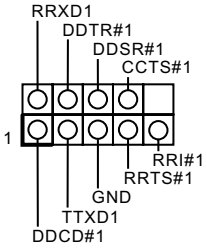
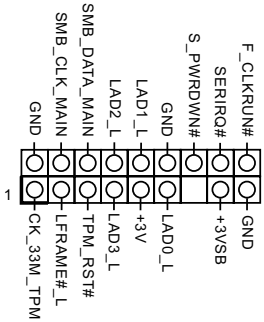
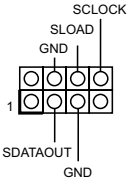
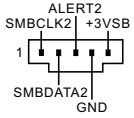
HDMI_SPDIF Header
(2-pin HDMI_SPDIF1)
(see p.7 No. 40)

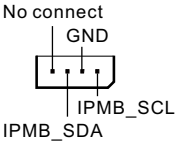
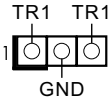
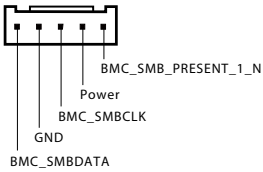


HDMI_SPDIF header, providing SPDIF audio output to HDMI VGA card, allows the system to connect HDMI Digital TV/projector/LCD devices. Please connect the HDMI connector of HDMI VGA card to this header.

English

CPU Fan Connector (4-pin CPU_FAN1) (see p.7, No. 10)		This motherboard provides a 4-Pin CPU fan (Quiet Fan) connector. If you plan to connect a 3-Pin CPU fan, please connect it to Pin 1-3.
Front and Rear Fan Connectors (4-pin FRONT_FAN1) (4-pin FRONT_FAN2) (4-pin FRONT_FAN3) (see p.7, No. 7, 12, 21) (4-pin REAR_FAN1) (see p.7, No. 1)	 	Please connect fan cables to the fan connectors and match the black wire to the ground pin. All fans support Fan Control.
ATX Power Connector (24-pin ATXPWR1) (see p.7, No. 8)		This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13.
ATX 12V Power Connector (8-pin ATX12V1) (see p.7, No. 6)		This motherboard provides a 8-pin ATX 12V power connector.
IEEE 1394 Header (9-pin 1394_2) (see p.7 No. 35)		Besides one default IEEE 1394 port on the I/O panel, there is one IEEE 1394 header (1394_2) on this motherboard. This IEEE 1394 header can support one IEEE 1394 port.

Serial Port Header (9-pin COM2) (see p.7, No. 36)		This COM2 header supports a serial port module.
TPM Header (17-pin TPM1) (see p.7, No. 27)		This connector supports Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.
Serial General Purpose Input/Output Headers (7-pin SATA_SGPIO1) (see p.7, No. 14) (7-pin SATA_SGPIO2) (see p.7, No. 15)		These headers support Serial Link interface for onboard SATA connections.
PSU SMBus (PSU_SMB1) (see p.7, No. 5)		PSU SMBus monitors the status of the power supply, fan and system temperature.
Non Maskable Interrupt Button Header (NMI_BTN1) (see p.7, No. 20)		Please connect a NMI device to this header.

Intelligent Platform Management Bus header (4-pin IPMB_1) (see p.7, No. 37)		This 4-pin connector is used to provide a cabled base-board or front panel connection for value added features and 3rd-party add-in cards, such as Emergency Management cards, that provide management features using the IPMB.
Thermal Sensor Header (3-pin TR1) (see p.7, No. 29)		Please connect the thermal sensor cable to either pin 1-2 or pin 2-3 and the other end to the device which you wish to monitor its temperature.
Baseboard Management Controller SMBus Headers (5-pin BMC_SMB_1) (5-pin BMC_SMB_2) (5-pin BMC_SMB_3) (see p.7, No. 34, 33, 32)		These headers are used for the SM BUS devices.
SCU Connector (SCU_0-3) (see p.7, No. 26)		This SCU connector supports SAS/SATA data cables for internal storage devices. The current SAS2/SATA3 interface allows up to 6.0 Gb/s data transfer rate. For connecting SAS HDDs, please contact SAS data cable dealers.

2.9 Dr. Debug

Dr. Debug is used to provide code information, which makes troubleshooting even easier. Please see the diagrams below for reading the Dr. Debug codes.

Code	Description
00	Please check if the CPU is installed correctly and then clear CMOS.
0d	Problem related to memory, VGA card or other devices. Please clear CMOS, re-install the memory and VGA card, and remove other USB, PCI devices.
01 - 54 (except 0d), 5A- 60	Problem related to memory. Please re-install the CPU and memory then clear CMOS. If the problem still exists, please install only one memory module or try using other memory modules.
55	The Memory could not be detected. Please re-install the memory and CPU. If the problem still exists, please install only one memory module or try using other memory modules.
61 - 91	Chipset initialization error. Please press reset or clear CMOS.
92 - 99	Problem related to PCI-E devices. Please re-install PCI-E devices or try installing them in other slots. If the problem still exists, please remove all PCI-E devices or try using another VGA card.
A0 - A7	Problem related to IDE or SATA devices. Please re-install IDE and SATA devices. If the problem still exists, please clear CMOS and try removing all SATA devices.
b0	Problem related to memory. Please re-install the CPU and memory. If the problem still exists, please install only one memory module or try using other memory modules.
b4	Problem related to USB devices. Please try removing all USB devices.
b7	Problem related to memory. Please re-install the CPU and memory then clear CMOS. If the problem still exists, please install only one memory module or try using other memory modules.
d6	The VGA could not be recognized. Please clear CMOS and try re-installing the VGA card. If the problem still exists, please try installing the VGA card in other slots or use other VGA cards.
d7	The Keyboard and mouse could not be recognized. Please try re-installing the keyboard and mouse.
d8	Invalid Password.
FF	Please check if the CPU is installed correctly and then clear CMOS.

2.10 Driver Installation Guide

To install the drivers to your system, please insert the support CD to your optical drive first. Then, the drivers compatible to your system can be auto-detected and listed on the support CD driver page. Please follow the order from top to bottom to install those required drivers. Therefore, the drivers you install can work properly.

2.11 Dual LAN and Teaming Operation Guide

Dual LAN with Teaming enabled on this motherboard allows two single connections to act as one single connection for twice the transmission bandwidth, making data transmission more effective and improving the quality of transmission of distant images. Fault tolerance on the dual LAN network prevents network downtime by transferring the workload from a failed port to a working port.

The speed of transmission is subject to the actual network environment or status even with Teaming enabled.

Before setting up Teaming, please make sure whether your Switch (or Router) supports Teaming (IEEE 802.3ad Link Aggregation). You can specify a preferred adapter in Intel PROSet. Under normal conditions, the Primary adapter handles all non-TCP/IP traffic. The Secondary adapter will receive fallback traffic if the primary fails. If the Preferred Primary adapter fails, but is later restored to an active status, control is automatically switched back to the Preferred Primary adapter.

Step 1

From **Device Manager**, open the properties of a team.

Step 2

Click the **Settings** tab.

Step 3

Click the **Modify Team** button.

Step 4

Select the adapter you want to be the primary adapter and click the **Set Primary** button.

If you do not specify a preferred primary adapter, the software will choose an adapter of the highest capability (model and speed) to act as the default primary. If a failover occurs, another adapter becomes the primary. The adapter will, however, rejoin the team as a non-primary.

Chapter 3 UEFI Setup Utility

3.1 Introduction

This section explains how to use the UEFI SETUP UTILITY to configure your system. The UEFI chip on the motherboard stores the UEFI SETUP UTILITY. You may run the UEFI SETUP UTILITY when you start up the computer. Please press <F2> or <Del> during the Power-On-Self-Test (POST) to enter the UEFI SETUP UTILITY; otherwise, POST will continue with its test routines.

If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

3.1.1 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

Item	Description
Main	To set up the system time/date information
OC Tweaker	To set up overclocking features
Advanced	To set up the advanced UEFI features
H/W Monitor	To display current hardware status
Server Mgmt	To manage the server *(not supported for EPC602D8A-V+)*
Boot	To set up the default system device to locate and load the Operating System
Security	To set up the security features
Exit	To exit the current screen or the UEFI SETUP UTILITY
Event Logs	For event log configuration

Use <←> key or <→> key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

English

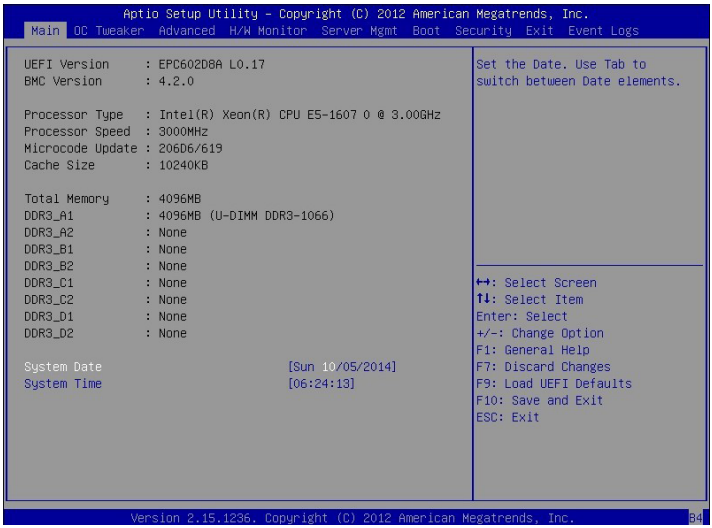
3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Tab>	Switch to next function
<Enter>	To bring up the selected screen
<PGUP>	Go to the previous page
<PGDN>	Go to the next page
<HOME>	Go to the top of the screen
<END>	Go to the bottom of the screen
<F1>	To display the General Help Screen
<F7>	Discard changes and exit the UEFI SETUP UTILITY
<F9>	Load optimal default values for all the settings
<F10>	Save changes and exit the UEFI SETUP UTILITY
<F12>	Print screen
<ESC>	Jump to the Exit Screen or exit the current screen

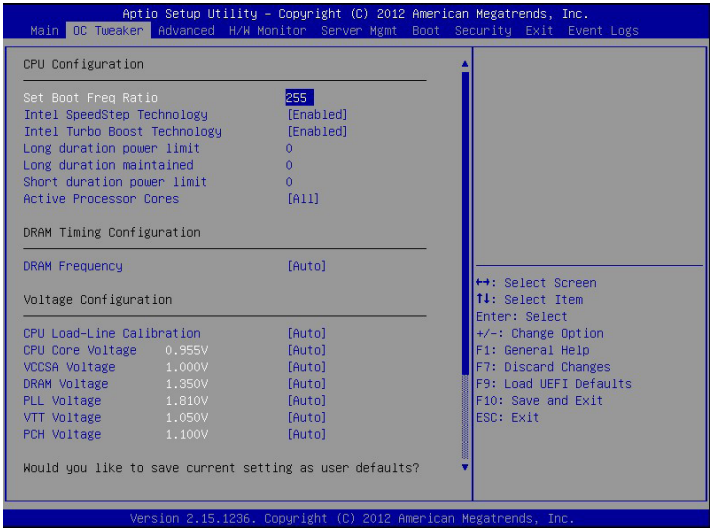
3.2 Main Screen

Once you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview. The Main screen provides system overview information and allows you to set the system time and date.



3.3 OC Tweaker Screen

In the OC Tweaker screen, you can set up overclocking features.



3.3.1 CPU Configuration

Set Boot Freq Ratio

Use this item to change the boot frequency ratio value of this motherboard.

Intel SpeedStep Technology

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled]. If you install Windows® Vista™ / 7 / 8 and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel(R) SpeedStep technology.

Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

Intel Turbo Boost Technology

Use this item to enable or disable Intel Turbo Boost Mode Technology. Turbo Boost Mode allows processor cores to run faster than marked frequency in specific conditions. The default value is [Enabled].

Long Duration Power Limit

Use this item to configure long duration power limit in watts. When the limit is exceeded, the CPU ratio will be lowered after a period of time. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

Long Duration Maintained

Use this item to configure time window which the long duration power is maintained.

Short Duration Power Limit

Use this item to configure short duration power limit in watts. When the limit is exceeded, the CPU ratio will be lowered immediately. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

Active Processor Cores

Use this item to select the number of cores to enable in each processor package. The default value is [All].

3.3.2 DRAM Timing Configuration

DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assign the appropriate frequency automatically.

3.3.3 Voltage Configuration

CPU Load-Line Calibration

CPU Load-Line Calibration helps prevent CPU voltage droop when the system is under heavy load.

CPU Core Voltage

Use this to select CPU Core Voltage. The default value is [Auto].

VCCSA Voltage

Use this to select VCCSA Voltage. The default value is [Auto].

DRAM Voltage

Use this to configure DRAM Voltage. The default value is [Auto].

PLL Voltage

Use this to select PLL Voltage. The default value is [Auto].

VTT Voltage

Use this to select VTT Voltage. The default value is [Auto].

PCH Voltage

Use this to configure PCH Voltage. The default value is [Auto].

3.3.4 Saving Current Settings as User Defaults

In this option, you are allowed to load and save three user defaults according to your own requirements.

Save 1st User Default

Type the name and press [ENTER] to save the changes as the 1st User Default.

Save 2nd User Default

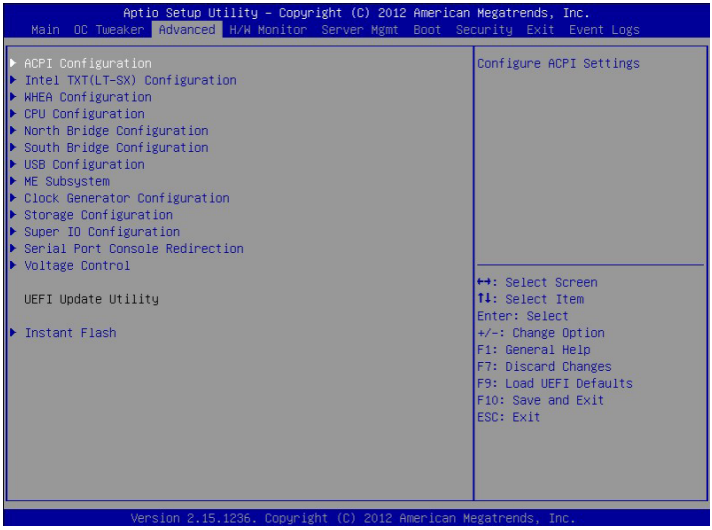
Type the name and press [ENTER] to save the changes as the 2nd User Default.

Save 3rd User Default

Type the name and press [ENTER] to save the changes as the 3rd User Default.

3.4 Advanced Screen

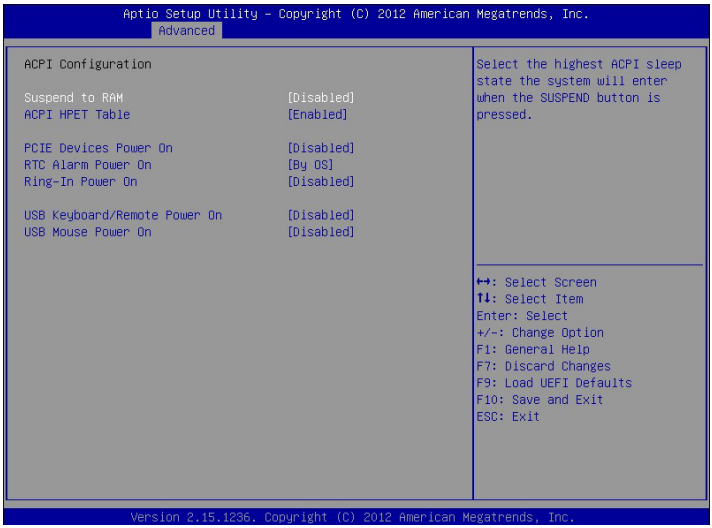
In this section, you may set the configurations for the following items: ACPI Configuration, Intel TXT(LS-SX) Configuration, WHEA Configuration, CPU Configuration, North Bridge Configuration, South Bridge Configuration, USB Configuration, ME Subsystem, Clock Generator Configuration, Storage Configuration, Super IO Configuration, Serial Port Console Redirection, Voltage Control and Instant Flash.



Setting wrong values in this section may cause the system to malfunction.

English

3.4.1 ACPI Configuration



Suspend to RAM

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Selecting [Auto] will enable this feature if the OS supports it.

ACPI HPET Table

Use this item to enable or disable ACPI HPET Table. The default value is [Enabled]. Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® certification.

PCIE Devices Power On

Use this item to enable or disable PCIE devices to turn on the system from the power-soft-off mode.

RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

Ring-In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

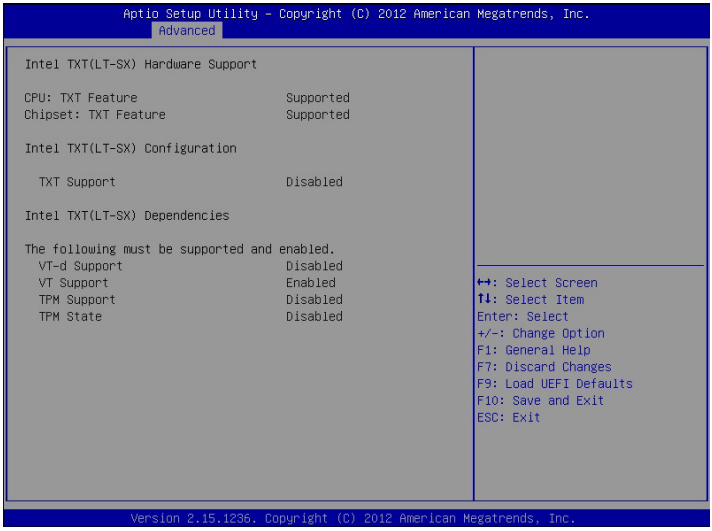
USB Keyboard/Remote Power On

Use this item to enable or disable USB Keyboard/Remote to turn on the system from the power-soft-off mode.

USB Mouse Power On

Use this item to enable or disable USB Mouse to turn on the system from the power-soft-off mode.

3.4.2 Intel TXT(LT-SX) Configuration

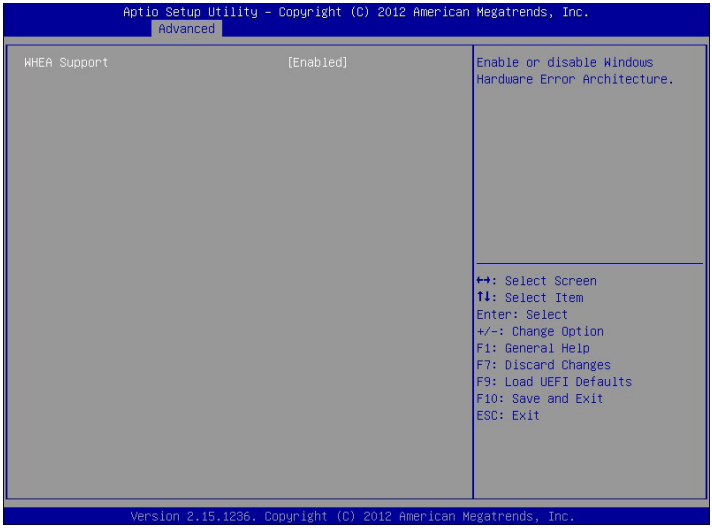


Intel Trusted Execution Technology (TXT) Hardware Support

Please install a Trusted Platform Module (TPM) on the motherboard to enable the Intel TXT(LT-SX) Configuration.

English

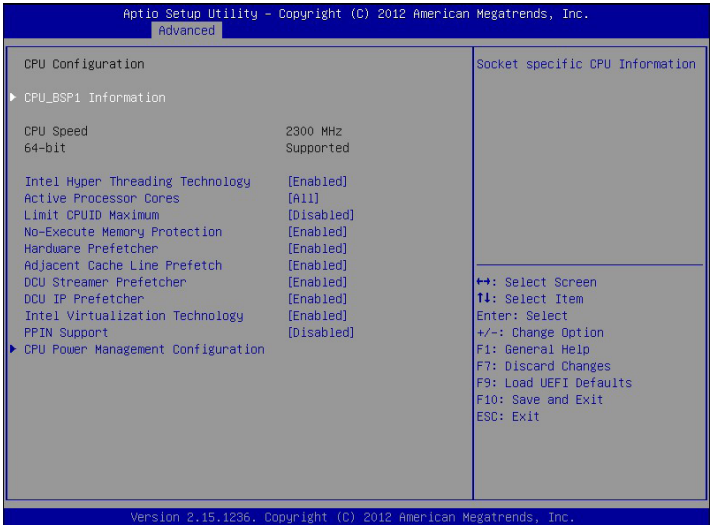
3.4.3 WHEA Configuration



WHEA Support

Use this option to enable or disable Windows Hardware Error Architecture. The default value is [Enabled].

3.4.4 CPU Configuration



CPU_BSP1 Information

Display information regarding the primary processor (BootStrap Processor).

Intel Hyper Threading Technology

Intel Hyper Threading Technology allows multiple threads to run on each core, so that the overall performance on threaded software is improved.

Active Processor Cores

Select the number of cores to enable in each processor package.

Limit CPUID Maxinum

This function allows you to limit CPUID maximum value. (It is set as Disabled for Windows® XP.)

No-Execute Memory Protection

Processors with No-Execution Memory Protection Technology may prevent certain classes of malicious buffer overflow attacks.

Hardware Prefetcher

Automatically prefetch data and code for the processor. Enable for better performance.

Adjacent Cache Line Prefetch

Automatically prefetch the subsequent cache line while retrieving the currently requested cache line. Enable for better performance.

DCU Streamer Prefetcher

If enabled, the DCU (data cache unit) Streamer Prefetcher prefetches the next L1 Data line based upon multiple loads in same cache line. It is recommended to enable this option to enhance data processing capacity.

DCU IP Prefetcher

If enabled, the DCU (data cache unit) IP (Instruction Pointer) Prefetcher predicts what memory addresses are going to be used by the program and delivers that data just in time.

Intel Virtualization Technology

Intel Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions, so that one computer system can function as multiple virtual systems.

PPIN Support

Use this item to enable or disable the PPIN support.

CPU Power Management Configuration

Set Boot Freq Ratio

Use this item to set boot ratio. Available value range depends on the CPU you use.

Power Technology

Use this item to enable the power management features.

Energy Performance

Use this item to configure energy performance.

Factory Long Duration Power Limit

Use this item to configure the factory long duration power limit.

Long Duration Power Limit

Use this item to configure long duration power limit in watts.

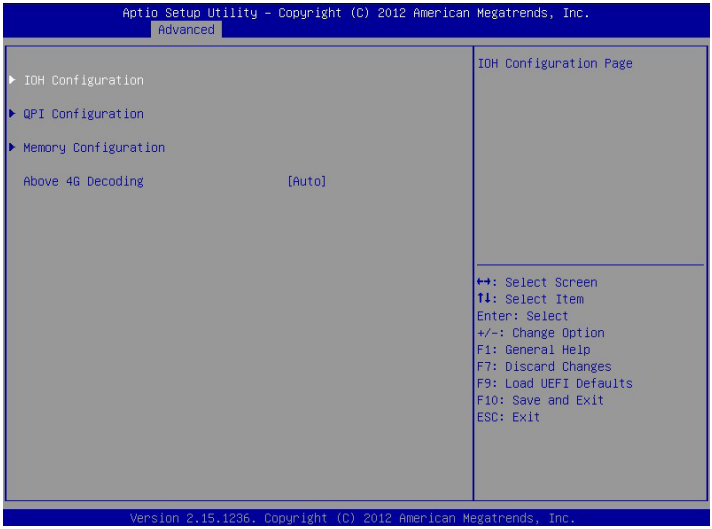
Long Duration Maintained

Use this item to configure time window which the long duration power is maintained.

Short Duration Power Limited

Use this item to configure short duration power limit in watts.

3.4.5 North Bridge Configuration



IOH Configuration

Intel(R) VT-d

Use this item to enable or disable Intel(R) Virtualization Technology for Directed I/O. The default value is [Enabled].

Intel(R) I/OAT

Use this to enable or disable Intel® I/O Accelearation Technology.

Primary Graphics Adapter

If both AGP card and PCI Express graphics card are installed on the motherboard, you may use this option to select PCI Express or Onboard as the primary graphics adapter.

Onboard VGA

Use this to enable or disable the Onboard VGA function. The default value is [Auto].

**This item is not available when the Primary Graphic Adapter is set to [Onboard].*

PCIE 1 & PCIE 2 Link Width

This allows you to select PCIE 1 & PCIE 2 Link Width. The default value is [Gen2].

PCIE 1 & PCIE 2 Link Speed

This allows you to select PCIE1 & PCIE2 Link Speed. The default value is [Auto].

PCIE 3 & PCIE 4 Link Width

This allows you to select PCIE 3 & PCIE 4 Link Width. The default value is [Gen2].

PCIE 3 & PCIE 4 Link Speed

This allows you to select PCIE3 & PCIE4 Link Speed. The default value is [Auto].

PCIE 5 & PCIE 6 Link Width

This allows you to select PCIE 5 & PCIE 6 Link Width. The default value is [Gen2].

PCIE 5 & PCIE 6 Link Speed

This allows you to select PCIE5 & PCIE6 Link Speed. The default value is [Auto].

QPI Configuration

Isoc

Use this to enable or disable Isoc. It is recommended to select [Enabled].

Snoop Mode

Use this item to set Snoop Mode. The default value is [Auto].

Memory Configuration

Memory Mode

Select the mode for memory initialization.

- [Independent]: Independent channel mode.
- [Mirroring]: The memory subsystem writes identical data to two channels simultaneously. Identical memory modules should be installed in the two channels closest to the processor.
- [Lock Step]: The two channels closest to the processor are combined to form a single channel. Memory modules must be identical in size, speed, and technology in corresponding slots.
- [Sparing]: This mode occurs when on-demand inactive memory is automatically activated by the system to temporarily replace failed memory until a service action can be performed.

ECC Support

Use this item to enable or disable DDR ECC support.

DRAM RAPL BWLIMIT

This item sets the limits on the average power consumption and the bandwidth of a DRAM module.

Perform and DFX Devices

This item can set the Perform and DFX devices hidden or unhidden.

DRAM RAPL(Running Average Power Limit) Mode

RAPL (Running Average Power Limit) provides mechanisms to enforce power consumption limits on supported processors. The default is [DRAM RAPL Mode 1].

DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assigns appropriate frequency automatically.

Channel Interleaving

It allows you to enable Channel Memory Interleaving. The default value is [Auto].

Rank Interleaving

It allows you to select a rank memory interleaving method. The default value is [Auto].

Patrol Scrub

Patrol Scrub is a background activity initiated by the processor to seek out and fix memory errors. The default value is [Enabled].

Demand Scrub

Fix the error when the CPU or I/O issues a demand-read command, and the read data from memory turns out to be a correctable error. The default value is [Disabled].

Data Scrambling

Enable this feature to ensure data security and integrity.

Thermal Throtting

Use this automatic memory throttling feature to reduce power consumption. The default value is [CLTT] (Closed Loop Thermal Throttling).

DIMM Information

Display DIMM information.

Above 4G Decoding

Use this option to enable or disable 64bit capable devices to be decoded in above 4G address space (only if system supports 64bit PCI decoding).

3.4.6 South Bridge Configuration

Restore on AC/Power Loss

This allows you to set the power state after an unexpected AC/power loss. If [Power Off] is selected, the AC/power remains off when the power recovers. If [Power On] is selected, the AC/power resumes and the system starts to boot up when the power recovers. If [Last State] is selected, the AC/power resumes or remains off when the power recovers, depending on the last state when an unexpected AC/power loss occurs.

Deep Sleep

Mobile platforms support Deep S4/S5 in DC only and desktop platforms support Deep S4/S5 in AC only. The default value is [Disabled].

Onboard 1394

Use this item to enable and disable the onboard 1394 controller.

Onboard LAN1

This allows you to enable or disable the Onboard LAN 1 feature.

Onboard LAN2

This allows you to enable or disable the Onboard LAN 2 feature.

Onboard Debug Port LED

Use this to enable or disable the Onboard Debug Port LED. The default value is [Auto].

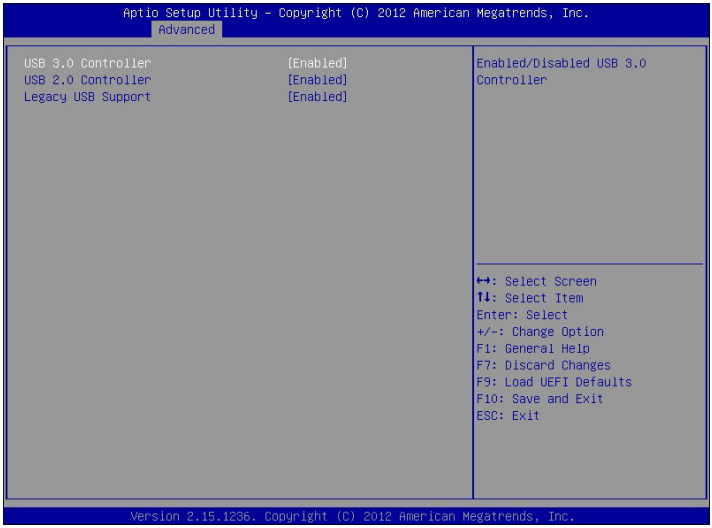
Onboard HD Audio

Select [Enabled] or [Disabled] for the onboard HD Audio feature. If you select [Enabled], the onboard HD Audio will be disabled when PCI Sound Card is plugged.

Front Panel

Select [Auto] or [Disabled] for the onboard HD Audio Front Panel.

3.4.7 USB Configuration



USB 3.0 Controller

Use this item to enable or disable the use of USB controller. The default value is [Enabled].

USB 2.0 Controller

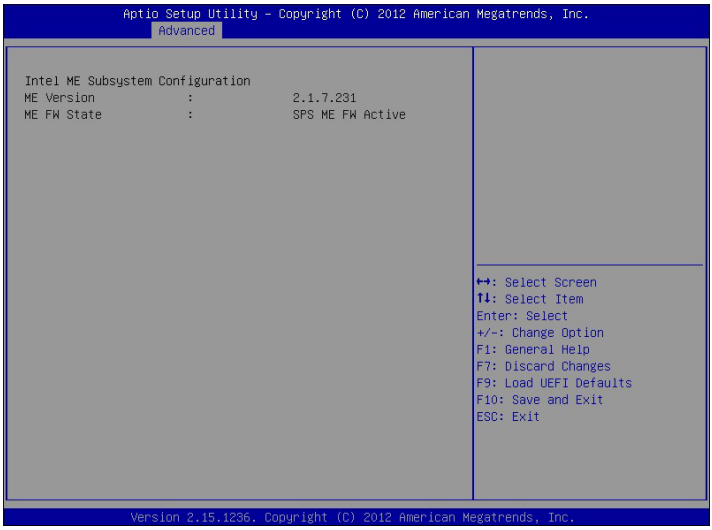
Use this item to enable or disable the use of USB controller. The default value is [Enabled].

Legacy USB Support

Use this option to select legacy support for USB devices. There are four configuration options: [Enabled], [Auto], [Disabled] and [UEFI Setup Only]. The default value is [Enabled]. Please refer to below descriptions for the details of these four options:

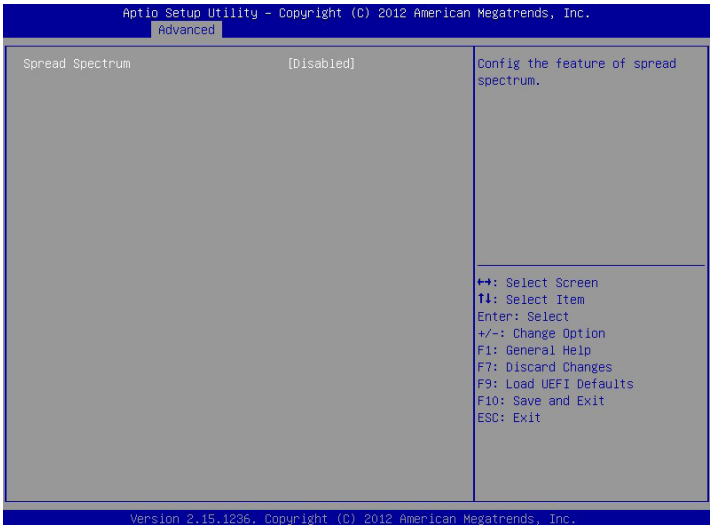
Option	Description
Enabled	Enables support for legacy USB.
Disabled	USB devices are not allowed to use under legacy OS and UEFI setup when [Disabled] is selected. If you have USB compatibility issues, it is recommended to select [Disabled] to enter OS.
Auto	Enables legacy support if USB devices are connected.
UEFI Setup Only	SB devices are allowed to use only under UEFI setup and Windows / Linux OS.

3.4.8 ME Subsystem



ME Subsystem screen displays the Intel ME Subsystem Configuration information, such as ME Version and ME FW State.

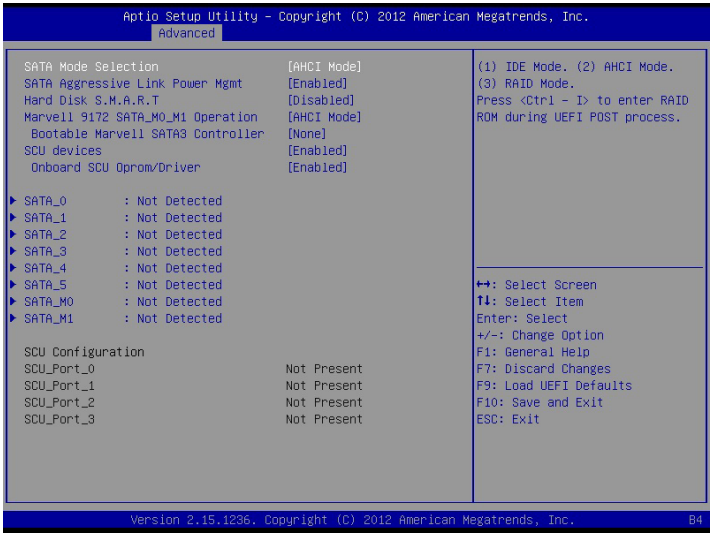
3.4.9 Clock Generator Configuration



Spread Spectrum

Use this item to enable or disable the spread spectrum feature. The default valu is [Disabled].

3.4.10 Storage Configuration



SATA Mode Selection

Use this to select SATA mode. Configuration options: [Disabled], [IDE Mode], [AHCI Mode] and [RAID Mode]. The default value is [AHCI Mode].

AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages.

SATA Aggressive Link Power Management

Use this item to configure SATA Aggressive Link Power Management.

Hard Disk S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled] and [Enabled].

Marvell 9172 SATA_M0_M1 Operation

This item is for eSATA ports. Use this to select Marvell SATA operation mode. Configuration options: [Disabled], [IDE Mode], [AHCI Mode], [RAID Mode] and [Disabled]. The default value is [AHCI Mode].

Bootable Marvell SATA3 Controller

Use this to enable or disable Onboard Marvell SATA3 Option ROM. If Option ROM is disabled, you cannot use the SATA devices connected to the Marvell SATA3 controller as Boot Device.

SCU Devices

Use this to enable or disable SCU devices.

Onboard SCU Oprom/Driver

Use this to enable or disable LSI SAS Option ROM. If Option ROM is disabled, you cannot use the SATA devices connected to the LSI SAS controller as Boot Device.

Depending on how many SATA ports you have, you will see SATA_x (x means number) listed on the screen, with its status indicated as SATA device [(Model Name)] or [Not Detected].
Enter either one of the options will see the followings:

SATA_X Hot Plug

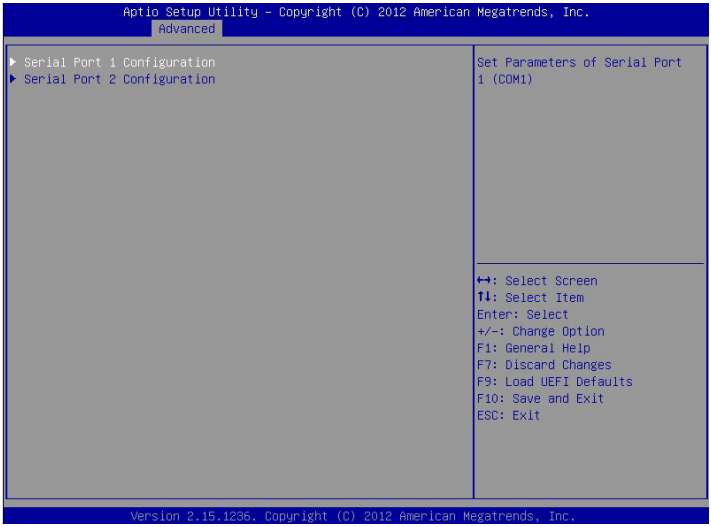
Use this item to enable or disable Hot Plug for the designated port.

External SATA_X

Use this item to enable SATA safe removal notifications. Please note that the SATA device will be downgraded to SATA2.

We recommend to use IntelC602 SATA ports for your bootable devices. This will minimize your boot time and get the best performance. But if you still want to boot from the LSI controller or Marvell SATA3 controller, you can enable these from the UEFI.

3.4.11 Super IO Configuration



Serial Port 1 Configuration

Use this item to configure the onboard serial port 1.

Select and enter the "Serial Port 1 Configuration" and you will see the followings:

Serial Port
Use this item to enable or disable the onboard serial port.

Change Settings
Use this item to select an optimal setting for Super IO device.

Serial Port 2 Configuration

Use this item to configure the onboard serial port 2.

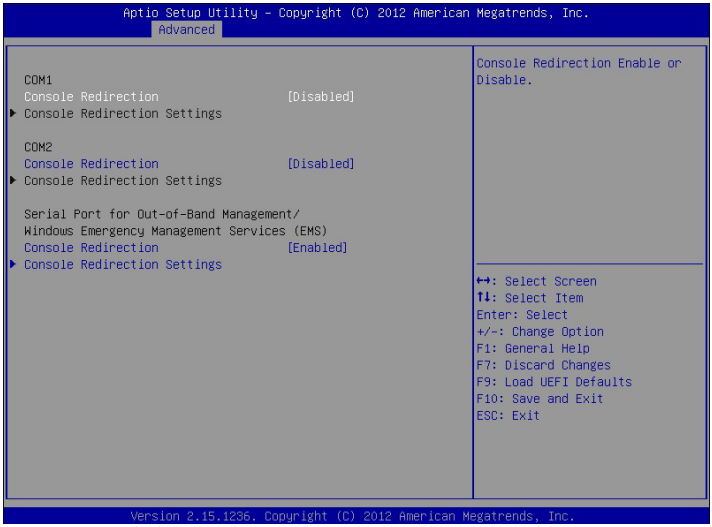
Select and enter the "Serial Port 2 Configuration" and you will see the followings:

Serial Port
Use this item to enable or disable the onboard serial port.

Serial Port Mode
Use this item to select Serial Over LAN or COM mode.

Change Settings
Use this item to select an optimal setting for Super IO device.

3.4.12 Serial Port Console Redirection



Console Redirection

Use this option to enable or disable Console Redirection. If this item is set to Enabled, you can select a COM Port to be used for Console Redirection.

Console Redirection Settings

Use this option to configure Console Redirection Settings, and specify how your computer and the host computer to which you are connected exchange information.

Out-of-Band-Mgmt (Management) Port

Use this item to select the port to be used for out-of-band management. The options include [COM1] and [SOL].

Terminal Type

Use this item to select the preferred terminal emulation type for out-of-band management. It is recommended to select [VT-UTF8].

Option	Description
VT100	ASCII character set
VT100+	Extended VT100 that supports color and function keys
VT-UTF8	UTF8 encoding is used to map Unicode chars onto 1 or more bytes
ANSI	Extended ASCII character set

Bits Per Second
Use this item to select the serial port transmission speed. The speed used in the host computer and the client computer must be the same. Long or noisy lines may require lower transmission speed. The options include [9600], [19200], [57600] and [115200].

Data Bits
Use this item to set the data transmission size. The options include [7] and [8] (Bits).

Parity
Use this item to select the parity bit. The options include [None], [Even], [Odd], [Mark] and [Space].

Stop Bits
The item indicates the end of a serial data packet. The standard setting is [1] Stop Bit. Select [2] Stop Bits for slower devices.

Flow Control
Use this item to set the flow control to 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 restart the flow. Hardware flow uses two wires to send start/stop signals. The options include [None], [Hardware RTS/CTS], and [Software Xon/Xoff].

VT-UTF8 Combo Key Support
Use this item to enable or disable the VT-UTF8 Combo Key Support for ANSI/VT100 terminals.

Recorder Mode
Use this item to enable or disable Recorder Mode to capture terminal data and send it as text messages.

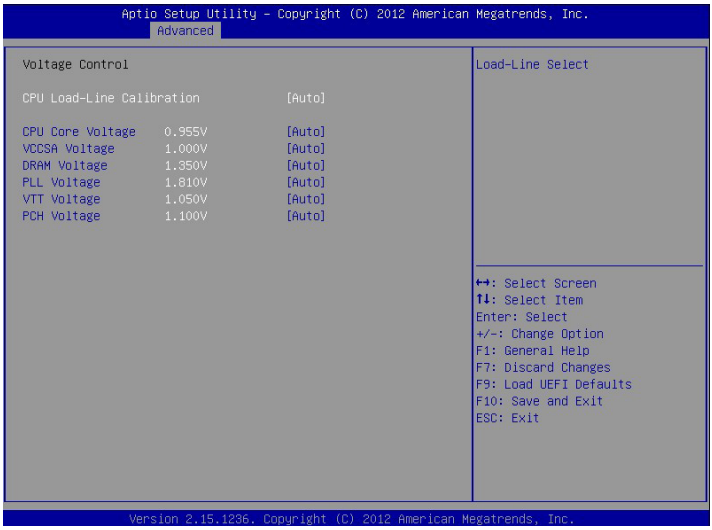
Resolution 100x31
Use this item to enable or disable extended terminal resolution support.

Legacy OS Redirection Resolution
Use this item to select the number of rows and columns used in legacy OS redirection.

Putty Keypad
Use this item to select Function Key and Keypad on Putty.

Redirection After BIOS POST
If the [LoadBooster] is selected, legacy console redirection is disabled before booting to legacy OS. If [Always Enabled] is selected, legacy console redirection is enabled for legacy OS. The default value is [Always Enabled].

3.4.13 Voltage Control



CPU Load-Line Calibration

CPU Load-Line Calibration helps prevent CPU voltage droop when thesystem is under heavy load.

CPU Core Voltage

Use this to select CPU Core Voltage. The default value is [Auto].

VCCSA Voltage

Use this to select VCCSA Voltage. The default value is [Auto].

DRAM Voltage

Use this to select DRAM Voltage. The default value is [Auto].

PLL Voltage

Use this to select PLL Voltage. The default value is [Auto].

VTT Voltage

Use this to select VTT Voltage. The default value is [Auto].

PCH Voltage

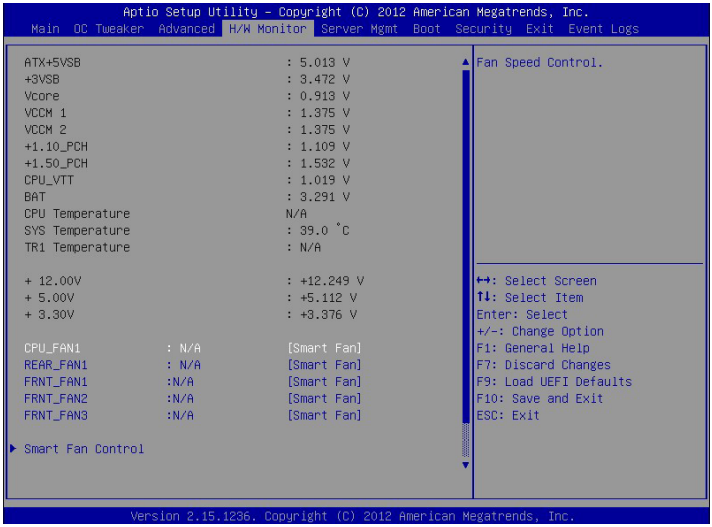
Use this to select PCH Voltage. The default value is [Auto].

3.4.14 Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like MS-DOS or Windows®. Just save the new UEFI file to your USB flash drive, floppy disk or hard drive and launch this tool, then you can update your UEFI only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after the UEFI update process is completed.

3.5 H/W Monitor Screen (Hardware Health Event Monitoring)

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.



CPU_FAN 1

This allows you to set the CPU fan 1's speed. The default value is [Smart Fan].

REAR_FAN 1

This allows you to set the rear fan 1's speed. The default value is [Smart Fan].

FRNT_FAN 1

This allows you to set the front fan 1's speed. The default value is [Smart Fan].

FRNT_FAN 2

This allows you to set the front fan 2's speed. The default value is [Smart Fan].

FRNT_FAN 3

This allows you to set the front fan 3's speed. The default value is [Smart Fan].

Smart Fan Control

This allows you to set the Smart fan's level speed.

Smart Fan Duty Control

Smart Fan Duty x (x means 1 to 11 stage)

This allows you to set duty cycle for each stage.

Smart Fan Temp Control

Smart Fan Temp x (x means 1 to 11 stage)

This allows you to set temperature for each stage.

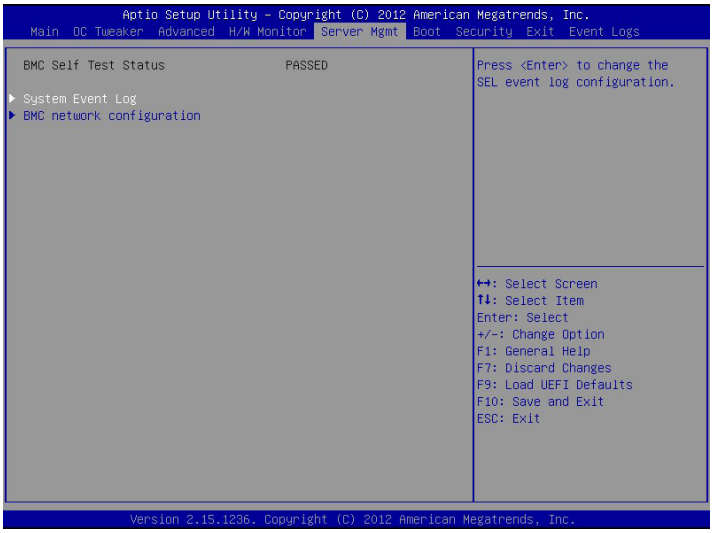
Watch Dog Timer

This allows you to enable or disable the Watch Dog Timer. The default value is [Disabled].

Case Open Feature

This allows you to enable or disable the Case Open Feature. The default value is [Enabled].

3.6 Server Mgmt (Server Management)



System Event Log

Enter to configure System Event Logging features during boot.

BMC Network Configuration

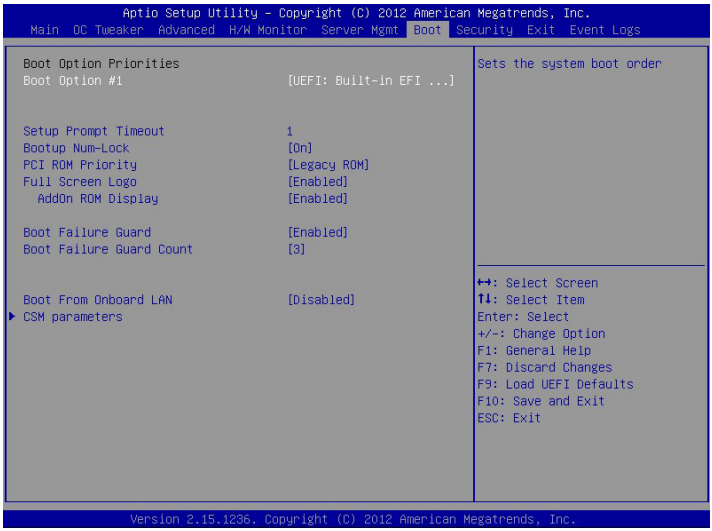
Enter to configure BMC Network parameters.

Configuration Address Source

Select to configure LAN channel parameters statically or dynamically (by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.

3.7 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



Boot Option #1

Use this item to set the system boot order.

Setup Prompt Timeout

This shows the number of seconds to wait for setup activation key.

Bootup Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

PCI ROM Priority

Use this item to adjust PCI ROM Priority. The default value is [LegacyROM]

Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Enabled].

AddOn ROM Display

Use this option to adjust AddOn ROM Display. If you enable the option “Full Screen Logo”

but you want to see the AddOn ROM information when the system boots, please select [Enabled]. Configuration options: [Enabled] and [Disabled]. The default value is [Enabled].

Boot Failure Guard

Use this item to enable or disable the feature of Boot Failure Guard

Boot Failure Guard Count

Use this item to configure Boot Failure Guard Count.

Boot From Onboard LAN

Use this item to enable or disable the Boot From Onboard LAN feature.

CSM Parameters

Use this option to configure the parameters of OpROM execution, boot options filter, etc.

Boot Option Filter

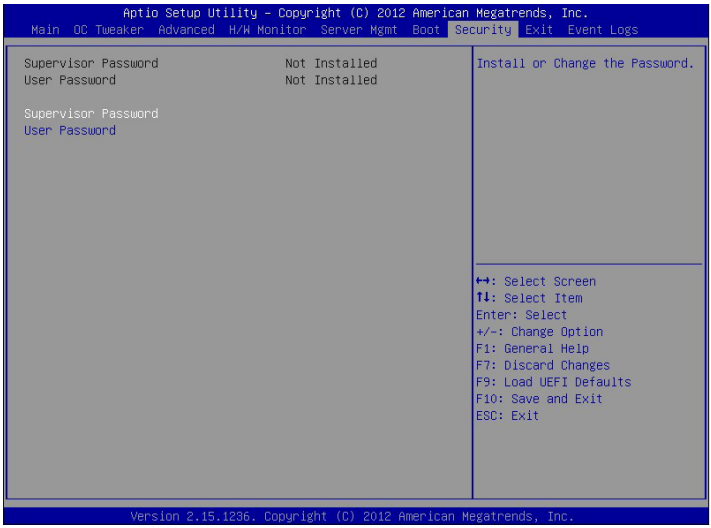
Use this option to control what devices system can boot to. Configuration options: [UEFI and Legacy], [Legacy only] and [UEFI only].

Launch Storage OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select [Legacy only] to run those that support legacy option ROM only.

3.8 Security Screen

In this section, you may set or change the supervisor/user password for the system. For the user password, you may also clear it.



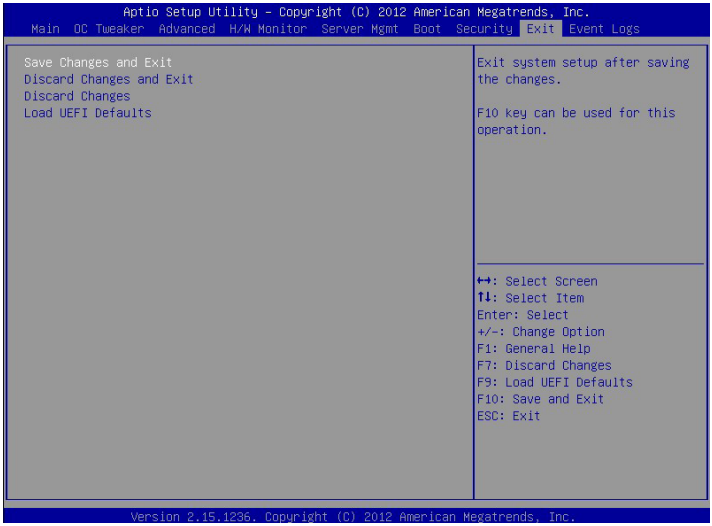
Supervisor Password

Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

User Password

Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

3.9 Exit Screen



Save Changes and Exit

When you select this option, the following message "Save configuration changes and exit setup?" will pop-out. Select [Yes] to save the changes and exit the UEFI SETUP UTILITY.

Discard Changes and Exit

When you select this option, the following message "Discard changes and exit setup?" will pop-out. Select [Yes] to exit the UEFI SETUP UTILITY without saving any changes.

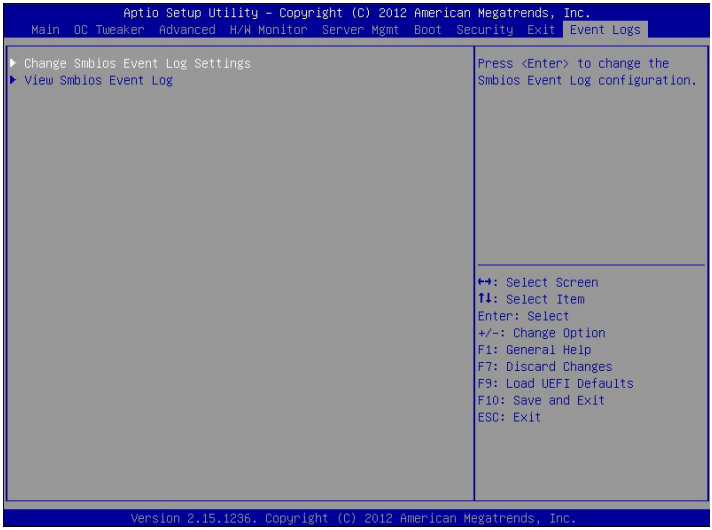
Discard Changes

When you select this option, the following message "Discard changes?" will pop-out. Select [Yes] to discard all changes.

Load UEFI Defaults

Load UEFI default values for all the setup questions. F9 key can be used for this operation.

3.10 Event Logs



Change Smbios Event Log Settings

This allows you to configure the Smbios Event Log Settings.

When entering the item, you will see the followings:

Smbios Event Log

Use this item to enable or disable all features of the SMBIOS Event Logging during system boot.

Erasing Event Log

The options include [No], [Yes, Next reset] and [Yes, Every reset]. If Yes is selected, all logged events will be erased.

When Log is Full

Use this item to choose options for reactions to a full Smbios Event Log. The options include [Do Nothing] and [Erase Immediately].

MECI (Multiple Event Count Increment)

Use this item to enter the increment value for the multiple event counter. The valid range is from 1 to 33.

METW (Multiple Event Time Window)

Use this item to specify the number of minutes which must pass between duplicate log

entries which utilize a multiple-event counter. The value ranges from 0 to 99 minutes.

View Smbios Event Log

This allows you to view the Smbios Event Log records.

All values changed here do not take effect until computer is restarted.

BMC Mac Backup Tool

Use this to restore BMC Mac from the backup.

System Event Log

Enter to configure System Event Logging features during boot.

BMC Nework Configuration

Enter to configure BMC Network parameters.

Chapter 4 Software Support

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® Server 2003 / 2003 R2 / 2008 / 2008 R2 / Linux compliant. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

4.2 Support CD Information

The Support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard's features.

4.2.1 Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu does not appear automatically, locate and double click on the file "ASRSetup.exe" from the root folder in the Support CD to display the menu.

4.2.2 Drivers Menu

The Drivers Menu shows the available device's drivers if the system detects installed devices. Please install the necessary drivers to activate the devices.

4.2.3 Utilities Menu

The Utilities Menu shows the application softwares that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

4.2.4 Contact Information

If you need to contact ASRockRack or want to know more about ASRockRack, welcome to visit ASRockRack's website at http://www.asrockrack.com; or you may contact your dealer for further information.

Chapter 5 Troubleshooting

5.1 Troubleshooting Procedures

Follow the procedures below to troubleshoot your system.

Always unplug the power cord before adding, removing or changing any hardware components. Failure to do so may cause physical injuries to you and damages to motherboard components.

1. Disconnect the power cable and check whether the PWR LED is off.
2. Unplug all cables, connectors and remove all add-on cards from the motherboard. Make sure that the jumpers are set to default settings.
3. Confirm that there are no short circuits between the motherboard and the chassis.
4. Install a CPU and fan on the motherboard, then connect the chassis speaker and power LED.

If there is no power...

1. Confirm that there are no short circuits between the motherboard and the chassis.
2. Make sure that the jumpers are set to default settings.
3. Check the settings of the 115V/230V switch on the power supply.
4. Verify if the battery on the motherboard provides ~3VDC. Install a new battery if it does not.

If there is no video...

1. Try replugging the monitor cables and power cord.
2. Check for memory errors.

If there are memory errors...

1. Verify that the DIMM modules are properly seated in the slots.
2. Use recommended DDR3 1600/1333/1066 non ECC, unbuffered DIMMs.
3. If you have installed more than one DIMM modules, they should be identical with the same brand, speed, size and chip-type.
4. Try inserting different DIMM modules into different slots to identify faulty ones.
5. Check the settings of the 115V/230V switch on the power supply.

Unable to save system setup configurations...

1. Verify if the battery on the motherboard provides ~3VDC. Install a new battery if it does not.
2. Confirm whether your power supply provides adaquate and stable power.

Other problems...

1. Try searching keywords related to your problem on ASRockRack's FAQ page: http://www.asrock.com/support/faq.asp
2. Try downloading and updating the latest UEFI on ASRockRack's website: http://www.asrock.com/support/download.asp

5.2 Technical Support Procedures

If you have tried the troubleshooting procedures mentioned above and the problems are still unsolved, please contact ASRockRack's technical support with the following information:

1. Your contact information
2. Model name, BIOS version and problem type.
3. System configuration.
4. Problem description.

You may contact ASRockRack's technical support at:
http://www.asrock.com/support/tsd.asp

5.3 Returning Merchandise for Service

For warranty service, the receipt or a copy of your invoice marked with the date of purchase is required. By calling your vendor or going to our RMA website (http://www.asrock.com/support/index.asp?cat=RMA) you may obtain a Returned Merchandise Authorization (RMA) number.
The RMA number should be displayed on the outside of the shipping carton which is mailed prepaid or hand-carried when you return the motherboard to the manufacturer. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty does not cover damages incurred in shipping or from failure due to alteration, misuse, abuse or improper maintenance of products.

Contact your distributor first for any product related problems during the warranty period.