ASRock Rack

OPEN
Industry Standard, Flexible Architecture

GREEN
Less Heat, Less Power Consumption

STABLE
Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation
Motherboard

C226M WS
Z97M WS
H97M WS

User Manual

English

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(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

CALIFORNIA, USA ONLY

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"

ASRock Rack's Website: www.ASRockRack.com

Contact Information

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

ASRock Rack Incorporation

6F., No.37, Sec. 2, Jhongyang S. Rd., Beitou District,

Taipei City 112, Taiwan (R.O.C.)

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Chapter 1 Introduction

Thank you for purchasing ASRock Rack ***H97M WS / Z97M WS / C226M WS*** motherboard, a reliable motherboard produced under ASRock Rack's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock Rack'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 ASRock Rack website without further notice. You may find the latest memory and CPU support lists on ASRock Rack website as well. ASRock Rack'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.
http://www.asrockrack.com/support/

1.1 Package Contents

- ASRock Rack H97M WS / Z97M WS / C226M WS Motherboard (Micro ATX Form Factor: 9.6-in x 9.6-in, 24.4 cm x 24.4 cm)
- 4 x SATA3 Cables (50cm)
- 2 x SATA3 Cables (60cm)
- 1 x Screw for M.2_SSD (NGFF) Socket 3
- 1 x I/O Shield
- Support CD
- User Manual

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

English

1.2 Specifications

H97M WS / Z97M WS / C226M WS	
MB Physical Status	
Form Factor	micro ATX
Dimension	9.6'' x 9.6'' (24.4 cm x 24.4 cm)
Processor System	
CPU	***C226M WS:*** - Intel® Xeon® E3-1200 v3/v4* series and 5th/4th Generation Core™ i7/i5/i3/Pentium®/Celeron® processor - Supports Hyper-Threading Technology - Supports Intel® Turbo Boost 2.0 Technology **BIOS version 3.0 or above is required* ***Haswell i5/i7 processor support is an extended advantage provided by ASRock Rack. It is out of warranty, user's discretion is required.* ***HDMI only works with certain Intel® CPUs* ***Z97M WS / H97M WS:*** - Supports 4th Gen & 5th Generation Intel® Core™ Processors (Socket 1150) - Supports Intel® K-Series CPU - Supports Intel® Turbo Boost 2.0 Technology
Socket	Single socket H3 (LGA1150)
Chipset	Intel® H97 / Z97 / C226
System Memory	
Capacity	- 4 x 240-pin DDR3 DIMM slots - Support up to 32GB, un-buffered DIMM
Type	- Dual Channel DDR3 1600/1333 UDIMM ***C226M WS:*** - Supports DDR3 1600/1333 ***H97M WS:*** - Supports DDR3 1600/1333/1066 non-ECC ***Z97M WS:*** - Supports DDR3 2400+(OC)/2133(OC)/1866(OC)/1600/1333 /1066 non-ECC - Supports Intel® Extreme Memory Profile (XMP) 1.3/1.2 **The overclocking performance varies on different hardware platforms or operating systems.*
Voltage	1.5V, 1.35V
Expansion Slot	
PCIe 3.0 x 16	1 slot (x16 or x8, switch with x8 slot)
PCIe 3.0 x 8	1 slot (x0 or x8, switch with x16 slot) *(not supported for H97M WS)*

PCIe 2.0 x 4	1 slot
M.2	1 slot (share with SATA Port4 & Port5)
Storage	
SATA Controller	- Intel® H97 / Z97 / C226 : 6 x SATA3 6.0 Gb/s Connectors, support RAID (RAID 0, RAID 1, RAID 5, RAID 10, Intel® Rapid Storage Technology 13 and Intel® Smart Response Technology), NCQ, AHCI and Hot Plug - Supports SATA Express (SATA Port5 & Port4, share with M.2 slot)
Ethernet	
Interface	Gigabit LAN 10/100/1000 Mb/s
LAN Controller	Intel® i210 + Intel® i217LM (with Intel® vPro support) - Supports Wake-On-LAN - Supports Energy Efficient Ethernet 802.3az - Supports PXE
Gracphics	
Controller	Intel® HD Graphics Built-in Visuals and the VGA outputs can be supported only with processors which are GPU integrated
VRAM	Max. shared memory 1792MB
Output	- HDMI: max. resolution up to 4096x2304@ 24 Hz - Display Port 1.2 : max. resolution up to3840x2160 @ 60 Hz - DVI : max. resolution up to 1920x1200 @ 60 Hz - D-Sub : max. resolution up to 2048x1536 @ 75Hz
Audio	
Audio code	Realtek ALC892
Rear Panel I/O	
PS/2 KB/Mouse	1
VGA Port	D-sub x 1, DVI x 1, HDMI x 1, Display port x1
USB 2.0 Port	4
USB 3.0 Port	2
Lan Port	- 2 x RJ45 Gigabit Ethernet LAN ports - LAN Ports with LED (ACT/LINK LED and SPEED LED)
Audio Jack	3 Jack
Internal Connector	
COM Port Header	1 (COM1)
Power LED Header	1
Auxiliary Panel Header	1 (includes chassis intrusion and front LAN LED)
TPM Header	1
Fan Header	5 x 4pin
ATX Power	1 (24-pin) + 1 (8-pin)

USB 2.0 Header	1 (each supports 2 USB 2.0 ports)
USB 3.0 Header	1 (each supports 2 USB 3.0 ports)
System BIOS	
BIOS Type	128Mb 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 - CPU Core, IGPU, DRAM, 1.8V PLL, VTT, VCCSA Voltage Multi-adjustment
Hardware Monitor	
Temperature	- CPU Temperature Sensing - System Temperature Sensing
Fan	- CPU/Rear/Front Fan Tachometer - CPU Quiet Fan (Allow Chassis Fan Speed Auto-Adjust by CPU Temperature) - CPU/Rear/Front Fan Multi-Speed Control
Voltage	Voltage Monitoring: +12V, +5V, +3.3V, CPU Vcore
Support OS	
OS	***H97M WS / Z97M WS / C226M WS:*** Microsoft® - Windows® 7 (32 / 64 bit) - Windows® 8 (32 / 64 bit) - Windows® 8.1 (32 / 64 bit) - Windows® 10 (64 bit) ***C226M WS:*** - Windows® Server 2012 R2 (64 bit)
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.

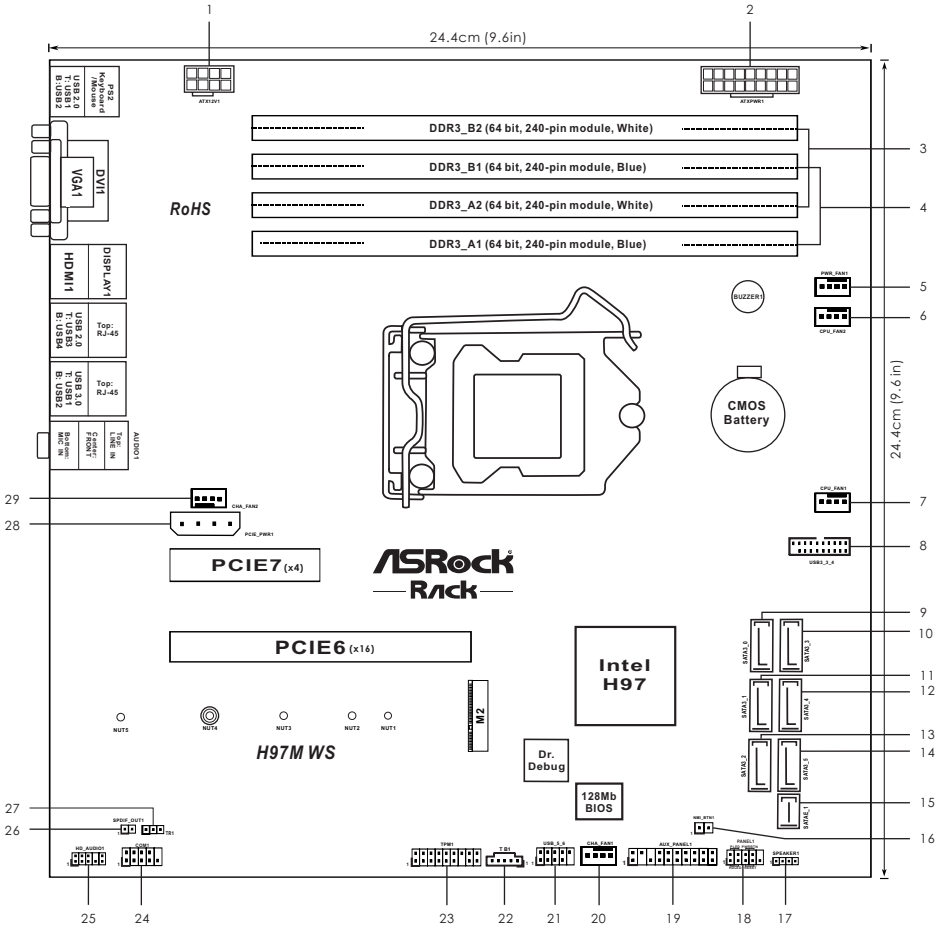
English

1.3 Unique Features

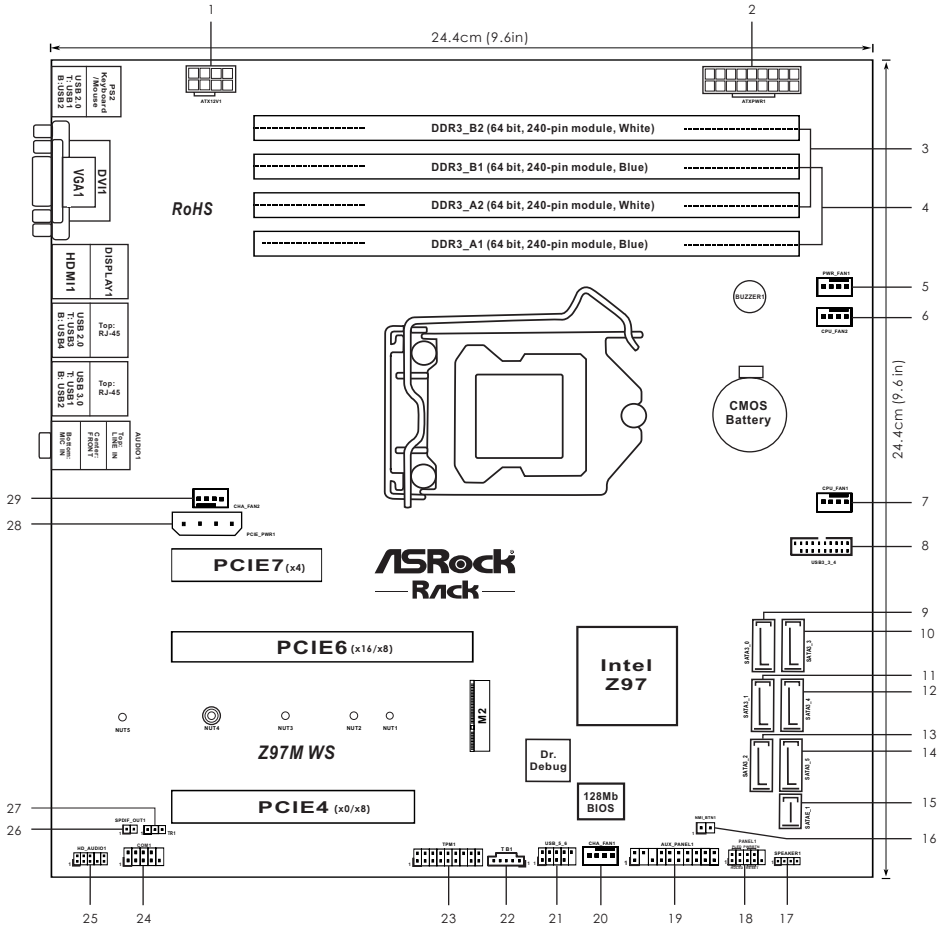
ASRock Rack Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update system BIOS without entering operating systems first like MS-DOS or Windows®. With this utility, you can press the <F6> key during the POST or the <F2> key to enter into the BIOS setup menu to access ASRock Rack 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

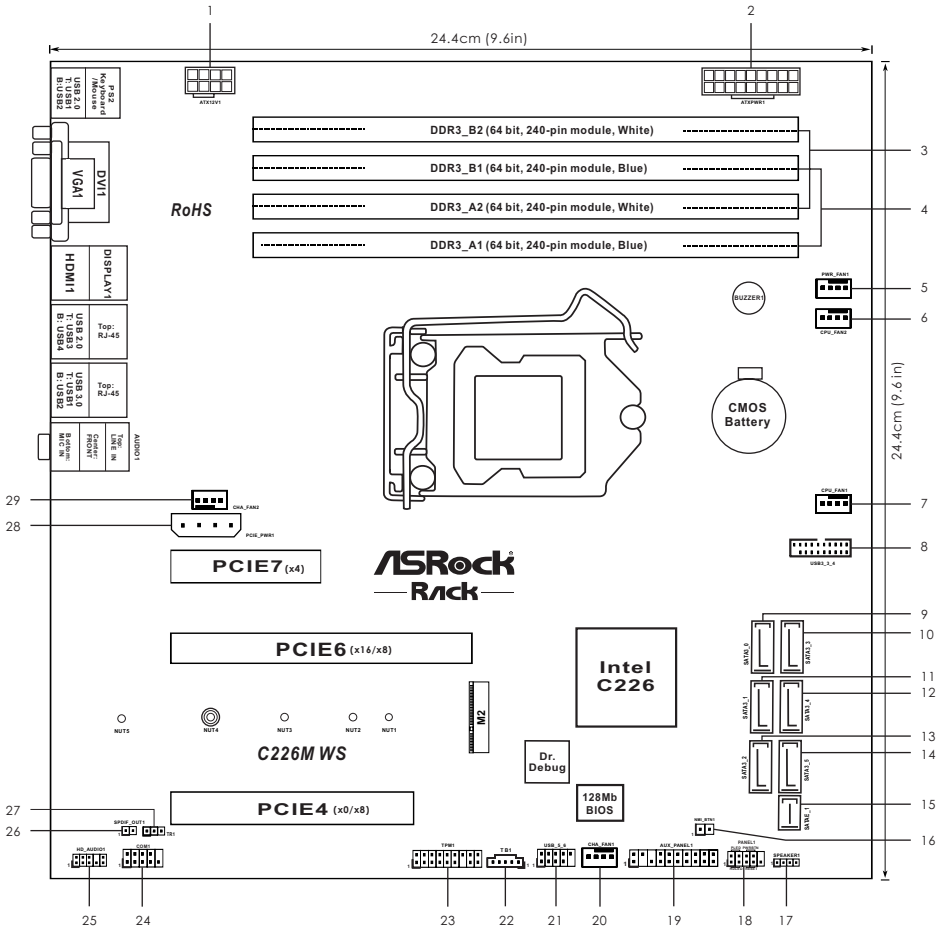
H97M WS



Z97M WS


1
2
24.4cm (9.6in)
ATX12V1
ATXPWR1
PS2 Keyboard / Mouse
USB 2.0 T: USB1 B: USB2
VGA1
DVI1
RoHS
DDR3_B2 (64 bit, 240-pin module, White)
DDR3_B1 (64 bit, 240-pin module, Blue)
DDR3_A2 (64 bit, 240-pin module, White)
DDR3_A1 (64 bit, 240-pin module, Blue)
3
4
HDMI1
DISPLAY1
USB 2.0 T: USB3 B: USB4
Top: RJ-45
USB 3.0 T: USB1 B: USB2
Top: RJ-45
Bottom: MIC IN
Center: FRONT
Top: LINE IN
AUDIO1
PWR_FAN1
5
BUZZER1
CPU_FAN2
6
CMOS Battery
24.4cm (9.6 in)
29
CHA_FAN2
28
PCIE_PWR1
PCIE7 (x4)
CPU_FAN1
7
USB3_3_4
8
ASRock Rack
9
10
PCIE6 (x16/x8)
Intel Z97
11
12
M2
NUT5
NUT4
NUT3
NUT2
NUT1
Z97M WS
Dr. Debug
13
14
27
26
PCIE4 (x0/x8)
128Mb BIOS
15
16
SPDIF_OUT1
HD_AUDIO1
CLRCMOS1
TPM1
T_SI1
DIMM_B_1
CHA_FAN1
AUX_PANEL1
PANEL1
SPEAKER1
25
24
23
22
21
20
19
18
17

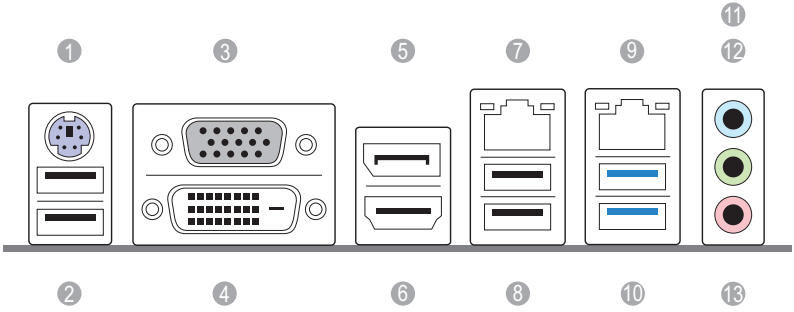
C226M WS


1
2
24.4cm (9.6in)
DDR3_B2 (64 bit, 240-pin module, White)
DDR3_B1 (64 bit, 240-pin module, Blue)
DDR3_A2 (64 bit, 240-pin module, White)
DDR3_A1 (64 bit, 240-pin module, Blue)
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
24.4cm (9.6 in)
PS/2 Keyboard / Mouse
USB 2.0 T: USB1 B: USB2
VGA1
DVI1
RoHS
HDMI1
DISPLAY1
USB 3.0 T: USB3 B: USB4
Top: RJ-45
USB 3.0 T: USB5 B: USB6
Top: RJ-45
Side Spk Out
Center / Front Spk Out
Line In
Mic In
AUDIO1
BUZZER1
CMOS Battery
PCIE7 (x4)
PCIE6 (x16/x8)
PCIE4 (x0/x8)
C226M WS
Intel C226
M2
Dr. Debug
128Mb BIOS

No.	Description
1	ATX 12V Power Connector (ATX12V1)
2	ATX Power Connector (ATXPWR1)
3	2 x 240-pin DDR3 DIMM Slots (DDR3_A2, DDR3_B2, White)
4	2 x 240-pin DDR3 DIMM Slots (DDR3_A1, DDR3_B1, Blue)
5	Power Fan Connector (PWR_FAN1)
6	CPU Fan Connector (CPU_FAN2)
7	CPU Fan Connector (CPU_FAN1)
8	USB 3.0 Header (USB3_3_4)
9	SATA3 Connector (SATA3_0)
10	SATA3 Connector (SATA3_3)
11	SATA3 Connector (SATA3_1)
12	SATA3 Connector (SATA3_4)*
13	SATA3 Connector (SATA3_2)
14	SATA3 Connector (SATA3_5)*
15	SATA Express Connector (SATAE_1)
16	Non Maskable Interrupt Button (NMI_BTN1)
17	Speaker Header (SPEAKER1)
18	System Panel Header (PANEL1)
19	Auxiliary Panel Header (AUX_PANEL1)
20	Chassis Fan Connector (CHA_FAN1)
21	USB 2.0 Header (USB_5_6)
22	Thunderbolt Connector (TB1)
23	TPM Header (TPM1)
24	COM Port Header (COM1)
25	Front Panel Audio Header (HD_AUDIO1)
26	SPDIF Header (SPDIF_OUT1)
27	Thermal Sensor Header (TR1)
28	PCIE Power Connector (PCIE_PWR1)
29	Chassis Fan Connector (CHA_FAN2)

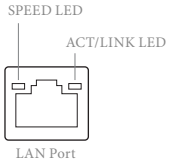
**The M.2 slot shares lanes with SATA3_4 and SATA3_5 ports.*

1.5 I/O Panel



No.	Description	No.	Description
1	PS/2 Mouse/Keyboard Port	8	USB 2.0 Ports (USB_3_4)
2	USB 2.0 Ports (USB_1_2)	9	LAN RJ-45 Port (LAN2)
3	D-Sub Port (VGA1)	10	USB 3.0 Ports (USB3_1_2)
4	DVI-D Port (DVI1)	11	Front Speaker (Lime)
5	Display Port (DP_1)	12	Microphone (Pink)
6	HDMI Port (HDMI1)	13	Line In (Light Blue)
7	LAN RJ-45 Port (LAN1)		

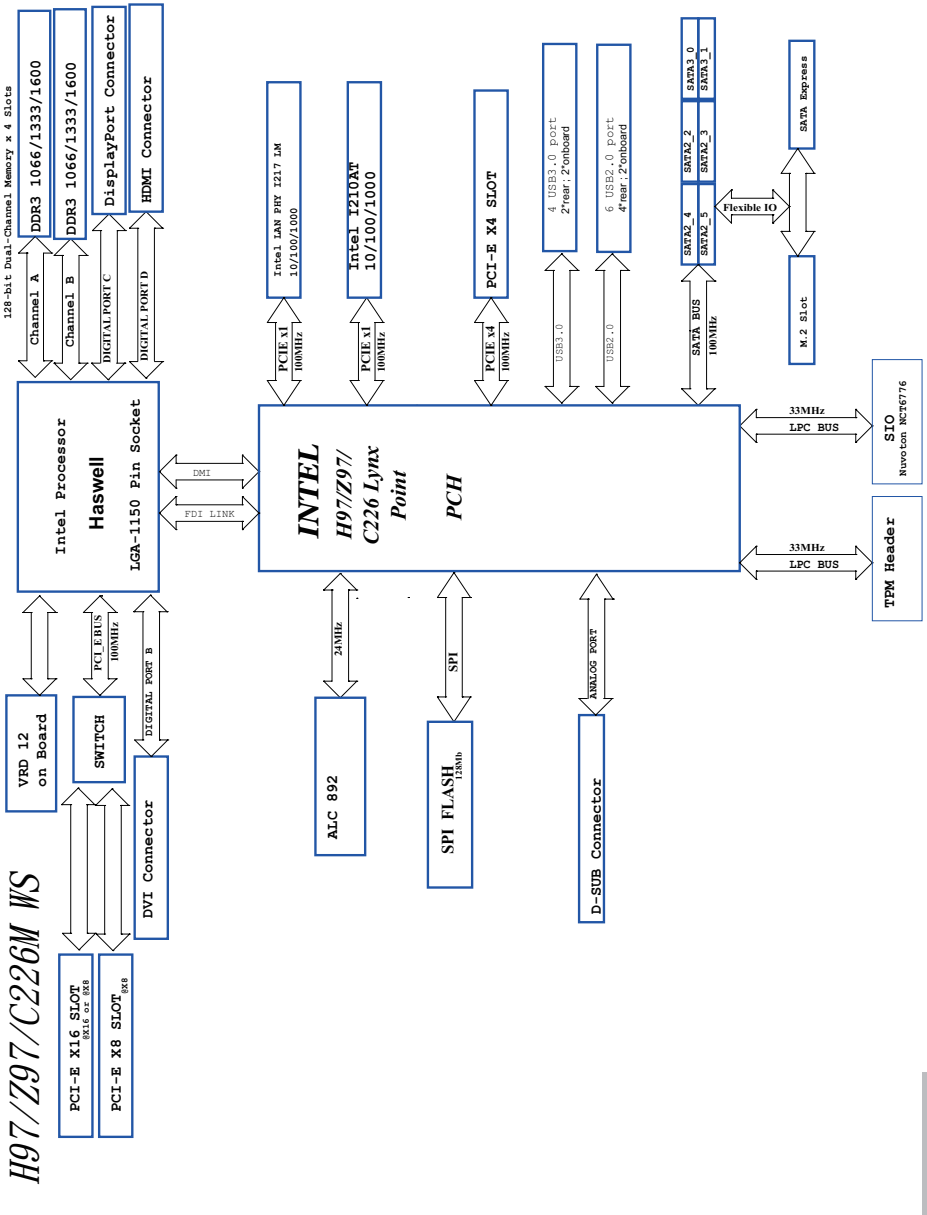
There are two LEDs on each LAN port. Please refer to the table below for the LAN port LED indications.



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

English

1.6 Block Diagram



Chapter 2 Installation

This is a micro ATX form factor (9.6'' x 9.6'', 24.4 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.

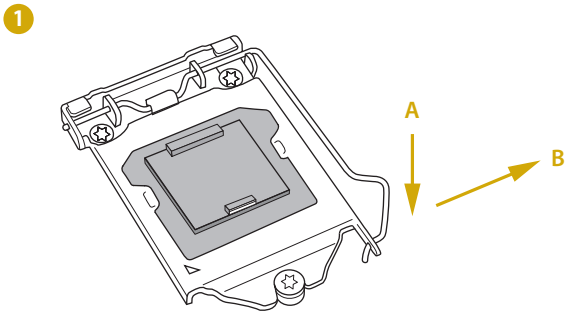
1. Unplug the power cord from the wall socket before touching any components.
2. To avoid damaging the motherboard's components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before 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.

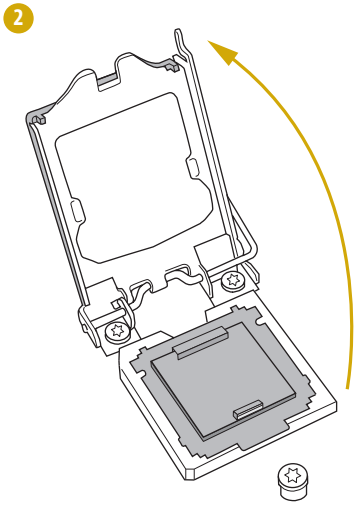
Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

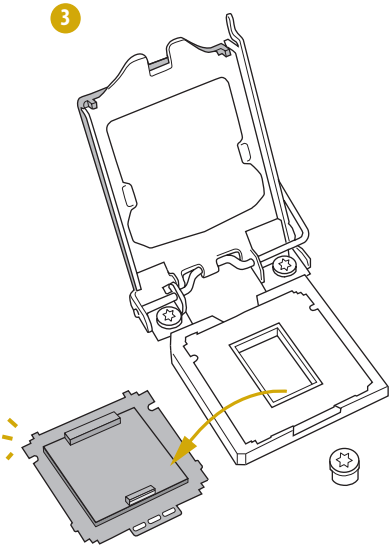
2.3 Installing the CPU

1. *Before you insert the 1150-Pin CPU into the socket, please check if the PnP cap is on the socket, 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.*
2. *Unplug all power cables before installing the CPU.*

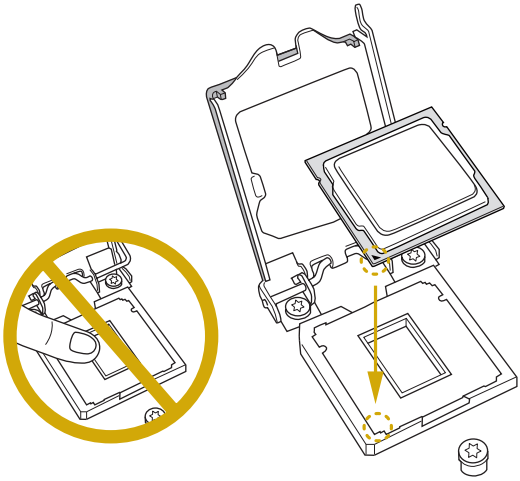
Illustrations in this User Manual are provided for reference only and may slightly differ from actual product appearances.



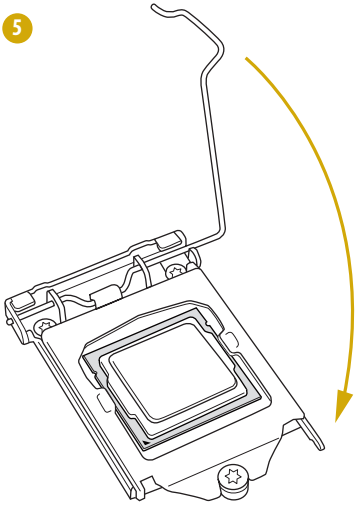




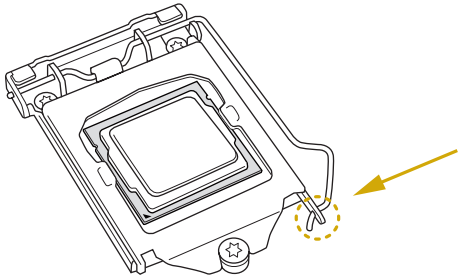
4



5



6

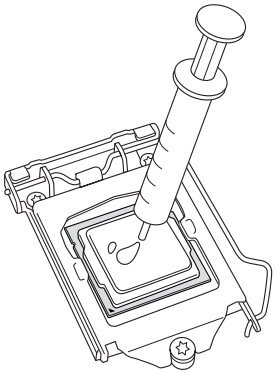


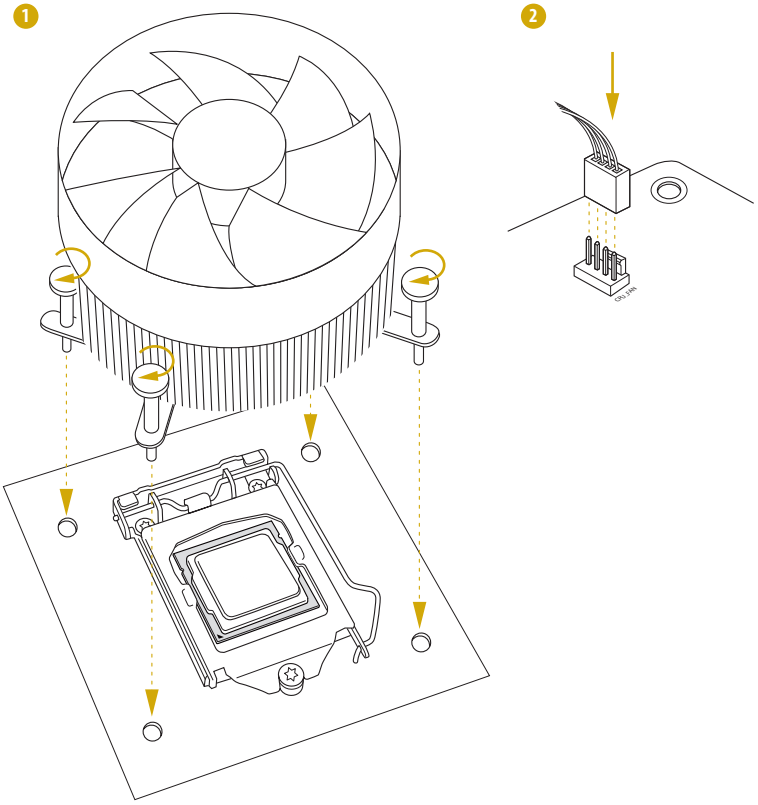
Please save and replace the cover if the processor is removed. The cover must be placed if you wish to return the motherboard for after service.

English

2.4 Installing the CPU Fan and Heatsink

Before you installed the heatsink, you need to spray thermal interface material between the CPU and the heatsink to improve heat dissipation.





2.5 Installation of Memory Modules (DIMM)

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

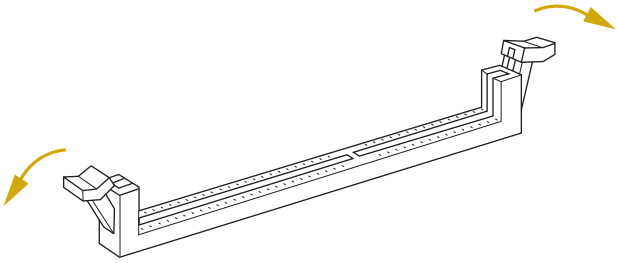
1. *For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR3 DIMM pairs.*
2. *It is unable to activate Dual Channel Memory Technology with only one or three memory module installed.*
3. *It is not allowed to install a DDR or DDR2 memory module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

Dual Channel Memory Configuration

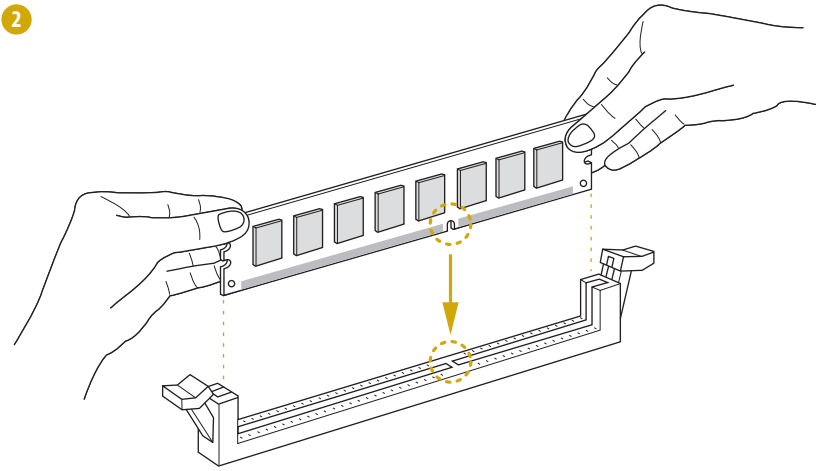
Priority	DDR3_A1	DDR3_A2	DDR3_B1	DDR3_B2
1	Populated		Populated	
2	Populated	Populated	Populated	Populated

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.

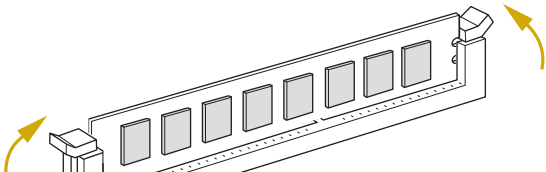
1



2



3



2.6 Expansion Slots (PCI Express Slots)

There are 3 PCI Express slots on Z97M WS / C226M WS motherboard.
There are 2 PCI Express slots on H97M WS motherboard.

PCIE slot:

Z97M WS / C226M WS:

PCIE7 (PCIE 2.0 x4 slot, from Intel® Z97 / C226 chipset) is used for PCI Express x4 lane width graphics cards.
PCIE4 (PCIE 3.0 x8 slot, from CPU) is used for PCI Express x8 lane width graphics cards.
PCIE6 (PCIE 3.0 x16 slot, from CPU) is used for PCI Express x16 lane width graphics cards.

Slot	Generation	Mechanical	Electrical	Source
PCIE 7	2.0	x4	x4	Intel® Z97 / C226 chipset
PCIE 6	3.0	x16	x16	CPU
PCIE 4	3.0	x8	x8	CPU

PCI Express Slot Configuration

	PCIE 6	PCIE 4
Single Graphics Card	x16	
Two Graphics Cards	x8	x8

H97M WS:

PCIE7 (PCIE 2.0 x4 slot, from Intel® H97 chipset) is used for PCI Express x4 lane width graphics cards.
PCIE6 (PCIE 3.0 x16 slot, from CPU) is used for PCI Express x16 lane width graphics cards.

Slot	Generation	Mechnical	Eletrical	Source
PCIE 7	2.0	x4	x4	Intel® H97 chipset
PCIE 6	3.0	x16	x16	CPU

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.

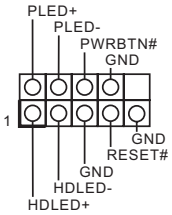
Step 6. Replace the system cover.

2.7 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.

Please see p.6, p.7 or p.8 for the motherboard layout.

System Panel Header
(9-pin PANEL1)
(No. 18)



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.

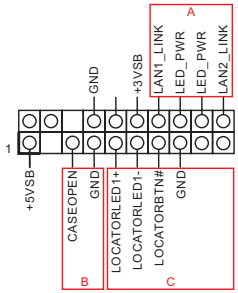
RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

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 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)
(No. 19)



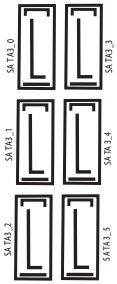
This header supports multiple functions on the front panel, including the front panel SMB, internet status indicator and chassis intrusion pin.

A. 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.

B. 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.

C. Locator LED (4-pin LOCATOR)
This header is for the locator switch and LED on the front panel.

Serial ATA3 Connectors
(SATA3_0)
(No. 9)
(SATA3_1)
(No. 11)
(SATA3_2)
(No. 13)
(SATA3_3)
(No. 10)
(SATA3_4)
(No. 12)
(SATA3_5)
(No. 14)



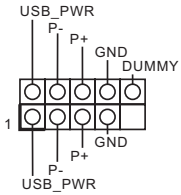
These six SATA3 connectors support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate.

Serial ATA Express Connector
(SATAE_1)
(No. 15)

Please connect either SATA or PCIe storage devices to this connector. The SATA Express connector is shared with the SATA3_4, SATA3_5 and the M.2 Socket.

*The SATA Express interface is a combination of SATAE_1, SATA3_4, and SATA3_5.

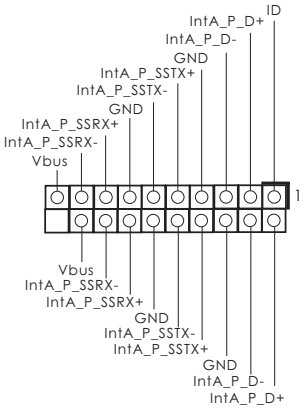
USB 2.0 Header
(9-pin USB_5_6)
(No. 21)



Besides four 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.

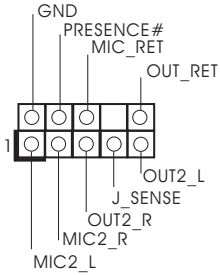
English

USB 3.0 Header
(19-pin USB3_3_4)
(No. 8)



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.

Front Panel Audio Header
(9-pin HD_AUDIO1)
(No. 25)

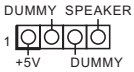
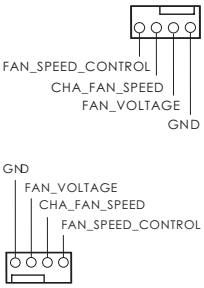
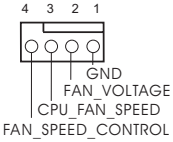


This is an interface for the front panel audio cable that allows convenient connection and control of audio devices.

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.

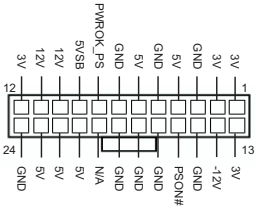
2. If you use AC'97 audio panel, please install it to the front panel audio header as below:

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) (No. 17)		Please connect the chassis speaker to this header.
Chassis and Power Fan Connectors (4-pin CHA_FAN1) (No. 20) (4-pin CHA_FAN2) (No. 29) (4-pin PWR_FAN1) (No. 5)		Please connect fan cables to the fan connectors and match the black wire to the ground pin.
SPDIF Header (2-pin SPDIF_OUT1) (No. 26)		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.
CPU Fan Connectors (4-pin CPU_FAN1) (No. 7) (4-pin CPU_FAN2) (No. 6)		This motherboard provides two 4-Pin CPU fan (Quiet Fan) connectors. If you plan to connect a 3-Pin CPU fan, please connect it to Pin 1-3.

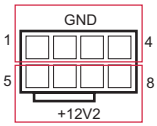
English

ATX Power Connector
(24-pin ATXPWR1)
(No. 2)



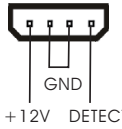
This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13.

ATX 12V Power Connector
(8-pin ATX12V1)
(No. 1)



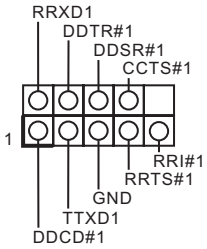
This motherboard provides a 8-pin ATX 12V power connector.

PCIe Power Connector
(4-pin PCIE_PWR1)
(No. 28)



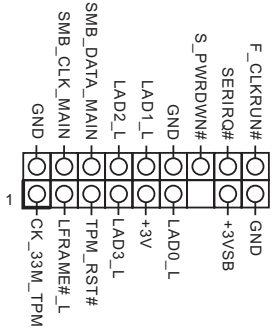
Please connect a 4 pin molex power cable to this connector when more than three graphics cards are installed.

Serial Port Header
(9-pin COM1)
(No. 24)



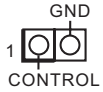
This COM2 header supports a serial port module.

TPM Header
(17-pin TPM1)
(No. 23)



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.

English

Non Maskable Interrupt Button Header (NMI_BTN1) (No. 16)		Please connect a NMI device to this header.
Thunderbolt Connector (5-pin TB1) (No. 22)		Please connect a Thunderbolt™ cable to this connector via the GPIO cable.
Thermal Sensor Header (3-pin TR1) (No. 27)		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.

2.8 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.

2.9 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.

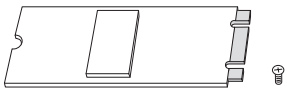
2.10 M.2_SSD (NGFF) Module Installation Guide

The M.2, also known as the Next Generation Form Factor (NGFF), is a small size and versatile card edge connector that aims to replace mPCIe and mSATA. The M.2_SSD (NGFF) Socket 3 can accommodate either a M.2 SATA3 6.0 Gb/s module or a M.2 PCI Express module up to Gen 2 x2 (10 Gb/s). Please be noted that the M.2_SSD (NGFF) Socket 3 is shared with the SATA Express connector; you can only choose either the M.2_SSD (NGFF) Socket 3 or the SATA Express connector to use.

*The M.2_SSD (NGFF) Socket 3 supports SSD drives. Please note that the WiFi or other non-SSD M.2 modules are not supported.

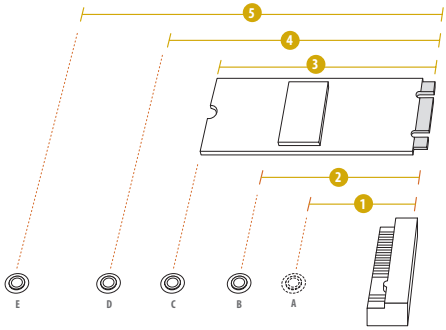
**The M.2 slot is shared with SATA3_4 and SATA3_5 ports.*

Installing the M.2_SSD (NGFF) Module



Step 1

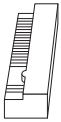
Prepare a M.2_SSD (NGFF) module and the screw.



Step 2

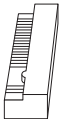
Depending on the PCB type and length of your M.2_SSD (NGFF) module, find the corresponding nut location to be used.

No.	1	2	3	4	5
Nut Location	A	B	C	D	E
PCB Length	3cm	4.2cm	6cm	8cm	11cm
Module Type	Type2230	Type 2242	Type2260	Type 2280	Type 22110



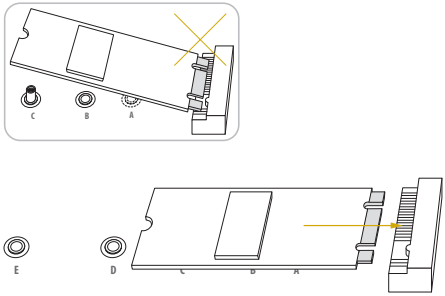
Step 3

Move the standoff based on the module type and length.
The standoff is placed at the nut location D by default. Skip Step 3 and 4 and go straight to Step 5 if you are going to use the default nut. Otherwise, release the standoff by hand.



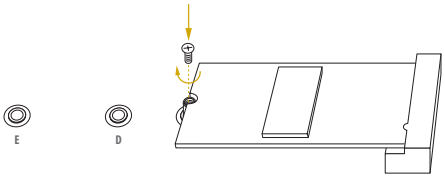
Step 4

Peel off the yellow protective film on the nut to be used. Hand tighten the standoff into the desired nut location on the motherboard.



Step 5

Align and gently insert the M.2 (NGFF) SSD module into the M.2 slot. Please be aware that the M.2 (NGFF) SSD module only fits in one orientation.



Step 6

Tighten the screw with a screwdriver to secure the module into place. Please do not overtighten the screw as this might damage the module.

M.2_SSD (NGFF) Module Support List

PCIe Interface	SATA Interface
Plextor PX-G512M6e	ADATA AXNS381E-128GM-B
Plextor PX-G256M6e	ADATA AXNS381E-256GM-B
SanDisk SD6PP4M-128G	Crucial CT120M500SSD4/120G
SanDisk SD6PP4M-256G	Crucial CT240M500SSD4/240G
Samsung XP941-512G (MZHPU512HCGL)	Intel SSDSCKGW080A401/80G
	Kingston RBU-SM2280S3/120G

For the latest updates of M.2_SSD (NFGG) module support list, please visit our website for details: http://www.asrockrack.com

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 *(only supported for Z97M WS)*
Tool	Useful tools
Advanced	To set up the advanced UEFI features
H/W Monitor	To display current hardware status
Boot	To set up the default system device to locate and load the Operating System
Security	To set up the security features
Event Logs	For event log configuration
Exit	To exit the current screen or the UEFI SETUP UTILITY

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.

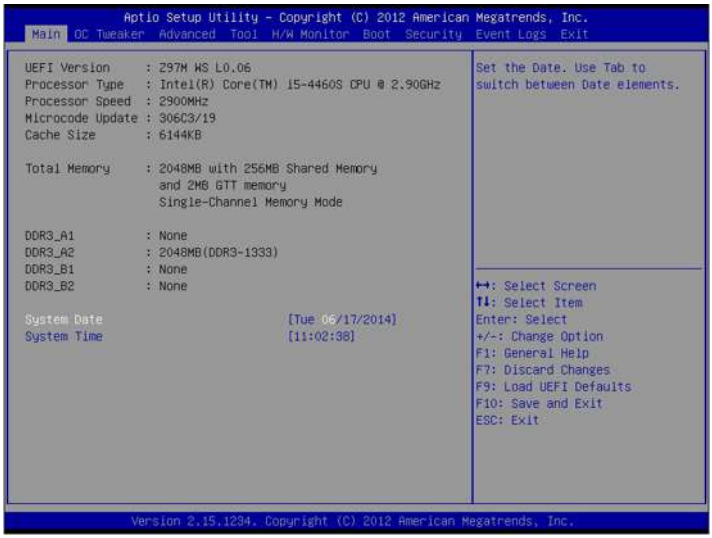
3.1.2 Navigation Keys

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

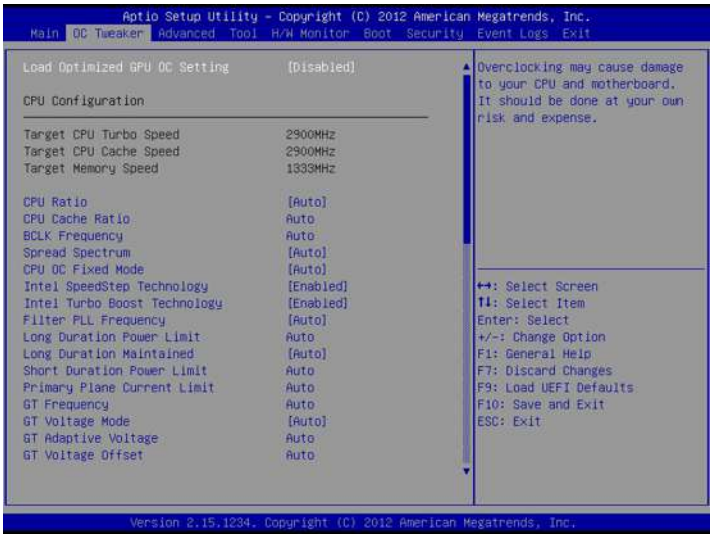
3.2 Main Screen

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 (only for Z97M WS motherboard)

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



Load Optimized GPU OC Setting

You can use this option to load optimized GPU overclocking setting. Please note that overclocking may cause damage to your GPU and motherboard. It should be done at your own risk and expense. This option appears only when you adopt K-Series CPU.

3.3.1 CPU Configuration

CPU Ratio

The CPU speed is determined by the CPU Ratio multiplied with the BCLK. Increasing the CPU Ratio will increase the internal CPU clock speed without affecting the clock speed of other components.

CPU Cache Ratio

The CPU Internal Bus Speed Ratio. The maximum should be the same as the CPU Ratio.

BCLK Frequency

The CPU speed is determined by the CPU Ratio multiplied with the BCLK. Increasing the BCLK will increase the internal CPU clock speed but also affect the clock speed of other components.

Spread Spectrum

Enable Spread Spectrum to reduce electromagnetic interference for passing EMI tests. Disable to achieve higher clock speeds when overclocking.

CPU OC Fixed Mode

CPU OC fix mode allows you to keep the max CPU ratio as your setting without throttling. Please note that overclocking may cause damage to your CPU and motherboard. It should be done at your own risk and expense.

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].

Filter PLL Frequency

CPU BCLK Filter Frequency. Choose 1.6 for better overclocking capabilities.

Long Duration Power Limit

Configure Package Power Limit 1 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

Configure the period of time until the CPU ratio is lowered when the Long Duration Power Limit is exceeded.

Short Duration Power Limit

Configure Package Power Limit 2 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.

Primary Plane Current Limit

Configure the current limit of the CPU under Turbo Mode in ampere. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

GT Frequency

Configure the frequency of the integrated GPU.

GT Voltage Mode

Auto: For optimized settings.

Adaptive: Add voltage to the integrated GPU when the system is under heavy load.

Override: The voltage is fixed.

GT Adaptive Voltage

Configure the fixed voltage added to the integrated GPU.

GT Voltage Offset

Configure the voltage added to the integrated GPU when the system is under heavy load.

3.3.2 DRAM Timing Configuration

Load XMP Setting

Load XMP settings to overclock the DDR3 memory and perform beyond standard specifications.

DRAM Reference Clock

Select Auto for optimized settings.

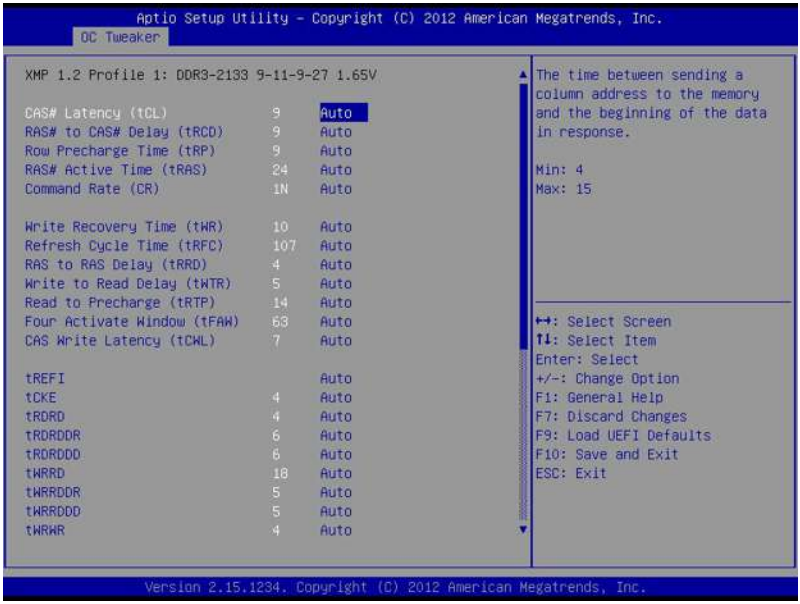
DRAM Frequency

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

DRAM Performance Mode

Choose high performance mode can increase memory performance, but you might lose stability.

DRAM Configuration



CAS# Latency (tCL)

The time between sending a column address to the memory and the beginning of the data in response.

RAS# to CAS# Delay (tRCD)

The number of clock cycles required between the opening of a row of memory and accessing columns within it.

Row Precharge Time (tRP)

The number of clock cycles required between the issuing of the precharge command and opening the next row.

RAS# Active Time (tRAS)

The number of clock cycles required between a bank active command and issuing the precharge command.

Command Rate (CR)

The delay between when a memory chip is selected and when the first active command can be issued.

Write Recovery Time (tWR)

The amount of delay that must elapse after the completion of a valid write operation, before an active bank can be precharged.

Refresh Cycle Time (tRFC)

The number of clocks from a Refresh command until the first Activate command to the same rank.

RAS to RAS Delay (tRRD)

The number of clocks between two rows activated in different banks of the same rank.

Write to Read Delay (tWTR)

The number of clocks between the last valid write operation and the next read command to the same internal bank.

Read to Precharge (tRTP)

The number of clocks that are inserted between a read command to a row pre-charge command to the same rank.

Four Activate Window (tFAW)

The time window in which four activates are allowed the same rank.

CAS Write Latency (tCWL)

Configure CAS Write Latency.

tREFI

Configure refresh cycles at an average periodic interval.

tCKE

Configure the period of time the DDR3 initiates a minimum of one refresh command internally once it enters Self-Refresh mode.

tRDRD

Configure between module read to read delay.

tRDRDDR

Configure between module read to read delay from different ranks.

tRDRDDD

Use this to change DRAM tRWSR Auto/Manual settings. The default is [Auto].

tWRRD

Configure between module write to read delay.

tWRRDDR

Configure between module write to read delay from different ranks.

tWRRDDD

Use this to change DRAM tRRSR Auto/Manual settings. The default is [Auto].

Configure between module write to read delay from different DIMMs.

tWRWR

Configure between module write to write delay.

tWRWRDR

Configure between module write to write delay from different ranks.

tWRWRDD

Configure between module write to write delay from different DIMMs.

tRDWR

Configure between module read to write delay.

tRDWRDR

Configure between module read to write delay from different ranks.

tRDWRDD

Configure between module read to write delay from different DIMMs.

RTL (CHA)

Configure round trip latency for channel A.

RTL (CHB)

Configure round trip latency for channel B.

IO-L (CHA)

Configure IO latency for channel A.

IO-L (CHB)

Configure IO latency for channel B.

ODT WR (CHA)

Configure the memory on die termination resistors' WR for channel A.

ODT WR (CHB)

Configure the memory on die termination resistors' WR for channel B.

ODT NOM (CHA)

Use this to change ODT (CHA) Auto/Manual settings. The default is [Auto].

ODT NOM (CHB)

Use this to change ODT (CHB) Auto/Manual settings. The default is [Auto].

Command Tri State

Enable for DRAM power saving.

MRC Fast Boot

Enable Memory Fast Boot to skip DRAM memory training for booting faster.

DIMM Exit Mode

Select Slow Exit to reduce power consumption, or Fast Exit for better performance.

3.3.3 FIVR Configuration

FIVR Switch Frequency Signature

Select whether to boost or lower the FIVR Switch Frequency.

FIVR Switch Frequency Offset

Configure the percentage of frequency boost or deduction.

Vcore Override Voltage

Configure the voltage added to the Vcore when the system is under heavy load.

Vcore Voltage Additional Offset

Configure the dynamic Vcore voltage added to the Vcore.

CPU Cache Override Voltage

Add voltage to the CPU Cache when the system is under heavy load.

CPU Cache Voltage Offset

Configure the voltage for the CPU Cache. Setting the voltage higher may increase system stability when overclocking.

System Agent Voltage Offset

Configure the voltage for the System Agent. Setting the voltage higher may increase system stability when overclocking.

CPU Analog IO Voltage Offset

CPU I/O Analog Voltage.

CPU Digital IO Voltage Offset

CPU I/O Digital Voltage.

CPU Integrated VR Faults

Disable FIVR Faults to raise the threshold to trigger CPU over current protection and over voltage protection for better overclocking capabilities.

CPU Integrated VR Efficiency Mode

Enable FIVR Efficiency Management for power saving. Disable for better performance and overclocking capabilities.

3.3.4 Voltage Configuration

Power Saving Mode

Enable Power Saving Mode to reduce power consumption.

CPU Input Voltage

Configure the voltage for the CPU.

CPU Load-Line Calibration

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

DRAM Voltage

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

PCH 1.05V Voltage

Chipset 1.05V Voltage. Use default settings for best performance.

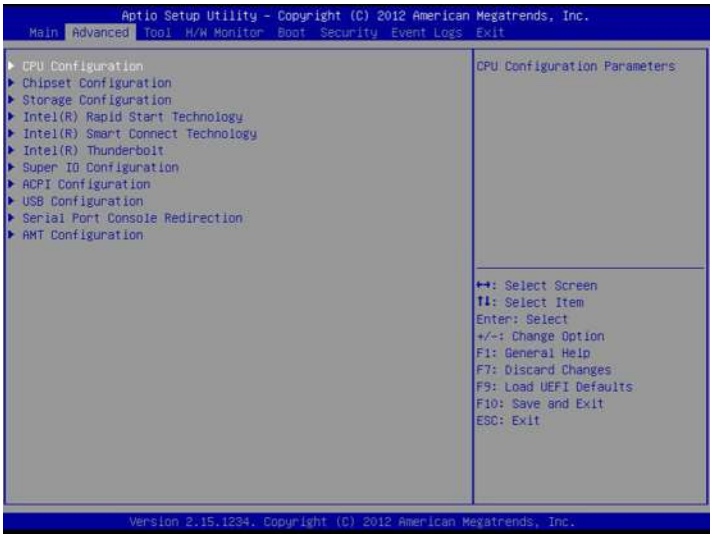
PCH 1.5V Voltage

I/O 1.5V Voltage. Use default settings for best performance.

3.4 Advanced Screen

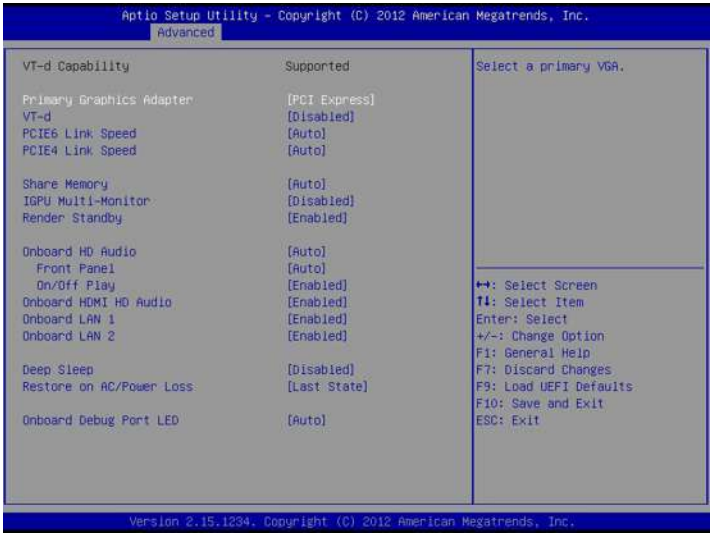
In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Storage Configuration, Intel(R) Rapid Start Technology, Intel(R) Smart Connect Technology, Intel(R) Thunderbolt, Super IO Configuration, ACPI Configuration, USB Configuration, Serial Port Console Redirection, and AMT Configuration*.

**AMT Configuration is only supported for C226M WS motherboard*



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

3.4.1 CPU Configuration



Active Processor Cores

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

CPU C States Support

Enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

Enhanced Halt State (C1E)

Enable Enhanced Halt State (C1E) for lower power consumption.

CPU C3 State Support

Enable C3 sleep state for lower power consumption.

CPU C6 State Support

Enable C6 deep sleep state for lower power consumption.

CPU C7 State Support

Enable C7 deep sleep state for lower power consumption.

CPU Thermal Throttling

Enable CPU internal thermal control mechanisms to keep the CPU from overheating.

No-Execute Memory Protection

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

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.

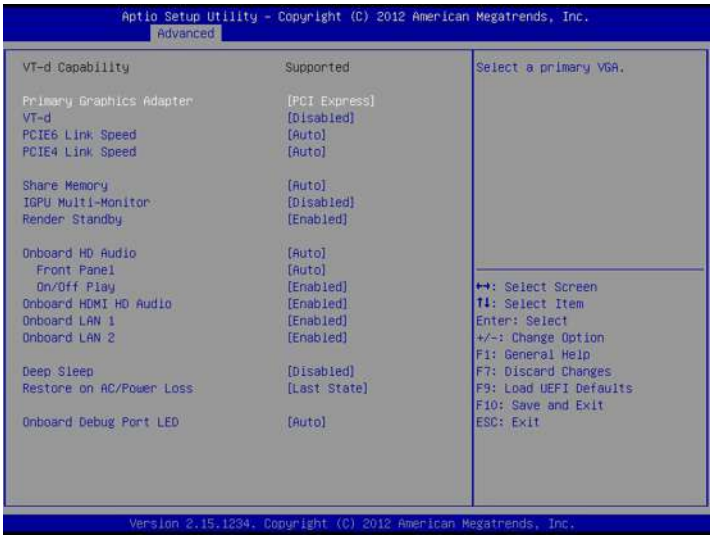
Hardware Prefetcher

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.

3.4.2 Chipset Configuration



Primary Graphics Adapter

Select a primary VGA.

VT-d

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

PCIE6 Link Speed

Select the link speed for PCIE6.

PCIE4 Link Speed *(not supported for H97M WS)*

Select the link speed for PCIE4.

Share Memory

Configure the size of memory that is allocated to the integrated graphics processor when the system boots up.

IGPU Multi-Monitor

Select disable to disable the integrated graphics when an external graphics card is installed. Select enable to keep the integrated graphics enabled at all times.

Render Standby

Power down the render unit when the GPU is idle for lower power consumption.

Onboard HD Audio

Enable/disable onboard HD audio. Set to Auto to enable onboard HD audio and automatically disable it when a sound card is installed.

Front Panel

Enable/disable front panel HD audio.

On/Off Play

With On/Off Play users can connect their portable audio devices, such as an MP3 player or a mobile phone to the PC and listen to music through the computer's speakers even when the computer is turned off.

Onboard HDMI HD Audio

Enable audio for the onboard digital outputs.

Onboard LAN 1

Enable or disable the onboard network interface controller.

Onboard LAN 2

Enable or disable the onboard network interface controller.

Deep Sleep

Configure deep sleep mode for power saving when the computer is shut down.

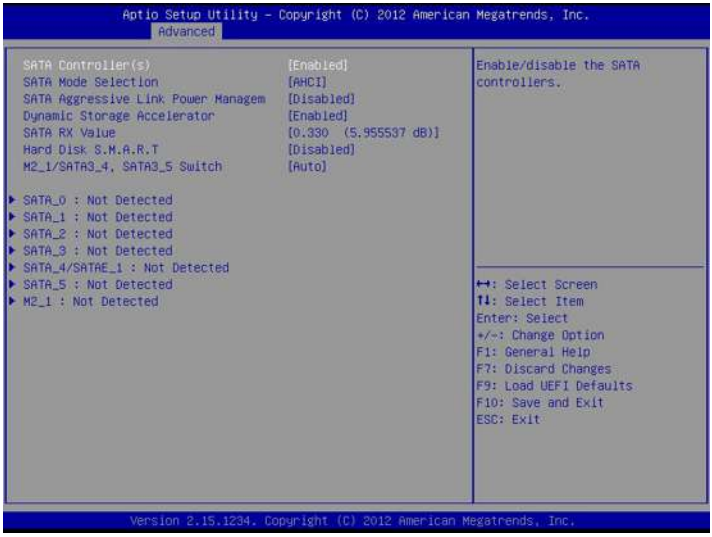
Restore on AC/Power Loss

Select the power state after a power failure. If [Power Off] is selected, the power will remain off when the power recovers. If [Power On] is selected, the system will start to boot up when the power recovers.

Good Night LED

By enabling Good Night LED, the Power/HDD LEDs will be switched off when the system is on. It will also automatically switch off the Power and Keyboard LEDs when the system enters into Standby/Hibernation mode.

3.4.3 Storage Configuration



SATA Controller(s)

Enable/disable the SATA controllers.

SATA Mode Selection

IDE: For better compatibility.

AHCI: Supports new features that improve performance.

RAID: Combine multiple disk drives into a logical unit.

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

SATA Aggressive Link Power Management allows SATA devices to enter a low power state during periods of inactivity to save power. It is only supported by AHCI mode.

Dynamic Storage Accelerator

Keep this option enabled for higher HDD and SDD I/O performance, lower latency and increased system responsiveness.

SATA RX Value

Use this to select a different value if the SATA port has HDD compatibility issue.

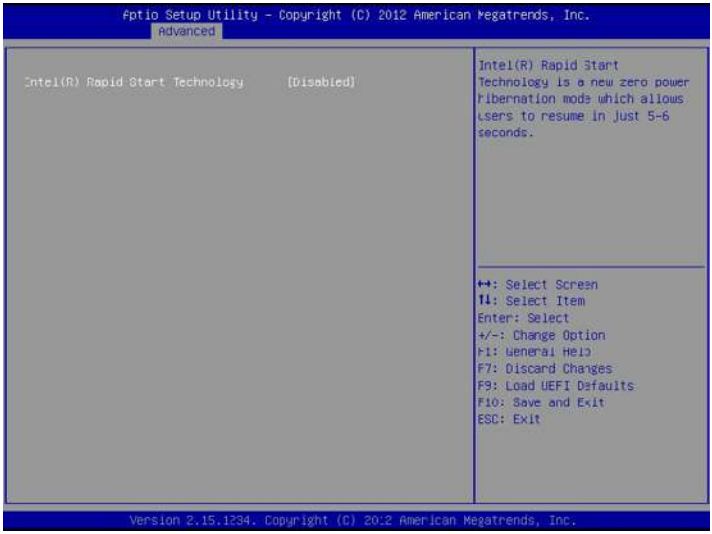
Hard Disk S.M.A.R.T.

S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability.

M2_1/SATA3_4, SATA3_5 Switch

Auto: M2/SATA3_4, SATA3_5 auto switch
Force_SATA: Switch to SATA3_4, SATA3_5
Force_M2_1: Switch to M2_1

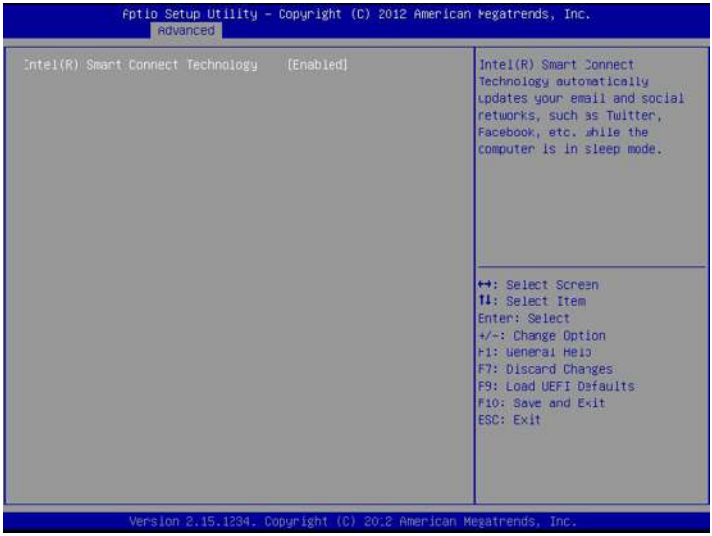
3.4.4 Intel® Rapid Start Technology



Intel® Rapid Start Technology

Intel® Rapid Start Technology is a new zero power hibernation mode which allows users to resume in just 5-6 seconds.

3.4.5 Intel® Smart Connect Technology



Intel® Smart Connect Technology

Intel® Smart Connect Technology automatically updates your email and social networks, such as Twitter, Facebook, etc. while the computer is in sleep mode.

3.4.6 Intel® Thunderbolt

Intel® Thunderbolt Technology

Enable or disable the Intel® Thunderbolt™ function.

Security Level

Select Legacy to skip the Windows certification checking process for Thunderbolt™ devices. Select Unique ID for checking the Windows certification, and show warning messages if the devices aren't certified. Or select DP++ to support DP 1.2.

Ignore Thunderbolt™ Option Rom

Enable to skip Thunderbolt™ Option ROM during POST for faster boot speed.

TBT Device IO resource Support

Enable IO Resource Support if your older Thunderbolt devices have trouble working properly.

Thunderbolt™ PCIe Cache-line Size

Configure the cache-line size of the Thunderbolt PCIe subtree.

3.4.7 Super IO Configuration

PS2 Y-Cable

Enable the PS2 Y-Cable or set this option to Auto.

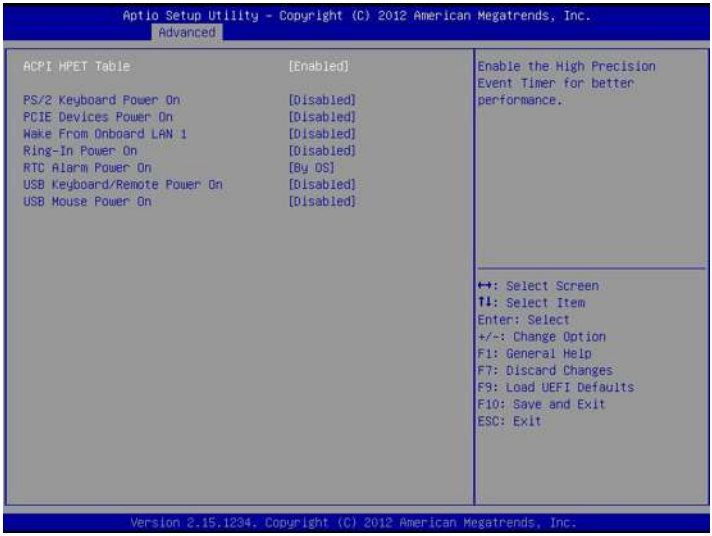
Serial Port

Enable or disable the Serial port.

Serial Port Address

Select the address of the Serial port.

3.4.8 ACPI Configuration



ACPI HPET Table

Enable the High Precision Event Timer for better performance and to pass WHQL tests.

PS/2 Keyboard Power On

Allow the system to be waked up by a PS/2 Keyboard.

PCIE Devices Power On

Allow the system to be waked up by a PCIE device and enable wake on LAN.

Ring-In Power On

Allow the system to be waked up by onboard COM port modem Ring-In signals.

RTC Alarm Power On

Allow the system to be waked up by the real time clock alarm. Set it to By OS to let it be handled by your operating system.

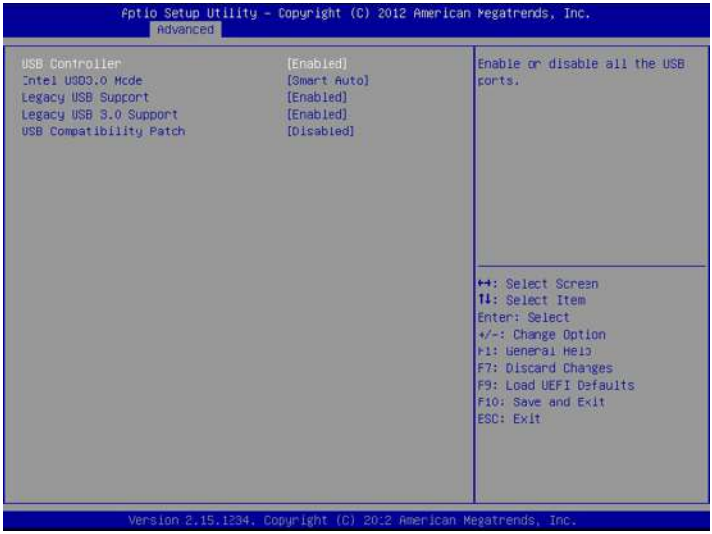
USB Keyboard/Remote Power On

Allow the system to be waked up by an USB keyboard or remote controller.

USB Mouse Power On

Allow the system to be waked up by an USB mouse.

3.4.9 USB Configuration



USB Controller

Enable or disable all the USB ports.

Intel USB 3.0 Mode

Select Intel® USB 3.0 controller mode. Set [Smart Auto] to keep the USB 3.0 driver enabled after rebooting (USB 3.0 is enabled in BIOS). Set [Auto] to automatically enable the USB 3.0 driver after entering the OS (USB 3.0 is disabled in BIOS). Set [Enabled] to keep the USB 3.0 driver enabled (Must install driver to use USB devices under Windows® 7). Set [Disabled] to disable the USB 3.0 ports.

Legacy USB Support

Enable or disable Legacy OS Support for USB 2.0 devices. If you encounter USB compatibility issues it is recommended to disable legacy USB support. Select UEFI Setup Only to support USB devices under the UEFI setup and Windows/Linux operating systems only.

Legacy USB 3.0 Support

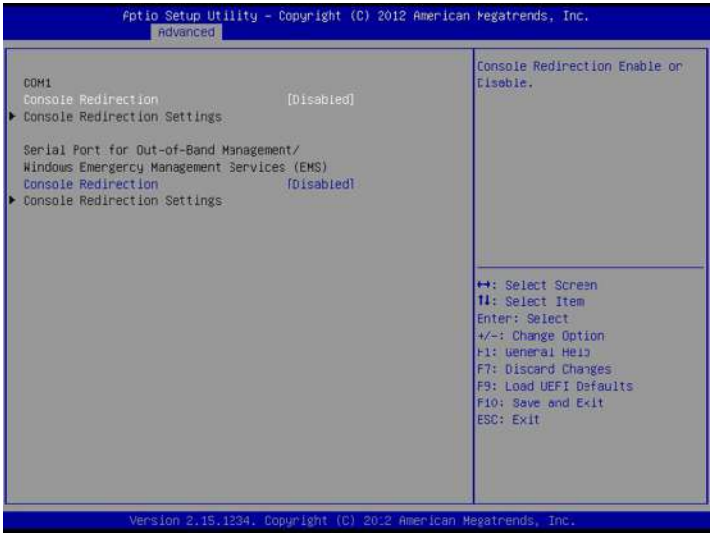
Enable or disable Legacy OS Support for USB 3.0 devices. If you encounter USB compatibility issues it is recommended to disable legacy USB support. Select UEFI

Setup Only to support USB devices under the UEFI setup and Windows/Linux operating systems only.

USB Compatibility Patch

If your USB devices (i.e. USB mouse or storage) encounter compatibility problems,please enable this option to fix it. Please note that after enabling this option, it is normal that the system will postpone booting up after pressing the power button.

3.4.10 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.

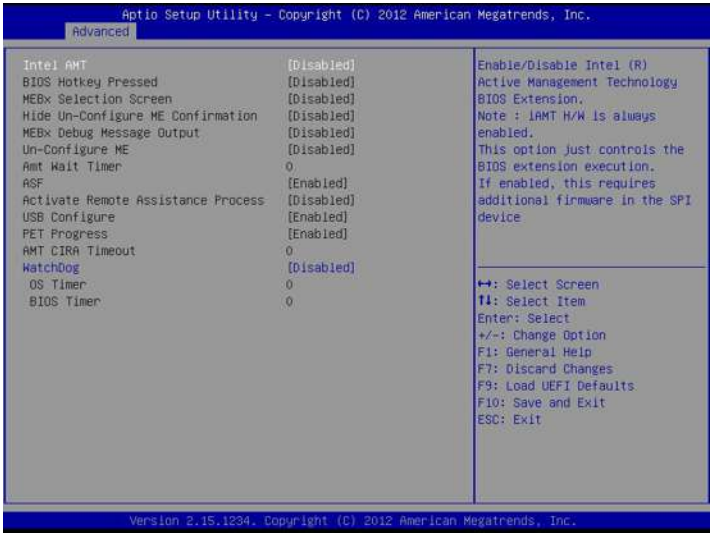
Resolution 100x31
Use this item to enable or disable extended terminal resolution support.

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].

3.4.11 AMT Configuration (only supported for C226M WS motherboard)



Intel AMT

Use this option to enable or disable Intel(R) Active Management Technology BIOS Extension. Please be noted that the iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.

BIOS Hotkey Pressed

OEMFLag Bit 1: Enable or disable BIOS hotkey press.

MEBx Selection Screen

OEMFLag Bit 2: Enable or disable MEBx selection screen.

Hide Un-Configure ME Confirmation

OEMFLag Bit 6: Hide Un-Configure ME without password Confirmation Prompt.

MEBx Debug Message Output

OEMFLag Bit 14: Enable MEBx debug message output.

Un-Configure ME

OEMFLag Bit 15: Un-Configure ME without password.

Amt Wait Timer

Use this item to set timer to wait before sending ASF_GET_BOOT_OPTIONS.

ASF

Use this item to enable or disable Alert Specification Format.

Acticate Remote Assistance Process

Use this item to trigger CIRA boot.

USB Configure

Use this item to enable or disable USB Configure function.

PET Progress

User can enable or disable PET Events progress to receive PET events or not.

AMT CIRA Timeout

OEM defined timeout for MPS connection to be established.

WatchDog

Use this item to enable or disable WatchDog function.

OS Timer

Use this item to set OS watchdog timer.

BIOS Timer

Use this item to set BIOS watchdog timer.

3.5 Tools

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.

Save 1st User Default

Type the Name and press [Enter] to save the changes as User Default.

Save 2nd User Default

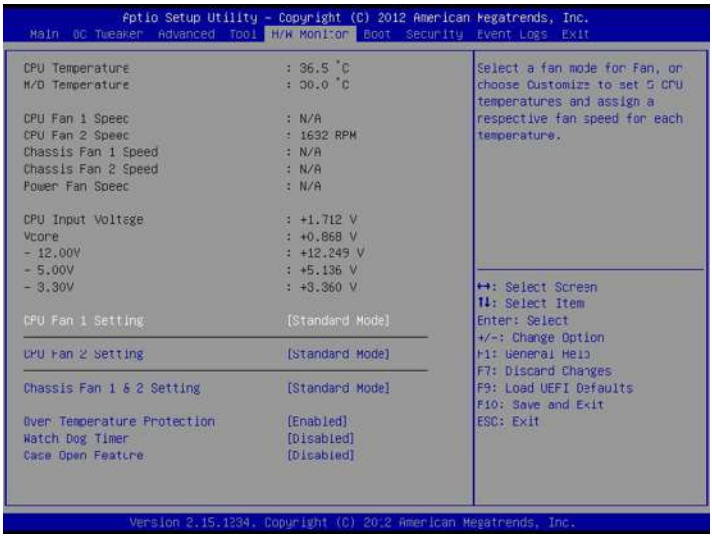
Type the Name and press [Enter] to save the changes as User Default.

Save 3rd User Default

Type the Name and press [Enter] to save the changes as User Default.

3.6 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 Setting

Use this to select a fan mode for Fan, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

CPU FAN 2 Setting

Use this to select a fan mode for Fan, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

Chassis FAN 1 & 2 Setting

Use this to select a fan mode for Fan, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

Over Temperature Protection

When Over Temperature Protection is enabled, the system automatically shuts down when the motherboard is overheated.

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].

3.7 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.

Boot Option #2

Use this item to set the system boot order.

USB Device BBS Priorities

Set the boot priorities for USB devices.

Fast Boot

Fast Boot minimizes your computer's boot time. Please note that Ultra Fast mode is only supported by Windows 8.1/8 and the VBIOS must support UEFI GOP if you are using an external graphics card.

Boot From Onboard LAN

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

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.

Boot Beep

Select whether the Boot Beep should be turned on or off when the system boots up. Please note that a buzzer is needed.

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].

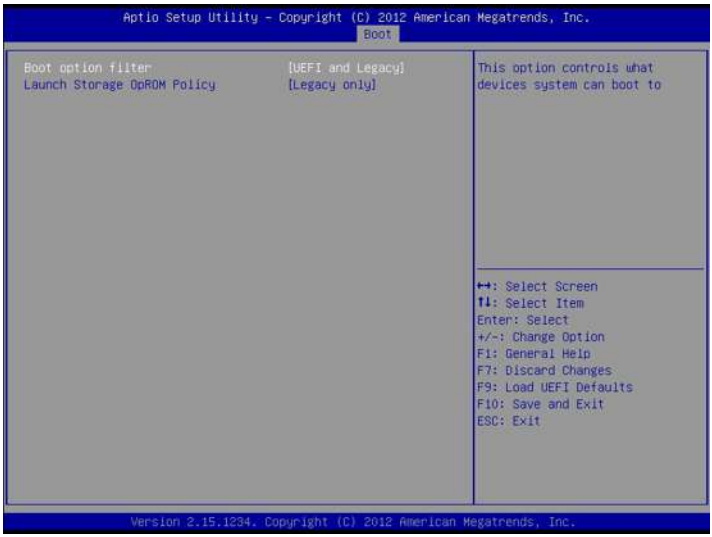
Boot Failure Guard

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.

CSM (Compatibility Support Module)



Boot option filter

This option controls what devices sytem can boot to.

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. Do not launch?

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.

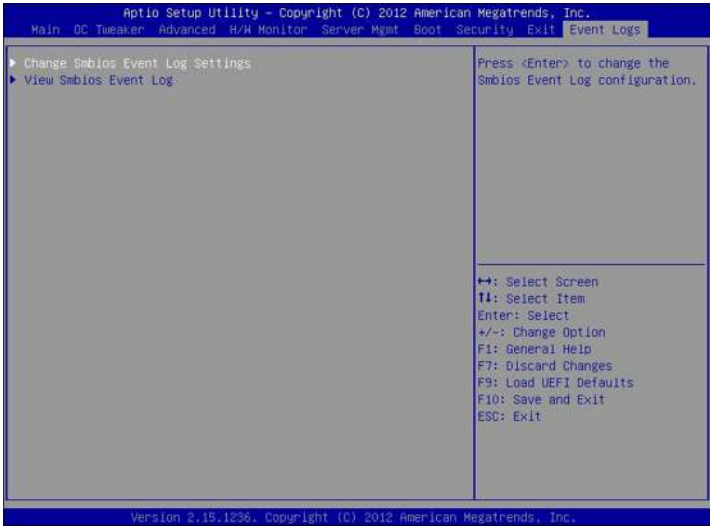
User Password

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.

Secure Boot

Use this to enable or disable Secure Boot.

3.9 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.

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 BMC network parameters statically or dynamically(by BIOS or BMC). Configuration options: [Unspecified], [Static] or [Dynamic].

Unspecified: BMC network parameters is configured by BMC itself.
Static: Manually enter the IP Address, Subnet Mask and Gateway Address in the BIOS for BMC LAN channel configuration.
Dynamic: IP address, Subnet Mask and Gateway Address are automatically assigned by the network's DHCP server.

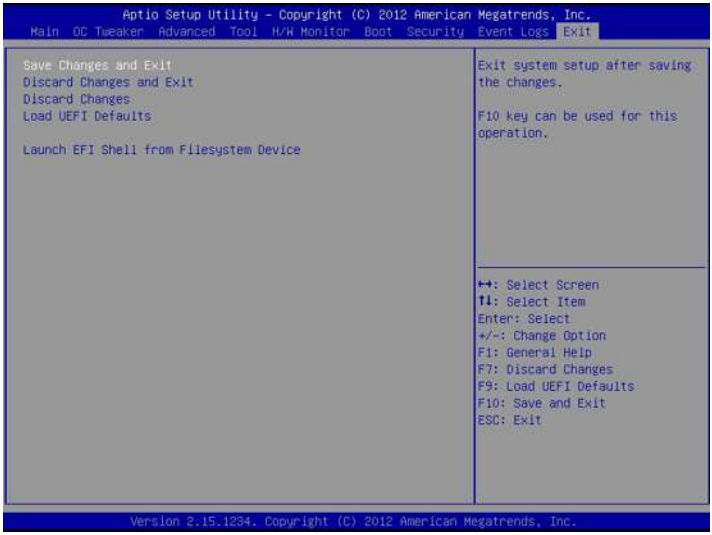
To configure BMC network parameters using the BIOS setup, select either [Static] or [Dynamic] option.
To configure BMC network parameters using the BMC web interface, select [Unspecified] option.

When [Dynamic] or [Static] is selected, do NOT modify the BMC network settings on the IPMI web page.

BMC Mac Backup Tool

Use this to restore BMC Mac from the backup.

3.10 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.

Chapter 4 Software Support

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® 7 / 8 / 8.1 / 10 / 2012 R2 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.

**Please download the Intel® SATA Floppy Image driver from the ASRock Rack's website (www.asrockrack.com) to your USB drive or simply install the SATA driver from the Support CD while installing OS in SATA RAID mode.*

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 ASRock Rack or want to know more about ASRock Rack, welcome to visit ASRock Rack'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 ASRock Rack's FAQ page: http://www.asrockrack.com/support

5.2 Technical Support Procedures

If you have tried the troubleshooting procedures mentioned above and the problems are still unsolved, please contact ASRock Rack'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 ASRock Rack's technical support at:
http://www.asrockrack.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://event.asrockrack.com/tsd.asp) 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.