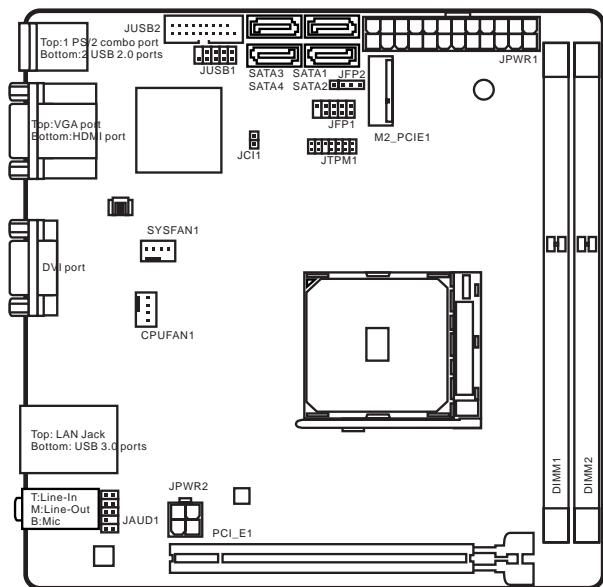




Thank you for choosing the A68HI AC/ A68HI Series (MS-7969 v1.X) Mini-ITX [motherboard](#). The A68HI AC/ A68HI Series motherboards are based on AMD A68H chipset for optimal system efficiency. Designed to fit the advanced AMD FM2+/ FM2 processor, the A68HI AC/ A68HI Series motherboards deliver a high performance and professional desktop platform solution.

Layout



Motherboard Specifications

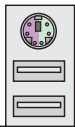
CPU Support	<ul style="list-style-type: none">■ AMD Socket FM2+ A-Series/Athlon™ Processors* <p>* Also supports FM2 A-Series/Athlon™ Processors</p>
Chipset	<ul style="list-style-type: none">■ AMD A68H
Memory Support	<ul style="list-style-type: none">■ 2x DDR3 memory slots support up to 32GB■ Supports DDR3 2133/ 1866/ 1600/ 1333 MHz■ Dual channel memory architecture■ Supports non-ECC, un-buffered memory■ Supports AMD Memory Profile (AMP)■ Supports Extreme Memory Profile (XMP)
Expansion Slots	<ul style="list-style-type: none">■ 1x PCIe 3.0 x16 slot*■ 1x M.2 slot (Key E, type 2230)<ul style="list-style-type: none">- Supports both PCIe (Wi-Fi module**) or USB (Bluetooth module) interface. <p>* Only FM2+ processors can support PCIe 3.0 ** M.2 port does not support Wake-On-WLAN function.</p>
Graphics	<ul style="list-style-type: none">■ 1x VGA port, supporting a maximum resolution of 1920x1200 @ 60Hz, 24bpp■ 1x DVI-D port, supporting a maximum resolution of 2560x1600@60Hz, 24bpp/ 1920x1200 @ 60Hz, 24bpp■ 1x HDMI port, supporting a maximum resolution of 4096x2160@24Hz, 36bpp*/ 3840x2160@30Hz, 36bpp*/ 1920x1200@120Hz, 36bpp and 1920x1200@60Hz, 36bpp <p>* Only be supported when using an FM2+ processors</p>
Storage	<ul style="list-style-type: none">■ AMD A68H Chipset<ul style="list-style-type: none">- 4x SATA 6Gb/s ports- Supports RAID 0, RAID1 and RAID 10
USB	<ul style="list-style-type: none">■ AMD A68H Chipset<ul style="list-style-type: none">- 2x USB 3.0 ports available through the internal USB 3.0 connector- 4x USB 2.0 ports (2 ports on the back panel, 2 ports available through the internal USB 2.0 connectors)■ VIA VL806 Chipset<ul style="list-style-type: none">- 2x USB 3.0 ports on the back panel- Rear USB 3.0 ports do not support the function of M-flash Recovery
Audio	<ul style="list-style-type: none">■ Realtek® ALC887 Codec<ul style="list-style-type: none">- 7.1-Channel High Definition Audio

LAN	<ul style="list-style-type: none"> ■ Realtek® RTL8111G Gigabit LAN controller
WLAN & Bluetooth	<ul style="list-style-type: none"> ■ Wi-Fi/Bluetooth expansion module with Intel Dual Band Wireless-AC 7260 chip*. <ul style="list-style-type: none"> - Supports Wi-Fi 802.11 a/b/g/n/ac, dual band (2.4GHz, 5GHz) up to 867 Mbps speed. - Supports Intel Wireless Display (WiDi) - Supports Bluetooth v4.0 (includes BLE** and Bluetooth 3.0+HS) <p>* Only A68HI AC has a Wi-Fi/ Bluetooth module pre-installed. ** BLE: Bluetooth Low Energy</p>
Back Panel Connectors	<ul style="list-style-type: none"> ■ 1x PS/2 keyboard/ mouse combo port ■ 2x USB 2.0 ports ■ 2x USB 3.0 ports ■ 1x VGA port ■ 1x DVI-D port ■ 1x HDMI port ■ 1x LAN (RJ45) port ■ 3x audio jacks
Internal Connectors	<ul style="list-style-type: none"> ■ 1x 24-pin ATX main power connector ■ 1x 4-pin ATX 12V power connector ■ 4x SATA 6Gb/s connectors ■ 1x USB 2.0 connector (supports additional 2 USB 2.0 ports) ■ 1x USB 3.0 connector (supports additional 2 USB 3.0 ports) ■ 1x 4-pin CPU fan connector ■ 1x 4-pin system fan connector ■ 1x Front panel audio connector ■ 2x Front panel connectors ■ 1x Chassis Intrusion connector ■ 1x TPM module connector ■ 1x Clear CMOS jumper
BIOS Features	<ul style="list-style-type: none"> ■ 64 Mb flash ■ UEFI AMI BIOS ■ ACPI 5.0, PnP 1.0a, SM BIOS 2.7, DMI 2.0 ■ Multi-language
Form Factor	<ul style="list-style-type: none"> ■ Mini-ITX Form Factor ■ 6.7 in. x 6.7 in. (17 cm x 17 cm)

Back Panel

A68HI AC

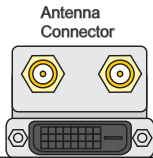
PS/2 Mouse/ Keyboard



USB 2.0



HDMI

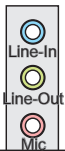


DVI-D

LAN



USB 3.0



Line-In
Line-Out
Mic

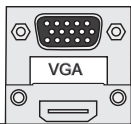
HDMI[™]
HIGH-DEFINITION MULTIMEDIA INTERFACE

A68HI

PS/2 Mouse/ Keyboard



USB 2.0



HDMI

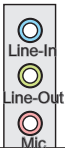


DVI-D

LAN



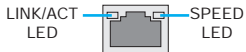
USB 3.0



Line-In
Line-Out
Mic

HDMI[™]
HIGH-DEFINITION MULTIMEDIA INTERFACE

LAN LED Indicator

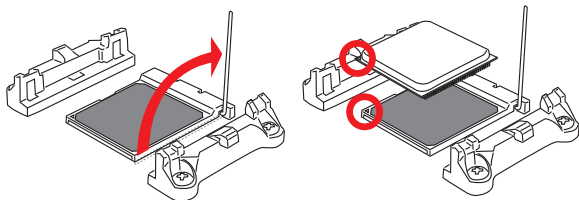


LED	LED Status	Description
Link/ Activity LED	Off	No link
	Yellow	Linked
	Blinking	Data activity
Speed LED	Off	10 Mbps connection
	Green	100 Mbps connection
	Orange	1 Gbps connection

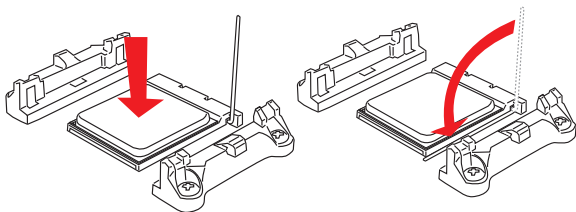
APU & Heatsink Installation

When installing a APU, always remember to install a APU heatsink. An APU heatsink is necessary to prevent overheating and maintain system stability. Follow the steps below to ensure correct APU and heatsink installation. Wrong installation can damage both the APU and the motherboard.

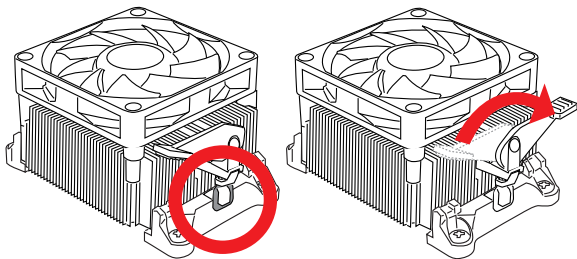
1. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90-degree angle.
2. Look for the gold arrow on the APU. The gold arrow should point as shown in the picture. The APU can only fit in the correct orientation.



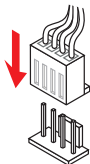
3. If the APU is correctly installed, the pins should be completely embedded into the socket and can not be seen. Please note that any violation of the correct installation procedures may cause permanent damages to your motherboard.
4. Press the APU down firmly into the socket and close the lever. As the APU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the APU to make sure the APU is properly and completely embedded into the socket.



5. Locate the APU fan connector on the motherboard.
6. Position the cooling set onto the retention mechanism. Hook one end of the clip to hook first.
7. Then press down the other end of the clip to fasten the cooling set on the top of the retention mechanism. Locate the Fix Lever and lift up it.
8. Fasten down the lever.



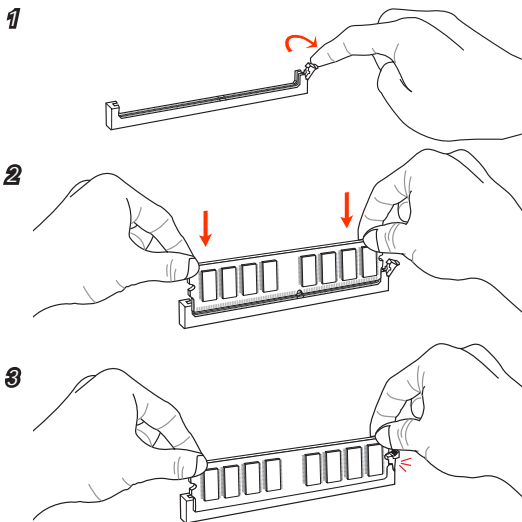
9. Attach the APU Fan cable to the APU fan connector on the motherboard.



Important

- While disconnecting the Safety Hook from the fixed bolt, it is necessary to keep an eye on your fingers, because once the Safety Hook is disconnected from the fixed bolt, the fixed lever will spring back instantly.
- Confirm that the APU cooler has formed a tight seal with the APU before booting your system.
- Please refer to the documentation in the APU cooler package for more details about APU cooler installation.

Memory Installation



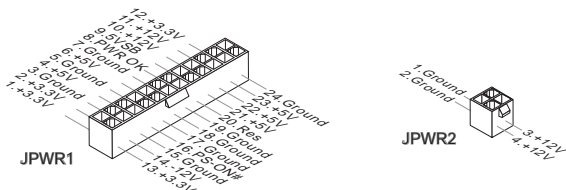
Important

- *DDR3 memory modules are not interchangeable with DDR2, and the DDR3 standard is not backward compatible. Always install DDR3 memory modules in DDR3 DIMM slots.*
- *To ensure system stability, memory modules must be of the same type and density in Dual-Channel mode.*

Internal Connectors

JPWR1~2: ATX Power Connectors

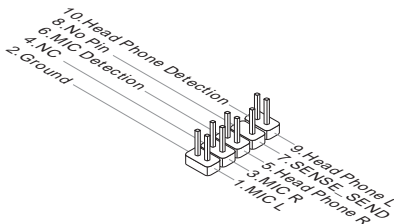
These connectors allow you to connect an ATX power supply. To connect the ATX power supply, align the power supply cable with the connector and firmly press the cable into the connector. If done correctly, the clip on the power cable should be hooked on the motherboard's power connector.



Make sure that all the power cables are securely connected to a proper ATX power supply to ensure stable operation of the motherboard.

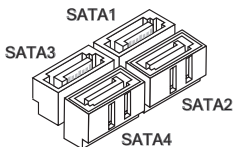
JAUD1: Front Panel Audio Connector

This connector allows you to connect the front audio panel located on your computer case.



SATA1~4: SATA Connectors

This connector is a high-speed SATA interface port. Each connector can connect to one SATA device. SATA devices include disk drives (HDD), solid state drives (SSD), and optical drives (CD/ DVD/ Blu-Ray).



SATA1~4 (6Gb/s, by AMD A68H)

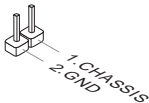


Important

- Many SATA devices also need a power cable from the power supply. Such devices include disk drives (HDD), solid state drives (SSD), and optical drives (CD / DVD / Blu-Ray). Please refer to the device's manual for further information.
- Many computer cases also require that large SATA devices, such as HDDs, SSDs, and optical drives, be screwed down into the case. Refer to the manual that came with your computer case or your SATA device for further installation instructions.
- Please do not fold the SATA cable at a 90-degree angle. Data loss may result during transmission otherwise.
- SATA cables have identical plugs on either sides of the cable. However, it is recommended that the flat connector be connected to the motherboard for space saving purposes.

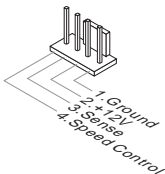
JCI1: Chassis Intrusion Connector

This connector connects to the chassis intrusion switch cable. If the computer case is opened, the chassis intrusion mechanism will be activated. The system will record this intrusion and a warning message will flash on screen. To clear the warning, you must enter the BIOS utility and clear the record.



CPUFAN1, SYSFAN1: Fan Power Connectors

The fan power connectors support system cooling fans with +12V. If the motherboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with a speed sensor to take advantage of the CPU fan control. Remember to connect all system fans. Some system fans may not connect to the motherboard and will instead connect to the power supply directly. A system fan can be plugged into any available system fan connector.

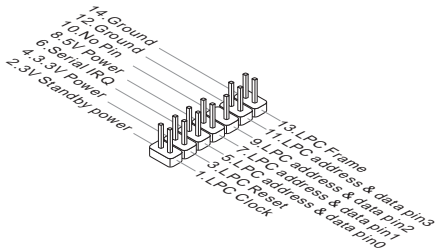


Important

- Please refer to your processor's official website or consult your vendor to find recommended CPU heatsink.
- These connectors support Smart Fan Control with liner mode. The Command Center utility can be installed to automatically control the fan speeds according to the CPU's and system's temperature.
- If there are not enough ports on the motherboard to connect all system fans, adapters are available to connect a fan directly to a power supply.
- Before first boot up, ensure that there are no cables impeding any fan blades.

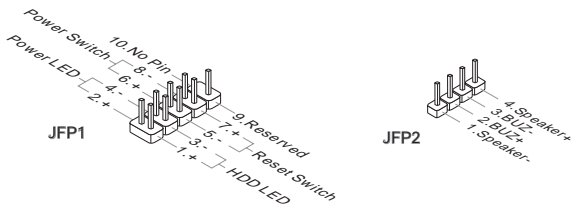
JTPM1: TPM Module Connector

This connector connects to a TPM (Trusted Platform Module). Please refer to the TPM security platform manual for more details and usages.



JFP1, JFP2: System Panel Connectors

These connectors connect to the front panel switches and LEDs. When installing the front panel connectors, please use the optional M-Connector to simplify installation. Plug all the wires from the computer case into the M-Connector and then plug the M-Connector into the motherboard.

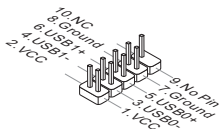


Important

- On the connectors coming from the case, pins marked by small triangles are positive wires. Please use the diagrams above and the writing on the optional M-Connectors to determine correct connector orientation and placement.
- The majority of the computer case's front panel connectors will primarily be plugged into JFP1.

JUSB1: USB 2.0 Expansion Connector

This connector is designed for connecting high-speed USB peripherals such as USB HDDs, digital cameras, MP3 players, printers, modems, and many others.

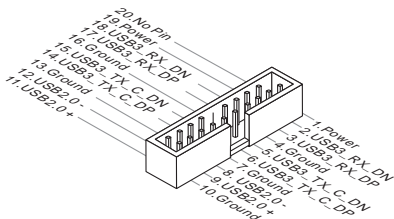


Important

Note that the VCC and GND pins must be connected correctly to avoid possible damage.

JUSB2: USB 3.0 Expansion Connector

The USB 3.0 port is backwards compatible with USB 2.0 devices. It supports data transfer rates up to 5Gbits/s (SuperSpeed).

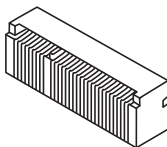


Important

- Note that the VCC and GND pins must be connected correctly to avoid possible damage.
- To use a USB 3.0 device, you must connect the device to a USB 3.0 port through an optional USB 3.0 compliant cable.

M2_PCIE1: M.2 Key E Slot

This M.2 port supports for both Wi-Fi and Bluetooth module, A68HI AC is already installed the Wi-Fi and Bluetooth combo module and connected to the antenna connectors on the back panel.



JBAT1: Clear CMOS Jumper

There is CMOS RAM onboard that is external powered from a battery located on the motherboard to save system configuration data. With the CMOS RAM, the system can automatically boot into the operating system (OS) every time it is turned on. If you want to clear the system configuration, set the jumpers to clear the CMOS RAM.



Keep Data



Clear Data

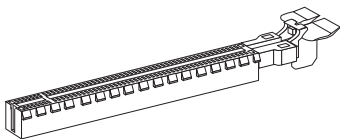


Important

You can clear the CMOS RAM by shorting this jumper while the system is off. Afterwards, open the jumper. Do not clear the CMOS RAM while the system is on because it will damage the motherboard.

PCI_E1: PCIe Expansion Slots

The PCIe slot supports the PCIe interface expansion card.



PCIe 3.0 x16 Slot



Important

When adding or removing expansion cards, always turn off the power supply and unplug the power supply power cable from the power outlet. Read the expansion card's documentation to check for any necessary additional hardware or software changes.

BIOS Setup

The default settings offer the optimal performance for system stability in normal conditions. You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.



Important

- Please load the default settings to restore the optimal system performance and stability if the system becomes unstable after changing BIOS settings. Select the "Restore Defaults" and press <Enter> in BIOS to load the default settings.
- If you are unfamiliar with the BIOS settings, we recommend that you keep the default settings to avoid possible system damage or failure booting due to inappropriate BIOS configuration.

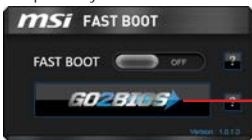
Entering BIOS Setup

Power on the computer and the system will start the Power On Self Test (POST) process. When the message below appears on the screen, please key to enter BIOS:

Press DEL key to enter Setup Menu, F11 to enter Boot Menu

If the message disappears before you respond and you still need to enter BIOS, restart the system by turning the computer OFF then back ON or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

MSI additionally provides a method to enter the BIOS setup. You can click the "GO2BIOS" tab on "MSI Fast Boot" utility screen to enable the system going to BIOS setup directly at next boot.



Click "GO2BIOS" tab on "MSI Fast Boot" utility screen.

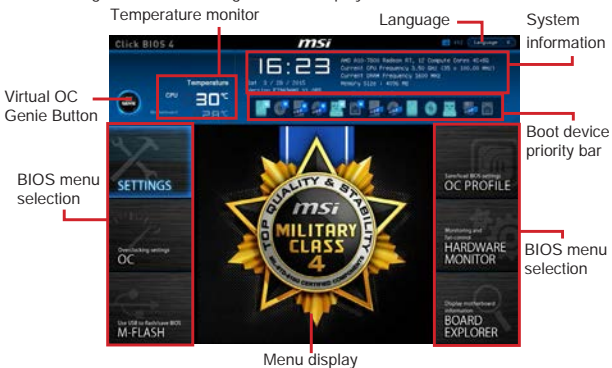


Important

Please be sure to install the "MSI Fast Boot" utility before using it to enter the BIOS setup.

Overview

After entering BIOS, the following screen is displayed.



OC Menu



Important

- Overclocking your PC manually is only recommended for advanced users.
- Overclocking is not guaranteed, and if done improperly, can void your warranty or severely damage your hardware.
- If you are unfamiliar with overclocking, we advise you to use OC Genie for easy overclocking.

► **Current CPU/ DRAM Frequency**

These items show the current frequencies of installed CPU and Memory. Read-only.

► **CPU Base Frequency (MHz) [Default]**

Sets the CPU Base clock. You may overclock the CPU by adjusting this value. Please note that overclocking behavior and stability is not guaranteed. This item appears when the installed processor supports this function.

► **Adjust CPU Ratio [Auto]**

Sets the CPU ratio that is used to determine CPU clock speed. This item can only be changed if the processor supports this function.

► **Adjusted CPU Frequency**

Shows the adjusted CPU frequency. Read-only.

► **Adjust CPU-NB Ratio [Auto]**

Sets the CPU-NB ratio that is used to determine CPU-NB clock speed.

► **Adjusted CPU-NB Frequency**

Shows the adjusted CPU-NB frequency. Read-only.

► **AMD Turbo Core Technology [Auto]**

Base on AMD Turbo Core Technology, part of CPU core ratio may pop down for providing more performance headroom for active CPU core, even AMD Cool'n'Quiet Technology is Disabled.

[Auto] Turbo Core Technology will linked to AMD Cool'n'Quiet Technology.

[Enabled] Enables this function.

[Disabled] Disables this function.

► **Adjust Turbo Core Ratio [Auto]**

Specifies the Turbo Core frequency multiplier.

► **Adjusted Turbo Core Frequency**

Shows the adjusted Turbo Core frequency. Read-only.

► **Adjust GPU Engine Frequency [Auto]**

Adjust GPU Engine Frequency.

► **Adjusted GPU Engine Frequency**

Shows the adjusted GPU Engine frequency. Read-only.

► **DRAM Frequency [Auto]**

Sets the DRAM frequency. Please note the overclocking behavior is not guaranteed.

► **Adjusted DRAM Frequency**

Shows the adjusted DRAM frequency. Read-only.

► Intel Extreme Memory Profile (XMP) [Disabled]

XMP is the overclocking technology by memory module. This item will be available when you install the memory modules that support XMP technology. When the XMP is Enabled, the AMP will be forced to be disabled.

- [Disabled] Disables this function.
- [Profile 1] Uses profile1 over-clocking settings of installed XMP memory module.
- [Profile 2] Uses profile2 over-clocking settings of installed XMP memory module.

► DRAM Timing Mode [Auto]

Selects the memory timing mode.

- [Auto] DRAM timings will be determined based on SPD (Serial Presence Detect) of installed memory modules.
- [Link] Allows user to configure the DRAM timing manually for all memory channel.
- [UnLink] Allows user to configure the DRAM timing manually for respective memory channel.

► Advanced DRAM Configuration

Press <Enter> to enter the sub-menu. This sub-menu will be activated after setting [Link] or [Unlink] in "DRAM Timing Mode". User can set the memory timing for each memory channel. The system may become unstable or unbootable after changing memory timing. If it occurs, please clear the CMOS data and restore the default settings. (Refer to the Clear CMOS jumper/ button section to clear the CMOS data, and enter the BIOS to load the default settings.

► DRAM Voltage [Auto]

Sets DRAM voltage. If set to "Auto", BIOS will set DRAM voltage automatically or you can set it manually.

► Spread Spectrum [Enabled]

This function reduces the EMI (Electromagnetic Interference) generated by modulating clock generator pulses.

- [Enabled] Enables the spread spectrum function to reduce the EMI (Electromagnetic Interference) problem.
- [Disabled] Enhances the overclocking ability of CPU Base clock.



Important

- *If you do not have any EMI problem, leave the setting at [Disabled] for optimal system stability and performance. But if you are plagued by EMI, select the value of Spread Spectrum for EMI reduction.*
- *The greater the Spread Spectrum value is, the greater the EMI is reduced, and the system will become less stable. For the most suitable Spread Spectrum value, please consult your local EMI regulation.*
- *Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clock speed which may just cause your overclocked processor to lock up.*

► CPU Memory Changed Detect [Enabled]

Enables or disables the system to issue a warning message during boot when the CPU or memory has been replaced.

[Enabled] The system will issue a warning message during boot and then needs to load the default settings for new devices.

[Disabled] Disables this function and keeps the current BIOS settings.

► OC Retry Count [1]

When overclocking has failed, setting this item will allow system to reboot specified number of times with the same overclocked configuration. If overclocking has failed every time, the system will restore the defaults.

[1], [2], [3] Retry 1,2,3 times.

[Disabled] Disables this function and keeps the current BIOS settings.

► CPU Specifications

Press <Enter> to enter the sub-menu. This sub-menu displays the information of installed CPU. You can also access this information menu at any time by pressing [F4]. Read only.

► CPU Technology Support

Press <Enter> to enter the sub-menu. The sub-menu shows what the key features does the installed CPU support. Read only.

► MEMORY-Z

Press <Enter> to enter the sub-menu. This sub-menu displays all the settings and timings of installed memory. You can also access this information menu at any time by pressing [F5].

► DIMM1~2 Memory SPD

Press <Enter> to enter the sub-menu. The sub-menu displays the information of installed memory. Read only.

► CPU Features

Press <Enter> to enter the sub-menu.

► AMD Cool'n'Quiet [Auto]

Enabled or disabled AMD Cool'n'Quiet function.

[Auto] Depends on AMD Design.

[Enable] Enables AMD Cool'n'Quiet function. The Cool'n'Quiet technology can effectively and dynamically lower CPU speed and power consumption.

[Disabled] Disables this function.



Important

When adjust CPU Ratio then Cool'n'Quiet function will be disabled automatically. For CPU which supports the Turbo Core Tech., please set AMD Turbo Core Technology and AMD Cool'n'Quiet as Disabled to retain the default CPU core speed.

► **SVM Mode [Enabled]**

Enables or disables CPU Virtualization.

[Enabled] Enables CPU Virtualization and allows a platform to run multiple operating systems in independent partitions. The system can function as multiple systems virtually.

[Disabled] Disables this function.

► **Core C6 State [Enabled]**

Enables or disables C6 state support.

[Enabled] When the CPU enters C6 state, all cores will save architectural state and reduce core voltages to zero volts. Wake up the CPU from C6 state will take a lot longer.

[Disabled] Disables this function.

► **Power Policy Mode**

Sets the NB P-state.

[Performance] Disables the NB P-state. High NB frequency is fixed for optimum performance.

[Battery Life] Enables the NB P-state. NB frequency will be changed dynamically.

► **cTDP [Auto]**

Sets TDP for installed APU to fit in platform with thermal and VDD power solutions. If set to "Auto", BIOS will set it automatically.