BIOS Setup (Intel® 700 Series)

- The BIOS Setup menus described in this section may differ from the exact settings for your motherboard. The actual BIOS Setup menu options you will see shall depend on the motherboard specifications and the BIOS version.
- Some of the BIOS settings are available only when the motherboard chipset and the CPU/memory used support the feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the CMOS on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features.

When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <Delete> key during the POST when the power is turned on.

To upgrade the BIOS, use either the GIGABYTE Q-Flash or Q-Flash Plus utility.
• Q-Flash allows the user to quickly and easily upgrade or back up BIOS without entering the operating system.
• Q-Flash Plus allows you to update the BIOS when your system is off (S5 shutdown state). Save the latest BIOS on a USB thumb drive and plug it into the dedicated port, and then you can now flash the BIOS automatically by simply pressing the Q-Flash Plus button.
For instructions on using the Q-Flash and Q-Flash Plus utilities, please navigate to the "Unique Features" page of GIGABYTE's website and search for "BIOS Update Utilities."

• Because BIOS flashing is potentially risky, if you do not encounter problems using the current version of BIOS, it is recommended that you not flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
• It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values.
• Refer to the introductions of the battery/clear CMOS jumper/button in user's manual or refer to the "Load Optimized Defaults" section for how to clear the CMOS values.

Startup Screen

The following startup Logo screen will appear when the computer boots. (The screen may vary from motherboards.)

DEL：BIOS SETUP\Q-FLASH   F12：BOOT MENU   END：Q-FLASH —— Function Keys

Function Keys:

<DEL>: BIOS SETUP\Q-FLASH

Press the <Delete> key to enter BIOS Setup or to access the Q-Flash utility in BIOS Setup.

<F12>: BOOT MENU

Boot Menu allows you to set the first boot device without entering BIOS Setup. In Boot Menu, use the up arrow key <↑> or the down arrow key <↓> to select the first boot device, then press <Enter> to accept. The system will boot from the device immediately.

Note: The setting in Boot Menu is effective for one time only. After system restart, the device boot order will still be based on BIOS Setup settings.
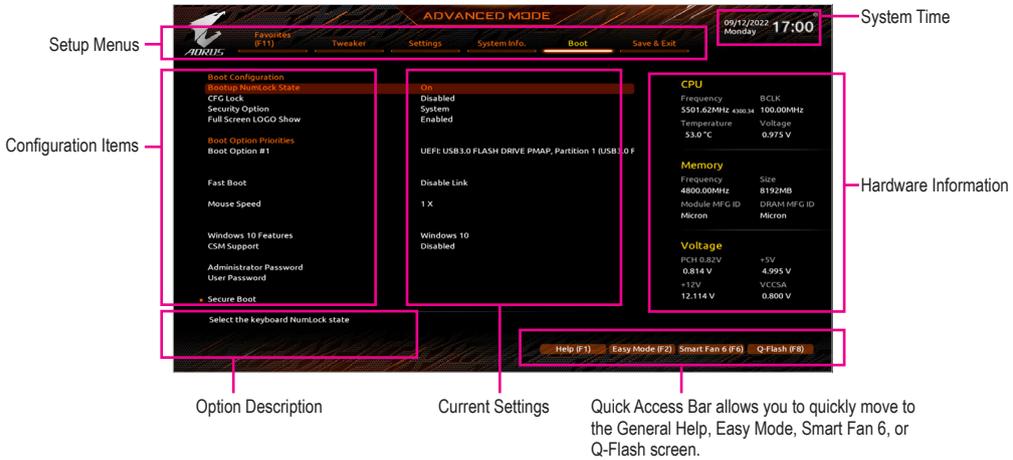
<END>: Q-FLASH

Press the <End> key to access the Q-Flash utility directly without having to enter BIOS Setup first.

The Main Menu

Advanced Mode

The Advanced Mode provides detailed BIOS settings. You can press the arrow keys on your keyboard to move among the items and press <Enter> to accept or enter a sub-menu. Or you can use your mouse to select the item you want.

Setup Menus — System Time — Configuration Items — Hardware Information — Option Description — Current Settings — Quick Access Bar allows you to quickly move to the General Help, Easy Mode, Smart Fan 6, or Q-Flash screen.

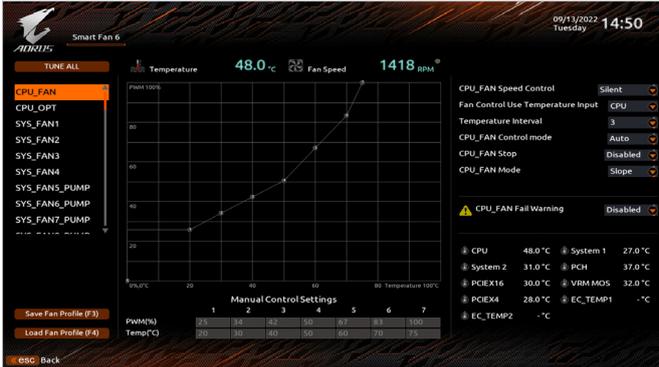### Advanced Mode Function Keys

<←><→>	Move the selection bar to select a setup menu
<↑><↓>	Move the selection bar to select an configuration item on a menu
<Enter>/Double Click	Execute command or enter a menu
<+>/<Page Up>	Increase the numeric value or make changes
<->/<Page Down>	Decrease the numeric value or make changes
<F1>	Show descriptions of the function keys
<F2>	Switch to Easy Mode
<F3>	Save the current BIOS settings to a profile
<F4>	Load the BIOS settings from a profile created before
<F5>	Restore the previous BIOS settings for the current submenus
<F6>	Display the Smart Fan 6 screen
<F7>	Load the Optimized BIOS default settings for the current submenus
<F8>	Access the Q-Flash utility
<F10>	Save all the changes and exit the BIOS Setup program
<F11>	Switch to the Favorites submenu
<F12>	Capture the current screen as an image and save it to your USB drive
<Insert>	Add or remove a favorite option
<Ctrl>+<S>	Display information on the installed memory
<Esc>	Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu
<Alt>+<F>	Enter keyword(s) to find the BIOS configuration item you are looking for

B. Easy Mode

Easy Mode allows users to quickly view their current system information or to make adjustments for optimum performance. In Easy Mode, you can use your mouse to move through configuration items or press <F2> to switch to the Advanced Mode screen.

Smart Fan 6

Use the <F6> function key to quickly switch to this screen. This screen allows you to configure fan speed related settings for each fan header or monitor your system/CPU temperature.

  ⌐ **TUNE ALL**
     Allows you to apply the current settings to all fan headers.

  ⌐ **Temperature**
     Displays the current temperature of the selected target area.

  ⌐ **Fan Speed**
     Displays current fan/pump speeds.

  ⌐ **Flow Rate**
     Displays the flow rate of your water cooling system. Press <Enter> on **Fan Speed** to switch to this function.

  ⌐ **Fan Speed Control**
     Allows you to determine whether to enable the fan speed control function and adjust the fan speed.
     ▶▶ Normal   Allows the fan to run at different speeds according to the temperature. You can adjust the fan speed on the FAN Control page of GIGABYTE Control Center based on your system requirements.
     ▶▶ Silent   Allows the fan to run at slow speeds.
     ▶▶ Manual   Allows you to drag the curve nodes to adjust fan speed. Or you can use the **EZ Tuning** feature. After adjusting the node position, press **Apply** to automatically calculate the slope of the curve.
     ▶▶ Full Speed   Allows the fan to run at full speeds.

  ⌐ **Fan Control Use Temperature Input**
     Allows you to select the reference temperature for fan speed control.

  ⌐ **Temperature Interval**
     Allows you to select the temperature interval for fan speed change.

  ⌐ **FAN/PUMP Control Mode**
     ▶▶ Auto   Lets the BIOS automatically detect the type of fan installed and sets the optimal control mode.
     ▶▶ Voltage   Voltage mode is recommended for a 3-pin fan/pump.
     ▶▶ PWM   PWM mode is recommended for a 4-pin fan/pump.

☞ **FAN/PUMP Stop**
Enables or disables the fan/pump stop function. You can set the temperature limit using the temperature curve. The fan or pump stops operation when the temperature is lower than the limit.

☞ **FAN/PUMP Mode**
Allows you to set the operating mode for the fan.
▶ Slope   Adjusts the fan speed linearly based on the temperature.
▶ Stair   Adjusts the fan speed stepwise based on the temperature.

☞ **FAN/PUMP Fail Warning**
Allows the system to emit warning sound if the fan/pump is not connected or fails. Check the fan/pump condition or fan/pump connection when this occurs.
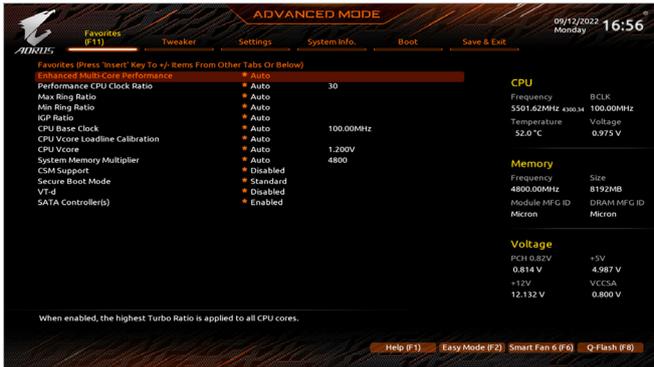
☞ **Save Fan Profile**
This function allows you to save the current settings to a profile. You can save the profile in the BIOS or select **Select File in HDD/FDD/USB** to save the profile to your storage device.

☞ **Load Fan Profile**
This function allows you to load a previously saved BIOS profile without the hassles of reconfiguring the BIOS settings. Or you can select **Select File in HDD/FDD/USB** to load a profile from your storage device.

Favorites (F11)

Set your frequently used options as your favorites and use the <F11> key to quickly switch to the page where all of your favorite options are located. To add or remove a favorite option, go to its original page and press <Insert> on the option. The option is marked with a star sign if set as a "favorite."

Tweaker

Whether the system will work stably with the overclock/overvoltage settings you made is dependent on your overall system configurations. Incorrectly doing overclock/overvoltage may result in damage to CPU, chipset, or memory and reduce the useful life of these components. This page is for advanced users only and we recommend you not to alter the default settings to prevent system instability or other unexpected results. (Inadequately altering the settings may result in system's failure to boot. If this occurs, clear the CMOS values and reset the board to default values.)

☞ **CPU Upgrade**

Allows you to set the CPU frequency. The final result may vary depending on the CPU used. Options are: Default, Gaming Profile, Advanced Profile.

☞ **CPU Base Clock**

Allows you to manually set the CPU base clock in 0.01 MHz increments.
Important: It is highly recommended that the CPU frequency be set in accordance with the CPU specifications.

☞ **PCIe/DMI/PEG Clock Frequency**

Allows you to manually set the PCIe/DMI/PEG clock frequency in 0.01MHz increments.

☞ **Enhanced Multi-Core Performance**

Allows you to determine whether to apply the highest Turbo ratio to all CPU cores.

☞ **Performance CPU Clock Ratio**

Allows you to alter the clock ratio for the installed Performance CPU. The adjustable range is dependent on the CPU being installed.

☞ **Efficiency CPU Clock Ratio**

Allows you to alter the clock ratio for the installed Efficiency CPU. The adjustable range is dependent on the CPU being installed.

☞ **Max Ring Ratio**

Allows you to set the maximum CPU Uncore ratio. The adjustable range is dependent on the CPU being used.

☞ **Min Ring Ratio**

Allows you to set the minimum CPU Uncore ratio. The adjustable range is dependent on the CPU being used.
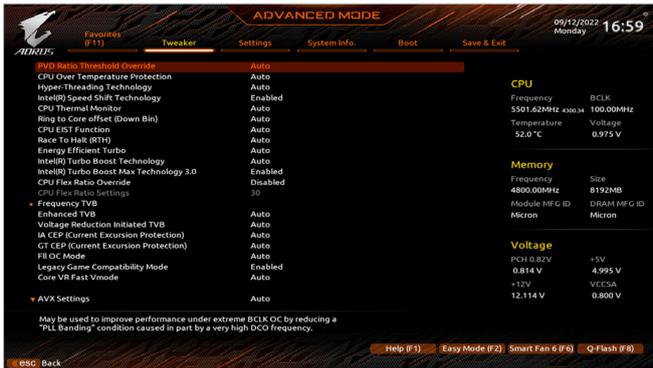
☞ **IGP Ratio**

Allows you to set the Graphics Ratio.

Some of the BIOS settings are available only when the motherboard chipset and the CPU/memory used support the feature. For more information about Intel® CPUs' unique features, please visit Intel's website.

■ **Advanced CPU Settings**

🛶 **PVD Ratio Threshold Override**
Allows you to determine whether to improve performance under extreme BCLK OC by reducing a "PLL Banding" condition caused in part by a very high DCO frequency.

🛶 **CPU Over Temperature Protection**
Allows you to fine-tune the TJ Max offset value.

🛶 **Hyper-Threading Technology**
Allows you to determine whether to enable multi-threading technology when using an Intel® CPU that supports this function. This feature only works for operating systems that support multi-processor mode. **Auto** lets the BIOS automatically configure this setting.

🛶 **Intel(R) Speed Shift Technology (Intel® Speed Shift Technology)**
Enables or disables Intel® Speed Shift Technology. Enabling this feature allows the processor to ramp up its operating frequency more quickly and then improves the system responsiveness.

🛶 **CPU Thermal Monitor**
Enables or disables Intel® Thermal Monitor function, a CPU overheating protection function. When enabled, the CPU core frequency and voltage will be reduced when the CPU is overheated. **Auto** lets the BIOS automatically configure this setting.

🛶 **Ring to Core offset (Down Bin)**
Allows you to determine whether to disable the CPU Ring ratio auto-down function. **Auto** lets the BIOS automatically configure this setting.

🛶 **CPU EIST Function**
Enables or disables Enhanced Intel® Speed Step Technology (EIST). Depending on CPU loading, Intel® EIST technology can dynamically and effectively lower the CPU voltage and core frequency to decrease average power consumption and heat production. **Auto** lets the BIOS automatically configure this setting.

🛶 **Race To Halt (RTH) /Energy Efficient Turbo**
Enables or disables the CPU power saving related settings.

🛶 **Intel(R) Turbo Boost Technology**
Allows you to determine whether to enable the Intel® CPU Turbo Boost technology. **Auto** lets the BIOS automatically configure this setting.

🛶 **Intel(R) Turbo Boost Max Technology 3.0**
Enables or disables Intel® Turbo Boost Max Technology 3.0. Intel® Turbo Boost Max Technology 3.0 allows the system to identify the processor's best performance core and lets you manually direct the most critical workloads to it. You can even adjust the frequency of each core individually for performance optimization.

🗰 **CPU Flex Ratio Override**
Enables or disables the CPU Flex Ratio.

🗰 **CPU Flex Ratio Settings**
Allows you to set the CPU Flex Ratio. The adjustable range may vary by CPU.

▼ **Frequency TVB**

🗰 **Frequency Clipping TVB**
Allows you to enable or disable automatic CPU frequency reduction initiated by Thermal Velocity Boost.

🗰 **Enhanced TVB**
Enables or disables the enhanced Thermal Velocity Boost (TVB) feature. **Auto** lets the BIOS automatically configure this setting.

🗰 **Voltage reduction initiated TVB**
Allows you to enable or disable automatic CPU voltage reduction initiated by Thermal Velocity Boost. **Auto** lets the BIOS automatically configure this setting.

🗰 **IA CEP (Current Excursion Protection)**
Allows you to enable or disable IA CEP.

🗰 **GT CEP (Current Excursion Protection)**
Allows you to enable or disable GT CEP.

🗰 **Fll OC Mode**
Allows you to select FLL mode.

🗰 **Legacy Game Compatibility Mode**
Allows you to enable Legacy Game Compatibility Mode to improve functionality of older games.

🗰 **Core VR Fast Vmode**
Enables or disables Core Fast V-Mode.

🗰 **Under Voltage Protection**
Enables or disables the under-voltage protection feature.

▼ **AVX Settings**
Allows you to configure AVX related settings. **Auto** sets the settings according to the CPU specifications.

🗰 **AVX**
Allows you to disable the AVX instruction sets on a CPU that supports AVX. This item is configurable only when **AVX Settings** is set to **User Defined**.

🗰 **AVX Offset**
When the processor runs AVX workloads, the CPU Clock Ratio will be reduced by the desired AVX offset value. For example, if the value is set to 3, the CPU Clock Ratio will be reduced by 3 when executing AVX instructions.

🗰 **AVX Optimum**
Allows you to optimize the AVX instructions.

🗰 **AVX Voltage Guardband Scale Factor**
Allows you to lower the standard AVX voltage.

▼ **Active Turbo Ratios**

🗰 **Turbo Ratio**
Allows you to set the CPU Turbo ratios for different number of active cores. **Auto** sets the CPU Turbo ratios according to the CPU specifications. This item is configurable only when **Active Turbo Ratios** is set to **Manual**.

▼ **CPU Cores Enabling Mode**
   Allows you to select how to enable CPU cores.

☞ **No. of CPU P-Cores Enabled**
   Allows you to select the number of CPU P-cores to enable (the number of CPU cores may vary by CPU). This item is configurable only when **CPU Cores Enabling Mode** is set to **Random Mode**. **Auto** lets the BIOS automatically configure this setting.

☞ **No. of CPU E-Cores Enabled**
   Allows you to select the number of CPU E-cores to enable (the number of CPU cores may vary by CPU). This item is configurable only when **CPU Cores Enabling Mode** is set to **Random Mode**. **Auto** lets the BIOS automatically configure this setting.

☞ **Active P-Core/E-Core**
   Allows you to select which CPU core to enable. The number of CPU cores may vary by CPU. This item is configurable only when **CPU Cores Enabling Mode** is set to **Selectable Mode**. **Auto** lets the BIOS automatically configure this setting.

▼ **per Core HT Disable Settings**

☞ **Core HT Disable**
   Allows you to determine whether to disable the HT feature for each CPU core. This item is configurable only when **per Core HT Disable Setting** is set to **Manual**.

▼ **C-States Control**

☞ **CPU Enhanced Halt (C1E)**
   Enables or disables Intel® CPU Enhanced Halt (C1E) function, a CPU power-saving function in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. **Auto** lets the BIOS automatically configure this setting. This item is configurable only when **C-States Control** is set to **Enabled**.

☞ **C6/C7 State Support**
   Allows you to determine whether to let the CPU enter C6/C7 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C6/C7 state is a more enhanced power-saving state than C3. **Auto** lets the BIOS automatically configure this setting. This item is configurable only when **C-States Control** is set to **Enabled**.

☞ **C8 State Support**
   Allows you to determine whether to let the CPU enter C8 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C8 state is a more enhanced power-saving state than C6/C7. **Auto** lets the BIOS automatically configure this setting. This item is configurable only when **C-States Control** is set to **Enabled**.

☞ **C10 State Support**
   Allows you to determine whether to let the CPU enter C10 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C10 state is a more enhanced power-saving state than C8. **Auto** lets the BIOS automatically configure this setting. This item is configurable only when **C-States Control** is set to **Enabled**.

☞ **Package C State limit**
   Allows you to specify the C-state limit for the processor. **Auto** lets the BIOS automatically configure this setting. This item is configurable only when **C-States Control** is set to **Enabled**.

▼ **Turbo Power Limits**
Allows you to set a power limit for CPU Turbo mode. When the CPU power consumption exceeds the specified power limit, the CPU will automatically reduce the core frequency in order to reduce the power. **Auto** sets the current limit according to the CPU specifications.

☞ **Power Limit TDP (Watts) / Power Limit Time**
Allows you to set the power limit for CPU/platform/memory Turbo mode and how long it takes to operate at the specified power limit. **Auto** sets the power limit according to the CPU specifications. This item is configurable only when **Turbo Power Limits** is set to **Enabled**.

☞ **Core Current Limit (Amps)**
Allows you to set a current limit for CPU Turbo mode. When the CPU current exceeds the specified current limit, the CPU will automatically reduce the core frequency in order to reduce the current. **Auto** sets the current limit according to the CPU specifications. This item is configurable only when **Turbo Power Limits** is set to **Enabled**.

▼ **Turbo Per Core Limit Control**
Allows you to control each CPU core limit separately.

☞ **DDR5 Auto Booster**
Enables or disables the DDR5 Dynamic Turbo Boost feature, which allows automatic switching between default frequency and boosted frequency. **Auto** lets the BIOS automatically configure this setting.

☞ **DDR5 XMP Booster**
Allows you to select among profiles that are built for specific memory IC manufacturers to enhance memory performance.

☞ **Extreme Memory Profile (X.M.P.)**
Allows the BIOS to read the SPD data on the installed XMP memory module(s) to enhance memory performance when enabled.
▸▸ Disabled   Disables this function.
▸▸ Profile1   Uses Profile 1 settings.
▸▸ Profile2   Uses Profile 2 settings. (Available only when you install a memory module that supports this feature.)

☞ **System Memory Multiplier**
Allows you to set the system memory multiplier. **Auto** sets memory multiplier according to memory SPD data.

■ **Advanced Memory Settings**

& **Memory Ref Clock**

Allows you to manually adjust the memory reference clock.

& **Gear Mode**

Allows you to improve the maximum OC frequency potential.

& **Memory Boot Mode**

Provides memory detection and training methods.

▶▶Auto   Lets the BIOS automatically configure this setting.
▶▶Normal   The BIOS automatically performs memory training. Please note that if the system
                     becomes unstable or unbootable, try to clear the CMOS values and reset the board
                     to default values. (Refer to the introductions of the battery/clear CMOS jumper/
                     button in Chapter 2 of the user's manual for how to clear the CMOS values.)
▶▶Enable Fast Boot   Skip memory detection and training in some specific criteria for faster memory
                     boot.
▶▶Disable Fast Boot Detect and train memory at every single boot.

& **SA GV**

Enables or disables System Agent Geyserville (SAGV), which allows the system to dynamically switich voltgages or frequencies according to workloads, or fix the value to a specific point. **Auto** lets the BIOS automatically configure this setting.

& **Dynamic Memory Boost**

Enables or disables the Dynamic Memory Bootst feature, which allows automatic switching between default SPD Profile frequency and select XMP profile frequency. **Auto** lets the BIOS automatically configure this setting. This item is configurable only when **Realtime Memory Frequency** is set to **Disabled.**

& **Realtime Memory Frequency**

Enables or disables the Realtime Memory Frequency feature, which allows manual switching between default SPD profile frequency and selected XMP profile frequency. This item is configurable only when **Dynamic Memory Boost** is set to **Disabled.**

& **Realtime Memory Timing**

Allows you to fine-tune memory timings after the BIOS stage.

& **Memory Enhancement Settings**

Allows the system to operate at three different performance levels.

🡒 **Memory Channel Detection Message**
Allows you to determine whether to show an alert message when the memory is not installed in the optimal memory channel.

🡒 **Retry Loop Count**
Allows you to set the number of times for memory self-test if memory overclocking fails.

■ **SPD Info**
Displays information on the installed memory.

■ **SPD Setup**
Allows you to configure memory parameters for the installed memory or save the settings as a profile.

■ **Memory Channels Timings**

▼ **Channels Standard Timing Control, Channels Advanced Timing Control, Channels Misc Timing Control**
These sections provide memory timing settings. Note: Your system may become unstable or fail to boot after you make changes on the memory timings. If this occurs, please reset the board to default values by loading optimized defaults or clearing the CMOS values.
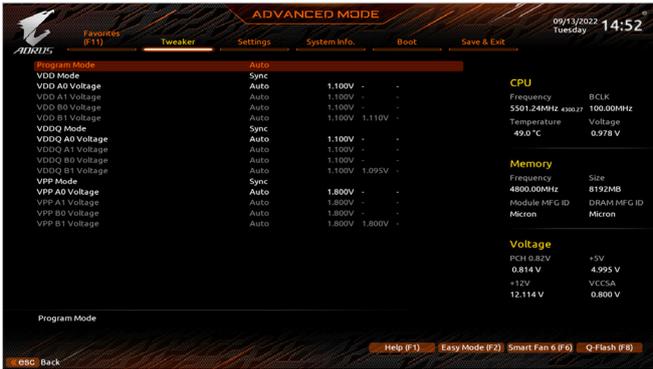
■ **Memory Training Settings**

Allows you to adjust memory training settings.

■ **CPU/PCH Voltage Control/DRAM Voltage Control**
These items allow you to adjust the CPU, Chipset, and memory voltages. The displayed items and values may vary depending on motherboard chipset and the CPU used.

■ **DDR5 Voltage Control**

These items allow you to adjust DDR5 memory voltages. This submenu is only present on models that support DDR5 memory.
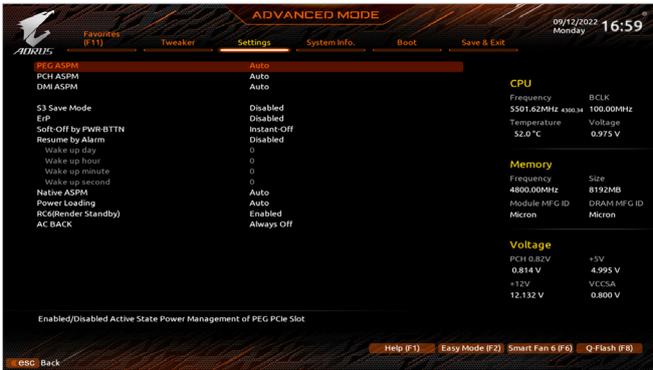
■ **Advanced Voltage Settings**

This submenu allows you to configure Load-Line Calibration level, over-voltage protection level, and over-current protection level.

Settings

■ **Platform Power**

  PEG ASPM
    Allows you to configure the ASPM mode for the device connected to the CPU PEG bus.

  PCH ASPM
    Allows you to configure the ASPM mode for the device connected to Chipset's PCI Express bus.

  DMI ASPM
    Allows you to configure the ASPM mode for both CPU side and Chipset side of the DMI link.

  S3 Save Mode
    Allows you to determine whether to let the system enter power-saving mode in system S3 state.

  ErP
    Determines whether to let the system consume least power in S5 (shutdown) state.
    Note: When this item is set to **Enabled**, the Resume by Alarm function becomes unavailable.

  Soft-Off by PWR-BTTN
    Configures the way to turn off the computer in MS-DOS mode using the power button.
    ▸▸Instant-Off   Press the power button and then the system will be turned off instantly.
    ▸▸Delay 4 Sec.   Press and hold the power button for 4 seconds to turn off the system. If the power
                        button is pressed for less than 4 seconds, the system will enter suspend mode.

☞ **Resume by Alarm**
Determines whether to power on the system at a desired time.
If enabled, set the date and time as following:
▶▶ Wake up day: Turn on the system at a specific time on each day or on a specific day in a month.
▶▶ Wake up hour/minute/second: Set the time at which the system will be powered on automatically.
Note: When using this function, avoid inadequate shutdown from the operating system or removal of the
AC power, or the settings may not be effective.

☞ **Native ASPM**
Allows you to select between BIOS or operating system-controlled ASPM. **Auto** lets the BIOS automatically
configure this setting.

☞ **Power Loading**
Enables or disables dummy load. When the power supply is at low load, a self-protection will activate causing
it to shutdown or fail. If this occurs, please set to **Enabled**. **Auto** lets the BIOS automatically configure this
setting.

☞ **RC6(Render Standby)**
Allows you to determine whether to let the onboard graphics enter standby mode to decrease power
consumption.

☞ **AC BACK**
Determines the state of the system after the return of power from an AC power loss.
▶▶ Memory   The system returns to its last known awake state upon the return of the AC power.
▶▶ Always On   The system is turned on upon the return of the AC power.
▶▶ Always Off   The system stays off upon the return of the AC power.

■ **IO Ports**

    ⟜ **Initial Display Output**

Specifies the first initiation of the monitor display from the installed PCI Express graphics card or the onboard graphics.
- ▶▶ IGFX   Sets the onboard graphics as the first display.
- ▶▶ PCIe 1 Slot   Sets the graphics card on the PCIEX16 slot as the first display.
- ▶▶ PCIe 2 Slot   Sets the graphics card on the PCIEX8 slot as the first display.
- ▶▶ PCIe 3 Slot   Sets the graphics card on the PCIEX4 slot as the first display.

    ⟜ **Internal Graphics**

Enables or disables the onboard graphics function.

    ⟜ **DVMT Pre-Allocated**

Allows you to set the onboard graphics memory size.

    ⟜ **Aperture Size**

Allows you to set the maximum amount of system memory that can be allocated to the graphics card. Options are: 128MB, 256MB, 512MB, 1024MB, and 1024MB.

    ⟜ **PCIE Bifurcation Support**

Allows you to determine how the bandwidth of the PCIEX16 slot is divided.

    ⟜ **OnBoard LAN Controller**

Enables or disables the onboard LAN function. If you wish to install a 3rd party add-in network card instead of using the onboard LAN, set this item to **Disabled**.

    ⟜ **OnBoard LAN Controller#2**

Enables or disables the onboard LAN function. If you wish to install a 3rd party add-in network card instead of using the onboard LAN, set this item to **Disabled**.

    ⟜ **Audio Controller**

Enables or disables the onboard audio function. If you wish to install a 3rd party add-in audio card instead of using the onboard audio, set this item to **Disabled**.

    ⟜ **Above 4G Decoding**

Enables or disables 64-bit capable devices to be decoded in above 4 GB address space (only if your system supports 64-bit PCI decoding). Set to **Enabled** if more than one advanced graphics card are installed and their drivers are not able to be launched when entering the operating system (because of the limited 4 GB memory address space).

    ⟜ **Re-Size BAR Support**

Enables or disables support for Resizable BAR.

    ⚭ **IOAPIC 24-119 Entries**
Enables or disables this function.

    ■ **Super IO Configuration**

    ⚭ **Serial Port**
Enables or disables the onboard serial port.

    ⚭ **Parallel Port**
Enables or disables the onboard parallel port.

    ■ **Gigabyte Utilities Downloader Configuration**

    ⚭ **Gigabyte Utilities Downloader Configuration**
Allows you to determine whether to automatically download and install GIGABYTE Control Center after entering the operating system. Before the installation, make sure the system is connected to the Internet.

    ▶ **Thunderbolt(TM) Configuration**
This sub-menu provides Thunderbolt related configuration options. This sub-menu appears only on motherboards that have an onboard Intel® Thunderbolt™ controller or motherboards that have a GIGABYTE Thunderbolt™ add-in card installed.

    ⚭ **PCIE Tunneling over USB4**
Enables or disables PCIE Tunneling over USB4.

    ⚭ **Wake up from Thunderbolt(TM) Devices**
Enabled allows the system to wake up from Thunderbolt™ devices.

    ■ **USB Configuration**

    ⚭ **Legacy USB Support**
Allows USB keyboard/mouse to be used in MS-DOS.

    ⚭ **XHCI Hand-off**
Determines whether to enable XHCI Hand-off feature for an operating system without XHCI Hand-off support.

    ⚭ **USB Mass Storage Driver Support**
Enables or disables support for USB storage devices.

    ⚭ **Port 60/64 Emulation**
Enables or disables support for USB storage devices.

    ⚭ **Mass Storage Devices**
Displays a list of connected USB mass storage devices. This item appears only when a USB storage device is installed.

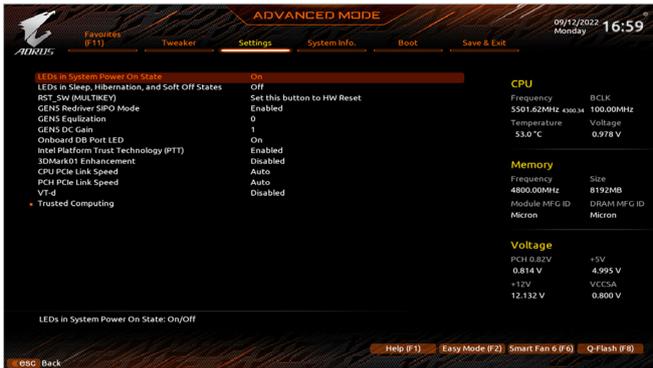   ■ **Network Stack Configuration**

    ⚭ **Network Stack**
Disables or enables booting from the network to install a GPT format OS, such as installing the OS from the Windows Deployment Services server.

    ⚭ **IPv4 PXE Support**
Enables or disables IPv4 PXE Support. This item is configurable only when **Network Stack** is enabled.

-   **IPv4 HTTP Support**
Enables or disables HTTP boot support for IPv4. This item is configurable only when **Network Stack** is enabled.

-   **IPv6 PXE Support**
Enables or disables IPv6 PXE Support. This item is configurable only when **Network Stack** is enabled.

-   **IPv6 HTTP Support**
Enables or disables HTTP boot support for IPv6. This item is configurable only when **Network Stack** is enabled.

-   **PXE boot wait time**
Allows you to configure how long to wait before you can press <Esc> to abort the PXE boot. This item is configurable only when **Network Stack** is enabled.

-   **Media detect count**
Allows you to set the number of times to check the presence of media. This item is configurable only when **Network Stack** is enabled.

- ■ **NVMe Configuration**
Displays information on your M.2 NVME PCIe SSD if installed.

- ■ **SATA Configuration**

-   **SATA Controller(s)**
Enables or disables the integrated SATA controllers.

-   **Aggressive LPM Support**
Enables or disables the power saving feature, ALPM (Aggressive Link Power Management), for the Chipset SATA controllers.

-   **Port**
Enables or disables each SATA port.

-   **SATA Port DevSlp**
Allows you to determine whether to let the connected SATA device go into sleep mode.

-   **Hot plug**
Enables or disable the hot plug capability for each SATA port.

-   **Configured as eSATA**
Enables or disables support for external SATA devices.

- ■ **VMD setup menu**
Allows you to configure the VMD controllers. To create RAID configurations, set **Enable VMD controller** to **Enabled** and set **Enable VMD Global Mapping** to **Disabled**. Then depending on the SATA/M.2 connector you use, set the corresponding **Map this Root Port under VMD** item to **Enabled**. Please navigate to the "Configuring a RAID Set" page of GIGABYTE's website for instructions on configuring a RAID array.

- ■ **Ethernet Controller / PCIe GBE Family Controller**
This sub-menu provides information on LAN configuration and related configuration options.

■ **Miscellaneous**

C **LEDs in System Power On State**

Allows you to enable or disable motherboard LED lighting when the system is on.
▶ Off   Disables the selected lighting mode when the system is on.
▶ On   Enables the selected lighting mode when the system is on.

C **LEDs in Sleep, Hibernation, and Soft Off States**

Allows you to set the lighting mode of the motherboard LEDs in system S3/S4/S5 state.
This item is configurable when **LEDs in System Power On State** is set to **On**.
▶ Off   Disables the selected lighting mode when the system enters S3/S4/S5 state.
▶ On   Enables the selected lighting mode when the system enters S3/S4/S5 state.

C **RST_SW (MULTIKEY) (Functionality of the RST_SW Button)**
▶ Set this button to HW Reset   Use the button to reset your system.
▶ Set this button to Switch LED On/Off   Use the button to turn on/off the motherboard LEDs.
▶ Set this button to Enter BIOS Setup   Use the button to enter the BIOS Setup.
▶ Set this button to Boot on Safe Mode   Use the button to boot the system in safe mode.

C **GEN5 Redriver SIPO Mode**

Enables or disables GEN5 Redriver SIPO Mode.

C **GEN5 Equlization**

Allows you to adjust the GEN5 equalization value.

C **GEN5 DC Gain**

Allows you to adjust the GEN5 DC Gain value.

C **Onboard DB Port LED**

Allows you to enable or disable the LED lighting of the motherboard debug LEDs when the system is on.

C **Intel Platform Trust Technology (PTT)**

Enables or disables Intel® PTT Technology.

C **3DMark01 Enhancement**

Allows you to determine whether to enhance some legacy benchmark performance.

C **CPU PCIe Link Speed**

Allows you to set the operation mode of the CPU-controlled PCI Express slots. Actual operation mode is subject to the hardware specification of each slot. **Auto** lets the BIOS automatically configure this setting.

- **PCH PCIe Link Speed**
  Allows you to set the operation mode of the chipset-controlled PCI Express slots. Actual operation mode is subject to the hardware specification of each slot. **Auto** lets the BIOS automatically configure this setting.
- **VT-d**
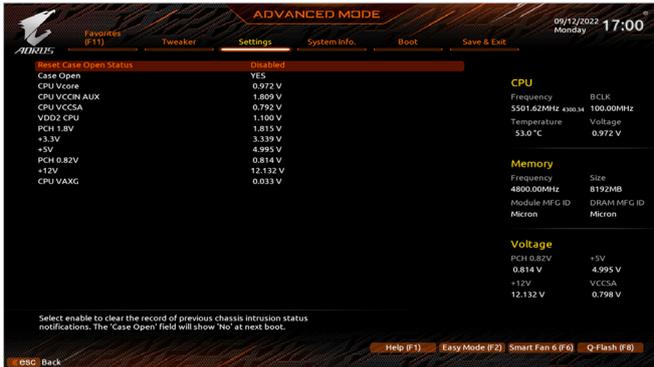 Enables or disables Intel® Virtualization Technology for Directed I/O.
- **Trusted Computing**
  Enables or disables Trusted Platform Module (TPM).

- **Option Search (Hot Key: Alt-F)**
  This screen allows you to enter keyword(s)(English only) to find the BIOS option you are looking for. Press <Alt> and <F> to enter the **Option Search** screen. Type the keyword(s) in the search field and press <Enter> or click **Search**.

■ **PC Health Status**

) **Reset Case Open Status**
▶ Disabled   Keeps or clears the record of previous chassis intrusion status.
▶ Enabled   Clears the record of previous chassis intrusion status and the **Case Open** field will show "No" at next boot.
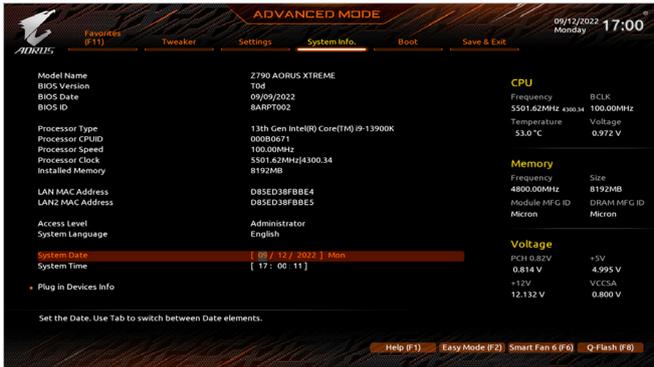
) **Case Open**
Displays the detection status of the chassis intrusion detection device attached to the motherboard CI header. If the system chassis cover is removed, this field will show "Yes", otherwise it will show "No". To clear the chassis intrusion status record, set **Reset Case Open Status** to **Enabled**, save the settings to the CMOS, and then restart your system.

) **CPU Vcore/CPU VCCIN AUX/CPU VCCSA/VDD2 CPU/PCH1.8V/+3.3V/+5V/PCH 0.82V/+12V/CPU VAXG**
Displays the current system voltages. The displayed items and values may vary depending on motherboard chipset and the CPU used.

System Information

This section provides information on your motherboard model and BIOS version. You can also select the default language used by the BIOS and manually set the system time.

☞ **Access Level**

Displays the current access level depending on the type of password protection used. (If no password is set, the default will display as **Administrator**.) The Administrator level allows you to make changes to all BIOS settings; the User level only allows you to make changes to certain BIOS settings but not all.

☞ **System Language**

Selects the default language used by the BIOS.

☞ **System Date**

Sets the system date. The date format is week (read-only), month, date, and year. Use <Enter> to switch between the Month, Date, and Year fields and use the <Page Up> or <Page Down> key to set the desired value.

☞ **System Time**

Sets the system time. The time format is hour, minute, and second. For example, 1 p.m. is 13:00:00. Use <Enter> to switch between the Hour, Minute, and Second fields and use the <Page Up> or <Page Down> key to set the desired value.
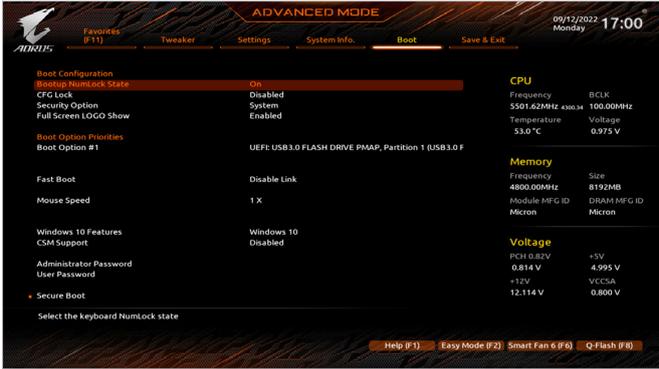
▪ **Plug in Devices Info**

Displays information on your PCI Express and M.2 devices if installed.

▪ **Q-Flash**

Allows you to access the Q-Flash utility to update the BIOS or back up the current BIOS configuration.

Boot

⬩ **Bootup NumLock State**

Enables or disables Numlock feature on the numeric keypad of the keyboard after the POST.

⬩ **CFG Lock**

Enables or disables the MSR 0xE2 function.

⬩ **Security Option**

Specifies whether a password is required every time the system boots, or only when you enter BIOS Setup.
After configuring this item, set the password(s) under the **Administrator Password/User Password** item.
▶▶ Setup   A password is only required for entering the BIOS Setup program.
▶▶ System   A password is required for booting the system and for entering the BIOS Setup program.

⬩ **Full Screen LOGO Show**

Allows you to determine whether to display the GIGABYTE Logo at system startup. **Disabled** skips the
GIGABYTE Logo when the system starts up.

⬩ **Boot Option Priorities**

Specifies the overall boot order from the available devices. Removable storage devices that support GPT
format will be prefixed with "UEFI:" string on the boot device list. To boot from an operating system that
supports GPT partitioning, select the device prefixed with "UEFI:" string.
Or if you want to install an operating system that supports GPT partitioning such as Windows 11 64-bit,
select the optical drive that contains the Windows 11 64-bit installation disc and is prefixed with "UEFI:"
string.

⬩ **Fast Boot**

Enables or disables Fast Boot to shorten the OS boot process. **Ultra Fast** provides the fastest bootup
speed.

⬩ **SATA Support**

▶▶ Last Boot SATA Devices Only   Except for the previous boot drive, all SATA devices are disabled
before the OS boot process completes.
▶▶ All SATA Devices   All SATA devices are functional in the operating system and during the POST.
This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.

○ **VGA Support**
   Allows you to select which type of operating system to boot.
   ▶▶ Auto   Enables legacy option ROM only.
   ▶▶ EFI Driver   Enables EFI option ROM.
   This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.

○ **USB Support**
   ▶▶ Disable Link   All USB devices are disabled before the OS boot process completes.
   ▶▶ Full Initial   All USB devices are functional in the operating system and during the POST.
   ▶▶ Partial Initial Part of the USB devices are disabled before the OS boot process completes.
   This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**. This function is disabled
   when **Fast Boot** is set to **Ultra Fast**.

○ **NetWork Stack Driver Support**
   ▶▶ Disable Link Disables booting from the network.
   ▶▶ Enabled   Enables booting from the network.
   This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.

○ **Next Boot After AC Power Loss**
   ▶▶ Normal Boot   Enables normal bootup upon the return of the AC power.
   ▶▶ Fast Boot   Keeps the Fast Boot settings upon the return of the AC power.
   This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.

○ **Mouse Speed**
   Allows you to set the mouse cursor movement speed.

○ **Windows 10 Features**
   Allows you to select the operating system to be installed.

○ **CSM Support**
   Enables or disables UEFI CSM (Compatibility Support Module) to support a legacy PC boot process.
   ▶▶ Disabled   Disables UEFI CSM and supports UEFI BIOS boot process only.
   ▶▶ Enabled   Enables UEFI CSM.

○ **LAN PXE Boot Option ROM**
   Allows you to select whether to enable the legacy option ROM for the LAN controller.
   This item is configurable only when **CSM Support** is set to **Enabled**.

○ **Storage Boot Option Control**
   Allows you to select whether to enable the UEFI or legacy option ROM for the storage device controller.
   ▶▶ Do not launch Disables option ROM.
   ▶▶ UEFI   Enables UEFI option ROM only.
   ▶▶ Legacy   Enables legacy option ROM only.
   This item is configurable only when **CSM Support** is set to **Enabled**.

○ **Other PCI devices**
   Allows you to select whether to enable the UEFI or Legacy option ROM for the PCI device controller other
   than the LAN, storage device, and graphics controllers.
   ▶▶ Do not launch Disables option ROM.
   ▶▶ UEFI   Enables UEFI option ROM only.
   ▶▶ Legacy   Enables legacy option ROM only.
   This item is configurable only when **CSM Support** is set to **Enabled**.

Administrator Password
 Allows you to configure an administrator password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. Differing from the user password, the administrator password allows you to make changes to all BIOS settings.

 User Password
 Allows you to configure a user password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. However, the user password only allows you to make changes to certain BIOS settings but not all. To cancel the password, press <Enter> on the password item and when requested for the password, enter the correct one first. When prompted for a new password, press <Enter> without entering any password. Press <Enter> again when prompted to confirm.
 Note: Before setting the User Password, be sure to set the Administrator Password first.
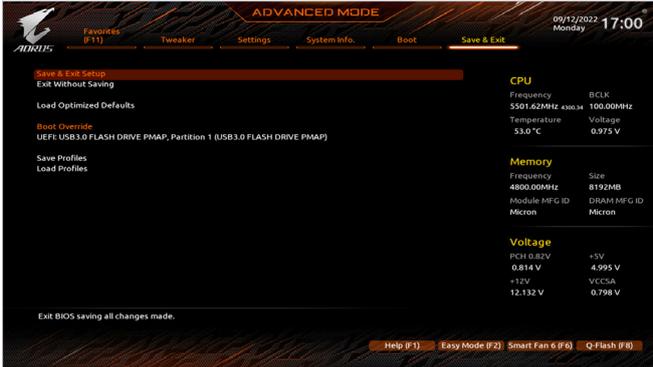
■ **Secure Boot**
 Allows you to enable or disable Secure Boot and configure related settings. This item is configurable only when **CSM Support** is set to **Disabled**.

 Preferred Operating Mode
 Allows you to select whether to enter Easy mode or Advanced mode after entering BIOS Setup. **Auto** enters the BIOS mode where it was last time.

Save & Exit

) **Save & Exit Setup**
Press <Enter> on this item and select **Yes**. This saves the changes to the CMOS and exits the BIOS Setup program. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.

) **Exit Without Saving**
Press <Enter> on this item and select **Yes**. This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.

) **Load Optimized Defaults**
Press <Enter> on this item and select **Yes** to load the optimal BIOS default settings. The BIOS defaults settings help the system to operate in optimum state. Always load the Optimized defaults after updating the BIOS or after clearing the CMOS values.

) **Boot Override**
Allows you to select a device to boot immediately. Press <Enter> on the device you select and select **Yes** to confirm. Your system will restart automatically and boot from that device.

) **Save Profiles**
This function allows you to save the current BIOS settings to a profile. You can create up to 8 profiles and save as Setup Profile 1~ Setup Profile 8. Press <Enter> to complete. Or you can select **Select File in HDD/FDD/USB** to save the profile to your storage device.

) **Load Profiles**
If your system becomes unstable and you have loaded the BIOS default settings, you can use this function to load the BIOS settings from a profile created before, without the hassles of reconfiguring the BIOS settings. First select the profile you wish to load and then press <Enter> to complete. You can select **Select File in HDD/FDD/USB** to input the profile previously created from your storage device or load the profile automatically created by the BIOS, such as reverting the BIOS settings to the last settings that worked properly (last known good record).