

# **BIOS Setup (Intel® 700 Series)**

BIOS Setup	
Startup Screen	
The Main Menu	4
Smart Fan 6	6
Favorites (F11)	
Tweaker	9
Settings	
System Information	
Boot	
Save & Exit	



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<sup>®</sup> 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.)



## 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  $<\uparrow>$  or the down arrow key  $<\downarrow>$  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.



# 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</enter>	Execute command or enter a menu
	<+>/ <page up=""></page>	Increase the numeric value or make changes
	<->/ <page down=""></page>	Decrease the numeric value or make changes
	<f1></f1>	Show descriptions of the function keys
	<f2></f2>	Switch to Easy Mode
	<f3></f3>	Save the current BIOS settings to a profile
	<f4></f4>	Load the BIOS settings from a profile created before
	<f5></f5>	Restore the previous BIOS settings for the current submenus
	<f6></f6>	Display the Smart Fan 6 screen
	<f7></f7>	Load the Optimized BIOS default settings for the current submenus
	<f8></f8>	Access the Q-Flash utility
	<f10></f10>	Save all the changes and exit the BIOS Setup program
	<f11></f11>	Switch to the Favorites submenu
	<f12></f12>	Capture the current screen as an image and save it to your USB drive
	<insert></insert>	Add or remove a favorite option
	<ctrl>+<s></s></ctrl>	Display information on the installed memory
	< For>	Main Menu: Exit the BIOS Setup program
		Submenus: Exit current submenu
	<alt>+<f></f></alt>	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.

A JON		EASYM			09/12/2022 Monday 16:57
ADRUS					
Information MB: 2790 AORUS XTREME BIOS Vec. Tod CPU: 13th Gen Intel(R) Core(TM) 19-13900K RAM: 8GB	CPU Frequency 5501.62 MHz 4300.34 Memory Frequency 4800.00 MHz	CPU Temp. 53.0 °c System Temp. 31.0 °c	CPU Voltage 0.975 v PCH 43.0 °c	VRM MOS 38.0 ℃	
DRAM Status DDR5_A1: N/A DDR5_A2: N/A DDR5_B1: N/A DDR5_B1: N/A DDR5_B2: Micron 8GB 4800MHz		SATA PCIE			
			No Device Fou	ind	English
X.M.P. Disabled					Help (F1)
Boot Sequence					🗄 Advanced Mode (F2)
Partition 1 (USB3.0 FLASH DRIVE PMAP)					😤 Smart Fan 6 (F6)
					S Load Optimized Defaults (F7)
					Q-Flash (F8)
					E+ Save & Exit (F10)
for an april of the					Ei Favorites (F11)
- 100 all to be					

# Smart Fan 6

TUNE ALL	📩 Tempe	rature	48	.0 -c	8	an Spee		14	18 <sub>RPM</sub> ®					
CPU_FAN										CPU_FAN Spee	d Control		Silent	
PU_OPT										Fan Control Us	e Tempera	ature Input	CPU	
YS_FAN1							*			Temperature li	nterval			
YS_FAN2										CPU_FAN Cont	rol mode		Auto	
rs_FAN3										CPU_FAN Stop			Disablec	
S_FAN4										CPU_FAN Mod	e		Slope	
S_FANS_PUMP					ř									
S_FAN6_PUMP				r						A CPU FAN	Fail Warnin	na	Disabler	
S_FAN7_PUMP			r							4			DISGONCE	
										⊕ CPU	48.0 °C	System	1 27.0	ľ
										System 2	31.0 °C	PCH	37.0	*
										PCIEX16	30.0 *C	I VRM M	OS 32.0	*0
			Man	Jal Con	trol Sel	tings				PCIEX4	28.0 °C	EC_TEM	1P1 -	*<
Save Fan Profile (F3)	PWM(%)	25	34	42	3	. 6	7	83	100	EC_TEMP2				
Load Fan Profile (F4)	Temp("C)	20	30	40	50	6	0	70	75					

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)

	Environ						09/12/2 Monday	<sup>022</sup> 16:5
115	(F11)					Save & Exit		
Favorit		y To +/- Items From						
Enhano	ced Multi-Core Perfo	ormance	* Auto					
Perform	mance CPU Clock Ra	itio	Auto	30			CPU	
Max Rir	ng Ratio		Auto					
Min Rin	ng Ratio		Auto				5501.62MHz 4300.34	100.00MHz
IGP Rat	tio		Auto				Temperature	Voltage
CPU Ba	ise Clock		Auto	100.00MHz			sante	o o a c
CPU Vc	ore Loadline Calibra	ation	Auto				52.0 °C	0.975 V
CPU Vc	ore		Auto	1.200V				
System	Memory Multiplier		Auto	4800			Memory	
CSM Su	troggi		Disabled				Memory	
Secure	Boot Mode		Standard					
D-TV			Disabled				4800.00MHz	8192MB
SATA C	iontroller(s)		Enabled				Module MFG ID	DRAM MF
							Micron	Micron
							Voltage	
							voicage	
							PCH 0.82V	
							0.814 V	4.987 V
							12.132 V	0.800 V
When	enabled, the highes	t Turbo Ratio is ap	plied to all CPU core	PS.				
				a montal sta at an	Helo (E1)	Easy Mode (E2)	Smart Fan 6 (F6)	O-Elash (E8

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

(511)		Twester	Cattinge	Surtem lofo			
RUS		an weaken					
CPU Upgrade			Default				
CPU Base Clock			Auto	100.00MHz			
PCIe/DMI/PEG Clo	ck Frequenc	y	Auto	100.00MHz		CPU	
Enhanced Multi-C	ore Perform	ince	Auto			Frequency	
Performance CPU	Clock Ratio		+ Auto	30		5501.62MHz 4100.14	100.00MH
Efficiency CPU Clo	ock Ratio		Auto			Temperature	Voltage
Max Ring Ratio			Auto			remperatore	ootru
Min Ring Ratio			Auto			53.0 °C	0.975 V
IGP Ratio			* Auto				
Advanced CPU Se	ttings					Memory	
DDRS Auto Boost	ter		Auto			Frequency	
DDR5 XMP Booste	er		Disabled			4800.00MHz	8192MB
System Memory N	Aultiplier		+ Auto	4800		Module MFG ID	DRAM MF
Advanced Memor	y Settings					Micron	Micron
CPU/PCH Voltage							
Vcore Voltage Mo	ode		Auto			Voltage	
CPU Vcore			Auto	1.200V		DCH 0 921/	
Dynamic Vcore(D)	VID)		Auto	+0.000V		0.914.1/	4 005 1/
<b>BCLK Adaptive Vo</b>	oltage		Auto			0.814 V	4.993 V
<b>CPU Graphics Volt</b>	tage (VAXG)		Auto	1.200V			VCCSA
	Override Mod	e	Auto			12.132 V	0.800 V



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<sup>®</sup> CPUs' unique features, please visit Intel's website.

# Advanced CPU Settings

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Favorites (F11)	Tweaker	Settings	System Info.	Boot	Save & Exit	Monda	10.35
PVD Ratio Threshold Override	e	Auto					
<b>CPU Over Temperature Prote</b>	ction	Auto					
Hyper-Threading Technology		Auto				CPU	
Intel(R) Speed Shift Technolo	gy	Enabled				Frequency	
CPU Thermal Monitor		Auto				5501.62MHz 4100.34	100.00MHz
Ring to Core offset (Down Bi	n)	Auto				Temperature	Voltage
CPU EIST Function		Auto				52 O*C	0.07EV
Race To Halt (RTH)		Auto				32.0 C	0.973 V
Energy Efficient Turbo		Auto					
Intel(R) Turbo Boost Technol	ogy	Auto				Memory	
Intel(R) Turbo Boost Max Teci	hnology 3.0	Enabled					
CPU Flex Ratio Override		Disabled				Frequency	Size
CPU Flex Ratio Settings						4800.00MHz	8192MB
Frequency TVB						Module MFG ID	DRAM MFG ID
Enhanced TVB		Auto				Micron	Micron
Voltage Reduction Initiated 1	TVB	Auto					
IA CEP (Current Excursion Pro	otection)	Auto					
GT CEP (Current Excursion Pr	otection)	Auto				Voltage	
Fll OC Mode		Auto				PCH 0.82V	
Legacy Game Compatibility M	lode	Enabled				0.814 V	4.995 V
Core VR Fast Vmode		Auto					
VX Settings		Auto				12.114 V	0.800 V
May be used to improve perf "PLL Banding" condition cau	ormance under e sed in part by a v	xtreme BCLK OC by ery high DCO frequ	reducing a ency.				
				Help (F1)	Easy Mode (F2)	Smart Fan 6 (F6)	Q-Flash (F8)
esc Back							

# ∽ 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<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> 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.

- 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. ☞ FII 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

CPU Flex Ratio Override

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

୍ମ 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

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ADRUS Favorités	reaker Settings	System Info.			Monday	
Among the Casch Grant Mode So Car Dynamic Memory Boost Realtime Internory Boost Memory Chancement Settings Memory Chancement Settings Memory Channe Detection Messa Refry Lang Caut - SPD Info - SPD Setting - Memory Chanad Training	Auto Auto Auto Auto Auto Auto Auto ge Disabled Auto				CPU Frequency 5501.62MHz 4300.34 Temperature 53.0°C Memory Frequency 4800.00MHz Module MFG ID Micron	BCLK 100.00MHz Voltage 0.975 V Size 8192M8 DRAM MFG ID Micron
Memory Training Settings  Adjusts the CPU Base Clock frequ	ency to DRAM frequency ratio.				Voltage PCH 0.82V 0.814 V 122V 12.132 V	+5V 4.995 V VCCSA 0.798 V
Cesc Back			Help (F1)	Easy Mode (F2)	Smart Fah 6 (F6)	Q-Flash (F8)

#### ∽ 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

CVD         CVD         CVD           VDD Mokelage         Auto		Save & Exit	Root	System Info	Settings	Tweaker	(F11)	
Program Mode         Auto           VDD Mode         Syrc         CPU         Frequency or voltage         Auto         1.100V         -         Frequency or voltage         Auto         Nota Voltage								RUS
VDD Model VDD AM Voltage         Sync Auto         1.000 / ·         ·         CPU           VDD AM Voltage VDD AM Voltage         Auto         1.100 / ·         ·         Still Admit 2 sour;         Got Admit 2 sour;         G					Auto		m Mode	Program
VDD Alvoltage         Autos         1.100V         -         CPU           VDD Alvoltage         Autos         1.100V         -         Prependor SUD 2012           VDD Alvoltage         Autos         1.100V         -         SD1 JAMIZ 2002         DD1 JAMIZ 2002           VDD Block         Autos         1.100V         -         -         SD1 JAMIZ 2002         Voltage           VDD Block         Autos         1.100V         -         -         400.1°         Voltage           VDD Alvoltage         Autos         1.100V         -         -         Memory         Voltage         Voltage         -         400.1°         -         -         100V         Voltage         Voltage         -         -         Memory         Voltage         Voltage         -					Sync		lode	VDD M
V00 A1 Voltage         Auto         1.100V         -         Frequency         BV Oblage           V00 B1 Voltage         Auto         1.100V         -         S01244MHz sawarz         10000MHz           V00 B1 Voltage         Auto         1.100V         -         S01244MHz sawarz         10000MHz           V00 D1 Voltage         Auto         1.100V         -         -         50124MHz sawarz         6000MHz           V00D A1 Voltage         Auto         1.100V         -         -         407         6.978           V00D A1 Voltage         Auto         1.100V         -         -         4000 MIZ         6.978           V00D A1 Voltage         Auto         1.100V         -         -         4000 MIZ         6.978           V00D A1 Voltage         Auto         1.100V         -         -         4000 MIZ         6.978           V00D A1 Voltage         Auto         1.100V         -         -         4000 MIZ         6.978           VPFA1 Voltage         Auto         1.100V         -         -         4000 MIZ         6.978           VPFA1 Voltage         Auto         1.100V         -         -         Module MIG MIZ         0.978           VPF1 Voltage <td>CPU</td> <td>CPU</td> <td></td> <td>1.100V</td> <td>Auto</td> <td></td> <td>0 Voltage</td> <td>VDD A</td>	CPU	CPU		1.100V	Auto		0 Voltage	VDD A
VCD B Voldage         Auto         1.100V         -         S36124Mt2 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	Frequency BCLK	Frequence						VDD A
ViDB B1 Voltage         Auto         1.100V         1.100V         Interpretative         Voltage           VIDD Mode         Spr.         1.00V         -         40°         Voltage         Voltage           VIDD Mode         Auto         1.100V         -         40°         Voltage         Voltage           VIDD B1 Voltage         Auto         1.100V         -         40°         MemOry           VIDD Q10 B0 Voltage         Auto         1.00V         -         40°         MemOry           VIDD Q10 B0 Voltage         Auto         1.00V         -         40°         MemOry         872.88           VIPA NV Notage         Auto         1.00V         -         40°         Module MFG ID         60°           VIPA NV Notage         Auto         1.00V         -         Module MFG ID         60°         MemOry         872.88           VIPA NV Notage         Auto         1.00V         -         Module MFG ID         60°         MemOry         97.98         Module MFG ID         60°         97.94         40°         97.94         40°         97.94         40°         97.94         40°         97.94         97.94         97.94         97.94         97.94         97.94         9	5501.24MHz 4300.27 100.00MH	5501.24N						VDD B
VDDD Mode VDDD AV VdDage         Sync         Hosp 1c         0.978 V           VDDD AV VdDage         Auto         1.100V         -         0.978 V           VDDD AV VdDage         Auto         1.100V         -         Memory           VDD AV VdDage         Auto         1.100V         -         Memory           VDD AV VdDage         Auto         1.100V         -         Memory           VPP AV VdDage         Auto         1.000V         -         4800.000mtr         812240           VPP AV VdDage         Auto         1.000V         -         Medouberr         Mico         Mico           VPP AV VdDage         Auto         1.000V         -         Mcdouberr         812240           VPP AV VdDage         Auto         1.000V         -         Mcdouberr         Mcdouberr         Mcdouberr         9034 V         -           VP BV vdDage         Auto         1.000V         1.000V         -         Mcdouber F         Mcdouber F         9044 V         -         904 V         -         904 V         -         -         Mcdouber F         9044 V         -         -         904 V         -         -         104 V         -         905 V         -         102 V	Temperature Voltage	Temperal						VDD B1
VDDD Advaltage         Auto         1.100V         -         No. C         0.918           VDDD Al Voltage         Auto         1.100V         -         -         Memory           VDDD Al Voltage         Auto         1.100V         -         -         Memory           VDD Al Voltage         Auto         1.100V         1.00V         -         -         Memory           VDD Al Voltage         Auto         1.00V         -         -         Medical Memory         5124           VPP Al Voltage         Auto         1.00V         -         -         Medical Memory         Discontine           VPP AL Voltage         Auto         1.00V         -         -         Medical Memory         Microni           VPP BL Voltage         Auto         1.00V         -         -         Medical Memory         Microni           VPP BL Voltage         Auto         1.00V         1.00V         -         -         Meconic Micronic Meconic Memory         Micronic Micronic Meconic Micronic Micr	40.0*C 0.078.V	40.0*0			Sync		Mode	VDDQ
V000 AT Voltage         Auto         1.000 · · · ·         ·           V000 AT Voltage         Auto         1.000 · · ·         ·         Memory           V000 AT Voltage         Auto         1.000 · · ·         •         #80000Mtrz         \$12248           VPFA Voltage         Auto         1.000 · · ·         •         #8000Mtrz         \$12248           VPFA Voltage         Auto         1.000 · · ·         •         Module MTGID         DAM MR           VPFA Voltage         Auto         1.000 · · ·         •         Module MTGID         Mido           VPFA Voltage         Auto         1.000 · · ·         •         Module MTGID         Mido         Mido         •         Module MTGID         Mido         •         •         Module MTGID         Mido         •         •         Module MTGID         •         •         •         Module MTGID         •         •         •         •         •         Module MTGID         •	49.0 C 0.978 V	49.0 C		1.100V	Auto		A0 Voltage	VDDQ
VIDD 80 voltage         Auto         1.00V         -         Memory           VIDD 81 voltage         Auto         1.00V         -         Froumary         Store           VIPP Mode         Store         1.00V         -         Memory         Store         1.00V         1.00V         Notes         1.00V         1.00V         Notes         1.00V         1.00V         Notes         1.00V         Notes         1.00V         Notes         1.00V         Notes         1.00V         Notes								
VCDQ B1 Voltage         Auto         1.00V	Memory	Memor						
VPF Mode         Sync         Info@umit()         Prequenci()         Status           VPF AV Voltage         Auto         1.800V         -         480.000Mtz         8132MB           VPF AV Voltage         Auto         1.800V         -         Module MrG         Dubus/Br           VPF AV Voltage         Auto         1.800V         -         Module MrG         Dubus/Br           VPF AV Voltage         Auto         1.800V         -         Module MrG         Dubus/Br           VPF BV Voltage         Auto         1.800V         -         Module MrG         Dubus/Br           VPF BV Voltage         Auto         1.800V         -         Module MrG         Dubus/Br           VPF BV Voltage         Auto         1.800V         -         Module MrG         Dubus/Br           VPF BV Voltage         Auto         1.800V         -         -         Module MrG         Dubus/Br           VPF BV Voltage         Auto         1.800V         -         -         -         -         -           VPF BV Voltage         Auto         1.800V         -         -         -         -         -         -         -         -         -         -         -         - <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>								
VPP AL Voltage         Auto         1.800 /         4490.000Hr /         4490.000Hr /         122.00           VPP AL Voltage         Auto         1.800 /         Module MrG ID         Dista Hr / D         D	Frequency Size	Frequenc			Sync		ode	VPP Mo
VIPP AT Voltage         Auto         1.800V         -         Module MG ID         Distant MF           VIPP AT Voltage         Auto         1.800V         -         Module MG ID         Micro	4800.00MHz 8192MB	4800.001		1.800V	Auto		0 Voltage	VPP A0
VIPP B0 Voltage         Auto         1.000V         -         Micron         Micro         Micro<	Module MFG ID DRAM ME	Module N						
VPPB1 Volkage Auto 1.000V VPB1 Volkage Proto 450V - 50V 0414 V 405V -12V VCCSA 12.114 V 0.800V Pogram Mode	Micron Micron	Micron						
Voltage           PCI 0.82V         +SV           0.814 V         4.995 V           +12V         VCGA           12.114 V         0.800 V								
PCI 0.827V - 55V 0.0114V 4.095V -127V VCSA 12.114V 0.800V Pogram Mode	Voltage	Voltag						
0.814 V         4.95 V           +12V         V/CCSA           12.114 V         0.800 V	PCH 0.82V +5V	PCH 0.82						
+ 11V V VCCA 12.114 V 0.800 V Program Mode	0.914.1/ 4.005.1/	0.914.1/						
-12V VCCSA 12314V 0.800V Pogram Mode	0.814 0 4.993 0	0.314 V						
Program Mode 12.114 V 0.800 V								
Program Mode	12.114 V 0.800 V	12.114 V						
							im Mode	Progra

These items allow you to adjust DDR5 memory voltages. This submenu is only present on models that support DDR5 memory.

# Advanced Voltage Settings

1 10/7/2	ADV	ANCED MOD			09/13/2	022 14:52
ADRU5 Favorités (F11) Tweaker	Settings	System Info.			Tuesda	
CPU Core PLL Overvoltage (+mV)	Auto					
RING PLL Overvoltage (+mV)	Auto				CPU	
GT PLL Overvoltage (+mV)	Auto	0				
SA PLL Overvoltage (+mV)	Auto	0			Frequency	BCLK
Atom PLL Overvoitage (+mv)	Auto	0			5501.24MHZ 4300.21	100.00MHz
CPU/VRM Settings	Auto	Ū			Temperature 49.0 °C	Voltage 0.978 V
					Memory	
					Frequency 4800.00MHz	Size 8192MB
					Module MFG ID Micron	DRAM MFG ID Micron
					Voltage	
					PCH 0.82V	
					0.814 V	4.987 V
					12 114 V	0.800 V
			Help (F1)	Easy Mode (F2)	Smart Fan 6 (F6)	Q-Flash (F8)

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

# Settings

1		1.	ADV				09/12/2 Mondu	<sup>022</sup> 16:59
ADRUS	(F11)		Settings				-	
<ul> <li>Platfor</li> <li>IO Port</li> <li>Miscell</li> <li>Option</li> <li>PC Heat</li> </ul>	m Power :s aneous I Search (Hot Key: Alt Ilth Status						CPU Frequency 5501.62MHz 4360.34 Temperature 53.0 °C	BCLK 100.00MHz Voltage 0.978 V
							Memory Frequency 4800.00MHz Module MFG ID Micron	Size 8192MB DRAM MFG ID Micron
							Voltage PCH 0.82V 0.814 V +12V 12.114 V	+5V 4.995 V VCCSA 0.798 V
				and die	Help (F1)	Easy Mode (F2)	Smart Fan 6 (F6)	O-Flash (F8)

Platform Power

1		1. Ale	ADVAN		E	1/0	09/12/2	2022 16.59
anone	Favorités (F11)	Tweaker	Settings	System Info.	Boot	Save & Exit	Monda	y 10.39
PEG	ASPM		Auto					
PCH DMI	ASPM ASPM		Auto Auto				CPU	
53 Si	ave Mode		Disabled				Frequency 5501.62MHz 4300.34	BCLK 100.00MHz
ErP Soft- Resu	Off by PWR-BTTN me by Alarm		Disabled Instant-Off Disabled				Temperature 52.0 °C	Voltage 0.975 V
Wa Wa	ske up hour ske up minute ske up record						Memory Frequency	
Nath Pow RC6(	ve ASPM er Loading Render Standby)		Auto Auto Enabled				4800.00MHz Module MFG ID Micron	8192MB DRAM MFG ID Micron
AC B	ACK		Always Off				Voltage PCH 0.82V	
							0.814 V +12V 12.132 V	4.995 V VCCSA 0.800 V
Enal	oled/Disabled Active St	ate Power Manager	ment of PEG PCIe Sk	ot				
					Help (F1)	Easy Mode (F2)	Smart Fan 6 (F6)	Q-Flash (F8)
Cesc Bac	k							

#### ☞ 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 Displ					A C C C C XIC		
Initial Displ							
	ay Output		PCIe 1 Slot				
internal Gr	aphics		Enabled			CPU	
DVMT Pre-	Allocated		60M			Frequency	
Aperture S	ize		256MB			5501.62MHz 4100.34	100,00MH
PCIE Bifurc	ation Support		Auto			Temperature	Voltage
OnBoard L	AN Controller		Enabled			52 O*C	0.075 V
OnBoard L	AN Controller#2		Enabled			33.0 C	0.973 V
Above 4G t	Decoding		Auto				
Re-Size BA	R Support		Auto			Memory	
IOAPIC 24-	119 Entries		Enabled			memory	
Compliance	e Test Mode		Disabled			Frequency	
Compliance	e Test Mode		Disabled			4800.00MHz	8192MB
IOTG PLL S	SCEN (CPU Side SSC	)	Enabled			Module MFG ID	DRAM MF
Pcie Pll SSC			Auto			Micron	Micron
intel Graph	ics Pei Display Peim		Disabled				
Gigabyte U	tilities Downloader	Configuration					
Thunderbo	It(TM) Configuration					Voltage	
USB Config	uration					PCH 0.82V	
Network SI	tack Configuration					0.803 V	4 995 V
NVMe Coni	Figuration					0.000 1	
SATA Conf	iguration					+12V	VCCSA
VMD setup	menu					12.132 V	0.800 V
Select whi	ch video display out	put will be enable	ed during POST				

# ☞ 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.
- ▶ PCle 1 Slot Sets the graphics card on the PCIEX16 slot as the first display.
- ▶ PCle 2 Slot Sets the graphics card on the PCIEX8 slot as the first display.
- ▶ PCle 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<sup>®</sup> Thunderbolt<sup>™</sup> controller or motherboards that have a GIGABYTE Thunderbolt<sup>™</sup> 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<sup>™</sup> 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  $\ensuremath{\textit{Network Stack}}$  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  $\ensuremath{\textit{Network Stack}}$  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

LEDS IN System LEDS IN Sileep, RST_SW (MUL GENS Redrive GENS DC Gair Onboard DB I Intel Platform 30Mark01 En CPU PCIe Link PCH PCIe Link VT-d	11) Tweat m Power On State Hibernation, and Soft of TIKEY) r SiPO Mode tion Port LED Trust Technology (PTT) hancement Speed	Off States	On Off Set this but Enabled 0 1 On Enabled	System Info.	Save & Exit	CPU Frequency 5501.62MHz 4360.34 Temperature	BCLK 100.00MHz
<ul> <li>Trusted Comp</li> </ul>	Speed		Disabled Auto Auto Disabled			53.0 °C Memory Frequency 4800.00MHz Module MFG ID Micron Voltage	0.978 V Size 8192MB DRAM MFG Micron
LEDs in Syste	m Power On State: On/	off				PCH 0.82V 0.814 V +12V 12.132 V	+SV 4.995 V VCCSA 0.800 V

# ∽ 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.

## ∽ 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.

# 

- ▶ Set this button to HW Reset
- ➡ Set this button to Switch LED On/Off
- Use the button to reset your system.
- o Switch LED On/Off Use the button to turn on/off the motherboard LEDs.
- Set this button to Enter BIOS Setup
   Set this button to Boot on Safe Mode
- Use the button to enter the BIOS Setup. Use the button to boot the system in safe mode.
- → GEN5 Redriver SIPO Mode

Enables or disables GEN5 Redriver SIPO Mode.

# ☞ GEN5 Equization

Allows you to adjust the GEN5 equalization value.

☞ GEN5 DC Gain

Allows you to adjust the GEN5 DC Gain value.

# ∽ Onboard DB Port LED

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

Intel Platform Trust Technology (PTT) Enables or disables Intel® PTT Technology.

# 3DMark01 Enhancement Allows you to determine whether to enhance some legacy benchmark performance.

# ☞ 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<sup>®</sup> 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

1 6/5							09/12/2	022 17:00
ADRUS	Favorités (F11)		Settings	System Info.		Save & Exit	Monday	11.00
Reset Cal Case Opt CPU Vcol CPU VCC VDD2 CP PCH 1.8V +3.3V +SV	se Open Status en N AUX SA U		Disabled YES 0.972 V 1.809 V 0.792 V 1.100 V 1.815 V 3.339 V 4.995 V				CPU Frequency 5501.62MHz 4300.34 Temperature 53.0 °C	BCLK 100.00MHz Voltage 0.972 V
PCH 0.82 +12V CPU VAX	G		0.814 V 12.132 V 0.033 V				Memory Frequency 4800.00MHz Module MFG ID Micron	Size 8192MB DRAM MFG ID Micron
							Voltage PCH 0.82V 0.814 V +12V 12.132 V	+5V 4.995 V VCCSA 0.798 V
Select er notificat	able to clear the ions. The 'Case O	record of previous cl pen' field will show 'f	hassis intrusion sta No' at next boot.	tus				
esc Back	la de la de la desta de la de la desta d	(10)	A de la	<u></u>	Help (F1)	Easy Mode (F2)	Smart Fan 6 (F6)	Q-Flash (F8)

# ∽ 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

Favorites					Monday	
(F11) Twea	Ker Settings	System Info.	Boot	Save & Exit		
Model Name	Z790 AOF	IUS XTREME				
BIOS Version	TOd				CPU	
BIOS Date	09/09/202	2			Frequency	
BIOS ID	8ARPT002	2			5501.62MHz 4300.34	100.00MH
					Temperature	Voltage
Processor Type	13th Gen	Intel(R) Core(TM) i9-13	900K		53.0 °C	0.972 V
Processor CPUID	cessor CPUID 000B0671					
Processor Speed	100.00MF	IZ				
Processor Clock S501.62MHz]4300.34				Memory		
Installed Memory	8192MB				Frequency	Size
	0000000	50054			4800.00MHz	8192MB
LAND MAC Address	D85ED38	D85ED38FBBE4				
DANZ MAC Address	DOSEDSO	FDDES			Module MrG ID	DRAM MP
Access Level	Administr	ator			MICION	MICION
System Language	English					
					Voltage	
System Date	[ 09 / 12	/ 2022 1 Mon			00100000	
System Time	[ 17 : 00	:11]			PCH 0.82V	100514
					0.814 V	4.995 V
Plug in Devices Info						VCCSA
					12.132 V	0.800 V
Set the Date. Use Tab to switch betw	veen Date elements.					

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

		1. del	ADV	ANCED MOD	E		09/12/2	<sup>022</sup> 17:0
RUS	(F11)					Save & Exit		
Save & I	Exit Setup						CRU	
Exit Wit	hout Saving						CFU	DCLK
Load Or	timized Defaults						SS01.62MHZ 4340.34	100.00MHz
							Temperature	Voltage
							53.0 °C	0.975 V
UEFI: US	B3.0 FLASH DRIVE	PMAP, Partition 1	USB3.0 FLASH DF	RVE PMAP)				
Save Pri	ofiles						Memory	
Load Pr	ofiles						Memory	
							4800 00MHz	5120 8192MB
							Module MEG ID	DRAM MEC
							Micron	Micron
							Voltage	
							PCH 0.82V	
							0.814 V	4.995 V
							12.132 V	0.798 V
Exit BIC	S saving all chang	es made.						
					Help (F1)	Easy Mode (F2)	Smart Fan 6 (E6)	O-Flash (F8

#### ☞ 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).