# Z690GTA Motherboard

- Supports 12th/ 13th/ 14th Generation Intel Core™ Processor
- Intel Z690 single chip architecture
- Supports 4-DIMM DDR4- 1866/ 2133/ 2400/ 2666/ 2800/ 29333200/ 3600(OC)/ 3800(OC)/ 4000(OC)/ 4133(OC)/4333(OC)/ 5000+(OC) up to 128 GB Memory
- Supports PCIe 5.0
- Supports PCIe M.2 4.0 (64Gb/s)
- Supports Intel Optane Technology
- Supports HDMI®
- Supports 2.5 GbE LAN
- Supports USB 3.2 Gen2 Type C
- Support WiFi 6 & 6E module (No WiFi card included)

| Specifcation | |
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| CPU SUPPORT | Support for 12th/ 13th/ 14th Generation Intel Core™ i9/ i7/ i5/ i3 processors and Intel Pentium processors/ Intel Celeron processors in the LGA1700 package<br>* Please refer to www.biostar.com.tw for CPU support list. |
| MEMORY | Supports Dual Channel DDR4-1866/ 2133/ 2400/ 2666/2800/2933/3200/3600(OC)/3800(OC)/4000(OC)/ 4133(OC)/4300(OC)/5000+(OC)<br>4 x DDR4 DIMM Memory Slot, Max. Supports up to 128 GB Memory<br>Each DIMM supports non-ECC 4/ 8/ 16/ 32GB DDR4 module<br>Support Intel Extreme Memory Profile (XMP) memory modules<br>* Please refer to www.biostar.com.tw for Memory support list |
| INTEGRATED VIDEO | By CPU model<br>Supports DX12<br>Supports HDCP |

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| STORAGE | Total supports 3 x M.2 socket and 8x SATA III (6Gb/s) ports<br>Intel 12th/13th/14th Processors<br>1 x M.2 (M Key) Socket (M2-PCIE4_64G_1)<br>Supports M.2 Type 2280 SSD module<br>Supports PCIe 4.0 x 4 (64Gb/s)<br>Intel Z690 Chipset<br>1 x M.2 (M Key) Socket (M2_PCIE4_64G_2):<br>Supports M.2 Type 2280 SSD module<br>Supports PCIe 4.0 x 4 (64Gb/s)<br>Supports Intel Rapid Storage Technology and Intel Optane Technology<br>1 x M.2 (M Key) Socket (M2_PCIEG3_32G_SATA_1):<br>Supports M.2 Type 2242/ 2260/ 2280/ 22110 SSD module<br>Supports PCIe 3.0 x 4 (32Gb/s) & SATA lll (6Gb/s) SSD<br>Supports Intel Rapid Storage Technology and Intel Optane Technology<br>8 x SATA III Connector (6Gb/s): Supports AHCI, RAID 0, 1, 5, 10 (Support Only SATA_1~SATA_4) & Intel Rapid Storage Technology<br>* When using SATA SSD module on M.2 Socket (M2_PCIEG3_32_SATA_1), the SATA_8 connector will be disabled.<br>** When using PCIE SSD module on M.2 Socket (M2_PCIEG4_64G_2), the PCIEG4X4 slot will be disabled. |
| LAN | Realtek RTL8125B<br>10/ 100/ 1000/ 2500 Mb/s auto negotiation, Half / Full duplex capability |
| AUDIO CODEC | ALC1220<br>7.1 Channels, High Definition Audio, Hi-Fi(Front) |
| USB | 2 x USB 3.2 (Gen2) Type-C port (1 on rear I/O and 1 via internal header)<br>5 x USB 3.2 (Gen2) port (5 on rear I/Os)<br>2 x USB 3.2 (Gen1) port (2 via internal header)<br>6 x USB 2.0 port (2 on rear I/Os and 4 via internal header) |
| EXPANSION SLOT | INTEL 12th/13th/14th Processors<br>1 x PCIe 5.0 x16 Slot (x16 mode or x8/x8 mode)<br>1 x PCIe 4.0 x16 Slot (x4 mode)<br>INTEL Z690 Chipset<br>2 x PCIe 3.0 x1 Slots |
| REAR I/O | 2 x WIFI Antenna Ports<br>1 x PS/2 Keyboard/ Mouse Port<br>1 x HDMI® Port<br>1 x DP Port<br>1 x DVI-D Port<br>1 x USB 3.2 (Gen2) Type-C Port<br>5 x USB 3.2 (Gen2) Ports<br>2 x USB 2.0 ports<br>1 x LAN port<br>3 x Audio Jack |

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| INTERNAL I/O | 8 x SATA III Connectors (6Gb/s)<br>1 x M.2 (E Key) Socket : Supports 2230 type Wi-Fi & Bluetooth module and Intel CNVi<br>2 x USB 2.0 Headers (each header supports 2 USB 2.0 ports)<br>1 x USB 3.2 (Gen1) Header (each header supports 2 USB 3.2 (Gen1) ports)<br>1 x USB 3.2 (Gen2) Type C Header.<br>1 x 4-Pin Power Connector<br>1 x 8-Pin Power Connector<br>1 x 24-Pin Power Connector<br>1 x CPU Fan Connector<br>1 x CPU water cooling connector (CPU_OPT)<br>3 x System Fan Connectors<br>2 x MOSFET Fan Connectors<br>1 x Front Panel Header<br>1 x Front Audio Header<br>1 x Speaker Header<br>1 x Clear CMOS Header<br>1 x COM Port Header<br>1 x TPM Header<br>1 x Thunderbolt Header<br>2 x LED Header (5V)<br>1 x LED Header (12V)<br>1 x IO LED Header<br>1 x SB LED Header<br>* M.2 (E key) Wi-Fi card is not provided |
| H/W MONITORING | CPU / System Temperature Monitoring<br>CPU / System Fan Monitoring<br>Smart / Manual CPU Fan Control<br>System Voltage Monitoring |
| DIMENSION | ATX Form Factor Dimension: 30.5 cm x 24.4cm ( W x L ) |
| OS SUPPORT | Supports Windows 10(64bit) / 11(64bit)<br>※Biostar reserves the right to add or remove support for any OS with or without notice. |
| BUNDLE SOFTWARE | Racing GT Utility<br>BullGuard |
| ACCESSORIES | 4 x SATA Cable<br>1 x DVD Driver<br>1 x User Manual |
| FEATURES | VIVID LED DJ<br>M.2 Cooling Protection<br>Tweak Tech<br>BIO-FLASHER<br>A.I FAN<br>LED ROCK ZONE<br>RGB Memory Sync<br>BIOS EZ Mode /Advanced Mode<br>Intel Optane technology |

# OVERVIEW

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## Intel Z690 chipset

With the Intel® Z690 chipset and the 12th generation Intel® Core™ i9/ i7/ i5/ i3 processors and Intel® Pentium® processors, you will immediately be at the forefront of the battlefield, fueled by mind-blowing power and performance. From content creation to gaming, the Intel Z690 chipset provides you with the power and performance you need.

## Hi-Fi

A combination of exclusive hardware & software design including "ground-isolation circuit design","an independent audio power", and "a built=on-board amplifier", with all these hardware features gives you the best audio quality and performance. As for software, we offer you a free bundle utility "Multi-Channel Calibration" which normally you'll find in high level sound systems; this feature allows you to auto detect your location; with a user friendly interface, you can easily adjust the volume of every speakers to make a well balanced surround sound. And of course, the built-on-board amplifier always gives you a super powerful sound comparing to other motherboards.

## HD Audio

Provides high quality sound with minimal loss of audio fidelity.

## Hi-Fi Ground

BIOSTAR Hi-Fi Ground ( Golden Line ) is noise-blocking multi-layer PCB design to isolates analog audio signals from digital sources. Unique PCB layout is ideal for exceptional clarity and high fidelity sound.

## Hi-Fi AMP

The built-in amplifier can drive major high-end headphones with over 100dB loads and offer wide band-width, low noise, high slew rate and low distortion audio source from front panel I/O. Gaming enthusiasts can enjoy a fuller range of dynamic sound with crisper details and less distortion.

## Smart Ear

Smart EAR is a windows-based audio utility which allows you to easily adjust system volume. With its user-friendly GUI, you can also increase or decrease impedance setting (Low/High Gain) to optimize your headphone performance. You can easily enjoy high-quality and awesome sound.

## Hi-Fi Cap

Hi-Fi Cap delivers low noise, low distortion, and wide bandwidth to achieve the highest sound resolution and sound expansion. It ensures the most realistic sound effects to gaming enthusiasts.

## HDMI® 2.0

HDMI® 2.0 supports true 4K resolution- 4096*2160@60hz. A significant increase in bandwidth is up to 18mbps, and significant enhancements are added to support the continued increase consumer demands on video and audio experience.

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## HDMI® 4K2K

The new 4K2K resolution enables high-definition image display with four times the resolution of full HD, 4K2K display is faithfully express bright, highly detailed content that fills the entire screen with lifelike images. Connectivity with PCs via a single HDMI® cable for displaying 4K2K data.

## DVI

DVI is better than VGA for LCD displays since it is digital while VGA is analog. For LCD displays, the picture is digitized pixel per pixel. Through DVI, the panel gets data for each pixel, so the picture generated in the Graphics device matches the pixels on the panel itself.

## DisplayPort

DisplayPort is a digital display interface developed by the Video Electronics Standards Association (VESA). The interface is primarily used to connect a video source to a display device such as a computer monitor, though it can also be used to carry audio.

## DX12

DirectX 12 introduces the next version of Direct3D, the graphics API at the heart of DirectX. Direct3D is one of the most critical pieces of a game or game engine, and we've redesigned it to be faster and more efficient than ever before. Direct3D 12 enables richer scenes, more objects, and full utilization of modern GPU hardware.

## PCIe M.2

PCIe M.2 32Gb/s delivers the highest bandwidth and lower latency. It is 3 times faster compared with PCIe M.2 10Gb/s.

## SATAIII 6Gbps

SATAIII 6Gbps provides a higher bandwidth to retrieve and transfer HD media. With this super speed data transfer, SATAIII allows an incredible data boost which is 2x faster than the SATA II.

## Dual DDR4

The primary advantages of DDR4 over DDR3, include higher module density, lower voltage requirements, coupled with higher data transfer rate.

## PCIe 5.0

PCIe 5.0 increases the data rate from 16GT/s to 32GT/s, which is twice as fast as PCIe 4.0. The maximum data transfer of bandwidth for two-way communication can reach 128GB/s. In addition, synchronized compatible with PCIe 4.0 and previous versions of devices.

## PCIe 4.0

PCIe 4.0 is the ubiquitous and general-purpose PCI Express I/O standard. At 16GT/s bit rate, the interconnect performance bandwidth is doubled over PCIe 3.0, while preserving compatibility with software and mechanical interfaces.

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## PCIe 4.0 M.2

PCIe 4.0 M.2 delivers the highest bandwidth and lower latency. It is 2 times faster compared with PCIe 3.0 M.2 .

## USB 3.2 Gen2 Type-C

USB 3.2 Gen2 offers up to double the transfer speed of USB 3.2 Gen1 at 10 Gbps that allows for much higher data transfer rates and more efficient data transfer. And the Type-C connector is reversible so it's easier to plug in.

## USB 3.2 Gen2 Type-A

USB 3.2 Gen2 is a new standard called SuperSpeed USB 10Gbps to address increased performance and improve data transmission speed. It is for a max data transfer rate of 10Gbps and creates the best possible connection between your devices.

## Intel Optane Memory Ready

Intel Optane memory can accelerate traditional storage devices to reduce boot times and improve the overall performance, like a brand-new system. This revolutionary memory technology transforms your old PC to a performance monster without expensive SSD.

## Dr. MOS

Dr. MOS integrates driver ICs and high-side / low-side MOSFETs into a small package to reduce switching losses that enables superior efficiency and performance at higher switching frequencies.

## Digital PWM

Digital PWM controller is with dual-output multiphase that faster transient performance and accurately regulated frequency control. It can be enabled to greatly increase system efficiency.

## Super Durable Solid Caps

The best quality solid state capacitors with ultra low ESR design, the Super Durable Solid Caps doubles the lifespan.

## Iron Slot Protection

The exclusive Iron Slot Protection can reinforce PCI-E x16 slots to handle heavier graphics cards, prevent bending, and extend longevity of the slot, making the new-gen RACING Series much more robust.

## Tough Power Connectors

Tough Power Connectors are very robust that have larger area to ensure stable and reliable power supply. They can pack more power and durability to make your PC last longer.

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## Super Durable Inductor

Super Durable Inductor brings the benefits of higher current capacity, lower energy loss and better power stability.

## Moistureproof PCB

The PCB will be oxidizing easily by damp or absorbed moisture, and ionic migration or CAF (Conductive Anodic Filament) will be generated. Moistureproof PCB meets high density and high reliability requirements for moisture proof.

## M.2 Cooling Protection

M.2 heatsink features ultra-high cooling efficiency for protecting the M.2 SSD from thermal problems, extending the M.2 SSD lifespan for long-term usage and stable operation. To top it off, this cooling design makes the performance of certain M.2 (PCI-e 3.0x4) products most efficient even under high-temperature operating.

## ESD Protection

ESD (Electrostatic Discharge) is the major factor to destroy the PC by electrical overstress (EOS) condition. ESD occurred by PC users when touch any devices connect to a PC, which may result in damage to the motherboard or parts. ESD protection is designed to protect the motherboard and equipment from damage by EOS.

## OC / OV / OH Protection

OC / OV / OH Protection design detects overvoltage conditions and prevents voltage surges from spreading in real time. It also actively cuts off the overvoltage supply to protect your system.

## Armor Gear

The new Armor Gear, which offers more stability and durability, comes with I/O Armor to protect I/O interfaces from static electricity. It is equipped with full-color RGB LED light that users can use VIVID LED DJ to synchronize it and build your own color gaming lights.

## 2.5Guard

2.5GUARD features 2.5G having higher data transfer speeds and can strengthen electrical stability and prevent damage from lightning strikes and electrical surges. It's 2.5X improvement than standard Ethernet connections.

## VIVID LED DJ

New VIVID LED DJ with more customizability and options to control multiple RGB LED lighting zones independently. Users can control color, speed and brightness for different modes at ease. Moreover,have more possibilities for users to create unlimited creativity with 5050 LED FUN ZONE which comes with dual RGB LED products.

## UEFI BIOS

Unified Extensible Firmware Interface (UEFI) is a brand new framework that provides a revolutionary interface. It is a modern clear and easy-to-use graphical user interface. The UEFI comes with a colorful easy-understand icons lead users into the setup layer directly.

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## EZ Mode

BIOSTAR EZ Mode makes everything as simple and efficient as possible. It has an attractive easy-to-use BIOS system interface that guides users to solve their problems with ease. It lays out the things which you often do in BIOS system to make the flow smooth and seamless.

## BIO-Flasher

BIO-Flasher is a convenient BIOS update tool. Just launch this tool and put the BIOS on USB pen driver before entering the OS. You can update your BIOS with only a few clicks without preparing an additional floppy disk or other complicated flash utility.

## A.I FAN

With A.I FAN users can ensure that their gaming PC can maintain its performance while staying cool. According to different cooling needs and usage scenarios, users can control speed modes. Allows users to have more customizability of fan modes and automatically detects different temperatures to make fan operate at defined speed for optimal cooling performance.

## LED ROCK ZONE

LED ROCK ZONE comes with the RGB 12V LED header and Digital 5V LED header which offer more colorful lighting options to DIY lovers. Adjusting the color of LED and changing system colors by VIVID LED DJ will make you fully enjoy the process of PC modding developing your personal style.

## CPU OPT

BIOSTAR offers one more fan header which is called CPU OPT. Users can use it to connect any kind of water coolers for a liquid cooling system. Keep your computer stable and enjoy your machine at the utmost potential.

## BIOSTAR RGB SYNC

BISOTAR RGB SYNC is designed to create your personalized lighting effects. Let all the RGB peripherals and components sync together.

## Debug LED

Debug LED helps you identify any issues going with your board or hardware. When error occurs, the corresponding LED lights will inform you on the status of your board or hardware to shorten the test time effectively.

## A.I TP Control

A.I TP Control is designed for overclockers. It provides a user-friendly BIOS environment that overclockers can adjust the temperature setting to keep your PC safe and enjoy extreme overclocking performance.

## Smart Update

Biostar Smart Update is a utility that can help users run online update. It can download the drivers for your motherboard from Biostar official website and install them automatically.

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## HDMI®

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*The specification and pictures are subject to change without notice and the package contents may differ by area or your motherboard version!

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