

GA-Z690-AORUS-PRO

Gigabyte Z690 AORUS PRO Z690 Express Chipset Gen 12 LGA 1700 ATX Motherboard

Product Overview

Gigabyte GA-Z690-AORUS-PRO Z690 AORUS PRO - Z690 Express Chipset: Socket LGA1700, Supports 12th Generation Intel Core Processors, Memory: 4x Dual Channel DDR5 DIMM Slots (128GB Max), Expansion Slots: 1x PCI-Express 5.0 (x16 Speed), 2x PCI-Express 3.0 (4x Speed), Storage and USB: 6x SATA 3 (6 Gb/s) connection, 4x M.2 Gen4, 6x USB 3.2 Gen 1 (4x Back, 2x Cable), 4x USB3.2 Gen 2 Type A, 2x USB Type C (1x Back), 8x USB 2.0 Ports (4x Back, 4x Cable), Misc.: 1x Intel 2.5GbE LAN chip, Wifi 6 BT, Rear IO Panel Display Ports Available: 1x DP



Specifications

Features:

- Supports 12th Gen Intel® Core™ Series Processors
- Dual Channel Non-ECC Unbuffered DDR5, 4 DIMMs
- 16 1 2 Direct Digital VRM Design with 90A Power Stage* and Tantalum Polymer Capacitor
- DDR5 XTREME MEMORY Design with SMD DIMM and Shielded Memory Routing
- Fully Covered Thermal Design with High Coverage MOSFET Heatsinks
- Intel® WIFI 6 802.11ax 2T2R & BT5 with AORUS Antenna
- Hi-Fi Audio with ALC4080 and WIMA Audio Capacitors
- Fast 2.5GbE LAN with Bandwidth Management
- 4x Ultra-Fast NVMe PCIe 4.0*/3.0 x4 M.2 with Enlarged Thermal Guard
- SuperSpeed USB 3.2 Gen2x2 TYPE-C delivers up to 20Gb/s transfer speeds
- RGB FUSION 2.0 with Multi-Zone Addressable LED Light Show Design, Support Addressable LED & RGB LED Strips
- Smart Fan 6 Features Multiple Temperature Sensors , Hybrid Fan Headers with FAN STOP
- Q-Flash Plus Update BIOS without Installing the CPU, Memory and Graphics Card

THE NEW KING OF GAMING

Rule supreme with the Z690 AORUS gaming motherboards. The new king of gaming platform continues the legendary AORUS bloodline with the most robust power delivery and dominant thermal design, glorified with the complete memory overclocking technology to crown your PC with the best Alder Lake's performance in all its gaming glory.

Unparalleled Performance

With technology moving so fast, GIGABYTE still keep up with the latest trends and provide our customers with advanced features and latest technology. GIGABYTE Z690 Series motherboards come with upgraded power solution, latest storage standards and outstanding connectivity to enable optimize performance for gaming.

Direct Digital VRM Design

To ensure maximum Turbo Boost and overclocking performance of Intel's new generation CPU, GIGABYTE Z690 series equip the best VRM design ever built with the highest quality components.

GIGABYTE DIRECT VRM DESIGN

The more advanced manufacturing process and the higher core count on the new generation of CPUs, requires motherboards to utilize a more sophisticated VRM design to make CPUs run at their full potential. GIGABYTE uses fully DIRECT VRM DESIGN, high quality MOSFETs and tantalum polymer capacitors to achieve higher efficiency, lower voltage ripple and lower temperature than traditional parallel VRM design.

Tantalum Polymer Capacitor

- Lower impedance than regular capacitor to reduce voltage ripple
- Stable capacitance under high temperature
- Mounted right under the CPU area to stabilize CPU voltage during heavy loading

PCIe 5.0 Design

GIGABYTE Z690 Motherboards are ready to work with the upcoming PCIe 5.0 devices which are expected to experience double bandwidth than the current PCIe 4.0 devices. To reach the high speed and maintain good signal integrity, GIGABYTE R&D uses the low impedance PCB to provide the maximum performance.

Ultra Durable™ SMD PCIe 5.0 Armor

GIGABYTE' exclusive stainless steel shielding design.

Triple 7GB/s Gen4 M.2 PCIe SSDs in RAID 0

The exclusive 3 PCIe 4.0 M.2 and 2nd Generation 7000 MB/s SSD provides unparalleled Read/ Write performance up to 21053 and 15499 MB/s.

Hybrid Cores Optimization

With new Intel Hybrid technology, GIGABYTE exclusively creates two new "CPU Upgrade" in BIOS profiles to meet different users' scenarios by adjusting P-Core and E-Core activation and voltage policy.

XTREME MEMORY

GIGABYTE Z690 Motherboards feature the latest DDR5 architecture and XMP 3.0 capability. The new DDR5 memory technology brings 50% more bandwidth to the platform and increases the system performance drastically by implementing Unlocked Native DDR5 Voltage, Xtreme Memory Routing and reliable SMD slot. In addition to the hardware upgrades, the user friendly UI provides full functionality to overclock higher with exclusive DDR5 tuning capability.

DDR5 Comes with 50% Performance Increase

DDR5 delivers 50% improvement compared to last generation. DDR5 massively elevates the system level performance. DDR5 provides more bandwidth to keep up with the higher CPU core count bandwidth requirement. The new memory architecture also reduces the power consumption.

Support for DDR5 XMP Up to 6200MHz and Beyond*

AORUS is offering a tested and proven platform that ensures proper compatibility with profiles up to 6200MHz and beyond. All users need to do to attain this performance boost is to ensure that their memory module is XMP capable and that the XMP function is activated and enabled on their AORUS motherboard.

Unlock DDR5 Voltage

- GIGABYTE exclusive circuit design unlocks Native DDR5 voltage control
- Transforms Native DDR5 memory module to Overclocked DDR5 memory
- Increases DDR5 memory overclocking performance and capability

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- Supports all PMIC vendors for maximum compatibility

Programmable Mode

GIGABYTE's exclusive design unlocks Native DDR5 PMIC secure mode into programmable mode and control Native DDR5 voltage with wide range.

Shielded Memory Routing

All memory routing is under the PCB inner layer shielded by a large ground layer to protect from external interference.

Ultra Durable™ SMD DDR5 Memory Armor

GIGABYTE's exclusive stainless steel shielding design.

DDR5 Auto Booster

Automatically Boost the Native DDR5 frequency to 5000MHz while the system is under heavy loading by a single click.

DDR5 Memory Upgrade

GIGABYTE BIOS offers pre-defined and retrievable profiles for users to get higher performance easily. The profiles are based on a database that is created by checking each memory IC and PMIC vendors to optimize the modules to unleash their full potential. This is a time saving feature to manually configure overclocked DDR5 memory kits.

- Instantly upgrade memory performance
- Overclock Native and XMP 3.0 DDR5 memory to higher frequency easily
- No need to input dozens of memory parameters such as clock, voltage and timings
- Built-in wide variety pre-tuned profiles database for different memory IC vendors

XMP 3.0 User Profile

Define and create your own SPD profile into Native and XMP 3.0 memory modules or apply the pre-tuned profiles to XMP 3.0 User Profile. Two user-defined profiles can be saved, loaded either locally or from/to an external storage device.

- Two empty SPD profiles can be defined by users and carry to next computer
- Transfer DDR5 XMP Booster profiles into XMP 3.0 User Profiles
- Quick memory performance simulation based on user input clock and timing parameters
- Profile save and load function to share your memory parameters online

THERMAL REACTIVE ARMOR

GIGABYTE Z690 Series Motherboards' Un-throttled performance is guaranteed by innovative and optimized thermal design to ensure the best CPU, Chipset, SSD stability and low temperatures under full load application and gaming.

Fully Covered Thermal Design

High coverage MOSFET and integrated molding Heatsinks to improve thermal efficiency with better airflow and heat exchange.

M.2 Thermal Guard II

M.2 Thermal Guard II uses a double-sided heatsink design and prevents throttling and bottlenecks on high speed M.2 SSDs by dissipating heat before it becomes an issue.

Enlarged Thermal Guard

Enlarged double-sided M.2 heatsink prevents high-speed, large capacity PCIe 4.0/3.0 SSDs with double side flash from throttling due to overheating.

5 W/mK Thermal Pad

By using 1.5mm thicker 5 W/mK thermal conductivity pads, it can transfer 2.7x more heat compared to traditional thermal pads in the same time.

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2X Copper PCB

2X Copper PCBs design effectively lower the component temperature by its high thermal conductivity and low impedance.

2X Large Surface

Increased surface area up to 2X larger compared to traditional heatsinks. It improves heat dissipation from the MOSFETs.

Real One-piece Build

TMOS is a TRUE single piece heatsink. Its one-piece design and larger surface drastically improve the cooling performance against competitors' multi-piece design.

Multi-Cut Design

TMOS features several channels and inlets on the heatsink. This design allows for the air flow to go through which leads to a great improvement of the heat transfer performance.

AORUS M.2 Thermal Guard II

The M.2 Thermal Guard II uses a double-sided heatsink design and prevents throttling and bottlenecks on high speed M.2 SSDs by dissipating heat before it becomes an issue.

3% Cooler by implementing 2X copper PCB Design

By adopting 2X copper on PCB inner layer, it lowers the components' temperature at least 3% by turning the PCB into a super thin PCB size copper heatsink to dissipate the heat from the components effectively, due to its high thermal conductivity and lower impedance.

Smart Fan 6

Smart Fan 6 contains several unique cooling features that ensure gaming PC maintain its performance while staying cool and quiet. Multiple fan headers can support PWM/DC fan and pump, and users can easily define each fan curve based on different temperature sensors across the board via intuitive user interface.

High Current Support

Each fan headers support PWM and DC fan and Water cooling Pump , and up to 24W (12V x 2A) with Over-Current Protection

Precision Control

9 temperature/fan speed control points for precise fan curve

Dual Curve Mode

Slope/Stair dual mode for different user scenario

Fan Stop

Fan can stop completely below users' specified temperature point

Improve fan curve UI

We increase control points from 5 to 7 and larger fan speed graph for precise and easier fan curve control.

Slope/Stair dual graph mode

Fan curve can be quickly switch with Slope and Stair modes for different user scenario. Slope is traditional and intuitive linear fan speed curve. With newly added Stair non-linear mode, fan keeps at same speed between specified temperature interval.

Manual Input

For advanced users, we provide fan speed manual input for more precise control.

EZ Tuning

Use can place 4 EZ Tuning points at rough temperature/fan speed, and Smart Fan 6 can quickly generate a fan curve.

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Fan curve profile

Fan curve profile can be saved in BIOS ROM, profile will be kept after updating BIOS.

Fan Stop

Achieve fan silence. With Fan Stop, map any fan to stop completely when temperatures drop below a specified threshold. Which fan stops, based on readings from which sensor, and at what temperature-all of it can be customized to your liking.

CONNECTIVITY

GIGABYTE Z690 Series Motherboards let you experience ultimate connection flexibility and blazing data-transfer speed with next generation network, storage, and WIFI connectivity.

2X Faster than ever

- Adoption of 2.5G LAN provide up to 2.5 GbE network connectivity, with at least 2 times faster transfer speeds compared to general 1GbE networking, perfectly designed for gamers with ultimate online gaming experience.
- Support Multi-Gig(10/100/1000/2500Mbps) RJ-45 Ethernet

New Introduce Intel® WIFI 6 802.11ax BT 5 Module

Wireless solution supports 802.11ax, enables gigabit wireless performance, provides smooth video streaming, better gaming experience, few dropped connections and speeds up to 2.4Gbps*. Moreover, Bluetooth 5 provides 4X range over BT 4.2 and with faster transmission.

Benefit of WIFI 6E

- 5.5X throughput than 802.11ac 1x1*
- 4X better network capacity, no traffic jams especially in those dense area with lots of devices
- Network efficiency increase for better user experience.

Connecting the Future - USB 3.2 Gen 2x2 Type-C®

Featuring the USB 3.2 Gen 2x2 design which is doubled the performance than previous generation of USB 3.2 Gen 2. It works up to 20Gbps ultra-fast data transfer while connecting to USB 3.2 compliant peripherals. Through the USB Type-C® connector, users can enjoy the flexibility of reversible connection to access and store massive amounts of data rapidly.

Hi-Res Audio

Hi-Res Audio certified, meaning that the product is capable of reproducing frequencies up to 40kHz or above which ensures user with the best audio quality at all times.

Immersive Gaming ViBes Realtek High-End HD Audio Codec

Supports audio format up to 32-bit/384KHz and output SNR up to Rear/Front 120dB/110dB.
Automatically detects impedance of audio device, preventing low volume and distortion.
Stream voice with up to 110dB(A) SNR via microphone.

DEFINITIVE AESTHETICS

GIGABYTE motherboards bundle several useful and intuitive software to help users to control every aspect of motherboard and provide customizable lighting effect with outstanding aesthetics to fit your unique personality.

Multi-Zone Light Show Design

Now offering more LED customizations than ever, users can truly adapt their PC to represent their lifestyle. With full RGB support and a redesigned RGB Fusion 2.0 application, the user has complete control over the LEDs which surround the motherboard. Note: Lighting effects depicted are for demonstration purposes only. Actual lighting effects may vary by model.

New User Interface

All new EASY MODE shows important hardware information in one page including CPU clock, Memory, Storage, Fan.

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My Favorites

Add constantly used items into the favorite menu for quick access.

Storage Information

Show all kinds of storage information including SATA, PCIE and M.2 interface.

Changelog

List all changes before saving and exiting bios. Quickly review overall settings modification.

Intuitive Load Line Curve

Clearly show each loadline calibration setting in an intuitive curve graph.

Easy Tune

GIGABYTE's EasyTune™ is a simple and easy-to-use interface that allows users to fine-tune their system settings or adjust system and memory clocks and voltages in a Windows environment. With Smart Quick Boost, one click is all it takes to automatically overclock your system, giving an added performance boost when you need it the most.

System Information Viewer

GIGABYTE System Information Viewer is a central location that gives you access to your current system status. Monitor components such as the clocks and processor, set your preferred fan speed profile, create alerts when temperatures get too high or record your system's behavior; these are the possibilities of the System Information Viewer.

Update the BIOS easily without installing the CPU, memory and graphics card.

With GIGABYTE Q-Flash Plus, you don't need to install the CPU, memory and graphics card nor enter the BIOS menu to flash the BIOS. Just download and save a new BIOS file (rename to gigabyte.bin) on the USB flash drive, then press the dedicated Q-Flash Plus button and you're good to go!

Solid Pin Power Connectors

AORUS motherboards feature solid plated ATX 24pin & ATX 12V 8pin 4pin power connectors to offer a stable power supply during CPU overloading.

Solid Pin Power connector advantages

- Larger contact area for electricity
- More metal quantity to sustain higher power and generated heat
- Ultra durable and longer lifespan

Specifications:

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Specifications

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CPU	1. LGA1700 socket: Support for 12th Generation Intel Core i9 processors/Intel Core i7 processors/Intel Core i5 processors
	(Go to GIGABYTE's website for the latest CPU support list.)
	2. L3 cache varies with CPU
	Chipset
	1. Intel Z690 Express Chipset
Memory	1. Support for DDR5 6200(O.C.) / 6000(O.C.) / 5800(O.C.) / 5600(O.C.) / 5400(O.C.) / 5200(O.C.) / 4800 / 4000 MHz memory modules
	2. 4 x DDR DIMM sockets supporting up to 128 GB (32 GB single DIMM capacity) of system memory
	3. Dual channel memory architecture
	4. Support for ECC Un-buffered DIMM 1Rx8/2Rx8 memory modules (operate in non-ECC mode)
	5. Support for non-ECC Un-buffered DIMM 1Rx8/2Rx8/1Rx16 memory modules
	6. Support for Extreme Memory Profile (XMP) memory modules
Onboard Graphics	Integrated Graphics Processor-Intel HD Graphics support:
	1 x DisplayPort, supporting a maximum resolution of 4096x2304@60 Hz
	* Support for DisplayPort 1.2 version and HDCP 2.3
Audio	1. Realtek ALC4080 CODEC
	2. High Definition Audio
	3. 2-channel analog output
	4. Support for S/PDIF Out
	7.1-channel digital signals
	* Actual output of digital signals may vary depending on the playback content and software used, and an external DAC is required.
LAN	1. Intel 2.5GbE LAN chip (2.5 Gbps/1 Gbps/100 Mbps)
Wireless Communication module	Intel Wi-Fi 6 AX200:
	1. WIFI a, b, g, n, ac, ax, supporting 2.4/5 GHz Dual-Band
	2. BLUETOOTH 5.2
	3. Support for 11ax 160MHz wireless standard and up to 2.4 Gbps data rate
	* Actual data rate may vary depending on environment and equipment.
Expansion Slots	1. 1 x PCI Express x16 slot, running at x16 (PCIEX16)
	(The PCIEX16 slot conforms to PCI Express 5.0 standard.)
	2. 2 x PCI Express x16 slots, running at x4 (PCIEX4_1, PCIEX4_2)
	(The PCIEX4 slots conform to PCI Express 3.0 standard.)
Multi-Graphics Technology	1. Support for AMD Quad-GPU CrossFire and 2-Way AMD CrossFire technologies

Storage Interface	CPU:
	1. 1 x M.2 connector (Socket 3, M key, type 2260/2280/22110 PCIe 4.0 x4/x2 SSD support) (M2A_CPU)
	Chipset:
	1. 1 x M.2 connector (Socket 3, M key, type 2260/2280/22110 SATA and PCIe 4.0 x4/x2 SSD support) (M2C_SB)
	2. 2 x M.2 connectors (Socket 3, M key, type 2260/2280/22110 PCIe 4.0 x4/x2 SSD support) (M2P_SB/M2Q_SB)
	3. 6 x SATA 6Gb/s connectors
	Support for RAID 0, RAID 1, RAID 5, and RAID 10
	* Refer to "2-8 Internal Connectors, " for the installation notices for the M.2 and SATA connectors.
	Intel Optane Memory Ready
	* System acceleration with Intel Optane Memory can only be enabled on the M.2 connectors supported by the Chipset.
USB	Chipset:
	1. 2 x USB Type-C ports, with USB 3.2 Gen 2x2 support (1 port on the back panel, 1 port available through the internal USB header)
	2. 4 x USB 3.2 Gen 2 Type-A ports (red) on the back panel
	Chipset 2 USB 3.2 Gen 1 Hubs:
	1. 6 x USB 3.2 Gen 1 ports (4 ports on the back panel, 2 ports available through the internal USB header)
	Chipset 2 USB 2.0 Hub:
	1. 8 x USB 2.0/1.1 ports (4 ports on the back panel, 4 ports available through the internal USB headers)

Internal I/O Connectors	1. 1 x 24-pin ATX main power connector
	2. 1 x 8-pin ATX 12V power connector
	3. 1 x 4-pin ATX 12V power connector
	4. 1 x CPU fan header
	5. 1 x water cooling CPU fan header
	6. 4 x system fan headers
	7. 2 x system fan/water cooling pump headers
	8. 2 x addressable LED strip headers
	9. 2 x RGB LED strip headers
	10. 4 x M.2 Socket 3 connectors
	11. 6 x SATA 6Gb/s connectors
	12. 1 x front panel header
	13. 1 x front panel audio header
	14. 1 x USB Type-C header, with USB 3.2 Gen 2x2 support
	15. 1 x USB 3.2 Gen 1 header
	16. 2 x USB 2.0/1.1 headers
	17. 1 x noise detection header
	18. 2 x Thunderbolt add-in card connectors
	19. 1 x Trusted Platform Module header (For the GC-TPM2.0 SPI/GC-TPM2.0 SPI 2.0 module only)
	20. 1 x power button
	21. 1 x reset button
	22. 1 x Q-Flash Plus button
	23. 2 x temperature sensor headers
	24. 1 x reset jumper
	25. 1 x Clear CMOS jumper
	öAll fan headers are subject to support AIO_Pump, Pump and high performance fan with the capability of delivering up to 2A/12V @ 24W.
Back Panel Connectors	1. 1 x USB Type-C port, with USB 3.2 Gen 2x2 support
	2. 4 x USB 3.2 Gen 2 Type-A ports (red)
	3. 4 x USB 3.2 Gen 1 ports
	4. 4 x USB 2.0/1.1 ports
	5. 2 x SMA antenna connectors (2T2R)
	6. 1 x DisplayPort
	7. 1 x RJ-45 port
	8. 1 x optical S/PDIF Out connector
	9. 2 x audio jacks

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I/O Controller	1. iTE I/O Controller Chip
H/W Monitoring	1. Voltage detection
	2. Temperature detection
	3. Fan speed detection
	4. Water cooling flow rate detection
	5. Fan fail warning
	6. Fan speed control
	* Whether the fan (pump) speed control function is supported will depend on the fan (pump) you install.
	7. Noise detection
BIOS	1. 1 x 256 Mbit flash
	2. Use of licensed AMI UEFI BIOS
	3. PnP 1.0a, DMI 2.7, WfM 2.0, SM BIOS 2.7, ACPI 5.0
Unique Features	1. Support for APP Center
	* Available applications in APP Center may vary by motherboard model. Supported functions of each application may also vary depending on motherboard specifications.
	@BIOS
	EasyTune
	Fast Boot
	Game Boost
	ON/OFF Charge
	RGB Fusion
	Smart Backup
	System Information Viewer
	2. Support for Q-Flash Plus
	3. Support for Q-Flash
	4. Support for Xpress Install
Bundled Software	1. Norton Internet Security (OEM version)
	2. cFosSpeed
Operating System	1. Support for Windows 10 64-bit
Form Factor	1. ATX Form Factor; 30.5cm x 24.4cm

Product Information Online

For the latest product information, availability and purchasing details, please visit the product page:

Product page:

<https://www.comx.co.za/GA-Z690-AORUS-PRO-Gigabyte-Z690-AORUS-PRO-Z690-Express-Chipset-Gen-12-LGA-1700-ATX-p-260726.php>

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