GIGABYTE Z790 AORUS MASTER X

GIGABYTE Z790 AORUS MASTER X Motherboard User Manual

Model: Z790 AORUS MASTER X

Supports Intel 13th Gen and Next-Gen Processors

1. Product Overview

The GIGABYTE Z790 AORUS MASTER X is a high-performance ATX motherboard designed for Intel LGA 1700 socket processors, including 13th Gen and next-generation Intel Core CPUs. It features robust power delivery, advanced cooling solutions, and extensive connectivity options, making it suitable for demanding gaming and professional applications. This manual provides essential information for the proper installation, configuration, and maintenance of your motherboard.



Figure 1.1: GIGABYTE Z790 AORUS MASTER X Motherboard and its retail packaging.

2. Key Features

- **LGA 1700 Socket:** Supports Intel Core 13th and next-gen processors.
- **Digital Direct VRM:** Features a 20+1+2 phases digital power solution for stable power delivery.
- **DDR5 Memory Support:** Full support for DDR5 memory modules up to 8266MHz (OC).
- **PCIe 5.0 & 4.0 M.2 Connectors:** Includes one PCIe 5.0 x4 and four PCIe 4.0 x4 M.2 connectors for high-speed storage.
- **Advanced Thermal Design:** Equipped with VRM Thermal Armor Fins-Array and M.2 Thermal Guard XL

for efficient heat dissipation.

- **DIY-Friendly Design:** Features Quick Release & Screwless Design for M.2 modules and graphics card for easier installation.
- **High-Speed Networking:** Integrated 10GbE LAN and Wi-Fi 7 for ultra-fast network connectivity.
- **USB 3.2 Gen 2x2:** Provides high-speed USB connectivity.

3. Package Contents

Before proceeding with installation, please verify that all items listed below are present in your motherboard package. If any items are missing or damaged, contact your retailer.

- GIGABYTE Z790 AORUS MASTER X Motherboard
- User Manual / Quick Installation Guide
- SATA Data Cables
- M.2 Screw/Standoff Package
- Wi-Fi Antenna
- Driver CD/USB Drive (or download instructions)
- G-Connector (for front panel headers)

4. Setup and Installation

Always ensure your system is powered off and unplugged from the wall outlet before installing or removing any components. Wear an anti-static wrist strap to prevent electrostatic discharge (ESD) damage to sensitive components.

4.1. Motherboard Layout



Figure 4.1: Top-down view of the motherboard, highlighting key component locations such as the CPU socket, DIMM slots, and M.2 slots.

4.2. CPU Installation

1. Locate the LGA 1700 CPU socket on the motherboard.
2. Gently push down the load lever and pull it to the side to open the CPU socket retention frame.
3. Align the triangular mark on the CPU with the mark on the socket. Carefully place the CPU into the socket without forcing it.
4. Close the retention frame and push the load lever back into its locked position.

4.3. Memory (RAM) Installation

This motherboard supports DDR5 memory modules. Refer to the motherboard's QVL (Qualified Vendor List)

for compatible memory kits.

1. Open the clips at both ends of the DIMM slots.
2. Align the notch on the DDR5 memory module with the key in the DIMM slot.
3. Insert the module firmly into the slot until the clips snap into place.

4.4. M.2 SSD Installation

The motherboard features multiple M.2 slots, including one PCIe 5.0 x4 and four PCIe 4.0 x4 slots. Utilize the screwless design for easy installation.

1. Locate an available M.2 slot and remove the M.2 Thermal Guard XL heatsink if present.
2. Insert the M.2 SSD into the slot at a 30-degree angle.
3. Gently push down the M.2 SSD until it is flat, and secure it using the Quick Release latch or the provided screw.
4. Reattach the M.2 Thermal Guard XL heatsink.

4.5. Graphics Card Installation

The primary PCIe x16 slot supports PCIe 5.0 for the latest graphics cards.

1. Open the retention clip on the PCIe x16 slot.
2. Align your graphics card with the slot and press it down firmly until it clicks into place.
3. Secure the graphics card to your PC case with screws.

4.6. Power Connections

Connect the 24-pin ATX main power connector and the 8-pin + 4-pin ATX 12V power connectors from your power supply unit (PSU) to the corresponding headers on the motherboard.

4.7. Rear I/O Panel

The rear I/O panel provides various ports for connecting peripherals.



Figure 4.2: Detailed view of the rear I/O panel, showing USB ports, LAN, audio jacks, and Wi-Fi antenna connectors.

- **USB Ports:** Multiple USB 3.2 Gen 2x2 Type-C, USB 3.2 Gen 2 Type-A, and USB 3.2 Gen 1 Type-A ports.
- **LAN Port:** 10GbE RJ-45 LAN port for high-speed wired network.
- **Audio Jacks:** Standard audio output, microphone input, and line-in jacks.
- **Wi-Fi Antenna Connectors:** For attaching the included Wi-Fi 7 antenna.
- **Q-Flash Plus Button:** Allows BIOS updates without CPU, memory, or graphics card installed.
- **Clear CMOS Button:** Resets BIOS settings to default.

5. Operating Your Motherboard

5.1. BIOS/UEFI Setup

The BIOS (Basic Input/Output System) or UEFI (Unified Extensible Firmware Interface) is the first software that runs when you power on your computer. It allows you to configure hardware settings, boot order, and system performance.

- To enter BIOS Setup, press the `DEL` key during the Power-On Self-Test (POST).
- **XMP (Extreme Memory Profile):** Enable XMP in the BIOS to utilize your DDR5 memory at its advertised speeds.
- **Boot Order:** Configure the boot device priority (e.g., SSD, HDD, USB drive).

5.2. Driver Installation

After installing your operating system, it is crucial to install the latest drivers for your motherboard's components (chipset, LAN, audio, Wi-Fi, etc.). Drivers can be found on the GIGABYTE official website or on the included driver media.

5.3. GIGABYTE Software Utilities

GIGABYTE provides various software utilities to enhance your system's functionality and performance. These may include:

- **GIGABYTE Control Center (GCC):** A unified software platform for managing various GIGABYTE utilities.
- **RGB Fusion:** For controlling the motherboard's integrated RGB lighting and connected RGB devices.
- **System Information Viewer (SIV):** Monitors system status, fan speeds, and temperatures.

6. Maintenance

- **Cleaning:** Regularly clean dust from your PC case and motherboard components using compressed air. Ensure the system is powered off and unplugged before cleaning.
- **BIOS Updates:** Periodically check the GIGABYTE website for BIOS updates. BIOS updates can improve compatibility, stability, and performance. Use the Q-Flash Plus feature for convenient updates.
- **Driver Updates:** Keep your drivers updated to ensure optimal performance and compatibility with new software and hardware.

7. Troubleshooting

This section provides solutions to common issues you might encounter.

- **No Power/No Boot:**
  - Ensure all power cables (24-pin ATX, 8-pin + 4-pin CPU) are securely connected.
  - Verify that the PSU is switched on and the wall outlet is functional.
  - Check front panel power button connections.
- **No Display:**

- Ensure the monitor is connected to the graphics card (not the motherboard's integrated graphics ports, unless using an Intel CPU with integrated graphics).
- Reseat the graphics card and memory modules.
- Try booting with only one RAM stick.

- **System Instability/Crashes:**
  - Check CPU and GPU temperatures.
  - Ensure memory is properly seated and running at stable speeds (disable XMP temporarily if issues persist).
  - Update BIOS and drivers to the latest versions.
- **Clear CMOS:** If you encounter boot issues after changing BIOS settings, press the Clear CMOS button on the rear I/O panel or short the CLR_CMOS pins on the motherboard (refer to the detailed manual for location) to reset BIOS settings to default.

8. Specifications

Feature	Specification
CPU Socket	LGA 1700
Compatible Processors	Intel Core i9/i7/i5/i3, Pentium Gold, Celeron (13th Gen and Next-Gen)
Chipset	Intel Z790 Express Chipset
Memory Type	DDR5
Memory Speed (Max)	8266 MHz (OC)
Memory Slots	4 x DIMM, Dual Channel
PCIe Slots	1 x PCIe 5.0 x16, 2 x PCIe 4.0 x16 (x4 mode)
M.2 Slots	1 x PCIe 5.0 x4, 4 x PCIe 4.0 x4
SATA Ports	4 x SATA 6Gb/s
LAN	1 x Intel 10GbE LAN chip
Wireless Connectivity	Wi-Fi 7, Bluetooth 5.3
USB Ports (Rear)	USB 3.2 Gen 2x2 Type-C, USB 3.2 Gen 2 Type-A, USB 3.2 Gen 1 Type-A, USB 2.0/1.1
Audio	Realtek ALC1220-VB Codec, High Definition Audio
Form Factor	E-ATX (10.24 x 12.01 inches)
Dimensions (LxWxH)	10.24 x 12.01 x 1.38 inches
Weight	2.2 pounds

9. Warranty and Support

GIGABYTE motherboards come with a limited warranty. Please refer to the warranty card included in your product package or visit the official GIGABYTE website for detailed warranty terms and conditions specific to your region.
For technical support, driver downloads, BIOS updates, and FAQs, please visit the official GIGABYTE support website:

www.gigabyte.com/support

When contacting support, please have your motherboard model name (Z790 AORUS MASTER X) and serial number ready.

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