GIGABYTE Z790 D AX

GIGABYTE Z790 D AX Ultra Durable Motherboard User Manual

Model: Z790 D AX

1. Introduction

This manual provides comprehensive instructions for the installation, operation, and maintenance of your GIGABYTE Z790 D AX Ultra Durable Motherboard. Designed for Intel Core processors of the 14th, 13th, and 12th generations, this motherboard offers robust performance and advanced features for personal computer builds.
Please read this manual thoroughly before beginning installation to ensure proper setup and to maximize the performance and longevity of your system.

2. Key Features

- **Processor Support:** Compatible with Intel Core processors of the 14th, 13th, and 12th generations.
- **Power Design:** Twin 12*+1+1 phase digital VRM solution for unmatched performance stability.
- **Memory:** Dual-channel DDR5 support with 4 DIMM slots and XMP 3.0 memory module support.
- **Storage:** Three PCIe 4.0 x4 M.2 ports for next-generation storage solutions.
- **Thermal Management:** Advanced Thermal Design and M.2 Thermal Guard for optimal VRM and M.2 SSD performance.
- **Ease of Use:** EZ-Latch for quick release of the PCIe 4.0 x16 slot.
- **Networking:** Integrated 2.5GbE LAN and Wi-Fi 6E 802.11ax for fast and reliable network connections.
- **Connectivity:** Features DisplayPort (DP), HDMI, and Rear USB-C 10Gb/s ports.
- **Cooling Control:** Smart Fan 6 with multiple temperature sensors and hybrid fan connections, including FAN STOP functionality.
- **BIOS Update:** Q-Flash Plus allows BIOS updates without installing the CPU, memory, or graphics card.

3. Product Overview

Familiarize yourself with the components and layout of your GIGABYTE Z790 D AX motherboard.

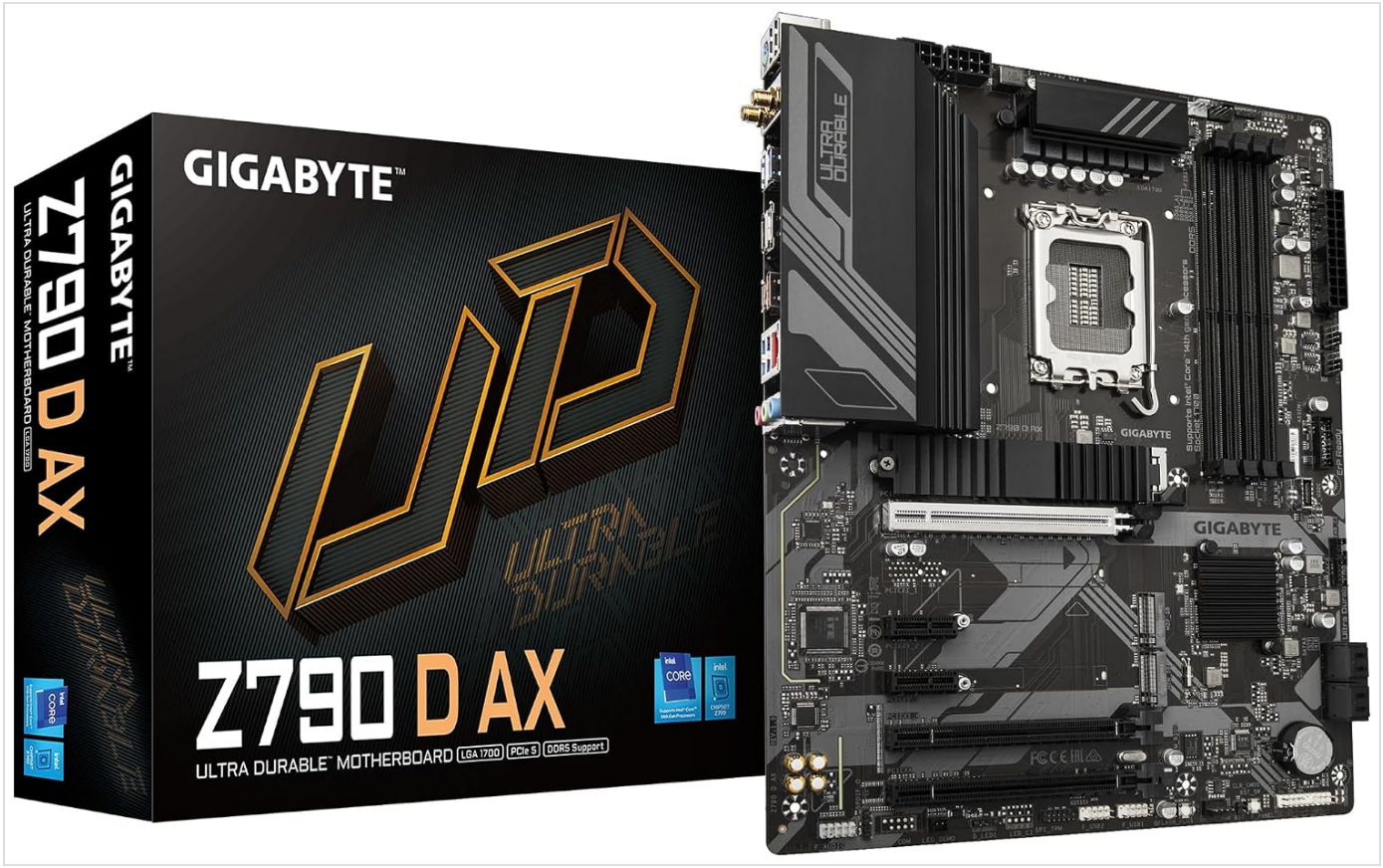


Figure 3.1: GIGABYTE Z790 D AX Motherboard and its retail packaging, showcasing the "Ultra Durable" branding.

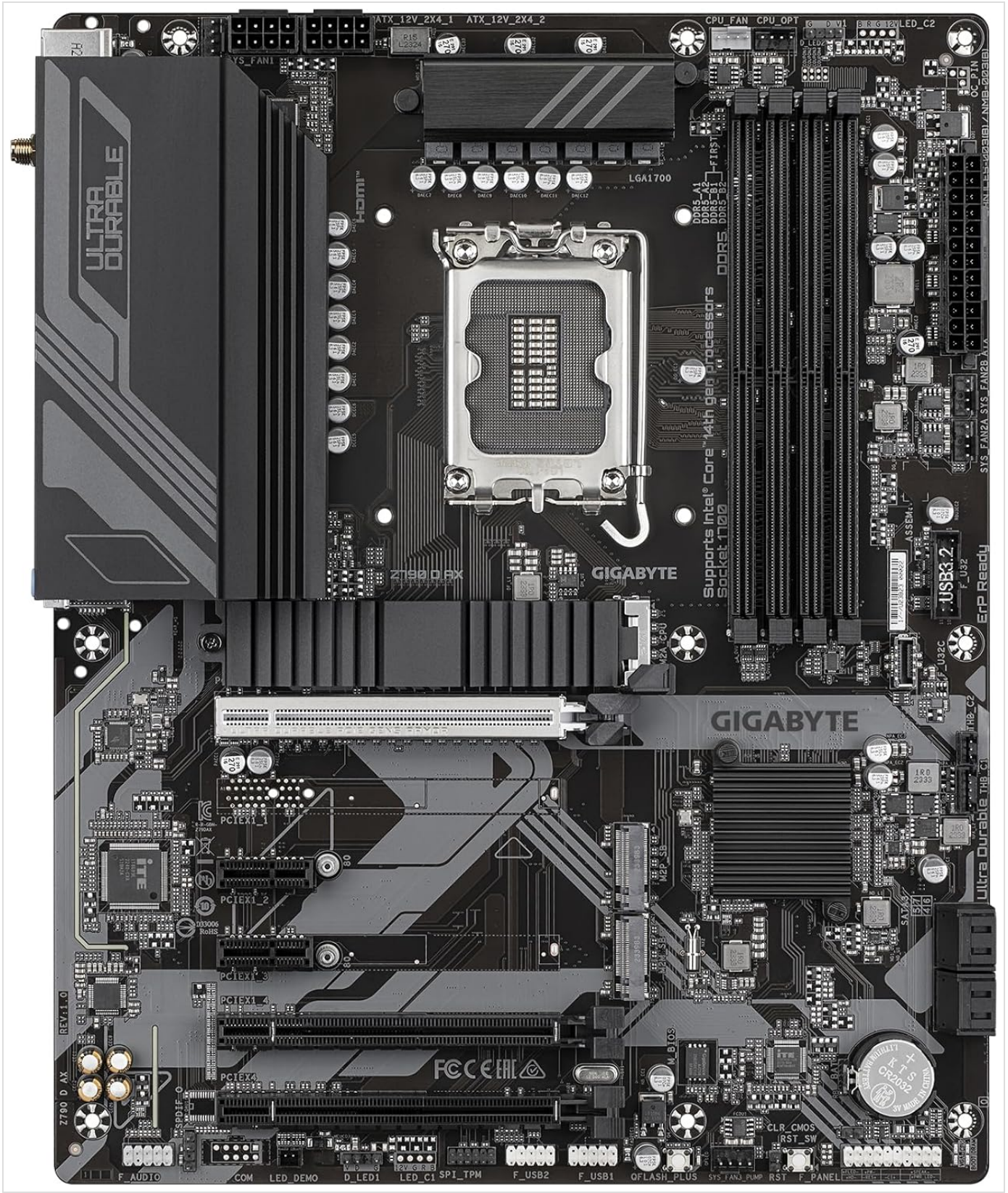


Figure 3.2: Overhead view of the GIGABYTE Z790 D AX motherboard, highlighting the LGA 1700 CPU socket, four DDR5 DIMM slots, and various expansion slots and headers.



Figure 3.3: Detailed view of the rear I/O panel, showing various ports including USB, DisplayPort, HDMI, Ethernet, Wi-Fi antenna connectors, and audio jacks.

4. Setup and Installation

Before proceeding with installation, ensure your workspace is clean, well-lit, and static-free. It is recommended to wear an anti-static wrist strap.

4.1. Pre-installation Checklist

- GIGABYTE Z790 D AX Motherboard
- Compatible Intel LGA 1700 CPU (12th, 13th, or 14th Gen)
- DDR5 RAM modules
- CPU Cooler
- Graphics Card (if not using integrated graphics)
- Storage Devices (M.2 SSDs, SATA SSDs/HDDs)
- Power Supply Unit (PSU)
- Computer Case
- Screwdriver set, anti-static wrist strap

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 corresponding 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.
5. Install your CPU cooler according to its manufacturer's instructions.

4.3. RAM Installation

1. Identify the four DDR5 DIMM slots. For dual-channel operation, refer to the motherboard manual for recommended slot pairing (typically slots A2 and B2 first).
2. Open the clips at both ends of the DIMM slot.
3. Align the notch on the DDR5 memory module with the key in the DIMM slot.
4. Insert the module firmly into the slot until the clips snap into place. Ensure both clips are fully closed.

4.4. M.2 SSD Installation

1. Locate the M.2 slots on the motherboard. The Z790 D AX features three PCIe 4.0 x4 M.2 ports.
2. Remove the M.2 Thermal Guard heatsink if present.
3. Insert the M.2 SSD into the slot at a slight angle.

4. Gently push down the SSD and secure it with the provided screw or EZ-Latch mechanism.
5. Reattach the M.2 Thermal Guard heatsink, ensuring proper contact for cooling.

4.5. Graphics Card and Expansion Cards

1. Locate the PCIe 4.0 x16 slot (typically the top reinforced slot).
2. Open the EZ-Latch mechanism on the PCIe slot.
3. Align your graphics card with the slot and press down firmly until it clicks into place. The EZ-Latch should automatically secure the card.
4. Install any other expansion cards (e.g., sound cards, network cards) into available PCIe slots as needed.

4.6. Power Supply Connections

- Connect the 24-pin ATX main power connector from your PSU to the corresponding header on the motherboard.
- Connect the 8-pin (or 4+4 pin) CPU power connector(s) to the ATX_12V_2X4 and ATX_12V_2X1 headers.
- Connect SATA power cables to your SATA storage devices.
- Connect PCIe power cables to your graphics card if required.

4.7. Front Panel and Case Connections

Connect the various cables from your computer case to the motherboard headers:

- **Front Panel Headers:** Power button, reset button, HDD LED, power LED. Refer to the motherboard manual for exact pin assignments.
- **USB Headers:** Connect front panel USB 2.0, USB 3.0, and USB-C headers.
- **Audio Header:** Connect the front panel audio cable.
- **Fan Headers:** Connect case fans to the available fan headers (SYS_FAN1, SYS_FAN2, etc.) for optimal cooling control via Smart Fan 6.

5. Operating Instructions

5.1. First Boot and BIOS/UEFI Setup

1. After completing all hardware installations, connect your monitor, keyboard, and mouse.
2. Power on your system. Press the `DEL` key repeatedly during startup to enter the BIOS/UEFI setup utility.
3. In the BIOS, you can configure system settings such as boot order, date/time, fan curves (Smart Fan 6), XMP profiles for RAM, and storage configurations.
4. Save changes and exit the BIOS. The system will restart.

5.2. Driver Installation

After installing your operating system, it is crucial to install the latest drivers for your motherboard components to ensure optimal performance and stability. Drivers can be found on the GIGABYTE official website for your specific model (Z790 D AX).

- Chipset Drivers
- LAN Drivers (2.5GbE)
- Wi-Fi Drivers (Wi-Fi 6E)
- Audio Drivers
- Intel Management Engine (ME) Drivers
- Graphics Drivers (for integrated graphics or dedicated GPU)

5.3. Operating System Installation

Insert your operating system installation media (USB drive or DVD) and follow the on-screen prompts to install your preferred operating system (e.g., Windows).

6. Maintenance

6.1. Cleaning Your Motherboard

Regular cleaning helps maintain optimal performance and extends the lifespan of your motherboard.

- Always power off and unplug your PC before cleaning.
- Use compressed air to remove dust from heatsinks, fan blades, and other components. Hold fans to prevent them from spinning excessively.
- For stubborn dirt, use a soft brush or a lint-free cloth lightly dampened with isopropyl alcohol.
- Avoid using harsh chemicals or excessive moisture.

6.2. BIOS Updates (Q-Flash Plus)

GIGABYTE's Q-Flash Plus feature allows you to update the BIOS without installing the CPU, memory, or graphics card, which is useful for supporting newer CPUs or resolving compatibility issues.

1. Download the latest BIOS file from the GIGABYTE website for your Z790 D AX motherboard.
2. Rename the downloaded BIOS file to**GIGABYTE.bin** (or as specified in the Q-Flash Plus instructions).
3. Copy the renamed BIOS file to the root directory of a FAT32 formatted USB flash drive.
4. With the system powered off, plug the USB drive into the designated Q-Flash Plus USB port (usually marked).
5. Press the Q-Flash Plus button on the motherboard's rear I/O panel or internal header.
6. The Q-Flash Plus LED will blink, indicating the update process. Wait until the LED stops blinking, which signifies completion. Do not power off the system during this process.

6.3. Driver and Software Updates

Regularly check the GIGABYTE website for updated drivers and utility software to ensure your system has the latest optimizations and security patches.

7. Troubleshooting

This section addresses common issues you might encounter.

7.1. No Power / No Boot

- Ensure all power cables (24-pin ATX, 8-pin CPU) are securely connected to the motherboard and PSU.
- Verify the PSU switch is in the "ON" position.
- Check front panel power button connection to the motherboard.
- Try a different power outlet or power cable.
- If the motherboard has diagnostic LEDs (often labeled CPU, DRAM, VGA, BOOT), observe which LED stays lit to identify the problematic component.

7.2. No Display Output

- Ensure your monitor is connected to the graphics card (or motherboard if using integrated graphics) and is powered on.

- Reseat the graphics card in its PCIe slot.
- Check if the graphics card requires additional PCIe power cables from the PSU and ensure they are connected.
- Try a different display cable or monitor.
- If using integrated graphics, ensure your CPU supports it and that the display cable is connected to the motherboard's video output.

7.3. System Instability / Crashes

- Ensure all drivers are up to date.
- Check RAM modules: Reseat them or test them one by one to identify a faulty stick.
- Monitor CPU and GPU temperatures. Overheating can cause instability. Ensure proper airflow in your case and that CPU cooler is correctly installed.
- Run a memory diagnostic tool (e.g., Windows Memory Diagnostic).
- Reset BIOS settings to default.

8. Specifications

Feature	Detail
Model Name	Z790 D AX
CPU Socket	LGA 1700
Compatible Processors	Intel Core 14th Gen, Intel Core 13th Gen, Intel Core 12th Gen
Chipset Type	Intel Z790
RAM Memory Technology	DDR5
Memory Clock Speed	Up to 7600 MHz (OC)
Product Dimensions	9.61 x 12.01 x 1.38 inches (ATX Form Factor)
Item Weight	3.32 pounds
Manufacturer	GIGABYTE
Platform	Windows
Connectivity	2.5GbE LAN, Wi-Fi 6E, DP, HDMI, Rear USB-C 10Gb/s
M.2 Sockets	3x PCIe 4.0 x4 M.2 ports

9. Warranty and Support

For detailed warranty information, please refer to the warranty card included with your product or visit the official GIGABYTE website. GIGABYTE provides technical support and resources to assist with product inquiries and troubleshooting.
Online Support: Visit the GIGABYTE support page for drivers, BIOS updates, FAQs, and troubleshooting guides. www.gigabyte.com/support
Contact Information: Refer to the GIGABYTE website for regional contact details for technical assistance.

10. Important Safety Information

- Always disconnect the power cord from the wall outlet before installing or removing any components.
- Wear an anti-static wrist strap to prevent electrostatic discharge (ESD) damage to components.
- Handle components by their edges; avoid touching pins or circuit boards directly.
- Ensure proper ventilation within your PC case to prevent overheating.
- Do not expose the motherboard to moisture or extreme temperatures.

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Question

Example: How do I reset this device or fix this error?

Details

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