GIGABYTE B650 AORUS ELITE AX V2

GIGABYTE B650 AORUS ELITE AX V2 Motherboard User Manual

Model: B650 AORUS ELITE AX V2

1. Introduction

This manual provides comprehensive instructions for the installation, operation, and maintenance of your GIGABYTE B650 AORUS ELITE AX V2 motherboard. Designed for AMD Ryzen 7000 Series Processors, this motherboard offers advanced features for high-performance computing.
Key features include:

- AMD AM5 Socket support for Ryzen 7000 Series Processors.
- Dual Channel DDR5 memory support with 4 DIMM slots.
- Robust Twin 12+2+2 Phases Power Design and 6-Layer 2X Copper PCB.
- Cutting-Edge Thermal Design with M.2 Thermal Guard for optimal performance.
- Next-Gen Connectivity: PCIe 5.0, PCIe 5.0 NVMe x4 M.2, USB 3.2 Gen 2 Type-C.
- EZ-Latch for quick release and screwless installation of PCIe 5.0 and M.2 connectors.
- Fast Networking: 2.5GbE LAN, WiFi 6E, BT5.3.
- Dynamic Audio with Hi-Fi Audio Capacitors.
- Fine Tuning Features: RGB FUSION, Smart Fan 6, Multi-key, Q-Flash Plus.



Figure 1.1: GIGABYTE B650 AORUS ELITE AX V2 Motherboard and Retail Packaging.

2. Setup and Installation

2.1. Pre-Installation Checklist

- Ensure you have all necessary components: CPU, CPU cooler, DDR5 RAM, M.2 SSDs (optional), Graphics Card (optional), Power Supply Unit (PSU), PC Case.
- Prepare a clean, static-free workspace. Use an anti-static wrist strap or frequently touch a grounded metal object to discharge static electricity.
- Refer to your CPU and cooler manuals for specific installation instructions.

2.2. Motherboard Layout

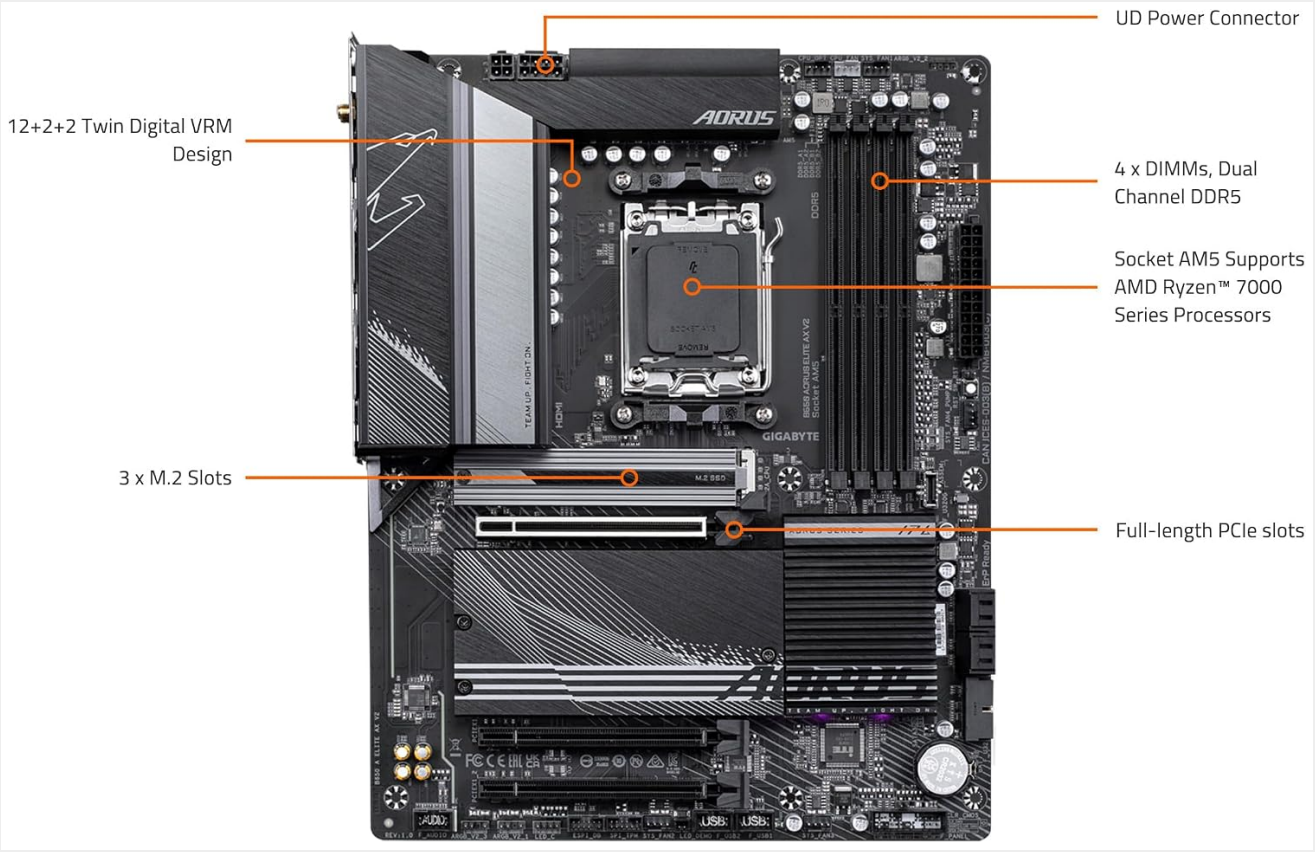


Figure 2.1: Key Components of the B650 AORUS ELITE AX V2 Motherboard.

This diagram highlights the main areas of the motherboard, including the AM5 CPU socket, four DDR5 DIMM slots, three M.2 slots for NVMe SSDs, and multiple PCIe slots for expansion cards. The UD Power Connector and VRM design are also indicated.

2.3. Component Installation

1. **CPU Installation:** Carefully open the CPU socket lever. Align the triangular mark on the AMD Ryzen 7000 Series Processor with the mark on the socket. Gently place the CPU into the socket without forcing it. Close the lever to secure the CPU.
2. **CPU Cooler Installation:** Install your CPU cooler according to its manufacturer's instructions. Ensure proper thermal paste application and secure mounting.
3. **Memory (RAM) Installation:** Open the clips on both ends of the DDR5 DIMM slots. Align the notch on the DDR5 memory module with the key in the DIMM slot. Press down firmly on both ends of the module until the clips snap into place. For dual-channel operation, refer to the motherboard manual for recommended slot configurations (typically slots A2 and B2 first).
4. **M.2 SSD Installation:** The motherboard features three M.2 slots. For M.2 SSDs, remove the M.2 Thermal Guard. Insert the M.2 SSD into the slot at an angle, then gently push it down. Utilize the EZ-Latch mechanism for screwless installation where available. Reattach the M.2 Thermal Guard.
5. **Graphics Card (GPU) Installation:** Open the retention clip on the PCIe 5.0 x16 slot. Align your graphics card with the slot and press down firmly until it is fully seated and the clip locks into place.
6. **Power Supply Connection:** Connect the 24-pin ATX main power connector and the 8-pin (or 4+4-pin) CPU power connector from your PSU to the corresponding ports on the motherboard. Connect power to your graphics card if required.
7. **Case Mounting:** Install the motherboard into your PC case, aligning it with the standoffs. Secure the motherboard with screws.
8. **Front Panel Connections:** Connect the front panel headers (power button, reset button, USB ports, audio jacks) to the corresponding pins on the motherboard. Refer to the motherboard's detailed manual for pin layouts.



Figure 2.2: Angled view of the Motherboard, highlighting component placement.



Figure 2.3: Top-down view of the Motherboard, showing the CPU socket and DIMM slots.

2.4. Rear I/O Panel

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



Figure 2.4: Rear I/O Panel Connectivity.

- **USB Ports:** Multiple USB 2.0, USB 3.2 Gen 1, USB 3.2 Gen 2, and USB 3.2 Gen 2x2 Type-C ports for peripherals.
- **Video Outputs:** HDMI and DisplayPort for integrated graphics (requires compatible CPU).
- **Network:** 2.5GbE LAN port for wired network connection.
- **Wireless:** Wi-Fi 6E antenna connectors for wireless networking and Bluetooth.
- **Audio Jacks:** Line In, Line Out, and Microphone jacks for audio devices.
- **Q-Flash Plus Button:** For updating BIOS without CPU, memory, or graphics card installed.

3. Operating Instructions

3.1. Initial Boot and BIOS Setup

After assembling your system, power it on. Press the **DEL** key repeatedly during startup to enter the BIOS (Basic Input/Output System) setup. The BIOS allows you to configure system settings, boot order, and hardware parameters.

- **Boot Order:** Configure the boot order to prioritize your operating system drive.
- **XMP/EXPO Profile:** If using high-speed DDR5 memory, enable the XMP (Extreme Memory Profile) or EXPO (Extended Profiles for Overclocking) profile in the BIOS to achieve advertised memory speeds.
- **Save and Exit:** After making changes, save your settings and exit the BIOS to boot into your operating system installer or existing OS.

3.2. Driver and Software Installation

For optimal performance and stability, install the latest drivers for your motherboard components. GIGABYTE provides a utility called **GIGABYTE Control Center (GCC)** which can assist with driver installation and system management.

- Visit the official GIGABYTE website for your motherboard model to download the latest drivers (Chipset, LAN, Audio, Wi-Fi/Bluetooth) and utilities.
- Install GIGABYTE Control Center for easy access to features like RGB FUSION (for lighting control) and Smart Fan 6 (for fan speed control).

4. Maintenance

4.1. Cleaning

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

- Power off and unplug your PC before cleaning.
- Use compressed air to remove dust from heatsinks, fans, and other components. Hold the can upright to prevent propellant discharge.
- For stubborn dust, use a soft brush or lint-free cloth. Avoid using liquids or abrasive materials.

4.2. BIOS and Driver Updates

Keeping your BIOS and drivers updated ensures compatibility, stability, and access to new features.

- **BIOS Updates:** Check the GIGABYTE website periodically for new BIOS versions. Use the Q-Flash or Q-Flash Plus utility for safe BIOS updates. Follow the instructions provided by GIGABYTE carefully.
- **Driver Updates:** Regularly check for updated drivers via GIGABYTE Control Center or the official GIGABYTE support page.

5. Troubleshooting

This section addresses common issues you might encounter.

- **No Power/No Boot:**
  - Ensure PSU cables (24-pin ATX, 8-pin CPU) are securely connected to the motherboard.
  - Verify the power button cable from the case is correctly connected to the motherboard's front panel header.
  - Check if the PSU switch is turned on.
- **No Display:**
  - Ensure the monitor cable is connected to the graphics card (or motherboard if using integrated graphics).
  - Reseat the graphics card in its PCIe slot.
  - Reseat RAM modules. Try booting with one RAM stick at a time.
  - Check the debug LEDs on the motherboard (if present) for error codes.
- **Memory Issues (System Instability/Crashes):**
  - Ensure RAM modules are fully seated in their slots.
  - Disable XMP/EXPO profile in BIOS and test with default memory speeds.
  - Test RAM modules individually to identify a faulty stick.
- **Network Connectivity Issues (LAN/Wi-Fi):**
  - Ensure LAN cable is securely connected or Wi-Fi antennas are attached.
  - Install or update LAN/Wi-Fi drivers from the GIGABYTE website.
  - Check network adapter settings in your operating system.
- **BIOS Update Failure:**
  - Utilize the Q-Flash Plus feature to recover or update the BIOS without needing a CPU, memory, or graphics card. Refer to the GIGABYTE website for detailed Q-Flash Plus instructions.

If issues persist, consult the comprehensive motherboard manual available on the GIGABYTE support website or contact GIGABYTE technical support.

6. Specifications

Feature	Specification
Brand	GIGABYTE
Model Name	B650 AORUS ELITE AX V2

Feature	Specification
CPU Socket	LGA 1718 (AM5)
Compatible Processors	AMD Ryzen 7000 series
Chipset Type	AMD B650
RAM Memory Technology	DDR5
Memory Slots	4 x DIMM
Memory Speed	Up to 4800MHz (Native), higher with XMP/EXPO
PCIe Slots	PCIe 5.0, PCIe 4.0
M.2 Slots	3 (PCIe 5.0 NVMe x4 M.2 support)
USB Ports	USB 3.2 Gen2X2 Type-C, USB 3.2 Gen 2, USB 3.2 Gen 1, USB 2.0
LAN	2.5GbE LAN
Wireless Connectivity	WiFi 6E, BT5.3
Audio	Hi-Fi Audio with High-End Audio Capacitors
Form Factor	ATX
Dimensions (LxWxH)	3.27 x 10.67 x 16.89 inches
Item Weight	4.37 pounds

7. Warranty and Support

7.1. Product Warranty

The GIGABYTE B650 AORUS ELITE AX V2 motherboard comes with a **5-Year Warranty**. Please retain your proof of purchase for warranty claims. For detailed warranty terms and conditions, refer to the official GIGABYTE website or the warranty card included with your product.

7.2. Technical Support

For further assistance, technical support, driver downloads, BIOS updates, and detailed product information, please visit the official GIGABYTE support website:

GIGABYTE Official Support

You can also find FAQs and community forums on their website for common queries and solutions.

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