GIGABYTE B450 AORUS M

GIGABYTE B450 AORUS M Motherboard User Manual

Model: B450 AORUS M
Brand: GIGABYTE

1. Introduction

This manual provides detailed instructions for the installation, configuration, operation, and maintenance of your GIGABYTE B450 AORUS M motherboard. Designed for AMD Ryzen processors, this Micro ATX motherboard offers robust features including M.2 Thermal Guard, multiple display outputs (HDMI, DVI-D), USB 3.1 Gen 2, and DDR4 memory support. Please read this manual thoroughly before proceeding with installation to ensure proper setup and to maximize the performance and longevity of your system.

2. Safety Information

Always observe the following safety precautions to prevent damage to the motherboard, components, and to ensure personal safety:

- **Electrostatic Discharge (ESD) Prevention:** Always wear an anti-static wrist strap or frequently touch a grounded metal object (like the computer case) before handling the motherboard or any internal components.
- **Power Disconnection:** Ensure the power supply is disconnected from the wall outlet before installing or removing any components.
- **Component Compatibility:** Verify that all components (CPU, RAM, GPU, PSU) are compatible with the B450 AORUS M motherboard. Refer to GIGABYTE's official website for the latest compatibility lists.
- **Proper Ventilation:** Ensure adequate airflow within your computer case to prevent overheating.
- **Handle with Care:** Avoid touching the gold contacts on any components. Hold circuit boards by their edges.
- **Professional Installation:** If you are unsure about any installation steps, seek assistance from a qualified technician.

For more detailed safety guidelines, refer to the officialSafety Information PDF.

3. Package Contents

Upon opening your GIGABYTE B450 AORUS M motherboard package, please verify that all the following items are

included:

- GIGABYTE B450 AORUS M Motherboard
- I/O Shield
- SATA Data Cables (typically 2-4)
- M.2 Screw and Standoff
- User Manual / Quick Installation Guide
- Driver CD/DVD (or USB drive, if applicable)

If any items are missing or damaged, please contact your retailer or GIGABYTE customer support immediately.

4. Product Overview

The GIGABYTE B450 AORUS M is a high-performance Micro ATX motherboard designed for AMD Ryzen processors, offering a balance of features and compact size. Below are visual representations and descriptions of its key components and layout.



Image: The GIGABYTE B450 AORUS M motherboard alongside its retail packaging, showcasing the AORUS branding and design.

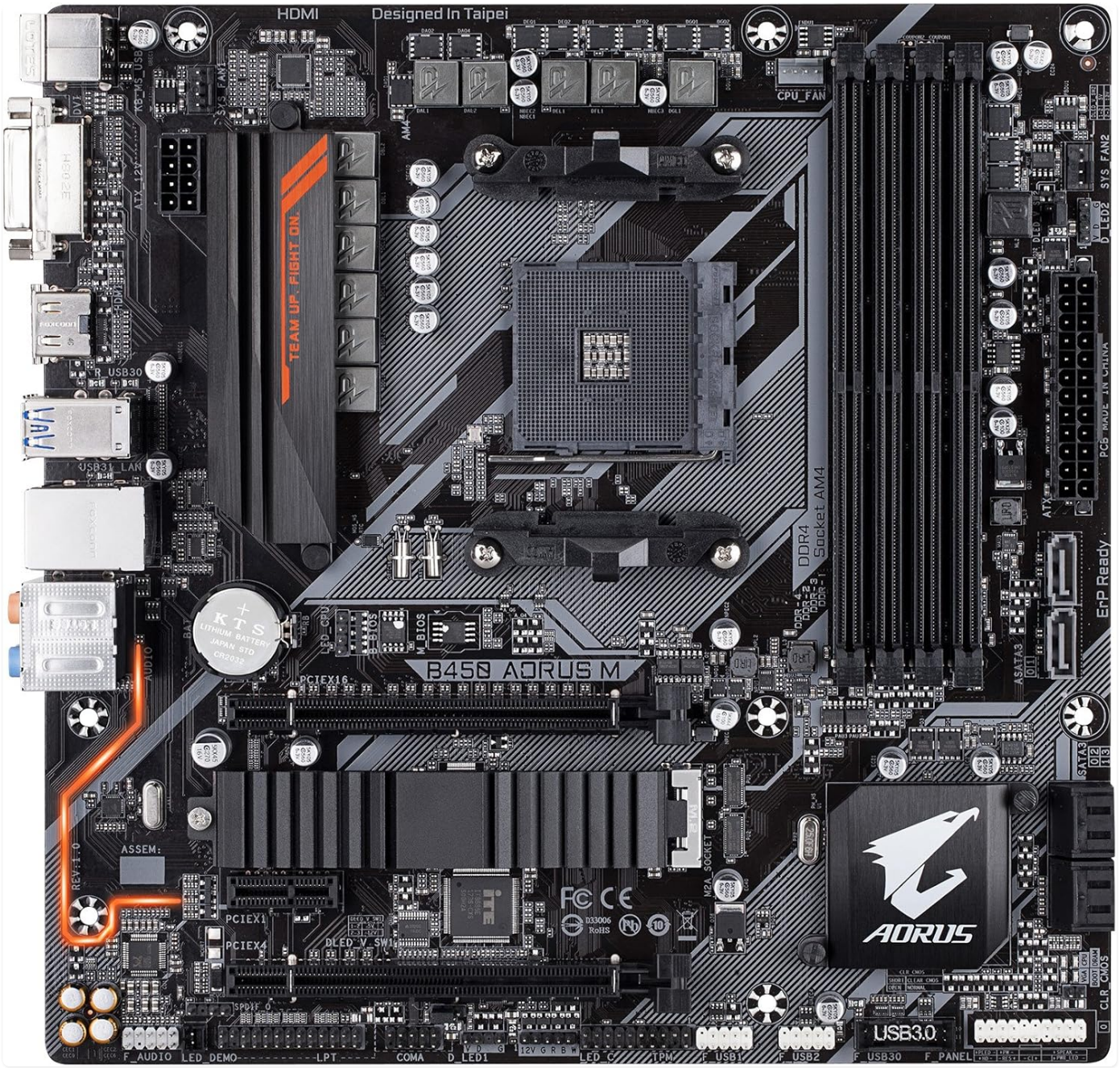


Image: A top-down perspective of the GIGABYTE B450 AORUS M motherboard, highlighting the CPU socket, DIMM slots, PCIe slots, and heatsinks.

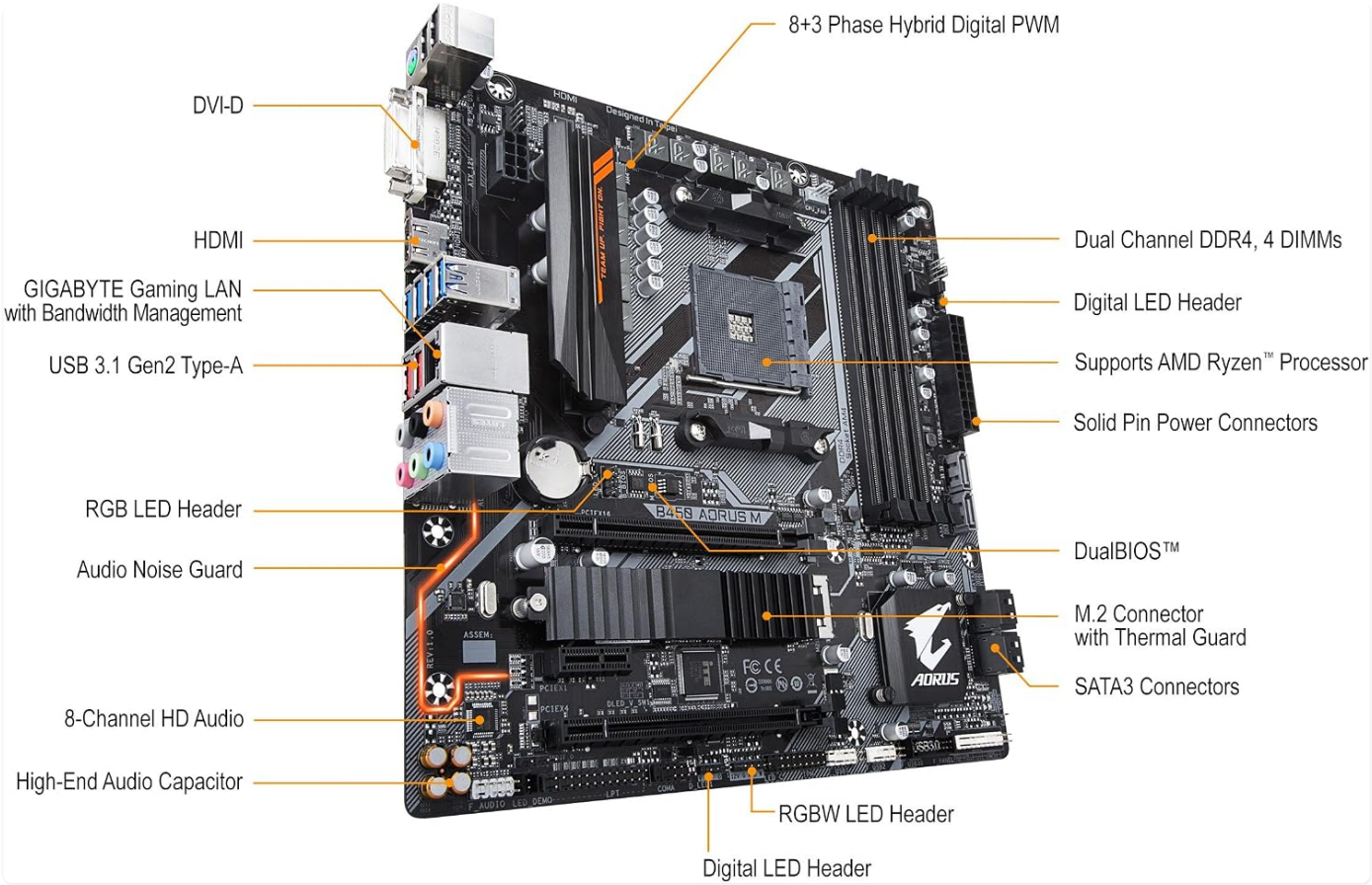


Image: An angled view of the motherboard with labels pointing to key features such as the CPU socket, DDR4 DIMM slots, M.2 connector with Thermal Guard, SATA3 connectors, RGB LED headers, and the rear I/O panel.



Image: A close-up of the rear input/output (I/O) panel, showing the various ports including USB, HDMI, DVI-D, LAN, and audio jacks.

Key Features:

- **AMD Ryzen Processor Support:** Compatible with AMD 1st and 2nd Generation Ryzen processors, including those with Radeon Vega Graphics.
- **Dual Channel DDR4:** Four DIMM slots supporting non-ECC unbuffered DDR4 memory for high-speed performance.
- **Ultra-Fast NVMe PCIe Gen3 x4 M.2 with Thermal Guard:** Provides high-speed storage solutions with an integrated heatsink to prevent thermal throttling.
- **Multiple Display Outputs:** Features HDMI and DVI-D ports for flexible display connectivity.
- **High Quality Audio:** Equipped with high-quality audio capacitors and an audio noise guard with LED trace path lighting for immersive sound.
- **RGB Fusion:** Customizable RGB lighting with multi-zone LED light show design, supporting digital LED and RGB LED strips.
- **GIGABYTE Exclusive 8118 Gaming LAN:** Optimized network performance with bandwidth management for a smooth online experience.
- **Smart Fan 5:** Features 5 temperature sensors and 3 hybrid fan headers with FAN STOP function for precise cooling

control.

- **Anti-Sulfur Resistors Design:** Enhanced durability against sulfur compounds in the air, preventing component degradation.
- **Ultra Durable Protection:** Includes 25KV ESD and 15KV Surge LAN Protection for increased system stability and longevity.

5. Setup and Installation

Follow these steps carefully to install your GIGABYTE B450 AORUS M motherboard and its components:

5.1. Preparing the Case

1. Ensure your computer case is compatible with Micro ATX motherboards.
2. Install the I/O shield into the rear I/O opening of your case.
3. Install the necessary standoffs in your case for the Micro ATX form factor.

5.2. CPU Installation

1. Locate the AM4 CPU socket on the motherboard.
2. Lift the CPU retention lever.
3. Carefully align the triangular mark on the CPU with the mark on the socket and gently place the CPU into the socket. Do not force it.
4. Lower the retention lever to secure the CPU.
5. Install your CPU cooler according to its manufacturer's instructions. Ensure thermal paste is applied correctly.

5.3. RAM (Memory) Installation

1. Open the clips on both ends of the DDR4 DIMM slots.
2. Align the notch on the memory module with the notch in the DIMM slot.
3. Press down firmly on both ends of the memory module until the clips snap into place.
4. For dual-channel operation, refer to the motherboard manual for recommended slot configurations (typically slots 2 and 4, or A2 and B2).

5.4. M.2 SSD Installation

1. Locate the M.2 slot, often covered by the M.2 Thermal Guard heatsink. Remove the heatsink if present.
2. Insert the M.2 SSD into the slot at a slight angle.
3. Gently push down the SSD and secure it with the provided M.2 screw and standoff.
4. Reinstall the M.2 Thermal Guard heatsink if applicable.

5.5. Graphics Card (GPU) and Other PCIe Cards

1. Open the retention clip on the PCIe x16 slot (usually the top-most long slot).
2. Align your graphics card with the slot and press down firmly until it clicks into place.
3. Secure the graphics card to the case with screws.
4. Install any other PCIe expansion cards (e.g., Wi-Fi card, sound card) into the available PCIe x1 or x4 slots.

5.6. Power Connections

1. Connect the 24-pin ATX main power connector from your power supply to the motherboard.
2. Connect the 8-pin (or 4+4-pin) CPU power connector to the motherboard.
3. Connect any necessary PCIe power cables from your power supply to your graphics card.

5.7. Storage and Front Panel Connections

1. Connect your SATA SSDs/HDDs to the SATA ports on the motherboard using SATA data cables. Connect SATA power cables from your power supply to the drives.
2. Connect the front panel connectors (Power SW, Reset SW, HDD LED, Power LED) to the corresponding pins on the motherboard. Refer to the motherboard manual for the exact pin layout.
3. Connect front panel USB and audio headers.

5.8. Initial Boot and BIOS Setup

After assembling all components, connect your monitor, keyboard, and mouse. Power on the system. You may need to:

- **Access BIOS/UEFI:** Press the **DEL** key during startup to enter the BIOS/UEFI setup.
- **Load Optimized Defaults:** It is recommended to load optimized defaults in the BIOS for initial stability.
- **Set Boot Order:** Configure the boot order to install your operating system from a USB drive or optical drive.
- **BIOS Update:** For compatibility with newer CPUs (e.g., AMD Ryzen 5000 series), a BIOS update may be required. GIGABYTE provides a Q-Flash Plus feature for updating BIOS without a CPU or RAM installed. Detailed instructions for BIOS updates can be found on the GIGABYTE support website.

6. Operating the Motherboard

Once your system is assembled and the operating system is installed, you can begin to utilize the features of your GIGABYTE B450 AORUS M motherboard.

6.1. Driver Installation

After installing your operating system, install the necessary drivers for the motherboard's components. These typically include chipset drivers, LAN drivers, audio drivers, and any specific utility drivers. Drivers can be found on the included driver disc or downloaded from the official GIGABYTE B450 AORUS M support page.

6.2. GIGABYTE Software Utilities

GIGABYTE provides several software utilities to enhance your user experience:

- **APP Center:** A centralized platform to access and manage various GIGABYTE utilities.
- **EasyTune:** Allows for easy system tuning, including CPU and memory overclocking, and fan speed control directly from the operating system.
- **RGB Fusion:** Control and synchronize the RGB lighting effects on your motherboard and compatible peripherals.
- **Smart Fan 5:** Provides advanced fan control features, allowing you to set custom fan curves based on temperature sensors and utilize the FAN STOP function for silent operation at low loads.

6.3. BIOS/UEFI Settings

The BIOS (Basic Input/Output System) or UEFI (Unified Extensible Firmware Interface) is the firmware that initializes hardware during startup. You can access it by pressing the **DEL** key during boot. Key settings include:

- **Boot Options:** Adjust boot device priority.

- **Peripherals:** Enable/disable integrated components like LAN, audio, and USB controllers.
- **M.I.T. (Motherboard Intelligent Tweaker):** For advanced users, this section allows for CPU, memory, and voltage adjustments for overclocking.
- **Smart Fan 5:** Detailed fan control settings.

7. Maintenance

Regular maintenance helps ensure the longevity and stable operation of your motherboard and PC system.

- **Dust Removal:** Periodically clean dust from inside your computer case, especially from heatsinks (CPU, chipset) and fan blades. Use compressed air and ensure fans are held stationary to prevent damage.
- **Cable Management:** Ensure cables are neatly routed to improve airflow and prevent interference.
- **BIOS Updates:** Check the GIGABYTE support website regularly for new BIOS versions. Updates can improve compatibility, stability, and performance. Follow the provided instructions carefully when updating the BIOS.
- **Driver Updates:** Keep your drivers updated to ensure optimal performance and compatibility with new software and hardware.
- **System Monitoring:** Use GIGABYTE's Smart Fan 5 or other monitoring software to keep an eye on system temperatures and fan speeds to prevent overheating.

8. Troubleshooting

This section provides solutions to common issues you might encounter with your GIGABYTE B450 AORUS M motherboard.

8.1. No Display Output

- **Check Cables:** Ensure your monitor cable is securely connected to the graphics card or motherboard (if using an APU).
- **Power Connections:** Verify that all power cables (24-pin ATX, 8-pin CPU, PCIe power for GPU) are firmly connected.
- **Graphics Card Seating:** Reseat the graphics card in its PCIe slot.
- **Debug LEDs:** The motherboard has debug LEDs (VGA, CPU, DRAM, BOOT). If one stays lit, it indicates an issue with that specific component. For example, a lit VGA LED suggests a graphics card problem.
- **RAM Seating:** Reseat your RAM modules. Try booting with only one RAM stick if you have multiple.
- **Clear CMOS:** Turn off the PC, unplug the power cord, and remove the CMOS battery for 1-2 minutes, or use the Clear CMOS jumper/button if available. This resets BIOS settings to default.

8.2. System Fails to Boot / Random Restarts

- **Power Supply:** Ensure your power supply unit (PSU) has sufficient wattage for all your components and is functioning correctly.
- **Overheating:** Check CPU and chipset temperatures. Ensure CPU cooler is properly installed and fans are spinning.
- **Component Seating:** Reseat all major components (CPU, RAM, GPU, M.2 SSDs).
- **Short Circuits:** Ensure no metal parts of the case are touching the motherboard where they shouldn't, causing a short circuit.

8.3. M.2 SSD Not Detected

- **Reseat M.2:** Ensure the M.2 SSD is fully seated in its slot and secured with the screw.

- **BIOS Settings:** Check BIOS settings to ensure the M.2 slot is enabled and configured correctly (e.g., PCIe mode).
- **SATA Port Sharing:** Note that some M.2 slots share bandwidth with SATA ports. Refer to your detailed user manual to see if using the M.2 slot disables certain SATA ports.

8.4. USB Devices Not Working

- **Driver Installation:** Ensure USB drivers are correctly installed.
- **BIOS Settings:** Check if USB controllers are enabled in the BIOS.
- **Front Panel Connections:** Verify that front panel USB headers are correctly connected to the motherboard.

9. Specifications

Detailed technical specifications for the GIGABYTE B450 AORUS M motherboard:

Category	Specification
CPU Socket	Socket AM4
Compatible Processors	AMD 1st & 2nd Generation Ryzen / Ryzen with Radeon Vega Graphics Processors
Chipset	AMD B450
Form Factor	Micro ATX (24.4 cm x 24.4 cm)
RAM Memory Technology	DDR4 (Dual Channel, Non-ECC Unbuffered)
Memory Slots	4 DIMM slots
Max Memory Speed	Up to 3600 MHz (OC)
PCIe Slots	1 x PCIe 3.0 x16, 1 x PCIe 2.0 x4, 1 x PCIe 2.0 x1
Storage	1 x M.2 connector (PCIe Gen3 x4/x2 & SATA mode), 6 x SATA 6Gb/s ports
USB Ports (Rear I/O)	2 x USB 3.1 Gen 2 Type-A, 4 x USB 3.1 Gen 1, 2 x USB 2.0/1.1
Video Outputs	1 x HDMI, 1 x DVI-D
LAN	Realtek GbE LAN chip (10/100/1000 Mbit)
Audio	Realtek ALC892 codec, High Definition Audio, 2/4/5.1/7.1-channel
Dimensions (LxWxH)	15 x 12.25 x 4.22 inches
Item Weight	2.51 pounds

10. Warranty and Support

GIGABYTE products are designed for reliability and performance. For detailed warranty information, please refer to the warranty card included with your product or visit the official GIGABYTE website.

10.1. Official Documentation

For further assistance and detailed diagrams, please refer to the official PDF manuals:

- User Manual (PDF)
- User Guide (PDF)
- Safety Information (PDF)

10.2. Customer Support

If you encounter issues that cannot be resolved using this manual or the troubleshooting section, please contact GIGABYTE customer support through their official website for technical assistance and service.

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Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

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Question

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

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

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