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> [ASUS Prime B650M-A AX II AMD B650 AM5 Ryzen™ Desktop 9000 8000 & 7000 Micro-ATX mATX Motherboard, DDR5, PCIe 5.0 M.2, 2.5Gb LAN, Wi-Fi 6, DisplayPort, HDMI®, USB 3.2, USB 3.2 Type-C®, BIOS Flashback™ mATX PRIME B650M-A AX II](#)

ASUS PRIME B650M-A AX II

ASUS Prime B650M-A AX II Motherboard User Manual

Comprehensive Guide for Setup, Operation, and Maintenance

PRODUCT OVERVIEW

The ASUS PRIME B650M-A AX II motherboard is engineered to unlock the full potential of AMD Ryzen 7000, 8000, and 9000 series processors. It features a robust power design, comprehensive cooling solutions, and intelligent tuning capabilities, providing users and PC DIY builders with a range of performance optimizations.

- **AMD AM5 Socket:** Ready for AMD Ryzen 7000 Series Desktop Processors.
- **Ultrafast Connectivity:** DDR5 6400+(OC), Wi-Fi 6, M.2 PCIe 5.0, Realtek 2.5Gb Ethernet, USB 3.2 Gen 2 ports, front USB 3.2 Gen 1 Type-C.
- **ASUS OptiMem II:** Careful routing of traces and vias, plus ground layer optimizations to preserve signal integrity for improved memory overclocking.
- **Comprehensive Cooling:** VRM heatsink, PCH heatsink, hybrid fan headers and Fan Xpert 2plus.
- **Aura Sync RGB Lighting:** Onboard Addressable Gen 2 headers and Aura RGB header for RGB LED strips, easily synced with Aura Sync-capable hardware.
- **CEC Tier II ready.**



Figure 1: ASUS Prime B650M-A AX II Motherboard and retail packaging.

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Video 1: A quick overview of the Asus Prime B650-Plus motherboard AM5, highlighting its key features and design.

WHAT'S IN THE BOX

Upon unboxing your ASUS Prime B650M-A AX II motherboard, you will find the following components:

- ASUS Prime B650M-A AX II Motherboard
- Rear I/O Panel Shield
- 2x SATA Cables
- M.2 Screw Package
- Wi-Fi Antenna
- User Guide

Ultrafast Connectivity

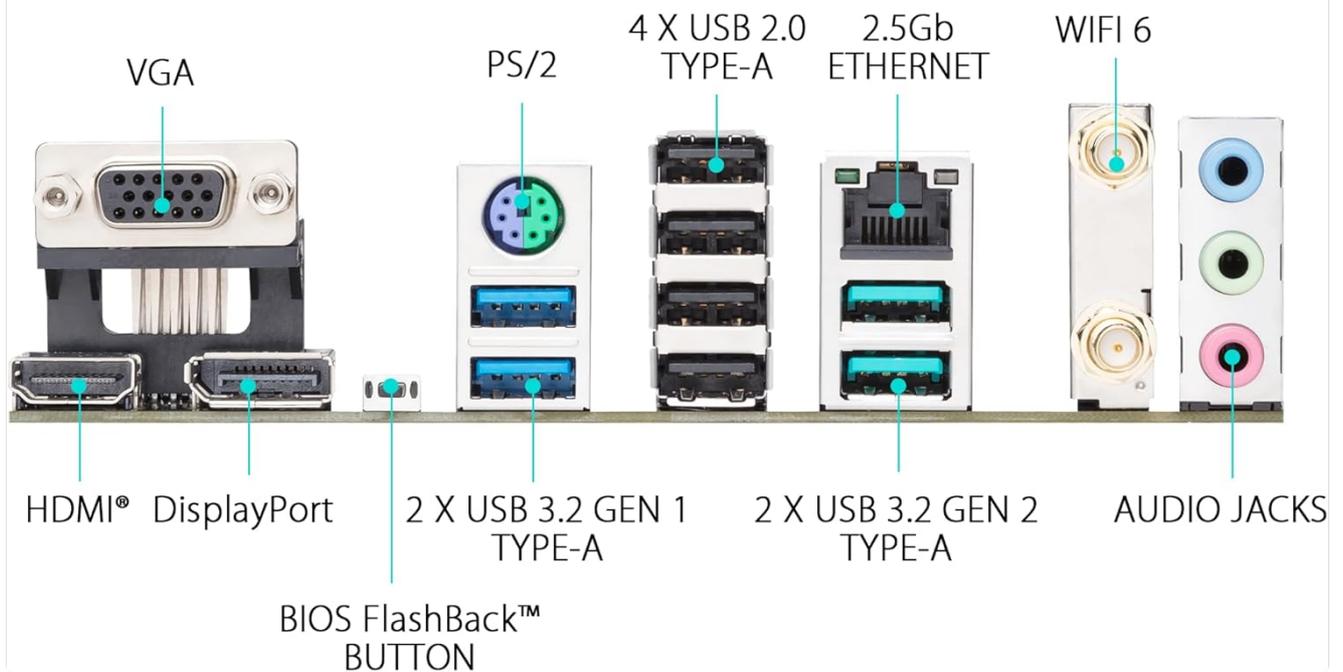


Figure 2: All components included in the ASUS Prime B650M-A AX II retail package.

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Video 2: An unboxing and overview of the ASUS PRIME B650-PLUS motherboard, showing included accessories.

SETUP AND INSTALLATION

Follow these steps for proper installation of your motherboard and components:

- 1. Prepare the Case:** Ensure your PC case is compatible with mATX motherboards. Verify that all necessary standoffs are correctly installed to prevent motherboard flex.
- 2. Install CPU:** Carefully place your AMD Ryzen 7000/8000/9000 series processor into the AM5 socket. Ensure proper alignment and secure the retention arm.
- 3. Install CPU Cooler:** Attach your chosen CPU cooler. For optimal thermal performance, ensure proper contact with the CPU and secure mounting.
- 4. Install Memory (RAM):** Insert DDR5 memory modules into the DIMM slots. For dual-channel memory architecture, refer to your user guide for recommended slot configurations.
- 5. Install M.2 SSDs:** The motherboard features two M.2 slots, one PCIe 5.0 and one PCIe 4.0. Install your M.2 SSDs into the desired slots. If your SSD is single-sided, use the provided spacer for proper mounting.
- 6. Install Graphics Card:** Insert your graphics card into the PCIe 4.0 x16 slot. Ensure it is securely seated and fastened.
- 7. Connect Power:** Connect the 24-pin ATX power connector and the 8-pin CPU power connector from your power

supply to the motherboard.

8. **Connect Peripherals:** Connect SATA drives using the provided SATA cables, and attach front panel connectors (USB, audio, power buttons) according to the motherboard manual.
9. **Connect Wi-Fi Antenna:** Attach the included Wi-Fi antenna to the rear I/O panel for wireless connectivity.

Enhanced Power Delivery and Cooling

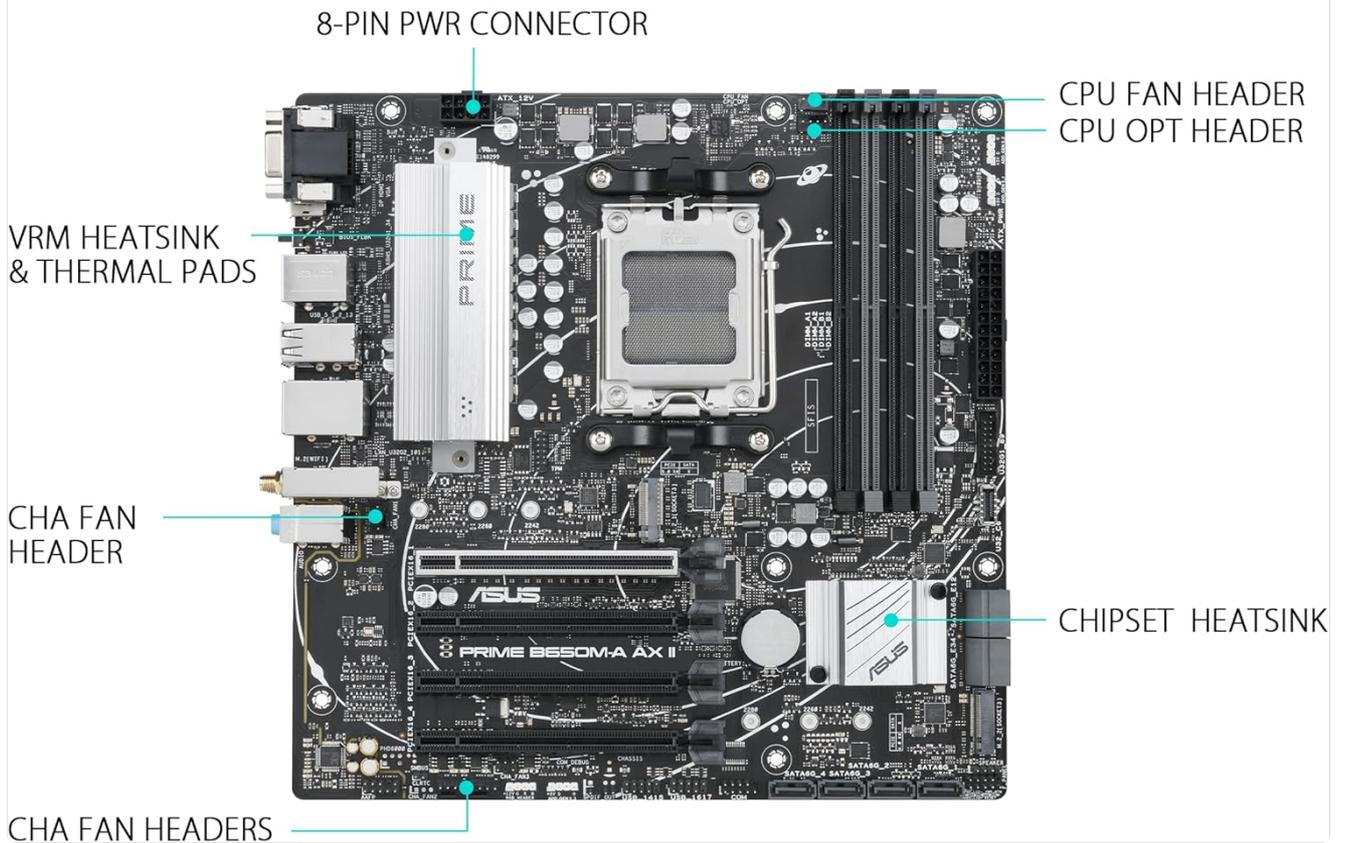


Figure 3: Key power delivery and cooling components on the motherboard, including VRM heatsink, CPU fan headers, and chipset heatsink.

Build For Every Productivity

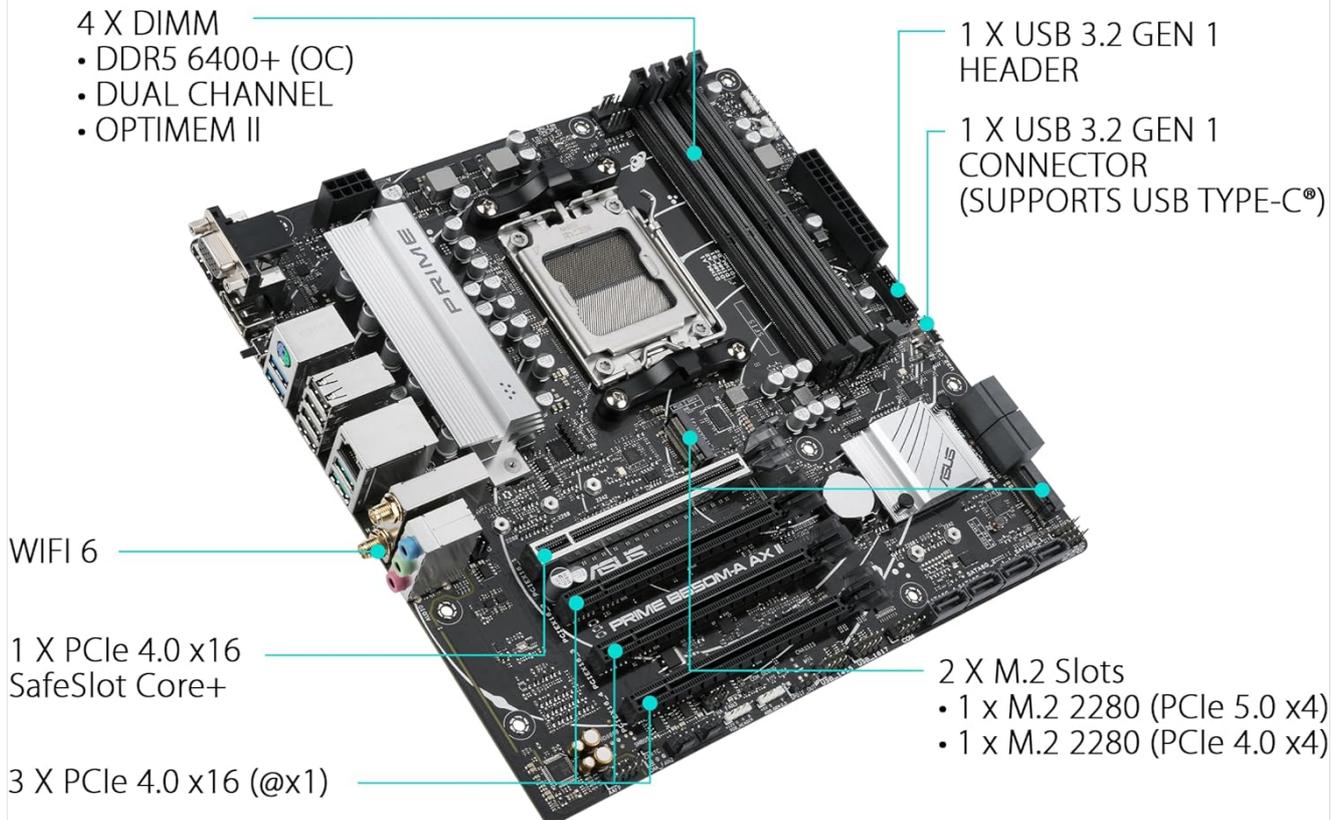


Figure 4: Overview of productivity features, including DIMM slots for DDR5 memory, PCIe slots, and M.2 slots.

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Video 3: Step-by-step guide on how to install the Kingston NV2 SSD on the Asus Prime B650-Plus motherboard.

OPERATING YOUR SYSTEM

Once all components are installed and connected, you can power on your system. The motherboard's BIOS is user-friendly, allowing for easy configuration. For initial setup, it is recommended to use a wired internet connection to download necessary drivers, especially for Wi-Fi and Bluetooth, which may not be recognized automatically by Windows.

What's in the Box

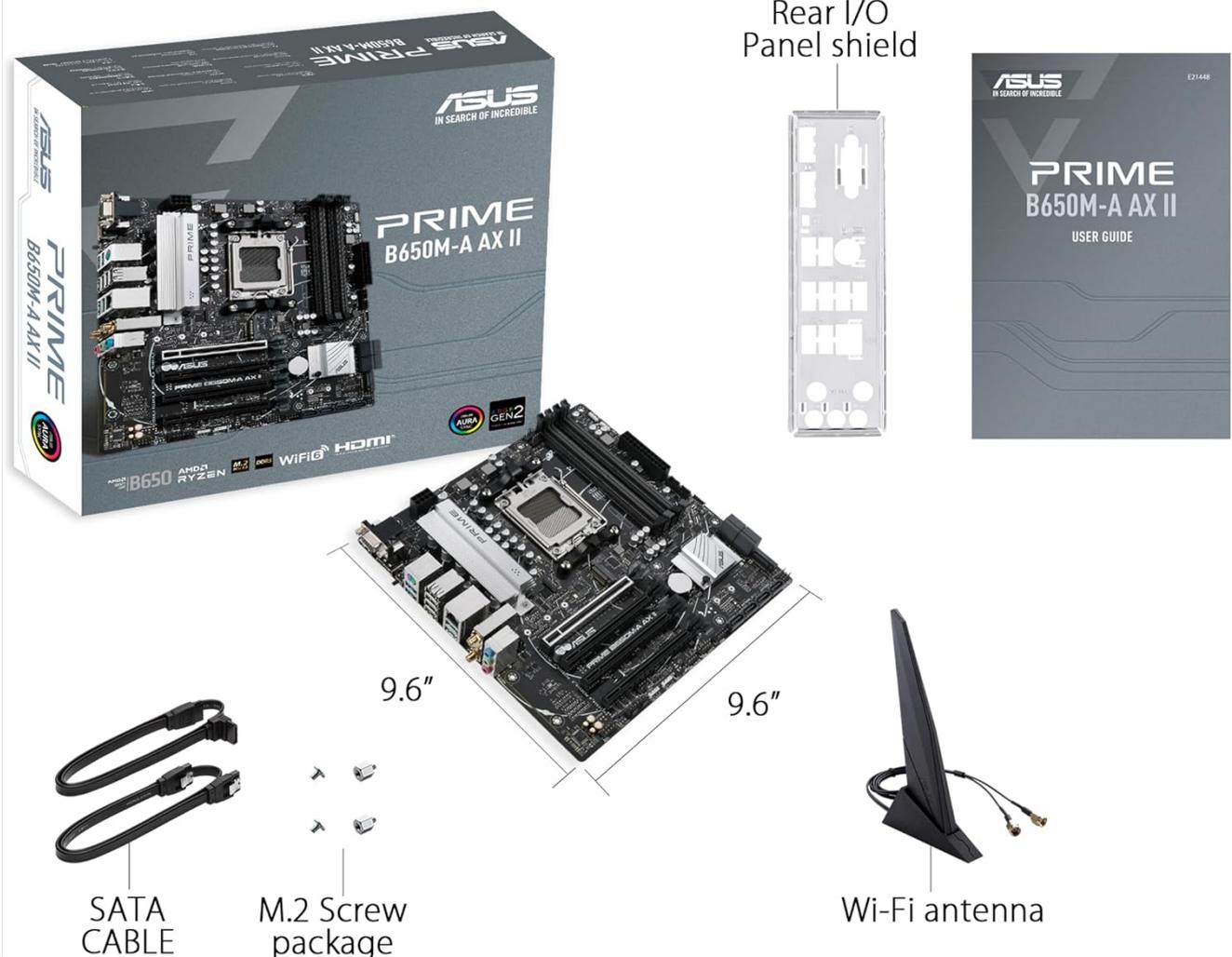


Figure 5: Rear I/O panel showcasing various connectivity options including USB ports, Ethernet, Wi-Fi antenna connectors, and audio jacks.

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Video 4: A full demo and results video explaining the choice of this motherboard and its performance in a PC build.

MAINTENANCE

Regular maintenance ensures the longevity and optimal performance of your motherboard. Keep your system clean from dust, ensure proper airflow, and regularly update your drivers and BIOS. ASUS provides the Armoury Crate application to simplify driver updates and BIOS management.



WiFi 6



Figure 6: Aura Sync RGB lighting headers for customizing your build's aesthetics.

TROUBLESHOOTING

Common issues and potential solutions:

- **System Not Posting:** Ensure all power cables are securely connected. Verify that the CPU and RAM are correctly seated. If the BIOS is outdated, use the BIOS Flashback™ button to update it without a CPU installed.
- **Memory Compatibility Issues:** High-density DDR5 memory may require BIOS tweaks or frequency adjustments. Refer to the ASUS QVL (Qualified Vendor List) for compatible memory modules.
- **No Wi-Fi/Bluetooth After OS Install:** Connect to the internet via Ethernet and install the necessary drivers through the ASUS Armory Crate application.
- **SATA Drive Not Recognized:** Ensure the drive is properly connected. For older drives, check if they require reformatting to UEFI. Some BIOS settings related to drive recognition might be grayed out without a dedicated graphics card.

SPECIFICATIONS

Feature	Detail
Brand	ASUS
Model Name	PRIME B650M-A AX II
CPU Socket	Socket AM5
Compatible Processors	AMD Ryzen 7000/8000/9000 Series Desktop Processors
Chipset Type	AMD B650
RAM Memory Technology	DDR5
Memory Clock Speed	Up to 6400 MHz (OC)
Memory Storage Capacity	128 GB (Max)
Product Dimensions	11 x 10.9 x 2.8 inches
Item Weight	2.9 pounds
Country of Origin	China

WARRANTY AND SUPPORT

For detailed warranty information and technical support, please refer to the official ASUS website or the user guide included with your product. You can also visit the [ASUS Store on Amazon](#) for additional resources.

An official User Guide (PDF) is available for download [here](#).