ASUS 90MB1FV0-M0EAY0

ASUS TUF Gaming B650M-E WIFI Motherboard User Manual

Model: 90MB1FV0-M0EAY0

1. INTRODUCTION

This user manual provides comprehensive instructions for the installation, operation, and maintenance of your ASUS TUF Gaming B650M-E WIFI motherboard. Designed with military-grade components, an upgraded power solution, and an extensive cooling system, this motherboard is engineered to deliver robust and stable performance for demanding applications and extended gaming sessions.

Please read this manual thoroughly before beginning the installation process to ensure proper setup and to maximize the performance and longevity of your system.

2. SAFETY INFORMATION

Always observe the following safety precautions when handling and installing the motherboard:

- Ensure your hands are clean and dry before handling any components.
- Wear an anti-static wrist strap or frequently touch a grounded metal object (e.g., the metal casing of your power supply) to discharge static electricity.
- Disconnect the power cord from the wall outlet before installing or removing any components.
- Handle the motherboard by its edges to avoid touching sensitive components.
- Keep the motherboard and all components away from moisture and extreme temperatures.
- Do not attempt to repair the motherboard yourself. Refer to qualified service personnel for assistance.

3. PACKAGE CONTENTS

Verify that all items listed below are present in your motherboard package. If any item is missing or damaged, contact your retailer.

- ASUS TUF Gaming B650M-E WIFI Motherboard
- ASUS Wi-Fi Antenna
- SATA 6Gb/s Cables
- M.2 Screw Package
- User Manual

- Support DVD (may vary by region)
- TUF Gaming Stickers

Figure 3.1: Contents of the ASUS TUF Gaming B650M-E WIFI motherboard package.

4. PRODUCT OVERVIEW

The ASUS TUF Gaming B650M-E WIFI is a micro-ATX motherboard featuring the AMD B650 chipset, designed for AMD Ryzen™ 7000 series processors with the AM5 socket. It supports DDR5 memory up to 6400 MHz (OC), offers dual M.2 slots for high-speed storage, and includes 2.5 Gigabit Ethernet and Wi-Fi 6 for robust network connectivity. The board also features Aura RGB lighting for customizable aesthetics.

Figure 4.1: ASUS TUF Gaming B650M-E WIFI Motherboard and Box.

4.1 Motherboard Layout

Familiarize yourself with the key components and connectors on the motherboard.

Figure 4.2: Main components layout of the motherboard.

4.2 Rear I/O Panel

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

Figure 4.3: Rear Input/Output (I/O) Panel.

- **DisplayPort (DP) & HDMI:** For video output.
- **USB Ports:** Various USB 2.0, USB 3.2 Gen 1, and USB 3.2 Gen 2 ports for peripherals.
- **BIOS FlashBack™ Button & Port:** For updating BIOS without a CPU or RAM installed.

- **2.5G Ethernet Port:** For high-speed wired network connection.
- **Wi-Fi Antenna Connectors:** For connecting the included Wi-Fi antenna.
- **Audio Jacks:** For audio input and output.

5. SETUP

5.1 Hardware Installation

Follow these steps to install the essential components onto your motherboard.

5.1.1 CPU Installation (AMD AM5 Socket)

1. Locate the AM5 CPU socket on the motherboard.
2. Lift the load lever and open the CPU socket cover.
3. Carefully align the triangular mark on the CPU with the mark on the socket.
4. Gently place the CPU into the socket. Do not force it.
5. Close the socket cover and push down the load lever until it clicks into place.
6. Install the CPU cooler according to its manufacturer's instructions.

5.1.2 RAM Installation (DDR5)

1. Open the clips at both ends of the DIMM slots.
2. Align the notch on the DDR5 memory module with the key on the DIMM slot.
3. Insert the memory module firmly into the slot until the clips snap into place. For dual-channel performance, install modules into matching color slots (A2 and B2 are recommended first).

5.1.3 Storage Installation (M.2 SSDs and SATA Drives)

- **M.2 SSD:** Locate the M.2 slots. Remove the M.2 heatsink (if present). Insert the M.2 SSD into the slot at a 45-degree angle, then gently push it down and secure it with the provided M.2 screw or Q-Latch mechanism. Reinstall the heatsink.
- **SATA Drives:** Connect SATA data cables from your storage drives (HDDs/SSDs) to the SATA ports on the motherboard. Connect SATA power cables from your power supply to the drives.

5.1.4 Graphics Card Installation

1. Open the retention clip on the PCIe x16 slot.
2. Align your graphics card with the slot and press it firmly until it seats correctly and the retention clip locks.
3. Secure the graphics card to your PC case with screws.
4. Connect PCIe power cables from your power supply to the graphics card if required.

5.1.5 Power Supply Connections

- Connect the 24-pin ATX power connector from your power supply to the main power socket on the motherboard.
- Connect the 8-pin (or 4+4-pin) CPU power connector(s) to the CPU power socket(s) near the CPU.

5.2 Initial Boot-up and BIOS/UEFI Configuration

After assembling your hardware, connect your monitor, keyboard, and mouse. Power on your system.

- Press the **DEL** or **F2** key during POST (Power-On Self-Test) to enter the BIOS/UEFI setup utility.
- In the BIOS, you can configure boot order, system time, enable/disable integrated peripherals, and adjust performance settings.

- It is highly recommended to update your BIOS to the latest version for optimal compatibility and performance, especially for newer AMD Ryzen™ processors. Refer to the "Maintenance" section for BIOS update instructions.

Figure 5.1: Connecting the Wi-Fi antenna to the rear I/O panel.

6. OPERATING INSTRUCTIONS

6.1 Software Installation

6.1.1 Operating System Installation

Install your preferred operating system (e.g., Windows 11) from a bootable USB drive or DVD. Ensure your BIOS boot order is set correctly.

6.1.2 Driver Installation

After OS installation, install the necessary drivers for your motherboard components. You can find the latest drivers on the ASUS support website or on the included support DVD.

- Chipset Drivers
- LAN Drivers (2.5G Ethernet)
- Wi-Fi and Bluetooth Drivers
- Audio Drivers
- Graphics Drivers (for integrated graphics or discrete GPU)

6.1.3 Utility Software (Armoury Crate)

ASUS Armoury Crate is a software utility that provides centralized control for your ASUS products. It allows you to:

- Monitor system information (temperatures, voltages, fan speeds).
- Control Aura Sync RGB lighting effects.
- Update drivers and utilities.
- Manage fan profiles.

While Armoury Crate offers many features, some users have reported issues with fan control and auto-tuning. If you

experience difficulties, consider manually adjusting fan curves in the BIOS or using alternative fan control software.

6.2 Performance Optimization

6.2.1 AMD Precision Boost Overdrive (PBO)

The motherboard supports AMD Precision Boost Overdrive (PBO), which enhances CPU current and voltage to improve performance. AMD's algorithm leverages the motherboard's power solutions to further boost performance by allowing you to set PBO parameters in the BIOS/UEFI. Exercise caution when adjusting these settings, as improper configuration can lead to system instability.

6.2.2 Power Saving Features

The Power Saving function includes various settings to optimize power consumption. You can enable the CPU power limit, turn off Aura lighting, and switch the fan profile to power-saving mode. Additionally, you can utilize the Power Saving plan available within Microsoft Windows settings for further optimization.

7. MAINTENANCE

7.1 Cleaning

Regular cleaning helps maintain optimal performance and extends the lifespan of your motherboard. Use compressed air to remove dust from heatsinks, fans, and other components. For stubborn dirt, use a soft, lint-free cloth lightly dampened with isopropyl alcohol. Ensure the system is powered off and unplugged before cleaning.

7.2 BIOS Updates

Keeping your BIOS updated is crucial for system stability, compatibility with new hardware (like newer Ryzen X3D CPUs), and performance improvements. ASUS provides several methods for updating the BIOS:

- **ASUS EZ Flash 3:** Update the BIOS directly from the BIOS utility using a USB flash drive.
- **BIOS FlashBack™:** This feature allows you to update the BIOS without a CPU, memory, or graphics card installed. Simply download the BIOS file from the ASUS website, rename it according to the instructions (usually `MB.CAP`), place it on a FAT32 formatted USB drive, insert it into the designated BIOS FlashBack™ USB port on the rear I/O panel, and press the BIOS FlashBack™ button.
- **Armoury Crate:** While convenient, some users prefer manual BIOS updates for critical stability.

Always download BIOS updates from the official ASUS support website for your specific motherboard model (B650M-E WIFI).

8. TROUBLESHOOTING

This section provides solutions to common issues you might encounter.

- **No Display Output:**

  - Ensure monitor cables are securely connected to the graphics card or motherboard (if using integrated graphics).
  - Reseat the graphics card and RAM modules.
  - Check if the CPU power and main ATX power cables are fully seated.
  - Try clearing the CMOS (refer to your motherboard manual for jumper location).

- **System Does Not Boot / Boot Loop:**

  - Verify all power connections.

- Reseat RAM modules. Try booting with only one RAM stick.
- Clear CMOS.
- Ensure CPU is correctly installed and cooler is properly mounted.

- **USB Ports Malfunctioning (Intermittent Disconnections):**

  - Ensure all motherboard drivers, especially chipset and USB drivers, are up to date.
  - Check BIOS settings for USB power management or legacy USB support.
  - Test different USB devices and ports to isolate the issue.
  - If the issue persists, it may indicate a hardware fault. Contact ASUS support.

- **Fan Control Issues (e.g., Fans at 100%):**

  - Access the BIOS/UEFI and manually configure fan curves in the Q-Fan Control section.
  - Ensure Armoury Crate or other fan control software is not conflicting with BIOS settings. Try uninstalling and reinstalling Armoury Crate, or use BIOS for fan control exclusively.
  - Verify fan headers are correctly connected to the motherboard.

9. SPECIFICATIONS

Feature	Specification
Brand	ASUS
Model Name	90MB1FV0-M0EAY0
CPU Socket	AMD Socket AM5
Chipset Type	AMD B650
RAM Memory Technology	DDR5
Memory Clock Speed	6400 MHz
Memory Storage Capacity (Max)	128 GB
Compatible Processors	Ryzen (AMD Ryzen™ 7000 Series)
Compatible Devices	Personal Computer
Platform	Windows 11
Item Weight	2.2 pounds
Manufacturer	Asus Computer
ASIN	B0C6HXLPJP
Date First Available	December 1, 2023

10. WARRANTY AND SUPPORT

ASUS products are manufactured to the highest quality standards. For information regarding the warranty period and terms for your ASUS TUF Gaming B650M-E WIFI motherboard, please refer to the warranty card included in your package or visit the official ASUS support website.
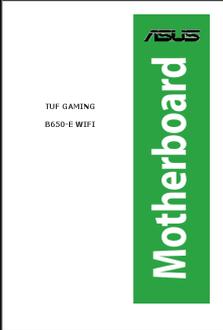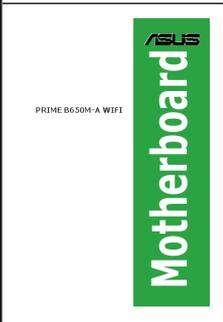
For technical support, driver downloads, BIOS updates, and additional documentation, please visit the official ASUS support website:

www.asus.com/support/

When contacting support, please have your product model number (90MB1FV0-M0EAY0) and serial number ready. The serial number is typically located on a sticker on the motherboard itself or on the retail packaging.

Related Documents - 90MB1FV0-M0EAY0

	[ASUS TUF GAMING B650-E WIFI Motherboard Benutzerhandbuch](#) Umfassendes Benutzerhandbuch für das ASUS TUF GAMING B650-E WIFI Motherboard, das Installationsanleitungen, Spezifikationen und Sicherheitshinweise enthält.
	[ASUS TUF GAMING B650M-E WIFI Motherboard Quick Start Guide](#) This guide provides essential steps for installing the ASUS TUF GAMING B650M-E WIFI motherboard, including CPU, fan, memory, storage, and expansion card installation, along with system connections and initial setup.
	[ASUS TUF GAMING Z490-PLUS Motherboard User Manual](#) Detailed user manual for the ASUS TUF GAMING Z490-PLUS motherboard, covering product introduction, basic installation, BIOS and RAID support, specifications, package contents, and safety information. Includes hardware setup procedures and component details.
	[ASUS PRIME B650M-A WIFI Motherboard User Manual](#) Comprehensive user manual for the ASUS PRIME B650M-A WIFI motherboard, detailing installation, configuration, BIOS, RAID support, specifications, and safety precautions.
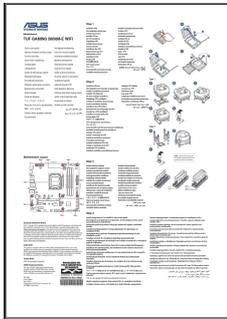
[ASUS TUF GAMING B650M-E WIFI Quick Start Guide](#)

A concise guide for installing and setting up the ASUS TUF GAMING B650M-E WIFI motherboard, covering CPU, memory, storage, expansion cards, and system connections.
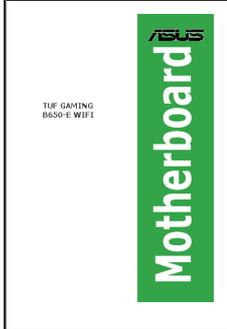
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ASUS TUF GAMING B650-E WIFI   BIOS RAID   /