

ASUS PRIME B650-PLUS AMD B650 Socket AM5 ATX

Model: 90MB1BS0-M0EAY0

Manufacturer: ASUS

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R5,471

ASUS Prime series motherboards are expertly engineered to unleash the full potential of AMD Ryzen 7000-series processors. Boasting a robust power design, comprehensive cooling solutions and intelligent tuning options, PRIME B650-PLUS provides users and PC DIY builders with a range of performance optimizations via intuitive software and firmware features.

FLEXIBILITY

Comprehensive controls form the foundation of the ASUS PRIME series. The PRIME B650 motherboard packs flexible tools to tune every aspect of your system, enabling performance tweaks to perfectly match the way you work to maximize productivity.

Intelligent Control

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CPU Performance Boost

AMD Precision Boost Overdrive(PBO) pushes the CPU current and voltage budget to opportunistically increase performance. By aggressively tuning the PBO parameters, AMD‘s algorithm can leverage the motherboard’s robust power solution to ramp up performance even higher.

All-Around Energy Efficiency

The Power Saving function contains several settings can easily optimize power consumption and maximize energy savings. You can enable a CPU power limit, darken Aura lighting, and set the fan profile to a power saving mode. You can also toggle the Power Saver plan that is built into Microsoft Windows.

Flexible Air- and Liquid-Cooling Controls

ASUS Fan Xpert 2+ software provides comprehensive control over fans and all-in-one (AiO) coolers. Whether cooling with air or water, an Auto-Tuning mode intelligently configures all parameters with a single click. There’s also an Extreme Quiet mode that reduces chassis fan speeds to below the default minimum to keep your system whisper-quiet when performing light tasks. Fans, AiO coolers can also be controlled via the UEFI BIOS.

Precise Digital Power Control

The Digi+ voltage-regulator module (VRM) delivers real-time control over voltage droop, automatically switching frequency and power-efficiency settings. It also allows you to fine-tune your CPU for ultimate stability and performance.

UEFI BIOS

The renowned ASUS UEFI BIOS provides everything you need to configure, tweak and tune your system. It offers intelligently simplified options for PC DIY beginners, as well as comprehensive features for seasoned veterans.

Advanced Tuning for Serious Tweakers

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An intuitive Advanced mode offered via the UEFI lets you take complete control. A built-in search feature makes it easy to find options, and various advanced functions let you intelligently make nuanced adjustments so you can dial in performance just the way you want.

Quick and Simple Setup

EZ mode displays vital settings and stats and also offers guided wizards, drag-and-drop functionality, and one-click application of important settings — all to help you get your rig up and running in no time.

Intuitive Graphical Fan Control

Fine-tune individual fan settings simply by dragging a curve with the mouse.

Aura On/Off Mode (Stealth)

Easily enable or disable Aura RGB lighting or every onboard LED, for a subdued aesthetic touch.

COOLING

Prime B650 series are engineered with multiple onboard heatsinks and an array of hybrid fan headers to ensure your rig stays cool and stable under intense workloads.

Heatsinks

M.2 Heatsink

An M.2 heatsink takes care of the two M.2 slots, warding off throttling that can occur with M.2 storage during sustained transfers. The heatsink is held in place by captive screws.

VRM Heatsinks and Thermal Pads

VRM heatsinks and thermal pads improve heat transfer from the MOSFETs and chokes for better cooling performance.

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Cooler by Design

Prime B650 series feature comprehensive cooling controls that are configurable via Fan Xpert 2+ software or via the UEFI BIOS.

Multiple Temperature Sources

Each header can dynamically reference three thermal sensors. Fan Xpert 2+ allows you to map the temperature of supported ASUS graphics cards to optimize cooling for GPU- and CPU-intensive tasks.

AIO Pump Header

A dedicated PWM/DC header for self-contained water-cooling setups.

Smart Protection

A dedicated integrated circuit protects each fan header from overheating and overcurrent.

4-Pin PWM/DC Fan

Each onboard header supports auto-detection of PWM or DC fans.

PERFORMANCE

The PRIME B650 series is built to handle the high core counts and bandwidth demands of AMD processors. ASUS B650 motherboard provides all the fundamentals to boost daily productivity, so your system will be ready for action with stable power, intuitive cooling and flexible data transfer options.

Robust Power Design

Stable power is essential to extract every last bit of performance out of AMD processors. The PRIME B650-PLUS is geared to cater to the demands of these high-core-count CPUs.

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ProCool Connectors

Proprietary connectors augment the motherboard's link to the PSU with 8 pin connectors that pass 12 volts of power directly to the processors. Each jack features solid pins that can handle more current than hollow-pin connectors.

Six-Layer PCB Design

Multiple PCB layers optimize heat management for critical components, providing more headroom to push CPUs beyond stock speeds.

Memory

DDR5 Performance Enhancement

Comprehensive memory tuning options are the cornerstone of PRIME motherboards. With the PRIME B650-PLUS, you can extract all of the potential out of your DDR5 modules, whether they're from an extreme-speed kit or an entry-level set that would otherwise be locked.

For entry-level modules without EXPO™ memory support, we’ve got you covered. Click here to learn more about AEMP. arrow.

For those who want to fly past stock DDR5 speeds, the PRIME B650-PLUS is primed and ready for enthusiast-grade kits courtesy of vast AMD Extended Profiles for Overclocking (EXPO™) support. Seasoned veterans can further tweak performance via the extensive array of settings in the UEFI.

ASUS OptiMem II

Revisions to the motherboard’s trace routing provide the latest processors with unrestricted access to memory bandwidth. ASUS OptiMem II technology carefully maps memory signal pathways across different PCB layers to reduce vias and adds shielding zones that significantly reduce crosstalk.

Benefits of ASUS OptiMem II:

Improved memory stability and compatibility

Allows lower memory latencies at equivalent voltages

Improved memory frequency margin

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Motherboards with OptiMem II technology were tested with Synopsys HSPICE simulation software

Storage

PCIe 5.0 M.2 Support

PRIME B650-PLUS offers a total of two M.2 slots, the first one supports data-transfer speeds of up to 128Gbps via PCIe 5.0, enabling quicker boot-up and app load times with OS or application drives.
*Actual transmission speeds will be lower than the theoretical maximum speed.

Connectivity

PCIe 4.0 Slot

Prime B650 motherboards offer PCIe 4.0 Slot connectivity for the latest GPUs. The wide bandwidth and superfast transmission speeds allow you to create feature-rich builds that can handle high loads effortlessly.

USB 3.2 Gen 2 Type-C®

A batch of USB ports support high-end rigs loaded with peripherals, including a rear USB Type-C® connector with ultrafast USB 3.2 Gen 2 for transmission speeds of up to 10Gbps.

Front USB Type-C®

A full complement of USB ports support high-end rigs loaded with peripherals, including a front-panel USB 3.2 Gen 1 Type-C® connector that provides data transfer speeds of up to 5Gbps.

USB4® Support

PRIME B650-PLUS motherboard features USB4® support via a Thunderbolt™ (USB4®) header. With an ASUS add-on card*, PRIME motherboards can enable bi-directional speeds of up to 40 Gbps on a single cable, while providing power to fast-charge device. Additionally, this card has a daisy-chain function for multi-screen connection and supports up to dual displays with 4K resolution.
*ASUS add-on card is sold separately.

Realtek 2.5 Gb Ethernet

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Realtek 2.5 Gb Ethernet reduces CPU overhead and offers exceptionally high TCP and UDP throughput for faster, smoother data transfers.

LANGuard

ASUS LANGuard is a hardware-level network protection feature that integrates advanced signal-coupling technology and premium anti-EMI surface-mounted capacitors to improve throughput and ensure a more reliable connection.

Audio Shielding

Audio shielding ensures precision analog/digital separation and greatly reduced multi-lateral interference.

Dedicated Audio PCB Layers

Separate layers for left and right tracks ensures both channels deliver consistent, equal quality.

Premium Audio Capacitors

Provides warm, natural, and immersive sound with exceptional clarity and fidelity.

Aura Sync

Outshine the Competition

A well-tuned enthusiast system deserves a matching aesthetic. ASUS Aura offers full RGB lighting control with a variety of functional presets for the built-in RGB LEDs as well as strips and devices connected to the onboard RGB headers — and it can all be synced with an ever-growing portfolio of Aura-capable hardware.

Addressable Gen 2 Headers

Three addressable Gen 2 headers are capable of detecting the number of LEDs on second-gen addressable RGB devices, allowing the software to automatically tailor lighting effects to specific devices. The new headers also offer backward-compatibility with existing Aura RGB gear.

Armoury Crate

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Within a single intuitive interface, Armoury Crate offers easily customized Aura Sync RGB settings for every compatible device in your arsenal , plus controls for an ever-growing family of ASUS products, including keyboard and mouse preferences. Armoury Crate also integrates product registration and a news feed so that you never miss updates of interest to the ASUS community.

Q-LED Core

The Q-LED Core display produces light patterns by power LED during the Power-On Self-Test (POST) that can help users troubleshoot potential issues.

BIOS FlashBack™

BIOS FlashBack™ is the simplest and safest (UEFI) BIOS update method. Simply drop the (UEFI) BIOS file onto a FAT32 formatted USB stick, plug it into the USB BIOS FlashBack™ port and press the button. Updates can even be performed without a memory or a CPU installed.

SafeSlot Core+

SafeSlot Core+ is the ASUS-exclusive PCIe slot fortified with a one-piece stainless-steel brace that shields the slot to protect it from damage. The metal cover is tightly secured to the slot with hooks, and the entire assembly is firmly anchored to the PCB with strengthened solder points to provide a secure foundation for heavyweight graphics cards.

Overvoltage Protection

World-class circuit-protecting power design

An exclusive circuit design with built-in voltage regulators to protect your motherboard from damage caused by unexpected high-level voltages from unstable or inferior power supplies.

Stainless-Steel Back I/O

3X corrosion-resistance for greater durability

Corrosion-resistant stainless-steel back I/O panels bonded with chromium oxide have a lifespan that's three times longer than ordinary panels.

THIS CHANGES EVERYTHING.

FROM THIS NEW PLATFORM, YOU CAN SEE THE FUTURE

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Build your next rig with an AMD Ryzen™ 7000 Series processor and PRIME B650-PLUS to experience advanced performance. With up to 16 “Zen 4” cores and 32 threads, boost clocks of up to 5.7GHz, and 80MB cache, the AMD Ryzen™ 7000 Series keeps you ahead of the game.1

You’ll also gain access to new features for gamers with AMD Socket AM5, from the speed of DDR5 memory to the increased bandwidth of PCIe® 5.0. AMD Ryzen™ 7000 Series processors and AMD socket AM5 motherboards are unlocked for overclocking to personalize your experience. Gain even more performance when you overclock your DDR5 memory with AMD EXPO™ technology.2

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