# B650MT Motherboard

- Socket AM5 support AMD Ryzen™ 7000 / 8000 / 9000 series Processors
- AMD B650 single chip architecture
- Supports 2-DIMM DDR5 up to 128 GB Memory
- Supports Realtek Gigabit LAN
- Supports Front USB 3.2 Gen2 Type-C
- Supports PCIe 4.0 M.2 (64Gb/s)
- Supports HDMI® 4K resolution

| Specifcation | |
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| CPU SUPPORT | Socket AM5 support AMD Ryzen™ 7000 / 8000 / 9000 series Processors<br>Support for future AMD Ryzen processors with BIOS update<br>* Please refer to www.biostar.com.tw for CPU support list. |
| MEMORY | AMD Ryzen 7000 / 8000 / 9000 Series Processors:<br>Supports Dual Channel DDR5 - 6000+(OC) MT/s, Non-ECC, Un-buffered Memory<br>2 x DDR5 DIMM Memory Slot, Max. Supports up to 128 GB Memory<br>Support Intel Extreme Memory Profile (XMP) memory modules and AMD EXTended Profiles for Overclocking (EXPO) memory modules<br>* Please refer to www.biostar.com.tw for Memory support list. |
| INTEGRATED VIDEO | By CPU model<br>Supports DX12<br>Supports HDCP |
| STORAGE | Total support 1 x M.2 Socket and 4 x SATA (6Gb/s) ports<br>AMD Ryzen 7000 / 8000 / 9000 Series Processors<br>1 x M.2 (Key M) Socket (M2M_CPU) :<br>Supports M.2 Type 2242/ 2260/ 2280 SSD module<br>Supports PCIe 4.0 x 4 (64Gb/s) - NVMe SSD<br>AMD B650 Chipset<br>4 x SATA III Connector (6Gb/s) : Supports AHCI & RAID 0, 1, 10 |
| LAN | Realtek RTL8111H<br>10/ 100/ 1000 Mb/s auto negotiation, Half / Full duplex capability |
| AUDIO CODEC | ALC897<br>7.1 Channels, High Definition Audio, Hi-Fi |
| USB | 1 x USB 3.2 Gen2 Type-C port (1 via internal headers)<br>6 x USB 3.2 Gen1 ports (4 on rear I/Os and 2 via internal headers)<br>6 x USB 2.0 ports (2 on rear I/Os and 4 via internal headers) |
| EXPANSION SLOT | AMD Ryzen 7000 / 8000 / 9000 Series Processors<br>1 x PCIe 4.0 x16 Slot (x16 or x8/x8 mode)<br>AMD B650 Chipset<br>1 x PCIe 3.0 x1 Slot |

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| REAR I/O | 1 x BIOS UPDATE Button<br>1 x HDMI® Port<br>1 x DP Port (DP1.2)<br>4 x USB 3.2 (Gen1) Type-A Ports<br>2 x USB 2.0 Type-A Ports<br>1 x Giga LAN port<br>3 x Audio Jack |
| INTERNAL I/O | 4 x SATA III Connector (6Gb/s)<br>2 x USB 2.0 Header (each header supports 2 USB 2.0 ports)<br>1 x USB 3.2 (Gen1) Header (each header supports 2 USB 3.2 (Gen1) ports)<br>1 x USB 3.2 (Gen2) Type-C Header<br>1 x 8-Pin Power Connector<br>1 x 24-Pin Power Connector<br>1 x CPU Fan Connector<br>1 x System Fan Connector<br>1 x CPU water cooling connector (CPU_OPT)<br>1 x Front Panel Header<br>1 x Front Audio Header<br>1 x Speaker Header<br>1 x Clear CMOS Header<br>1 x COM Port Header<br>1 x TPM Header |
| H/W MONITORING | CPU / System Temperature Monitoring<br>CPU / System Fan Monitoring<br>Smart / Manual CPU Fan Control<br>CPU/DDR Voltage Monitoring |
| DIMENSION | Micro ATX Form Factor Dimension: 22.1cm x 23.5cm ( W x L ) |
| OS SUPPORT | Supports Windows 10(64bit)/ 11(64bit)<br>※Biostar reserves the right to add or remove support for any OS with or without notice. |
| BUNDLE SOFTWARE | BullGuard |
| ACCESSORIES | 2 x SATA Cable<br>1 x I/O Shield<br>1 x DVD Driver<br>1 x Quick Guide<br>1 x M.2 Anchor |

# OVERVIEW

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| AMD B650 | **AMD B650 chipset**<br>If you are a serious gamer or creator, you will want an AMD B650 motherboard. With PCIe® 5.0 support for your NVMe drive and DDR5 support featuring AMD EXPO™ technology, AMD B650 is packed with features that help speed up your game. |
| HD AUDIO | **HD Audio**<br>Provides high quality sound with minimal loss of audio fidelity. |

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## Hi-Fi Ground

BIOSTAR Hi-Fi Ground ( Golden Line ) is noise-blocking multi-layer PCB design to isolates analog audio signals from digital sources. Unique PCB layout is ideal for exceptional clarity and high fidelity sound.

## Hi-Fi AMP

The built-in amplifier can drive major high-end headphones with over 100dB loads and offer wide band-width, low noise, high slew rate and low distortion audio source from front panel I/O. Gaming enthusiasts can enjoy a fuller range of dynamic sound with crisper details and less distortion.

## Smart Ear

Smart EAR is a windows-based audio utility which allows you to easily adjust system volume. With its user-friendly GUI, you can also increase or decrease impedance setting (Low/High Gain) to optimize your headphone performance. You can easily enjoy high-quality and awesome sound.

## HDMI® 4K2K

The new 4K2K resolution enables high-definition image display with four times the resolution of full HD, 4K2K display is faithfully express bright, highly detailed content that fills the entire screen with lifelike images. Connectivity with PCs via a single HDMI® cable for displaying 4K2K data.

## DisplayPort

DisplayPort is a digital display interface developed by the Video Electronics Standards Association (VESA). The interface is primarily used to connect a video source to a display device such as a computer monitor, though it can also be used to carry audio.

## DX12

DirectX 12 introduces the next version of Direct3D, the graphics API at the heart of DirectX. Direct3D is one of the most critical pieces of a game or game engine, and we've redesigned it to be faster and more efficient than ever before. Direct3D 12 enables richer scenes, more objects, and full utilization of modern GPU hardware.

## SATAIII 6Gbps

SATAIII 6Gbps provides a higher bandwidth to retrieve and transfer HD media. With this super speed data transfer, SATAIII allows an incredible data boost which is 2x faster than the SATA II.

## DDR5

DDR5 provides 50% higher bandwidth than DDR4, the frequency can be up to 6000+(OC)MHz, and can boasts the largest memory capacity available. It also supports dual channels and has lower power consumption, which can provide better performance and experience for overclockers.

## PCIe 4.0

PCIe 4.0 is the ubiquitous and general-purpose PCI Express I/O standard. At 16GT/s bit rate, the interconnect performance bandwidth is doubled over PCIe 3.0, while preserving compatibility with software and mechanical interfaces.

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## PCIe 4.0 M.2

PCIe 4.0 M.2 delivers the highest bandwidth and lower latency. It is 2 times faster compared with PCIe 3.0 M.2 .

## USB 3.2 Gen2 Type-C

USB 3.2 Gen2 offers up to double the transfer speed of USB 3.2 Gen1 at 10 Gbps that allows for much higher data transfer rates and more efficient data transfer. And the Type-C connector is reversible so it's easier to plug in.

## USB 3.2 Gen1 Type-A

USB 3.2 Gen1 delivers a compelling performance boosts and can be used to connect multiple devices without worrying about compatibility. It is capable of data transfer speeds up to 5Gbps and backwards compatible with all existing USB products.

## S-Hyper PWM

The S-Hyper PWM has DCR current sensing architecture and lossless characteristic, offering excellent precision in delivering stable power with 100% fixed voltage to ensure that critical components of the motherboard are under protected with the maximum performance and reliability.

## OC TWEAKER

OC TWEAKER is the process of adjusting performance settings to optimize system functionality and ensure reliable operation.
By increasing the computer is processing speed and GPU frame rates (FPS), it enables the system to handle demanding tasks more effectively, thereby improving user satisfaction.

## Super Durable Solid Caps

The best quality solid state capacitors with ultra low ESR design, the Super Durable Solid Caps doubles the lifespan.

## Super Durable Inductor

Super Durable Inductor brings the benefits of higher current capacity, lower energy loss and better power stability.

## Moistureproof PCB

The PCB will be oxidizing easily by damp or absorbed moisture, and ionic migration or CAF (Conductive Anodic Filament) will be generated. Moistureproof PCB meets high density and high reliability requirements for moisture proof.

## Super LAN Surge Protection

Super LAN Surge Protection, providing LAN port with more advanced antistatic protection capabilities by adding an integrated chip to strengthen electrical stability and prevent damage from lightning strikes and electrical surges. SLSP (Super LAN Surge Protection) series motherboard upgrades the existing system protection standards with maximum 4X protection comparing to other board makers.

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## ESD Protection

ESD (Electrostatic Discharge) is the major factor to destroy the PC by electrical overstress (EOS) condition. ESD occurred by PC users when touch any devices connect to a PC, which may result in damage to the motherboard or parts. ESD protection is designed to protect the motherboard and equipment from damage by EOS.

## OC / OV / OH Protection

OC / OV / OH Protection design detects overvoltage conditions and prevents voltage surges from spreading in real time. It also actively cuts off the overvoltage supply to protect your system.

## UEFI BIOS

Unified Extensible Firmware Interface (UEFI) is a brand new framework that provides a revolutionary interface. It is a modern clear and easy-to-use graphical user interface. The UEFI comes with a colorful easy-understand icons leads users into the setup layer directly.

## BIO-Flasher

BIO-Flasher is a convenient BIOS update tool. Just launch this tool and put the BIOS on USB pen driver before entering the OS. You can update your BIOS with only a few clicks without preparing an additional floppy disk or other complicated flash utility.

## A.I FAN

With A.I FAN users can ensure that their gaming PC can maintain its performance while staying cool. According to different cooling needs and usage scenarios, users can control speed modes. Allows users to have more customizability of fan modes and automatically detects different temperatures to make fan operate at defined speed for optimal cooling performance.

## CPU OPT

BIOSTAR offers one more fan header which is called CPU OPT. Users can use it to connect any kind of water coolers for a liquid cooling system. Keep your computer stable and enjoy your machine at the utmost potential.

## Debug LED

Debug LED helps you identify any issues going with your board or hardware. When error occurs, the corresponding LED lights will inform you on the status of your board or hardware to shorten the test time effectively.

## A.I TP Control

A.I TP Control is designed for overclockers. It provides a user-friendly BIOS environment that overclockers can adjust the temperature setting to keep your PC safe and enjoy extreme overclocking performance.

## Smart Update

Biostar Smart Update is a utility that can help users run online update. It can download the drivers for your motherboard from Biostar official website and install them automatically.

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| | **SMART BIOS UPDATE**<br>The easiest way to update the BIOS is provided.<br>Connect the USB driver to the SMART BIOS USB port to update. |
| | **HDMI®**<br>The terms HDMI® and HDMI® High-Definition Multimedia Interface, and the HDMI® Logo are trademarks or registered trademarks of HDMI® Licensing Administrator, Inc. in the United States and other countries. |

*The specification and pictures are subject to change without notice and the package contents may differ by area or your motherboard version!

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