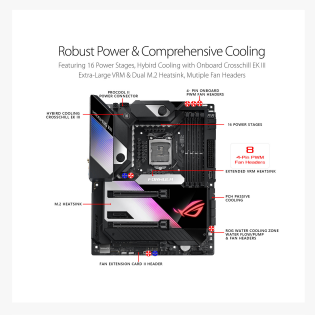




ASUS Republic of Gamers Maximus XII Formula LGA 1200 ATX Motherboard

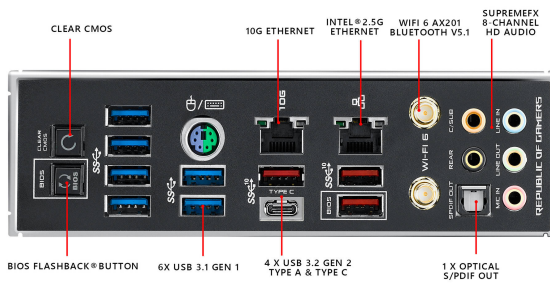
\$489.95

Product Images



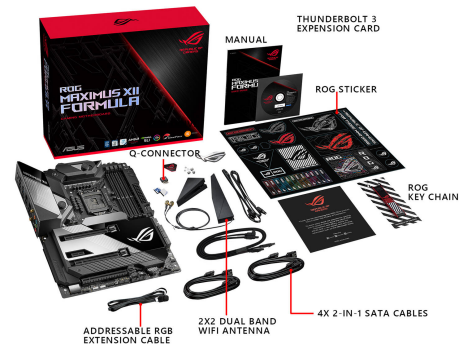
Full Gaming Connectivity

WiFi 6 AX201, 10G LAN, Intel®2.5G LAN, Bluetooth v5.1
USB 3.2 Gen 2, SupremeFX 8-Channel HD Audio



What's in the Box

Exclusive ROG MAXIMUS XII FORMULA Bundle



Short Description

Bring ultimate performance to your gaming experience with the ROG Maximus XII Formula LGA 1200 ATX Motherboard from ASUS. Designed for gamers, enthusiasts, professionals, and content creators who want to pack a ton of power into their desktop computer systems, this ATX motherboard is powered by the Intel Z490 chipset and supports 10th generation Intel processors with the LGA 1200 socket. It takes full advantage of the PCIe 3.0 data bandwidth to deliver high performance for tasks such as video editing, gaming, and 3D modeling. The motherboard also features an advanced cooling design with extensive support for fans and liquid cooling systems.

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High Quality Components

- 8-pin ProCool II power connector
- 70 A power stage
- MicroFine alloy chokes
- 10K Japanese-made black metallic capacitors



ASUS OptiMem III

Boasting proprietary memory trace layout tweaks that improve signal integrity and mitigate noise, ASUS OptiMem III is more compatible with 3600 MHz+ memory kits, allowing them to run at higher frequencies. You can opt to optimize memory for high frequency settings, or low latency settings. With higher capacity memory kits, OptiMem III enables you to run at maximum frequency, whereas other motherboards will trade off frequency for capacity. Stack Maximus XII Formula with your favorite modules and maximize throughput of the new 10th Generation Intel Core Comet Lake-S processor for applications that demand massive bandwidth.



ASUS OptiMem III

CrossChill EK III lets you cool with air and water. The redesigned copper cooling channel is wider to provide up to 37.2°C-lower MOSFET temperatures on water, while the standard G1/4" threaded fittings allow it to fit existing setups for efficient, quiet cooling with minimum effort.

1. G1/4" threaded design
2. Watertight rubber gasket
3. Copper water channel
4. Large copper surface area



Three PCIe 3.0 M.2

Three M.2 slots are wired directly to the PCH. One slot supports both SATA and PCIe 3.0 x4 modes, while the other two supports PCIe 3.0 x4 for NVMe. Additional Intel Optane memory recognizes, remembers, and speeds up access to most frequently used files, applications, and games for faster, more responsive performance.



Networking

1. WiFi 6 (AX201)
2. 10 Gbps onboard Ethernet
3. Intel 2.5G Ethernet



Headers

Cooler by design:

- Multiple temperature sources
- 4-pin PWM/DC fan
- AIO pump ROG

Water-Cooling Zone:

- Water pump+
- Water in/out



AI Overclocking

Tuning is now faster and smarter than ever before. AI Overclocking profiles the CPU and cooling to predict the optimal configuration for each system.

Up to 128GB of dual-channel DDR4 RAM, reaching 4800 MHz when overclocked, can be installed across four memory slots. Additionally, up to six Intel Optane-enhanced SATA III storage drives can be installed alongside three M.2 SSDs, which can be put into RAID 0, 1, 5, or 10 configuration. Intel Rapid Storage Technology helps to boost performance and responsiveness of connected storage drives. Dedicated graphics cards can be installed into the PCIe 3.0 x16 slots with support for 2-Way NVIDIA SLI and 3-Way AMD CrossFireX configurations to maximize frame rates, connect 4K monitors, and for faster video rendering times. An additional PCIe 3.0 x1 slot is available alongside a Thunderbolt 3 header for compatible expansion cards.

The USB 3.2 Gen 2 Type-A and Type-C ports allow you to transfer data from compatible peripherals at up to 10 Gb/s. Other features include fast network connections with both a 2.5 Gigabit Ethernet port and a 10 Gigabit Ethernet port quickly transfer data from network attached storage drives and other compatible devices. They operate alongside the built-in 802.11ax Wi-Fi that can reach speeds of up to 2.4 Gb/s over compatible wireless networks.

The ROG Maximus XII Formula also delivers deep and immersive 7.1-channel surround sound through the SupremeFX S1220 audio codec and ESS ES9023P DAC. You can customize your computing experience using the addressable RGB headers to connect light strips, which can be synced with other Aura Sync-compatible peripherals such as mice and keyboards. There is also a 2" LiveDash OLED display built onto the motherboard, which can be programmed to show hardware statistics or customized graphics. Windows 10 64-bit is required to take advantage of all the motherboard's features.

Features

Performance Features

- The ROG Maximus XII Formula features 16 power stages, each rated to support up to 70 amps.
- Quality chokes and durable capacitors help to deliver strong electrical performance.
- The Digi+ voltage-regulator module (VRM) helps to ensure smooth and clean power delivery. It also allows for direct control over voltages, the switching frequency, and power-efficiency settings to fine-tune the CPU voltage regulation for stability and performance.
- The TurboV Processing Unit (TPU) onboard micro-controller that helps to provide a variety of system-tuning features. It can be used to fine-tune voltages, monitor system stats, and adjust overclocking parameters.
- The Energy Processing Unit (EPU) optimizes power consumption to maximize savings in Away mode, which shuts down I/O controllers.
- Turbo App utility allows you to customize the computer system's performance for individual applications.

Storage and Memory

- Three PCIe 3.0 M.2 slots are available, supporting up to type 22110 SATA and NVMe SSDs.
- Six SATA III ports are available for hard drives and 2.5" SSDs.
- Supports RAID 0, 1, 5, and 10.
- Intel Rapid Storage technology enhances the performance and responsiveness of storage drives.
- Intel Optane modules are supported, which enhances storage drive performance by caching frequently accessed data.
- Up to 128GB of dual-channel DDR4-4800 (OC) memory can be installed across four slots.

- Supports Intel Extreme Memory Profile (XMP).
- The RAMCache III utility can automatically caches all your storage devices so that games and apps load faster.
- OptiMem III technology enhances memory stability and compatibility.

Comprehensive Cooling

- The VRM heatsink and thermal pad help to efficiently transfer heat away from the motherboard's electrical systems.
- The CrossChill EK III design lets you cool the MOSFET with air and water.
- A dedicated water-cooling zone includes high performance pump headers and monitoring for both flow rate and water temperatures.
- The motherboard's M.2 slots are covered by large heatsinks to help prevent speed throttling when the SSDs become too hot.
- Artificial intelligence monitors system temperatures and loads to automatically set fan speeds, which optimizes cooling while keeping noise to a minimum.
- Fan Xpert 4: Manually or automatically control the speed of your fans to find a balance of cooling performance and noise. Extreme Quiet mode reduces fan speeds to below the default minimum to keep your system quiet during light tasks.

AI Enhancements

Integrated artificial intelligence features help to optimize overclocking, cooling, and network performance.

Fully Connected

- USB 3.2 Gen 2 features a maximum throughput of 10 Gb/s when used with compatible devices.
- USB 3.2 Gen 1 ports support data transfer speeds of up to 5 Gb/s.
- USB 2.0 Type-A ports are included for compatible devices such as mice and keyboards.

Networking Performance

- 10 Gigabit and 2.5 Gigabit Ethernet ports provide fast wired connections with compatible devices.
- The built-in 802.11ax Wi-Fi can transfer data at up to 2.4 Gb/s over compatible wireless networks.
- LANGuard technology improves the tradition Ethernet port by protecting it against surges, providing a cleaner data signal, and reducing the chance of errors without taking up CPU resources.
- The GameFirst VI network customization tool for ROG routers uses AI-enhanced features that allow you to analyze, optimize, and boost network data traffic to help ensure stability with minimal interference.
- Bluetooth 5.1 connectivity allows for strong and stable connections when paired with compatible wireless devices.

Upgrade-Friendly

- The pre-mounted I/O shield streamlines the motherboard installation process.
- Q-DIMM slots allow you to easily install and remove memory modules.
- Memory slots support Intel Extreme Memory Profile (XMP)
- A differential-sensing circuit and dedicated IC provide accurate voltage monitoring, allowing you to efficiently overclock and tune your system.
- SafeSlot technology reinforces the PCIe slots to provide strong device retention and shearing

resistance.

- Onboard Q-LED lights indicate the power status and problems with the CPU, memory, graphics card, or boot device.
- The ROG AI Overclocking utility helps you get the most out of your build by automatically profiling your CPU and cooling system to predict optimal voltage and frequency settings.

NVIDIA SLI / AMD CrossFireX Support

Installing multiple graphics cards will enhance the computer's performance for demanding tasks such as gaming, video editing, and more. This motherboard supports a 2-Way NVIDIA SLI and 3-Way AMD CrossFireX configurations.

SupremeFX Audio

- The integrated SupremeFX S1220 audio technology is designed to deliver a flat frequency response for detailed sound with 7.1-channel playback.
- 32-bit / 192 kHz playback support.
- 120 dB stereo output signal-to-noise ratio.
- 113 dB input signal-to-noise ratio.
- The ESS ES9023 digital-to-analog converter (DAC) and RC4580 amp deliver high-quality audio to the front panel output.
- A Texas Instruments RC4580 op amp delivers high gain with low distortion
- Gold plated audio jacks enhance audio quality and performance
- The switching MOSFET design allow the audio codec's impedance-sensing function to be ported with either the front or rear headphone outputs.
- Electromagnetic shielding protects against interference from nearby components for cleaner-sounding audio.
- Nichicon capacitors are designed to produce a warm, natural sound with high clarity.
- The Sonic Studio III software allows you to customize EQ profiles across different audio devices and applications.
- The DTS: Sound Unbound app works with Windows Sonic technology to deliver spatial sound to headsets, immersing you into virtual environments and entertainment.

LiveDash OLED

The integrated 2" LiveDash OLED display can be programmed to show hardware monitoring information, an animated Extreme logo, BIOS updated progress, and custom images such as animated GIFs.

Aura Sync RGB Lighting

Aura Sync technology allows you to connect, customize, and control lighting equipment such as RGB LEDs and light strips on the onboard RGB headers. You can choose from a variety of lighting presets that include Static, Strobing, and Color Cycle. These presets can be synchronized with Aura Sync-compatible peripherals such as keyboards, mice, monitors, and more. The addressable RGB headers can detect the number of LEDs on a compatible device and control them individually to further tailor the lighting effects.

Armoury Crate

ASUS Armoury Crate is a suite of management software for system customization. It includes ASUS Aura Sync RGB lighting control, keyboard and mouse preferences, fan speed control, and more.

ASUS Maximus XII Formula Specs

CPU

Chipset Intel Z490

CPU Socket LGA 1200

Back Panel I/O

USB 3 x USB 3.1 / USB 3.2 Gen 2 Type-A
1 x USB 3.1 / USB 3.2 Gen 2 Type-C
6 x USB 3.1 / USB 3.2 Gen 1 Type-A

Thunderbolt *None*

Display *None*

Audio 5 x 3.5 mm
1 x S/PDIF

Ethernet / Controller 1 x Intel I225-V 2.5Gigabit
1 x Aquantia AQC107 10GbE

PS/2 1 x Combo

Wi-Fi Antenna 2 x Connector

Buttons BIOS Flashback, Clear CMOS

Memory

Memory Slots 4 x 288-Pin

Memory Support DDR4 2133, 2400, 2666, 2800, 2933, 3000, 3200, 3333, 3400, 3466, 3600, 3733, 3866, 4000, 4133, 4266, 4400, 4500, 4600, 4700, 4800 MHz

Maximum Capacity 128 GB

Channel Architecture Dual Channel

ECC Support Non-ECC Unbuffered

Storage Expansion

SATA 6 x SATA III

M.2 1 x M Key 2242, 2260, 2280, 22110 (PCIe 3.0 x4, SATA III)
2 x M Key 2242, 2260, 2280 (PCIe 3.0 x4)

U.2 *None*

Optane Memory Support Yes

RAID Support	RAID 0, 1, 5, 10
Internal I/O	
Expansion Slots	2 x PCIe 3.0 x16 (x16 mode) 1 x PCIe 3.0 x16 (x4 mode) 1 x PCIe 3.0 x1
USB	2 x USB 3.1 / USB 3.2 Gen 1 Header (Supports 4 USB Type-A Port) 2 x USB 2.0 Header (Supports 4 USB Type-A Port)
Multi-GPU Support	2-Way NVIDIA SLI 3-Way AMD CrossFireX
Air Cooling	1 x 4-Pin CPU 1 x 4-Pin Assistant 3 x 4-Pin System 1 x 2-Pin W_IN 2 x 2-Pin W_OUT 3 x 3-Pin W_FLOW 1 x Thermal Sensor
Liquid Cooling	2 x 4-Pin Pump 1 x Radiator Fan
Power Connectors	1 x 24-Pin Mainboard 1 x 8-Pin ATX 1 x 4-Pin ATX
LED Header	4 x RGB
Audio	1 x Speaker
Diagnostics	Flash BIOS, ReTry, Start
Add-On	1 x Thunderbolt Card Header
BIOS	
ROM	256 Mb
Front Panel I/O	
I/O Connection Headers	AAFP, USB 3.1 / USB 3.2 Gen 1
Audio	
Audio Codec	SupremeFX S1220 (7.1-Channel)
Wireless	
Bluetooth	5.1
Wi-Fi	Wi-Fi 6 (802.11ax) (MU-MIMO)
Module Support	1 E Key M.2
Software	
Supported Operating Systems	Windows 10 (64-Bit)

Physical

Form Factor ATX

Dimensions 12.01 x 9.61" / 30.5 x 24.4 cm

Packaging Info

Package Weight 7.32 lb

Box Dimensions (LxWxH) 14.7 x 12.2 x 4.4"

Additional Information

Brand	ASUS
SKU	ROG-MAXIMUS-XII-FORMULA
Weight	9.0000
Processor Manufacturer	Intel
Chipset	Z490

