

## Best Z790 Motherboards for Intel Processors

### Intro

Looking for the best Z790 Chipset motherboard to pair up with Intel's newly released 13th Gen Raptor Lake processors? If so, we've got you covered as we compile and rate a list of three of the best Intel Z790 motherboards available in the current market according to your budget and requirements.

To pick the best motherboards we rated the overall features, connectivity, and connection speeds on the component's ports, incredible RAM speeds, and the board's aesthetics. Once we selected the competitors we then compared and rated them accordingly in our opinion.

Raptor Lake uses the same socket of LGA1700 as its previous lineup of Alder Lake generation, hence a layer of cross-compatibility between the motherboards and CPUs of these two generations.

Intel launched the Z790 exclusively for the 13th Gen processors however these motherboards are also compatible with the previous generation of processors and vice-versa.

The Z790 motherboards are Intel's top-of-the-line chipsets offering the best connectivity and features, however, that means the cost is also higher and that is a trade-off for the fact that the Z790s enables to unleash the highest performance out of the latest generation of hardware.

Our three Z790 motherboard picks

Editors Choice: GIGABYTE Z790 AORUS Elite AX ~\$259

Best Premium: ASUS ROG Strix Z790-E Gaming WiFi 6E ~\$499

Best Budget: MSI PRO Z790-P WiFi ~\$239

#### 1. GIGABYTE Z790 AORUS Elite AX - Editor's Choice

Form Factor: ATX | Chipset: Z790 | VRM: Twin 16+1+2 Hybrid Digital | Memory: 4x DIMM, 128GB, DDR5-4800, DDR5-7600 (O.C.) | Video Outputs: 1x HDMI, 1x DisplayPort | USB Ports: x10 rear IO, 7x internal | Network: 1x 2.5GbE LAN, 1x WiFi 6E AX211 | Storage: 4x M.2, 6x SATA 6gb/s

#### Pros:

Outstanding Thermal Design

Great Connectivity

Ultra Durable

4x M.2 Slots

#### Cons:

Expensive

Singular PCIe Gen 5 x16 slot|  
Minimalistic design

Starting with our editor's choice, the Gigabyte Z790 Aorus Elite AX is one of the strongest contenders for the best Z790 motherboards available in terms of offering value for money. It's an all-rounder that covers every aspect there is while being cost-efficient as Gigabyte manages to keep the costs down while still managing to offer competitive features for the consumer.

#### Design and Aesthetics:

In terms of looks, the Gigabyte Z790 Aorus Elite AX is rather a simplistically designed ATX form factor motherboard that features a large heat sink design with plenty of cooling on the VRMs. Much of the PCB is exposed so such a design keeps its price down towards the reasonable end.

Its PCB is all black while the heatsinks have a black & grey color combination giving the board a sleek look. There are RGB elements towards the bottom of the board which can be customized to your liking using the Gigabyte RGB Fusion 2.0 software.

The heatsinks add depth to the board which not only keeps your SSDs and the board itself cool but provide an aesthetic yet subtle look too.

#### Features and Functionality

The Aorus Elite AX features four DDR5-based DIMM slots with 128GB of max capacity. Furthermore, you can overclock your DIMMs to an astounding 7600MHz. The board sports a dual-channel memory architecture and those looking towards enabling the maximum capacity of performance will want to make use of the high overclocking capability of this board with the new XMP 3.0 memory module support.

When it comes to PCIe slots, this motherboard has three of them. However only the top PCIe slot wired to the CPU socket is a fully functional PCIe Gen 5 x16 slot which will open up your upgrade paths for the future, the remaining two are standard PCIe 4 slots with the ratings of x4 speed.

Gigabyte offers its exclusive stainless steel PCIe shielding for the Z790 AORUS ELITE AX. The new-generation PCIe 5.0 armor is 20% wider to provide reinforced tensile strength. Its stainless steel pins have multiple points to penetrate the PCB and increase the durability of the SMD.

The board features four M.2 ports and all of them are PCIe Gen 4 only. The M.2 Thermal Guard III installed here features a 6x optimized heat dissipation surface and double-sided M.2 heatsinks to bottlenecks and throttling caused by overheating and ensures VRM power stability.

EZ-Latch Plus is also present which enhances the user experience with a quick-release and screwless design of the M.2 connectors.

This motherboard is faster than ever with amazing connectivity features, the Z790 Aorus Elite AX uses the 802.11ax WiFi 6E which is the latest wireless solution with a dedicated 6GHz band. It enables lower latency and seamless connectivity where you can enjoy up to 2.4Gbps speeds.

WiFi 6E offers improved battery life for VR solutions and as a result, wirelessly streamed VR games are much smoother.

Bluetooth 5.3 is also featured here from which you can take advantage of faster transmissions and extended range.

With the 2.5GBe LAN chip installed it delivers more than double the standard transfer speeds of 1GBe, which makes it perfect for improved gaming experiences.

The WIMA and Fine gold audio capacitors allow the Z790 Aorus Elite AX to reproduce a studio-grade quality experience.

The Q-Flash plus feature allows the user to upgrade BIOS without installing the CPU, memory, and graphics card. This feature might not be so handy for now but if you're planning to upgrade your rig down the line it'll be the best bonus feature you get.

The rear IO has a fair share of a few options when it comes to high-speed USBs. The fastest USB port is a Type-C format USB 3.2 Gen2x2 which rates up to 20GB/s. There's also a line-out and mic-in on the back IO plus there's a S/PDIF to get plenty of options for surround systems or speaker setups.

Finally, the Z790 AORUS Elite AX supports Windows 10 and 11 64bit.

## 2. ASUS ROG Strix Z790-E GAMING WiFi - Best Premium

Form Factor: ATX | Chipset: Z790 | VRM: 18+1 Power Stages | Memory: 4x DIMM, 128GB, DDR5-5600, DDR5-7800+ (O.C.) | Video Outputs: 1x HDMI, 1x DisplayPort | USB Ports: x12 rear IO, 9x internal | Network: 1x 2.5Gbe LAN, 1x WiFi 6E AX211 | Storage: 5x M.2, 4x SATA 6gb/s

### Pros:

- Powerful power design
- Plenty of USB ports
- 5x M.2 slots
- Good aesthetics
- Solid build quality
- Plenty of USB ports
- Improved Q-release design

### Cons:

Steep price

Coming over to our best premium pick, the ASUS ROG Strix Z790-E GAMING WiFi is hands down one of the best-looking boards out there with a handful of good features. The board offers great quality and overall performance and kudos to ASUS as they never disappoint with stunning aesthetics.

Aesthetics and Design:

The ASUS ROG Strix Z790-E comes with the usual ASUS signature theme, the PCB is primarily black with softly contrasting metallic heatsinks nearby.

There is a white version available too which goes by the model name Z790-A instead.

Right on our IO roofing, we have a bold ROG-EYE RGB logo staring back at us with its 65 million shades of colors, which in my opinion gives off a very unique look compared to other boards.

The board shows off an aggressive look with large heat spreaders for the M.2 ports and the chipsets, moreover the VRM's heat spreader is also a massive one.

There are also cool graphics spread all over the board, which makes the board look very unique and not too bland. Plus, the metal finish just looks astonishing.

Features and Functionality

ASUS ROG Strix Z790-E features four DDR5-based DIMM slots as well with 128GB of maximum capacity with dual-channel memory architecture. It supports the highest speeds of about 5600MHz and is overclockable to an astonishing frequency of 7800MHz+ with Intel's Extreme Memory Profile.

Heading over to PCIe slots; this board offers a singular PCIe Gen 5.0 x16 slot embracing the newer standard amongst two PCIe Gen 4.0 x16 slots as well as one PCIe 3.0 x1 slot.

The IO Armor and the heatsinks on the VRMs(which are linked via a heat pipe) are bulky and massive, but this is mainly because they passively cool down the VRMs. ASUS certainly did not cheap out on the power configurations and no compromises were made to its quality. ASUS has provided an 18+1 power solution rated for 90A per stage on this specific motherboard with dual ProCool II power connectors, high-quality alloy chokes, and durable capacitors to support multi-core processors.

There are a total of five M.2 ports however only one of them is geared for blistering 16GB/s read and write speeds thanks to its PCIe Gen 5.0 interface, however, the rest support the standard PCIe Gen 4.0 x4 mode that delivers impressive 8GB/s speeds. Every M.2 port is covered with

heatsinks to dissipate the heat and prevent throttling. Four SATA 6GB/s ports are also present on the board, considering these points it's very clear that there are plenty of storage options and you'll never have to worry about running out of storage ports.

Many DIY-friendly features are also delivered in the ROG STRIX Z790-E, which include the PCIe slot Q-release, M.2 Q-latch, Q-code, clear CMOS button, internal START button, and BIOS FlashBack which is a simple way to update your BIOS without having memory or a CPU installed.

In terms of connectivity, this board certainly doesn't lack behind as it features the latest WiFi 6E and the onboard Intel 2.5G Ethernet which enables low-latency gaming, impressive transfer speeds, and seamless high-resolution video streaming alongside much more. The Strix Z790-E comes loaded with two USB 3.2 Gen2x2 Type-C connectors which allow data transfer speeds of up to 20GB/s. One is a port on the rear IO and the other one can be attached to the chassis panel, it also features Power Delivery (PD) 3.0 technology to quickly charge up devices up to 30w, so that is a plus.

In terms of audio networking, the exclusive ROG SupremeFX is present here that is a mix of hardware and software technologies that essentially provides superior audio qualities

Adding to the end, it supports Windows 10 and 11 64bit.

### 3. MSI PRO Z790-P WiFi - Best Budget

Form Factor: ATX | Chipset: Z790 | VRM: 14+1+1 DRPS | Memory: 4x DIMM, 128GB, DDR4-5333MHz, DDR4-7000MHz+ (O.C.) | Video Outputs: 1x HDMI, 1x DisplayPort | USB Ports: 8x rear IO, 9x internal | Network: 1x 2.5GbE LAN, 1x WiFi 6E AX211 | Storage: 4x M.2, 6x SATA 6gb/s

Pros:

Cheaper

Plenty of storage options

WiFi 6E & Bluetooth support

Cons:

No Gen 5.0 M.2 SSD port

Basic looks

No RGB elements

Our best budget pick is the MSI PRO Z790-P WiFi, it's priced towards the lower end of Z790 boards hence the bare minimum option however we make sure that our budget choice still offers somewhat competitive features and you get the best bang for the buck.

Design and Aesthetics:

This motherboard is of ATX form factor and at first glance shows off a pretty basic look, although it does have VRMs and heatsinks on the PCB itself. The board's PCB is of a black theme with a touch of silver linings moreover, white graphics on top of the heatsinks are present.

Considering the price point, we understand that MSI didn't provide any RGB elements or flashy aesthetics so the price stays down while still offering good performance and the latest features.

The board overall is a minimalistic one in design and aesthetics.

Features and Functionality:

The MSI PRO Z790-P WiFi has the LGA1700 socket like all Z790 chipsets and there are a total of four DDR5-based DIMMs with a maximum memory capacity of 128GB. In terms of memory support, this board does well as it supports 5600MHz+ and a max frequency of 7800MHz when overclocked. The DIMMs are also based on dual-channel architecture and support Intel's new XMP 3.0 for overclocking RAM.

Coming towards PCIe slots, despite being towards the lower end MSI didn't disappoint us as they keep up with current standards. This board features a single PCIe Gen 5.0 x16 slot, one PCIe Gen 4.0 x4 slot, and two PCIe Gen 3.0 x1 slots.

Unleash and sustain the maximum performance with a VRM design built with a total of 14+1+1 power designs. Combining dual power connectors and exclusive Core Boost technology, MSI PRO Z790-P is ready to sustain heavy daily work.

The enlarged PWM heatsink along with strengthened built-in M.2 SSDs thermal solutions and enhanced circuit design ensures that there are no performance drawbacks due to overheating and throttling.

In terms of storage options, there are plenty available. There are a total of four M.2 SSD slots however none of them are Gen 5 x16 based so that is the price you pay for going towards the budget-oriented option. Nonetheless, Gen 4 x4 based M.2 ports are also of very high standard speeds so you won't be missing out on much unless you want the best of the best speed frequencies you can get.

Moreover, the MSI PRO Z790-P WiFi also has a total of x6 SATA 6GB/s ports, and considering that it's safe to say that MSI did not cut down on storage options and that these many ports are more than enough for an average user.

In terms of connectivity, all the latest features are present on this board. Intel's latest WiFi 6E is featured here and for ethernet, MSI provided Intel's 2.5GBps LAN, furthermore, Bluetooth 5.3 is also available on this specific motherboard.

MSI uses its audio boost design here, it includes a high-definition audio processor and

capacitors, high-quality audio jacks, isolated audio signals, and de-pop protection which overall then delivers improved audio quality.

The built-in USB 3.2 Gen 2x2 port offers a 20GBps transmission speed which is x4 faster than USB 3.2 Gen 1.

One of the handiest features, which is the flash BIOS button, is also available here which allows the user to update their BIOS without any memory or CPU installed.

MSI motherboards have their own software called Mystic Light which you can use for free and control all the RGB elements in your gaming system (if you have any).

To finish it off, the MSI PRO Z790-P supports Windows 10 & 11 64-bit.