ASRock

PHANTOM GAMING
Z890 NOVA WiFi

intel CORE ULTRA — Supports Intel® Core™ Ultra processors (Series 2)

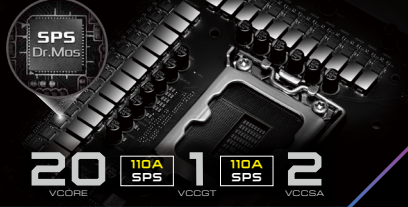intel CHIPSET Z890

WiFi 7

THUNDERBOLT™

PRODUCT BRIEF :

- Supports Intel® Core™ Ultra Processors (Series 2) (LGA1851)
- 20+1+2+1+1 Power Phase, 110A SPS for VCore
- 4 x DDR5 DIMMs
  Supports Dual Channel, up to 9200+ (OC)
- 1 PCIe 5.0 x16, 1 PCIe 4.0 x16
- Graphics Output Options: 1 HDMI, 2 Thunderbolt™ 4 Type-C
- Realtek ALC4082 7.1 CH HD Audio Codec, Nahimic Audio

- 4 SATA3
  1 Blazing M.2 (PCIe Gen5 x4)
  4 Hyper M.2 (PCIe Gen4 x4)
  1 Hyper M.2 (PCIe Gen4 x4 & SATA3)
- 2 Thunderbolt™ 4 Type-C (Rear)
  1 USB 3.2 Gen2x2 Type-C (Front)
  4 USB 3.2 Gen2 Type-A (Rear)
  8 USB 3.2 Gen1 (4 Rear, 4 Front)
  6 USB 2.0 (2 Rear, 4 Front)

- 5Gbps LAN, Killer 2.5G LAN
- 802.11be Wi-Fi 7 + Bluetooth
- Supports Memory OC Shield, BIOS Flashback, 20K Caps with 1000uF Capacitance, M.2 Expansion Card

I/O OVERVIEW

20+1+2+1+1 Power Phase Design

Vcore with SPS design, delivering smoother and neater power to the CPU.

SPS Dr.Mos

20 VCORE | 110A SPS | 1 VCCGT | 110A SPS | 2 VCCSA

Dual Thunderbolt™ 4 Type-C

It enables lightning-fast data transfer up to 40Gbps and connects versatile devices with a single Thunderbolt™ 4 cable.

THUNDERBOLT.

Beyond Deluxe 6*M.2 Sockets

Supports the latest PCI Express 5.0 standard and M.2 Expansion card to support even more M.2 SSDs.

Blazing M.2 SSD
Hyper M.2 SSD
Hyper M.2 SSD
Hyper M.2 SSD
Hyper M.2 SSD
Hyper M.2 SSD

Bundled: M.2 Expansion Card

802.11be 7

20K Caps with 1000uF Capacitance

Memory OC Shield (Patent Pending)

ASRock's exclusive Memory OC Shield effectively absorbs EMI noise, enhancing memory overclocking performance and stability.

*Patent applied number 113209060

EZ Release Design

Experience hassle-free installation with our EZ Release design, allowing you to remove the graphics card effortlessly.

EZ RELEASE

Optimized 5Gbps LAN (Patent Pending)

Featuring exclusive patented design with EMI resistance, surge protection, and noise filtering for a better networking experience.

5Gbps

PATENT PENDING

BIOS Flashback

BIOS Flashback

SERVER-GRADE 8-LAYER

PCB

DETAIL SPECIFICATION

Platform	- ATX Form Factor: 12.0-in x 9.6-in, 30.5 cm x 24.4 cm - 8 Layer PCB - 2oz Copper PCB

Unique Feature	Superb Productivity
	   - PCIe Gen5 (Graphics, M.2)
	   - Dual Channel DDR5
	   - USB4 Thunderbolt™ 4 Type-C Ports (40 Gb/s)
	Rock-Solid Durability
	   - Server-Grade Low-Loss PCB
	   - 20+1+2+1+1 Power Phase, 110A SPS for VCore with Enlarged Heatsink Armor
	   - Memory OC Shield
	   - Flexible Integrated I/O Shield
	   - 20K Long-lasting Black Caps (high quality and conductive polymer capacitors)
	Ultrafast Gaming
	   - 5G LAN, Killer 2.5G LAN, 802.11be Wi-Fi 7 Module
	   - ASRock Lightning Gaming Ports
	EZ Update
	   - BIOS Flashback Button
	   - ASRock Auto Driver Installer

CPU	- Supports Intel® Core™ Ultra Processors (Series 2) (LGA1851RL-ILM) - Supports Intel® Hybrid Technology - Supports Intel® Turbo Boost Max 3.0 Technology - Supports Intel® Thermal Velocity Boost (TVB) - Supports Intel® Adaptive Boost Technology (ABT) - Integrated NPU for dedicated AI acceleration - Supports ASRock Hyper BCLK Engine
Chipset	- Intel® Z890

Memory	- Dual Channel DDR5 Memory Technology
	- 4 x DDR5 DIMM Slots
	- Supports DDR5 non-ECC, un-buffered memory up to 9200+(OC)*
	  1DPC 1R Up to 9200+ MHz (OC), 5600 MHz Natively.
	  1DPC 2R Up to 6800+ MHz (OC), 5600 MHz Natively.
	  2DPC 1R Up to 6800+ MHz (OC), 4800 MHz Natively.
	  2DPC 2R Up to 5800+ MHz (OC), 4400 MHz Natively.
	- Max. capacity of system memory: 256GB
	- Supports Intel® Extreme Memory Profile (XMP) 3.0x
	* Please refer to Memory Support List on ASRock's website for more information.
	  (http://www.asrock.com/)

Expansion Slot	CPU: - 1 x PCIe 5.0 x16 Slot (PCIE1), supports x16 mode* Chipset: - 1 x PCIe 4.0 x16 Slot (PCIE2), supports x4 mode* - 1 x M.2 Socket (Key E), supports type 2230 WiFi/BT PCIe WiFi module * PCIE1 supports PCIe riser cards to extend one x16 slot to x8/x8 or x8/x4/x4 slots. * If PCIE2 is occupied, M2_4 will be disabled. * Supports NVMe SSD as boot disks

Graphics	* Intel® UHD Graphics Built-in Visuals and the VGA outputs can be supported only
	  with processors which are GPU integrated.
	- Intel® Xᵉ LPG Graphics Architecture
	- 1 x HDMI 2.1 TMDS/FRL 8G Compatible, supports HDR, HDCP 2.3 and max.
	  resolution up to 4K 120Hz
	- 2 x Intel® Thunderbolt™ 4, support HDCP 2.3 and max. resolution up to 8K 60Hz /
	  5K 120Hz*
	* Supports two 4K displays or one 8K display
	* Only the CPU's embedded graphics can be displayed through Thunderbolt ports.
	  If you want to display to a Thunderbolt monitor, please use CPU models with
	  embedded graphics.

Audio	- 7.1 CH HD Audio with Content Protection (Realtek ALC4082 Audio Codec) - Individual PCB Layers for R/L Audio Channel - Impedance Sensing on Rear Out port - Nahimic Audio
LAN	1 x 5 Gigabit LAN 10/100/1000/2500/5000 Mb/s (Realtek RTL8126) 1 x 2.5 Gigabit LAN 10/100/1000/2500 Mb/s (Killer® E3100G) - Supports Killer LAN Software

Wireless LAN	- 802.11be 2x2 Wi-Fi 7 Module
	- Supports IEEE 802.11a/b/g/n/ac/ax/axe/be
	- Supports 2.4GHz/5GHz/6GHz* frequency band
	- Supports 320MHz channel bandwidth with 6GHz* frequency band
	* Wi-Fi 7 (6GHz band) will be supported by Microsoft® Windows® 11. The availability
	  will depend on the different regulation status of each country and region.
	  It will be activated (for supported countries) through Windows Update and software
	  updates once available.
	- 1 antenna to support 2 (Transmit) x 2 (Receive) diversity technology
	- Supports Bluetooth 5.4
	- Supports MU-MIMO

USB	CPU: - 2 x Thunderbolt™ 4 Type-C (Rear) Chipset: - 1 x USB 3.2 Gen2x2 Type-C (Front) - 4 x USB 3.2 Gen2 Type-A (Rear) - 8 x USB 3.2 Gen1 (4 Rear, 4 Front) - 6 x USB 2.0 (2 Rear, 4 Front) * All USB ports support ESD Protection
Rear Panel I/O	- 2 x Antenna Ports - 1 x HDMI Port - 1 x Optical SPDIF Out Port - 2 x Thunderbolt™ 4 Type-C Ports (40 Gb/s for USB4 protocol; 40Gb/s for Thunderbolt protocol)* - 4 x USB 3.2 Gen2 Type-A Ports (10 Gb/s)** - 4 x USB 3.2 Gen1 Ports** - 2 x USB 2.0 Ports - 2 x RJ-45 LAN Ports - 1 x Clear CMOS Button - 1 x BIOS Flashback Button - 1 x Line Out Jack (Gold Audio Jack) - 1 x Microphone Input Jack (Gold Audio Jack) * Supports USB PD 3.0 up to 5V@3A (15W) charging ** USB32_56 are Lightning Gaming Ports. USB32_34 support Ultra USB Power.
Storage	CPU: - 1 x Blazing M.2 Socket (M2_1, Key M), supports type 2280 PCIe Gen5x4 (128 Gb/s) mode* - 1 x Hyper M.2 Socket (M2_2, Key M), supports type 2260/2280 PCIe Gen4x4 (64 Gb/s) mode* Chipset: - 1 x Hyper M.2 Socket (M2_3, Key M), supports type 2230/2242/2260/2280 SATA3 6.0 Gb/s & PCIe Gen4x4 (64 Gb/s) modes* - 1 x Hyper M.2 Socket (M2_4, Key M), supports type 2260/2280 PCIe Gen4x4 (64 Gb/s) mode* - 1 x Hyper M.2 Socket (M2_5, Key M), supports type 2260/2280 PCIe Gen4x4 (64 Gb/s) mode* - 1 x Hyper M.2 Socket (M2_6, Key M), supports type 2260/2280 PCIe Gen4x4 (64 Gb/s) mode* - 4 x SATA3 6.0 Gb/s Connectors * Supports Intel® Volume Management Device (VMD) * Supports NVMe SSD as boot disks * If PCIE2 is occupied, M2_4 will be disabled.
RAID	- Supports RAID 0, RAID 1, RAID 5 and RAID 10 for SATA storage devices - Supports RAID 0, RAID 1, RAID 5 and RAID 10 for M.2 NVMe storage devices

Connector	- 3 x Thermistor Cable Headers
	- 1 x SPI TPM Header
	- 1 x Power LED and Speaker Header
	- 1 x RGB LED Header*
	- 3 x Addressable LED Headers**
	- 2 x CPU Fan Connector (4-pin) (Smart Fan Speed Control)***
	- 4 x Chassis Fan Connectors (4-pin) (Smart Fan Speed Control)***
	- 1 x AIO Pump Fan Connector (4-pin) (Smart Fan Speed Control)***
	- 1 x Water Pump Fan Connector (4-pin) (Smart Fan Speed Control)***
	- 1 x 24 pin ATX Power Connector (Hi-Density Power Connector)
	- 2 x 8 pin 12V Power Connectors (Hi-Density Power Connector)
	- 1 x Front Panel Audio Connector (15µ Gold Audio Connector)
	- 2 x USB 2.0 Headers (Support 4 USB 2.0 ports)
	- 2 x USB 3.2 Gen1 Headers (Support 4 USB 3.2 Gen1 ports)
	- 1 x Front Panel Type C USB 3.2 Gen2x2 Header (20 Gb/s)
	- 1 x Dr. Debug with LED
	- 1 x Power Button with LED
	- 1 x Reset Button with LED
	* Supports in total up to 12V/3A, 36W LED Strip
	** Support in total up to 5V/3A, 15W LED Strip
	*** CPU_FAN1 supports the fan power up to 1A (12W).
	*** CPU_FAN2, CHA_FAN1~4, AIO_PUMP and W_PUMP support the fan power up to
	   3A (36W).
	*** CPU_FAN2, CHA_FAN1~4, AIO_PUMP and W_PUMP can auto detect if 3-pin or 4-pin
	   fan is in use.

BIOS Feature	- 256Mb AMI UEFI Legal BIOS with GUI support
Software and UEFI	Software - ASRock Motherboard Utility (Phantom Gaming Tuning) - ASRock Polychrome SYNC - Killer Control Center * These utilities can be downloaded from ASRock Live Update & APP Shop. UEFI - ASRock EZ Mode - ASRock Full HD UEFI - ASRock My Favorites in UEFI - ASRock Auto Driver Installer - ASRock Instant Flash
OS	- Microsoft® Windows® 11 64-bit
Certifications	- FCC, CE - ErP/EuP ready (ErP/EuP ready power supply is required) - CEC Tier II ready
Accessories	- 4 x SATA Data Cables - 1 x M.2 Expansion Card - 1 x ASRock WiFi 2.4/5/6 GHz Antenna - 1 x ARGB Splitter Cable - 3 x Thermistor Cables - 1 x Screw for M.2 Socket - 1 x Standoff for M.2 Socket