



KEY FEATURES

- Intel® 14th/13th/12th Gen (Raptor Lake-S Refresh/Raptor Lake-S/Alder Lake-S) Core™ Processors with W680 chipset
- 2 x 262-pin ECC/non-ECC SO-DIMM DDR5 4800/5600 MHz, up to 64GB (32GB per DIMM)
- 1 x PCIe x16 (Gen5), 4 x USB 3.2 Gen2, 2 x USB 3.2 Gen1, 4 x USB 2.0, 1 x M.2 Key B, 1 x M.2 Key E, 2 x M.2 Key M, 4 x COM, 4 x SATA3
- 1 x Intel 2.5 Gigabit LAN, 1 x Intel 1 Gigabit LAN
- Supports Quad display, 1 x HDMI 2.0b, 1 x HDMI 1.4b, 1 x DP1.4a, 1 x LVDS or eDP
- TPM 2.0 onboard IC
- Supports Intel® vPro, VMD RAID 0/1/5/10
- ATX-PWR (24+4-pin) and +12V DC-In co-design

SPECIFICATIONS

Form Factor

| | |
|--------------------|---|
| Dimensions (LxWxH) | Mini-ITX (6.7-in x 6.7-in x 1.5-in, 17.0 cm x 17.0 cm x 3.8 cm) |
|--------------------|---|

Processor System

| | |
|---------|--|
| CPU | Intel® 14th/13th/12th Gen (Raptor Lake-S Refresh/Raptor Lake-S/Alder Lake-S) Core™ Processors, up to 65W |
| Chipset | Intel® W680 |
| Socket | LGA1700 |
| BIOS | AMI SPI 256 Mbit |

Memory

| | |
|------------|---|
| Technology | Dual Channel ECC/non-ECC DDR5 4800/5600 MHz* *Actual memory frequency depends on the CPU types and DRAM modules, for more information refer to https://www.asrockind.com/en-gb/index.php?route=newsblog/faq&faq_id=90 technical FAQ *If motherboard ambient temp. is over 55°C, the memory thermal solution should be added to avoid thermal issue |
| Capacity | 64 GB (32 GB per DIMM) |
| Socket | 2 x 262-pin SO-DIMM |

Graphics

| | |
|--------------|--|
| Controller | Intel® UHD Graphics |
| HDMI | HDMI 2.0b Max resolution up to 4096x2160@60Hz HDMI 1.4b Max resolution up to 4096x2160@30Hz |
| DisplayPort | DisplayPort 1.4a, DP++ Max resolution up to 4096x2160@60Hz |
| LVDS | Dual channel 24 bit up to 1920x1200@60Hz (Connector shared with eDP) |
| eDP | Max resolution up to 1920 x 1200@60Hz (Connector shared with LVDS) |
| MultiDisplay | Quad Display |

Expansion Slot

| | |
|------------|---|
| PCIe | 1 x PCIe x16 (Gen5, Support riser card x8/x8) |
| M.2 | 1 x M.2 (Key E, 2230) with PCIe x1, USB 2.0 and CNVi for Wireless 1 x M.2 (Key B, 3042/3052) with PCIe x1, USB 3.2 Gen1, USB 2.0 and SIM for 4G/5G |
| SIM Socket | 1 x Socket connected to M.2 Key B |

Audio

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|-----------|---|
| Interface | Realtek ALC897, High Definition Audio. Line-out, Mic-in |
|-----------|---|

Ethernet

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|-------------------|---|
| Controller/ Speed | LAN1: Intel® I226V with 10/100/1000/2500 Mbps LAN2: Intel® I219LM with 10/100/1000 Mbps, supports vPro |
| Connector | 2 x RJ-45 |

Rear I/O

| | |
|-------------|--|
| HDMI | 1 x HDMI 2.0b 1 x HDMI 1.4b |
| DisplayPort | 1 x DP 1.4a++ |
| Ethernet | 1 x 2.5 Gigabit LAN 1 x 1 Gigabit LAN |
| USB | 4 x USB 3.2 (Gen2) 2 x USB 2.0 |
| Audio | 2 (Mic-in, Line-out) |
| COM | COM1, COM2 (RS-232/422/485) |

Internal Connector

| | |
|-----------------|--|
| USB | 2 x USB 3.2 Gen1 (1 x USB 3.2 header) 2 x USB 2.0 (1 x 2.54 pitch header) |
| COM | COM3, COM4 (RS-232) |
| GPIO | 4 x GPI, 4 x GPO |
| LVDS | 1 (Connector with LVDS/eDP signal, switch by BIOS) |
| SATA PWR Output | 1 |
| Speaker Header | 1 |

Storage

| | |
|------|---|
| M.2 | 1 x M.2 (Key M, 2242/2280) with PCIe Gen4 x4 for SSD 1 x M.2 (Key M, 2242) with PCIe Gen3x4 and SATA3 for SSD* *Recommend using M2x4-SATA-4P module to support extra 4 SATA ports (Support by special BIOS) |
| SATA | 4 x SATA3 (6Gb/s) |
| RAID | Intel® VMD RAID 0/1/5/10 ***supported by identical interface (PCIe or SATA) PCIe interface: M.2 Key B + M.2 Key M1/2 or 2*M.2 Key M SATA interface: SATA por |

Security

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|-----|--------------------|
| TPM | TPM 2.0 onboard IC |
|-----|--------------------|

Watchdog Timer

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|----------|----------------------------------|
| Output | From Super I/O to drag RESETCON# |
| Interval | 256 Segments, 0, 1, 2, ...255sec |

Power Requirements

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|-----------|---|
| Input PWR | ATX PWR (24+4-pin) and +12V DC-In co-design |
| Power On | AT/ATX Supported - AT : Directly PWR on as power input ready - ATX : Press button to PWR on after power input ready |

Environment

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|--------------------|----------------|
| Operating Temp | 0°C ~ 70°C |
| Storage Temp | -40° C ~ 85° C |
| Operating Humidity | 5% ~ 90% |
| Storage Humidity | 5% ~ 90% |

BLOCK DIAGRAM

