



KEY FEATURES

- Intel® 14th/13th/12th Gen (Raptor Lake-S Refresh/Raptor Lake-S/Alder Lake-S) Core™ Processors with Q670 chipset
- 4 x 288-pin Long-DIMM DDR4 3200 MHz, up to 128GB (32GB per DIMM)
- 1 x PCIe16 (Gen4), 1 x PCIe8 (Gen4), 2 x PCIe4 (Gen4),
1 x USB3.2 Gen2x2, 5 x USB 3.2 Gen2, 2x USB 3.2 Gen1, 4 x USB 2.0,
1 x M.2 Key E, 2 x M.2 Key M, 1 x M.2 Key B, 6 x COM, 8 x SATA3
- 2 x Intel 2.5 Gigabit LAN
- Supports Quad display, 1 x HDMI 2.0b, 1 x DP 1.4a, 1 x VGA, 1 x LVDS
- TPM 2.0 onboard IC
- Supports Intel® vPro, VMD RAID 0/1/5/10
- ATX PWR (24+8 Pin)

SPECIFICATIONS

Form Factor

Dimensions	Micro-ATX (9.6-in x 9.6-in x 1.4-in, 24.4 cm x 24.4 cm x 3.6 cm)
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Processor System

CPU	Intel® 14th/13th/12th Gen (Raptor Lake-S Refresh/Raptor Lake-S/Alder Lake-S) Core™ Processors, up to 125W
Chipset	Intel® Q670
Socket	LGA 1700
BIOS	AMI SPI 256 Mbit

Memory

Technology	Dual Channel DDR4 3200 MHz
Capacity	128GB (32GB per DIMM)
Socket	4 x 288-pin Long-DIMM

Graphics

Controller	Intel® UHD Graphics
HDMI	HDMI 2.0b Max resolution up to 4096 x 2160@60Hz
DisplayPort	DisplayPort 1.4a, DP++ Max resolution up to 4096x2160@60Hz
VGA	Max resolution up to 1920 x 1200@60Hz
LVDS	Dual channel 24 bit up to 1920 x 1200@60Hz
MultiDisplay	Quad Display

Expansion Slot

PCIe	2 x PCIe Gen4 Slots (PCIe1/PCIe3:single at x16(PCIe1); dual at x8 (PCIe1) / x8 (PCIe3)) (PCIe1: Support riser card x8/x8) 2 x PCIe4 (Gen4)* *If using PCIe8/x16 card on PCIe2/PCIe4 slot, M.2 Key M2(M2_M2) and M.2 Key E(M2_E1) are limited to install.
M.2	1 x M.2 (Key B, 3042/3052) with PCIe1, USB 3.2 Gen1, USB 2.0 and SIM for 4G/5G 1 x M.2 (Key E, 2230) with PCIe x1, USB 2.0 and CNVi for Wireless
SIM Socket	1x SIM socket connected to M.2 key B

Audio

Interface	Realtek ALC897 HD, High Definition Audio. Line-In, Line-Out, Mic-In
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Ethernet

Controller/ Speed	LAN1: Intel® I225LM with 10/100/1000/2500 Mbps, supports vPro LAN2: Intel® I225LM/I225V with 10/100/1000/2500 Mbps
Connector	2 x RJ-45

Rear I/O

HDMI	1 x HDMI 2.0b
DisplayPort	1 x DP 1.4a
VGA	1
Ethernet	2 x 2.5 Gigabit LAN
USB	5 x USB 3.2 Gen2 1 x USB 3.2 Gen2x2 (Type-C, 5V/3A)
Audio	3 (Line-In/Line-Out/Mic-In)
Serial Port	COM1, COM2 (RS-232/422/485)

Internal Connector

USB	2 x USB 3.2 Gen1 (1xUSB3.2 header) 4 x USB 2.0 (2x2.54pitch header)
COM	COM3, COM4, COM5, COM6 (RS-232)
Parallel	1 (shared with GPIO)
GPIO	8 x GPI, 8 x GPO (shared with LPT header)
TPM	TPM 2.0 onboard IC
LVDS	1
Speaker Header	1
PS/2	1 x PS/2 header
Thunderbolt header	1 (only use with PCIe4)

Storage

M.2	1 x M.2 (Key M, up to 25110) with PCIe4 Gen4 for SSD 1 x M.2 (Key M, 2242/2260/2280) with PCIe4 Gen3 for SSD
SATA	8 x SATA3
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 port

Watchdog Timer

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

Power Requirements

Input PWR	ATX PWR (24+8-pin)
Power On	AT/ATX Supported - AT : Directly PWR on as power input ready - ATX : Press button to PWR on after power input ready

Environment

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