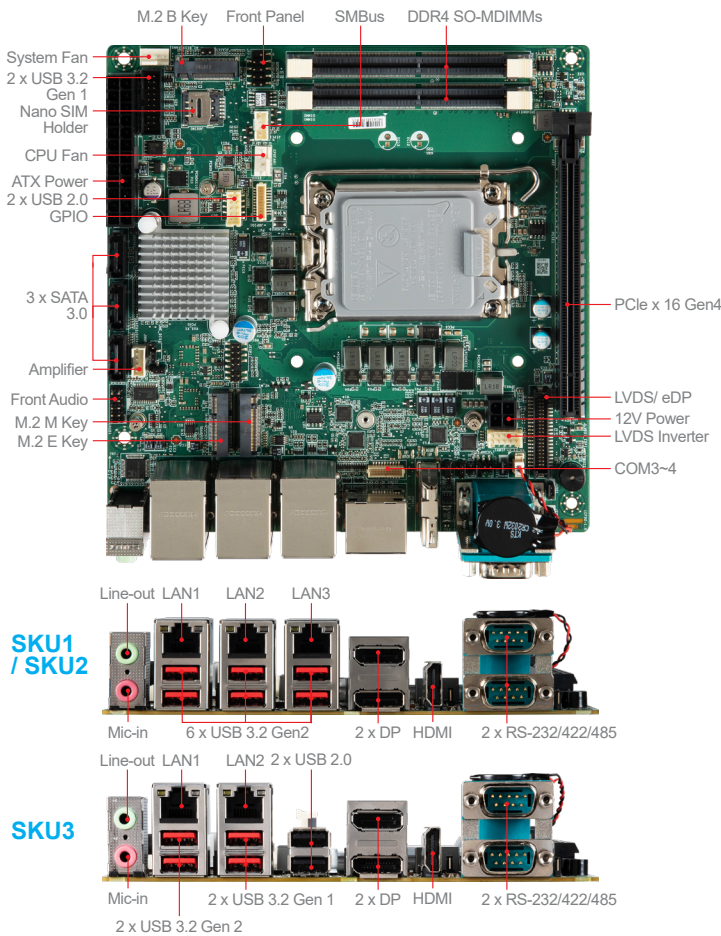


# MS-CF02

Mini-ITX with 14th/13th/12th Gen Intel® Raptor Lake-S Refresh/Raptor Lake-S/Alder Lake-S, Core™ i9/ i7/i5/i3, Pentium®, Celeron® Processor & Intel® R680E/Q670E/H610E for High-Performance Solution



## Features

- Intel® 14th/13th/12th Gen Raptor Lake-S Refresh/Raptor Lake-S/ Alder Lake-S Series with R680E/Q670E/H610E
- 2 DDR4 3200 MT/s ECC/non-ECC SODIMM slots up to 64GB
- Quadruple independent displays: 2DP, HDMI, LVDS/eDP
- 3/2 2.5GbE LAN with RJ-45
- 1 PCIe x16 (Gen 4) Slot, 1 M.2 E key (with CNVi), 1 M.2 B key (with SIM Holder) slots
- M.2 M key, 3 SATA 3.0 for storage
- SATA RAID 0/1/5
- 6 USB 3.2 Gen 2, 2 USB 3.2 Gen 1, 2 USB 2.0, 4 COM (4 RS-485), GPIO, Audio, System FAN
- Onboard TPM 2.0
- SMBus, iAMT 16.x
- ATX Power

## Ordering Information

Part Number	Description
911-CF02-001	MS-CF02/601-CF02-010/801-CF02-005 10 Intel Raptor Lake-S, R680E, 2*DDR4 SO DIMM, 1*HDMI, 2*DP, 1*eDP, 1*LVDS, 1*M.2 E key, 1*M.2 M key, 1*M.2 B key, 1*PCIe x16, 3*2.5GbE LAN, 3*SATA 3.0, 6*USB 3.2, 2*USB 2.0, 4*COM, TPM2.0, Mini-ITX
911-CF02-002	MS-CF02/601-CF02-020/801-CF02-006 10 OPTA Intel Raptor Lake-S, H610E, 2*DDR4 SO DIMM, 1*HDMI, 2*DP, 1*eDP, 1*LVDS, 1*M.2 E key, 1*M.2 M key, 1*PCIe x16, 2*2.5GbE LAN, 3*SATA 3.0, 4*USB 3.2, 4*USB 2.0, 4*COM, TPM2.0, Mini-ITX
911-CF02-003	MS-CF02/601-CF02-030/801-CF02-007 10 OPTB Intel Raptor Lake-S, Q670E, 2*DDR4 SO DIMM, 1*HDMI, 2*DP, 1*eDP, 1*LVDS, 1*M.2 E key, 1*M.2 M key, 1*M.2 B key, 1*PCIe x16, 3*2.5GbE LAN, 3*SATA 3.0, 6*USB 3.2, 2*USB 2.0, 4*COM, TPM2.0, Mini-ITX

## Packing List

Part Number	Description	Quantity
K1D-1008261-V03	SATA Cable, 500mm	1
K14-3018004-V03	COM Port Cable, 250mm	1
E21-CF02010-C22	I/O Shielding (For SKU 1&2)	1
E21-CF02010-C22	I/O Shielding (For SKU 3)	1

## Specifications

		SKU1	SKU2	SKU3
<b>System Processor</b>	CPU	12th Gen Intel® Alder Lake-S i9/i7/i5/i3/Pentium®/Celeron® IOTG Series Processor, Max 65W 13th Gen Intel® Raptor Lake-S i9/i7/i5/i3/Pentium®/Celeron® IOTG Series Processor, Max 65W 14th Gen Intel® Raptor Lake-S Refresh i9/i7/i5/i3/Pentium®/Celeron® IOTG Series Processor, Max 65W		
	Frequency	1.6 GHz~5.1 GHz (Depends on CPU)		
	L2 Cache	2MB~30MB (Depends on CPU)		
	CPU Type	Socket (LGA 1700)		
	Chipset	Intel® R680E	Intel® Q670E	Intel® H610E
<b>Memory</b>	BIOS	AMI UEFI		
	Technology	Dual-channel DDR4 (ECC/ non-ECC) 3200MT/s	Dual-channel DDR4 (non-ECC) 3200MT/s	
	Max. Capacity	Up to 64GB		
	Socket	2 x 260-pin DDR4 SO-DIMMs		
<b>Graphic</b>	Controller	Intel® UHD Graphics		
	Graphic Memory	Depends on CPU		
	LVDS	1 x Dual channel 18/24-bit (Connector shared with eDP)		
	eDP	1 (Connector shared with LVDS)		
	HDMI	1		
	DisplayPort	2		
	Multiple Display	4 independent displays	3 independent displays	
<b>Display Interface</b>	LVDS	up to 1920 x 1200@60Hz		
	eDP	up to 4096 x 2304@60Hz		
<b>Ethernet</b>	Controller	3 x Intel® I225-LM 2.5GbE LAN	2 x Intel® I225-V 2.5GbE LAN	
	Controller	Realtek® ALC897 Audio Codec (Co-lay ALC888S)		
<b>Super I/O</b>	Controller	Fintek F81966D-I		
	Watchdog Timer	256-level Watchdog Timer		
<b>H/W Monitor</b>	Smart Fan	Yes		
	TPM	Infineon SLB 9670VQ2.0		
<b>Expansion Slot</b>	PCIe x16	1 x PCIe x16 (Gen 4)		
	M.2	1 x M key (PCIe x4 NVMe), 2242/2280 1 x E key (PCIe x1, USB 2.0, CNVi), 2230 1 x B key (PCIe x1, USB 3.2 Gen 2 x 1, USB 2.0), 3042 (with SIM Holder)	1 x M key (PCIe x4 NVMe), 2242/2280 1 x E key (PCIe x1, USB 2.0, CNVi), 2230	
<b>Storage</b>	SATA	3 x SATA 3.0 (Support RAID 0/1/5)		3 x SATA 3.0 (Support AHCI Mode)
	USB	6 x USB 3.2 Gen 2 (rear) 2 x USB 3.2 Gen 1 (internal) 2 x USB 2.0 (internal)		
<b>I/O Interface</b>	Serial	4 x COM ports COM1: RS-232/422/485, RI/5V/12V, Auto-flow Control COM2~4: RS-232/422/485, 0V/5V/12V, Auto-flow Control		
	GPIO	16-bits (8 x GPI; 8 x GPO), 5V		
	DC Input	N/A		
<b>Power Supply</b>	AC Input	ATX-Power 24P, 12V-4P		
	Operating Temperature	0 ~ 60°C Note: Thermal Test w/ Airflow:0.7m/s		
<b>Environment</b>	Operating Humidity	10 ~ 90%, non-condensing		
	Storage Temperature	-20 ~ 80°C		
	Storage Humidity	10 ~ 90%, non-condensing		
<b>Physical characteristics</b>	Dimensions (WxDxH)	170 x 170 mm (Mini-ITX)		
	Weight	0.43 Kg	0.41 Kg	
<b>Certification</b>	EMC	CE, FCC Class B, BSMI, RCM, VCCI, UKCA		
<b>Software Platform</b>	OS Support	Windows 10 IoT Enterprise 2021 LTSC (64-bit) Windows 11 IoT Enterprise LTSC (64-bit) Linux (Support by request)		