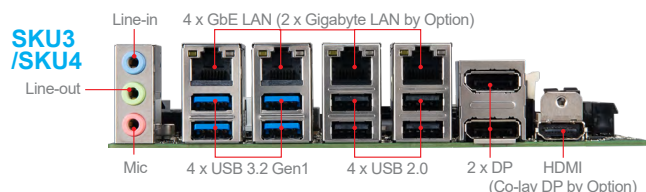
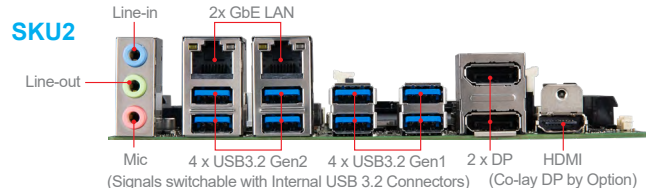
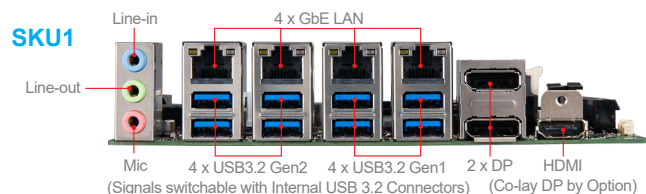
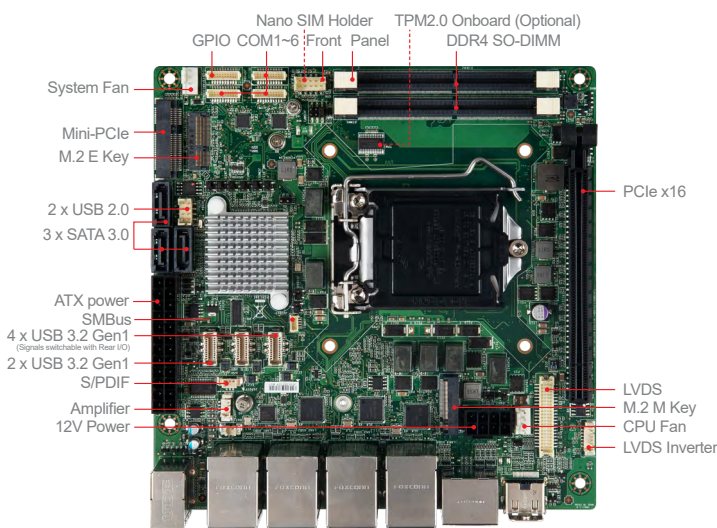


MS-98L1

Mini-ITX with 9th/8th Gen Intel® Coffee Lake Refresh-S/Coffee Lake-S Xeon®, Core™ i7/i5/i3, Pentium®, Celeron® Processor & Intel® C246/Q370/H310 for High-Performance Solution



Features

- Intel® 8th/9th Gen Coffee Lake-S/Coffee Lake Refresh-S Series with C246/Q370/H310
- 2 DDR4 2666 MHz ECC/non-ECC SODIMM slots up to 64GB
- Triple independent displays: 2DP, HDMI (DP by option), LVDS
- 4 GbE LAN with RJ-45
- 1 PCIe x16 (Gen 3) Slot, M.2 E key (with CNVi), 1 Mini-PCle (Full-size, with SIM Holder) slots
- M.2 M key, 3 SATA 3.0 for storage
- SATA RAID 0/1/5/10 (RAID 10 Configured with M.2 M Key)
- 4 USB 3.2 Gen 2, 6 USB 3.2 Gen 1, 2 USB 2.0, 6 COM (2 RS-485), GPIO, Audio, S/PDIF, System FAN
- Onboard TPM 2.0 (by option)
- SMBus, iAMT 12.x
- ATX Power

Ordering Information

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Packing List

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Specifications

System Processor	CPU	SKU1	SKU2	SKU3	SKU4	
		8th Gen Intel® Coffee Lake-S Xeon® i7/i5/i3/Pentium®/Celeron® Series Processor, Max 95W	8th Gen Intel® Coffee Lake-S i7/i5/i3/Pentium®/Celeron® Series Processor, Max 95W			
		9th Gen Intel® Coffee Lake Refresh-S Xeon® i7/i5/i3/Pentium®/Celeron® IOTG Processor, Max 65W	9th Gen Intel® Coffee Lake Refresh-S i7/i5/i3/Pentium®/Celeron® IOTG Processor, Max 65W			
		Frequency	2.0GHz~4.7GHz (Depends on CPU)			
		L2 Cache	2MB~16MB (Depends on CPU)			
		CPU Type	Socket (LGA 1151)			
Memory	Chipset	Intel® C246 Express	Intel® Q370 Express	Intel® H310 Express		
		BIOS	AMI UEFI			
		Technology	Dual-channel DDR4 (ECC/ non-ECC) 2666MHz	Dual-channel DDR4 (non-ECC) 2666MHz		
		Max. Capacity	Up to 64 GB			
		Socket	2 x 260-pin DDR4 SO-DIMMs			
Display	Controller	Intel® UHD Graphics				
	Graphic Memory	Depends on CPU				
	LVDS	1 x Dual-channel 18/24-bit		N/A		
	HDMI	1 (Co-lay with DP by Optional)				
	DisplayPort	2				
	Multiple Display	3 independent displays		2 independent displays		
Ethernet	Display Interface	3 independent displays		2 independent displays		
		LVDS up to 1920 x 1200 @60Hz		HDMI up to 4096 x 2160 @24Hz		
		HDMI up to 4096 x 2160 @24Hz		DP up to 4096 x 2304 @60Hz		
Ethernet	Controller	1 x Intel® I219-LM GbE LAN PHY		1 x Intel® I219-LM GbE LAN PHY		
		3 x Intel® I210-AT GbE LAN		3 x Intel® I211-AT GbE LAN		
Audio	Controller	Realtek® ALC887 Audio Codec (Co-lay ALC888S)				
Super I/O	Controller	Fintek F81866AD-I				
H/W Monitor	Watchdog Timer	256-level Watchdog Timer				
	Smart Fan	Yes				
TPM	Controller	Infineon SLB9665TT2.0		Box header (Default) Infineon SLB9665TT2.0 (by BOM option)		
I/O Interfaces	USB	2 x USB 2.0 (internal)		4 x USB 2.0 (rear)		
		6 x USB 3.2 Gen 1 (4 x rear, Signal Share with Internal Box Header; 2 x internal)		4 x USB 3.2 Gen1 (rear)		
	Serial	4 x USB 3.2 Gen 2 (rear)				
		6 x COM ports COM1: RS-232/422/485, RI/5V/12V, Auto-flow Control COM2: RS-232/422/485, 0V/5V/12V, Auto-flow Control COM3~6: RS-232, 0V/5V/12V (RS-232/422/485 by option)		4 x COM ports COM1: RS-232/422/485, RI/5V/12V, Auto-flow Control COM2~4: RS-232, 0V/5V/12V (RS-232/422/485 by option)		
	Expansion Slot	GPIO	2 x COM ports COM1: RS-232/422/485, RI/5V/12V, Auto-flow Control COM2: RS-232, 0V/5V/12V (RS-232/422/485 by option)		2 x COM ports COM1: RS-232/422/485, RI/5V/12V, Auto-flow Control COM2: RS-232, 0V/5V/12V (RS-232/422/485 by option)	
PCIe x16			16-bits (8 x GPI; 8 x GPO), 5V			
Storage		M.2	1			
	1 x M key (PCIe x4 NVMe, SATA), 2242/2280		1 x M key (SATA), 2242/2280			
	Mini-PCIe	1 x Full-size (w/SIM holder)				
Power Supply	SATA	3 x SATA 3.0 (Support RAID 0/1/5/10, AHCI Mode, RAID 10 Configured with M.2 M Key)		3 x SATA 3.0 (Support AHCI Mode)		
		3 x SATA 3.0 (Support RAID 0/1/5/10, AHCI Mode, RAID 10 Configured with M.2 M Key)				
Environment	AC Input	ATX-Power 24P, 12V-8P				
	Operating Temperature	-10 ~ 60°C Note: Thermal w/ Airflow:0.7m/s				
	Humidity	10 ~ 90%, non-condensing				
Form Factor	Storage Temperature	-20 ~ 80°C				
	Humidity	10 ~ 90%, non-condensing				
	Dimensions (W x D x H)	170 x 170 mm (Mini-ITX)				
Certification	Weight	0.405 kg	0.375 kg	0.39 kg	0.375 kg	
	EMC	CE, FCC Class B, BSMI, RCM, VCCI				
	Software Platform	Windows 10 IoT Enterprise LTSC/SAC 1809 (64-bit, RS5)				
OS Support	OS Support	Linux Kernel 4.x (by request)				