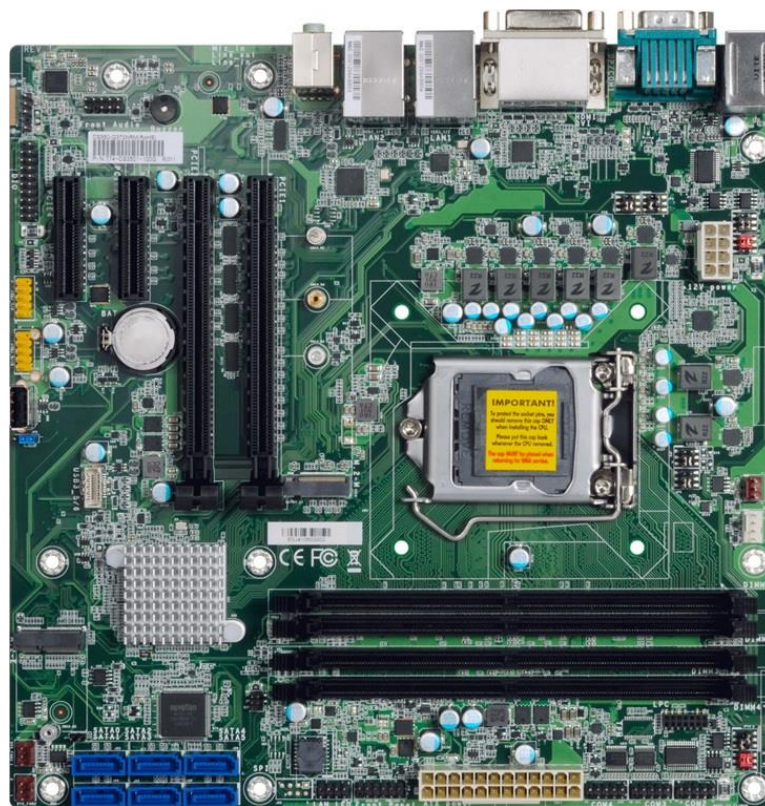


MBU4181

Industrial Motherboard Series



MBU4181

PRODUCT HIGHLIGHTS

- ▶ Intel Xeon & 8th/9th Gen Intel® Core™ with Intel® C246
- ▶ 4 DDR4 ECC/Non-ECC DIMM up to 128GB
- ▶ Multiple expansion: 2 PCIe x16 (1 x16 or 2 x8 signal), 2 PCIe x4, 1 M.2 E key, 1 M.2 M key (support Optane Memory)
- ▶ 3 independent displays: DVI-D, + DP++, + HDMI 1.4b
- ▶ Rich I/O: 2 Intel GbE, 4 COM, 2 USB 3.1 Gen 2, 4 USB 3.1 Gen 1, 6 USB 2.0
- ▶ 15-Year CPU Life Cycle Support Until Q3' 33 (Based on Intel IOTG Roadmap)



TECHNICAL INFORMATION

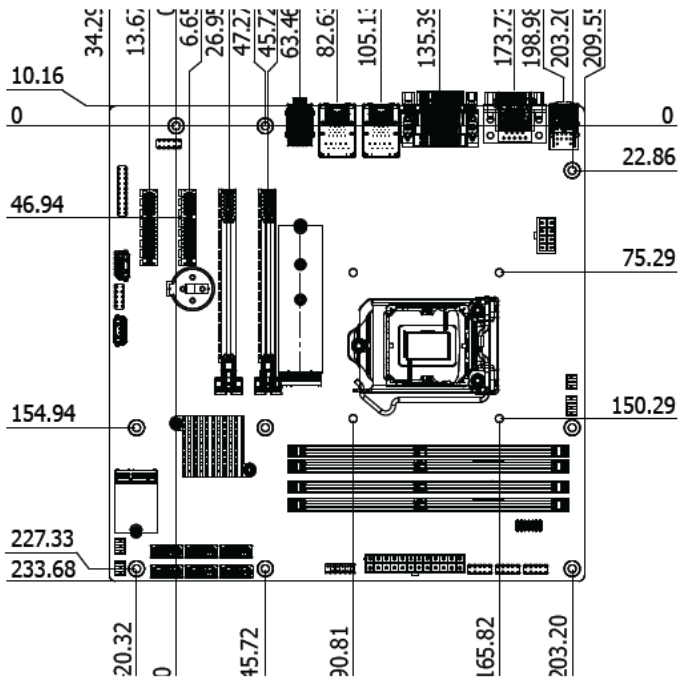
SYSTEM	PROCESSOR	8th Generation Intel® Core™ /Pentium®/Celeron® LGA 1151 Processors: Intel® Xeon® E-2176G (6 Cores, 12M Cache, up to 4.7 GHz); 80W Intel® Xeon® E-2124G (4 Cores, 8M Cache, up to 4.5 GHz); 71W Intel® Core™ i7-8700K (6 Cores, 12M Cache, up to 4.7 GHz); 95W (Non-LTS) Intel® Core™ i7-8700 (6 Cores, 12M Cache, up to 4.6 GHz); 65W Intel® Core™ i7-8700T (6 Cores, 12M Cache, up to 4.0 GHz); 35W Intel® Core™ i5-8500 (6 Cores, 9M Cache, up to 4.1 GHz); 65W Intel® Core™ i5-8500T (6 Cores, 9M Cache, up to 3.5 GHz); 35W Intel® Core™ i3-8100 (4 Cores, 6M Cache, 3.6 GHz); 65W Intel® Core™ i3-8100T (4 Cores, 6M Cache, to 3.1 GHz); 35W Intel® Pentium® G5400 (2 Cores, 4M Cache, 3.7 GHz); 58W Intel® Pentium® G5400T (2 Cores, 4M Cache, 3.1 GHz); 35W Intel® Celeron® G4900 (2 Cores, 2M Cache, 3.1 GHz); 54W Intel® Celeron® G4900T (2 Cores, 2M Cache, 2.9 GHz); 35W 9th Generation Intel® Core™ LGA 1151 Socket Processors: Intel® Xeon® E-2278GE (8 Cores, 16M Cache, up to 4.7 GHz); 80W Intel® Xeon® E-2278GEL (8 Cores, 16M Cache, up to 3.9 GHz); 35W Intel® Xeon® E-2226GE (6 Cores, 12M Cache, up to 4.6 GHz); 80W Intel® Core™ i7-9700K (8 Cores, 12M Cache, up to 4.9 GHz); 95W (Non-LTS) Intel® Core™ i7-9700E (8 Cores, 12M Cache, up to 4.4 GHz); 65W Intel® Core™ i7-9700TE (8 Cores, 12M Cache, up to 3.8 GHz); 35W Intel® Core™ i5-9500E (6 Cores, 9M Cache, up to 4.2 GHz); 65W Intel® Core™ i5-9500TE (6 Cores, 9M Cache, up to 3.6 GHz); 35W Intel® Core™ i3-9100E (4 Cores, 6M Cache, 3.7 GHz); 65W Intel® Core™ i3-9100TE (4 Cores, 6M Cache, to 3.2 GHz); 35W
	CHIPSET	Intel® C246 Chipset
	MEMORY	Four 288-pin DIMM up to 128GB Dual Channel DDR4 2400/2666MHz (ECC/Non-ECC support)
	BIOS	AMI SPI 128Mbit
	GRAPHICS	Intel® HD Gen 9 Graphics
GRAPHICS	CONTROLLER	Intel® HD Gen 9 Graphics
	FEATURE	OpenGL 5.0, DirectX 12, OpenCL 2.1 HW Decode: AVC/H.264,MPEG2,VC1/WMV9, JPEG/MJPEG, HEVC/H265, VP8, VP9 HW Encode: MPEG2, AVC/H264, JPEG, HEVC/H265, VP8, VP9
	DISPLAY	1 x DP++, DP++: resolution up to 4096x2106 @ 60Hz 1 x HDMI 1.4b: resolution up to 4096x2160@ 24Hz 1 x DVI-I (DVI-D signal), DVI-D: resolution up to 1920x1200 @ 60Hz
	TRIPLE DISPLAYS	DVI-D + DP++ + HDMI 1.4b
EXPANSION	INTERFACE	2 x PCIe x16 (Gen 3) (1 x16 signals or 2 x8 signals) 2 x PCIe x4 (Gen 3) 1 x M.2 2230 E key (PCIe x1/USB2.0/intel CNVi support) 1 x M.2 2242/2260/2280 M key (PCIe Gen3 x 4 NVMe)
AUDIO	AUDIO CODEC	Realtek ALC888

TECHNICAL INFORMATION (CONTINUED)

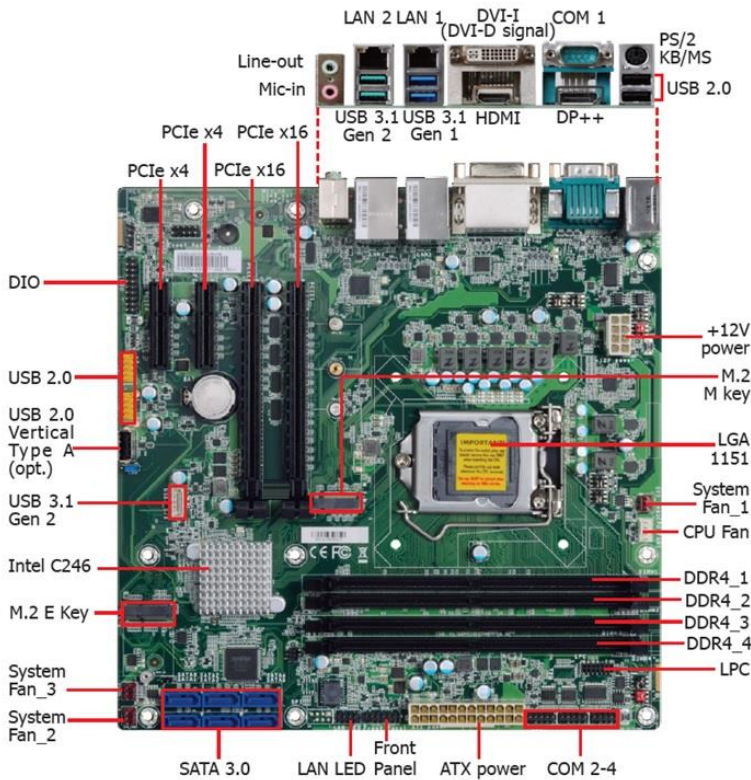
ETHERNET	CONTROLLER	1 x Intel® I211AT PCIe (10/100/1000Mbps) 1 x Intel® I219LM PCIe with iAMT12.0 (10/100/1000Mbps) (only Xeon, Core i7/i5 supports iAMT)
REAR I/O	ETHERNET	2 x GbE (RJ-45)
	SERIAL	1 x RS-232/422/485 (RS-232 w/power (DB-9)
	USB	2 x USB 3.1 Gen 2 2 x USB 3.1 Gen 1 2 x USB 2.0
	PS/2	1 x PS/2 (mini-DIN-6)
	DISPLAY	1 x DVI-I (DVI-D signal) 1 x DP++ 1 x HDMI 1.4b
	AUDIO	1 x S/PDIF, 1 x Front Audio header, 1 x Line-out, 1 x Mic-in, 1 x Line-in (Colay opt., MOQ required)
INTERNAL I/O	SERIAL	1 x RS-232/422/485 (RS-232 w/ power) (2.54mm pitch) 2 x RS-232
	USB	2 x USB 3.1 Gen 2 4 x USB 2.0 (2.54mm pitch) (1 x USB 2.0 Colay vertical Type A) (opt., MOQ required)
	AUDIO	N/A
	SATA	6 x SATA 3.0 RAID 0/1/5/10
	DIO	1 x 8-bit DIO
	LPC	1 x LPC (supports LPC EXT-RS232/RS485 module)
	SMBUS	1 x SMBus
	OUTPUT & INTERVAL	System Reset, Programmable via Software from 1 to 255 Seconds
	SECURITY TPM	Infineon TPM2.0 (opt., MOQ required)
	TYPE	ATX
	CONNECTOR	8-pin ATX 12V power 24-pin ATX power
	CONSUMPTION	Typical: i7-8700K: 3.3V @ 0.16A (0.53Watt); 5V @ 0.44A (2.2Watt); 12V @ 0.55A (6.6Watt) Max.: i7-8700K: 3.3V @ 0.35A (1.16Watt); 5V @ 1.34A (6.7Watt); 12V @ 12.54A (150.48Watt)
	RTC BATTERY	CR2032 Coin Cell
OS SUPPORT		Windows 10 Pro 64-bit Windows 10 IoT Enterprise 64-bit Linux Ubuntu 18.04
ENVIRONMENT	TEMPERATURE	Operating: -5 to 65°C Storage: -30 to 60°C with RTC Battery; -40 to 85°C without RTC Battery
	HUMIDITY	Operating: 5 to 90% RH Storage: 5 to 90% RH
	MTBF	548,936 hrs @ 25°C; 308,161 hrs @ 45°C ; 191,020 hrs @ 60°C ; 162,350 hrs @ 65°C Calculation model: Telcordia Issue 4 Environment: GB, GC – Ground Benign, Controlled
MECHANICAL	DIMENSIONS	microATX Form Factor 244mm (9.6") x 244mm (9.6")
	HEIGHT	PCB: 1.6mm Top Side: 31.51mm Bottom Side: 4.4mm
CERTIFICATIONS		CE, FCC, RoHS

MBU4181

MECHANICAL DRAWING



MOTHERBOARD LAYOUT



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BLOCK DIAGRAM

