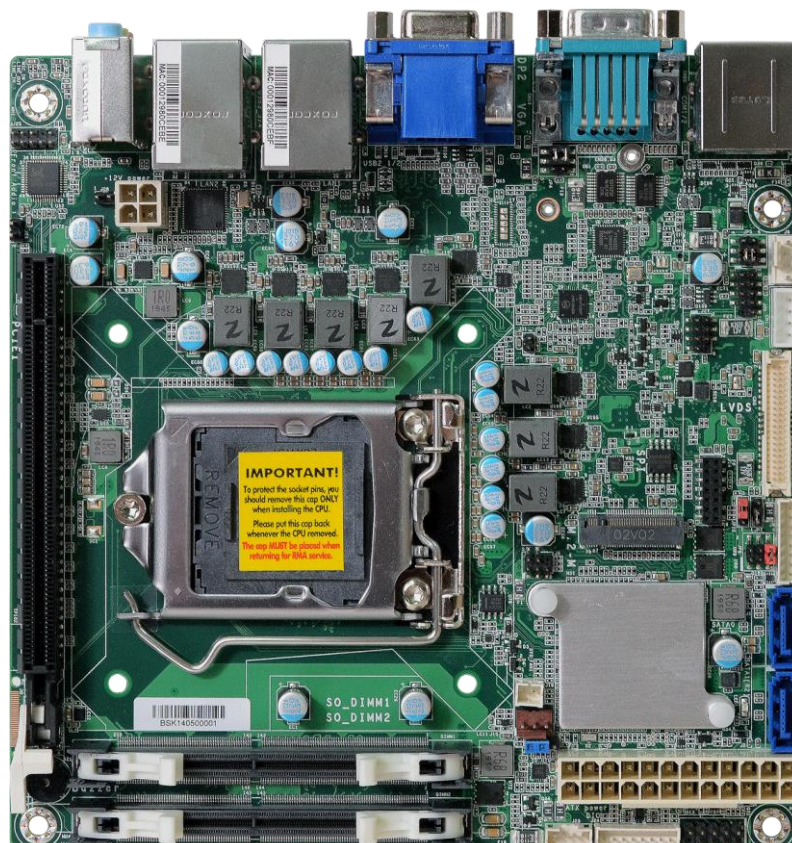


MBU4187

Industrial Motherboard Series



MBU4187

PRODUCT HIGHLIGHTS

- ▶ Intel 8th/9th Gen Intel® Core™ with Intel® Q370
- ▶ 2 DDR4 SODIMM up to 32Gb
- ▶ Multiple expansion: 1 PCIe x16, 1 x M.2 2280 M key, 1 x M.2 2230 E key
- ▶ Three independent displays supported
- ▶ Rich I/O: 2 Intel GbE, 2 COM, 6 USB 3.1
- ▶ 15-Year CPU Life Cycle Support Until Q3' 34 (Based on Intel IOTG Roadmap)



TECHNICAL INFORMATION

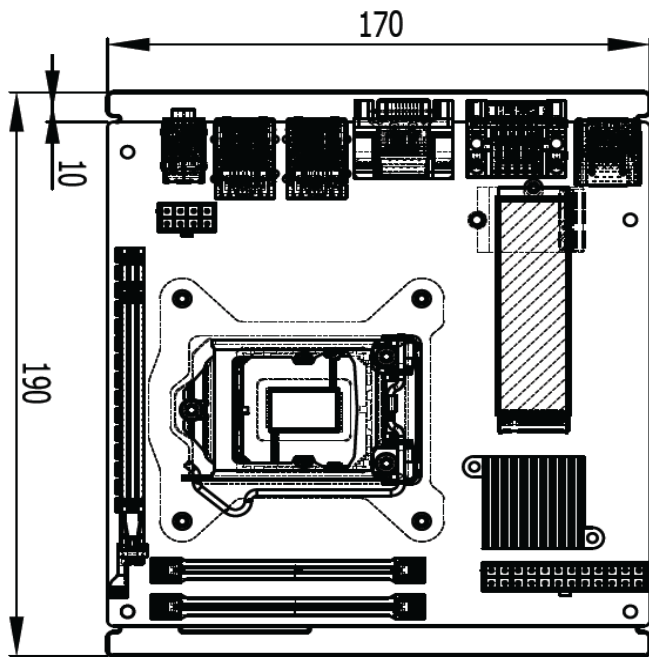
SYSTEM	PROCESSOR	9th Generation Intel® Core™ Processors, LGA 1151 Socket, TDP up to 95W Intel® Core i9-9900K Processor (Core 8; Max speed 5.0 GHz; TDP 95W) (Non-LTS) Intel® Core i7-9700E Processor (Core 8; Max speed 4.4 GHz; TDP 65W) Intel® Core i7-9700TE Processor (Core 8; Max speed 3.8 GHz; TDP 35W) Intel® Core i5-9500E Processor (Core 6; Max speed 4.2 GHz; TDP 65W) Intel® Core i5-9500TE Processor (Core 6; Max speed 3.6 GHz; TDP 35W) Intel® Core i3-9100E Processor (Core 4; Max speed 3.7 GHz; TDP 65W) Intel® Core i3-9100TE Processor (Core 4; Max speed 3.2 GHz; TDP 35W) 8th Generation Intel® Core™ Processors, LGA 1151 Socket, TDP up to 95W Intel® Core™ i7-8700 Processor (Core 6; Max speed 4.6 GHz; TDP 65W) Intel® Core™ i7-8700T Processor (Core 6; Max speed 4.0 GHz; TDP 35W) Intel® Core™ i5-8500 Processor (Core 6; Max speed 4.1 GHz; TDP 65W) Intel® Core™ i5-8500T Processor (Core 6; Max speed 3.5 GHz; TDP 35W) Intel® Core™ i3-8100 Processor (Core 4; Max speed 3.6 GHz; TDP 65W) Intel® Core™ i3-8100T Processor (Core 4; Max speed 3.1 GHz; TDP 35W) Intel® Pentium G5400 Processor (Core 2; Max speed 3.7 GHz; TDP 58W) Intel® Celeron G4900 Processor (Core 2; Max speed 3.1 GHz; TDP 54W)
	CHIPSET	Intel® Q370 Chipset
	MEMORY	Two 260-pin SODIMM up to 32GB Dual Channel DDR4 2400/2666MHz
	BIOS	AMI SPI 128Mbit
GRAPHICS	CONTROLLER	Intel® UHD Graphics 630 (Pentium G5400, Celeron G4900 support Intel® UHD610)
	FEATURE	OpenGL 4.5, DirectX 12, OpenCL 2.1 HW Decode: AVC/H.264, MPEG2, VC1/WMV9, JPEG/MJPEG, HEVC/H265, VP8, VP9 HW Encode: AVC/H.264, MPEG2, JPEG, HEVC/H265, VP8, VP9
	DISPLAY	1 x LVDS 1 x VGA 2 x DP++ LVDS: resolution up to 1920x1200 @ 60Hz VGA: resolution up to 1920x1200 @ 60Hz DP: resolution up to 4096x2304 @ 60Hz
	DUAL DISPLAYS	LVDS + VGA, LVDS + DP++, VGA + DP++, DP++ + DP++
EXPANSION	INTERFACE	1 x PCIe x16 (Gen 3) 1 x M.2 2280 M Key (PCIe) (support NVMe) 1 x M.2 2230 E Key (USB/PCIe)
AUDIO	AUDIO CODEC	Realtek ALC887S-VD2-GR
ETHERNET	CONTROLLER	1 x Intel® I219LM PHY with iAMT12 and vPro (10/100/1000Mbps) (Core i7/i5 supports iAMT) 1 x Intel® I210AT PCIe (10/100/1000Mbps)

TECHNICAL INFORMATION (CONTINUED)

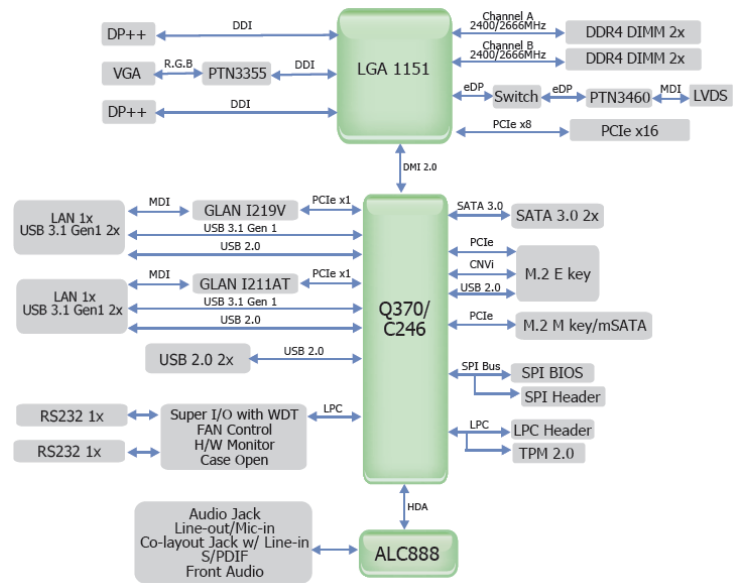
REAR I/O	ETHERNET	2 x GbE (RJ-45)
	SERIAL	2 x RS-232 (DB-9)
	USB	2 x USB 3.1 Gen2 4 x USB 3.1 Gen1
	PS/2	N/A
	DISPLAY	1 x VGA 2 x DP++
	AUDIO	1 x Line-out, 1 x Mic-in 1 x Line-in (MOQ available upon request)
INTERNAL I/O	SERIAL	N/A
	USB	2 x USB 2.0
	DISPLAY	1 x LVDS LCD Panel Connector 1 x LCD/Inverter Power
	AUDIO	1 x Front Audio (2.00mm pitch)
	SATA	2 x SATA 3.0 (up to 6Gb/s) (RAID 0/1/5)
	DIO	1 x 8-bit DIO 1 x DIO power
	LPC	1 x LPC (support LPC EXT-RS232/RS485 module)
	SMBUS	1 x SMBus
	OUTPUT & INTERVAL	System Reset, Programmable via Software from 1 to 255 Seconds
	SECURITY TPM	TPM2.0 (MOQ. available upon request)
	TYPE	ATX
	CONNECTOR	4-pin ATX 12V power 24-pin ATX power
	CONSUMPTION	Idle: i7-8700K 3.3V @ 0.11A (0.363W), 5V @ 0.45A (2.25W), 12V @ 0.31A (3.72W) Max: i7-8700K 3.3V @ 0.13A (0.429W), 5V @ 1.2A (6W), 12V @ 10.35A (124.2W)
	RTC BATTERY	CR2032 Coin Cell
OS SUPPORT		Windows 10 Pro 64-bit Windows 10 IoT Enterprise 64-bit Linux
ENVIRONMENT	TEMPERATURE	Operating: -10 to 70°C Storage: -40 to 85°C
	HUMIDITY	Operating: 5 to 90% RH Storage: 5 to 90% RH
	MTBF	634,945 hrs @ 25°C; 387,836 hrs @ 45°C; 254,993 hrs @ 60°C Calculation model: Telcordia Issue 4 Environment: GB, GC - Ground Benign, Controlled
MECHANICAL	DIMENSIONS	Mini-ITX Form Factor 170mm (6.7") x 170mm (6.7")
	HEIGHT	PCB: 1.6mm Top Side: 20mm Bottom Side: 3mm
CERTIFICATIONS		CE, FCC, RoHS

MBU4187

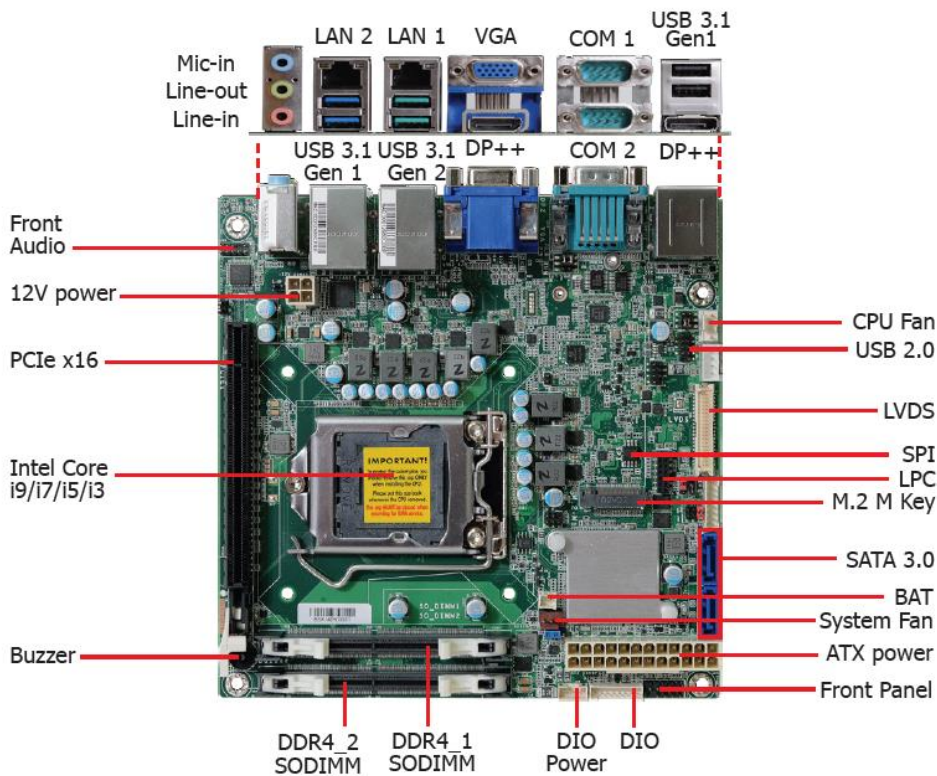
MECHANICAL DRAWING



BLOCK DIAGRAM



MOTHERBOARD LAYOUT



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