



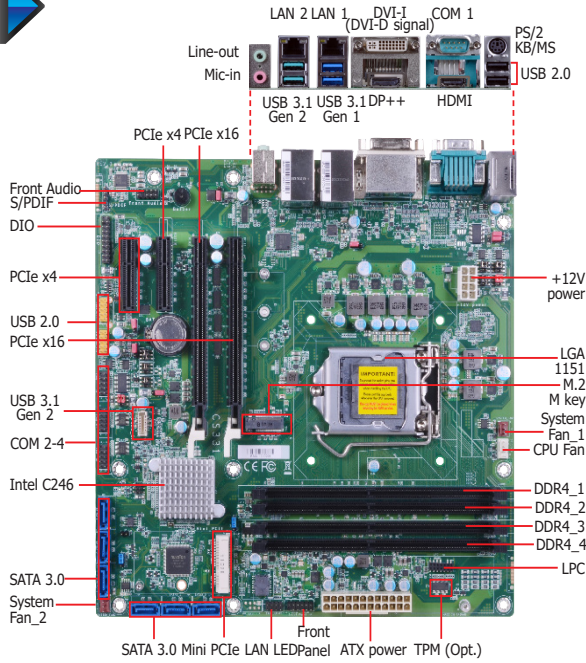
**9th/8th Gen Intel® Core™ Processor
microATX**



CS331-C246

Workstation

C246

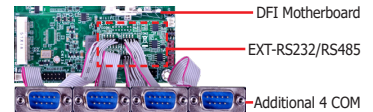


Features

- 4 DDR4 ECC/Non-ECC DIMM up to 128GB
- Three display ports: DVI-D, DP++, HDMI (HDMI 2.0a opt.) Supports triple independent displays
- DP++ resolution up to 4096x2160 @ 60Hz
DVI-D resolution up to 1920x1200 @ 60Hz
HDMI 1.2 resolution up to 1920x1200 @ 60Hz
HDMI 2.0a (opt.) resolution up to 4096x2160 @ 60Hz
- Multiple expansion: 2 PCIe x16 (1 x16 or 2 x8 signal), 2 PCIe x4, 1 mini PCIe, 1 M.2 M key (support Optane Memory)
- Rich I/O: 2 Intel GbE, 4 COM, 4 USB 3.1 Gen 2, 2 USB 3.1 Gen 1, 6 USB 2.0



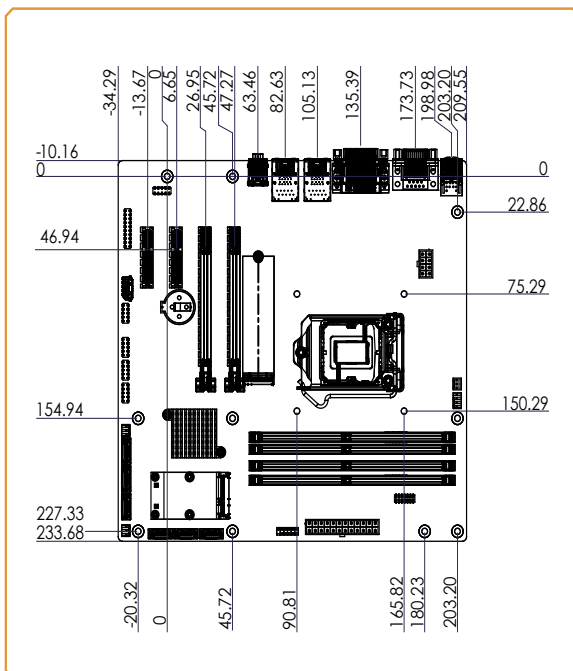
2 Extension Modules for Additional 4 COM Ports (via the LPC connector)



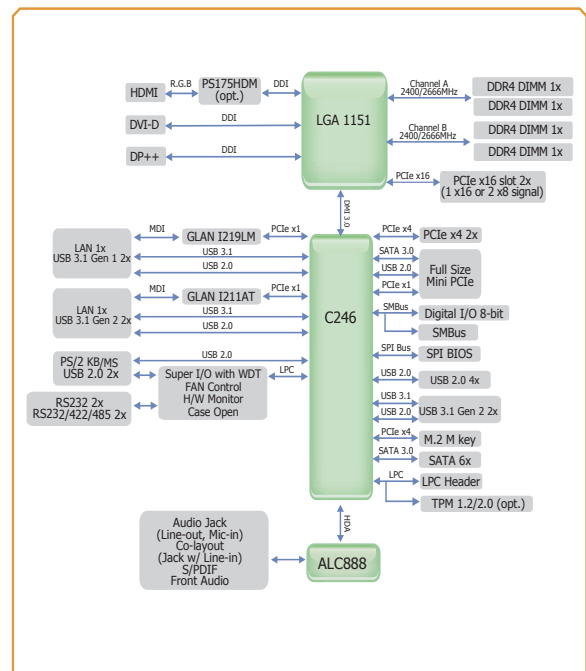
Ordering Information

Model Name	P/N	Memory	GbE	RS-232/422/485	RS-232	USB 3.1 Gen 2	USB 3.1 Gen 1	USB 2.0	Power	Thermal	Temp.
CS331-C246NRM	770-CS3311-000G	4 DIMM	2	2	2	4	2	6	24-pin ATX/8-pin ATX 12V	Active	0 to 60°C

Mechanical Drawing



Block Diagram





Specifications

SYSTEM	Processor	8th Generation Intel® Core™ /Pentium®/Celeron® LGA 1151 Socket 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 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, 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-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™ i7-9700TE (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, 3.2 GHz); 35W	
	Chipset	Intel® C246 Chipset			
	Memory	Four 288-pin DIMM up to 64GB Dual Channel DDR4 2400/2666 MHz (ECC/non ECC support)			
	BIOS	AMI SPI 128Mbit			
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 HDMI 1 x DVI-I (DVI-D signal) 1 x DP++	HDMI 1.2: resolution up to 1920x1200 @ 60Hz HDMI 2.0a: resolution up to 4096x2160 @ 60Hz (opt., MOQ required) DVI-D: resolution up to 1920x1200 @ 60Hz DP++: resolution up to 4096x2106 @ 60Hz		
	Triple Displays	DVI-D + HDMI + DP++			
EXPANSION	Interface	2 x PCIe x16 (Gen 3) (1 x16 signals or 2 x8 signals) 2 x PCIe x4 (Gen 3) 1 x mini PCIe (PCIe/mSATA/USB2.0) 1 x M.2 2242/2260/2280 M key (PCIe Gen3 x 4 NVMe)			
	Audio Codec	Realtek ALC888			
AUDIO	Controller	1 x Intel® i219LM PCIe (10/100/1000Mbps) 1 x Intel® i211AT PCIe (10/100/1000Mbps) with iAMT 12.0 (only Xeon, Core i7/i5 support iAMT)			
ETHERNET	Ethernet	2 x GbE (RJ-45)			
	USB	2 x USB 3.1 Gen 2 2 x USB 3.1 Gen 1	2 x USB 2.0		
	Serial	1 x RS-232/422/485 (RS-232 w/ power) (DB-9)			
	PS/2	1 x PS/2 (mini-DIN-6)			
	Display	1 x HDMI 1 x DVI-I (DVI-D signal)	1 x DP++		
	Audio	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		1 x S/PDIF, 1 x Front Audio Header			
SATA		6 x SATA 3.0 (up to 6Gb/s) RAID 0/1/5/10			
DIO		1 x 8-bit DIO			
LPC		1 x LPC (support LPC EXT-RS-232/485 module)			
SMBus		1 x SMBus			
WATCHDOG TIMER	Output & Interval	System Reset, Programmable via Software from 1 to 255 sec/min			
SECURITY	TPM	Infineon TPM 1.2/2.0 (opt., MOQ required)			
POWER	Type	ATX			
	Connector	8-pin ATX 12V power	24-pin ATX power		
	Consumption	TBD			
	RTC Battery	CR2032 Coin Cell			
OS SUPPORT		Windows 10 IoT Enterprise 64-bit	Linux		
ENVIRONMENT	Temperature	Operating: 0 to 60°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	TBD			
	MECHANICAL	Dimensions	microATX form factor	244mm (9.6") x 244mm (9.6")	
	Height	PCB: TBD	Top Side: TBD, Bottom Side: TBD		
CERTIFICATIONS		CE, FCC, RoHS, KCC			

Packing List

• 1 CS331-C246 motherboard	
• 1 COM port cable (W/Bracket, Length: 300mm, 2 x COM ports)	A81-015026-023G
• 1 Serial ATA data cable (W/LOCK, Length: 500mm)	332-553001-005G
• 1 I/O shield	A49-CS3311-000G
• 1 M.2 2242/2260/half mini PCIe standoff	A33-725019-090G
• 2 M.2 Screw	A32-112016-041G

Optional Items

• USB 2.0 port cable (Length: 350/398mm)	A81-001066-016G
• USB 3.1 Gen 2 port cable (Length: 350mm)	A81-001075-017G
• COM port cable (Length: 300mm, 2 x COM ports)	A81-015026-023G
• Serial ATA data cable (Length: 500mm, W/LOCK)	332-553001-005G
• Thermal solution (For 35W, Height: 37.3mm)	A71-101107-000G
• Thermal solution (For 65W, Height: 72.8mm)	552-200049-000G
• Thermal solution (For 95W, Height: 69.3mm)	761-103001-000G
• LPC EXT-RS232 module (4 x RS232 ports)	770-EXTRS1-000G
• LPC EXT-RS485 module (4 x RS485 ports)	770-EXTRS1-100G
• DP to HDMI Dongle	612-D2H13M-000G

Assured Systems

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