

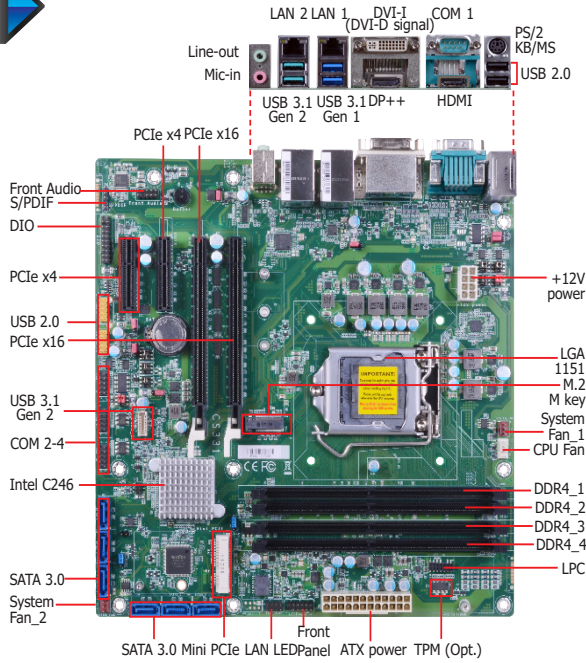


**9th/8th Gen Intel® Core™ Processor  
microATX**



**CS331-C246**

Workstation

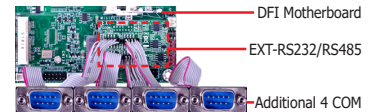


**Features**

- 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



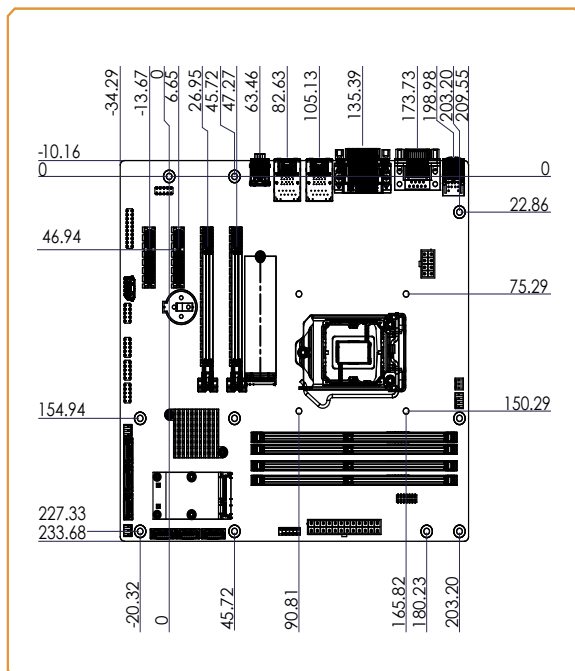
2 Extension Modules for Additional 4 COM Ports (via the LPC connector)



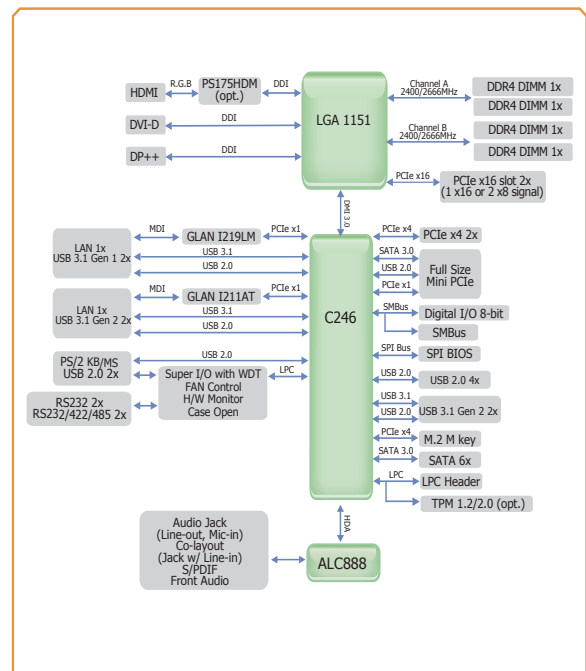
**Ordering Information**

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**

<b>SYSTEM</b>	<b>Processor</b>	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	
	<b>Chipset</b>	Intel® C246 Chipset			
	<b>Memory</b>	Four 288-pin DIMM up to 64GB Dual Channel DDR4 2400/2666 MHz (ECC/non ECC support)			
	<b>BIOS</b>	AMI SPI 128Mbit			
<b>GRAPHICS</b>	<b>Controller</b>	Intel® HD Gen 9 Graphics			
	<b>Feature</b>	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			
	<b>Display</b>	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		
	<b>Triple Displays</b>	DVI-D + HDMI + DP++			
<b>EXPANSION</b>	<b>Interface</b>	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)			
	<b>Audio Codec</b>	Realtek ALC888			
<b>AUDIO</b>	<b>Controller</b>	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)			
<b>ETHERNET</b>	<b>Ethernet</b>	2 x GbE (RJ-45)			
	<b>USB</b>	2 x USB 3.1 Gen 2 2 x USB 3.1 Gen 1	2 x USB 2.0		
	<b>Serial</b>	1 x RS-232/422/485 (RS-232 w/ power) (DB-9)			
	<b>PS/2</b>	1 x PS/2 (mini-DIN-6)			
	<b>Display</b>	1 x HDMI 1 x DVI-I (DVI-D signal)	1 x DP++		
	<b>Audio</b>	1 x Line-out 1 x Mic-in	1 x Line-in (colay, opt., MOQ required)		
	<b>INTERNAL I/O</b>	<b>Serial</b>	1 x RS-232/422/485 (RS-232 w/ power) (2.54mm pitch) 2 x RS-232		
<b>USB</b>		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)			
<b>Audio</b>		1 x S/PDIF, 1 x Front Audio Header			
<b>SATA</b>		6 x SATA 3.0 (up to 6Gb/s) RAID 0/1/5/10			
<b>DIO</b>		1 x 8-bit DIO			
<b>LPC</b>		1 x LPC (support LPC EXT-RS-232/485 module)			
<b>SMBus</b>		1 x SMBus			
<b>WATCHDOG TIMER</b>	<b>Output &amp; Interval</b>	System Reset, Programmable via Software from 1 to 255 sec/min			
<b>SECURITY</b>	<b>TPM</b>	Infineon TPM 1.2/2.0 (opt., MOQ required)			
<b>POWER</b>	<b>Type</b>	ATX			
	<b>Connector</b>	8-pin ATX 12V power	24-pin ATX power		
	<b>Consumption</b>	TBD			
	<b>RTC Battery</b>	CR2032 Coin Cell			
<b>OS SUPPORT</b>		Windows 10 IoT Enterprise 64-bit	Linux		
<b>ENVIRONMENT</b>	<b>Temperature</b>	Operating: 0 to 60°C Storage: -30 to 60°C with RTC Battery; -40 to 85°C without RTC Battery			
	<b>Humidity</b>	Operating: 5 to 90% RH Storage: 5 to 90% RH			
	<b>MTBF</b>	TBD			
	<b>MECHANICAL</b>	<b>Dimensions</b>	microATX form factor	244mm (9.6") x 244mm (9.6")	
	<b>Height</b>	PCB: TBD	Top Side: TBD, Bottom Side: TBD		
<b>CERTIFICATIONS</b>		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

Assured Systems is a leading technology company with over 1,500 regular clients in 80 countries, deploying over 85,000 systems to a diverse customer base in 12 years of business. We offer high-quality and innovative rugged computing, display, networking and data collection solutions to the embedded, industrial, and digital-out-of-home market sectors.

### US

[sales@assured-systems.com](mailto:sales@assured-systems.com)

Sales: +1 347 719 4508  
Support: +1 347 719 4508

1309 Coffeen Ave  
Ste 1200  
Sheridan  
WY 82801  
USA

### EMEA

[sales@assured-systems.com](mailto:sales@assured-systems.com)

Sales: +44 (0)1785 879 050  
Support: +44 (0)1785 879 050

Unit A5 Douglas Park  
Stone Business Park  
Stone  
ST15 0YJ  
United Kingdom

VAT Number: 120 9546 28  
Business Registration Number: 07699660