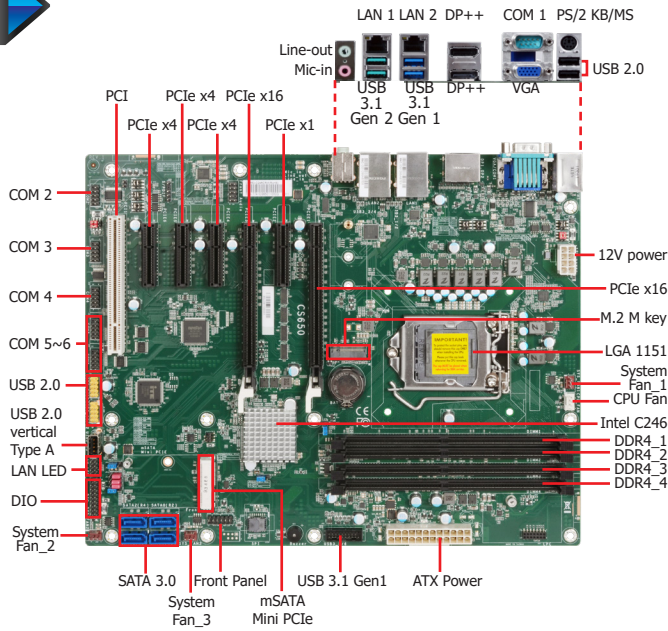


# CS650-C246

Workstation

C246

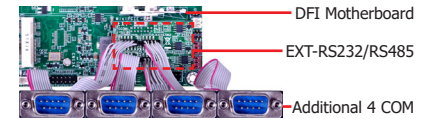


## Features

- 4 DDR4 ECC/Non-ECC DIMM up to 128GB
- 3 independent displays: VGA + DP++ + DP++
- DP++ resolution up to 4096x2160 @ 60Hz
- Multiple expansion: 2 PCIe x16 (1 x16 signal or 2 x8 signals), 3 PCIe x4, 1 PCIe x1, 1 PCI, 1 Full-sized Mini PCIe, 1 M.2 M key
- Rich I/O: 2 Intel GbE, 6 COM, 2 USB 3.1 Gen 2, 4 USB 3.1 Gen 1, 6 USB 2.0



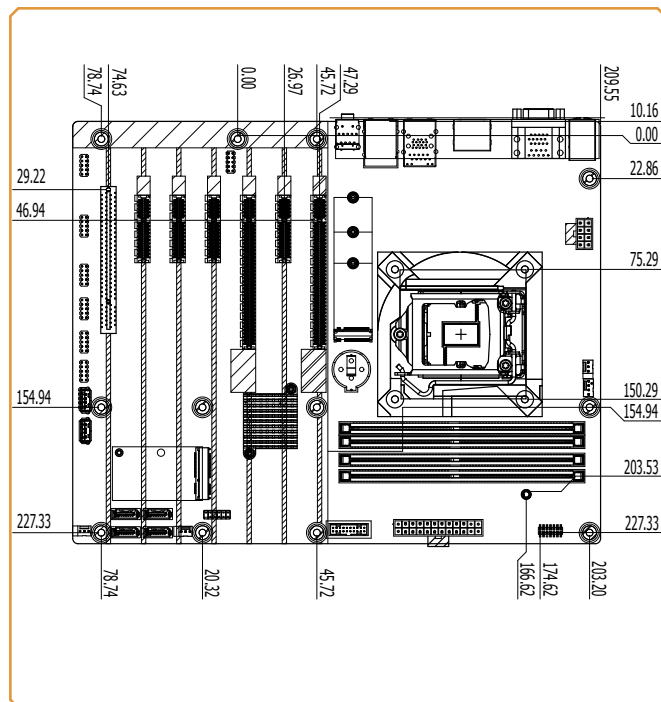
## 2 Extension Modules for Additional 4 COM Ports (via the LPC connector)



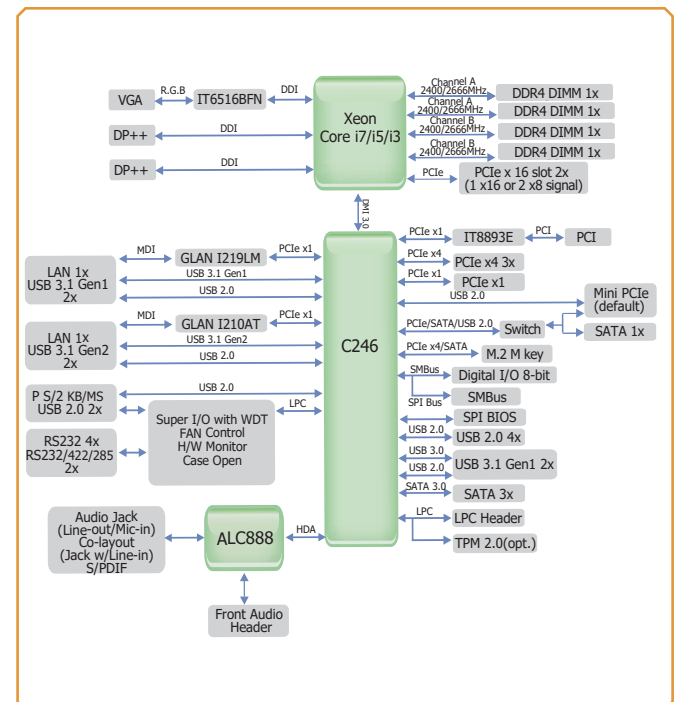
## Ordering Information

| Model Name    | P/N             | Memory | GbE | RS-232/422/485 | RS-232 | USB3.1 Gen 2 | USB3.1 Gen 1 | USB 2.0 | TPM 2.0 | Power      | Thermal | Temp.      |
|---------------|-----------------|--------|-----|----------------|--------|--------------|--------------|---------|---------|------------|---------|------------|
| CS650-C246CRM | 770-CS6503-000G | 4 DIMM | 2 2 | 4              | 2      | 4            | 2            | 6       | 0       | 24-pin ATX | Active  | -5 to 65°C |
| CS650-C246CRM | 770-CS6503-200G | 4 DIMM | 2 2 | 4              | 2      | 4            | 2            | 6       | 1       | 24-pin ATX | Active  | -5 to 65°C |

## Mechanical Drawing



## Block Diagram



## Specifications

|                       |                               |  |   |
|-----------------------|-------------------------------|--|---|
| <b>SYSTEM</b>         | <b>Processor</b>              | 8th Generation Intel® Core™/Pentium®/Celeron® LGA 1151 Socket Processors, TDP support up to 95W:<br>Intel® Xeon® E-2176G (6 Cores, 12M Cache, up to 4.7 GHz); 80W<br>Intel® Xeon® E-2124G (4 Cores, 6M Cache, up to 4.5 GHz); 71W<br>Intel® Core™ i7-8700 (6 Cores, 12M Cache, up to 4.6 GHz); 65W<br>Intel® Core™ i7-8700T (6 Cores, 12M Cache, up to 4.0 GHz); 35W<br>Intel® Core™ i5-8500 (6 Cores, 9M Cache, up to 4.1 GHz); 65W<br>Intel® Core™ i5-8500T (6 Cores, 9M Cache, up to 3.5 GHz); 35W<br>Intel® Core™ i3-8100 (4 Cores, 6M Cache, 3.6 GHz); 65W<br>Intel® Core™ i3-8100T (4 Cores, 6M Cache, 3.1 GHz); 35W<br>Intel® Pentium® G5400 (2 Cores, 4M Cache, 3.7 GHz); 58W<br>Intel® Pentium® G5400T (2 Cores, 4M Cache, 3.1 GHz); 35W<br>Intel® Celeron® G4900 (2 Cores, 2M Cache, 3.1 GHz); 54W<br>Intel® Celeron® G4900T (2 Cores, 2M Cache, 2.9 GHz); 35W | 9th Generation Intel® Core™/Xeon® LGA 1151 Socket Processors, TDP support up to 95W:<br>Intel® Xeon® E-2278GE (8 Cores, 16M Cache, up to 4.7 GHz); 80W<br>Intel® Xeon® E-2278GEL (8 Cores, 16M Cache, up to 3.9 GHz); 35W<br>Intel® Xeon® E-2226GE (6 Cores, 12M Cache, up to 4.6 GHz); 80W<br>Intel® Core™ i7-9700E (8 Cores, 12M Cache, up to 4.4 GHz); 65W<br>Intel® Core™ i7-9700TE (8 Cores, 12M Cache, up to 3.8 GHz); 35W<br>Intel® Core™ i5-9500E (6 Cores, 9M Cache, up to 4.2 GHz); 65W<br>Intel® Core™ i5-9500TE (6 Cores, 9M Cache, up to 3.6 GHz); 35W<br>Intel® Core™ i3-9100E (4 Cores, 6M Cache, 3.7 GHz); 65W<br>Intel® Core™ i3-9100TE (4 Cores, 6M Cache, to 3.2 GHz); 35W |
|                       | <b>Chipset</b>                | Intel® C246 Chipset  |   |
|                       | <b>Memory</b>                 | Four 288-pin Non-ECC DIMM up to 128GB<br>Core™ i5/i7 only support non-ECC  | Dual Channel DDR4 2400/2666MHz  |
|                       | <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<br>HW Decode: AVC/H.264, MPEG2, VC1/WMV9, JPEG/MJPEG, HEVC/H265, VP8, VP9<br>HW Encode: MPEG2, AVC/H264, JPEG, HEVC/H265, VP8, VP9  |   |
|                       | <b>Display</b>                | 1 x VGA<br>2 x DP++  | VGA: resolution up to 1920x1200 @ 60Hz<br>DP++: resolution up to 4096x2160 @ 60Hz   |
|                       | <b>Triple Displays</b>        | VGA + DP++ + DP++  |   |
| <b>EXPANSION</b>      | <b>Interface</b>              | 1 x Full-sized Mini PCIe (PCIe/SATA/USB2.0), share with SATA 3(R5)<br>1 x M.2 2242/2260/2280 M key (PCIe Gen3 x4 NVMe/SATA)<br>2 x PCIe x16 (Gen 3) (1 x16 signal or 2 x8 signals)<br>3 x PCIe x4 (Gen 3)<br>1 x PCIe x1 (Gen 3)<br>1 x PCI  |   |
| <b>AUDIO</b>          | <b>Audio Codec</b>            | Realtek ALC888   |   |
| <b>ETHERNET</b>       | <b>Controller</b>             | 1 x Intel® I210AT PCIe (10/100/1000Mbps)<br>1 x Intel® I219LM PCIe with iAMT12.0 (10/100/1000Mbps) (only Xeon, Core i7/i5 supports iAMT)   |   |
| <b>REAR I/O</b>       | <b>Ethernet</b>               | 2 x GbE (RJ-45)  |   |
|                       | <b>USB</b>                    | 2 x USB 3.1 Gen2<br>2 x USB 3.1 Gen1   | 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 VGA  | 2 x DP++  |
|                       | <b>Audio</b>                  | 1 x Line-out, 1 x Mic-in, 1 x Line-in (opt., MOQ required)   |   |
|                       | <b>INTERNAL I/O</b>           | <b>Serial</b>  | 1 x RS-232/422/485 (RS-232 w/ power) (2.54mm pitch)<br>4 x RS-232 (2.54mm pitch)  |
| <b>USB</b>            |                               | 2 x USB 3.1 Gen 1 (2.00mm pitch)<br>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 Front Audio Header   | 1 x S/PDIF  |
| <b>SATA</b>           |                               | 4 x SATA 3.0 (up to 6Gb/s, SATA 3(R5) shared with mini PCIe (SATA), default at mini PCIe)<br>RAID 0/1/5/10   |   |
| <b>DIO</b>            |                               | 1 x 8-bit DIO  |   |
| <b>LPC</b>            |                               | 1 x LPC (supports LPC EXT-RS232/RS485 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 Seconds   |
| <b>SECURITY</b>       | <b>TPM</b>                    | Infineon TPM2.0 (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>            | Typical: i7-8700K: 3.3V @ 0.34A (1.122Watt); 5V @ 0.58A (2.9Watt); 12V @ 0.65A (7.8Watt)<br>Max.: i7-8700K: 3.3V @ 0.52A (1.716Watt); 5V @ 1.27A (6.35Watt); 12V @ 13.01A (156.12Watt)   |   |
|                       | <b>RTC Battery</b>            | CR2032 Coin Cell   |   |
| <b>OS SUPPORT</b>     |                               | Windows 10 IoT Enterprise 64-bit<br>Windows 11 GAC   | Linux   |
| <b>ENVIRONMENT</b>    | <b>Temperature</b>            | Operating: -5 to 65°C<br>Storage: -30 to 60°C with RTC Battery; -40 to 85°C without RTC Battery  |   |
|                       | <b>Humidity</b>               | Operating: 5 to 95% RH<br>Storage: 5 to 95% RH   |   |
|                       | <b>MTBF</b>                   | 534,017 hrs @ 25°C; 298,488 hrs @ 45°C ; 184,547 hrs @ 60°C ; 133,068 hrs @ 70°C<br>Calculation Model: Telcordia Issue 4<br>Environment: GB, GC - Ground Benign, Controlled  |   |
| <b>MECHANICAL</b>     | <b>Dimensions</b>             | ATX Form Factor  | 305mm (12") x 244mm (9.6")  |
|                       | <b>Height</b>                 | PCB: 1.6mm   | Top Side: 32mm Bottom Side: 4.4mm   |
| <b>CERTIFICATIONS</b> | CE, FCC Class B, RoHS, KC, UL |  |   |

## Packing List

|  |                 |
|--|-----------------|
| • 1 CS650-C246 motherboard                         |                 |
| • 1 COM port cables (Length: 300mm, 2 x COM ports) | A81-015026-023G |
| • 1 Serial ATA data cable (Length: 500mm)          | 332-553001-005G |
| • 1 I/O shield                                     | A49-CS6310-000G |
| • 1 mini PCIe screw                                | A32-112016-041G |

## Optional Items

|   |                 |
|---|-----------------|
| • USB 2.0 port cable (Length: 350mm)            | A81-001066-016G |
| • USB 3.1 Gen1 port cable (Length: 320mm)       | A81-001052-023G |
| • 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: 74.47mm)   | A71-101158-000G |
| • Thermal solution (For 95W, Height: 77.2mm)    | 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 |