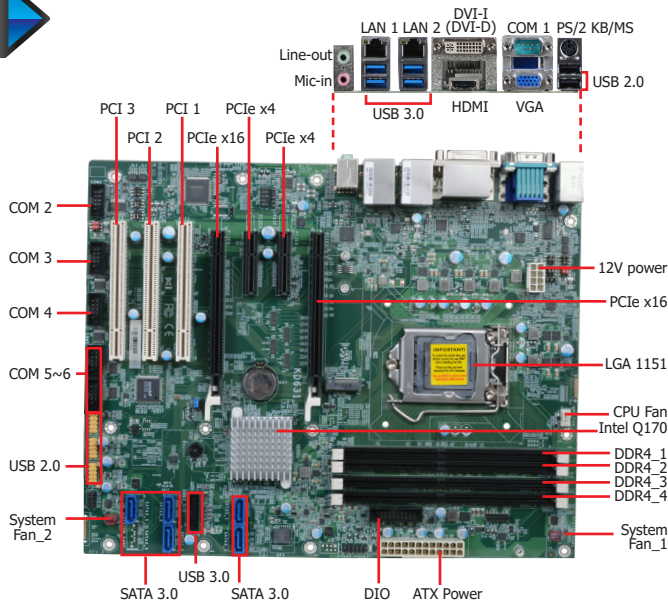




# KD631-Q170

Desktop

Q170

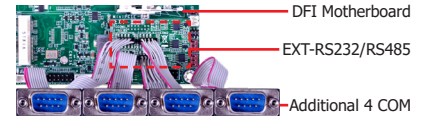


## Features

- 4 DDR4 DIMM up to 64GB
- 3 independent displays: VGA + DVI-I (DVI-D signal) + HDMI
- HDMI resolution up to 4096x2160 @ 24Hz
- Multiple expansion: 2 PCIe x16 (1 x16 or 2 x8 signal), 2 PCIe x4, 3 PCI, 1 M.2
- Rich I/O: 2 Intel GbE, 6 COM, 6 USB 3.0, 8 USB 2.0
- LPC EXT-RS232/485 module extends additional 4 COM ports



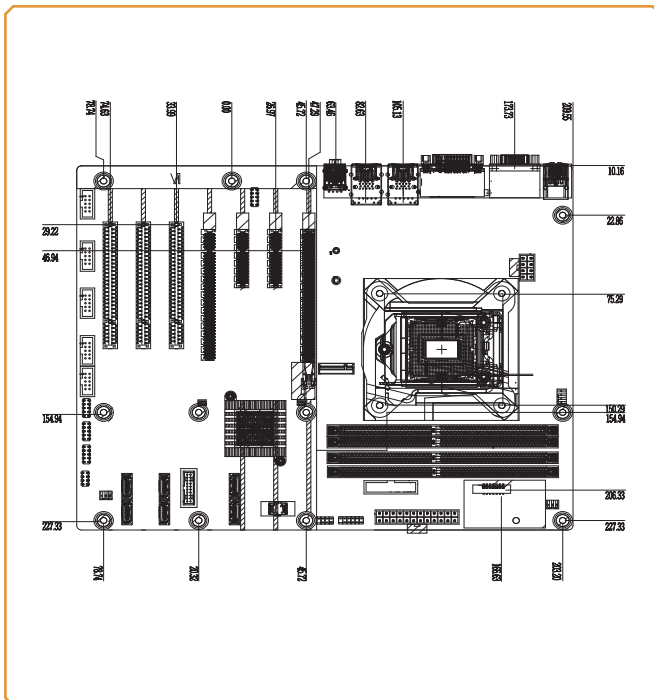
## 2 Extension Modules for Additional 4 COM Ports (via the LPC connector)



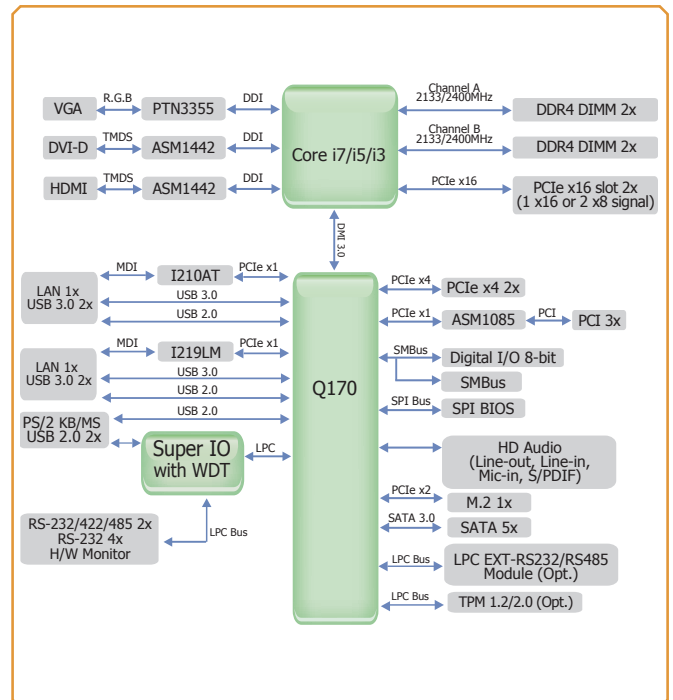
## Ordering Information

| Model Name    | P/N             | Memory | GbE | RS-232/422/485 | RS-232 | USB 3.0 | USB 2.0 | TPM     | Power      | Thermal | Temp.     |
|---------------|-----------------|--------|-----|----------------|--------|---------|---------|---------|------------|---------|-----------|
| KD631-Q170CRM | 770-KD6312-000G | 4 DIMM | 2   | 2              | 4      | 6       | 8       | 0       | 24-pin ATX | Active  | 0 to 60°C |
| KD631-Q170CRM | 770-KD6312-200G | 4 DIMM | 2   | 2              | 4      | 6       | 8       | TPM 2.0 | 24-pin ATX | Active  | 0 to 60°C |
| KD631-Q170CRM | 770-KD6312-300G | 4 DIMM | 2   | 2              | 4      | 6       | 8       | TPM 1.2 | 24-pin ATX | Active  | 0 to 60°C |

## Mechanical Drawing



## Block Diagram



## Specifications

|                       |                              |  |   |
|-----------------------|------------------------------|--|---|
| <b>SYSTEM</b>         | <b>Processor</b>             | 7th Gen Intel® Core™/Pentium®/Celeron® LGA 1151 Socket Processors with TDP up to 95W:<br>Intel® Core™ i7-7700K (4 Cores, 8M Cache, up to 4.5 GHz); 91W (Non-LTS)<br>Intel® Core™ i7-7700 (4 Cores, 8M Cache, up to 4.2 GHz); 65W<br>Intel® Core™ i7-7700T (4 Cores, 8M Cache, up to 3.8 GHz); 35W<br>Intel® Core™ i5-7500 (4 Cores, 6M Cache, up to 3.8 GHz); 65W<br>Intel® Core™ i5-7500T (4 Cores, 6M Cache, up to 3.3 GHz); 35W<br>Intel® Core™ i3-7101E (2 Cores, 3M Cache, 3.9 GHz); 65W<br>Intel® Core™ i3-7101TE (2 Cores, 3M Cache, to 3.4 GHz); 35W | 6th Gen Intel® Core™/Pentium®/Celeron® LGA 1151 Socket Processors with TDP up to 95W:<br>Intel® Core™ i7-6700K (Cores, 8M Cache, up to 4.2 GHz); 91W (Non-LTS)<br>Intel® Core™ i7-6700 (4 Cores, 8M Cache, up to 4.0 GHz); 65W<br>Intel® Core™ i7-6700TE (4 Cores, 8M Cache, up to 3.4 GHz); 35W<br>Intel® Core™ i5-6500 (4 Cores, 6M Cache, up to 3.6 GHz); 65W<br>Intel® Core™ i5-6500TE (4 Cores, 6M Cache, up to 3.3 GHz); 35W<br>Intel® Core™ i3-6101E (2 Cores, 4M Cache, 3.7 GHz); 65W<br>Intel® Core™ i3-6101TE (2 Cores, 4M Cache, to 2.7 GHz); 35W<br>Intel® Pentium® G4000 (2 Cores, 3M Cache, 3.3 GHz); 65W<br>Intel® Pentium® G400TE (2 Cores, 3M Cache, 2.9 GHz); 35W<br>Intel® Celeron® G3900 (2 Cores, 2M Cache, 2.8 GHz); 65W<br>Intel® Celeron® G3900TE (2 Cores, 2M Cache, 2.6 GHz); 35W |
|                       | <b>Chipset</b>               | Intel® Q170 Chipset  |   |
|                       | <b>Memory</b>                | Four 288-pin DIMM up to 64GB (Non-ECC Support)   | Dual Channel DDR4 2133/2400MHz  |
|                       | <b>BIOS</b>                  | Insyde 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>1 x DVI-I (DVI-D signal)<br>1 x HDMI  | VGA: resolution up to 1920x1200 @ 60Hz<br>DVI-D: resolution up to 1920x1200 @ 60Hz<br>HDMI: resolution up to 4096x2160 @ 24Hz   |
|                       | <b>Triple Displays</b>       | VGA + DVI-I (DVI-D signal) + HDMI  |   |
| <b>EXPANSION</b>      | <b>Interface</b>             | 2 x PCIe x16 (1 x16 or 2 x8 signal) (Gen 3)<br>2 x PCIe x4 (Gen 3)   | 3 x PCI<br>1 x M.2 2260/2280 M key (SATA3.0/PCIe Gen3 x2 NVMe)  |
| <b>AUDIO</b>          | <b>Audio Codec</b>           | Realtek ALC888S-VD2-GR   |   |
| <b>ETHERNET</b>       | <b>Controller</b>            | 1 x Intel® I210AT PCIe (10/100/1000Mbps)<br>1 x Intel® I219LM PCIe with iAMT11.0 (10/100/1000Mbps) (only Core i7/i5 supports iAMT)   |   |
| <b>REAR I/O</b>       | <b>Ethernet</b>              | 2 x GbE (RJ-45)  |   |
|                       | <b>USB</b>                   | 4 x USB 3.0<br>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<br>1 x DVI-I (DVI-D signal)  | 1 x HDMI  |
|                       | <b>Audio</b>                 | 1 x Line-out, 1 x Mic-in, 1 x Line-in (opt. by request, 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 3.0 (2.00mm pitch)<br>6 x USB 2.0 (2.54mm pitch) or 4 x USB 2.0 (2.54mm pitch) + 1 x Vertical USB 2.0 type A (available upon request)  |   |
|                       | <b>Audio</b>                 | 1 x Front Audio Header<br>1 x S/PDIF   |   |
|                       | <b>SATA</b>                  | 5 x SATA 3.0 (up to 6Gb/s)<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 TPM2.0/1.2 (optional)   |   |
| <b>POWER</b>          | <b>Type</b>                  | ATX  |   |
|                       | <b>Connector</b>             | 8-pin ATX 12V power  | 24-pin ATX power  |
|                       | <b>Consumption</b>           | Typical: i7-7700: 3.3V @ 0.3422A (1.129Watt); 5V @ 0.5672A (2.836Watt); 12V @ 0.7255A (8.706Watt)<br>Max.: i7-7700: 3.3V @ 0.3254A (1.0738Watt); 5V @ 0.5636A (2.818Watt); 12V @ 10.583A (126.996Watt)   |   |
|                       | <b>RTC Battery</b>           | CR2032 Coin Cell   |   |
| <b>OS SUPPORT</b>     |                              | Windows 7 32/64-bit<br>Window 8.1 64-bit<br>Windows 10 64-bit  | Linux<br>Note: 7th Gen CPU SKU ONLY support Windows 10 64-bit & Linux.  |
| <b>ENVIRONMENT</b>    | <b>Temperature</b>           | Operating: 0 to 60°C<br>Storage: -30 to 60°C with RTC Battery; -40 to 85°C without RTC Battery   |   |
|                       | <b>Humidity</b>              | Operating: 5 to 90% RH<br>Storage: 5 to 90% RH   |   |
|                       | <b>MTBF</b>                  | 378,982 hrs @ 25°C; 218,492 hrs @ 45°C; 139,687 hrs @ 60°C<br>Calculation model: Telcordia Issue 2<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: 31.47mm, Bottom Side: 4.4mm   |
| <b>CERTIFICATIONS</b> |                              | CE, FCC, RoHS  |   |

## Packing List

|  |                 |
|--|-----------------|
| • 1 KD631-Q170 motherboard                         |                 |
| • 1 COM port cables (Length: 400mm, 2 x COM ports) | A81-015012-001G |
| • 1 Serial ATA data cable (Length: 500mm)          | 332-553001-005G |
| • 1 I/O shield                                     | A49-KD6310-000G |
| • 1 M.2 standoff                                   | A33-725019-090G |
| • 1 M.2 screw for 2260                             | A32-112016-041G |
| • 1 M.2 screw for 2280                             | A32-112016-041G |

## Optional Items

|   |                 |
|---|-----------------|
| • USB 2.0 port cable (Length: 350mm)            | A81-001066-016G |
| • USB 3.0 port cable (Length: 320mm)            | A81-001052-023G |
| • COM port cable (Length: 400mm, 2 x COM ports) | A81-015012-001G |
| • Serial ATA data cable (Length: 500mm, W/LOCK) | 332-553001-005G |
| • Thermal solution (For 35W, Height: 37.3mm)    | A71-103004-000G |
| • 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 |