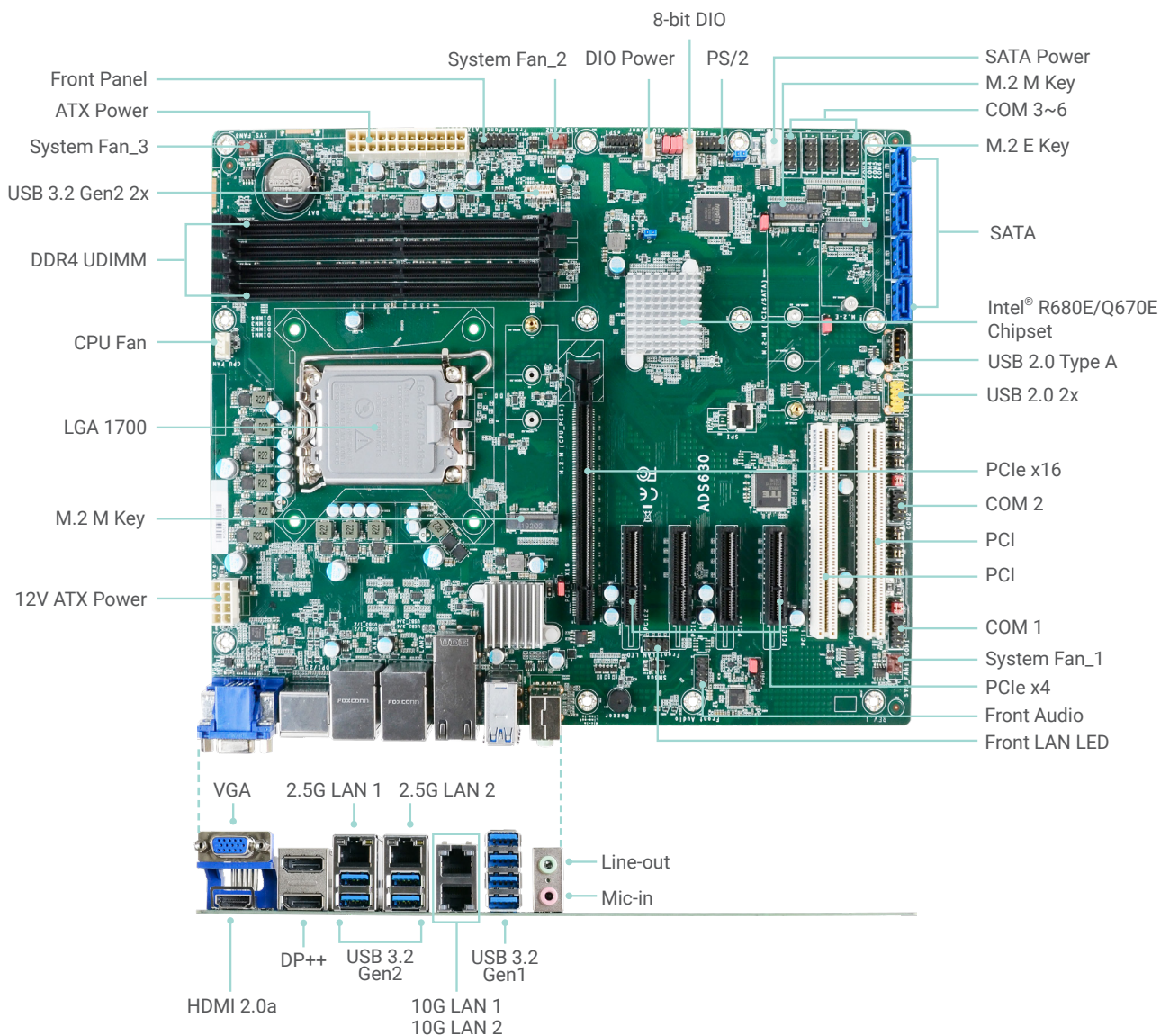


# ADS630-R680E/Q670E 13/12th Gen Intel® Core™ Desktop ATX



Top View

## KEY FEATURES



### DDR4

4 DDR4 UDIMM up to 128GB



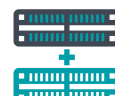
### 4K High Resolution

Supports 4K resolution



### Quad Displays

VGA + 2 x DP++ + HDMI



### Multiple Expansion

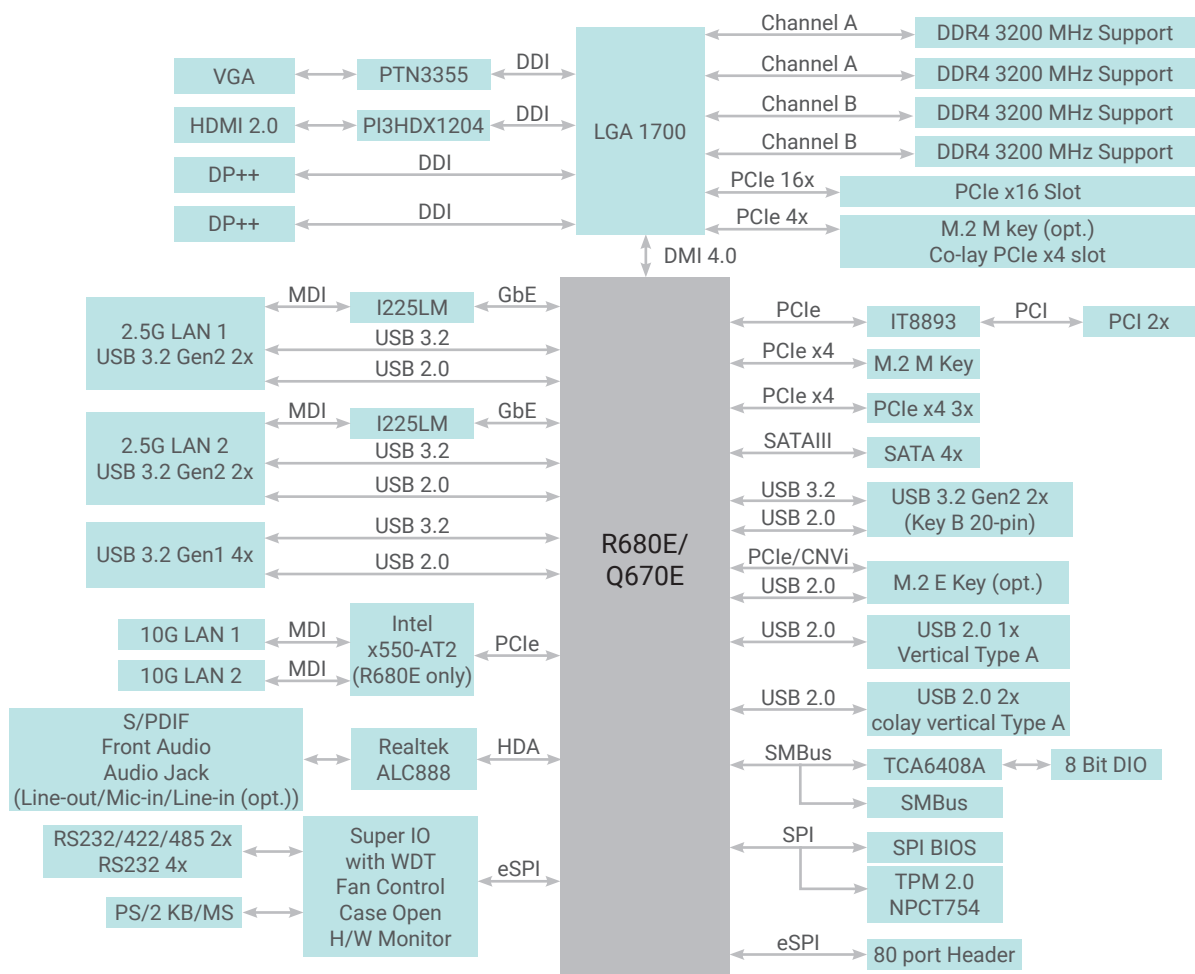
1 PCIe x16 (Gen 5)  
4 PCIe x4 (Gen 4)  
2 PCI, 2 M.2 M key  
1 M.2 E Key



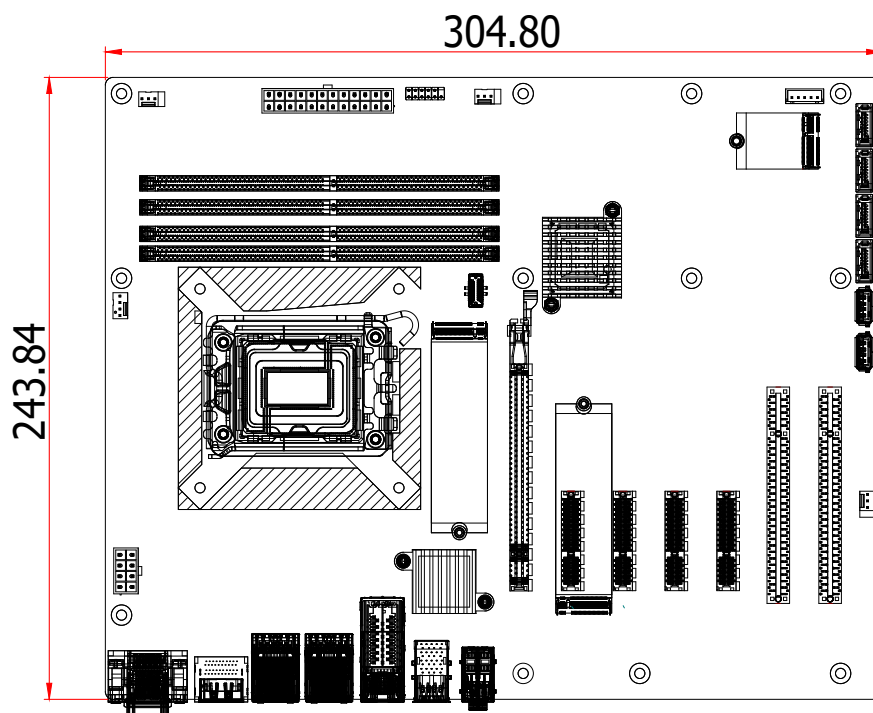
### Rich I/O

2 Intel 10GbE, 2 Intel 2.5GbE, 6 USB 3.2 Gen2, 4 USB 3.2 Gen1, 8 USB 2.0

## BLOCK DIAGRAM



## MECHANICAL DRAWING



## SPECIFICATION

|              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                         |
|--------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| SYSTEM       | Processor     | <p>13th Generation Intel® LGA 1700 Socket Processors, TDP support up to 125W</p> <p>Intel® Core™ i9-13900E (24 Cores, 36M Cache, up to 5.2 GHz); 65W</p> <p>Intel® Core™ i9-13900TE (24 Cores, 36M Cache, up to 5.0 GHz); 35W</p> <p>Intel® Core™ i7-13700E (16 Cores, 30M Cache, up to 5.1 GHz); 65W</p> <p>Intel® Core™ i7-13700TE (16 Cores, 30M Cache, up to 4.8 GHz); 35W</p> <p>Intel® Core™ i7-13700T (16 Cores, 30M Cache, up to 4.9 GHz); 35W</p> <p>Intel® Core™ i5-13500E (14 Cores, 24M Cache, up to 4.6 GHz); 65W</p> <p>Intel® Core™ i5-13500TE (14 Cores, 24M Cache, up to 4.5 GHz); 35W</p> <p>Intel® Core™ i5-13500T (14 Cores, 24M Cache, up to 4.6 GHz); 35W</p> <p>Intel® Core™ i5-13400E (10 Cores, 20M Cache, up to 4.6 GHz); 65W</p> <p>Intel® Core™ i3-13100E (4 Cores, 12M Cache, up to 4.4 GHz); 65W</p> <p>Intel® Core™ i3-13100TE (4 Cores, 12M Cache, up to 4.1 GHz); 35W</p> <p>Intel® Core™ i3-13100T (4 Cores, 12M Cache, up to 4.2 GHz); 35W</p> <p>12th Generation Intel® LGA 1700 Socket Processors, TDP support up to 125W</p> <p>Intel® Core™ i9-12900E (16 Cores, 30M Cache, up to 5.0 GHz); 65W</p> <p>Intel® Core™ i9-12900TE (16 Cores, 30M Cache, up to 4.8 GHz); 35W</p> <p>Intel® Core™ i7-12700E (12 Cores, 25M Cache, up to 4.8 GHz); 65W</p> <p>Intel® Core™ i7-12700TE (12 Cores, 25M Cache, up to 4.6 GHz); 35W</p> <p>Intel® Core™ i5-12500E (6 Cores, 18M Cache, up to 4.5 GHz); 65W</p> <p>Intel® Core™ i5-12500TE (6 Cores, 18M Cache, up to 4.3 GHz); 35W</p> <p>Intel® Core™ i3-12100E (4 Cores, 12M Cache, up to 4.2 GHz); 60W</p> <p>Intel® Core™ i3-12100TE (4 Cores, 12M Cache, up to 4.0 GHz); 35W</p> <p>Intel® Pentium® G7400E (2 Cores, 6M Cache, 3.6 GHz); 46W</p> <p>Intel® Pentium® G7400TE (2 Cores, 6M Cache, 3.0 GHz); 35W</p> <p>Intel® Celeron® G6900E (2 Cores, 4M Cache, 3.0 GHz); 46W</p> <p>Intel® Celeron® G6900TE (2 Cores, 4M Cache, 2.4 GHz); 35W</p> |                                         |
|              | Chipset       | Intel® R680E/Q670E Chipset                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                         |
|              | Memory        | <p>Four 288-pin UDIMM up to 128GB</p> <p>Dual Channel DDR4 3200 MHz (ECC support: R680E only)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                         |
|              | BIOS          | AMI SPI 256Mbit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                         |
|              | Controller    | Intel® HD Gen 9 Graphics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |
| GRAPHICS     | Feature       | <p>OpenGL 4.5, DirectX 12, OpenCL 2.1</p> <p>HW Decode: AVC/H.264, MPEG2, VC1/WMV9, JPEG/MJPEG, HEVC/H265, VP8, VP9</p> <p>HW Encode: MPEG2, AVC/H264, JPEG, HEVC/H265, VP8, VP9</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                         |
|              | Display       | 1 x VGA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | VGA: resolution up to 1920x1200 @ 60Hz  |
|              |               | 2 x DP++                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | DP++: resolution up to 4096x2304 @60Hz  |
|              |               | 1 x HDMI 2.0a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | HDMI: resolution up to 4096x2160 @ 24Hz |
|              | Quad Displays | VGA + 2 x DP++ + HDMI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                         |
| EXPANSION    | Interface     | <p>1 x PCIe x16 (Gen 5)</p> <p>4 x PCIe x4 (Gen 4)</p> <p>2 x PCI</p> <p>1 x M.2 2230 E key (PCIe/USB 2.0/Intel CNVi/Wifi 6E as option, MOQ required)</p> <p>1 x M.2 2242/2260/2280 M key (PCIe x4 NVMe share with PCIe x4 slot#2 as optional, MOQ required)</p> <p>1 x M.2 2242/2260/2280 M key (PCIe x4 Gen3 NVMe/Intel Optane Memory support)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                         |
|              | Audio Codec   | Realtek ALC888                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                         |
|              | Controller    | <p>1 x Intel® I226-LM PCIe (10M/100M/1000Mbps/2.5G) (only Xeon, Core i9/i7/i5 support iAMT)</p> <p>1 x Intel® I226-V PCIe (10M/100M/1000Mbps/2.5G)</p> <p>2 x Intel® x550-AT2 (10 GBASE-T/1 GbE/100 Mbps)(R680E only, no support WOL)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |
|              | Ethernet      | <p>2 x 2.5GbE</p> <p>2 x 10GbE</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                         |
|              | USB           | <p>4 x USB 3.2 Gen2</p> <p>4 x USB 3.2 Gen1</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                         |
|              | Display       | <p>1 x VGA</p> <p>2 x DP++</p> <p>1 x HDMI 2.0a</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                         |
|              | Audio         | <p>1 x Line-out</p> <p>1 x Mic-in</p> <p>1 x Line-in (opt. by request, MOQ required)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |
| INTERNAL I/O | Serial        | <p>2 x RS-232/422/485 (RS-232 w/ power) (2.54mm pitch)</p> <p>4 x RS-232 (2.54mm pitch)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                         |
|              | USB           | <p>2 x USB 3.2 Gen2 Key B box header (R680E Gen2 ; Q670E Gen1)</p> <p>2 x USB 2.0 (2.54mm pitch, Colay vertical Type A, opt.: MOQ required)</p> <p>1 x USB 2.0 Vertical Type A</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                         |
|              | Audio         | <p>1 x Front Audio Header</p> <p>1 x S/PDIF</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                         |
|              | SATA          | 4 x SATA 3.0 (up to 6Gb/s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | RAID 0/1/5/10                           |
|              | PS/2          | 1 x PS/2 (2.54mm pitch)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                         |
|              | DIO           | 1 x 8-bit DIO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                         |
|              | SMBus         | 1 x SMBus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |
|              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                         |
|              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                         |

## SPECIFICATION

|                       |                              |                                                                                                 |
|-----------------------|------------------------------|-------------------------------------------------------------------------------------------------|
| <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>                   | Nuvoton TPM2.0 (opt., MOQ required)                                                             |
| <b>POWER</b>          | <b>Type</b>                  | ATX                                                                                             |
|                       | <b>Connector</b>             | 8-pin ATX 12V power<br>24-pin ATX power                                                         |
|                       | <b>Consumption</b>           | TBD                                                                                             |
|                       | <b>RTC Battery</b>           | CR2032 Coin Cell                                                                                |
| <b>OS SUPPORT</b>     | <b>Microsoft</b>             | Windows 10 IoT Enterprise 64-bit<br>Windows 11 Enterprise                                       |
|                       | <b>Linux</b>                 | 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>                  | TBD                                                                                             |
| <b>MECHANISM</b>      | <b>Dimensions</b>            | ATX Form Factor<br>305mm (12") x 244mm (9.6")                                                   |
|                       |                              |                                                                                                 |
|                       | <b>Height</b>                | PCB: 1.6mm<br>Top Side: 33.3mm<br>Bottom Side: 4mm                                              |
|                       |                              |                                                                                                 |
| <b>CERTIFICATIONS</b> | <b>Certifications</b>        | CE, FCC Class B, UKCA, RoHS                                                                     |

## ORDERING INFORMATION

| Model Name      | P/N              | Memory          | 10 GbE | 2.5 GbE | M.2 | RS-232/<br>422/485 | USB 3.2<br>Gen2 | USB 3.2<br>Gen1 | USB 2.0 | SATA | TPM<br>2.0 | Power                        | Thermal | Temp.      |
|-----------------|------------------|-----------------|--------|---------|-----|--------------------|-----------------|-----------------|---------|------|------------|------------------------------|---------|------------|
| ADS630-R680EIRM | 770-ADS6301-000G | 4 DDR4<br>UDIMM | -      | 2       | 1   | 2                  | 6               | 10              | 13      | 4    | -          | 24-pin ATX/<br>8-pin ATX 12V | Active  | -5 to 65°C |
| ADS630-Q670EIRM | 770-ADS6301-100G | 4 DDR4<br>UDIMM | -      | 2       | 1   | 2                  | 6               | 10              | 13      | 4    | -          | 24-pin ATX/<br>8-pin ATX 12V | Active  | -5 to 65°C |
| ADS630-R680EIRM | 770-ADS6301-200G | 4 DDR4<br>UDIMM | 2      | 2       | 1   | 2                  | 6               | 10              | 13      | 4    | -          | 24-pin ATX/<br>8-pin ATX 12V | Active  | -5 to 65°C |
| ADS630-R680EIRM | 770-ADS6301-300G | 4 DDR4<br>UDIMM | 2      | 2       | 1   | 2                  | 6               | 10              | 13      | 4    | 1          | 24-pin ATX/<br>8-pin ATX 12V | Active  | -5 to 65°C |
| ADS630-R680EIRM | 770-ADS6301-400G | 4 DDR4<br>UDIMM | -      | 2       | 1   | 2                  | 6               | 10              | 13      | 4    | 1          | 24-pin ATX/<br>8-pin ATX 12V | Active  | -5 to 65°C |
| ADS630-Q670EIRM | 770-ADS6301-500G | 4 DDR4<br>UDIMM | -      | 2       | 1   | 2                  | 6               | 10              | 13      | 4    | 1          | 24-pin ATX/<br>8-pin ATX 12V | Active  | -5 to 65°C |

## PACKING LIST

|                                                  |                 |
|--------------------------------------------------|-----------------|
| 1 ADS630 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 (4LAN)                              | A49-ADS630-000G |
| 1 I/O shield (2LAN)                              | A49-ADS630-010G |
| 1 M.2 screw/standoff                             | A32-112016-041G |

## OPTIONAL ITEMS

|                                                           |                 |
|-----------------------------------------------------------|-----------------|
| USB 2.0 port cable (Length: 350/398mm)                    | A81-001066-016G |
| USB 3.2 Gen1 port cable (Length: 320mm)                   | A81-001052-023G |
| USB 3.2 Gen2 port cable (Length: 300mm)                   | 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 |
| Serial ATA data cable (Length: 500mm, W/LOCK, 90D)        | A81-002128-017G |
| Thermal solution (For 35W, Height: 29.39mm)               | A71-101136-000G |
| Thermal solution (For 65W, Height: 46mm)                  | A71-101137-000G |
| Thermal solution (For 95W/125W, Height: 110mm)            | A71-101145-000G |
| Thermal solution (For 125W CPU X550 Cooler, Height: 35mm) | A71-100201-000G |
| DP to HDMI Dongle                                         | 612-D2H13M-000G |
| M.2-COM4 (M.2 serial port module)                         | 770-M2COM1-000G |
| M.2-2LAN (M.2 LAN port module)                            | 770-M22LN2-000G |
| M.2-2PSE (M.2 PSE module)                                 | 770-M22PS2-000G |