



## KEY FEATURES

- Intel® 12<sup>th</sup> Gen Core™ Processors with R680E Chipset
- 4 x 260-pin DDR4 SO-DIMM up to 128GB (32GB per DIMM)
- 1 x M.2 Key M, 1 x M.2 Key B, 1 x M.2 Key E, 2 x Mini PCIe
- 6 x USB 3.2 Gen2x1, 6 x COM, 4 x SATA3, 8 x DI, 8 x DO
- 5 x Intel 2.5G LAN (2 support PoE, 1 supports vPro)
- 1 x Displayport, 1 x HDMI 2.0b, 1 x VGA

## SPECIFICATIONS

### Processor System

|         |                                                                  |
|---------|------------------------------------------------------------------|
| CPU     | Intel® 12 <sup>th</sup> Gen Core™, Pentium or Celeron Processors |
| Chipset | Intel® R680E                                                     |
| Socket  | LGA 1700                                                         |

### Memory

|            |                                                                             |
|------------|-----------------------------------------------------------------------------|
| Technology | Dual Channel DDR4 2933MHz<br>(ECC memory supported by R680E + Selected CPU) |
| Capacity   | 128 GB (32 GB per DIMM)                                                     |
| Socket     | 4 x 260-pin SO-DIMM                                                         |

### Graphics

|             |                                                               |
|-------------|---------------------------------------------------------------|
| Controller  | Intel® UHD Graphics                                           |
| DisplayPort | DisplayPort 1.4a, DP++<br>Max resolution up to 4096x2160@60Hz |
| HDMI        | HDMI 2.0b<br>Max resolution up to 4096x2160@60Hz              |
| VGA         | Max resolution up to 1920x1200@60Hz                           |

### Expansion Slot

|             |                                                                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mini-PCIe   | 2 x Full/Half size with PCIe Gen3 x1 and USB 2.0                                                                                                                   |
| RF& Antenna | 8 x SMA connector hole reserved                                                                                                                                    |
| M.2         | 1 x M.2 (Key E, 2230) with CNVi/PCIe Gen3 x1<br>and USB2.0 for Wi-Fi/BT module<br>1 x M.2 (Key B, 2280/3042/3052) with PCIe Gen3 x1 /<br>USB3.2 Gen2x1 for 4G / 5G |
| SIM Socket  | 2 x Nano SIM Card slot<br>(1 connected to Mini PCIe, 1 connected to M.2 Key B)                                                                                     |

### Audio

|           |                                        |
|-----------|----------------------------------------|
| Interface | Realtek ALC897, High Definition Audio. |
|-----------|----------------------------------------|

### Ethernet

|                   |                                                                                               |
|-------------------|-----------------------------------------------------------------------------------------------|
| Controller/ Speed | 5 x Intel 2.5G LAN<br>(2 support PoE, each port supports IEEE 802.3AF PoE), (1 supports vPro) |
| Connector         | 5 x RJ45                                                                                      |

### Storage

|                |                                                                   |
|----------------|-------------------------------------------------------------------|
| M.2            | 1 x M.2 (Key M, 2280) with Gen4/Gen3 x4 for NVMe SSD              |
| SATA           | 4 x SATA3 (6Gb/s), support RAID 0/1/5/10<br>4 x 2.5" HDD/SSD Tray |
| Cfast (Option) | 1 x Type II socket (Shared with SATA3)                            |

### Rear I/O

|             |                                                                    |
|-------------|--------------------------------------------------------------------|
| DisplayPort | 1                                                                  |
| HDMI        | 1                                                                  |
| VGA         | 1                                                                  |
| Ethernet    | 5 x 2.5G LAN                                                       |
| USB         | 6 x USB 3.2 Gen2x1, 1 x USB2.0 internal connector w/ lock function |
| Audio       | 1 x Mic-in, 1 x Line-out                                           |
| COM         | 4 x RS232/422/485<br>2 x RS232                                     |
| DIO         | 8DI/8DOs                                                           |

### Watchdog Timer

|          |                                  |
|----------|----------------------------------|
| Output   | From Super I/O to drag RESETCON# |
| Interval | 256 Segments, 0, 1, 2, ...255sec |

### Power Requirements

|           |                                                                                                                                                                             |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input PWR | 9V~36V VDC with Ignition control and remote power on/off switch.<br>80V Surge Protection, OVP, UVP, OCP and reverse protection<br>Ignition Power Input w/ 13-mode condition |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Environment

|                       |                                                                                                         |
|-----------------------|---------------------------------------------------------------------------------------------------------|
| Operating Temperature | 35W CPU: -40°C~70°C (-40°F~158°F)<br>46W~65W CPU: -40°C~50°C (-40°F~122°F)<br>(w/ air flow 0.5~0.8 m/s) |
| Storage Temperature   | -40°C~85°C (-40°F~185°F)                                                                                |
| Humidity              | ~95% @ 40°C (non-condensing)                                                                            |
| Shock                 | Operating: 50G, half sine 11ms duration with SSD                                                        |
| Vibration             | Operating: 5 Grms, 5-500 Hz, 3 axes with SSD                                                            |
| ESD                   | Contact +/-4kV, Air +/-8kV                                                                              |
| EMC                   | EN61000-6-4/-2, CE & FCC Class A                                                                        |
| Safety                | LVD                                                                                                     |

### Mechanical

|                        |                                                             |
|------------------------|-------------------------------------------------------------|
| Construction           | Aluminum heatsink + Metal chassis                           |
| Mounting               | Wall Mount                                                  |
| Dimensions (W x H x D) | 202mm (W) x 244mm (D) x 108.7mm (H) (7.95" x 9.61" x 4.28") |
| Net Weight             | 6.5kg                                                       |

### Others

|                      |                              |
|----------------------|------------------------------|
| OS Support           | Windows 10 & Linux           |
| TPM                  | TPM 2.0                      |
| Real-Time Enablement | TSN, TCC support under YOCTO |