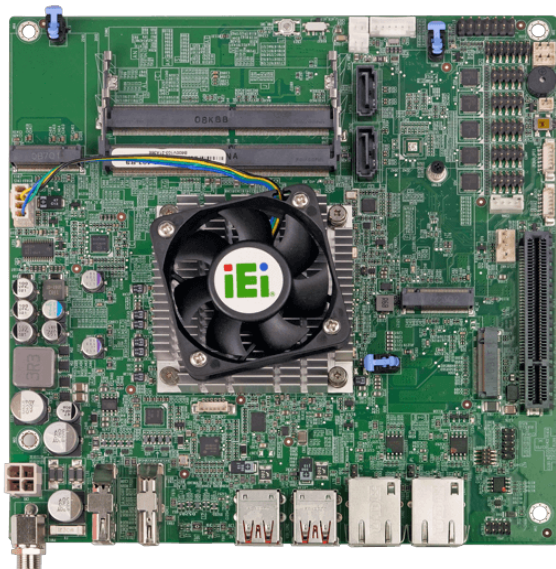


# KINO-TGL-U

Thin Mini-ITX SBC supports Intel® Tiger Lake-UP3 Processor, 9 ~ 36V DC input, triple independent displays, HDMI™, DP, iDPM, SATA 6Gb/s, Dual Intel® 2.5GbE, USB 3.2 Gen2, M.2 and RoHS



## Features

1. Mini-ITX SBC supports Intel® Tiger Lake-UP3, with Intel® 11th Gen. Core™ i7-1185G7E, i5-1145G7E, i3-1115G4E, Celeron® 6305 processor
2. Support Triple independent display via HDMI™, DP, iDPM
3. Support Dual Intel® 2.5 GbE LAN
4. Support one PCIe Gen4 x 8 slot (x 4 signal), M.2 A key, M.2 M key expansions

## Specifications

| System                      |                                                                             |
|-----------------------------|-----------------------------------------------------------------------------|
| CPU                         | 11th Gen. Intel® Tiger Lake-UP3 Processor                                   |
|                             | Intel® Core™ i7-1185G7E (up to 4.4GHz, quad-core, 12M Cache, TDP=28/15/12W) |
|                             | Intel® Core™ i5-1145G7E (up to 4.1GHz, quad-core, 8M Cache, TDP=28/15/12W)  |
|                             | Intel® Core™ i3-1115G4E (up to 3.9GHz, quad-core, 6M Cache, TDP=28/15/12W)  |
|                             | Intel® Celeron® 6305E(up to 1.8GHz, dual-core, 4M Cache, TDP=15W)           |
| Memory                      | 2 x 260-pin 3200 MHz DDR4 SO-DIMM                                           |
| Memory Max.                 | 64GB                                                                        |
| Cooling method / System Fan | 1 x CPU fan connector (1x4 pin)                                             |
|                             | 1 x System fan connector (1x4 pin)                                          |
| Storage                     |                                                                             |
| Storage                     | 2 x SATA : 6Gb/s with 5V SATA power connector                               |
|                             | 1 x M.2(NGFF) : M Key (2242/2280) with PCIe Gen3 x2, support NVME storage   |
| I/O Interface               |                                                                             |
| Display Output              | 1 x HDMI™ : up to 4096 x 2160@30Hz                                          |
|                             | 1 x Display Port : up to 4096 x 2160@60Hz                                   |
|                             | 1 x iDPM : IEI iDPM 3040 slot (only for IEI eDP/LVDS/VGA module)            |
| Ethernet                    | 2 x LAN -                                                                   |
|                             | LAN1: Intel® I225V/I226V 2.5GbE controller                                  |
|                             | LAN2: Intel® I225V/I226V 2.5GbE controller                                  |
| Audio                       | 1 x HD Audio : 1 x iAUDIO, support IEI AC-KIT-888S Audio Module (2 x 5 pin) |
| I/O Interface               | 5 x Internal RS-232 : 2x5 pin, P=2.0                                        |
|                             | 1 x Internal RS-422/485 : 2x5 pin, P=2.00, RS-485 support AFC               |
|                             | 2 x Internal USB 2.0 : 2x4 pin, P=2.00                                      |
|                             | 1 x DIO : 12-bit digital I/O (2x7 pin)                                      |
|                             | 4 x External USB 3.2 Gen2x1 : 10Gb/s                                        |
| Expansion                   | 1 x PCIe x8 : x 4 signal                                                    |
|                             | 1 x M.2(NGFF) : A key (2230) with PCIe Gen3 x1/USB 2.0                      |
| Other Features              |                                                                             |

|                       |                                                                                                                |
|-----------------------|----------------------------------------------------------------------------------------------------------------|
| TPM                   | Intel® PTT(TPM 2.0)                                                                                            |
| Power                 |                                                                                                                |
| Power Consumption     | 9V@9.19A, 12V@7.768A, 28V@3.119A, 36V@2.459A (Intel® Core™ i7-1185G7E CPU with one 8 GB 2933 MHz DDR4 SO-DIMM) |
| Power Supply          | 9 ~ 36V DC input                                                                                               |
|                       | 1 x Internal power connector (2x2 pin)                                                                         |
|                       | 1 x External DC power Jackc (Ø5.5mm)                                                                           |
|                       | ErP/EuP Compliant                                                                                              |
| Environment           |                                                                                                                |
| Operating Temperature | -10°C ~ 60°C                                                                                                   |
| Storage Temperature   | -30°C ~ 70°C                                                                                                   |
| Humidity              | 5% ~ 95%, non-condensing                                                                                       |
| Certifications        |                                                                                                                |
| Safety & EMC          | CE/FCC compliant                                                                                               |

## Ordering Information

|                   |                                                                                                                                                         |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| KINO-TGL-U-i7-R10 | Mini-ITX SBC with Intel® Tiger Lake-UP3 Core™ i7-1185G7E Processor,DDR4 SO-DIMM,9~36V DC input,Quad Display,SATA,Dual Intel® 2.5GbE,USB3.2,M.2,SoC,RoHS |
| KINO-TGL-U-i5-R10 | Mini-ITX SBC with Intel® Tiger Lake-UP3 Core™ i5-1145G7E Processor,DDR4 SO-DIMM,9~36V DC input,Quad Display,SATA,Dual Intel® 2.5GbE,USB3.2,M.2,SoC,RoHS |
| KINO-TGL-U-i3-R10 | Mini-ITX SBC with Intel® Tiger Lake-UP3 Core™ i3-1115G4E Processor,DDR4 SO-DIMM,9~36V DC input,Quad Display,SATA,Dual Intel® 2.5GbE,USB3.2,M.2,SoC,RoHS |
| KINO-TGL-U-CE-R10 | Mini-ITX SBC with Intel® Tiger Lake-UP3 Celeron® 6305E Processor,DDR4 SO-DIMM, 9~36V DC input, Quad Display,SATA,Dual Intel® 2.5GbE,USB3.2,M.2,SoC,RoHS |

## Packing List

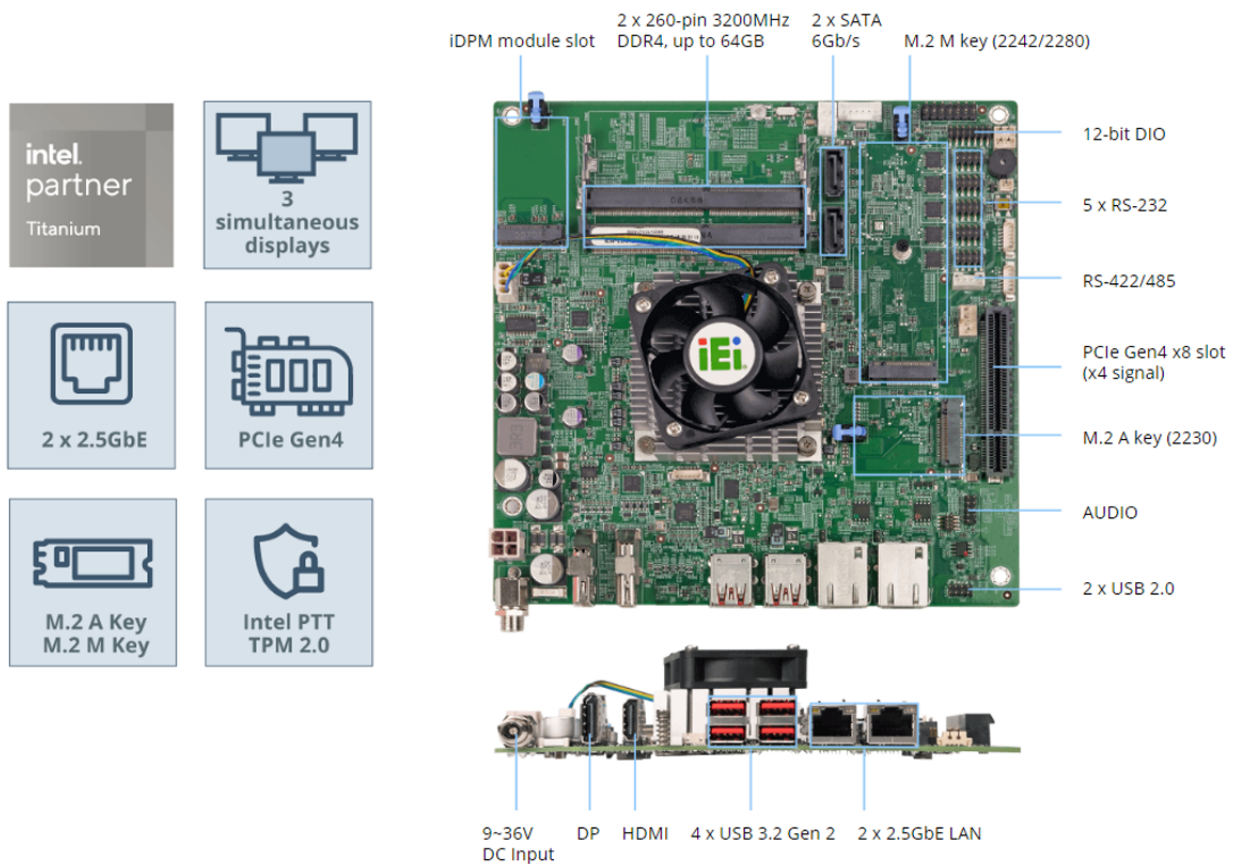
|                                      |                |
|--------------------------------------|----------------|
| 1 x KINO-TGL-U single board computer | 1 x SATA cable |
| 1 x I/O shielding                    | 1 x QIG        |

## Power Efficient and Low Profile Mini-ITX

IEI KINO-TGL is a single-stack Thin Mini-ITX motherboard with rich I/O Interfaces, including four USB 3.2 Gen 2 ports, dual 2.5Gbps Ethernet connection, and multiple serial ports. The KINO-TGL provides powerful CPU performance optimized to support three independent displays. With low profile hardware architecture and power efficient edge computing capabilities, the KINO-TGL is a competitive solution for use in thin kiosk systems, panel PC, signage display, and POS systems that have confined space limitations.



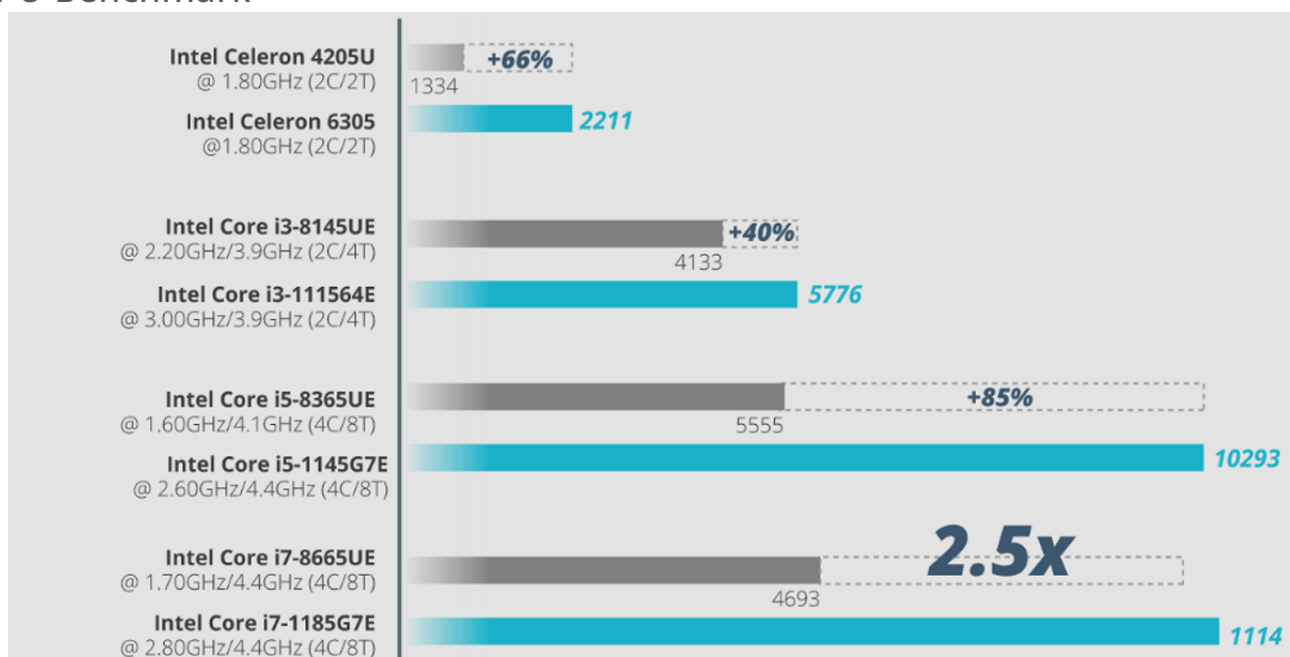
## Hardware Overview



## 11th Gen. Intel® Core™ U-series Processors

IEI KINO-TGL is a Mini-ITX embedded board equipped with the 11th generation Intel® Core™ U processor supporting up to 4 cores, 8 threads, turbo up-to 4.80 GHz. The Intel® Core™ i7 and i5 processors are integrated with Intel® Iris® Xe 96EU graphics core, delivering high AI inference performance for the SoC.

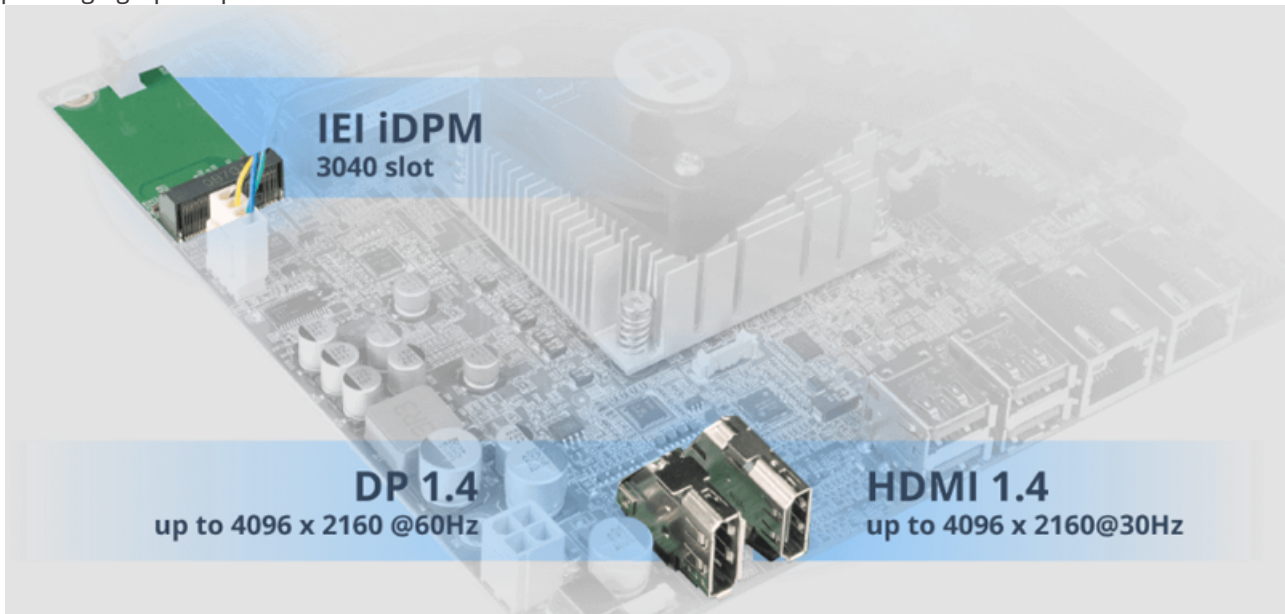
### CPU Benchmark



## Triple Independent Displays with up to 4K Resolution

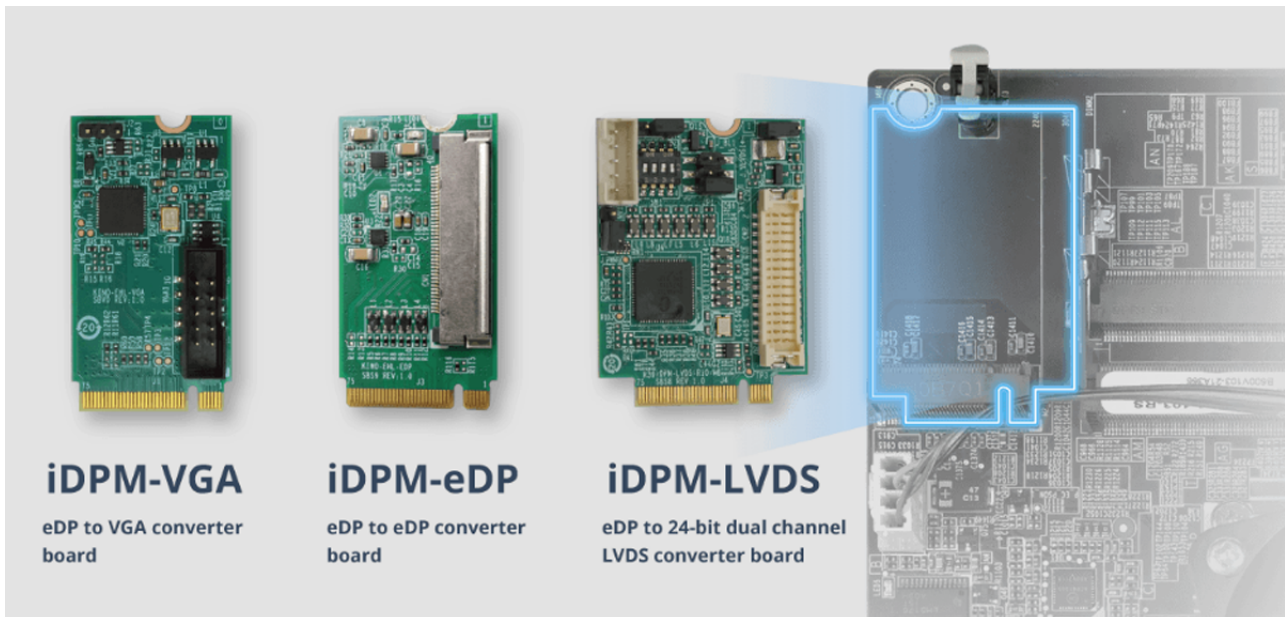


The latest Intel® Iris® Xe graphics (Gen12) with up to 96 EUs is integrated into the KINO-TGL Mini-ITX SBC to deliver up to 2.95 times faster graphics performance. Three independent displays are supported via HDMI™, DP and the option to use the iDPM interface, making it ideal for kiosks, digital signage, or medical imaging applications that require high graphics performance.



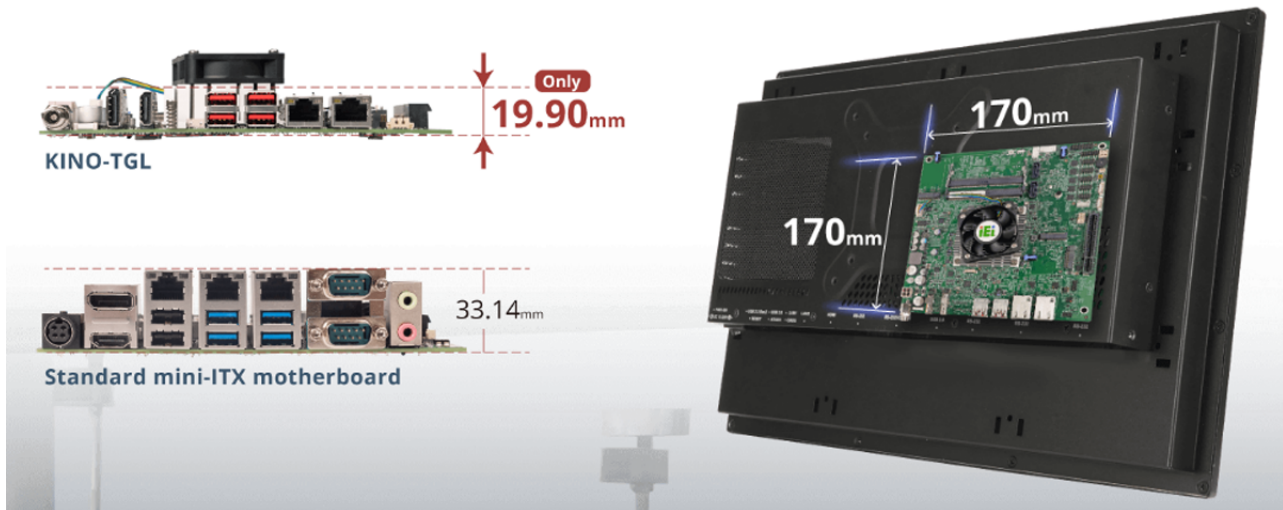
## Free to Choose Display Connections with iDPM Modules

More display I/Os are supported via IEI iDPM connector. The iDPM display converter boards allow the KINO-TGL to meet customers' diverse display interface requirements such as the legacy display port, VGA and LVDS, or eDP for TFT LCD connection.



## Less Than 20mm Height, Suitable for Limited Space Applications

The KINO-TGL is equipped with a maximum I/O in a small footprint of only 19.90 mm in height, making it ideal for height-constrained applications. Featuring a single-layer I/O design, the KINO-TGL is twice thinner than the standard Mini-ITX motherboard.

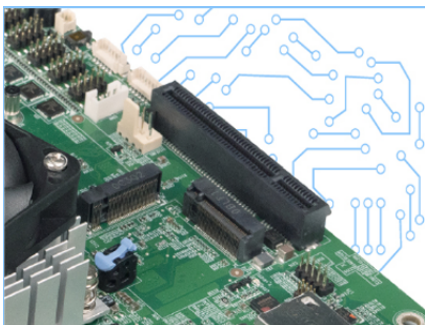


## Makes IoT Truly Feasible in Any Scenario

With mobile processing performance, low-profile hardware platform, and graphics-rich performance, the KINO-TGL Mini-ITX motherboard is a competitive solution for any feasible scenario. All features plus its stability and reliability enable it an ideal platform for IoT edge development.



## Abundant Expansion Capabilities



### PCIe x8 slot for AI Accelerating

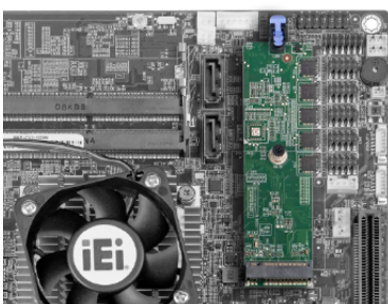
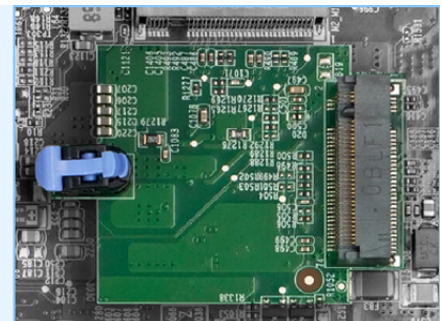
IEI Mini-ITX boards are AI Edge ready, supporting IEI's AI accelerators, Mustang series. IEI Mustang AI accelerators can bring much larger and computationally-intensive neural networks to the edge and ideal for deep learning inference computing to help you get faster, deeper insights for your customers and your business.

IEI's AI solutions are able to support up PCIe x8 (x4 signal) to deploy and run your AI projects in retail, transportation and surveillance efficiently.

### M.2 2230 A Key for Wi-Fi/Bluetooth

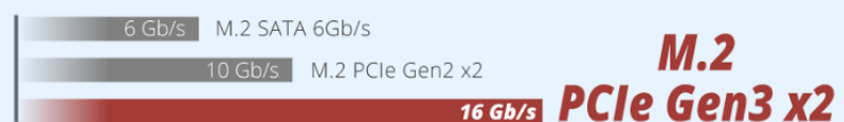
The M.2 2230 A key slot carrying with PCIe Gen3 x1 and USB 2.0 signals allows it to adopt the latest Wi-Fi 6E technology.

Wi-Fi 6E enhances low latency and supports service levels that are equivalent to 5G networks.



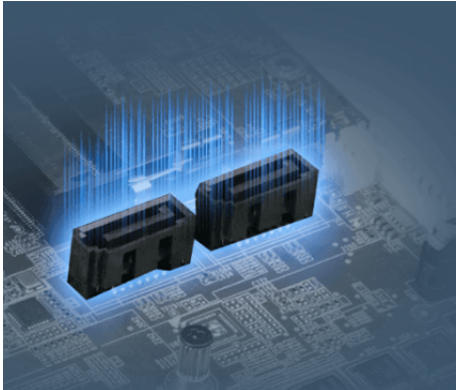
### M.2 2242/80 M key for PCIe

The M.2 2242/80 M key slot carrying with PCIe Gen3 x2 signs bandwidth supports up to 16Gbps data-transfer speeds. It's the perfect choice for installing an operating system or application drive to provide fast data access.





## High Speed Transmission



### SATA 6Gbps Provides Faster Transfer Speeds

Twice as fast data processing, it is capable of delivering lightning fast data transfer experience for edge AI data process applications.

| Interface  | Speed (Gb/s) |
|------------|--------------|
| SATA 3Gb/s | 300          |
| SATA 6Gb/s | 600          |

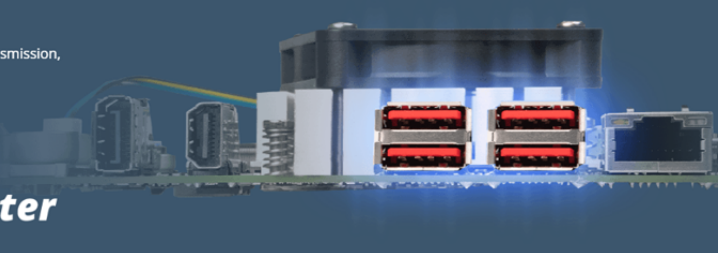
**2x Faster**

### Four USB 3.2 Gen 2 (10Gb/s)

Four USB 3.2 Gen 2x1 (10 Gb/s) ports are integrated to support high density data transmission, the device can be connected in any way.

| Interface     | Speed (Gb/s) |
|---------------|--------------|
| USB 3.2 Gen 1 | 5            |
| USB 3.2 Gen 2 | 10           |

**2x Faster**

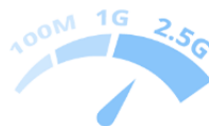


## Networking



### Delivers Dual Low-Latency 2.5G LAN Powered by Intel

2.5 GbE is a more attractive option since it supports various connection speeds between 100 Mbps and 2.5 Gbps on Cat6 and Cat 5e cables, which means user can experience the full capability of high-performance network solutions without significant costs for upgrading cables.



## Dimensions

