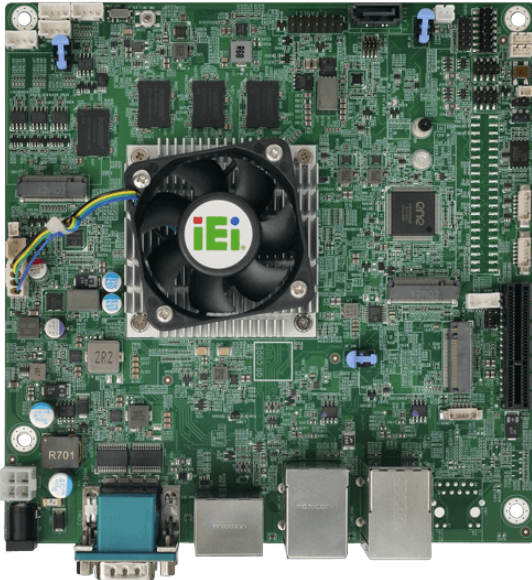


# KINO-EHL

Mini-ITX SBC supports Intel® Elkhart Lake Celeron® on-board SoC with 8GB LPDDR4x memory on board default, Triple Independent Display with HDMI™, DP and iDPM, SATA 6Gb/s, Dual 2.5GbE, USB 3.2, M.2, 12V DC input and RoHS



## Features

1. Mini-ITX SBC supports Intel® Elkhart Lake Celeron® J6412
2. Support Triple independent displays via HDMI™, DP, iDPM
3. Support dual Intel® i225V 2.5GbE ports
4. Support one PCIe Gen3 x4 slot, M.2 A key and M.2 B key expansions
5. Two USB 3.2 Gen2, six USB 2.0, two RS-232, four RS-422/485

## Specifications

System	
CPU	Intel® Elkhart Lake Processor
	Intel® Celeron® J6412 on-board SoC (up to 2.6GHz, quad-core, 1.5M Cache,TDP=10W)
Memory	Onboard LPDDR4x-3200MHz 8GB, system up to 16GB
Memory Max.	up to 16GB
Cooling method / System Fan	1 x CPU fan connector (1x4 pin)
	1 x System fan connector (1x3 pin)
Storage	
Storage	1 x SATA : 6Gb/s with 5V SATA power connector
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 : 1 x IEI iDPM 3040 slot (only for IEI eDP/LVDS/VGA module)
Ethernet	2 x LAN -
	LAN1: Intel® I225V 2.5GbE controller
	LAN2: Intel® I225V 2.5GbE controller
Audio	1 x HD Audio : 1 x iAUDIO, support IEI AC-KIT-888S Audio Module (2x5 pin)
I/O Interface	2 x External RS-232
	4 x Internal RS-422/485 : 1x4 pin, P=2.00
	2 x External USB 2.0
	4 x Internal USB 2.0 : 2x4 pin, P=2.00
	1 x DIO : 12-bit digital I/O (2x7 pin)
	2 x External USB 3.2 Gen2x1 : 10Gb/s
Expansion	1 x PCIe x4 : PCIe Gen3 x1 signal
	2 x M.2(NGFF) -
	1 x M.2 A key (2230) (PCIex1 & USB 2.0)
	1 x M.2 B key (3052/3042/2242/2280) w/ SIM holder (PCIe x2 / USB 2.0)

Other Features	
TPM	Intel® PTT (TPM 2.0)
Power	
Power Consumption	12V@2.78A (Intel® Celeron® J6412 2.0GHz with 8GB 3200MHz LPDDR4 memory and EUP enabled)
Power Supply	12V DC input
	1 x Internal power connector (2x2 pin)
	1 x External DC power Jackc (Ø2.5mm)
	ErP/EuP Compliant
Environment	
Operating Temperature	0°C ~ 60°C
Storage Temperature	-30°C ~ 70°C
Humidity	5% ~ 95%, non-condensing
Certifications	
Safety & EMC	CE/FCC compliant

## Ordering Information

KINO-EHL-J6412C-R10	Mini-ITX SBC supports Intel® quad-core Celeron® J6412 2.0GHz on-board SoC with 8GB LPDDR4x memory on board default, Triple Independent Display, HDMI™, DP, SATA 6Gb/s, Triple GbE, USB 3.2, M.2 and RoHS
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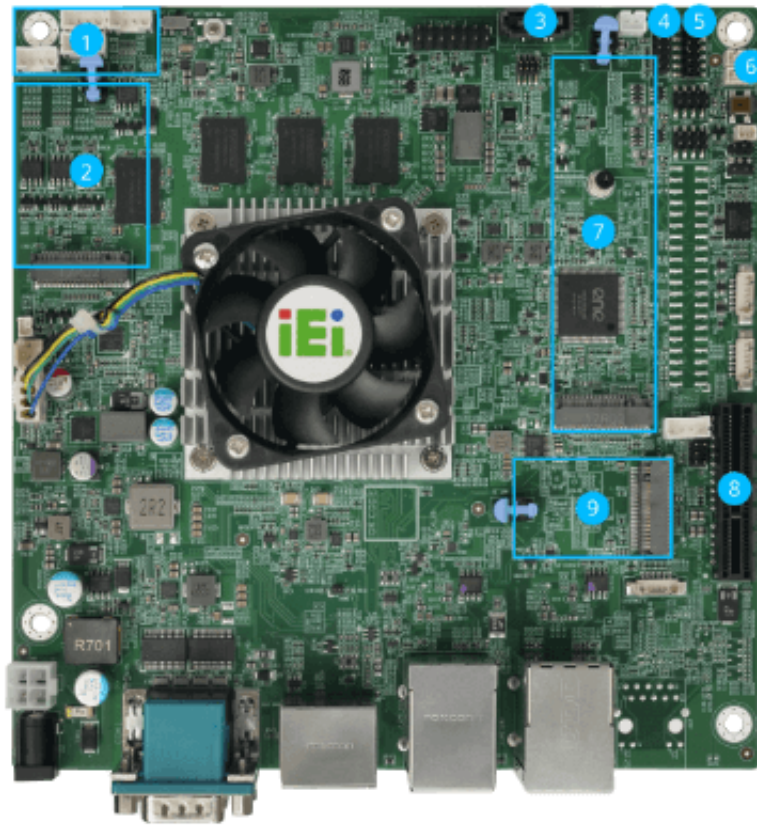
## Packing List

1 x KINO-EHL single board computer	1 x SATA cable
1 x I/O shielding	1 x QIG

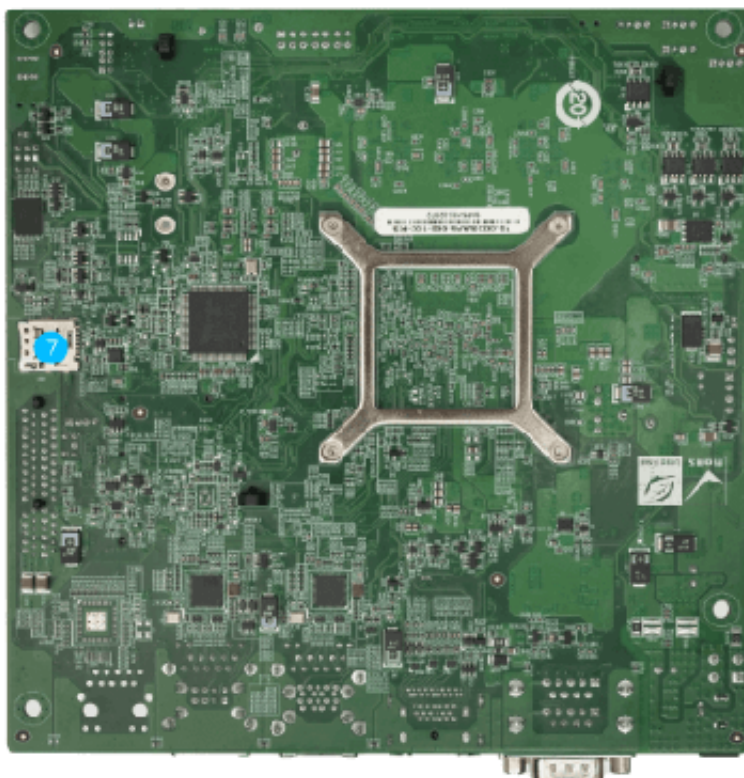


## Low-power Mini-ITX Motherboard for IoT Edge Computing

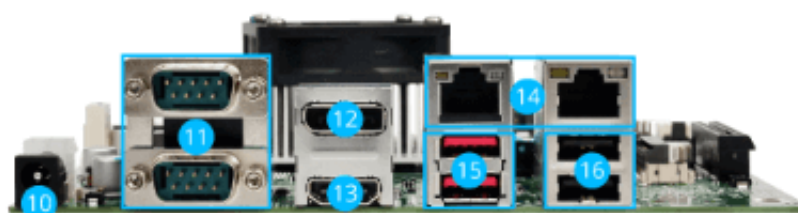
The KINO-EHL-J6412 Mini-ITX motherboard features reliable performance, advanced network connectivity and rich I/O capabilities in a compact board that fits small chassis size for space-critical in stallation like kiosk, POS or digital signage. The motherboard supports up to 3 display outputs, 8 USB ports and 6 COM ports for a wide range of peripheral connections. Dual 2.5GbE and 5G & Wi-Fi expandability are available to provide high-bandwidth data transmission. Its flexible customization options and low power advantages make it the ideal choice for IoT edge applications, which require economic solution with high scalability and reliability.



- |   |  |
|---|--|
| 1 4 x RS-422/485                                | 2 iDPM supports eDP to eDP/LVDS/VGA Module |
| 3 SATA 6Gb/s                                    | 4 iAUDIO for IEI AC-KIT-888S Audio Module  |
| 5 12-bit DIO/GPIO                               | 6 SMBus & I2C                              |
| 7 M.2 B key (3052/3042/2242/2280) with SIM slot | 8 PCIe x4 slot with x1 signal              |
| 9 M.2 A key (2230)                              |  |



- 7 M.2 B key (3052/3042/2242/2280) with SIM slot



- |                               |                               |
|-------------------------------|-------------------------------|
| 10 12V DC input               | 11 2 x RS-232                 |
| 12 DP                         | 13 HDMI                       |
| 14 2 x 2.5GbE via Intel I225V | 15 2 x USB 3.2 Gen 2 (10Gb/s) |
| 16 2 x USB 2.0                |                               |

## High Performance with Low Power

IEI WAFER-TGL is a 3.5" embedded board equipped with the 11th generation Intel® Core™ U processor supporting up to 4 cores, 8 threads, turbo up-to 4.40 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. With no graphics card required, it can provide a cost-effective industrial solution featuring low power consumption and effective heat transfer.



## CPU Benchmark

Source: [www.cpubenchmark.net](http://www.cpubenchmark.net)

Intel® Celeron® J3455  
@ 1.5GHz (4C/4T)



+75%

Intel® Celeron® J6412  
@ 2.0GHz (4C/4T)



3928

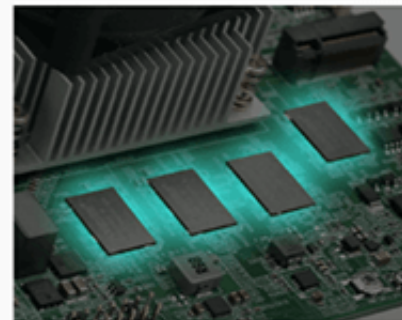
## Long-term Support

The Intel® Celeron® J6412 processor is available and supported for an extended period. This long-term availability makes the Mini-ITX motherboard an ideal solution for integrators looking to maximize their return on investment.



## 8GB On-board RAM

Stability is a necessity in applications where vibration is present. The 8GB LPDDR4X memory soldered on board enables the Mini-ITX motherboard to deliver much more stable, solid operation compared to the socket-type memory.



## 2.5GbE High-Bandwidth and Low-Latency Data Transmission

The two RJ45 LAN ports both provide 2.5GbE connectivity that gives an immediate boost to overall network performance and improves the bandwidth required at large-scale workloads. By connecting with a 2.5G network switch, it can form a solid, optimized infrastructure for the deployment of massive IoT devices or sensors to deliver lightning-fast transmission speed between devices.



## 5G & Wi-Fi Expandability

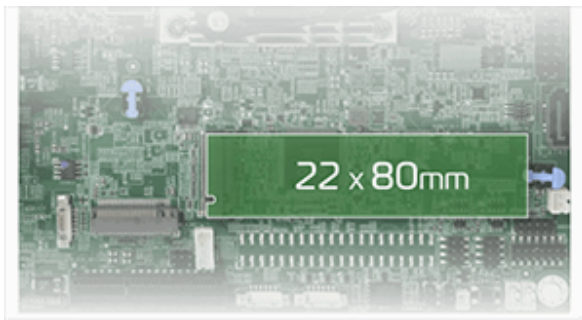
Wireless solution support is made through the two M.2 slots. The B-key slot comes with a SIM slot to support 5G modules. The A-key slot is designed to support Wi-Fi/Bluetooth network cards.



## Drive AIoT, 4K Graphics Applications at the Edge

The KINO-EHL-J6412 supports triple independent display via DisplayPort 1.4, HDMI™ 1.4 and IEI iDPM interface. The iDPM interface supports diverse display modules, enabling users to add LVDS, eDP or VGA display interface upon requirements. Up to 4K@60 high-resolution support provides great benefits for applications that demand on-image resolution and color realism at the edge.



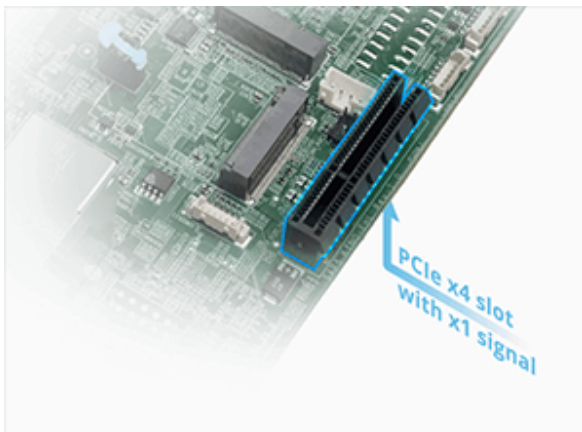
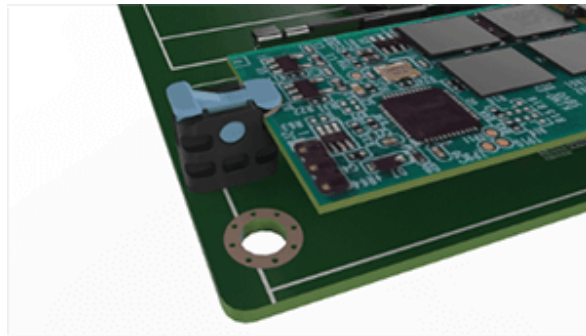


## M.2 B Key Slot for Cards in Different Sizes

In addition to offering wireless network connection, the M.2 B key socket on the KINO-EHL-J6412 supports NVMe SSD, AI accelerators and many more M.2 cards for stable storage configurations and scalable AI capability. The B-key slot can take different module sizes to make it more compatible with most M.2 module in the market. This includes module widths of 22 and 30 mm, and lengths of 42, 52 and 80 mm.

## Tool-less M.2 Installation

The two M.2 slots both contain a quick-release retainer, allowing tool-less installation and removal of an M.2 module. With just a simple press of the retainer, the module can be securely seated into the slot or be released.



## PCIe Gen3 Slot Allows More Functionality & Possibility

The Mini-ITX motherboard is equipped with a PCI Express Gen3 expansion slot providing easy integration of PoE, video capture or I/O cards with a compatible riser card. With twice the bandwidth of PCIe Gen2, the KINO-EHL-J6412 can take advantage of PCIe cards to expand AIoT application potential.

## Compact yet Versatile Connectivity

The KINO-EHL-J6412 provides rich I/O capabilities in a compact and versatile package, making it ideal for industrial applications. It can be used to integrate a wide variety of devices to meet your specific needs.





## Touch-enabled BIOS

IEI's tBIOS allows users to navigate with finger on a touch-enabled monitor to make BIOS configuration easily. It helps eliminate excessive steps and unnecessary keyboard connection.



## Dimensions

