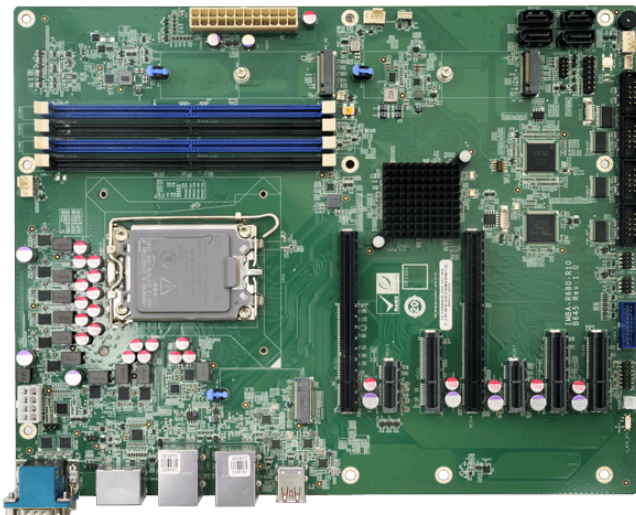


# IMBA-R680

ATX motherboard supports LGA1700 Intel® 12th/13th Generation Core™ i9/i7/i5/i3, Pentium® and Celeron® processor, DDR5, Triple independent displays, dual 2.5GbE LAN, M.2, USB 3.2, SATA 6Gb/s, and RoHS



## Features

1. LGA1700 Intel® 12th/13th Generation Core i9/i7/i5/i3, Pentium and Celeron processor(125W)
2. Dual-channel DDR5 4400MHz
3. Support DisplayPort 1.4a, HDMI™ & IDPM module
4. Support 2 x M.2 M key for NVMe storage
5. High Performance ATX motherboard with PCIe Gen4&Gen5 expansion Slot

## Specifications

Form Factor	
Form Factor	ATX Motherboard
System	
CPU	LGA1700 socket supports 12th generation Alder Lake-S Intel® Core™ i9/i7/i5/i3/Pentium®/Celeron® Processor (up to 125W TDP CPU)
Chipset	Intel®R680E
Memory	Four 288-pin Dual-Channel DDR5 (up to 4400 MHz) SDRAM Unbuffered DIMMs supported up to 128GB (ECC&non-ECC support)
Memory Max.	128GB
Cooling method / System Fan	1 x CPU fan connector (1x4 pin) 2 x System fan connector (1x4 pin)
Physical Characteristics	
Dimensions (LxWxH) (mm)	244mm x 305mm
Net Weight	700g
Storage	
Storage	4 x SATA : RAID 0/1/5/10 supported 2 x M.2(NGFF)
I/O Interface	
Display Output	1 x HDMI™ : up to 3840*2160 @30Hz 1 x Display Port : up to 4096 x 2304 @60Hz 1 x iDPM : support iEi eDP/ LVDS/ VGA module
Ethernet	2 x LAN - LAN1: Intel® I225V 2.5GbE controller (CO-LAY I225-LM support vPro) LAN2: Intel® I225V 2.5GbE controller
Audio	1 x HD Audio : 1 x iAUDIO supports IEI AC-KIT-888S Audio Kit (2x5 pin)
I/O Interface	2 x External RS-232/422/485 : RS-485 support AFC 4 x Internal RS-232 : 2x5 pin, P=2.54 2 x External USB 3.2 Gen1x1 : 5Gb/s (Type A) 4 x Internal USB 2.0 : 2x4 pin, P=2.00 2 x Internal USB 3.2 Gen1x1 : 5Gb/s (2 X 10pin, P=2.00)

	4 x External USB 3.2 Gen2x1 : 10Gb/s (Type A)
Expansion	2 x PCIe x16 : Gen5 slot with x8 Signal
	3 x PCIe x4 : Gen4 open-end
	2 x PCIe x1 : Gen3 x1
	2 x M.2(NGFF) : M Key (2242/2280, PCIe x4) NVMe supported
Power	
Power Consumption	3.3V@0.89A, 5V@10.05A, 12V@6.05A, 5VSB@0.64A
	(Intel® Core™ i7-12700E CPU with four 16 GB 4800 MHz DDR5 memory, EuP mode enabled)
Power Supply	ATX/AT power supply
	Support AT/ATX mode
	ErP/EuP Compliant
Environment	
Operating Temperature	0°C ~ 60°C
Storage Temperature	-30°C ~ 70°C
Humidity	5% ~95%, non-condensing

## Ordering Information

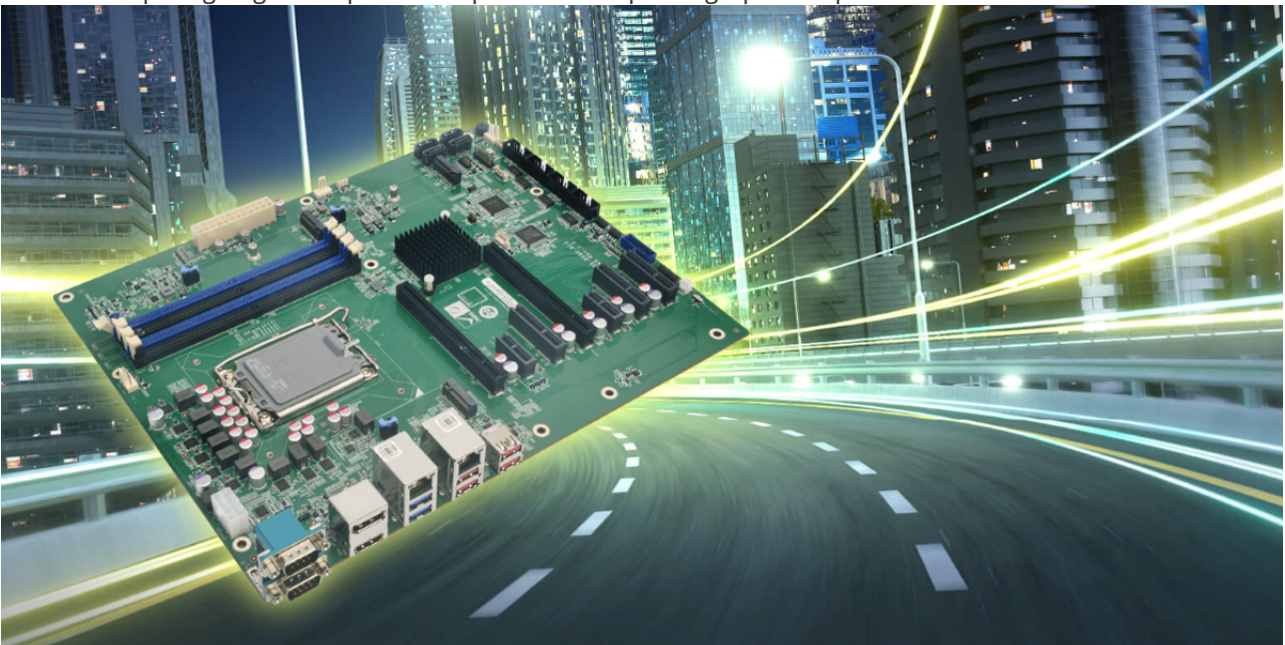
IMBA-R680-R10	ATX motherboard supports LGA1700 12th/13th Generation Intel® Core™ i9/i7/i5/i3, Pentium® and Celeron® processor, DDR5, triple independent displays, dual 2.5GbE LAN, M.2, USB 3.2, SATA 6Gb/s, and RoHS
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## Packing List

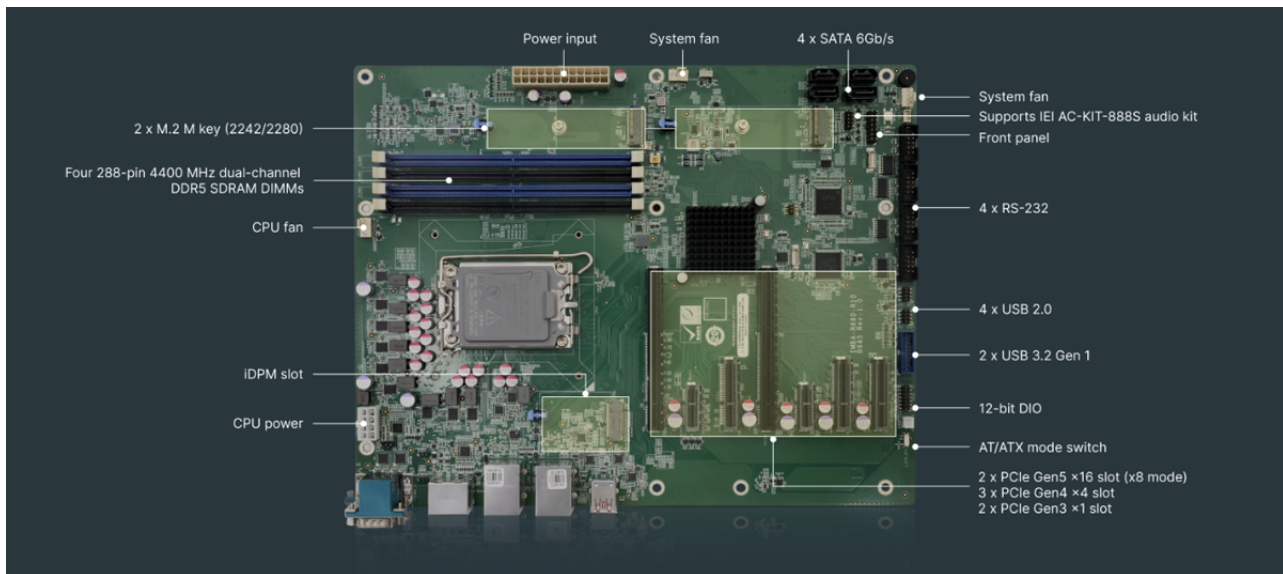
1 x IMBA-R680 single board computer	2 x SATA cable
1 x I/O shielding	1 x QIG

## Powerful ATX Motherboard to Accelerate Compute-intensive Workloads

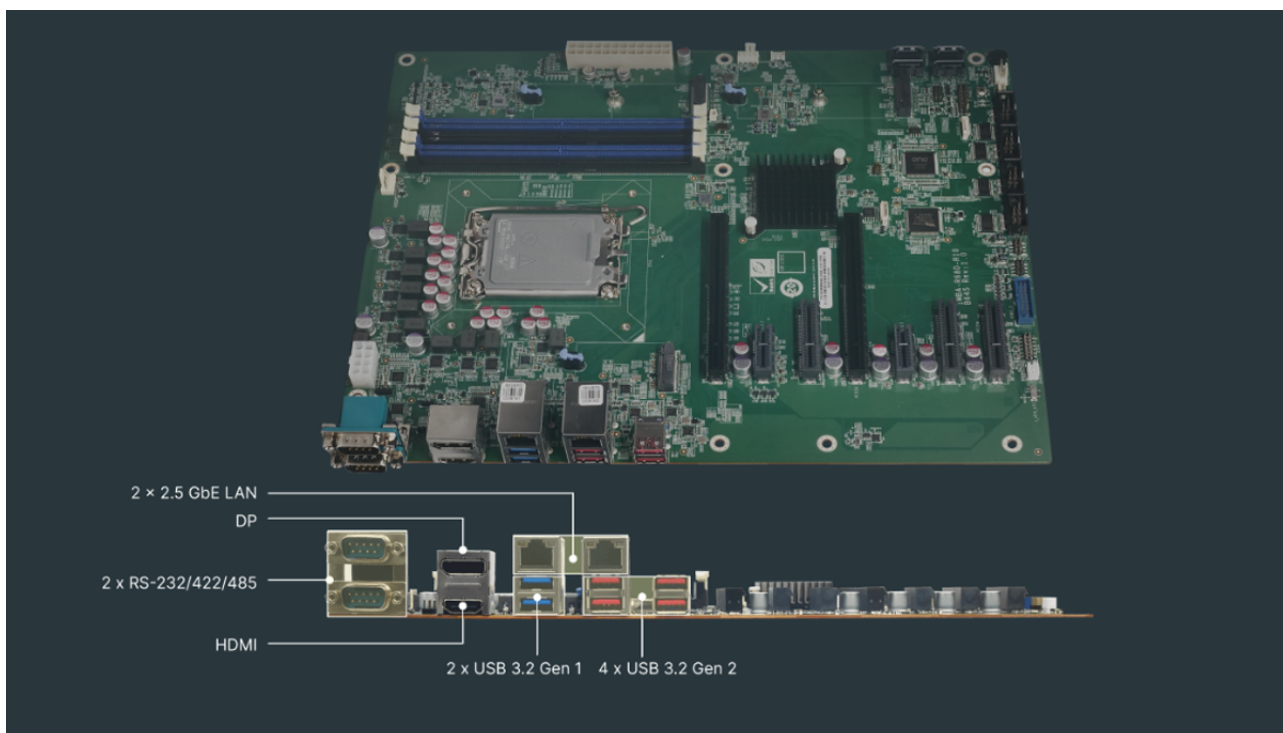
The IMBA-R680 is released to respond to the growing demands for massive data processing and high-performance computing in the industrial market. Integrated with the robust, innovative 12th Gen Intel® processor, DDR5 memory and PCI Express Gen5 technology, this ATX motherboard can deliver a massive leap forward in performance for applications requiring larger computational power and superior graphics capabilities.



## Internal I/O



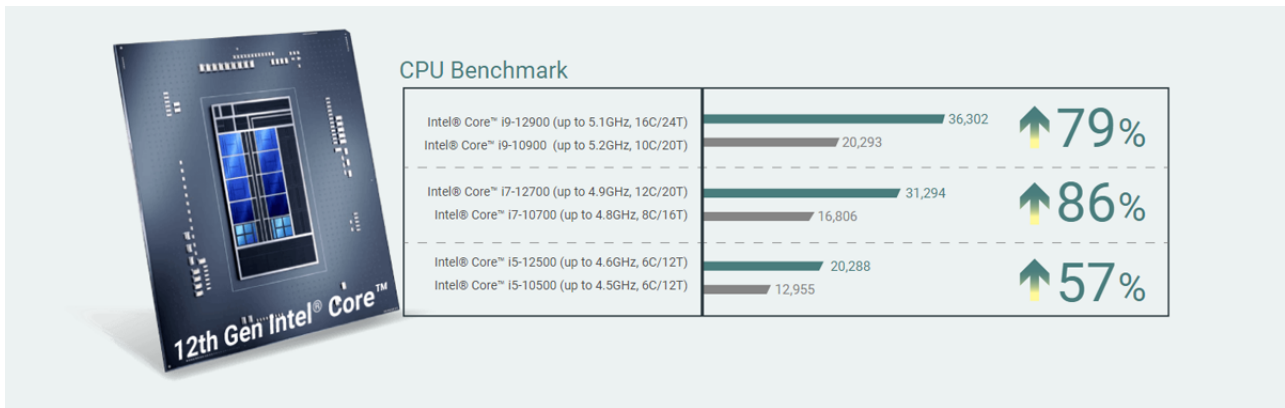
## External I/O



## Innovative 12th Gen Intel® Core™ Processors (Alder Lake S)

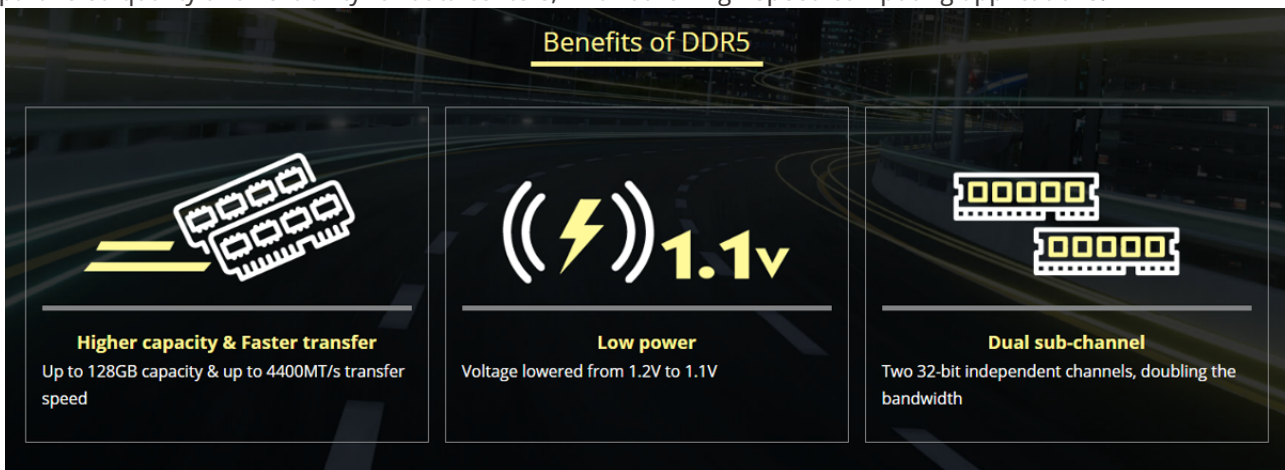
The latest Intel processor technology is adopted in the IMBA-R680. The supported 12th Gen Intel® Core™ processors come with up to 16 cores and 24 threads, and feature a new performance hybrid architecture, which combines performance-cores (P-cores) and efficient-cores (E-cores) on a single processor die. P-cores aims at enhancing IoT workload consolidation while at the same time E-cores can handle background task management and multitasking without affecting overall performance. With such a high computing performance and flexibility for heavier IoT workloads, the IMBA-R680 motherboard can help unleash IoT potential, boost AI capability and accelerate real-time processing.





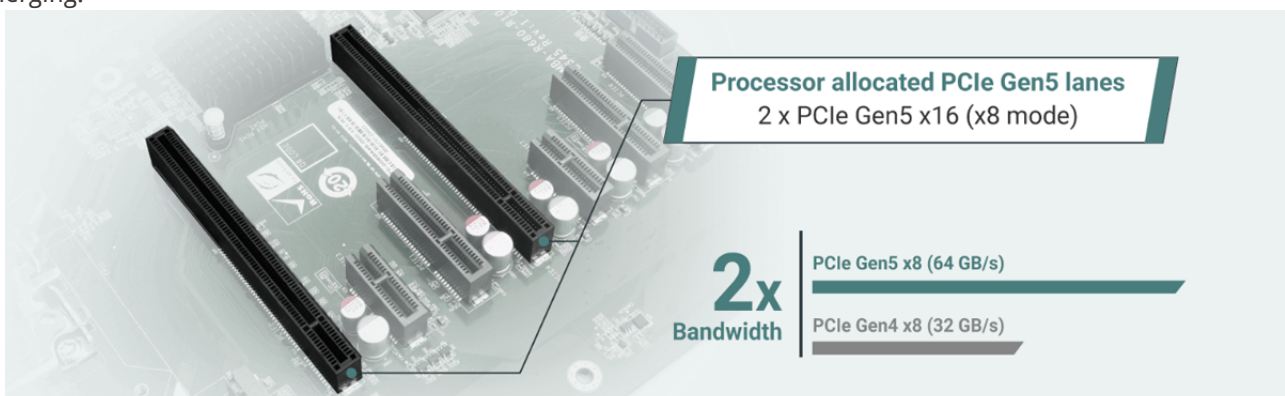
## DDR5 RAM Achieves Next Generation Performance

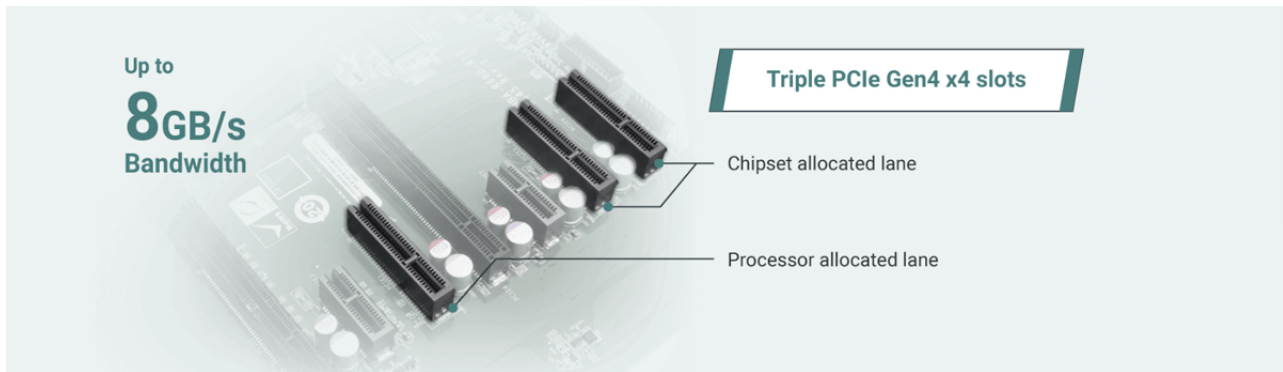
Bandwidth increase is a noticeable feature of the 5th-generation DDR. When compared to DDR4-3200 (the max. data rate of this predecessor), DDR5-4400 present the approximate performance increase of 1.75x. With four DIMM slots, the IMBA-R680 can be installed with up to 128GB 4400 MT/s DDR5 memory, delivering data transmission of unparalleled quality and reliability for data centers, AI or other high-speed computing applications.



## New PCI Express Gen5 Ready for Higher Bandwidth and Future Upgrade

Adopting the latest generation of PCI Express standard, the IMBA-R680 equips a total of 7 PCIe slots to provide multiple high-bandwidth expansions for peripherals like graphics cards, SSD, capture cards or wireless cards. Three of them are connected directly with the CPU, bypassing the bottleneck between the CPU and chipset, and further reducing latency. PCIe 5.0 at 32 GT/s offers twice that transfer rate of the current PCIe 4.0 offering. It not only provides backwards compatibility but also capability for future upgrade when more advanced technologies are emerging.





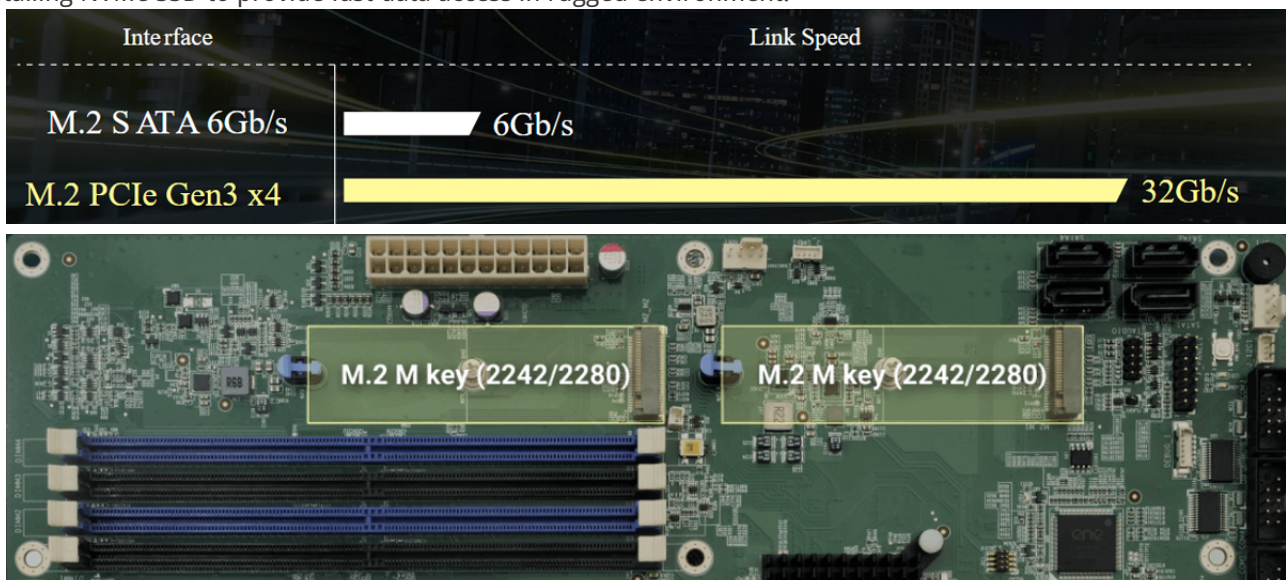
## Reliable RAID Storage Secures Data Processing

The IMBA-R680 offers four SATA 6Gb/s interfaces to expand storage capacity and enable fast data transfer. The equipped Intel R680E chipset provides reliable and high performance hardware RAID protection to back-up your media and critical information. You can configure through different RAID levels (RAID 0, 1, 5 and 10) to increase performance and/or provide automatic protection against data loss from drive failure.



## Dual M.2 M Key for NVMe SSD

SSD features shock and temperature resistance, long lifetime and high stability. It is widely used in industrial applications to provide reliable data storage. Both of the equipped M.2 2242/80 M-key sockets come with PCI Express® Gen3 x4 bandwidth and support up to 32Gbps data-transfer speeds, making them the perfect choice for installing NVMe SSD to provide fast data access in rugged environment.



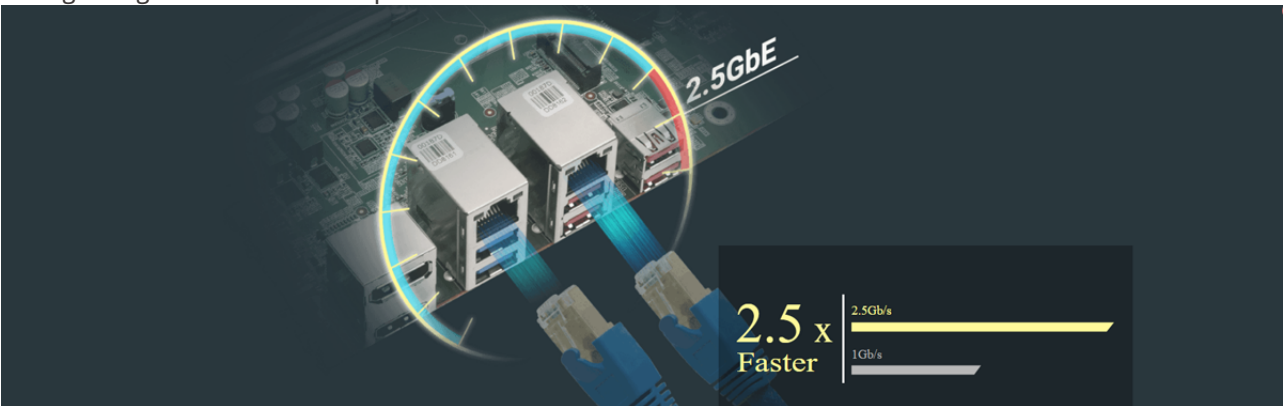
## Stunning 4K Resolution and Triple Display

The IMBA-R680 is integrated with Intel® UHD Graphics driven by Intel® Xe Architecture to deliver videos and images in stunning 4K resolutions. Triple independent display is supported via DisplayPort 1.4, HDMI™ 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.



## 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 smart surveillance and AI recognition to deliver lightning-fast transmission speed between devices.



## Abundant Connectivity Options for Additional Peripherals





## 12 USB Ports up to 10Gbps for More Possibilities

USB ports have become one of the most popular ports for computers to connect with peripherals in industrial applications. Its features in high transfer speed, power management and backward compatibility make USB an ideal option for a communication port. The IMBA-R680 is designed with 12 USB ports, allowing you to connect various devices with up to 10Gbps data transfer speed. The peripherals requiring high bandwidth such as high-resolution cameras, HIDs (human interface devices) and other edge IoT devices can all be connected through the reliable USB interfaces in providing better data collection and acquisitions.



## 6 COM Ports Bring Intelligence to Legacy

Over decades, serial ports are still extremely reliable for connecting industrial computers with legacy peripherals. The IMBA-R680 comes with six serial ports to connect to legacy factory machinery and devices, allowing enterprises to bring intelligence to legacy equipment without having to replace them. In addition, the RS-485 ports support Automatic Flow Control (AFC), which can ensure UART buffers are never overrun so data transmission between devices can be complete without the risk of losing data.

## Applications



## Dimensions

