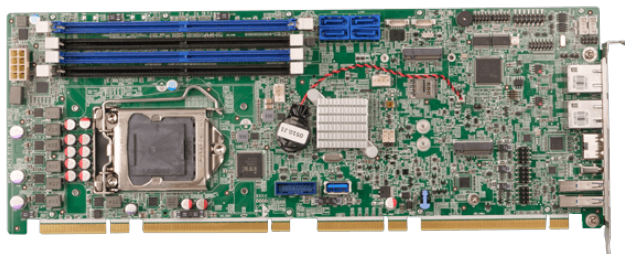


PCIE-Q470

Full-size PICMG 1.3 CPU Card supports LGA1200 Intel® 10th/11th Gen. Core™ i9/i7/i5/i3, Pentium®, Celeron® CPU with Q470/Q470E, DDR4, HDMI, Dual Intel® 2.5GbE, USB 3.2, SATA 6Gb/s, M.2, IAUDIO and RoHS



Features

1. LGA1200 Intel® 10th/11th Generation Core™ i9/i7/i5/i3, Celeron® and Pentium® processor
2. Support Dual Intel® i225v 2.5GbE controller
3. Support USB 3.2 Gen 2 (10Gb/s) with Type C interface
4. Support M.2 A key for WLAN expansion, M key for PCIe NVMe storage , B key for 5G module

Specifications

| | |
|-----------------------------|---|
| Form Factor | |
| Form Factor | Full Size Single Board Computer |
| System | |
| CPU | LGA1200 Intel® 10th/11th Gen. Core™ i9/i7/i5/i3, Pentium® and Celeron® processor (Support up to 65w) |
| Chipset | Intel® Q470/Q470E |
| Memory | 4 x 288-pin 2933 MHz Dual-channel DDR4 DIMMs support up to 128G |
| Memory Max. | up to 128GB |
| Cooling method / System Fan | 1 x CPU fan connector (1x4 pin) 1 x System fan connector (1x4 pin) |
| Physical Characteristics | |
| Dimensions (LxWxH) (mm) | 338 mm x 126 mm |
| Net Weight | 500g |
| Storage | |
| Storage | 4 x SATA : 6Gb/s (Support RAID 0/1/5/10) 1 x M.2(NGFF) : M Key (2280/2242) (with PCIe Gen3 x4), support NVME storage |
| I/O Interface | |
| Display Output | 1 x HDMI : up to 4096 x 2160@30Hz |
| 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 (2 x 5 pin) |
| I/O Interface | 2 x Internal RS-232 : 2x5 pin, P=2.0 2 x Internal RS-422/485 : 1x4 pin, P=2.00 ,RS-485 support AFC 2 x External USB 3.2 Gen1x1 : 5Gb/s (Type-A) 6 x Internal USB 2.0 : 2x4 pin, P=2.54 3 x Internal USB 3.2 Gen1x1 : 2 x USB 3.2 Gen1 (5Gb/s) (2x10 pin , P=2.00) 1 x USB 3.2 Gen1 (Type A 180°) DIO : 12-bit digital I/O (2x7 pin) 1 x External USB 3.2 Gen2x1 : 10Gb/s (Type-C) |
| Expansion | 1 x PCIe x16 : signal from CPU via golden finger (supports x16, or x8 + x8, or x4 + x4 + x8) 1 x PCIe x4 : signal from PCH via golden finger (supports x4, or x1 + x1 + x1 + x1) |

| | |
|-----------------------|---|
| | 4 x PCI Slot : signal via golden finger |
| | 3 x M.2(NGFF) : 1 x M.2 A Key (2230) (with PCIe Gen3 x2/USB 2.0) 1 x M.2 B Key(3042/3052/2280) w/ SIM holder (with PCIe Gen3 x2) 1 x M.2 M Key (2280/2242) (with PCIe Gen3 x4) |
| Power | |
| 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 |
| Certifications | |
| Safety & EMC | CE/FCC compliant |

Ordering Information

| | |
|---------------|---|
| PCIE-Q470-R10 | Full-size PICMG 1.3 CPU Card supports LGA1200 Intel® 10th Gen. Core™ i9/i7/i5/i3/Pentium®/Celeron® CPU with Q470E, DDR4, HDMI, Type-C DP, Dual Intel® 2.5GbE, USB 3.2, SATA 6Gb/s, M.2, HD Audio, iAMT and RoHS |
|---------------|---|

Packing List

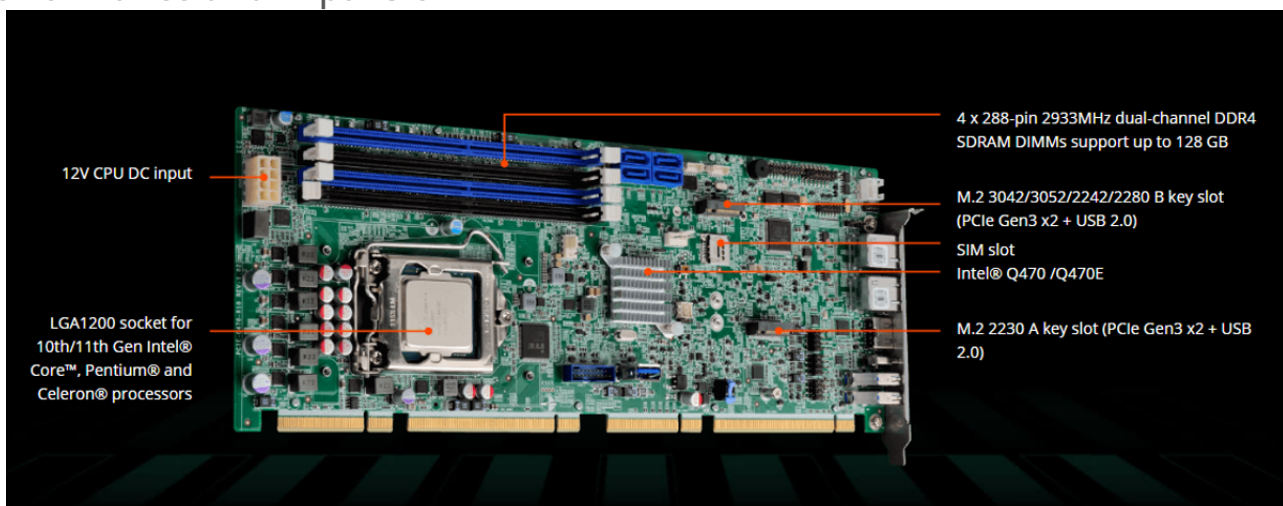
| | |
|-------------------------------------|----------------|
| 1 x PCIE-Q470 single board computer | 2 x SATA cable |
| 1 x I/O shielding | 1 x QIG |

Maximizes Design Flexibility

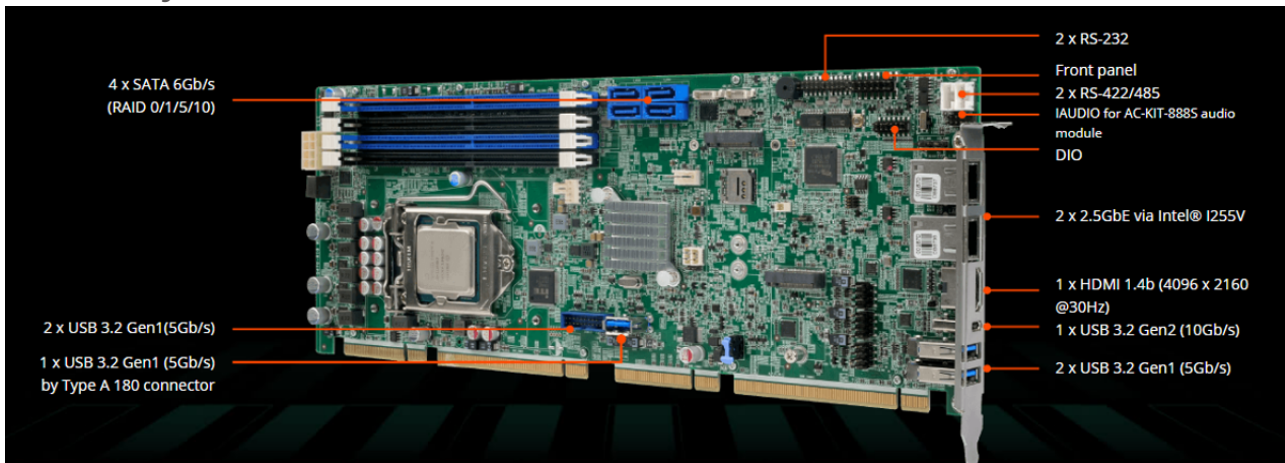
The PCIE-Q470 is a full-size PICMG® 1.3 single board computer with scalable CPU options of 10th/11th Intel® Generation Core™ i9/i7/i5/i3, Pentium® and Celeron® processors and Intel® Q470/Q470E chipset, supporting up to 10 cores. With IEI's comprehensive passive backplane and industrial chassis options, the configurable system can offer increased computing efficiency and flexible I/O expandability through PCIe x16, PCIe x4 and legacy PCI signals, allowing more industrial add-on cards to satisfy the requirements of performance-demanding applications in medical radiology equipment, digital surveillance, transportation and automation applications.

Spec Overview

Performance and Expansion



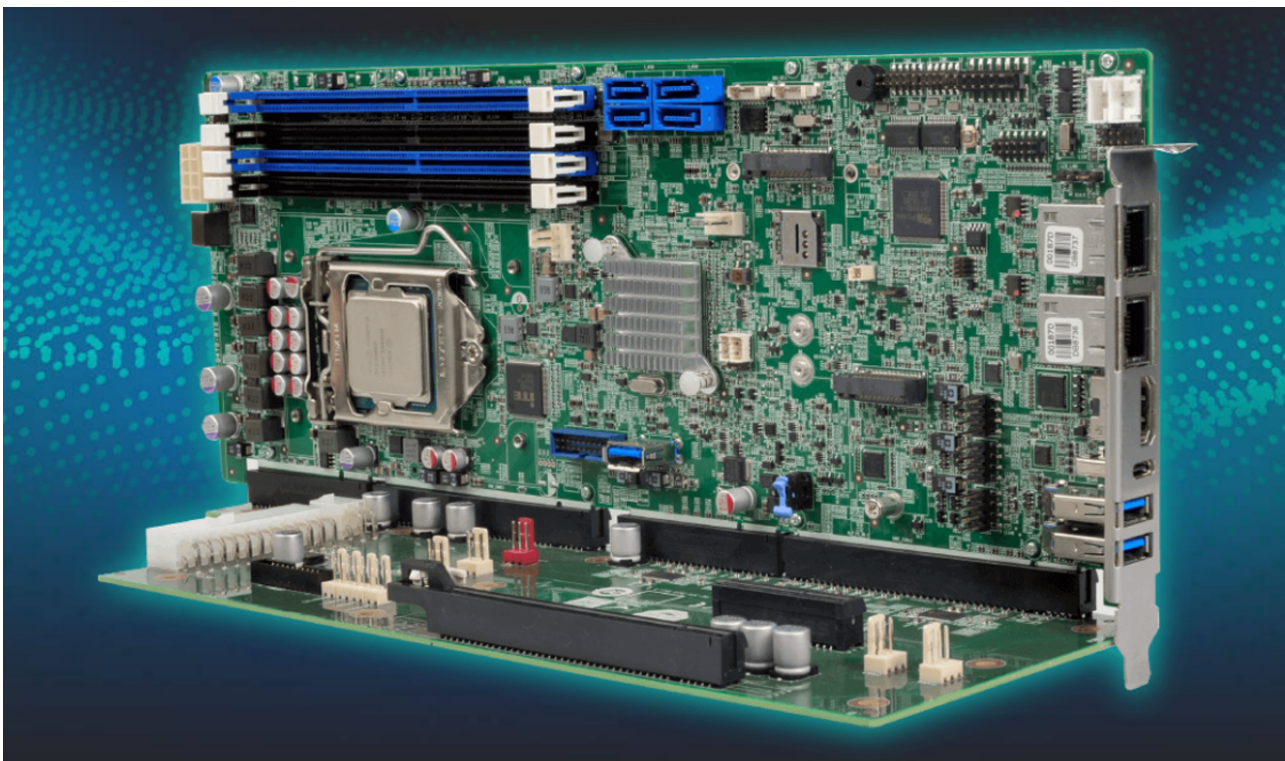
Connectivity



Solder Side



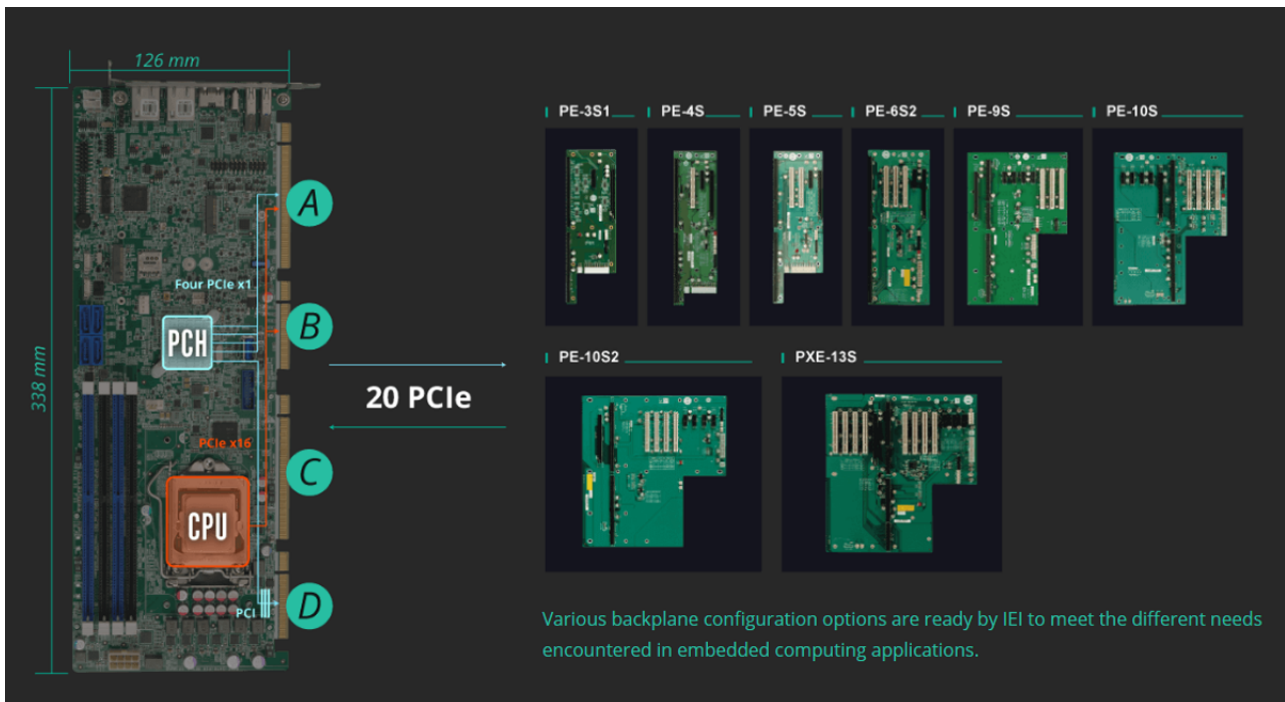
Full-size PICMG 1.3



Standard PICMG 1.3 SBCs have several advantages over non-standard SBCs. Firstly, they are more maintainable than a motherboard system and have a much lower mean time to repair (MTTR). Secondly, it is easy to upgrade to a newer or faster processor if desired.

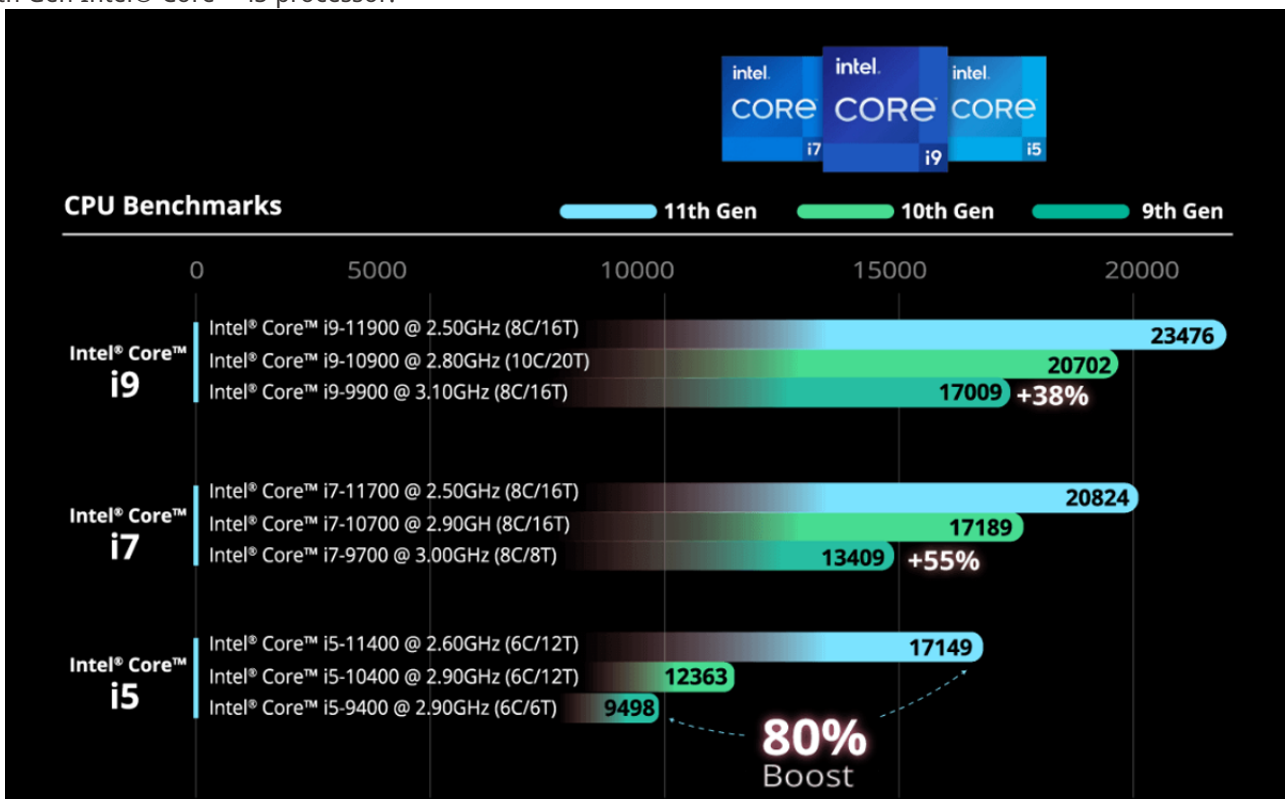
Features of PICMG 1.3:

- *20 PCI Express: 20 PCI Express lanes are supported, including PCI Express x16, x8, x4 and x1 configurations
- *ATX power signals are supported: Provides AUX voltages for standby power and sleep states (soft starts, wake on LAN), supports PS_ON#, PWRGD, PWRRBT# and ACPI states



Performance Boost

The 10th and 11th Gen Intel® Core™ processors, ranging from 6 to 10 cores, with increased I/O capacity and the latest DDR4-2933 memory support deliver the performance required to consolidate multiple industrial workloads. The CPU benchmark boosts up to 85% better integer multi-tasking compute intensive application performance on 11th Gen Intel® Core™ i5 processor.

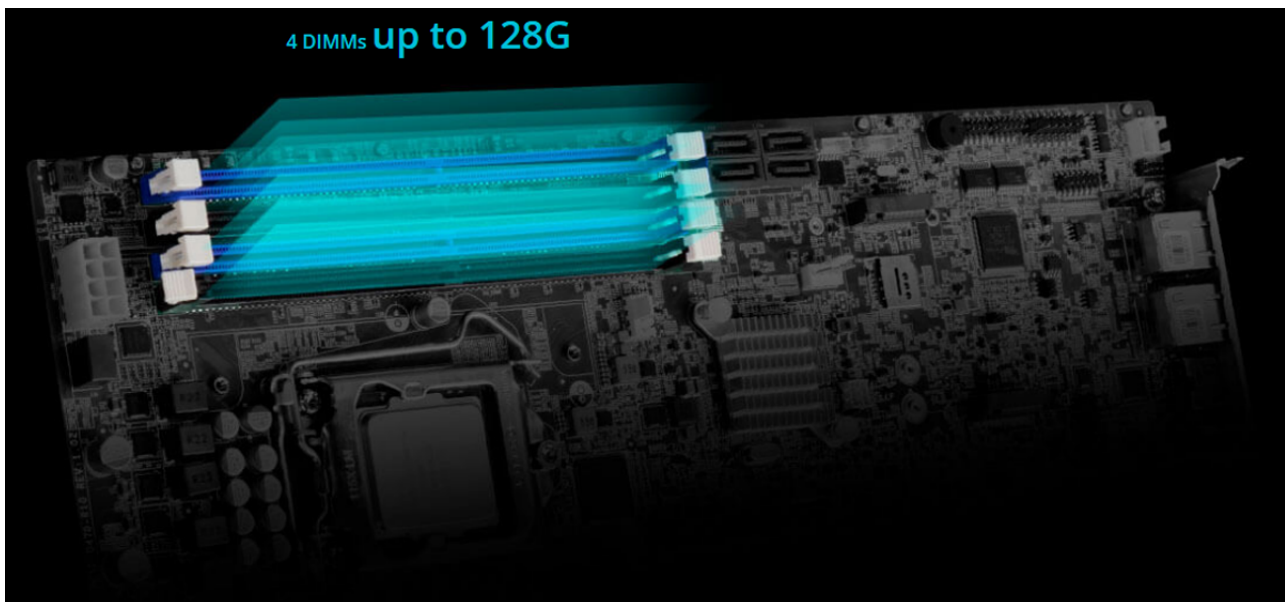


Embedded CPU Support List for 10th Gen Intel® Processors

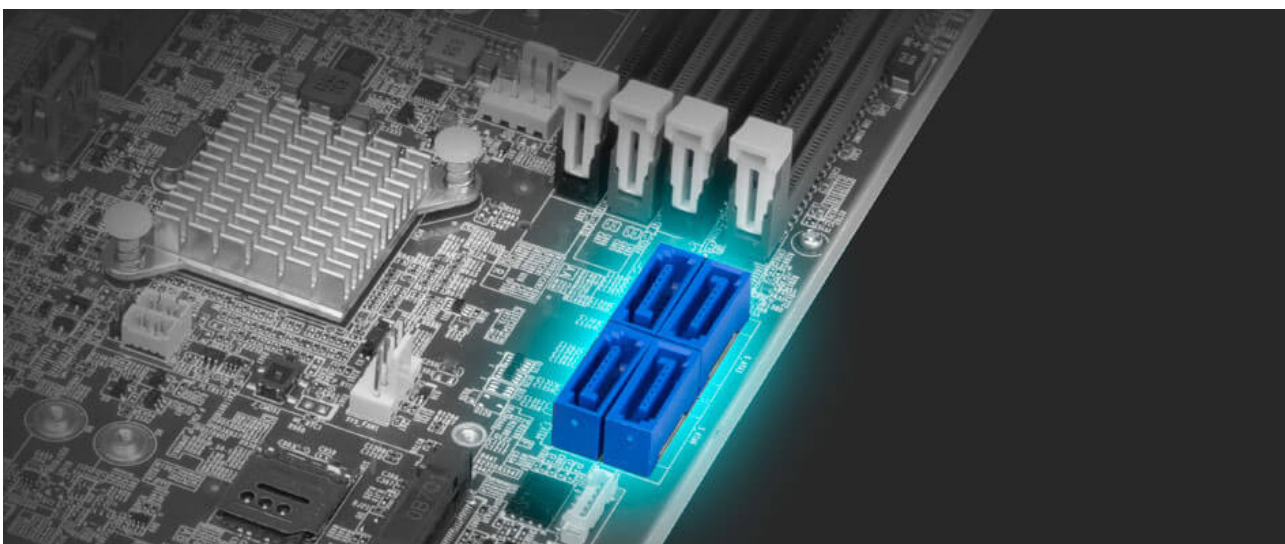
| Sockets | Brand | Process | Cores/Threads | CPU | Processor Base Frequency | Cache | TDP | Processor Graphics | Graphics Base Frequency | Memory Types | Chipset |
|-----------|----------|-------------------|---------------|------------|--------------------------|-------|-----|-------------------------|-------------------------|--------------|------------|
| FCLGA1200 | Core™ i9 | 14nm Comet Lake-S | 10/20 | I9-10900E | 2.8 GHz | 20MB | 65W | Intel® UHD Graphics 630 | 350 MHz | DDR4-2933 | Q470/Q470E |
| | | | 10/20 | I9-10900TE | 1.8 GHz | 20MB | 35W | | | DDR4-2933 | |
| | Core™ i7 | | 8/16 | I7-10700E | 2.9 GHz | 16MB | 65W | | | DDR4-2933 | |
| | | | 8/16 | I7-10700TE | 2.0 GHz | 16MB | 35W | | | DDR4-2933 | |
| | Core™ i5 | | 6/12 | I5-10500E | 3.1 GHz | 8MB | 65W | | | DDR4-2666 | |
| | | | 6/12 | I5-10500TE | 2.3 GHz | 8MB | 35W | | | DDR4-2666 | |
| | Core™ i3 | | 4/8 | I3-10100E | 3.2 GHz | 9MB | 65W | | | DDR4-2666 | |
| | | | 4/8 | I3-10100TE | 2.3 GHz | 9MB | 35W | | | DDR4-2666 | |
| | Pentium® | | 2/4 | G6400E | 3.8 GHz | 4MB | 58W | | | DDR4-2400 | |
| | Pentium® | | 2/4 | G6400TE | 3.2 GHz | 4MB | 35W | | | DDR4-2400 | |
| | Celeron® | | 2/2 | G5900E | 3.2 GHz | 2MB | 58W | | | DDR4-2400 | |
| | | | 2/2 | G5900TE | 3.0 GHz | 2MB | 35W | | | DDR4-2400 | |

Performance Boost DDR4 Dual-channel

Built with four DIMMs dual-channel mode, allowing significant performance boost on the system.

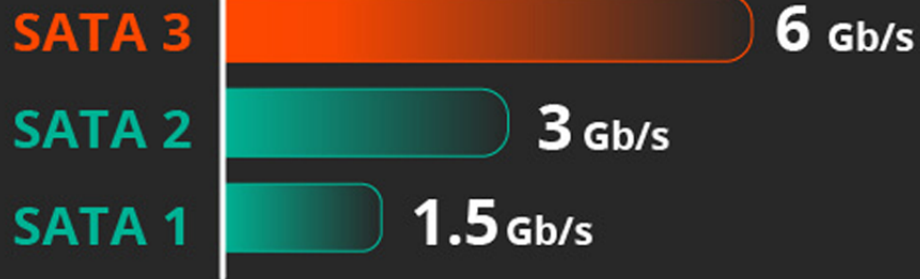


Data Protection



RAID 0/1/5/10 Protection

The PCIE-Q470 offers four high speed SATA 6Gb/s interfaces with configurable RAID 0, 1, 5, 10 functionality that can expand storage capabilities and enable fast data transfers.

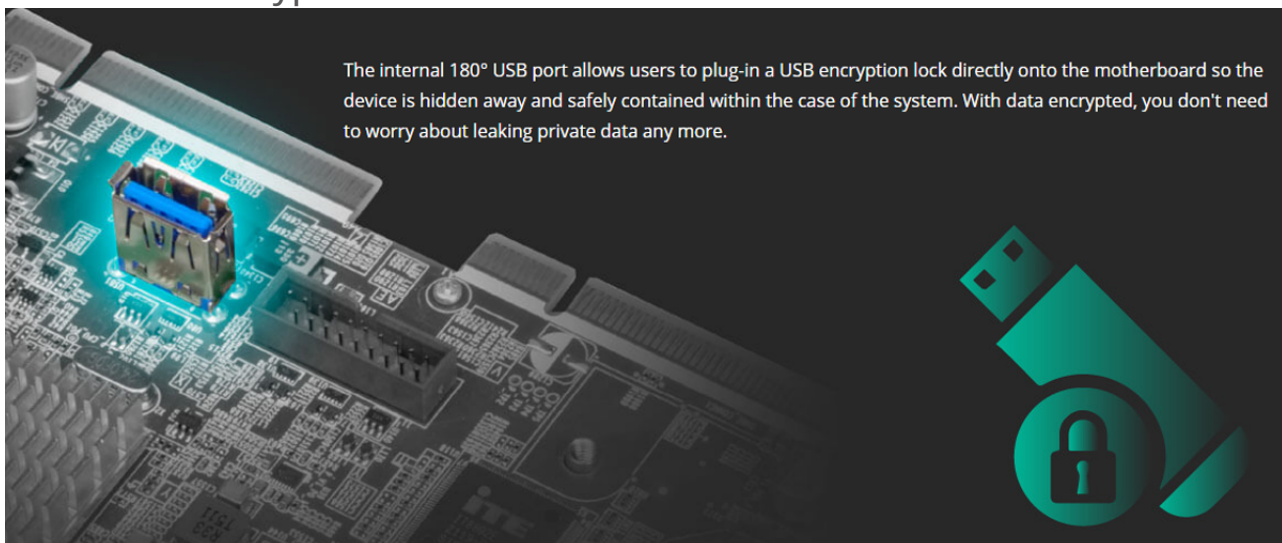


- RAID 0 (Striping) -The highest performing level
- RAID 1 (Mirroring) -Data safety
- RAID 5 (Distributed Parity)-offers both data safety and performance
- RAID 10 (combining mirroring and striping) data safety and big data volume

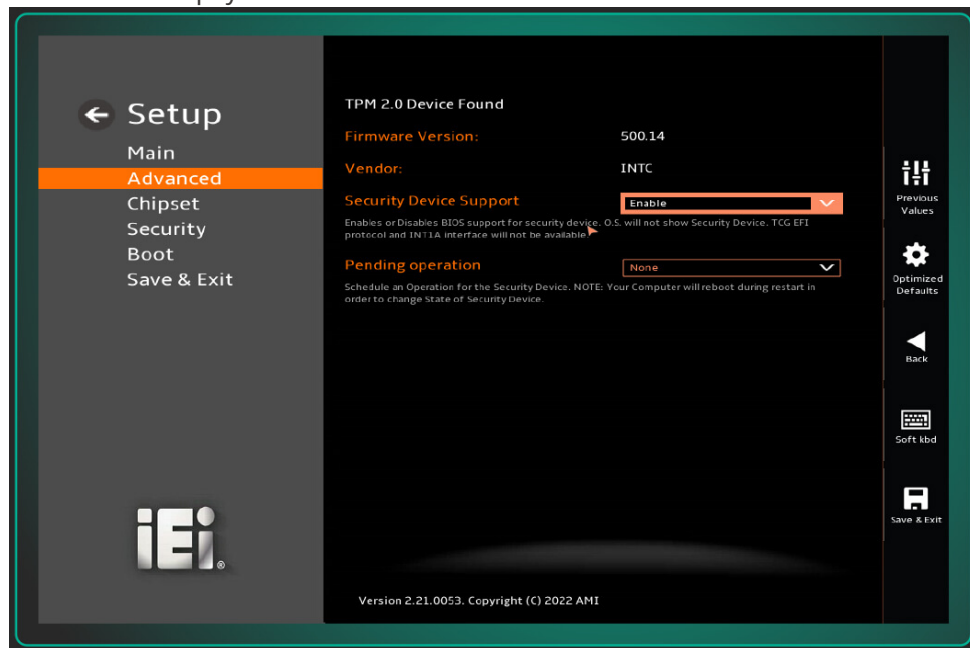


| Features | RAID 0 | RAID 1 | RAID 5 | RAID 10 |
|----------------------|--|--|--|--|
| Minimum # Drives | 2 | 2 | 3 | 4 |
| Data Protection | No | Single-drive failure | Single-drive failure | Up to one disk failure in each sub-array |
| Capacity Utilization | 100% | 50% | 67%-94% | 50% |
| Typical Application | High end workstations, data logging, real-time rendering, very transitory data | Operating system, Transaction database | Data warehousing, web serving, archiving | Fast databases, application servers |

Internal USB Encryption Lock



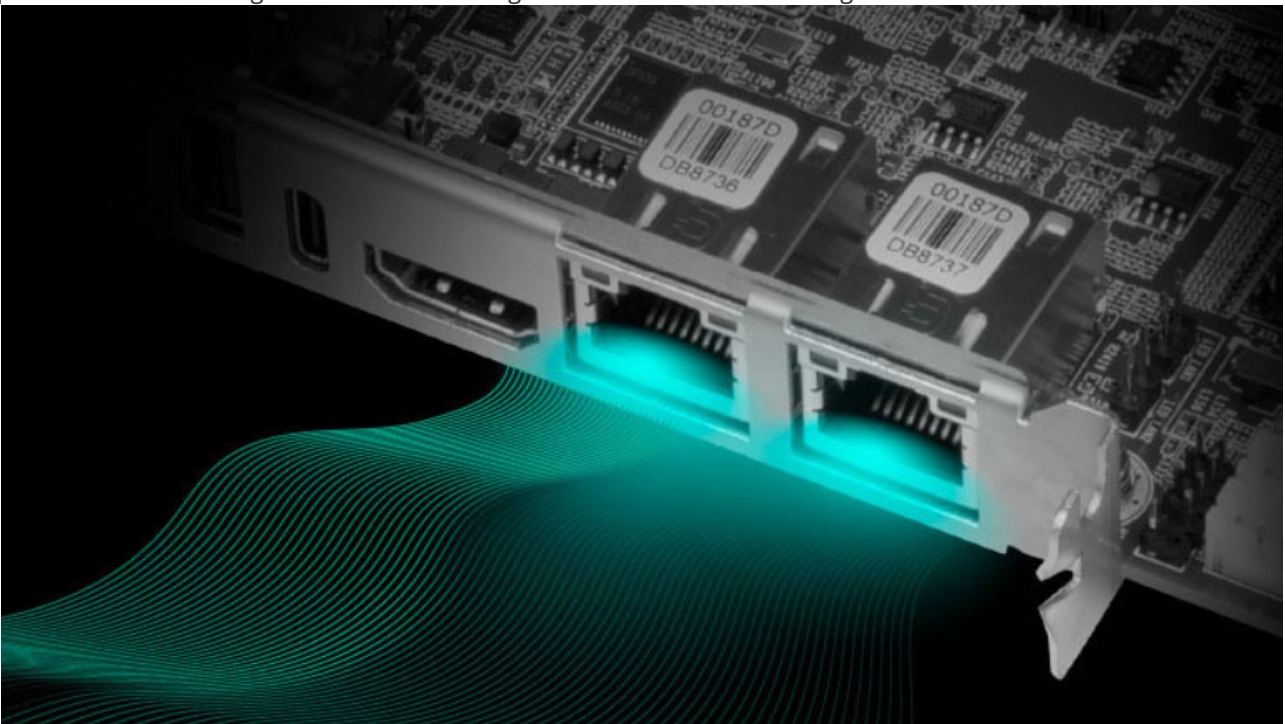
Intel® Platform Trust Technology (Intel® PTT) offers the capabilities of discrete TPM 2.0. TPM can be leveraged to encrypt your storage drive. This protects your data, including your identity and operating system files and also protects your data in the case of physical theft.



High Speed Transmission

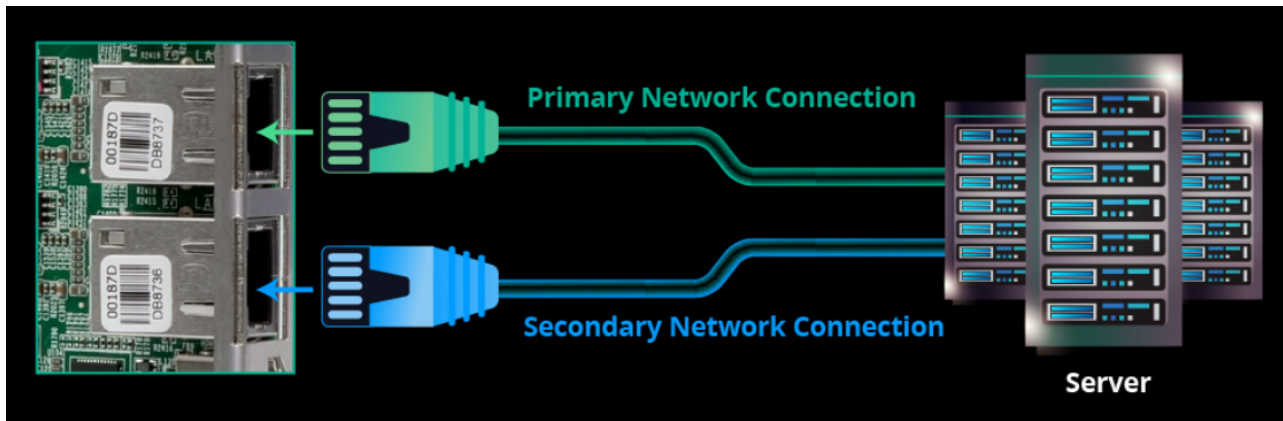
Delivers Dual Low-Latency 2.5G LAN by Intel

The on-board dual Intel® I225V 2.5GbE controllers enable the PCIE-Q470 to meet the bandwidth-intensive requirements such as large file transfers and high-resolution video streaming.



Redundant Networking Connection

With dual LAN configuration, the network redundancy for an internet connection has backup connectivity to switch the network from the first LAN input to the other LAN input automatically to avoid and mitigate the risk of downtime.



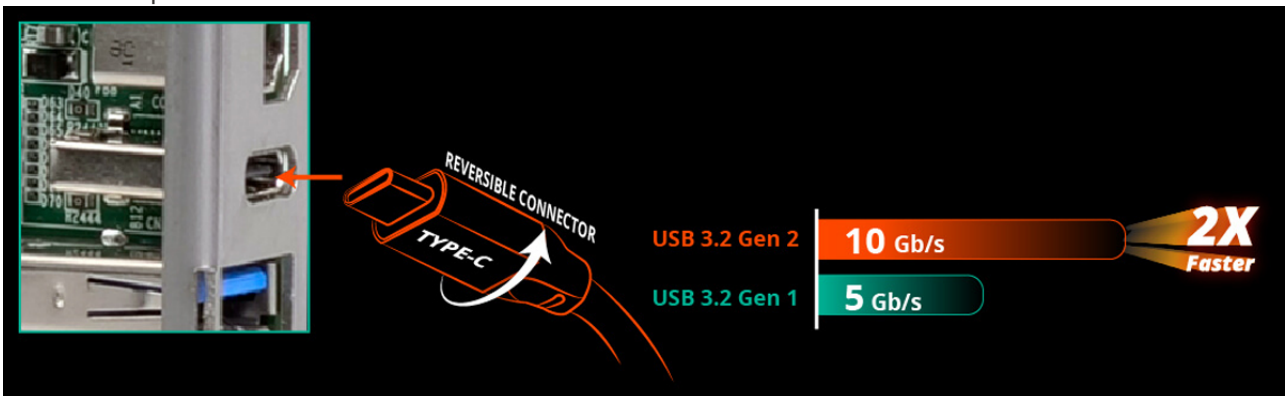
Multiple Device Connection

With dual LAN configuration, the single-board computer is capable of connecting various devices such as sensors, multiple cameras, or other hardware that connects to an industrial SBC.



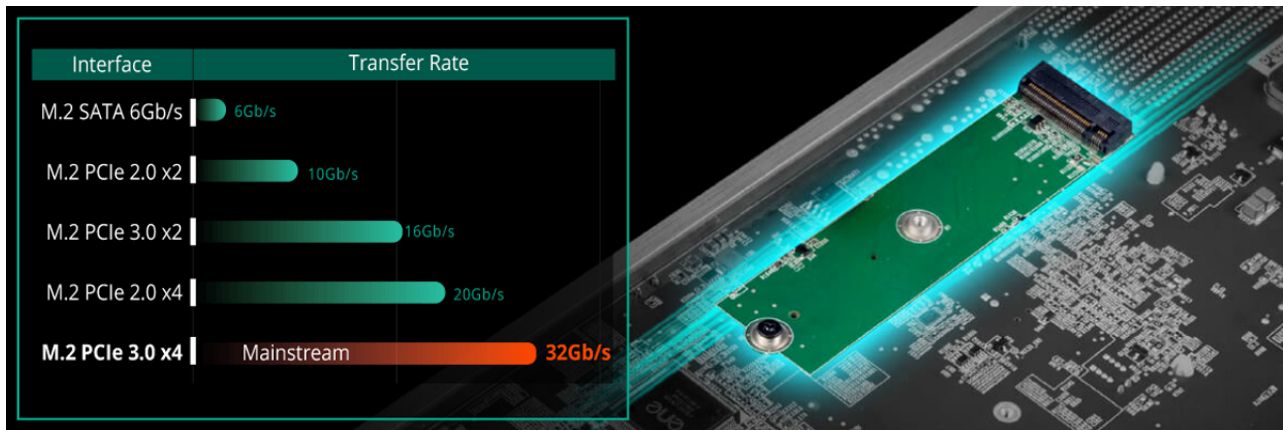
10 Gb/s USB 3.2 Gen 2 Type-C Foolproof Connector

USB Type-C connectors are widely adopted by many electronic devices, such as portable SSD hard drives, smart phones, USB cameras, etc. The PCIE-Q470 uses the reversible connector that should end the bane of users fiddling at the back of computers.



M.2 2242/2280 M Key for NVMe SSD or AI Accelerator

The M.2 2242/80 M-key socket with PCI Express® 3.0 x4 bandwidth supports up to 32Gbps data-transfer speeds. The sequential read/write speed is 5 times than SATA 6Gb/s. It's the perfect choice for installing an operating system or application drive to provide fast data access.



AI Accelerator

The Mustang-M2BM-MX2 card equipped with two Intel® Movidius™ Myriad™ X VPU, providing an flexible AI inference computing.

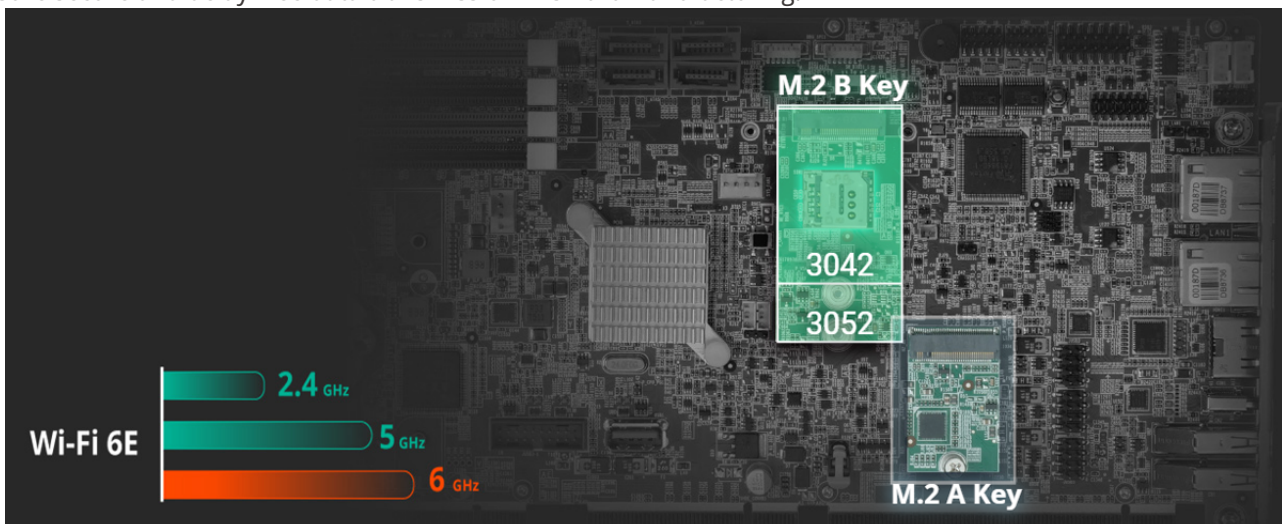
[Learn More](#)

NVMe

Networking

M.2 B Key with SIM Slot for LTE Cellular Communication

The M.2 B key supporting PCI Express 3.0 x2 signals plus onboard SIM slot allows you to use a LTE radio frequency to ensure secure and delay-free data transmission in smart manufacturing.

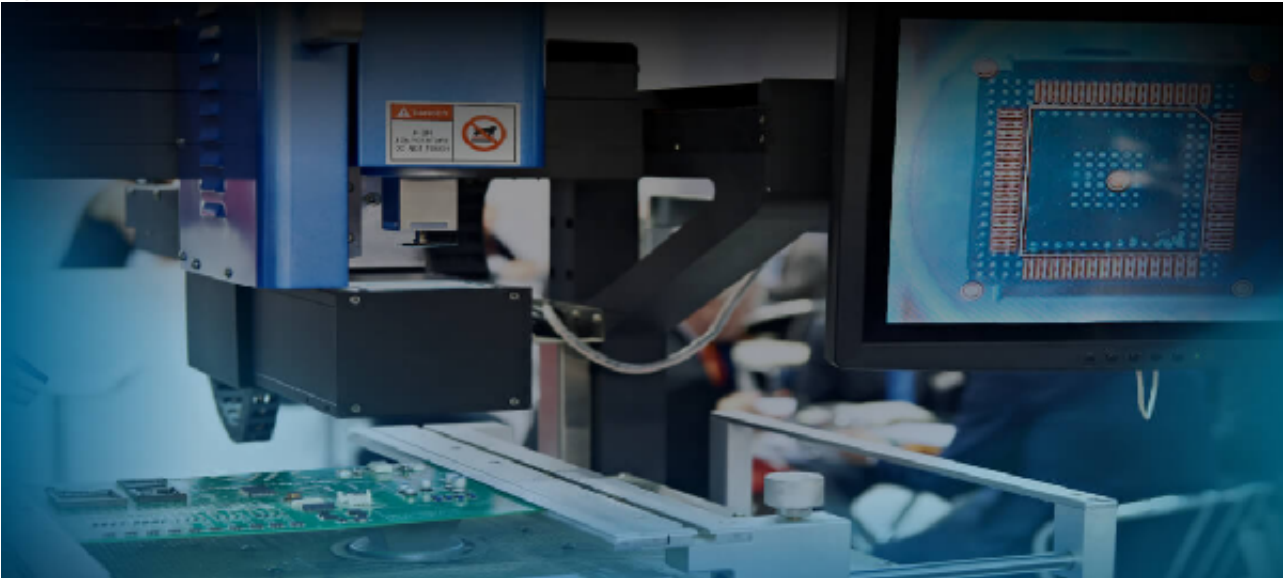


M.2 2230 A Key for Wi-Fi/Bluetooth

The M.2 2230 A key slot carrying with PCIe 3.0 x2 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.

Instant System-level Solution

To suit different AIoT applications, IEI offers a comprehensive range of PICMG 1.3 passive backplanes and industrial chassis to give system designers expanded options for integrating multi-level processors within a variety of configurations.



| | | PAC series wall-mount chassis | | 4U/5U rack-mount chassis | | 1U/2U rack-mount chassis | | | | |
|------------------------------|-------------|-------------------------------|--------------|--------------------------|--------------|--------------------------|--|-----------------------|--------------|--------------|
| PICMG 1.3 (PCIe+PCI) | Model | PE-2SD1 | PE-3S1 | PE-4S | PE-5S | PE-5S2 | PE-6S | PE-6S2 | PE-6SD | PE-6SD3 |
| Total Slot | | 2 | 5 | 4 | 5 | 5 | 6 | 6 | 5 | 5 |
| Expansion Slots | PCIe Slots | x16* | 1 (Gen 2.0) | 1 (Gen 3.0) | 1 | 1 (Gen 2.0) | 1 (Gen 2.0) | 1 (Gen 2.0) | 1 (Gen 2.0) | 1 (Gen 2.0) |
| | | X4 | | 1 (Gen 3.0) | 1 | 1 (Gen 2.0) | | | 1 (Gen 2.0) | 1 (Gen 2.0) |
| | | X1 | | | | 3 (Gen 2.0) | 2 (Gen 2.0) | | 3 (Gen 2.0) | |
| | PCI-X Slots | | | | | | | | | |
| | PCI Slots | | | | 1 | 2 | | 2 | 3 | |
| USB Connectors by Pin Header | | 4 | | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| PSU Type | | 24+4-pin ATX | 24+4-pin ATX | 24+4-pin ATX | 24+4-pin ATX | 24+4-pin ATX | 24+4-pin ATX | 24+4-pin ATX | 24+4-pin ATX | 24+4-pin ATX |
| Chassis | | RACK-1150-PE | RACK-500AI | N/A | N/A | N/A | RACK-305G RACK-360G RACK-3000G PAC-1700G PAC-125 G | PAC-106G PAC-1000G | N/A | N/A |
| Note | | 1U Type | | | | | | | 2U Type | 2U Type |

| PICMG 1.3 (PCIe+PCI) | Model | PE-7S | PE-8S | PE-9S | PE-10S | PE-10S2 | PXE-13S |
|------------------------------|-------------|--------------|--------------|--------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Total Slot | | 7 | 8 | 9 | 10 | 10 | 13 |
| Expansion Slots | PCIe Slots | x16* | 1 (Gen 2.0) | 1 (Gen 3.0) | 1 | 1 (Gen 2.0) | 1 (Gen 3.0) |
| | | X4 | | | | | |
| | | X1 | 2 (Gen 2.0) | 3 (Gen 2.0) | 4 (Gen 2.0) | 4 (Gen 2.0) | 3 (Gen 3.0) |
| | PCI-X Slots | | | | | | |
| PCI Slots | | 3 | 3 | 3 | 4 | 4 | 8 |
| USB Connectors by Pin Header | | 4 | 4 | 4 | 4 | 4 | 4 |
| PSU Type | | 24+4-pin ATX | 24+4-pin ATX | 24+4-pin ATX | 24+4-pin ATX | 24+4-pin ATX | 24+4-pin ATX |
| Chassis | | PAC-1700G | PAC-125G | N/A | RACK-305G RACK-360G RACK-3000G | RACK-3000G RACK-305G RACK-360G | RACK-3000G RACK-305G RACK-360G |
| Note | | | | | | | PCIe to PCI Bridge Backplane |

*When using a PCIe x16 add-on card, the length of the card must not exceed 167mm or 6.57 inches.

*When using a PCIe x16 add-on card, the length of the card must not exceed 167mm or 6.57 inches.

Automated Inspection Machine Application

