Industrial Board Solution Guide

Ver.222B

About Portwell

Portwell, Inc. was founded in 1993 and entered the Industrial PC market in 1995 by developing single-board computers. Today, our continuous development of leading-edge products has not only resulted in strong growth in market shares and revenue but established Portwell as a major worldwide supplier of specialty computing application platforms and services. Portwell, Inc. is an Associate member of the Intel® Partner Alliance. From modular components to market-ready systems, Intel® and the 250+ global member companies of the Intel® Partner Alliance provide scalable, interoperable solutions that accelerate deployment of intelligent devices and end-to-end analytics. Portwell, Inc. is also a member of the selected group of Intel® Applied Computing Platform Providers (IACPP), as well as Advanced Telecom Computing Architecture (ATCA) and an executive member of PCI Industrial Computer Manufacturing group (PICMG).

Portwell Engine (PE) Building

Portwell, Inc. has worldwide operations in the U.S.A., Taiwan, Japan, Korea, China, Netherlands, United Kingdom, Germany and India. Whether you are working on a computer board or turnkey system, Portwell is the perfect partner to help you deliver your products to the market on time as well as maintain longevity of product. With 28 years experience in the design and manufacturing of specialty computer boards and systems, Portwell not only provides a one-stop resource for off-the-shelf products, but also supplies custom-built solutions and a global logistics services to suit your needs.

Portwell OEM and ODM solutions satisfy your needs in retail automation, medical equipment, industrial automation, infotainment, communication, and network security markets. Encouraged by our flexible business support, manufacturing excellence, and compliance with high quality and environmental standards such as ISO 14001/13485/9001/45001/28000, OHSAS and RoHS, customers have taken advantage of our dedicated and sophisticated engineering resource to satisfy their requirements for the design, manufacturing and logistics of application-specific computer boards, customized computer chassis, and specific computer system configurations. Whether you are working on a Medical Single Board Computer or Internet Security Appliance, Portwell is, again, the perfect partner to help you deliver your products to the market on time and stay one step ahead of the competition.

Portwell is famous for her platform service that could offer the following benefits to customers.

Complete Product Portfolio

Select from our full range of both off-the-shelf and versatile custom solutions to scale your products. Portwell provides not only board-level products but also peripheral-level and complete system solutions.

Implement Latest Intel Technology

Portwell delivers cutting-edge solutions not only to meet and exceed the demand for the newest technologies, but also the need for greater product life cycles. Since partnering with Intel® in 1999, and with streamline access to the latest Intel® technologies and roadmaps, Portwell delivers superior products to meet your needs.

Faster Time-to-Market

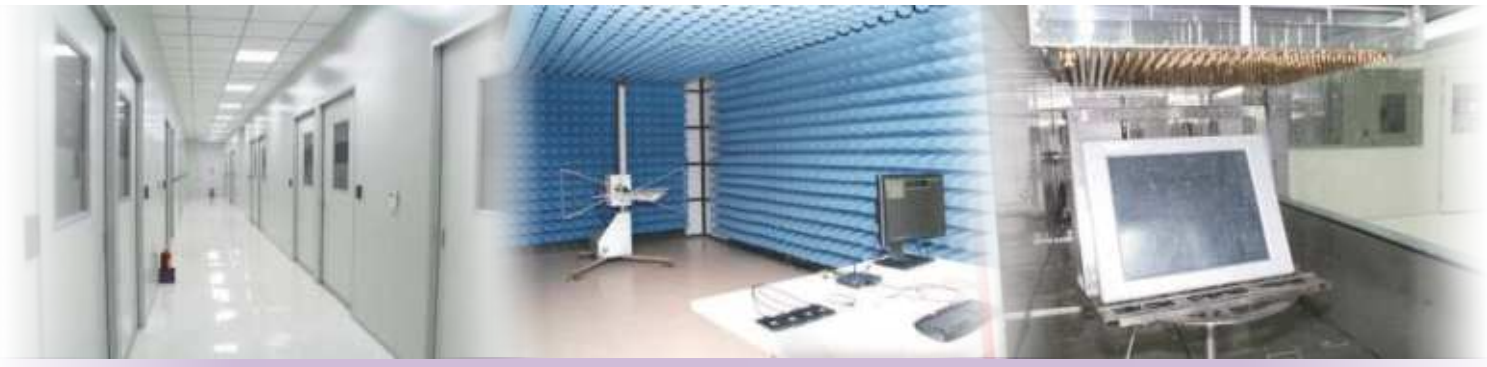
Portwell's experienced engineers, complete product solutions, global operation and flexible business service help you meet the time-to-market requirement and reduce your new product introduction cycles as well as the costs of conducting business.

Leading Edge Innovator

Portwell is committed to product and solution innovation. We have a complete variety of proof-of-concept designs with Intel and we are also a leader in offering the latest technologies to the market.

Committed to Customer Satisfaction

Portwell maintains high expectations in a determined pursuit of commitment to continuously improve our products and services in order to satisfy and exceed our customers' needs.



Consulting • Design • Product • Manufacturing • Logistics

Portwell is proud of the technology service it provides to our partners. These services include complete service-demand consulting, product development, advanced design, quality production and global logistics.

Share for Success

Portwell is eager to share its industrial know-how with customers via our online consulting. This feature enables customers to obtain suitable or customized solutions quickly and efficiently.

Design, Develop, and Deliver

- We design, develop and deliver our customer requirements, such as production, reliability, stability, cost-effectiveness, and longevity of product.
- Our experienced and sophisticated engineering capabilities include electronic, mechanical, firmware and system integration expertise.

Portwell Manufacturing Excellence

- We supply component inventory management with automation.
- In-house SMT lines and PCB assembly and functional testing.
- In-house system integration and testing.
- ISO 14001 and ISO 9001 certified manufacturing facilities (89,000 sq. ft. in Taipei).
- Flexible production capability.

Portwell Global Presence

- Single contact window, global support.
- Sales and technical support teams are available through Portwell worldwide offices in the U.S.A., Taiwan, Japan, China, Netherland, United Kingdom, and India.
- Customer-centric service and support.

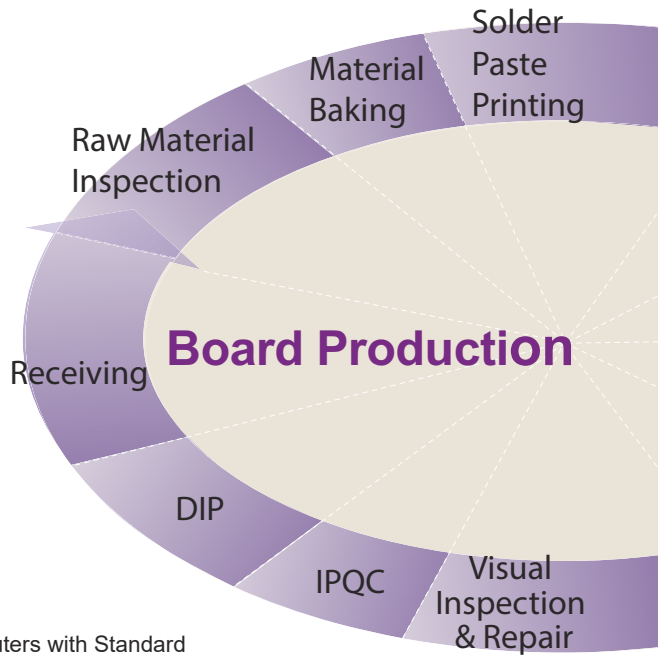
Board Production Flow - SMT

Material Baking

The SMD components tend to be thin, hence, can't endure high temperature.

Raw Material Inspection

Materials in the production line are prepared based on the packing list provided by the warehouse staff and are stored in the WIP buffer area.



IPQC

Our IPQC personnel examine all products according to the IPC-610D magnifying glass standards to determine and confirmed ECO, BOM and assure the production contents are without defects.

Visual Inspection

Visual inspection stations are equipped with computers with Standard Operating Procedures (SOP) for each product. The SOPs are composed of diagrams which allow our technicians to run their inspection effortlessly and efficiently.

In-Circuit Testing (ICT)

The ICT automated test system can check the assembly circuit wafer, short circuits, abruptions, resistors, capacitors, inductor components values, as well as diode, transistor, FET, SCR, TRIAC, IC for anomallies. Upon completion, reports regarding production and statistics aid in identifying errors in the production process and ensure product quality.

Certifications

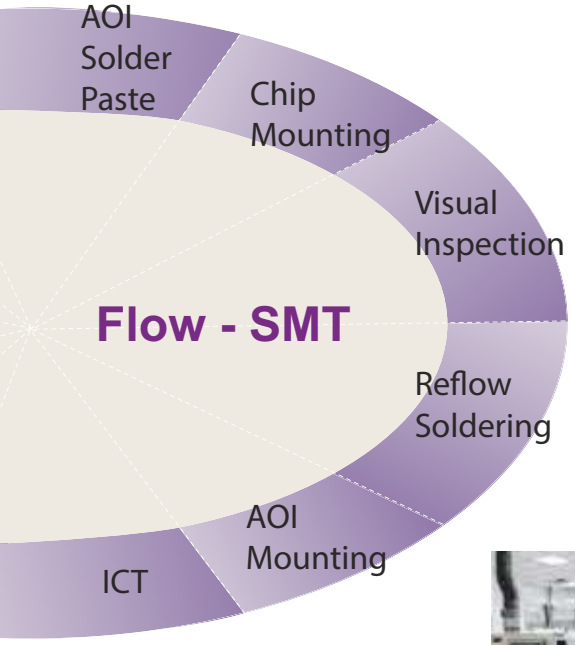
ISO 45001 is a standard which represent her highly regards labors' safety, the commitment to employees' health management and continuously improvement to the company and society.

Certifications

The ISO 14000 environmental management standards exist to help organizations minimize how their operations negatively affect the environment and comply with applicable laws, regulations, and other environmentally oriented requirements and continually improve in the above.

Solder Paste Printing
A stencil plate is used to print the soldering paste thru the plate holes onto the PCB.

AOI - Soldering Paste
One-hundred percent automatic inspection of the PCB after solder paste printing detects defects and improves quality the first time.



Chips Mounting
High Speed Mounting pertains to different tiny components such as resistors, capacitors and ICs. This is a widely used procedure to achieve high precision production.

Visual Inspection & Repair
Our visual technicians utilize magnifying glass examination to check for material flaws that causes undesirable tendency.

Reflow Soldering
Reflow utilization uses an internal heat cycle system which allows the soldered components on the PCB to be soldered after cooling.

AOI - Mounting
The AOI machine uses an optical inspection method to verify that the printing, mounting, and reflow processes were completed without defects.

Certifications
ISO 9001 deals with the fundamentals of quality management systems, including the eight management principles on which the family of standards is based.

Certifications
ISO 13485 is an ISO standard that represents the requirements for a comprehensive management system for the design and manufacture of medical devices.

What We Focus on

ESD Protection

ESD is usually caused by HBM (Human-Body Model), MM (Machine Model), CDM (Charge d-Device Model) and FIM (Field-Induced Model). The advantages of preventing ESD in the factory include better product reliability, extended usage life, cost savings and increased yields.

In order to ensure that the products will not be affected by ESD during production, an ESD control procedure is in place to meet standards.

For operator :

Wear anti-static suits and wrist straps in the factory.

For equipment :

Each device and working area is grounded and tested periodically to confirm that the ESD measurement is normal.

For ESD Area :

(1) Cover the anti-static tape on cables and test tools which are used in board functional testing.

(2) Use acrylic shelves which may prevent electrostatic charge build-up.

(3) Cover keyboards with an anti-static membrane to protect units under test from electrostatic damage.

For component :

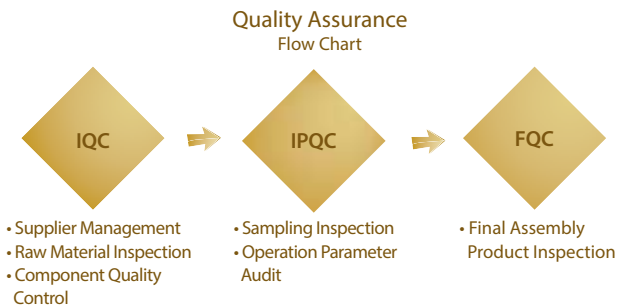
(1) Suppliers of ESD sensitive components are required to handle and ship them in a protective manner.

(2) Anti-static packaging is designed to prevent failures due to electrostatic charge build-up.

Quality Control

As an integral part of the overall quality system, Portwell emphasizes quality during the entire manufacturing process, from the acquisition of material to the delivery of finished goods.

In practice, documents are attached with materials from the Receiving department to IQC inspection or to IQC return if rejected. The internal audit checklist ensures that requirements are met for each process. In addition, Portwell periodically maintains and calibrates equipment. Per the standard process, if any equipment is found out of specification, the last three lots of products will be re-tested using confirmed calibrated equipment. Most importantly for quality control, all procedures include a checklist for inspection within incoming, in-process, and final out-going QC to ensure that correct documents and revisions are in place before assembly. MES software is used to ensure that each assembly station and process step is completed before moving to next step.



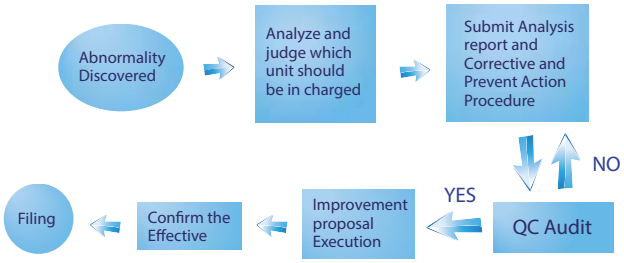
Corrective and Preventive Action (CAPA)

In order to ensure Portwell offers world-class manufacturing services, the corrective and preventive processes are implemented to manage abnormalities and potential problems.

The QA member in charge of a quality issue involves the supplier to provide corrective actions upon discovering issues. A Supplier Corrective Action form is sent to the supplier to document the root cause, corrective action and Portwell's approval. Once the supplier's corrective actions are returned and approved by the QA team, the document is signed which closes the request in Portwell's quality system.

Portwell reviews open issues monthly to track issues in order to resolve and provide closure. We provide a complete check on all of unresolved issues and establish a time line to close them.

Portwell ensures customer care by identifying and communicating abnormalities. It is for this reason that corrective and preventive action is taken – to find out the root cause and continuously monitor the effectiveness of the quality system after solutions are implemented to ensure issues do not recur.



Employee Training

In Portwell MOC, each operator's professional skills are improved by training before jobs and re-training periodically as necessary. By paying particular attention to the human aspects of production, MOC ensures stable and reliable quality which directly decreases the costs of poor quality and increase customer satisfaction.

Individual training needs to be established based upon job requirements, and re-established whenever new equipment, processes or products are introduced. Training ensures that employees understand the consequences of performing their jobs incorrectly, and is conducted prior to assigning employees, contractors, or temporary personnel to a new task. Training records are maintained according to the quality system.

In the meantime, competency is measured relative to quality trends and retraining is provided where necessary.

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ROBO-8114VG2AR


ROBO-8114VG2AR-Q370


ROBO-8113VG2AR


ROBO-8113VG2AR-Q170


ROBO-6912VG2AR


ROBO-6912VG2AR-Q370


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INDUSTRIAL BACKPLANE

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WUX-3455


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PEB-2773

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NANO-ITX FORM FACTOR

MINI-ITX FORM FACTOR

Portwell Embedded Board Solutions

Portwell Embedded Solutions meet your demand perfectly

Portwell Embedded product lines provide a wide range of selections from server grade to energy efficiency scale including Modules, 3.5'', NANO-ITX, Mini-ITX, µATX, ATX, SBC, and Backplane. According to the form factors listed below, Portwell offers diverse products from high computing power to low power consumption devices. Products with high performance are equipped with not only the latest design but also various features which can precisely fulfill standard and customized demands. In another way, when energy-saving is the primary concern, energy efficiency is always the first target we are dedicated to. Therefore, in terms of power budget and green technology, Portwell's designs are still able to perform with a minimum of power consumption suitable for numerous fields.

Due to our experience with customized projects, our reliable solutions can be adopted and applied to multiple applications such as ATM, Kiosk, Digital Signage, POS (Point-Of-Sale), Lottery, Vending, Gaming, Factory Automation, Industrial Control, Transportation, Medical and Energy.

Form factor comparison of embedded computer boards

Form Factor	Board Size (inch/mm)				Expansion	Board Size (inch²)
	L (inch)	W (inch)	L (mm)	W (mm)		
PC/104	3.55	3.78	90.17	95.89	Module	13.42
PC/104+	3.55	3.78	90.17	95.89	Module	13.42
STX	3.78	3.55	95.89	90.17	Carrier Board	13.42
ETX	4.49	3.74	114.00	95.00	Carrier Board	16.79
COM Express	4.92	3.74	125.00	95.00	Carrier Board	18.40
NANO-ITX	4.72	4.72	120.00	120.00	On Board	22.28
3.5" Embedded	5.75	4.02	146.00	102.00	Cables	23.12
3.5" ECX	5.75	4.13	146.00	105.00	Module	23.75
EPIC	6.50	4.53	165.00	115.00	Module	29.45
PICMG 1.3 Half-size	6.60	4.98	167.64	126.39	Backplane	32.87
PCI Half-size	7.28	4.80	185.00	122.00	Backplane	34.94
ISA Half-size	7.28	4.80	185.00	122.00	Backplane	34.94
PICMG 1.2 Half-size	7.52	4.80	191.03	121.92	Backplane	36.10
Mini-ITX	6.69	6.69	170.00	170.00	On Board	44.76
5.25"Embedded	5.75	8.00	146.05	203.20	Cables	46.00
EBX	5.75	8.00	146.05	203.20	Module	46.00
PICMG 1.0 Full-size	13.33	4.80	338.58	121.92	Backplane	63.98
PICMG 1.2 Full-size	13.33	4.80	338.58	121.92	Backplane	63.98
PICMG 1.3 Full-size	13.33	4.98	338.58	126.39	Backplane	66.38
Flex ATX	9.00	7.50	228.60	190.50	On Board	67.50
Micro-ATX	9.60	9.60	243.84	243.84	On Board	92.16
Embedded ATX	9.60	9.60	243.84	243.84	On Board	92.16
ATX	12.00	9.60	304.80	243.84	On Board	115.20

SBC Reference Table

FULL-SIZE SINGLE BOARD COMPUTER






MODEL	ROBO-8116G2AR	ROBO-8116G2AR-Q670E	ROBO-8115VG2AR	ROBO-8115VG2AR-Q470E	ROBO-8114VG2AR	ROBO-8114VG2AR-Q370
Form Factor	PICMG1.3	PICMG1.3	PICMG1.3	PICMG1.3	PICMG1.3	PICMG1.3
CPU	Intel® Core TM i3/i5/ i7/i9/ Pentium®/Celeron®	Intel® Core TM i3/i5/ i7/i9/ Pentium®/Celeron®	Intel® Xeon® W/ Core™ i3/i5/i7/i9/Pentium®/ Celeron®	Intel® Core™ i3/i5/i7/i9/ Pentium®/Celeron®	Intel® Xeon® E3/ Core™ i3/i5/i7/i9/ Pentium®/Celeron®	Intel® Core™ i3/i5/i7/i9/ Pentium®/Celeron®
Chipset	Intel® R680E	Intel® Q670E	Intel® W480E	Intel® Q470E	Intel® C246	Intel® Q370
BIOS	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI
Memory	2 x DDR5 ECC SODIMM up to 64GB	2 x DDR5 Non-ECC SODIMM up to 64GB	4 x DDR4 ECC DIMM up to 128GB	4 x DDR4 non- ECC DIMM up to 128GB	4 x DDR4 ECC SO-DIMM up to 128GB	4 x DDR4 non- ECC SO-DIMM up to 128GB
Expansion	4x PCI slots 1x PCIe x16 slot or 2x PCIe x8 slots 3x PCIe x4 slots 1x PCIe x4 slot or 4x PCIe x1slot	4x PCI slots 1x PCIe x16 slot or 2x PCIe x8 slots 3x PCIe x4 slots 1x PCIe x4 slot or 4x PCIe x1slot	4x PCI slots 1x PCIe x16 slot or 2x PCIe x8 slots or 1x PCIe x8 slot 2x PCIe x4 slots 1x PCIe x4 slot	4x PCI slots 1x PCIe x16 slot or 2x PCIe x8 slots or 1x PCIe x8 slot 2x PCIe x4 slots 1x PCIe x4 slot	4x PCI slots 1x PCIe x16 slot or 2x PCIe x8 slots or 1x PCIe x8 slot 2x PCIe x4 slots 1x PCIe x4 slot	4x PCI slots 1x PCIe x16 slot or 2x PCIe x8 slots or 1x PCIe x8 slot 2x PCIe x4 slots 1x PCIe x4 slot
Display	DVI-D / HDMI / DP	DVI-D / HDMI / DP	DVI-I / HDMI	DVI-I / HDMI	DVI-I / HDMI	DVI-I / HDMI
Audio	Realtek ALC888S HDA codec	Realtek ALC888S HDA codec	Realtek ALC888S HDA codec	Realtek ALC888S HDA codec	Realtek ALC886 HDA codec	Realtek ALC886 HDA codec
LAN	2x GbE	2x GbE	2x GbE	2x GbE	2x GbE	2x GbE
Serial Port	2x RS-232 ports 2x RS-232/422/485	2x RS-232 ports 2x RS-232/422/485	2x RS-232 ports 2x RS-232/422/485	2x RS-232 ports 2x RS-232/422/485	2x RS-232 ports 2x RS-232/422/485	2x RS-232 ports 2x RS-232/422/485
USB	1x USB3.2 Gen2x2 2x USB3.2 Gen2 2x USB3.2 Gen1 4x USB2.0	1x USB3.2 Gen2x2 2x USB3.2 Gen2 2x USB3.2 Gen1 4x USB2.0	6x USB3.2 Gen2 8x USB2.0	6x USB3.2 Gen2 8x USB2.0	8x USB3.2 Gen1 2x USB3.2 Gen2 4x USB2.0	8x USB3.2 Gen1 2x USB3.2 Gen2 4x USB2.0
Storage Devices	4x SATA III 1x M.2 Type M 2280	4x SATA III 1x M.2 Type M 2280	5x SATA III 1x M.2 Type M 2280	5x SATA III 1x M.2 Type M 2280	5x SATA III 1x M.2 Type M 2280	5x SATA III 1x M.2 Type M 2280
GPIO	8 bit	8 bit	8 bit	8 bit	8 bit	8 bit
Others	N/A	N/A	PS2/KB & MS	PS2/KB & MS	PS2/KB & MS	PS2/KB & MS
Dimension	338.5 x 126.39mm	338.5 x 126.39mm	338.5 x 126.39mm	338.5 x 126.39mm	338.5 x 126.39mm	338.5 x 126.39mm
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SBC Reference Table

FULL-SIZE SINGLE BOARD COMPUTER






MODEL	ROBO-8113VG2AR	ROBO-8113VG2AR-Q170	ROBO-6912VG2AR	ROBO-6912VG2AR-Q370	ROBO-6911VG2AR	ROBO-6911VG2AR-Q170
Form Factor	PICMG1.3	PICMG1.3	PICMG1.3	PICMG1.3	PICMG1.3	PICMG1.3
CPU	Intel® Xeon® E3/ Core™ i3/ i5/i7/Pentium®/Celeron®	Intel® Core™ i3/i5/i7/ Pentium®/Celeron®	Intel® Xeon® E3/ CoreTM i3/i5/i7/ i9/Pentium®/Celeron®	Intel® CoreTM i3/i5/i7/i9/ Pentium®/ Celeron®	Intel® Xeon® E3/ Core™ i3/ i5/i7/Pentium®/Celeron®	Intel® Core™ i3/i5/i7/ Pentium®/Celeron®
Chipset	Intel® C236	Intel® Q170	Intel® C246	Intel® Q370	Intel® C236	Intel® Q170
BIOS	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI
Memory	2 x DDR4 ECC DIMM up to 32GB	2 x DDR4 non-ECC DIMM up to 32GB	2 x DDR4 ECC SO-DIMM up to 32GB	2 x DDR4 non- ECC SO-DIMM up to 32GB	2 x DDR4 ECC DIMM up to 32GB	2 x DDR4 non-ECC DIMM up to 32GB
Expansion	4x PCI slots 1x PCIe x16 slot or 2x PCIe x8 slot or 1x PCIe x8 + 2x PCIe x4 slots 1x PCIe x4 slot	4x PCI slots 1x PCIe x16 slot or 2x PCIe x8 slot or 1x PCIe x8 + 2x PCIe x4 slots 1x PCIe x4 slot	1x PCIe x16 slot or 2x PCIe x8 slots or 1x PCIe x8 slot 2x PCIe x4 slots 1x PCIe x4 slot	1x PCIe x16 slot or 2x PCIe x8 slots or 1x PCIe x8 slot 2x PCIe x4 slots 1x PCIe x4 slot	4x PCI slots 1x PCIe x16 slot or 2x PCIe x8 slot or 1x PCIe x8 + 2x PCIe x4 slots 1x PCIe x4 slot	4x PCI slots 1x PCIe x16 slot or 2x PCIe x8 slot or 1x PCIe x8 + 2x PCIe x4 slots 1x PCIe x4 slot
Display	VGA / DVI-D / HDMI	VGA/DVI-D/HDMI	2x mini DP / DVI-D	2x mini DP / DVI-D	VGA/DVI-D/HDMI	VGA/DVI-D/HDMI
Audio	Realtek ALC886 HDA codec	Realtek ALC886 HDA codec	Realtek ALC888S HDA codec	Realtek ALC888S HDA codec	Realtek ALC886 HDA codec	Realtek ALC886 HDA codec
LAN	2x GbE	2x GbE	2x GbE	2x GbE	2x GbE	2x GbE
Serial Port	2x RS-232 2x RS-232/422/485	2x RS-232 2x RS-232/422/485	1x RS-232/422/485	1x RS-232/422/485	2x RS-232 2x RS-232/422/485	2x RS-232 2x RS-232/422/485
USB	10x USB 3.0 2x USB 2.0	10x USB 3.0 2x USB 2.0	4x USB3.2 Gen1 2x USB3.2 Gen2	4x USB3.2 Gen1 2x USB3.2 Gen2	10x USB 3.0 2x USB 2.0	10x USB 3.0 2x USB 2.0
Storage Devices	6x SATA III	6x SATA III	2x SATA III 1x mSATA	2x SATA III 1x mSATA	6x SATA III	6x SATA III
GPIO	8 bit	8 bit	8 bit	8 bit	8 bit	8 bit
Others	PS/2 KB & MS	PS/2 KB & MS	N/A	N/A	PS/2 KB & MS	PS/2 KB & MS
Dimension	338.5x126.39mm	338.5x126.39mm	167.64 x 126.39mm	167.64 x 126.39mm	338.5x126.39mm	338.5x126.39mm
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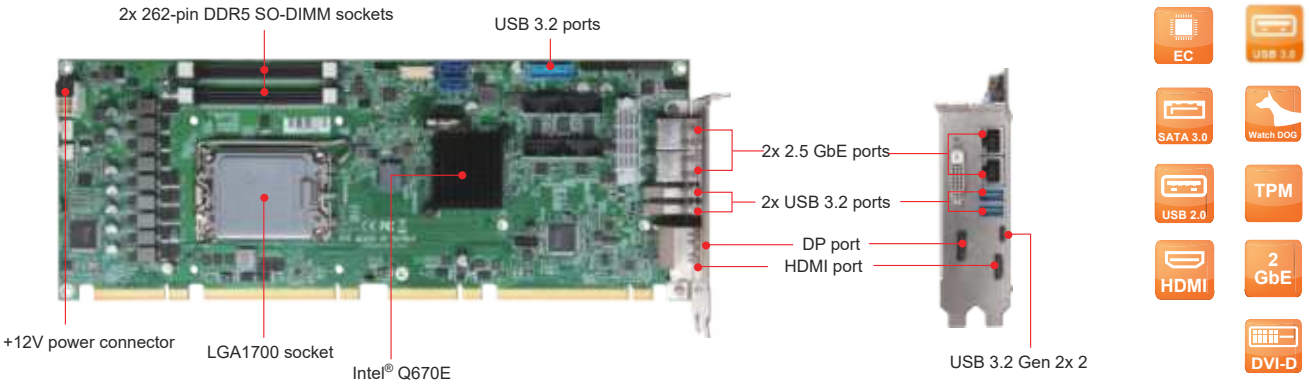
ROBO-8116G2AR

Intel® 12th Generation chipset 600 series with processor based on PICMG 1.3 SHB with DDR5 SDRAM,HDMI, DVI-D, DP, Dual Gigabit Ethernet, Audio and USB



ROBO-8116G2AR is based on Intel® 600 series chipset and workstation processors. Built with flexible PCI express expansions, ROBO-8116G2AR is suitable for Medical, Industrial automation, and Digital Signage application.

FEATURES

- Supports Intel®12th Generation Core processors Family in LGA 1700 package
- Delivers up to 64GB maximum DDR5 4800 ECC SO-DIMM on two sockets
- Supports mutiple display by DVI-D ,DP and HDMI
- High speed dual Gigabit Ethernet based on PCI express x 1, high bandwidth I/O interface
- Support two USB 3.2 Gen2 and USB 3.2 Gen2x2 on REAR I/O
- Support on board TPM2.0

ORDERING GUIDE

AB1-3K67	**(R).ROBO-8116G2AR.** PICMG 1.3(PCI-E+PCI).LGA1700. R680E PCH. Intel 12th gen processors.SHB.w/ HDMI/Dual GbE/Audio/fourCOM ports

PACKING LIST

Standard	B6902932 SATA III cable
	B8981980 PICMG SBC Handling and Installa
	B6902352 *(GP).Cable.DB9x2 to HSG(5x2)x2 L=300mm W/Bracket for Ruby-9717/Ruby-9718. CY-8A08006R.CHUAN YANG
	TBD Installa
Optional	B6903090 USB 3.0 cable with bracket
	B6902230 USB port cable with bracket

GENERAL

Processor	- Intel®12th Generation Core processors family in LGA1700 package - DMI x4 Link : 16GT/s - Support Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring, Trusted Execution and Speed Step Technology (depends on CPU sku)
Chipset	Intel® R680E
BIOS	AMI uEFI BIOS
Memory	- Supports up to 64GB DDR5 4800 SDRAM on two 262-pin SODIMM sockets - Supports ECC
Storage Devices	- 4x SATAIII drives (Dual ports via Backplane) - Supports RAID 0, 1, 5, 10 - 1x M.2 Type M 2280 (on bottom side)
Watchdog Timer	Programmable watchdog timer, time out period from 0.5 sec to 254.5 secs
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)
Expansion Interface	- From CPU: 1x PCIe x16(Gen5) or 2x PCIe x8(Gen5) and 1x PCe x4(Gen4) setting (Gen5 up to 32 GT/s) - From PCH: 1x PCIe x4 or 4x PCIe x1 by different bios support (Gen 3 up to 8.0 GT/s), 4x PCI devices at 32bit 33MHz

I/O INTERFACE

Super I/O	ITE IT5121E-I
Audio	- Intel® PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC888S HDA codec, 7.1 channels one on board audio pin header
Ethernet	- Dual Intel® WGI225LM Gigabit Ethernet controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T / 2500BASE-T Ethernet - PCI Express x1 interface based on Gigabit Ethernet - Dual RJ-45 connectors with two LED indicators
Serial Port	- 2x RS-232 ports - 2x RS-232/422/485 ports selectable - LPC to COM port IC: Fintek F81216DG
USB	- 4x USB 2.0 ports (through backplane) - 2x USB 3.2(Gen1) ports on board - 2x USB 3.2(Gen2) ports on bracket - 1x USB 3.2(Gen2 x2) type-C port on bracket
Keyboard & Mouse	TDB
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

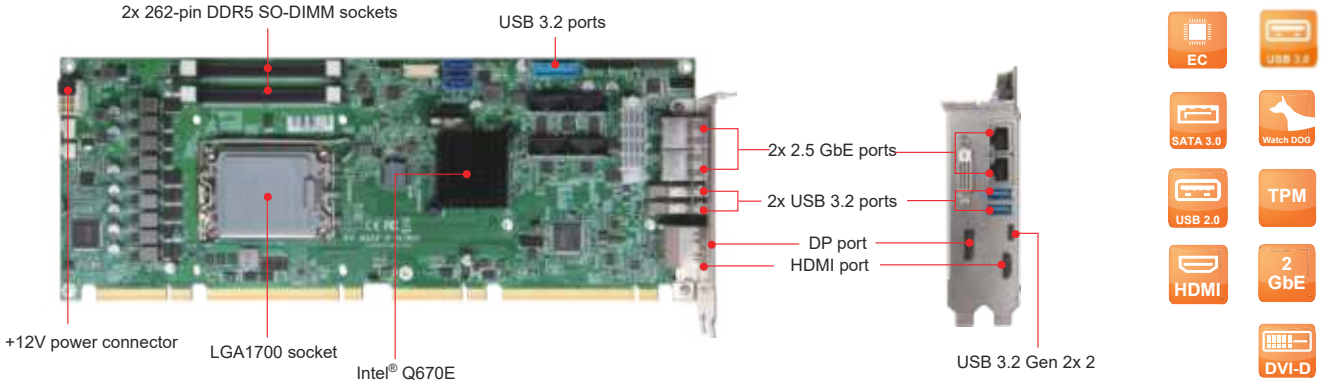
Graphic Controller	Intel® Core™ i3/i5/i7/i9 processors integrated graphics engine Provides improved 3D multimedia capabilities including Microsoft DirectX 12, OpenGL 4.5
Display Interface	- Support independent triple display by DP on bracket: Resolution up to 4096x2160 @ 60Hz - DVI-D on bracket: up to 1920x1200 @ 60Hz - HDMI on board: up to 4096x2160 @ 30Hz

Mechanical & Environment

Dimension	- 338.5mm(L) x 126.39mm(W),13.33"(L) x 4.98"(W) PCB: 12 layers
Power Supply	- Typical: +12V, +5V - Support ATX mode
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C

ROBO-8116G2AR-Q670E

Intel® 12th Generation chipset 600 series with processor based on PICMG 1.3 SHB with DDR5 SDRAM, HDMI, DVI-D, DP, Dual Gigabit Ethernet, Audio and USB



ROBO-8116G2AR-Q670E is based on Intel ® 600 series chipset and workstation processors.
Built with flexible PCI express expansions, ROBO-8116G2AR-Q670E is suitable for Medical, Industrial automation, and Digital Signage application.

FEATURES

- Supports Intel® 12th Generation Core processors Family in LGA 1700 package
- Delivers up to 64GB maximum DDR5 4800 non-ECC SO-DIMM on two sockets
- Supports mutiple display by DVI-D ,DP and HDMI
- High speed dual Gigabit Ethernet based on PCI express x 1, high bandwidth I/O interface
- Support two USB 3.2 Gen2 and USB 3.2 Gen2x2 on REAR I/O
- Support on board TPM2.0

ORDERING GUIDE

AB1-3K68	**(R).ROBO-8116G2AR-Q670E.** PICMG 1.3(PCI-E+PCI).LGA1700. Q670E PCH. Intel 12th gen processors.SHB.w/ HDMI/Dual GbE/Audio/fourCOM ports

PACKING LIST

Standard	B6902932 SATA III cable
	B8981980 PICMG SBC Handling and Installa
	B6902352 *(GP).Cable.DB9x2 to HSG(5x2)x2 L=300mm W/Bracket for Ruby-9717/Ruby-9718. CY-8A08006R.CHUAN YANG
	TBD Installa
Optional	B6903090 USB 3.0 cable with bracket
	B6902230 USB port cable with bracket

GENERAL

Processor	- Intel®12th Generation Core processors family in LGA1700 package - DMI x4 Link : 16GT/s - Support Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring, Trusted Execution and Speed Step Technology (depends on CPU sku)
Chipset	Intel® Q670E
BIOS	AMI uEFI BIOS
Memory	Supports up to 64GB DDR5 4800 SDRAM on two 262-pin SODIMM sockets
Storage Devices	- 4x SATAIII drives (Dual ports via Backplane) - Supports RAID 0, 1, 5, 10 - 1x M.2 Type M 2280 (on bottom side)
Watchdog Timer	Programmable watchdog timer, time out period from 0.5 sec to 254.5 secs
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)
Expansion Interface	- From CPU: 1x PCIe x16(Gen5) or 2x PCIe x8(Gen5) and 1x PCe x4(Gen4) setting (Gen5 up to 32 GT/s) - From PCH: 1x PCIe x4 or 4x PCIe x1 by different bios support (Gen 3 up to 8.0 GT/s), 4x PCI devices at 32bit 33MHz

I/O INTERFACE

Super I/O	ITE IT5121E-I
Audio	- Intel® PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC888S HDA codec, 7.1 channels one on board audio pin header
Ethernet	- Dual Intel® WGI225LM Gigabit Ethernet controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T / 2500BASE-T Ethernet - PCI Express x1 interface based on Gigabit Ethernet - Dual RJ-45 connectors with two LED indicators
Serial Port	- 2x RS-232 ports - 2x RS-232/422/485 ports selectable - LPC to COM port IC: Fintek F81216DG
USB	- 4x USB 2.0 ports (through backplane) - 2x USB 3.2(Gen1) ports on board - 2x USB 3.2(Gen2) ports on bracket - 1x USB 3.2(Gen2 x2) type-C port on bracket
Keyboard & Mouse	TDB
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

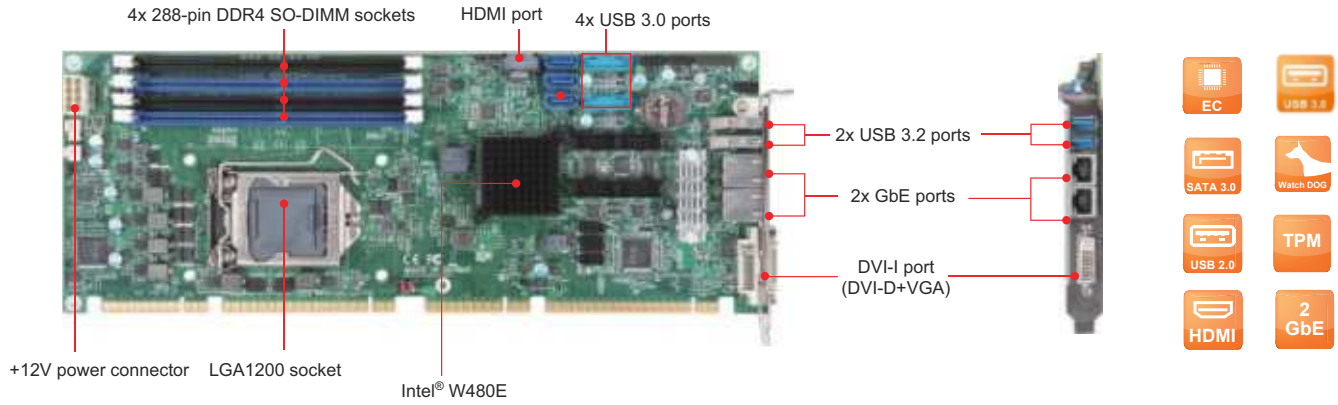
Graphic Controller	Intel® Core™ i3/i5/i7/i9 processors integrated graphics engine Provides improved 3D multimedia capabilities including Microsoft DirectX 12, OpenGL 4.5
Display Interface	- Support independent triple display by DP on bracket: Resolution up to 4096x2160 @ 60Hz - DVI-D on bracket: up to 1920x1200 @ 60Hz - HDMI on board: up to 4096x2160 @ 30Hz

Mechanical & Environment

Dimension	- 338.5mm(L) x 126.39mm(W),13.33"(L) x 4.98"(W) PCB: 12 layers
Power Supply	- Typical: +12V, +5V - Support ATX mode
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C

ROBO-8115VG2AR

Intel® Xeon® W/ Core™ i3/i5/i7/i9 Pentium®/Celeron® processor based on PICMG 1.3 SHB with DDR4 SDRAM, HDMI, DVI-I, Dual Gigabit Ethernet, Audio and USB



ROBO-8115VG2AR is based on Intel® W480E chipset and workstation processors. Built with flexible PCI express expansions, ROBO-8115VG2AR is suitable for Medical, Industrial automation, and Digital Signage application.

FEATURES

- Supports Intel® Xeon® W/Core™ i3/i5/i7/i9 /Pentium®/Celeron® processors in LGA 1200 package
- Delivers up to 128GB maximum DDR4 2666 ECC Long-DIMM on four sockets
- Supports mutiple display by DVI-I(DVI-D+VGA)and HDMI
- High speed dual Gigabit Ethernet based on PCI express x 1, high bandwidth I/O interface
- Rich I/O connections such as four serials ports,USB3.2(Gen2), SATA III ports
- Support on board TPM2.0

ORDERING GUIDE

AB1-3K28	**(R).ROBO-8115VG2AR.** PICMG 1.3(PCI-E+PCI).LGA1200. W480E PCH. Intel Xeon/Core i3 processors.SHB.w/ VGA/Dual GbE/Audio/fourCOM ports

PACKING LIST

Standard	B6902932 SATA III cable
	B8981980 PICMG SBC Handling and Installation Notice
	B6903351 (GP).Cable.Video DVI-I to DVI-D+VGA Y cable L=150mm.0130-069-00-0263. E-CALL
	B6902352 *(GP).Cable.DB9x2 to HSG(5x2)x2 L=300mm W/Bracket for Ruby-9717/Ruby-9718. CY-8A08006R.CHUAN YANG
	TBD Installation CD
Optional	B6903090 USB 3.0 cable with bracket B6902980 PS/2 Keyboard / Mouse Cable with bracket B6902230 USB port cable with bracket

GENERAL

Processor	- Intel® Xeon® W Family/ Core™ i3/i5/i7/i9/ Pentium®/ Celeron® processors up to 3.5 GHz(35~95W) in LGA-1200 package - DMI x4 Link: 5.0GT/s - Support Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring, Trusted Execution and Speed Step Technology (depends on CPU sku)
Chipset	Intel® W480E
BIOS	AMI uEFI BIOS
Memory	- Supports up to 128GB DDR4 2666 SDRAM on four 288-pin DIMM sockets - Supports ECC
Storage Devices	- 5x SATAIII drives (Dual ports via Backplane) - Supports RAID 0, 1, 5, 10 - 1x M.2 Type M 2280 (on bottom side)
Watchdog Timer	Programmable watchdog timer, time out period from 0.5 sec to 254.5 secs.
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)
Expansion Interface	- From CPU: 1x PCIe x16 or 2x PCIe x8 or 1x PCIe x8 + 2x PCIe x4 by jumper setting (Gen3 up to 8.0 GT/s) - From PCH: 1x PCIe x4 or 4x PCIe x1 by different bios support (Gen 3 up to 8.0 GT/s)4x PCI devices at 32bit 33MHz

I/O INTERFACE

Super I/O (Embedded Controller)	ITE IT5121E-I
Audio	- Intel® PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC888S HDA codec, 7.1 channels one on board audio pin header
Ethernet	- Intel® WGI219LM + WGI225LM Gigabit Ethernet controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T Ethernet - PCI Express x1 interface based on Gigabit Ethernet - Dual RJ-45 connectors with two LED indicators
Serial Port	- 2x RS-232 ports - 2x RS-232/422/485 ports selectable - LPC to COM port IC: Fintek F81216DG
USB	- 4x USB 2.0 ports (through backplane) - 480Mb/s bus capable of high-speed/full-speed/low-speed data ranges - 4x USB 3.2(Gen2) ports on board - 10Gbps bus capable of high-speed/ full-speed/low-speed data ranges - 2x USB 3.2(Gen2) ports on bracket - 10Gbps bus capable of high-speed/ full-speed/low-speed data ranges
Keyboard & Mouse	1x 10 pin box header for external PS/2 KB & MS
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

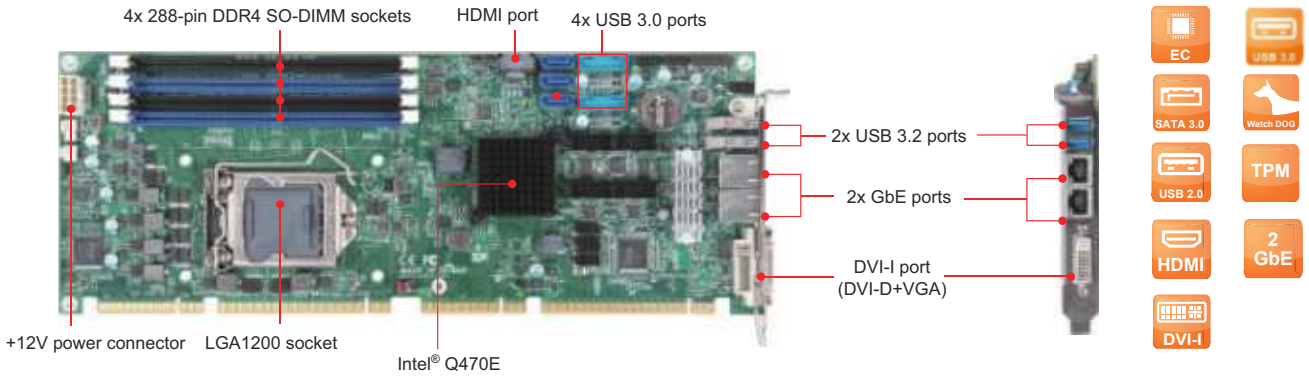
Graphic Controller	- Intel® Xeon® and Core™ i3 processors integrated graphics engine - Provides improved 3D multimedia capabilities including Microsoft DirectX 12, OpenGL 4.5
Display Interface	Support independent triple display by - VGA on bracket: Resolution up to 1920x1200 @ 60Hz - DVI-D on bracket: up to 1920x1200 @ 60Hz (VGA + DVI-D on bracket by DVI-I port) - HDMI on board: up to 4096x2160 @ 30Hz

Mechanical & Environment

Dimension	- 338.5mm(L) x 126.39mm(W),13.33"(L) x 4.98"(W) - PCB: 10 layers
Power Supply	- Typical: +12V, +5V - Support ATX mode
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C

ROBO-8115VG2AR-Q470E

Intel® Core™ i3/i5/i7/i9 Pentium®/Celeron® processor based on PICMG 1.3 SHB with DDR4 SDRAM, HDMI, DVI-I, Dual Gigabit Ethernet, Audio and USB



ROBO-8115VG2AR-Q470E is based on Intel® Q470E chipset and workstation processors. Built with flexible PCI express expansions, ROBO-8115VG2AR-Q470E is suitable for Medical, Industrial automation, and Digital Signage application.

FEATURES

- Supports Intel® Core™ i3/i5/i7/i9 /Pentium®/ Celeron® processors in LGA 1200 package
- Delivers up to 128GB maximum DDR4 2666 non-ECC Long-DIMM on four sockets
- Supports multiple display by DVI-I(DVI-D+VGA) and HDMI
- High speed dual Gigabit Ethernet based on PCI express x 1, high bandwidth I/O interface
- Rich I/O connections such as four serials ports,USB3.2(Gen2), SATA III ports
- Support on board TPM2.0

ORDERING GUIDE

AB1-3K31	**(R).ROBO-8115VG2AR-Q470E** PICMG 1.3(PCI-E+PCI).LGA1200. Q470E PCH. Intel Xeon/Core i3 processors.SHB.w/ VGA/Dual GbE/Audio/fourCOM ports

PACKING LIST

Standard	B6902932 SATA III cable
	B8981980 PICMG SBC Handling and Installation Notice
	B6903351 (GP).Cable.Video DVI-I to DVI-D+VGA Y cable L=150mm.0130-069-00-0263. E-CALL
	B6902352 *(GP).Cable.DB9x2 to HSG(5x2)x2 L=300mm W/Bracket for Ruby-9717/Ruby-9718. CY-8A08006R.CHUAN YANG
	TBD Installation CD
Optional	B6903090 USB 3.0 cable with bracket B6902980 PS/2 Keyboard / Mouse Cable with bracket B6902230 USB port cable with bracket

GENERAL

Processor	- Intel® Core™ i3/i5/i7/i9/ Pentium®/ Celeron® processors up to 3.5 GHz(35~95W) in LGA-1200 package - DMI x4 Link: 5.0GT/s - Support Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring, Trusted Execution and SpeedStep Technology (depends on CPU sku)
Chipset	Intel® Q470E
BIOS	AMI uEFI BIOS
Memory	- Supports up to 128GB DDR4 2666 SDRAM on four 288-pin DIMM sockets - Supports non-ECC
Storage Devices	- 5x SATAIII drives (Dual ports via Backplane) - Supports RAID 0, 1, 5, 10 - 1x M.2 Type M 2280 (on bottom side)
Watchdog Timer	Programmable watchdog timer, time out period from 0.5 sec to 254.5 secs
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)
Expansion Interface	From CPU: 1x PCIe x16 or 2x PCIe x8 or 1x PCIe x8 + 2x PCIe x4 by jumper setting (Gen3 up to 8.0 GT/s) From PCH: 1x PCIe x4 or 4x PCIe x1 by different bios support (Gen 3 up to 8.0 GT/s) 4x PCI devices at 32bit 33MHz

I/O INTERFACE

Super I/O (Embedded Controller)	ITE IT5121E-I
Audio	- Intel® PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC888S HDA codec, 7.1 channels one on board audio pin header
Ethernet	- Intel® WGI219LM + WGI225LM Gigabit Ethernet controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T Ethernet - PCI Express x1 interface based on Gigabit Ethernet - Dual RJ-45 connectors with two LED indicators
Serial Port	- 2x RS-232 ports - 2x RS-232/422/485 ports selectable - LPC to COM port IC: Fintek F81216DG
USB	- 4x USB 2.0 ports (through backplane) - 480Mb/s bus capable of high-speed/full-speed/low-speed data ranges - 4x USB 3.2(Gen2) ports on board - 10Gbps bus capable of high-speed/ full-speed/low-speed data ranges - 2x USB 3.2(Gen2) ports on bracket - 10Gbps bus capable of high-speed/ full-speed/low-speed data ranges
Keyboard & Mouse	- 1x 10 pin box header for external PS/2 KB & MS
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

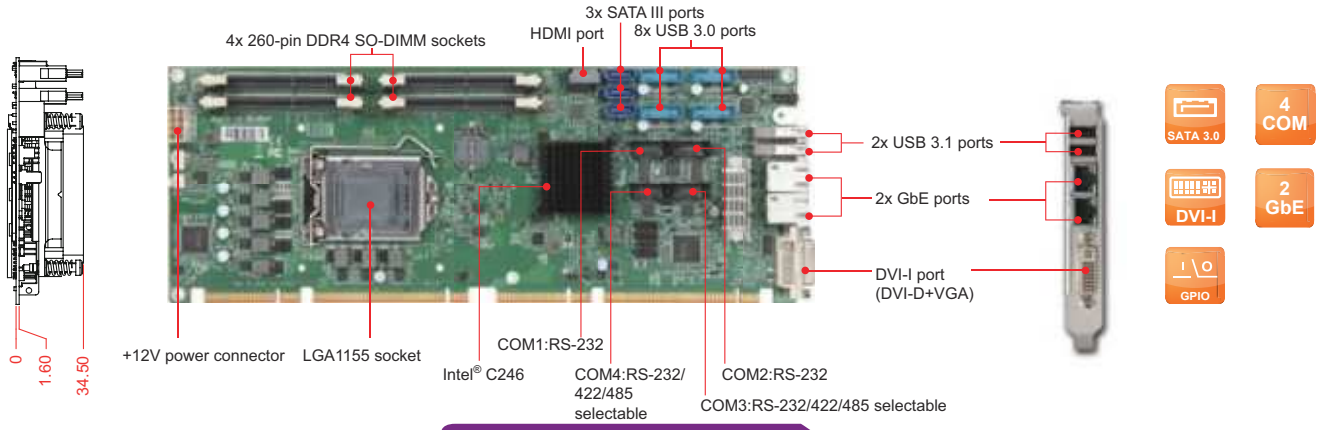
Graphic Controller	- Intel® Core™ i3/i5/i7/i9 processors integrated graphics engine - Provides improved 3D multimedia capabilities including Microsoft DirectX 12, OpenGL 4.5
Display Interface	Support independent triple display by - VGA on bracket: Resolution up to 1920x1200 @ 60Hz - DVI-D on bracket: up to 1920x1200 @ 60Hz (VGA + DVI-D on bracket by DVI-I port) - HDMI on board: up to 4096x2160 @ 30Hz

Mechanical & Environment

Dimension	- 338.5mm(L) x 126.39mm(W),13.33"(L) x 4.98"(W) - PCB: 10 layers
Power Supply	- Typical: +12V, +5V - Support ATX mode
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C

ROBO-8114VG2AR

Intel® Xeon® E/ Core™ i3/i5/i7 Pentium® / Celeron® processor based on PICMG 1.3 SHB with DDR4 SDRAM, HDMI, DVI-I, Dual Gigabit Ethernet, Audio and USB



ROBO-8114VG2AR is based on Intel® C246 chipsetand workstation processors. Built with flexible PCI express expansions, ROBO-8114VG2AR is suitablefor Medical, Industrial Automation.

FEATURES

- Supports Intel® Xeon®/Core™ i3/i5/i7/ Pentium®/ Celeron® processors in LGA 1151 package
- Delivers up to 64GB maximum DDR4 2133 ECC SO-DIMM on four sockets
- Supports mutiple display by DVI-I(DVI-D+VGA)and HDMI
- High speed dual Gigabit Ethernet based on PCIe x press x 1, high bandwidth I/O interface
- Rich I/O connections such as four serials ports,USB 3.0/3.1, SATA III ports
- Support on board TPM2.0

ORDERING GUIDE

AB1-3J28	**ROBO-8114VG2AR** PICMG 1.3(PCI-E+PCI).LGA1151. C246 PCH. IntelXeon/Core i3 processors.SHB.w/ VGA/Dua IGbE/Audio/four COM ports

PACKING LIST

Standard	TBD Installation CD
	B6902352 dual head COM port cable with bracket
	B6903351 DVI-D + VGA cable
	B8981980 PICMG SBC Handling and Installation Notice
	B6902932 SATA III cable
Optional	B6903090 USB 3.0 cable with bracket
	B6902980 PS/2 Keyboard / Mouse Cable with bracket
	B6902230 USB port cable with bracket

GENERAL

Processor	- Intel® Xeon® E Family/ Core™ i3/i5/i7/ Pentium®/ Celeron® processors up to 3.6 GHz(35~95W) in LGA-1151 package - DMI x4 Link: 5.0GT/s - Support Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring, Trusted Execution and SpeedStep Technology (depends on CPU sku)
Chipset	Intel® C246 PCH
BIOS	AMI UEFI BIOS (SPI ROM)
Memory	- Supports up to 64GB DDR4 2133 SDRAM on four 260-pin SO-DIMM sockets - Supports ECC
Storage Devices	- 5x SATAIII drives (Dual ports via Backplane) - Supports RAID 0, 1, 5, 10 - 1x M.2 Type M 2280 (on bottom side)
Watchdog Timer	Programmable via S/W from 0.5 sec. to 255 sec
Hardware Monitoring	System monitor(Voltage, Fan Speed and Temperature)

I/O INTERFACE

Expansion Interface	- From CPU: 1x PCIe x16 or 2x PCIe x8 or 1x PCIe x8 + 2x PCIe x4 by jumper seng (Gen3 up to 8.0 GT/s) - From PCH: 1x PCIe x4 or 4x PCIe x1 by different bios support (Gen 3 up to 8.0 GT/s) - 4x PCI devices at 32bit 33MHz
Super I/O (Embedded Controller)	ITE IT5121E-I-128
Audio	- Intel® PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC886 HDA codec, 7.1 channels - one on board audio pin header
Ethernet	- Intel® WGI219LM + WGI225LM Gigabit Ethernet controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T Ethernet - PCI Express x1 interface based on Gigabit Ethernet - Dual RJ-45 connectors with two LED indicators
Serial Port	- 2x RS-232 ports - 2x RS-232/422/485 ports selectable - LPC to COM port IC: Fintek F81216DG
USB	- 4x USB 2.0 ports (through backplane) 480Mb/s bus capable of high-speed/full-speed/low-speed data ranges - 5Gbps bus capable of high-speed/ full-speed/low-speed data ranges - 10Gbps bus capable of high-speed/ full-speed/low-speed data ranges
Keyboard & Mouse	- 2x USB 3.1 ports on bracket dedicated to keyboard & mouse - 1x 10 pin box header for external PS/2 KB & MS
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

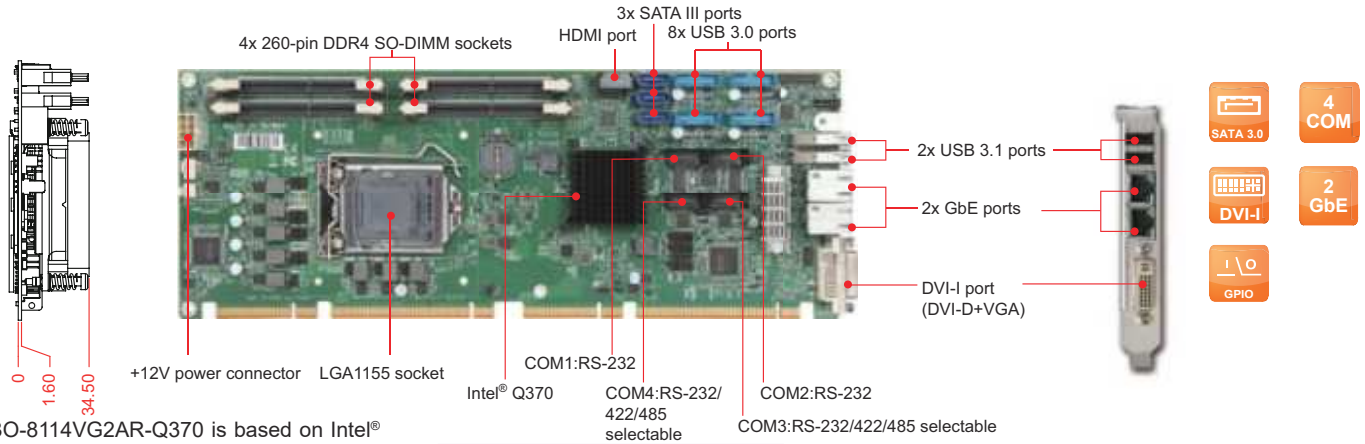
Graphic Controller	- Intel® Xeon® and Core™ i3 processors integrated graphics engine - Provides improved 3D multimedia capabilities including Microso DirectX 12, OCL 2.x and OpenGL 4.3/4.4
Display Interface	Support independent triple display by - VGA on bracket: Resolution up to 1920x1200 @ 60Hz - DVI-D on bracket: up to 1920x1200 @ 60Hz (VGA + DVI-D on bracket by DVI-I port) - HDMI on board: up to 3200x2000 @ 60Hz

Mechanical & Environment

Dimension	- 338.5mm(L) x 126.39mm(W), 13.33"(L) x 4.98"(W) - PCB: 8 layers
Power Supply	- Typical: +12V, +5V - Support ATX mode
Environment	- Operation Temperature: 0~60°C - Storage Temperature: -20~80°C - Relative Humidity: 5~95%, non-condensing

ROBO-8114VG2AR-Q370

Intel® Core™ i3/i5/i7 Pentium /Celeron® processor based on PICMG 1.3 SHB with DDR4 SDRAM, HDMI, DVI-I, Dual Gigabit Ethernet,Audio and USB



ROBO-8114VG2AR-Q370 is based on Intel® Q370 chipset and desktop processors. Built with flexible PCI express expansions, ROBO-8114VG2AR-Q370 is suitable for Medical, Industrial automation.

FEATURES

- Supports Intel® Core™ i3/i5/i7/Pentium®/ Celeron® processors in LGA 1151 package
- Delivers up to 128GB maximum DDR4 2133 Non-ECC SO-DIMM on four sockets
- Supports mutiple display by DVI-I(DVI-D+VGA)and HDMI
- High speed dual Gigabit Ethernet based on PCI express x 1, high bandwidth I/O interface
- Rich I/O connections such as four serials ports,USB 3.0/3.1, SATA III ports
- Support on board TPM2.0

ORDERING GUIDE

AB1-3J29	**ROBO-8114VG2AR-Q370** PICMG 1.3(PCI-E+PCI).LGA1151. Q370 PCH. Intel Core i5/i7 processors.SHB.w/ VGA/Dual GbE/Audio/four COM ports

PACKING LIST

Standard	TBD Installation CD
	B6902352 dual head COM port cable with bracket
	B6903351 DVI-D + VGA cable
	B8981980 PICMG SBC Handling and Installation Notice
	B6902932 SATA III cable
Optional	B6903090 USB 3.0 cable with bracket
	B6902980 PS/2 Keyboard / Mouse Cable with bracket
	B6902230 USB port cable with bracket

GENERAL

Processor	- Intel® Core™ i3/i5/i7/ Pentium/ Celeron® processors up to 3.6 GHz(35~95W) in LGA-1151 package - DMI x4 Link: 5.0GT/s - Support Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring, Trusted Execution and SpeedStep Technology (depends on CPU sku)
Chipset	Intel® Q370 PCH
BIOS	AMI UEFI BIOS (SPI ROM)
Memory	- Supports up to 128GB DDR4 2133 SDRAM on four 260-pin SO-DIMM sockets - Supports non-ECC
Storage Devices	- 5x SATAIII drives (Dual ports via Backplane) - Supports RAID 0, 1, 5, 10 - 1x M.2 Type M 2280 (on bottom side)
Watchdog Timer	Programmable via S/W from 0.5 sec. to 255 sec
Hardware Monitoring	System monitor(Voltage, Fan Speed and Temperature)

I/O INTERFACE

Expansion Interface	- From CPU: 1x PCIe x16 or 2x PCIe x8 or 1x PCIe x8 + 2x PCIe x4 by jumper settinng (Gen3 up to 8.0 GT/s) - From PCH: 1x PCIe x4 or 4x PCIe x1 by different bios support (Gen 3 up to 8.0 GT/s) - 4x PCI devices at 32bit 33MHz
Super I/O (Embedded Controller)	ITE IT5121E-I-128
Audio	- Intel® PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC886 HDA codec, 7.1 channels - one on board audio pin header
Ethernet	- Intel® WGI219LM + WGI225LM Gigabit Ethernet controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T Ethernet - PCI Express x1 interface based on Gigabit Ethernet - Dual RJ-45 connectors with two LED indicators
Serial Port	- 2x RS-232 ports - 2x RS-232/422/485 ports selectable - LPC to COM port IC: Fintek F81216DG
USB	- 4x USB 2.0 ports (through backplane) 480Mb/s bus capable of high-speed/full-speed/low-speed data ranges - 8x USB 3.0 ports on board 5Gbps bus capable of high-speed/ full-speed/low-speed data ranges - 2x USB 3.1 ports on bracket 10Gbps bus capable of high-speed/ full-speed/low-speed data ranges
Keyboard & Mouse	- 2x USB 3.1 ports on bracket dedicated to keyboard & mouse - 1x 10 pin box header for external PS/2 KB & MS
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

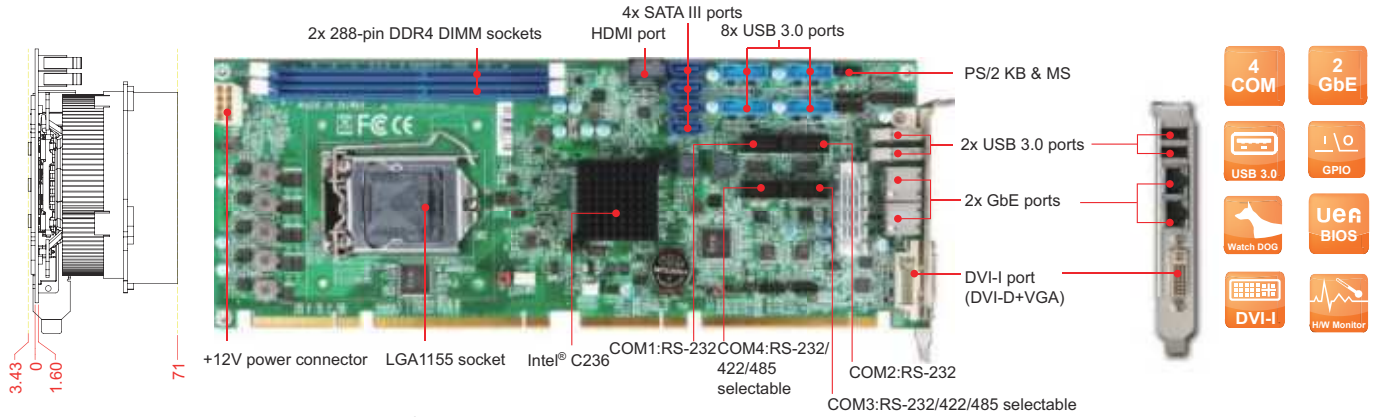
Graphic Controller	- Intel® Core i3™ processors integrated graphics engine - Provides improved 3D multimedia capabilities including Microso DirectX 12, OCL 2.x and OpenGL 4.3/4.4
Display Interface	Support independent triple display by - VGA on bracket: Resolution up to 1920x1200 @ 60Hz - DVI-D on bracket: up to 1920x1200 @ 60Hz (VGA + DVI-D on bracket by DVI-I port) - HDMI on board: up to 3200x2000 @ 60Hz

Mechanical & Environment

Dimension	- 338.5mm(L) x 126.39mm(W), 13.33"(L) x 4.98"(W) - PCB: 8 layers
Power Supply	- Typical: +12V, +5V - Support ATX mode
Environment	- Operation Temperature: 0~60°C - Storage Temperature: -20~80°C - Relative Humidity: 5~95%, non-condensing

ROBO-8113VG2AR

Intel® Xeon® E3/ Core™ i3/i5/i7 Pentium®/ Celeron® processor based on PICMG 1.3 SHB with DDR4 SDRAM, HDMI, DVI-I, Dual Gigabit Ethernet, Audio and USB



ROBO-8113VG2AR is based on Intel® C236 chipset and workstation processors. Built with flexible PCI express expansions, ROBO-8113VG2AR is suitable for Medical, Industrial automation, and Digital Signage application.

FEATURES

- Supports Intel® 7th and 6th Gen Skylake-S Kaby Lake-S Xeon®/Core™ i3/i5/i7/ Pentium®/Celeron® processors in LGA 1151 package
- Delivers up to 32GB maximum DDR4 2133 ECC DIMM on two sockets
- Supports mutiple display by DVI-I(DVI-D+VGA) and HDMI
- High speed dual Gigabit Ethernet based on PCI express x 1, high bandwidth I/O interface
- Rich I/O connections such as four serials ports, USB 3.0/2.0, SATA III ports
- Support on board TPM2.0

ORDERING GUIDE

AB1-3D40	**(R).ROBO-8113VG2AR** PICMG 1.3(PCI-E+PCI).LGA1151. Intel® Xeon®/Core™ i3 processors.SHB.w/VGA/ Dual GbE/Audio/four COM ports
AB1-3G68	**(R).ROBO-8113VG2AR-KBL** PICMG 1.3(PCI-E+PCI).LGA1151. Intel® Xeon®/Core™ i3 processors.SHB.w/VGA/ Dual GbE/Audio/four COM ports

PACKING LIST

Standard	B6902932 SATA III cable
	B8981980 PICMG SBC Handling and Installation Notice
	B6903351 DVI-D + VGA cable
	B6902352 dual head COM port cable with bracket
	B8983660 Installation CD
Optional	B6902980 PS/2 Keyboard / Mouse Cable with bracket
	B6902230 USB port cable with bracket
	B6903090 USB 3.0 cable with bracket

GENERAL

Processor	- Intel® Xeon® E3-1200v5/v6 series / Core™ i3/i5/i7/Pentium®/Celeron® processors up to 3.6 GHz (35~80W) with (8MB) Cache in LGA-1151 package - DMI x4 Link: 5.0GT/s - Support Intel® Turbo Boost , Hyper-Threading, Virtualization, Thermal Monitoring,Trusted Execution and SpeedStep Technology (depends on CPU sku)
Chipset	Intel® C236 PCH
BIOS	AMI UEFI BIOS (SPI ROM)
Memory	- Supports up to 32GB DDR4 2133/1866 SDRAM on two 288-pin DIMM sockets - Supports ECC
Storage Devices	- 6x SATAIII drives (Dual ports via Backplane) - RAID 0, 1, 5, 10
Watchdog Timer	Programmable via S/W from 0.5 sec. to 254.5 sec
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)
Expansion Interface	- From CPU (Xeon®/Core™ i3): 1x PCIe x16 or 2x PCIe x8 or 1x PCIe x8 + 2x PCIe x4 by jumper setting (Gen3 up to 8.0 GT/s) - From PCH:1x PCIe x4 or 4x PCIe x1 by different bios support (Gen 3 up to 8.0 GT/s) - 4x PCI devices at 32bit 33MHz

I/O INTERFACE

Embedded Controller	ITE IT8528E
Audio	- Intel® PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC886-GR HDA codec, 5.1 channels - one on- board audio pin header
Ethernet	- Intel® WGI219LM + WGI210AT Gigabit Ethernet controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T Ethernet - PCI Express x1 interface based on Gigabit Ethernet - Dual RJ-45 connector with two LED indicators
Serial Port	- 2x RS-232 ports - 2x RS-232/422/485 selectable - LPC to COM port IC: Fintek F81216DG
USB	- 4x USB 2.0 ports (through backplane) - 480Mb/s bus capable of high-speed/full-speed/low-speed data ranges - 10x USB 3.0 ports on board (eight ports on board, dual ports on bracket) - 5Gbps bus capable of high-speed/ full-speed/low-speed data ranges
Keyboard & Mouse	- 2x USB 3.0 ports on bracket dedicated to keyboard & mouse (on bracket) - 1x 10 pin box header for external PS/2 KB & MS
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

Graphic Controller	- Intel® Xeon® and Core™ i3 processors integrated graphics engine - Provides improved 3D multimedia capabilities including Microsoft DirectX 12, OCL 2.x and OpenGL 4.3/4.4
Display Interface	- Support independent triple display by - CRT on bracket: Resolution up to 1920x1200 @ 60Hz - DVI-D on bracket: up to 1920x1200 @ 60Hz (CRT + DVI-D on bracket by DVI-I port) - HDMI: up to 4096x2160 @ 24Hz

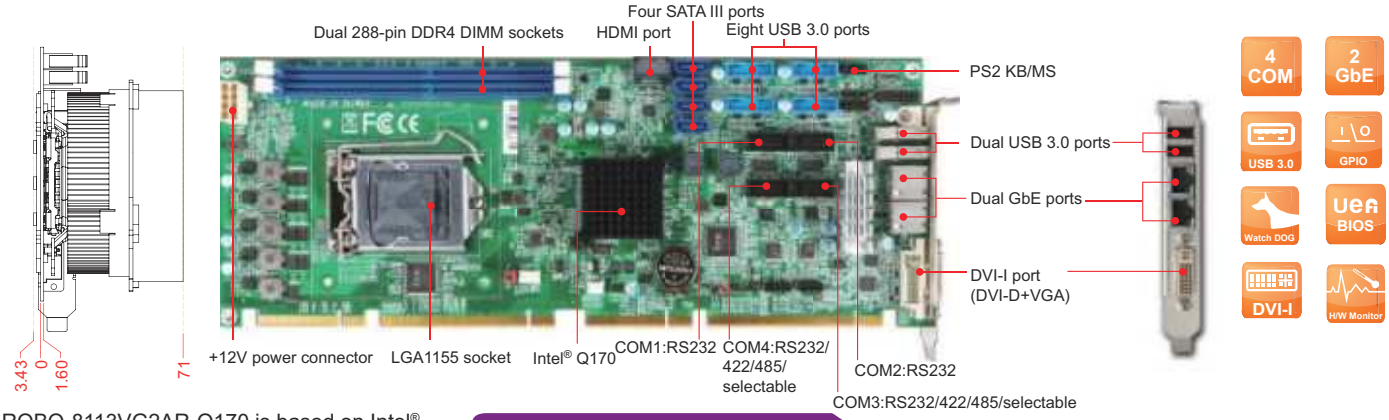
Mechanical & Environment

Dimension	- 338.5mm(L) x 126.39mm(W), 13.33"(L) x 4.98"" (W) - PCB: 8 layers
Power Supply	- Typical: +12V, +5V - Support ATX mode
Environment	- Operatin Temperature:0~60°C - Storage Temperature:-20~80°C - Relative Humidity:5~90%,non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C

Windows 10 IoT

ROBO-8113VG2AR-Q170

Intel® Core™ i3/i5/i7 Pentium®/Celeron® processor based on PICMG 1.3 SHB with DDR4 SDRAM, HDMI, DVI-I, Dual Gigabit Ethernet, Audio and USB



ROBO-8113VG2AR-Q170 is based on Intel® Q170 chipset and desktop processors. Built with flexible PCI express expansions, ROBO-8113VG2AR is suitable for Medical, Industrial automation, and Digital Signage application.

FEATURES

- Supports Intel® 7th and 6th Gen Skylake-S Kaby Lake-S Core™ i3/i5/i7/Pentium®/ Celeron® processors in LGA 1151 package
- Delivers up tp 32GB maximum DDR4 2133 MT/s non-ECC DIMM on two sockets
- Supports mutiple display by DVI-I(DVI-D+VGA)and HDMI
- High speed dual Gigabit Ethernet based on PCI express x 1, high bandwidth I/O interface
- On-board 6x SATA III ports
- Rich I/O connections such as four serials ports, USB 3.0/2.0, SATA III ports
- Support on board TPM 2.0

ORDERING GUIDE

AB1-3D41	**(R).ROBO-8113VG2AR-Q170** PICMG 1.3(PCI-E+PCI).LGA1151. Intel® Xeon®/Core™ i3 processors.SHB.w/VGA/ Dual GbE/Audio/four COM ports
AB1-3G67	**(R).ROBO-8113VG2AR-Q170-KBL** PICMG 1.3(PCI-E+PCI).LGA1151. Intel® Xeon®/Core™ i3 processors.SHB.w/VGA/ Dual GbE/Audio/four COM ports

PACKING LIST

Standard	B6902932 SATA III cable
	B8981980 PICMG SBC Handling and Installation Notice
	B6903351 DVI-D + VGA cable
	B6902352 dual head COM port cable with bracket
	B8983660 Installation CD
Optional	B6902980 PS/2 Keyboard / Mouse Cable with bracket
	B6902230 USB port cable with bracket
	B6903090 USB 3.0 cable with bracket

GENERAL

Processor	- Intel® Core™ i3/i5/i7 Pentium®/Celeron® processors up to 3.4 GHz (35~65W) with (8MB) Cache in LGA-1151 package - DMI x4 Link: 5.0GT/s - Support Intel® Turbo Boost , Hyper-Threading, Virtualization, Thermal Monitoring,Trusted Execution and SpeedStep Technology (depends on CPU sku)
Chipset	Intel® Q170 PCH
BIOS	AMI UFEI BIOS (SPI ROM)
Memory	- Supports up to 32GB DDR4 2133/1866 SDRAM on two 288-pin DIMM sockets - Supports non-ECC
Storage Devices	- 6x SATAIII drives (Dual ports via Backplane) - RAID 0, 1, 5, 10
Watchdog Timer	Programmable via S/W from 0.5 sec. to 254.5 sec
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)
Expansion Interface	- From CPU (Core™ i5/i7): 1x PCIe x16 or 2x PCIe x8 or 1x PCIe x8 + 2x PCIe x4 by jumper setting (Gen3 up to 8.0 GT/s) - From PCH:1x PCIe x4 or 4x PCIe x1 by different bios support (Gen 3 up to 8.0 GT/s) - 4x PCI devices at 32bit 33MHz

I/O INTERFACE

Embedded Controller	ITE IT8528E
Audio	- Intel® PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC886-GR HDA codec, 5.1 channels - one on- board audio pin header
Ethernet	- Intel® WGI219LM + WGI210AT Gigabit Ethernet controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T Ethernet - PCI Express x1 interface based on Gigabit Ethernet - Dual RJ-45 connector with two LED indicators
Serial Port	- 2x RS-232 ports - 2x RS-232/422/485 selectable - LPC to COM port IC: Fintek F81216DG
USB	- 4x USB 2.0 ports (through backplane) - 480Mb/s bus capable of high-speed/full-speed/low-speed data ranges - 10x USB 3.0 ports on board (eight ports on board, dual ports on bracket) - 5Gbps bus capable of high-speed/ full-speed/low-speed data ranges
Keyboard & Mouse	- 2x USB 3.0 ports on bracket dedicated to keyboard & mouse (on bracket) - 1x 10 pin box header for external PS/2 KB & MS
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

Graphic Controller	- Intel® Core™ i5/i7 processors integrated graphics engine - Provides improved 3D multimedia capabilities including Microsoft DirectX 12, OCL 2.x and OpenGL 4.3/4.4
Display Interface	- Support independent triple display by - CRT on bracket: up to 1920x1200 @ 60Hz - DVI-D on bracket: up to 1920x1200 @ 60Hz (CRT + DVI-D on bracket by DVI-I port) - HDMI: up to 4096x2160 @ 24Hz

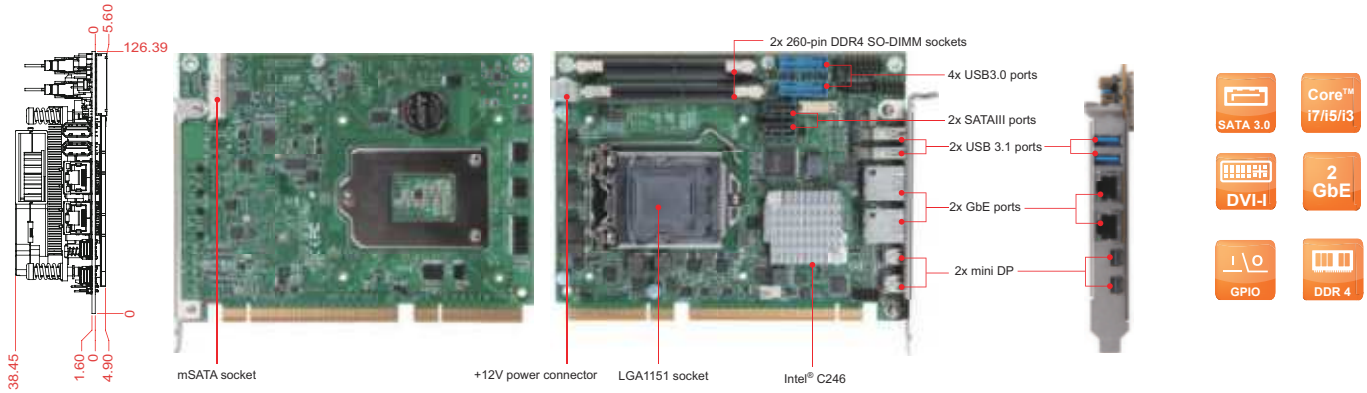
Mechanical & Environment

Dimension	- 338.5mm(L) x 126.39mm(W), 13.33"(L) x 4.98"" (W) - PCB: 8 layers
Power Supply	- Typical: +12V, +5V - Support ATX mode
Environment	- Operatin Temperature:0°C~60°C - Storage Temperature:-20°C~80°C - Relative Humidity:5~90%,non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C

Windows 10 IoT

ROBO-6912VG2AR

Intel® Core™ i3/i5/i7/Pentium® Celeron®/Xeon® E Family processor based on PICMG 1.3 half size SHB with DDR4 SO-DIMM, mini DP,DVI-D, Dual Gigabit Ethernet, SATAIII, mSATA, Audio, USB.



ROBO-6912VG2AR is based on Intel® C246 chipset to support both Intel® Xeon® and Core™ i3/i5/i7 processors. Built with flexible PCI express expansions, ROBO-6912VG2AR is suitable for Medical, Industrial automation, and Digital Signage application.

FEATURES

- Support Intel® 8th Gen Coffee Lake-S processor in LGA1151
- Delivers up tp 32GB maximum DDR4 2400 MT/s ECC SO-DIMM on two sockets
- High speed dual Gigabit Ethernet based on PCI express x 1, high bandwidth I/O interface
- On-board two SATAIII ports, support RAID 0, 1

ORDERING GUIDE

AB1-3J42	**(R).ROBO-6912VG2AR** PICMG 1.3(PCI-E+PCI).LGA1151. C246 PCH. IntelXeon/Core i3 processors.SHB.w/ DVI-D/miniDP*2/Dual GbE/Audio/USB 3.1/ COM

PACKING LIST

Standard	B8983650 Installation CD
	B8981980 PICMG SBC Handling and Installation Notice
	B6902932 SATA III cable
Optional	B6903090 USB 3.0 cable with bracket
	B6902230 USB port cable with bracket

GENERAL

Processor	- Intel® Core™ i3/i5/i7 Pentium®/Celeron®/ Xeon® processors up to 3.4 GHz (35~65W) with Cache in LGA-1151 package
Chipset	Intel® C246
BIOS	AMI UFEI BIOS (SPI ROM)
Memory	- Supports up to 32GB DDR4-2400MT/s SDRAM on two 260-pin ECC SO-DIMM sockets - Supports ECC
Storage Devices	- 2x SATAIII ports - 1x mSATA socket
Watchdog Timer	Programmable via S/W from 0.5 sec. to 255 sec
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)

I/O INTERFACE

Expansion Interface	- 1x PCIe x16 or 2x PCIe x8 or 1x PCIe x8 + 2x PCIe x4 by jumper setting or BIOS (Gen3 up to 8.0 GT/s) - 1x PCIe x4 or 4x PCIe x1 by different BIOS support (Gen3 up to 8.0 GT/s)
Super I/O (Embedded Controller)	IT5121E-I
Audio	- Realtek ALC888S-VD2-GR HDA codec, 7.1 channels - one on-board audio pin header
Ethernet	- Intel® WGI219LM + WGI225LM Gigabit Ethernet controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T Ethernet - PCI Express x1 interface based on Gigabit Ethernet - Dual RJ-45 connector with two LED indicators
Serial Port	- 1x RS-232/422/485 selectable by bios
USB	- 4x USB3.0 ports - 2x USB3.1 Gen 2 ports on bracket
Keyboard & Mouse	2x USB3.1 ports on bracket dedicated to keyboard & mouse
GPIO	N/A

DISPLAY

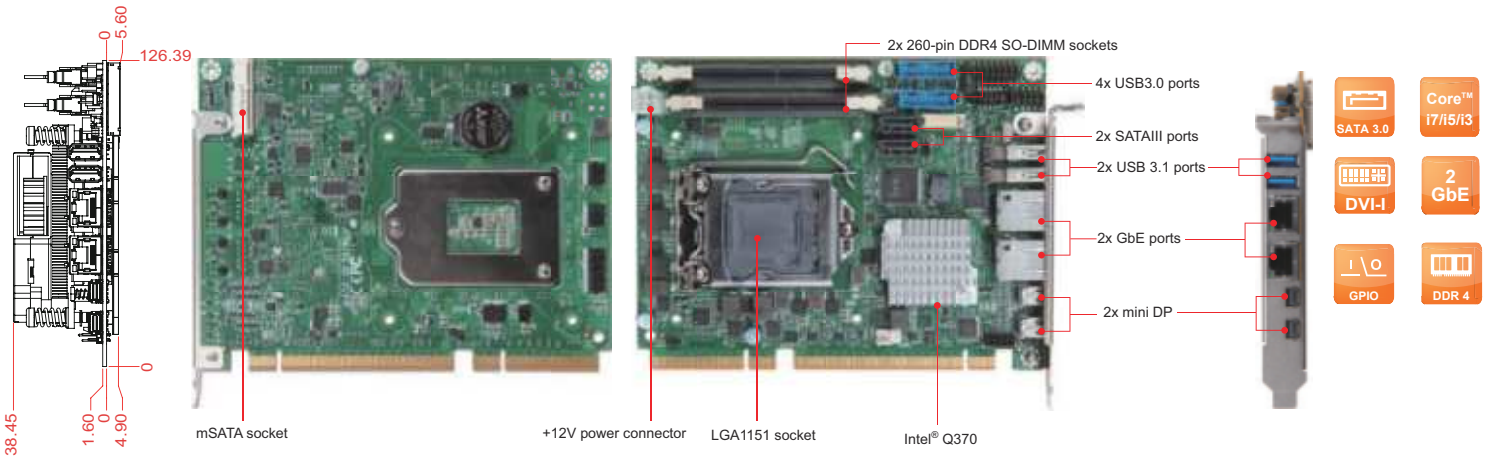
Graphic Controller	Intel® Coffee-Lake-S processors integrated graphics engine
Display Interface	-- DVI-D on board: up to 1920x1600 @ 60Hz - mini DP: two ports on bracket up to 4096x2304 @ 60Hz

Mechanical & Environment

Dimension	- 167.64mm(L) x 126.39mm(W), 6.6" (L) x 4.98"(W) - PCB: 12 Layers
Power Supply	- Typical: +12V, +5V - Support ATX mode
Environment	- Operation Temperature:0°C~60°C - Storage Temperature:-20°C~80°C - Relative Humidity:5~95%,non-condensing

ROBO-6912VG2AR-Q370

Intel® Core™ i3/i5/i7/Pentium® Celeron® processor based on PICMG 1.3 halfsize SHB with DDR4 SO-DIMM, mini DP, DVI-D,Dual Gigabit Ethernet, SATAIII, mSATA, Audio, USB



ROBO-6912VG2AR-Q370 is based on Intel® Q370 chipset to support Intel® Core™ i3/i5/i7 processors. Built with flexible PCI express expansions, ROBO-6912VG2AR-Q370 is suitable for Medical, Industrial automation, and Digital Signage application

FEATURES

- Support Intel® 8th Gen Coffee Lake-S processor in LGA1151
- Delivers up tp 32GB maximum DDR4 2400 MT/s non-ECC SO-DIMM on two sockets
- High speed dual Gigabit Ethernet based on PCI express x 1, high bandwidth I/O interface
- On-board two SATAIII ports, support RAID 0, 1

ORDERING GUIDE

AB1-3J43	**(R).ROBO-6912VG2AR-Q370** PICMG 1.3(PCI-E+PCI).LGA1151. Q370 PCH. Intel Core i5/i7 processors.SHB. w/ DVI-D/miniDP*2/Dual GbE/Audio/USB 3.1/ COM

PACKING LIST

Standard	B8981980 PICMG SBC Handling and Installation Notice
	B6902932 SATA III cable
	B8983650 Installation CD
Optional	B6902230 USB port cable with bracket
	B6903090 USB 3.0 cable with bracket

GENERAL

Processor	- Intel® Core™ i3/i5/i7 Pentium®/Celeron® processors up to 3.4 GHz (35~65W) with Cache in LGA-1151 package
Chipset	Intel® Q370
BIOS	AMI UFEI BIOS (SPI ROM)
Memory	- Supports up to 32GB DDR4-2400MT/s SDRAM on two 260-pin non-ECC SO-DIMM sockets
Storage Devices	- 2x SATAIII ports - 1x mSATA socket
Watchdog Timer	Programmable via S/W from 0.5 sec. to 255 sec
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)

I/O INTERFACE

Expansion Interface	- 1x PCIe x16 or 2x PCIe x8 or 1x PCIe x8 + 2x PCIe x4 by jumper setting or BIOS (Gen3 up to 8.0 GT/s) - 1x PCIe x4 or 4x PCIe x1 by different bios support (Gen 3 up to 8.0 GT/s)
Super I/O (Embedded Controller)	IT5121E-I
Audio	- Realtek ALC888S-VD2-GR HDA codec, 7.1 channels - one on-board audio pin header
Ethernet	- Intel® WGI219LM + WGI225LM Gigabit Ethernet controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T Ethernet - PCI Express x1 interface based on Gigabit Ethernet - Dual RJ-45 connector with two LED indicators
Serial Port	- 1x RS-232/422/485 selectable by BIOS
USB	- 4x USB3.0 ports - 2x USB3.1 Gen 2 ports on bracket
Keyboard & Mouse	2x USB3.1 ports on bracket dedicated to keyboard & mouse
GPIO	N/A

DISPLAY

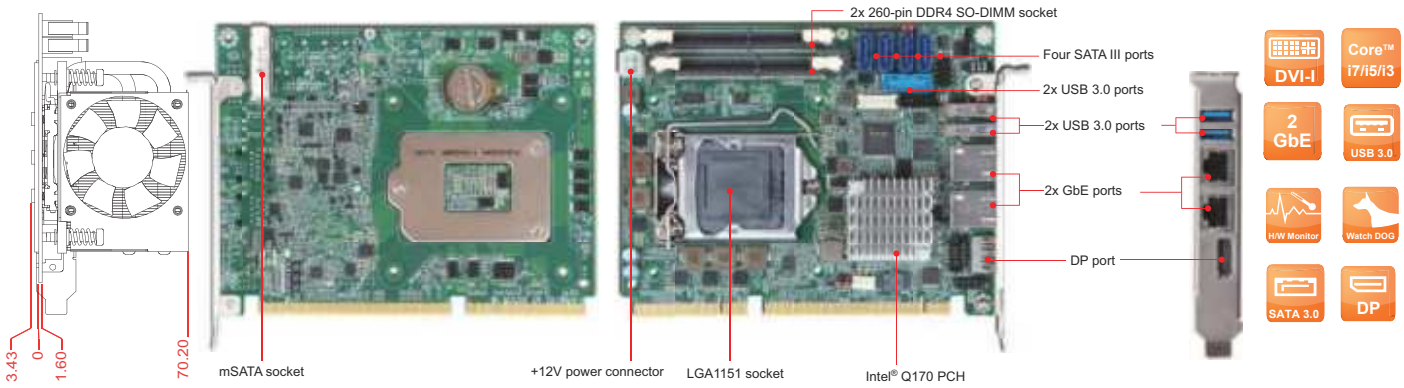
Graphic Controller	Intel® Coffee-Lake-S processors integrated graphics engine
Display Interface	- DVI-D on board: up to 1920x1600 @ 60Hz - mini DP: two ports on bracket up to 4096x2304 @ 60Hz

Mechanical & Environment

Dimension	- 167.64mm(L) x 126.39mm(W), 6.6" (L) x 4.98"(W) - PCB: 12 Layers
Power Supply	- Typical: +12V, +5V - Support ATX mode
Environment	- Operation Temperature:0°C~60°C - Storage Temperature:-20°C~80°C - Relative Humidity:5~95%,non-condensing

ROBO-6911VG2AR

Intel® Xeon® E3/Core™ i3/i5/i7/ Pentium®/Celeron® processor based on PICMG 1.3 half size SHB with DDR4 SO-DIMM, DP, DVI-I, Dual Gigabit Ethernet, mSATA, Audio, USB



ROBO-6911VG2AR is based on Intel® C236/ Q170 chipset to support both Intel® Xeon® and Core™ i3 processors. Built with flexible PCI express expansions, ROBO-6911VG2AR is suitable for Medical, Industrial automation, and Digital Signage application.

FEATURES

- Support Intel® 7th and 6th Gen Skylake-S Kaby Lake-S processor in LGA1151
- Delivers up tp 32GB maximum DDR4 2133 MT/s ECC SO-DIMM on two sockets
- Supports mutiple display by DP on bracket and on-board DVI-I(DVI-D+VGA)
- High speed dual Gigabit Ethernet based on PCI express x 1, high bandwidth I/O interface
- On-board four SATAIII ports, support RAID 0, 1, 5, 10

ORDERING GUIDE

AB1-3D38	**(R).ROBO-6911VG2AR** PICMG 1.3 half size (PCI-E) .LGA1151. Intel® Xeon®/Core™ i3 processors.SHB.w/ DP/DVI-I/Dual GbE/Audio/mSATA
AB1-3G66	**(R).ROBO-6911VG2AR-KBL** PICMG 1.3 half size (PCI-E) .LGA1151. Intel® Xeon®/Core™ i3 processors.SHB.w/ DP/DVI-I/Dual GbE/Audio/mSATA

PACKING LIST

Standard	B6902932 SATA III cable
	B8981980 PICMG SBC Handling and Installation Notice
	B8983650 Installation CD
Optional	B6902230 USB port cable with bracket
	B6903090 USB 3.0 cable with bracket

GENERAL

Processor	- Intel® Xeon® E3-1200v5/v6 series / Core™ i3/i5/i7/Pentium®/Celeron® processors up to 3.6 GHz (35~80W) with (8MB) Cache in LGA-1151 package - DMI x4 Link: 5.0GT/s - Support Intel® Turbo Boost , Hyper-Threading, Virtualization, Thermal Monitoring,Trusted Execution and SpeedStep Technology (depends on CPU sku)
Chipset	Intel® C236
BIOS	AMI UFEI BIOS (SPI ROM)
Memory	- Supports up to 32GB DDR4 2133/1066 MT/s SDRAM on two 260-pin ECC or non ECC SO-DIMM sockets - Supports ECC
Storage Devices	4x SATAIII ports 1x mSATA socket
Watchdog Timer	Programmable via S/W from 0.5 sec. to 254.5 sec
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)
Expansion Interface	- 1x PCIe x16 or 2x PCIe x8 or 1x PCIe x8 + 2x PCIe x4 by jumper setting (Gen3 up to 8.0 GT/s) - 1x PCIe x4 or 4x PCIe x1 by different bios support (Gen 3 up to 8.0 GT/s)

I/O INTERFACE

Super I/O	ITE IT8772E
Audio	- Intel® PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC886-GR HDA codec, 5.1 channels - one on-board audio pin header
Ethernet	- Intel® WGI219LM + WGI210AT Gigabit Ethernet controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T Ethernet - PCI Express x1 interface based on Gigabit Ethernet - Dual RJ-45 connector with two LED indicators
Serial Port	- 1x RS-232/422/485 selectable by bios
USB	- 4x USB3.0 ports (2 ports on bracket)
Keyboard & Mouse	2x USB3.0 ports on bracket dedicated to KB & MS
GPIO	N/A

DISPLAY

Graphic Controller	Intel® 6th Skylake-S processors integrated graphics engine
Display Interface	Support independent triple display by - CRT on bracket:up to 1920x1200 @ 60Hz - DVI-D on bracket: up to 1920x1200 @ 60Hz (CRT+ DVI-D by on-board connector) - DP: up to 4096X2304@60Hz (on bracket)

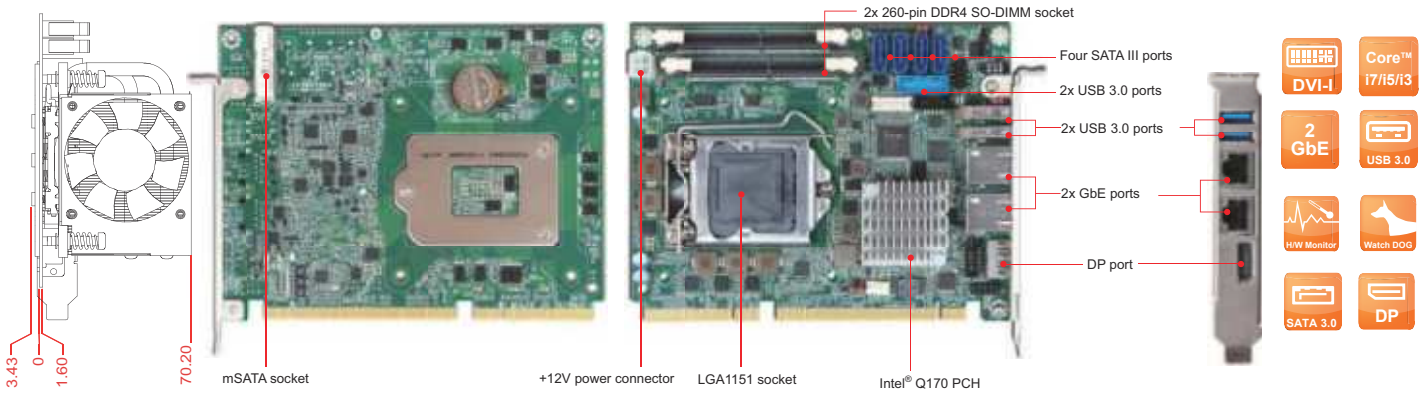
Mechanical & Environment

Dimension	167.64mm(L) x 126.39mm(W), 6.6" (L) x 4.98"(W) -PCB: 12 Layers
Power Supply	Typical: +12V, +5VSB -Support ATX mode
Environment	Operatin Temperature:0°C~60°C -Storage Temperature:-20°C~80°C -Relative Humidity:5~90%,non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C

Windows 10 IoT

ROBO-6911VG2AR-Q170

Intel® Core™ i3/i5/i7/Pentium®/Celeron® processor based on PICMG 1.3 half size SHB with DDR4 SO-DIMM, DP, DVI-I, Dual Gigabit Ethernet, mSATA, Audio, USB



ROBO-6911VG2AR-Q170 is based on Intel® Q170 chipset to support Core™ i5 and i7 processors. Built with flexible PCI express expansions, ROBO-6911VG2AR-Q170 is suitable for Medical, Industrial automation, and Digital Signage application.

FEATURES

- Support Intel® 7th and 6th Gen Skylake-S Kaby Lake-S processor in LGA1151
- Delivers up tp 32GB maximum DDR4 2133 MT/s non-ECC SO-DIMM on two sockets
- Supports mutiple display by DP on bracket and on-board DVI-I(DVI-D+VGA)
- High speed dual Gigabit Ethernet based on PCI express x 1, high bandwidth I/O interface
- On-board four SATAIII ports, support RAID 0, 1, 5, 10

ORDERING GUIDE

AB1-3D39	**(R).ROBO-6911VG2AR-Q170** PICMG 1.3 half size (PCI-E) .LGA1151. Intel® i5/i7 processors.SHB.w/DP/DVI-I/Dual GbE/Audio/mSATA
AB1-3G65	**(R).ROBO-6911VG2AR-Q170-KBL** PICMG 1.3 half size (PCI-E) .LGA1151. Intel® i5/i7 processors.SHB.w/DP/DVI-I/Dual GbE/Audio/mSATA

PACKING LIST

Standard	B6902932 SATA III cable
	B8981980 PICMG SBC Handling and Installation Notice
	B8983650 Installation CD
Optional	B6902230 USB port cable with bracket
	B6903090 USB 3.0 cable with bracket

GENERAL

Processor	- Intel® Core™ i3/i5/i7 Pentium®/Celeron® processors up to 3.4 GHz (35~65W) with (8MB) Cache in LGA-1151 package - DMI x4 Link: 5.0GT/s - Support Intel® Turbo Boost , Hyper-Threading, Virtualization, Thermal Monitoring,Trusted Execution and SpeedStep Technology (depends on CPU sku)
Chipset	Intel® Q170
BIOS	AMI UFEI BIOS (SPI ROM)
Memory	- Supports up to 32GB DDR4 2133/1866 MT/s SDRAM on two 260-pin ECC or non ECC SO-DIMM sockets - Supports non-ECC
Storage Devices	4x SATAIII ports 1x mSATA socket
Watchdog Timer	Programmable via S/W from 0.5 sec. to 254.5 sec
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)
Expansion Interface	- 1x PCIe x16 or 2x PCIe x8 or 1x PCIe x8 + 2x PCIe x4 by jumper setting (Gen3 up to 8.0 GT/s) - 1x PCIe x4 or 4x PCIe x1 by different bios support (Gen 3 up to 8.0 GT/s)

I/O INTERFACE

Super I/O	ITE IT8772E
Audio	- Intel® PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC886-GR HDA codec, 5.1 channels - one on-board audio pin header
Ethernet	- Intel® WGI219LM + WGI210AT Gigabit Ethernet controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T Ethernet - PCI Express x1 interface based on Gigabit Ethernet - Dual RJ-45 connector with two LED indicators
Serial Port	- 1x RS-232/422/485 selectable by bios
USB	- 4x USB3.0 ports (2 ports on bracket)
Keyboard & Mouse	2x USB3.0 ports on bracket dedicated to KB & MS
GPIO	N/A

DISPLAY

Graphic Controller	Intel ® 6th Skylake-S processors integrated graphics engine
Display Interface	Support independent triple display by - CRT on bracket:up to 1920x1200 @ 60Hz - DVI-D on bracket:up to 1920x1200 @ 60Hz (CRT+ DVI-D by on-board connector) - DP: up to 4096X2304@60Hz (on bracket)

Mechanical & Environment

Dimension	167.64mm(L) x 126.39mm(W), 6.6"(L) x 4.98"(W) -PCB: 12 layers
Power Supply	Typical: +12V, +5VSB -Support ATX mode
Environment	Operatin Temperature:0°C~60°C -Storage Temperature:-20°C~80°C -Relative Humidity:5~90%,non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C

Windows 10 IoT

PICMG 1.3 Backplane Matrix Table

		PCI Express				PCI-X	PCI
		x16 slot	x8 slot	x4 slot	x1 slot		
Server Grade	PBPE-19AG64	1 [x8]	1 [x4]			16	
	PBPE-14AD64		1	1		8	3
	PBPE-06V464			1		4	
	PBPE-08P41	2 [x8]	1 [x4]				4
	PBPE-06A364	2 [x8]				2	1
	PBPE-06P2	2 [x8]	1 [x4]				2
Non-Server Grade	PBPE-13A4	1 + 2 [x1]		5 [x1]			4
	PBPE-12P4	1 [x8]	2 [x4]	4 [x1]			4
	PBPE-11A3	1 + 2 [x8]	4 [x1]				3
	PBPE-13A8	1			3		8
	PBPE-12A9	1	1 [x4]				9
	PBPE-12AA64	1				8	2
	PBPE-06V3	1	1 [x4]				3
	PBPE-06V	1			4		
	PBPE-07P4	1	1 [x4]	1			4
	PBPE-05A364	1				2	1
	PBPE-06P4		1 [x4]				4
	PBPE-06P3	1		1			3

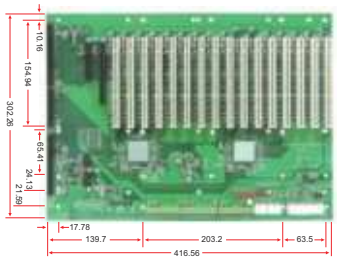
*Remark: [ ]→means real signal, ex. [x4] is for x4 signal but slot may not be x4 slot; [x8] is for x8 signal but slot may not be x8 slot

		ROBO-8120	ROBO-8113	ROBO-8113	ROBO-8112	ROBO-8112	ROBO-8111	ROBO-8111	ROBO-8110	ROBO-8110	ROBO-8210
		3420	C236	Q170	C226	Q87	C216	Q77	C206	Q67	QM57
Server Grade	PBPE-19AG64	✿	✿	✿	✿		✿		✿		
	PBPE-14AD64	✿	✿	✿	✿		✿		✿		
	PBPE-06V464	✿	✿	✿	✿		✿		✿		
	PBPE-08P41	✿	✿	✿	✿		✿		✿		
	PBPE-06A364	✿	✿	✿	✿		✿		✿		
	PBPE-06P2	✿	✿	✿	✿		✿		✿		
Non-Server Grade	PBPE-13A4	✿	✿	✿	✿	✿	✿	✿	✿	✿	✿
	PBPE-12P4		✿	✿	✿		✿		✿		
	PBPE-11A3	✿	✿	✿	✿	✿	✿	✿	✿	✿	✿
	PBPE-13A8	✿	✿	✿	✿	✿	✿	✿	✿	✿	✿
	PBPE-12A9	✿	✿	✿	✿	✿	✿	✿	✿	✿	✿
	PBPE-12AA64	✿	✿	✿	✿	✿	✿	✿	✿	✿	✿
	PBPE-06V3	✿	✿	✿	✿	✿	✿	✿	✿	✿	✿
	PBPE-06V	✿	✿	✿	✿	✿	✿	✿	✿	✿	✿
	PBPE-07P4	✿	✿	✿	✿	✿	✿	✿	✿	✿	✿
	PBPE-05A364	✿	✿	✿	✿	✿	✿	✿	✿	✿	✿
	PBPE-06P4	✿	✿	✿	✿	✿	✿	✿	✿	✿	✿
	PBPE-06P3	✿	✿	✿	✿	✿	✿	✿	✿	✿	✿

PICMG 1.3 Backplane

PICMG 1.3 BACKPLANE

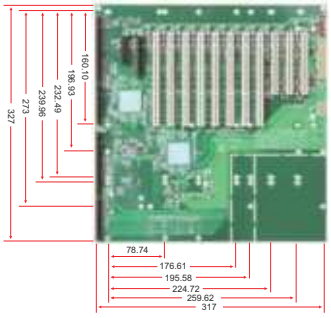
Server Grade Backplane



PBPE-19AG64

19-slot [PCIe x16 (1, x8 signal), PCIe x8 (1, x4 signal), PCI-X (16)]

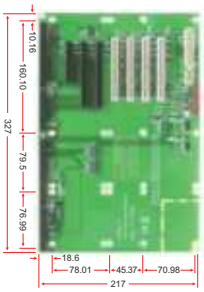
- Fit for 4U up chassis
- Four PCI-X buses support 16 PCI-X expansion slots



PBPE-14AD64

14-slot [PCIe x8 (1,x4 signal), PCIe x8 (1), PCI-X (8), PCI (3)]

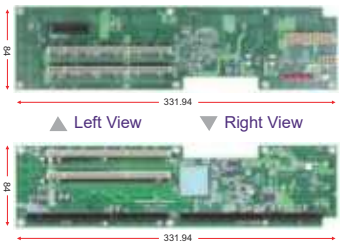
- Fit for 4U chassis
- Four PCI-X buses support eight PCI-X expansion slots



PBPE-08P41

8-slot [PCIe x8 (1, x4 signal), PCIe x16 (2, x8 signal), PCI (4)]

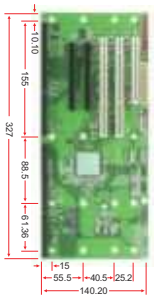
- Fit for Node chassis
- Four USB ports



PBPE-06V464

Vertical 6-slot [PCIe x4 (1), PCI-X (4)]

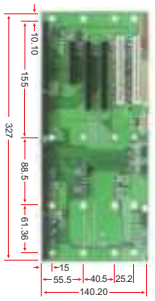
- Fit for 2U chassis
- Dual PCI-X buses support four PCI-X slots



PBPE-06A364

6-slot [PCIe x16 (2, x8 signal), PCI-X (2), PCI (1)]

- Fit for Node chassis
- Four USB ports
- Dual SATA ports
- Two PCI-X buses support two PCI-X expansion slot

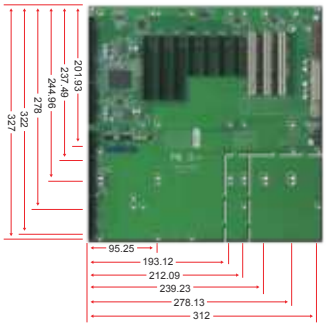


PBPE-06P2

6-slot [PCIe x8 (1, x4 signal), PCIe x16 (2, x8 signal), PCI (2)]

- Fit for Node chassis
- Four USB ports

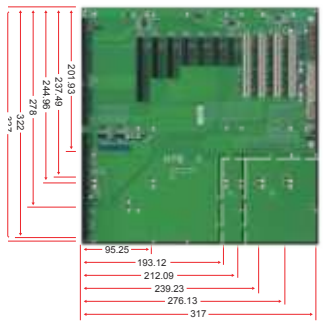
Non-Server Grade Backplane



PBPE-11A3

11-Slot [PCIe x16(1), PCIe x16 (2, x8 signal), PCIe x8 (4, x1 signal), PCI (3)]

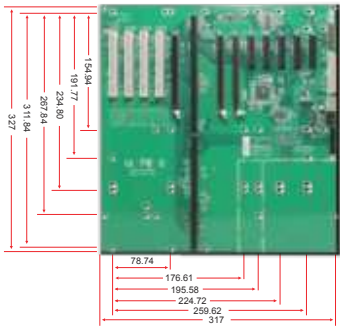
- Fit for 4U Chassis
- Four USB ports
- Two SATA ports
- Support PCIe Gen3 with ROBO-8112/8113 series



PBPE-12P4

12-Slot [PCIe x16 (1, x8 signal), PCIe x8 (2, x4 signal), PCIe x4 (4, x1 signal), PCI (4)]

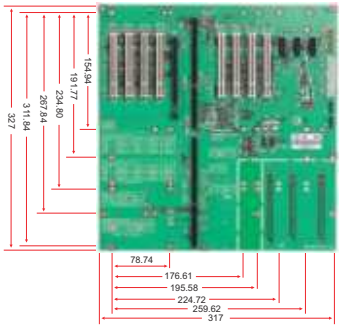
- Fit for 4U Chassis
- Four USB ports
- Two SATA ports
- Support PCIe Gen3 with ROBO-8112/8113 series



PBPE-13A4

13-slot [PCIe x16(1), PCIe x16(2, x1 signal), PCIe x4(5, x1 signal), PCI (4)]

- Fit for 4U chassis
- Four USB 2.0 ports
- Dual SATA II ports

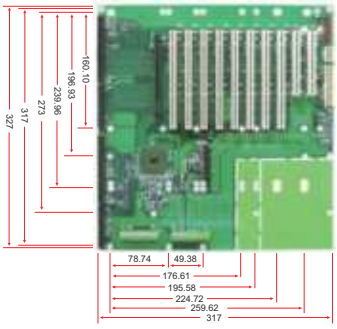


PBPE-13A8

13-slot [PCIe x1 (3), PCIe x16 (1), PCI (8)]

- Fit for 4U chassis
- Four USB ports
- Dual SATA ports
- 24-pin ESP12V power connector

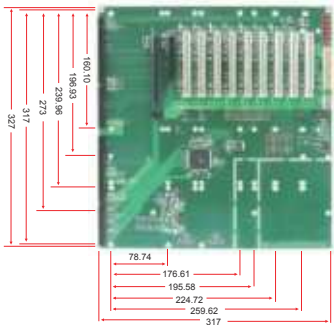
PICMG 1.3 Backplane



PBPE-12AA64

12-slot [PCI-X (8), PCIe x16 (1), PCI (2)]

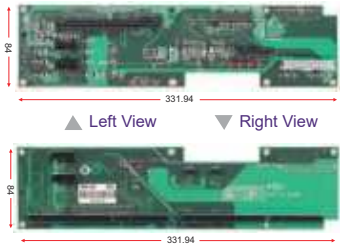
- Fit for 4U chassis
- Four USB ports
- Dual SATA ports
- Two PCI-X buses support eight PCI-X expansion slot



PBPE-12A9

12-slot [PCIe x16 (1), PCIe x8 (1, x4 signal), PCI (9)]

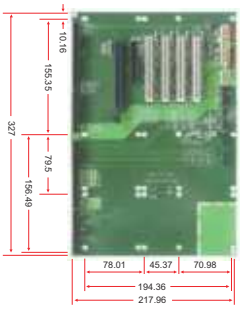
- Fit for 4U chassis
- Four USB ports
- Dual SATA ports



PBPE-06V

Vertical 6-slot [PCIe x1 (4), PCIe x16 (1)]

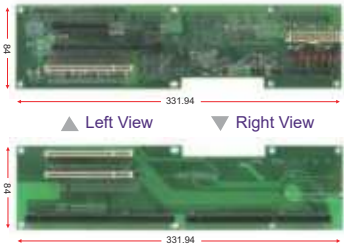
- Fit for 2U chassis
- Four USB ports
- Dual SATA ports
- 24-pin ESP 12V power connector



PBPE-07P4

7-slot [PCIe x8 (1, x4 signal), PCIe x16 (1), PCI (4)]

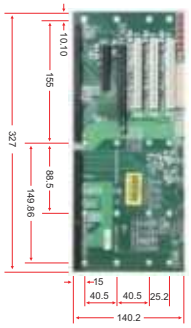
- Fit for Node chassis
- Four USB ports
- Dual SATA ports



PBPE-06V3

Vertical 6-slot [PCIe x8 (1, x4 signal), PCIe x16 (1), PCI (3)]

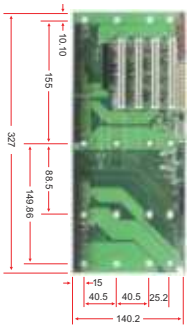
- Fit for 2U chassis
- Four USB ports
- Dual SATA ports



PBPE-06P3

6-slot [PCIe x16 (1), PCIe x4 (1), PCI (3)]

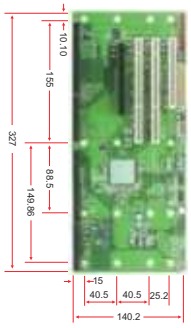
- Fit for Node chassis
- Four USB ports
- Dual SATA ports



PBPE-06P4

6-slot [PCIe x8 (1, x4 signal), PCI (4)]

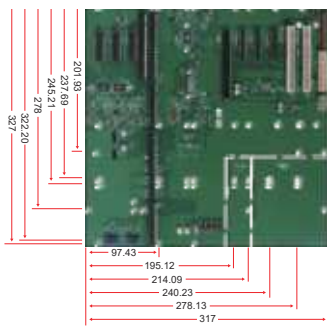
- Fit for Node chassis
- Four USB ports
- Dual SATA ports



PBPE-05A364

5-slot [PCIe x16 (1), PCI-X (2), PCI (1)]

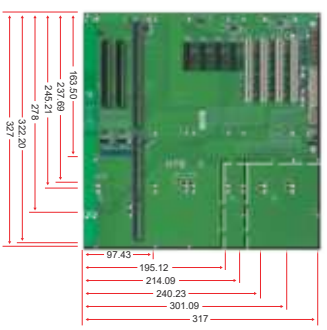
- Fit for Node chassis
- Four USB ports
- Dual SATA ports
- Two PCI-X buses support two PCI-X expansion slot



PBPE-10P2

10-slot [PCIe x16 (1), PCIe x4 (3, x4 signal), PCIe x4(3, x1 signal), PCI(2)]

- Fit for 4U Chassis
- Four USB ports
- Two SATA ports
- Support PCIe Gen5 with ROBO-8116 series



PBPE-11P4

11-slot [PCIe x16 (2, 1x16 or 2x8 signal), PCIe x4(4, x1 signal), PCI(4)]

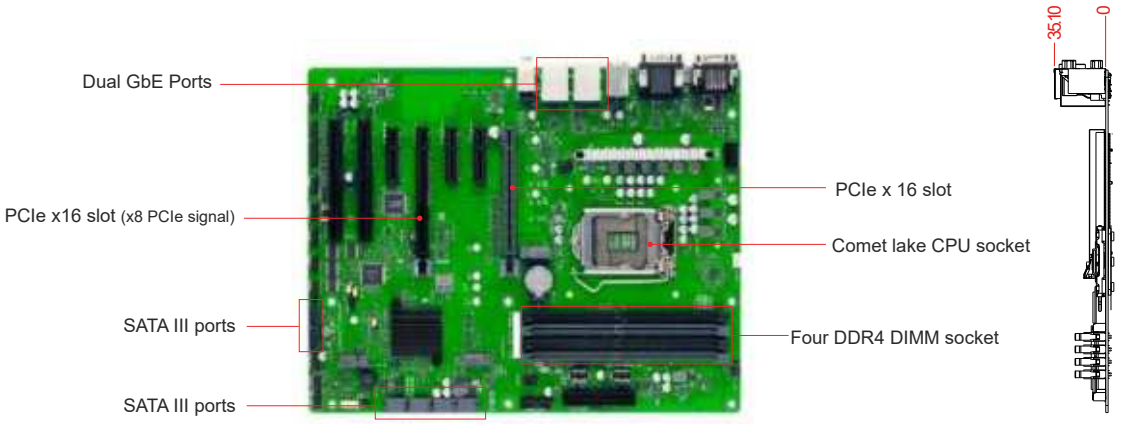
- Fit for 4U Chassis
- Four USB ports
- Two SATA ports
- Support PCIe Gen5 with ROBO-8116 series

IMB Reference Table

MODEL	RUBY-D812-Q470E	RUBY-D811-Q370	RUBY-D718VG2AR
Form Factor	ATX	ATX	ATX
CPU	Intel® CoreTM i3/i5/i7/i9/Pentium®/ Celeron®	Intel® Core™ i3/i5/i7/i9/Pentium®/ Celeron®	Intel® 7th and 6th Gen Core™ Processors CPU in LGA1151 package
Chipset	Intel® Q470E	Intel® Q370	Intel® Q170/H110/C236
BIOS	AMI UEFI	AMI UEFI	AMI UEFI
Memory	4 x DDR4 DIMM up to 128GB	4 x DDR4 DIMM up to 128GB	4x DDR4 DIMM up to 64GB
Expansion	2x PCIe x16 (1 x PCIe x8 signal) 3x PCIe x4 slots 2x PCI slots	2x PCIe x16 (1 x PCIe x8 signal) 3x PCIe x4 slots 2x PCIe x1 slots	4x PCI slots 1x PCIe x16 slot 2x PCIe x4 slots
Display	VGA/Dual DP/HDMI	VGA/Dual DP/HDMI	VGA/DVI-D/HDMI
Audio	Realtek ALC897 HDA codec	Realtek ALC887 HDA codec	Realtek ALC886 HDA codec
LAN	2x GbE	2x GbE	2x GbE
Serial Port	4x RS-232 ports 2x RS-232/422/485	8x RS-232 ports 2x RS-232/422/485	1x RS-232/422/485 5x RS-232
USB	4x USB3.2 Gen2 2x USB3.2 Gen1 4x USB2.0	6x USB3.2 Gen1 6x USB2.0	6x USB3.0 8x USB2.0
Storage Devices	6x SATAIII ports (port1 /port2 shared with M.2 Key M)	6x SATA III (SATAI shared with M.2 Key M)	6x SATA III (C236 supports 8x SATA III)
GPIO	8 bit	8 bit	8 bit
Others	N/A	N/A	PS/2 KB & MS
Dimension	304.8 x 243.8mm	304.8 x 243.8mm	304.8 x 243.8mm
Page	28	29	30

RUBY-D812-Q470E

Support D esktop Intel® 10th Gen Core™ Processors ATX wi th DDR4 Long- DI MM up to 128Gb , VGA 2x DP port, HDMI ,Dual GbE LAN, Six COM Ports

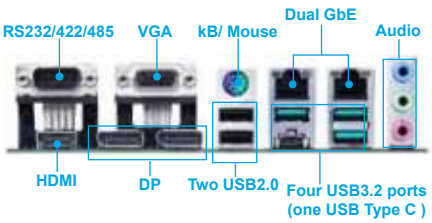


RUBY -D812 is based on Intel® Q470E chip-set and Desktop processors including Intel® 10th Gen Core™ i3/i5/i7 SKU. This board supports DDR4, PCIe 4.0, and SATAIII. Those features helpyou to build high perfor-mance and stabile system

FEATURES

- Intel®10th Gen Core™ Processors support
- Four Long-DIMM suppo rt DDR4 Non-ECC DRAM up to 128GB
- Support dual Ethernet, 6x COM Ports, 6x USB 3.2 Ports , 6x SATA III Ports and Audio
- Two PCIe x16 (1x PCIe x8 signal),threePCIe x4, two PCI slot, one M.2 (Type B) , one M.2(Key E)for Wireless, one M.2(Key M)for SSD

REAR I/O



ORDERING GUIDE

AB1-3L60	(R).RUBY-D812-Q470E.ATX ESB.Q470E w/o ECC LGA1200.w/DDR4 /VGA/Dual DP/HDMI Dual GbE/COM/Audio/USB

PACKING LIST

One RUBY-D812-Q470E Main board
One I/O shield
One SATA cable
One CPU coolor bracket

GENERAL

Processor	Intel® 10th Gen Core™ Processors CPU in LGA1200 package
Chipset	Intel® Q470E
BIOS	AMI uEFI BIOS
Memory	Support up to 128GB DDR4 2400/2666/2933 Non-ECC on four Long-DIMM socket
Storage Devices	6x SATAIII ports(port1 /port2 shared with M.2 Key M)
Watchdog Timer	Programmable watchdog timer, time out period from 1 sec to 255 secs
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)
Expansion Interface	- 2x PCIe x16 (1x PCIe x8 signal) - 3x PCIe x4 slots , 2x PCI slots - 1x M.2 (Key M) for SSD , 1x M.2(Key E) for Wireless, 1x M.2(Key B) for 4G/5G module

I/O INTERFACE

Super I/O	NCT6116D
Audio	Audio Jack on rear I/O with Line-out / Mic-in with Realtek ALC897 Audio controller
Ethernet	Intel® I219LM(1G) and Intel® I225V(2.5G) Ethernet controller 2x RJ45 connectors on rear I/O
Serial Port	2x RS232/422/485 port one on REAR I/O , one on board header 4x RS232 port on pin header
USB	4x USB3.2 (Gen2) on rear I/O(3x Type A + 1x Type C), 2x USB3.2(Gen1) on pin header 2x USB2.0 on pin header, 2x vertical connectors
GPIO	8-bit configurable controlled by embedded controller

DISPLAY

Graphic Controller	Intel® graphic UHD 630 supports DirectX 12, OpenGL 4.5
Display Interface	- DP:Two DP port on rear I/O, resolution up to 4K (4096x2160@60Hz) - VGA:One VGA port on rear I/O resolution up to 1920x1200 - HDMI:One HDMI connector on rear I/O, resolution up to 4096x2160@ 30Hz

Mechanical & Environment

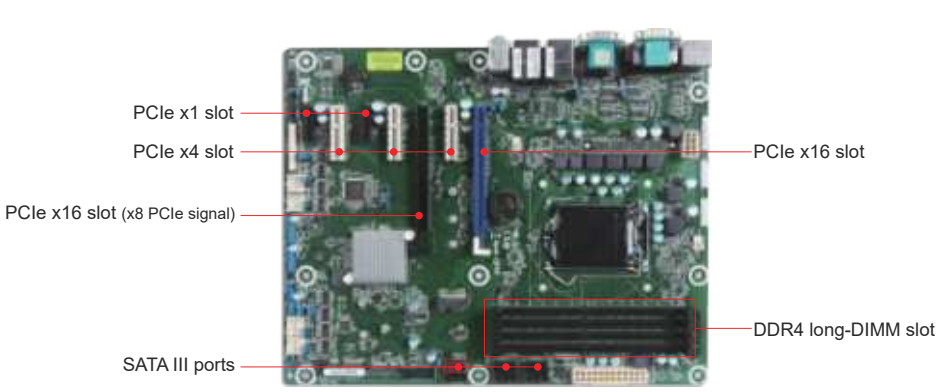
Dimension	304.8mm(L) x 243.8mm(W) x 1.6mm(H)
Power Supply	ATX power input
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
MTBF	Over 100,000 hours at 40°C

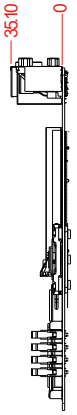
AMI BIOS · USB 3.0 · Watch DOG · H/W Monitor · 2 GbE · M2 · VGA · SATA 6Gb · GPIO · DP · Core™ i7/i5/i3

FC CE RoHS Windows 10 IoT intel partner IoT Industrial Specialist

RUBY-D811-Q370

Leading Desktop Intel® 8th/9th Gen Core™ Processors ATX with DDR4 Long-DIMM up to 128G, VGA ,Dual DP ports,HDMI ,Two GbE LAN ports, Ten COM Ports



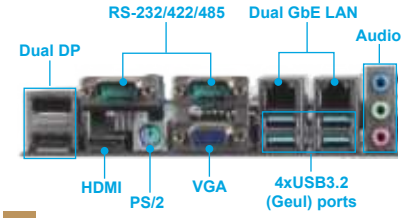


RUBY-D811-Q370 is based on Intel® Q370 chipset and Desktop processors including Intel® 8th/9th Gen Core™ i3/i5/i7 SKU. This board supports DDR4, PCIe 3.0, and SATA III.Those features help you to build high performance and stabile system.

FEATURES

- Intel® 8th/9th Gen Core™ Processors support
- Supports four Long- DIMMs suppor t DDR4 Non-ECC SDRAM up to 128GB
- Supports dual Ethernet, ten COM Ports, six USB3.0 Ports, six SATA III Ports and Audio
- Supports Two PCIe x16 (1x PCIe x8 signal), three PCIe x4 slot, two PCIex1 slot ,one M.2 Type E socket for Wireless,one M.2 Type M socket for SSD, and one mini-PCIe slot

REAR I/O



ORDERING GUIDE

AB1-3D29	(R).RUBY-D811-Q370 ATX ESB.Q370 w/o ECC LGA1151.w/ DDR4 /VGA/Dual DP/Dual GbE/COM/ Audio/USB

PACKING LIST

One RUBY-D811-Q370 Main board
One I/O shield
One Installation CD
One SATA cable
One CPU coolor bracket

GENERAL

Processor	Intel® 8th/9th Gen Core™ Processors CPU in LGA1151 package
Chipset	Intel® Q370
BIOS	AMI uEFI BIOS
Memory	Supports up to 128GB DDR4 2400/2666MHz Non-ECC SDRAM on four Long-DIMM socket
Storage Devices	Supports six SATA III ports(one is shared with M.2 Key M)
Watchdog Timer	Programmable watchdog timer, time out period from 1 sec to 255 secs.
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)
Expansion Interface	- 2x PCIe x16 (1 x PCIe x8 signal) - 3x PCIe x4 slots - 2x PCIe x1 slots - 1x M.2 Type E socket for Wireless - 1x M.2 Type M socket for SSD - 1x mini-PCIe socket

I/O INTERFACE

Super I/O	NCT5104D
Audio	- Realtek AL887 High Definition Audio integrated in Intel SoC - Audio Jack on rear I/O with Line-in/ Line-out/ Mic-in
Ethernet	- Intel® I219LM & I210AT Ethernet controller - 2x RJ45 connectors on rear I/O
Serial Port	- 2x RS-232/422/485 ports on REAR I/O - 8x RS-232 ports on board pin header
USB	- 4x USB3.0 on rear I/O,2x USB3.0 in pin header - 6x USB2.0 on board pin header
Keyboard & Mouse	PS/2 Keyboard & Mouse Pin Header
GPIO	8-bit configurable controlled by embedded controller

DISPLAY

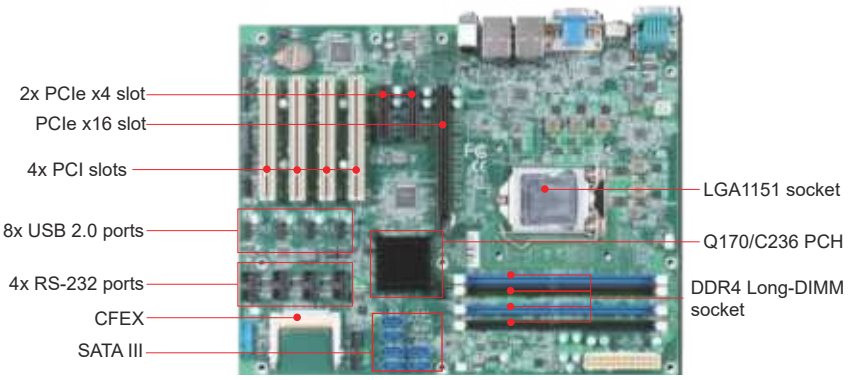
Graphic Controller	- Intel® UHD Graphics 630 supports DirectX 12, OpenGL 4.5 - Video decode HW acceleration support for H.264, H.265, MPEG2, VC-1/WMV9, JPEG, VP8, and VP9
Display Interface	- HDMI:HDMI ports on rear I/O, resolution up to 4096x2340 - DPI:Dual DP ports on rear I/O, resolution up to 4K (4096x2340) - VGA:One VGA port on rear I/O, resolutoin up to 1920x1200

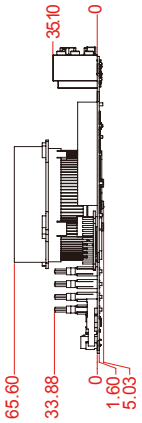
Mechanical & Environment

Dimension	304.8mm(L) x 243.8mm(W)
Power Supply	ATX power input
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C

RUBY-D718VG2AR

Leading Desktop Intel® 7th and 6th Gen Core™ processors (former Kaby Lake/ Skylake) ATX with DDR4 SDRAM, Triple Displays, 2x GbE LAN ports, 6x COM Ports



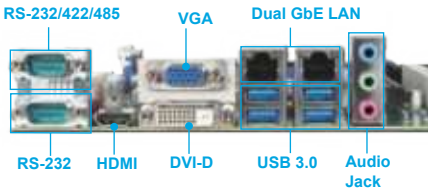


RUBY-D718VG2AR is based on Intel® Q170/ C236 chipset and desktop processor SKU like Intel® 7th and 6th Gen Core™ i3, i5 and i7 Processors. Built with PCI and PCIe expansions, it's suitable for Medical, Industrial automation, and Digital Signage application.

FEATURES

- Intel® 7th and 6th Gen Core™ Processors support
- 4x Long-DIMMs support DDR4 ECC(C236) / Non-ECC(Q170) SDRAM up to 64GB
- 1x PCIe x16, 2x PCIe x4, 4x PCI slots

REAR I/O



ORDERING GUIDE

AB1-3D29	(R).RUBY-D718VG2AR ATX.IMB.LGA1151.CPU.Q170.DDR4/VGA/ HDMI/DVI/Dual GbE/COM/Audio/USB
AB1-3D77	(R).RUBY-D718VG2AR-C236 ATX.IMB.LGA1151.CPU.C236.DDR4/VGA/ HDMI/DVI/Dual GbE/COM/Audio/USB
AB1-3G14	(R).RUBY-D718VG2AR-kBL ATX.IMB.LGA1151.CPU.Q170.DDR4/VGA/ HDMI/DVI/Dual GbE/COM/Audio/USB
AB1-3G15	(R).RUBY-D718VG2AR-C236-kBL ATX.IMB.LGA1151.CPU.Q170.DDR4/VGA/ HDMI/DVI/Dual GbE/COM/Audio/USB

PACKING LIST

One RUBY-D718VG2AR ATX Industrial Main Board
One Installation DVD
One SATA III cable
One I/O shield

GENERAL

Processor	Intel® 7th and 6th Gen Core™ Processors in LGA1151 package
Chipset	Intel® Q170 / C236
BIOS	AMI UEFI BIOS (SPI ROM)
Memory	4x DDR4 1866/2133 MT/s Long-DIMM up to 64GB non-ECC memory
Storage Devices	6x SATA III ports (C236 Supports 8x SATAIII ports)
Watchdog Timer	Programmable by embedded controller
Hardware Monitoring	System monitor voltage, fan speed, and temperature
Expansion Interface	- 1x PCIe 3.0 x16 slot - 2x PCIe 3.0 x4 slot - 4x PCI devices at 32 bit 33 MHz

I/O INTERFACE

Super I/O	N/A
Audio	- Realtek ALC886 HDAcodec - Audio jack on rear I/O with Line-out/ Line-in/ Mic-in
Ethernet	- Intel® I219LM and Intel® I210AT Ethernet controller - 2x RJ45 connectors on rear I/O
Serial Port	- 1x RS-232/422/485 on rear I/O - 1x RS-232 on rear I/O - 4x RS-232 on pin header
USB	- 4x USB 3.0 ports on rear I/O - 2x USB 3.0 ports on pin header - 8x USB 2.0 ports on pin header
Keyboard & Mouse	PS/2 Keyboard & Mouse Pin Header
GPIO	8-bit configurable controlled by embedded controller
Other	Option TPM module with LPC pin header

DISPLAY

Graphic Controller	Intel® Gen 9 graphic engine supports DirectX 12, OpenGL 4.4
Display Interface	- DVI-D: 1x DVI-D port on rear I/O, up to 1920x1200@60Hz - HDMI: 1x HDMI port on rear I/O, up to 4096x2160 @ 24Hz - VGA: 1x VGA port on rear I/O, up to 1920x1200 @ 60Hz

Mechanical & Environment

Dimension	304.8mm(L) x 243.8mm(W)
Power Supply	24-pin Pin ATX power input
Environment	- Operation temperature: 0°C~60°C - Storage temperature: -20°C~80°C - Relative humidity: 5%~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 120,000 hours at 40°C

Small Form Factor Reference Table

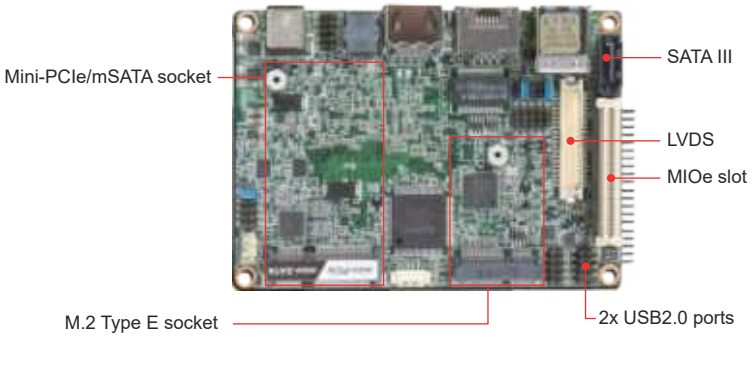


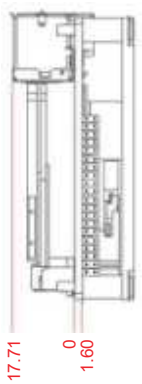


MODEL	PICO-6260	WUX-3350	WUX-3455	WUX-4200	PEB-2773
Form Factor	PICO-ITX	Intel® NUC board	Intel® NUC board	Intel® NUC board	3.5”
CPU	Intel® Atom® E3900 Family	Intel® Celeron® processor N3350	Intel® Celeron® processor J3455	Intel® Pentium® processor N4200	Intel® Atom® E3900 Family
Chipset	Integrated	Integrated	Integrated	Integrated	Integrated
BIOS	AMI UEFI	AMI UEFI BIOS	AMI UEFI BIOS	AMI UEFI BIOS	AMI UEFI
Memory	1x DDR3L SO-DIMM up to 8GB	2x DDR3L SO-DIMM up to 8GB	2x DDR3L SO-DIMM up to 8GB	2x DDR3L SO-DIMM up to 8GB	1x DDR3L SO-DIMM up to 8GB
Expansion	1x mini-PCIe socket (support mSATA) 1x M.2 Type E slot	1x M.2 socket (E+A key)	1x M.2 socket (E+A key)	1x M.2 socket (E+A key)	2x mini-PCIe socket
Display	LVDS/HDMI	DP/HDMI	DP/HDMI	DP/HDMI	LVDS/DP/HDMI
Audio	Realtek ALC887 HDA codec	Realtek ALC255 HDA codec	Realtek ALC255 HDA codec	Realtek ALC255 HDA codec	Realtek ALC886 HDA codec
LAN	1x GbE	1x GbE	1x GbE	1x GbE	2x GbE
Serial Port	1x RS232/422/485 1x RS232	1x RS232	1x RS232	1x RS232	1x RS-232/422/485 5x RS-232
USB	1x USB3.0 2x USB2.0	4x USB3.0 2x USB2.0	4x USB3.0 2x USB2.0	4x USB3.0 2x USB2.0	6x USB3.0
Storage Devices	1x SATAIII	1x SATAIII port 1X Micro-SD 3.0 socket Support Onboard eMMC 5.0(32G/64G)	1x SATAIII port 1X Micro-SD 3.0 socket Support Onboard eMMC 5.0(32G/64G)	1x SATAIII port 1X Micro-SD 3.0 socket Support Onboard eMMC 5.0(32G/64G)	1x SATA III
GPIO	8-bit	N/A	N/A	N/A	8 bit
Others	N/A	TPM2.0 on board(optional)	TPM2.0 on board(optional)	TPM2.0 on board(optional)	N/A
Dimension	100 x 72mm	101.6 x 101.6mm	101.6 x 101.6mm	101.6 x 101.6mm	146 x 102mm
Page	32	33	34	35	36

PICO-6260

Intel® Apollo Lake Atom® Processor based PICO-ITX embedded Board with DDR3L SDRAM, Gigabit Ethernet, HDMI, LVDS, mini-PCIe socket and 12V



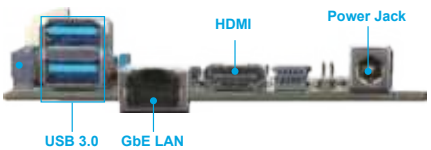


The PICO-6260 is a palm-sized fanless pi-co-ITX motherboard built with the latest 14 nm Intel® Pentium® or Celeron® processor (codename: Apollo Lake SoC).
Support for two USB3.0 ports ensures fast data transmission with low-power con-sumption and support two com ports . Intel® I211AT Gigabit Ethernet controllers provide one Gigabit Ethernet LAN access via the one RJ45 ports. PICO-6260 can design their own unique systems for Panel PC, Kiosk and Digital Signage applications.

FEATURES

- Supports Intel® Apollo Lake series processor
- Supports DD3L-1866/1600 non-ECC memory on one SO-DIMM slots, up to 8GB
- Supports HDMI, and Dual channel 24bit LVDS
- Supports Mini-PCIe / mSATA (Mini-PCIe slot), and M.2 (E Key) socket
- Supports 2*COM ports(COM1 supports RS-232/422/485, COM2 supports RS-232)

REAR I/O



ORDERING GUIDE

AB1-3F84	(R).PICO-6260 Intel® Apolloe Lake SoC on Board.EBC. w/ DDR3L/HDMI/GbE/COM/Audio/USB

GENERAL

Processor	BGA1296 for Intel® Atom® Apollo Lake SoC Processor
Chipset	N/A
BIOS	AMI UEFI BIOS
Memory	Support up to 8GB DDR3L 1333/1600/1866 MH/z SDRAM on one 204 pin SO-DIMM socket
Storage Devices	One SATA III port
Watchdog Timer	Programmable watchdog timer, time out period from 1 sec to 255 secs.
Hardware Monitoring	- Temperature (CPU & System) - Voltage (CPU Vcore,12V, 5V, 3.3V, 1.35V)
Expansion Interface	1x mini-PCIe socket (support mSATA) 1x M.2 Type E slot

I/O INTERFACE

Super I/O	NCT6116D
Audio	- High Definition Audio integrated in Intel® SoC - Realtek ALC887 HDA codec - Supports Mic-in/Line-out on board pin header
Ethernet	- Single Intel® I211AT GbE controller - 1x RJ45 connectors on rear I/O
Serial Port	- 1x RS-232/422/485 with on board pin header - 1x RS-232 with on board pin header
USB	- 1x USB 3.0 ports on rear I/O - 2x USB 2.0 ports on board with pitch 2.0 header
GPIO	8-bit

DISPLAY

Graphic Controller	- Intel® Gen 9 Graphics supports DirectX 12, OpenGL 4.2 / OpenCL 2.0 - Video decode HW acceleration support for H.264, H.265, MPEG2, VC-1/ WMV9, JPEG, VP8, and VP9"
Display Interface	- LVDS: dual channel 24bit LVDS on board connector, up to 1920x1200 - HDMI: on board connector, resolution up to 3840 x2160

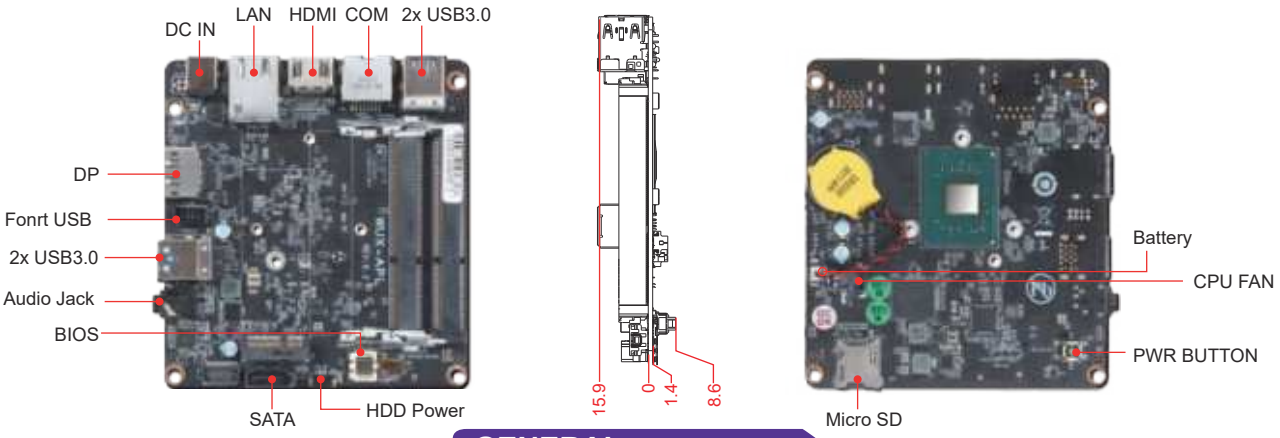
Mechanical & Environment

Dimension	100(L) x 72(W) mm; 3.9"(L) x 2.8"(W)
Power Supply	DC 12V input
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -40°C to 85°C - Relative Humidity: 5% to 95%, non-condensing
MTBF	Over 120,000 hours at 40°C

AMI BIOS | LVDS | HDMI | 2 GbE | Mini-PCIe | FC CE | Windows 10 IoT

WUX-3350

Intel® Apollo Lake Atom® Processor based 4x4-inch mini PC Board with DDR3L SDRAM, Gigabit Ethernet, M.2(E+A key)socket, one COM ports and 12~19V DC input

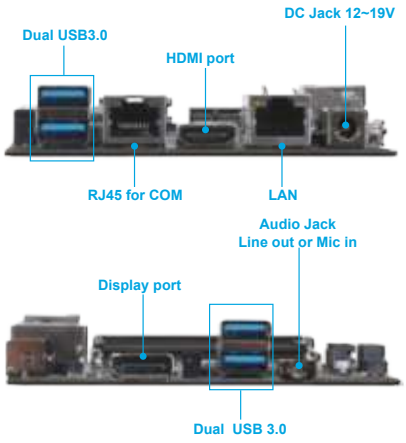


WUX-3350 builds on Intel® Atom Apollo Lake SoC and takes advantages of Intel® Celeron Processor support dual channel DDR3L memory. Support one Gigabit Ethernet port and one M.2 socket and wide voltage of power input from 12V to 19V

FEATURES

- Supports DDR3 1866/1600 MHz non-ECC SDRAM on two SODIMM slots, up to 8GB
- Supports Dual displays including DP and HDMI up to UHD resolution
- Supports one M.2(E+A key)slot, one SATAIII port and one Micro SD 3.0 socket
- Supports wide voltage of DC power input from 12V~19V

REAR I/O



ORDERING GUIDE

ABC-3007	(R).WUX-3350-WS. Intel N3350.USB. HDMI. LAN. Audio & 32G eMMC
ABC-3005	(R).WUX-3350. Intel N3350.USB. HDMI. LAN. Audio & 32G eMMC

GENERAL

Processor	Intel® Celeron® N3350, 2 cores, 1.1GHz/2.4GHz, 6W TDP
Chipset	Integrated
BIOS	AMI UEFI BIOS
Memory	- DDR3L 1866/1600 MHz memory - Dual 204-pin SODIMM sockets, up to 8GB
Storage Devices	- 1x SATA III - 1x microSD 3.0 - On-board eMMC 5.0 flash (32GB /64GB)
Watchdog Timer	Programmable watchdog timer from 1 sec. to 255 secs.
Hardware Monitoring	- Temperature (CPU & system) - Voltage (CPU Vcore, 12V, 5V, 3.3V, 1.35V)
Expansion Interface	1x M.2 interface (E+A key) supporting WiFi, Bluetooth, 3G, 4G

I/O INTERFACE

Super I/O	N/A
Audio	- Intel® HD Audio integrated in SoC - Realtek ALC255 HDA codec - Audio jack with Line-out or Mic-in function on rear I/O
Ethernet	1x Realtek RTL8111H with RJ45 connector on rear I/O
Serial Port	1x RS-232 with RJ45 connector on rear I/O
USB	- 4x USB 3.0 ports on rear I/O - 2x USB 2.0 ports on-board with pitch 2.0 header
Keyboard & Mouse	N/A
GPIO	N/A
Other	TPM2.0 on-board (optional)

DISPLAY

Graphic Controller	- Intel® Gen 9 Graphics supporting DirectX 12, OpenGL 4.2,OpenCL 2.0 - HW accelerated video decoding supporting H.264, H.265, MPEG2, VC-1/ WMV9, JPEG, VP8, VP9
Display Interface	- HDMI (1.4b): On-board connector, resolution up to 3840x2160 - DisplayPort (1.2): On-board connector, resolution up to 4096×2160

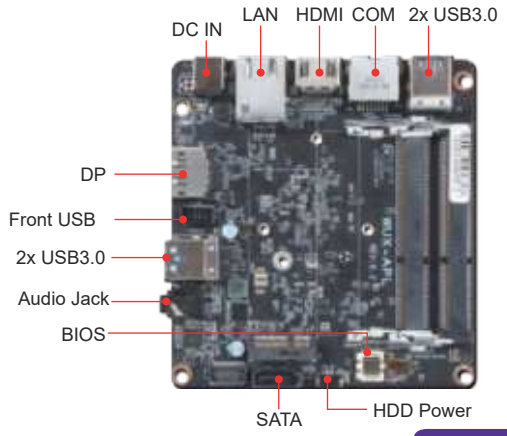
Mechanical & Environment

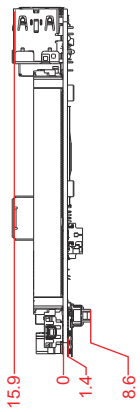
Dimension	101.6(L) x 101.6(W) mm; 4”(L) x 4”(W)
Power Supply	DC 12V~19V input
Environment	- Operating temperature: 0ºC to 60ºC - Storage temperature: -40ºC to 80ºC - Relative humidity: 5%-95%, non-condensing
MTBF	Over 150,000 hours at 40°C

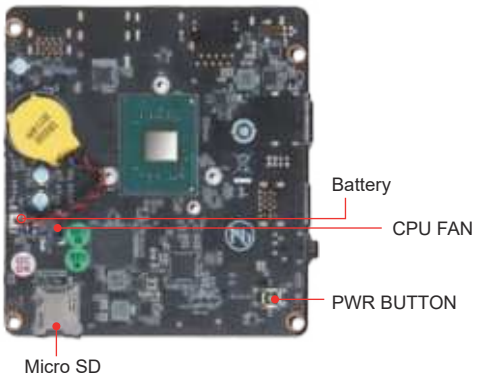
M2 · USB 3.0 · AMI BIOS · HDMI · DP · 1 COM · FC · CE · Windows 10 IoT · intel partner IoT Industrial Specialist · RoHS

WUX-3455

Intel® Apollo Lake Atom® Processor based 4x4-inch mini PC Board with DDR3L SDRAM, Gigabit Ethernet, M.2(E+A key)socket, one COM ports and 12~19V DC input





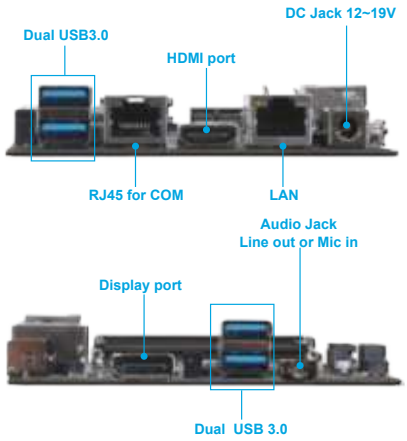


WUX-3455 builds on Intel® Atom Apollo Lake SoC and takes advantages of Intel® Celeron Processor support dual channel DDR3L memory. Support one Gigabit Ethernet port and one M.2 socket and wide voltage of power input from 12V to 19V

FEATURES

- Supports DDR3 1866/1600 MHz non-ECC SDRAM on two SODIMM slots, up to 8GB
- Supports Dual displays including DP and HDMI up to UHD resolution
- Supports one M.2(E+A key)slot, one SATAIII port and one Micro SD 3.0 socket
- Supports wide voltage of DC power input from 12V~19V

REAR I/O



ORDERING GUIDE

ABC-3008	(R).WUX-3455-WS. Intel J3455.USB. HDMI. LAN. Audio & 32G eMMC. Bulk
AB4-A001	(R).WUX-3455. Intel J3455.USB. HDMI. LAN. Audio & 32G eMMC

GENERAL

Processor	Intel® Celeron® J3455, 4 cores, 1.5GHz/2.3GHz, 10W TDP
Chipset	Integrated
BIOS	AMI UEFI BIOS
Memory	- DDR3L 1866/1600 MHz memory - Dual 204-pin SODIMM sockets, up to 8GB
Storage Devices	- 1x SATA III - 1x microSD 3.0 - On-board eMMC 5.0 flash (32GB /64GB)
Watchdog Timer	Programmable watchdog timer from 1 sec. to 255 secs
Hardware Monitoring	- Temperature (CPU & system) - Voltage (CPU Vcore, 12V, 5V, 3.3V, 1.35V)
Expansion Interface	1x M.2 interface (E+A key) supporting WiFi, Bluetooth, 3G, 4G

I/O INTERFACE

Super I/O	N/A
Audio	- Intel® HD Audio integrated in SoC - Realtek ALC255 HDA codec - Audio jack with Line-out or Mic-in function on rear I/O
Ethernet	1x Realtek RTL8111H with RJ45 connector on rear I/O
Serial Port	1x RS-232 with RJ45 connector on rear I/O
USB	– 4x USB 3.0 ports on rear I/O – 2x USB 2.0 ports on-board with pitch 2.0 header
Keyboard & Mouse	N/A
GPIO	N/A
Other	TPM2.0 on-board (optional)

DISPLAY

Graphic Controller	- Intel® Gen 9 Graphics supporting DirectX 12, OpenGL 4.2, OpenCL 2.0 - HW accelerated video decoding supporting H.264, H.265, MPEG2, VC-1/ WMV9, JPEG, VP8, VP9
Display Interface	- HDMI (1.4b): On-board connector, resolution up to 3840x2160 - DisplayPort (1.2): On-board connector, resolution up to 4096×2160

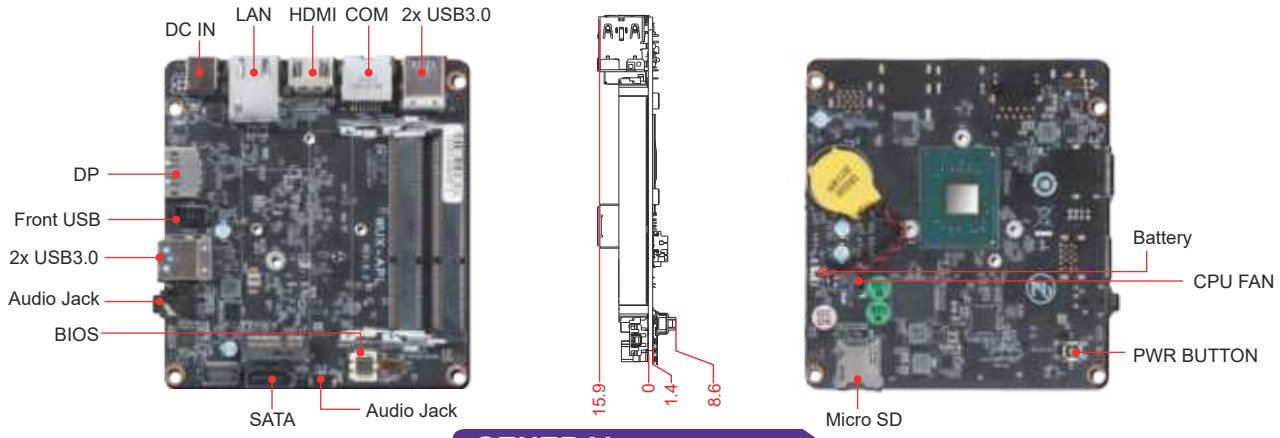
Mechanical & Environment

Dimension	101.6(L) x 101.6(W) mm; 4"(L) x 4"(W)
Power Supply	DC 12V~19V input
Environment	- Operating temperature: 0ºC to 60ºC - Storage temperature: -40ºC to 80ºC - Relative humidity: 5%-95%, non-condensing
MTBF	Over 150,000 hours at 40°C

M2 · USB 3.0 · AMI BIOS · HDMI · DP · 1 COM · FC · CE · Windows 10 IoT · intel partner IoT Industrial Specialist · RoHS

WUX-4200

Intel® Apollo Lake Atom® Processor based 4x4-inch mini PC Board with DDR3L SDRAM, Gigabit Ethernet, M.2(E+A key)socket, one COM ports and 12~19V DC input

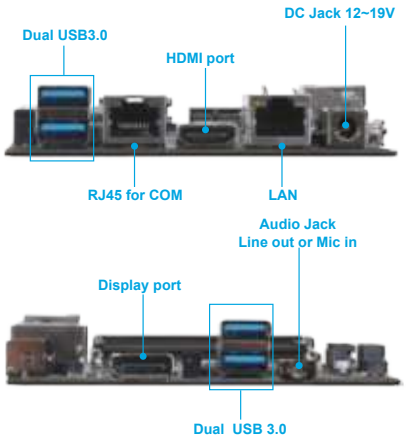


WUX-4200 builds on Intel® Atom Apollo Lake SoC and takes advantages of Intel® Pentium Processor support dual channel DDR3L memory. Support one Gigabit Ethernet port and one M.2 socket and wide voltage of power input from 12V to 19V

FEATURES

- Supports DDR3 1866/1600 MHz non-ECC SDRAM on two SODIMM slots, up to 8GB
- Supports Dual displays including DP and HDMI up to UHD resolution
- Supports one M.2(E+A key)slot, one SATAIII port and one Micro SD 3.0 socket
- Supports wide voltage of DC power input from 12V~19V

REAR I/O



ORDERING GUIDE

ABC-3006	(R).WUX-4200-WS. Intel N4200. USB. HDMI. LAN. Audio & 32G eMMC. Bulk
ABC-3004	(R).WUX-4200. Intel N4200. USB. HDMI. LAN. Audio & 32G eMMC

GENERAL

Processor	Intel® Pentium® N4200, 4 cores, 1.1GHz/2.5GHz, 6W TDP
Chipset	Integrated
BIOS	AMI UEFI BIOS
Memory	- DDR3L 1866/1600 MHz memory - Dual 204-pin SODIMM sockets, up to 8GB
Storage Devices	- 1x SATA III - 1x microSD 3.0 - On-board eMMC 5.0 flash (32GB /64GB)
Watchdog Timer	Programmable watchdog timer from 1 sec. to 255 secs
Hardware Monitoring	- Temperature (CPU & system) - Voltage (CPU Vcore, 12V, 5V, 3.3V, 1.35V)
Expansion Interface	1x M.2 interface (E+A key) supporting WiFi, Bluetooth, 3G, 4G

I/O INTERFACE

Super I/O	N/A
Audio	- Intel® HD Audio integrated in SoC - Realtek ALC255 HDA codec - Audio jack with Line-out or Mic-in function on rear I/O
Ethernet	1x Realtek RTL8111H with RJ45 connector on rear I/O
Serial Port	1x RS-232 with RJ45 connector on rear I/O
USB	- 4x USB 3.0 ports on rear I/O - 2x USB 2.0 ports on-board with pitch 2.0 header
Keyboard & Mouse	N/A
GPIO	N/A
Other	TPM2.0 on-board (optional)

DISPLAY

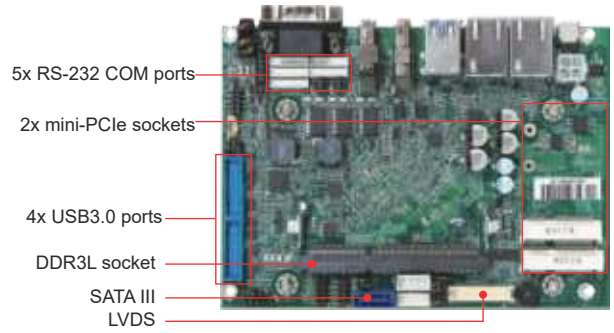
Graphic Controller	- Intel® Gen 9 Graphics supporting DirectX 12, OpenGL 4.2, OpenCL 2.0 - HW accelerated video decoding supporting H.264, H.265, MPEG2, VC-1/ WMV9, JPEG, VP8, VP9
Display Interface	– HDMI (1.4b): On-board connector, resolution up to 3840x2160 – DisplayPort (1.2): On-board connector, resolution up to 4096×2160

Mechanical & Environment

Dimension	101.6(L) x 101.6(W) mm; 4”(L) x 4”(W)
Power Supply	DC 12V~19V input
Environment	- Operating temperature: 0ºC to 60ºC - Storage temperature: -40ºC to 80ºC - Relative humidity: 5%-95%, non-condensing
MTBF	Over 150,000 hours at 40°C

PEB-2773

Intel® Apollo Lake Atom® Processor based 3.5' embedded Board with DDR3L SDRAM, Gigabit Ethernet, 2x mini-PCIe sockets, 6x COM ports and 12~24V DC input

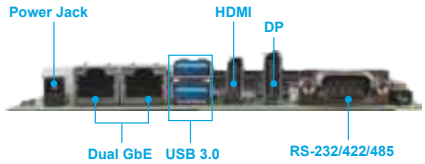


PEB-2773 build with Intel® Atom® processor E3900 series. Not only does it operates with TDP under 12W for fan-less applications, but it also supports industrial temperature range from -40°C to 80°C and wide voltage of power input from 12V to 24V.

FEATURES

- Supports Intel® Apollo Lake series processor
- Supports DD3L-1866/1600 MT/s non-ECC SDRAM on one SO-DIMM slot, up to 8GB
- Supports Triple displays including DP, HDMI, and Dual channel 24bit LVDS
- Supports mini-PCIe / mSATA (2x mini-PCIe slots)
- Supports 6x COM ports(REAR IO support RS-232/422/485)

REAR/IO



ORDERING GUIDE

AB1-3F65	(R).PEB-2773VG2ATM-E3950. Intel Apolloe Lake SoC on Board(X7-E3950,1.6G,4C,2M).EBC. w/DDR3L/DP/HDMI/GbE/COM/Audio/USB
AB1-3F64	(R).PEB-2773VG2ATM-E3940. Intel Apolloe Lake SoC on Board(X5-E3940,1.6G,4C,2M).EBC. w/DDR3L/DP/HDMI/GbE/COM/Audio/USB
AB1-3F63	(R).PEB-2773VG2ATM-E3930. Intel Apolloe Lake SoC on Board(X5-E3930,1.3G,2C,2M).EBC. w/DDR3L/DP/HDMI/GbE/COM/Audio/USB
AB1-3F85	(R).PEB-2773VG2ATM-N4200. Intel Apolloe Lake SoC on Board(N4200,1.1G,4C,2M).EBC. w/DDR3L/DP/HDMI/GbE/COM/Audio/USB
AB1-3F86	(R).PEB-2773VG2ATM-N3350. Intel Apolloe Lake SoC on Board(N3350,1.1G,2C,2M).EBC. w/DDR3L/DP/HDMI/GbE/COM/Audio/USB

PACKING LIST

One PEB-2773 Main board
One Installation CD
One SATA cable

GENERAL

Processor	Intel® Atom® Dual/Quad Core E3900 series Processor (up to 12W)
Chipset	Integrated
BIOS	AMI UEFI BIOS
Memory	Support up to 8GB DDR3L 1333/1600/1866 MT/s SDRAM on one 204 pin SO-DIMM socket
Storage Devices	- 1x SATA III port - 1x mSATA socket(mini-PCIe)
Watchdog Timer	Programmable watchdog timer, time out period from 1 sec to 255 secs.
Hardware Monitoring	Temperature (CPU & System)
Expansion Interface	2x mini-PCIe sockets (Full size support mSATA / Half size support WiFi/BT)

I/O INTERFACE

Super I/O	N/A
Audio	- High Definition Audio integrated in Intel® SoC - Realtek ALC888S HDA codec - Audio jack on rear I/O with Line-out ; Line-in and Mic-in on board pin header
Ethernet	- Dual Intel® GbE controller - 2x RJ45 connectors on rear I/O
Serial Port	- 1x RS-232/422/485 ports on REAR I/O - 5x RS-232 ports on board pin header
USB	- 2x USB 3.0 on REAR I/O - 4x USB 3.0 on board pin header
GPIO	8-bit configurable controlled by embedded controller

DISPLAY

Graphic Controller	- Intel® Gen 9 Graphics supports DirectX 12, OpenGL® 4.2 / OpenCL® 2.0 - Video decode HW acceleration support for H.264, H.265, MPEG2, VC-1/WMV9, JPEG, VP8, and VP9
Display Interface	- LVDS: dual channel 24bit LVDS on board connector, up to 1920x1200 - HDMI: on board connector, up to 3840 x2160 - DP: on board connector, up to 4096x2160

Mechanical & Environment

Dimension	146mm(L) x 102(W) mm; 5.75"(L) x 4.02"(W)
Power Supply	DC 12-24V input
Environment	- Operation Temperature: -40°C~80°C - Storage Temperature: -40°C~85°C - Relative Humidity: 5%~95%, non-condensing
MTBF	Over 120,000 hours at 40°C

EC SATA 3.0 AMI BIOS LVDS DDR 3 HDMI DP USB 3.0 Watch DOG Fanless DDR 3 FC CE Windows 10 IoT RoHS

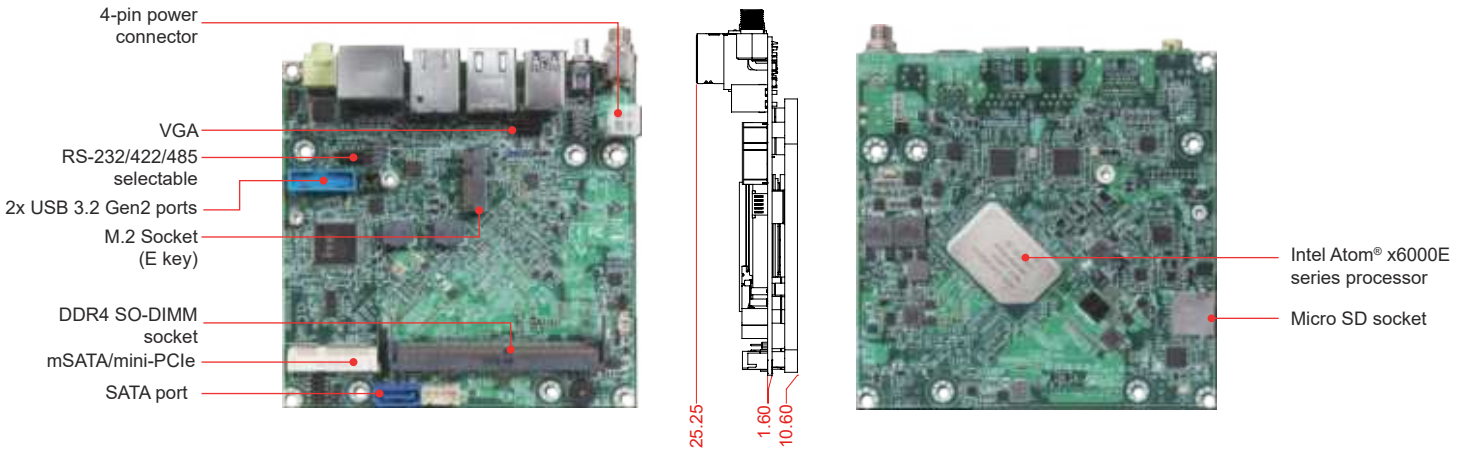
NANO-ITX Reference Table




MODEL	NANO-6063	NANO-6062	NANO-6060	NANO-6051
Form Factor	NANO-ITX	NANO-ITX	NANO-ITX	NANO-ITX
CPU	Intel Atom® x6000 Family	Intel Atom® E3900 Family	Intel Atom® E3800 Family	Intel® 8th Gen Core™ i5/i3 processor
Chipset	N/A	N/A	N/A	N/A
BIOS	AMI UEFI	AMI UEFI	Phoenix UEFI	AMI UEFI
Memory	1x DDR4 SO-DIMM up to 32GB	1x DDR3L SO-DIMM up to 8GB	1x DDR3L SO-DIMM up to 4GB	1x DDR4 SO-DIMM up to 32GB
Expansion	1x M.2 socket (E key) 1x mini-PCIe socket	1x M.2 socket (E key) 1x mini-PCIe socket	1x PCIe x1 slot 1x Half Size mini-PCIe socket	1x M.2 (M key) 2280 socket 1x M.2 (E key) 2230 socket
Display	VGA/HDMI/DP	VGA/LVDS/DP	VGA/LVDS/DP	Dau Mini DP
Audio	Realtek ALC888S HDA codec	Realtek ALC892 HDA codec	Realtek ALC892 HDA codec	Realtek ALC888S HDA codec
LAN	2x GbE	2x GbE	2x GbE/ 1x GbE	2x GbE
Serial Port	1x RS-232/422/485	1x RS-232/422/485	1x RS-232/422/485	1x RS-232/422/485
USB	4x USB 3.2 (Gen2)	4x USB 3.0	2x USB 2.0 4x USB 3.0	6x USB 3.2(Gen1)
Storage Devices	1x SATA III 1x mSATA 1x Micro-SD socket	1x SATA III 1x mSATA 1x Micro-SD socket	2x SATA II 1x Micro-SD socket	1x M.2 (M key)
GPIO	8 bit	8 bit	8 bit	8 bit
Dimension	120x 120mm	120x 120mm	120x 120mm	120 x 120 mm
Page	38	39	40	41

NANO-6063

Intel Atom® x6000E Series SoC based NANO-ITX Board with Triple Display,GbE LAN, USB 3.2 Gen 2, M.2, SATA III, Mini-PCIe, and mSATA

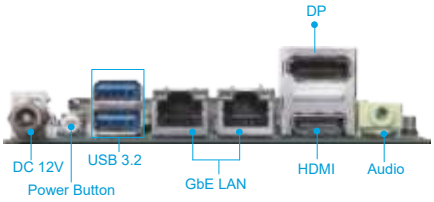


NANO-6063 is based on Intel Atom® family processor. This processor not only supports industrial temperature from -40°C to 85°C but operates in certain 12W with low-power consumption.
Succeeding previous version, NANO-6062, the flexibility of systematic expansions is suitable for Medical, Panel PC and Kiosk. Dual GbE LAN(GPY-215 & Intel® I210IT) design is fit in Industrial Automation, and Digital Signage application.

FEATURES

- Supports IIntel Atom® Dual/Quad Family SoC
- Up to 32 GB DDR4 3200 non-ECC SO-DIMM
- Supports multiple display by VGA, DP and HDMI
- High speed dual Gigabit Ethernet, high bandwidth I/O interface
- Supports Real-Time Performance: TSN, TCC
- Support on board TPM2.0

REAR/IO



ORDERING GUIDE

AB1-3K29	**(R).NANO-6063-x6425E** (R).Nano-ITX ESB. Intel SoC.x6425E/DDR4 SO-DIMM/VGA/HDMI/DP/Dual GbE LAN/micro SD

GENERAL

Processor	- Intel Atom® Dual/Quad x6000E series processor (up to 12W) - Supports Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring, Trusted Execution and Speed Step Technology (depends on CPU sku)
BIOS	AMI UEFI BIOS
Memory	- 1x DDR4 3200MT/s non-ECC SO-DIMM up to 32GB - Supports In-Band ECC(only selected skus)
Storage Devices	- 1x SATA III - 1x mini-PCIe socket (select mSATA/mini-PCIe by BIOS) - Micro SD socket
Watchdog Timer	Programmable watchdog timer, time out period from 0.5 sec to 254.5 secs
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)
Expansion Interface	- 1x M.2 (E key) - 1x full size mini-PCIe socket (select mSATA/mini-PCIe by BIOS)

I/O INTERFACE

Audio	- HDA controller intergated in Intel® SoC - Realtek ALC888S HDA codec - Audio jack on rear I/O (Line out) - On board pin header (Line in, Line out, Mic in)
Ethernet	- 1x Intel® GbE controller - 1x GPY-215 controller - 2x RJ45 connectors on rear I/O
Serial Port	- 1x RS-232/422/485 ports selectable
USB	- 2x USB 3.2 Gen2 ports on rear I/O - 2x USB 3.2 Gen2 ports on board with header
Others	- TPM 2.0 on board - Supports Real-time Performance - Intel® TCC & TSN

DISPLAY

Graphic Controller	Intel® Gen 11 graphics suports DirectX 12, OpenGL 4.5, Open GL ES 3.2, Vulkan
Display Interface	- HDMI: 1x HDMI port on reat I/O (HDMI 2.0b, 4096x2160 @ 60Hz) - DP: 1x DP port on rear I/O (DP 1.4 : 4096x2160 @ 60Hz) - VGA: 1x on board pin header, up to 1920x1200

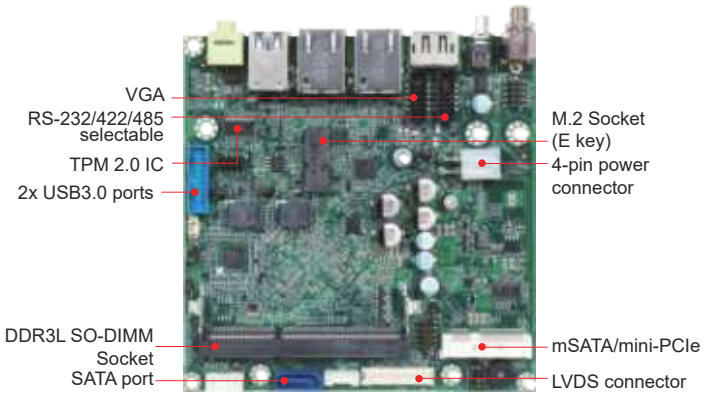
Mechanical & Environment

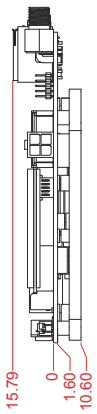
Dimension	120mm(L) x 120mm(W),4.72"(L) x 4.72"(W)
Power Supply	DC 12V inpurt
Environment	- Operating temperature:-40°C~85°C - Storage Temperature: -40°C~85°C - Relative Humidity: 5~95%, non-condensing
MTBF	Over 90,000hrs at 40°C

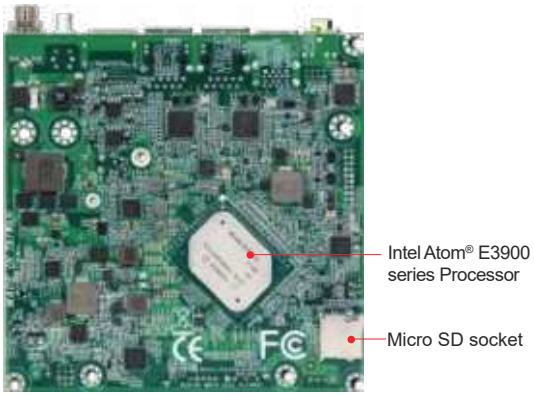
FC CE Windows 10 IoT RoHS EC SATA 3.0 AMI BIOS 1 COM Fanless TPM 2 GbE Wide Temperature Mini-PCIe DP

NANO-6062

Intel Atom® Dual/Quad Core E3900 series SoC based on NANO-ITX Board with Triple Displays, GbE LAN, USB 3.0, M.2, SATA III, Mini-PCIe, and mSATA





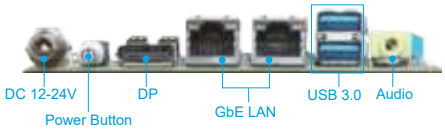


NANO-6062 build with Intel Atom® processor E3900 series. Not only does it operates with TDP under 12W for fan-less applications, but it also supports industrial temperature range from -40°C to 85°C and wide voltage of power input from 12V to 24V.
Support four USB 3.0 ports ensures fast data transmission with low-power consumption. Two SATA III interfaces with up to 6 Gb/s (one of them available as mSATA and the other for SATA) allow quick and lexible system expan-sions. Two Intel® Gigabit Ethernet controllers provide dual Gigabit Ethernet LAN access via the two RJ45 ports. NANO-6062 can design their own unique systems for Medical, Networking, Panel PC, Kiosk and Digital signage applications.

FEATURES

- Intel Atom® Dual/Quad Core E3900 series SoC
- DDR3L 1866/1600 MT/s SO-DIMM up to 8GB
- Triple Display by VGA, DP, and LVDS
- M.2 socket, SATA III port, mini-PCIe, and mSATA socket
- Wide range 12V to 24V DC power input
- Support a wide -40°C to 85°C industrial temperature range

REAR/IO



ORDERING GUIDE

AB1-3E89	**(R).NANO-6062-E3950** Nano-ITX ESB. Intel Atom® Quad Core 1.6GHz (12W). w/DDR3L SO-DIMM/ VGA/ LVDS/ DP/ Dual GbE LAN/ M.2/ SATA III
AB1-3G40	**(R).NANO-6062-E3940** Nano-ITX ESB. Intel Atom® Quad Core 1.6GHz (9W). w/DDR3L SO-DIMM/ VGA/ LVDS/ DP/ Dual GbE LAN/ M.2/ SATA III
AB1-3G41	**(R).NANO-6062-E3930** Nano-ITX ESB. Intel Atom® Dual Core 1.6GHz (6W). w/DDR3L SO-DIMM/ VGA/ LVDS/ DP/ Dual GbE LAN/ M.2/ SATA III

PACKING LIST

One NANO-6062 NANO-ITX Main Board
One Passive Heat Spreader
One Installatuon CD

GENERAL

Processor	- Intel Atom® Dual/Quad Core E3900 series Processor (up to 12W) - 2MB Cache
BIOS	AMI UEFI BIOS
Memory	1x DDR3L 1866/1600 MT/s non-ECC SO-DIMM up to 8GB
Storage Devices	- 1x SATA III port - 1x mSATA socket (Choose either mSATA or mini-PCIe by BIOS) - 1x Micro-SD socket
Watchdog Timer	Programmable by embedded controller
Hardware Monitoring	- Temperature (CPU & System) - Voltage (CPU Vcore,12V, 5V, 3.3V, 1.35V)
Expansion Interface	- 1x M.2 socket (E key) - 1x full size mini-PCIe socket (Choose either mSATA or mini-PCIe by BIOS)

I/O INTERFACE

Audio	- High Definition Audio integrated in Intel® SoC - Realtek ALC892 HDA codec - Audio jack on rear I/O with Line-out and on board pin header with Line-in, Line-out, and Mic-in
Ethernet	- 2x Intel® I210IT GbE controller - 2x Dual RJ45 connectors on rear I/O
Serial Port	1x RS-232/422/485 on board connector (selected by bios)
USB	- 2x USB 3.0 ports on rear I/O - 2x USB 3.0 ports on board with header
GPIO	8bit configurable controlled by embedded controller
Other	TPM 2.0 on board

DISPLAY

Graphic Controller	- Intel® Gen 9 Graphics supports DirectX 12, OpenGL® 4.2 / OpenCL® 2.0 - Video decode HW acceleration support for H.264, H.265, MPEG2, VC-1/WMV9, JPEG, VP8, and VP9
Display Interface	- LVDS: Dual channel 24bit LVDS on board connector, up to 1920x1200 - VGA: 1x DB-15 on board connector, up to 2560x1600 - DP: 1x DP port on rear I/O, up to 4096x2160

Mechanical & Environment

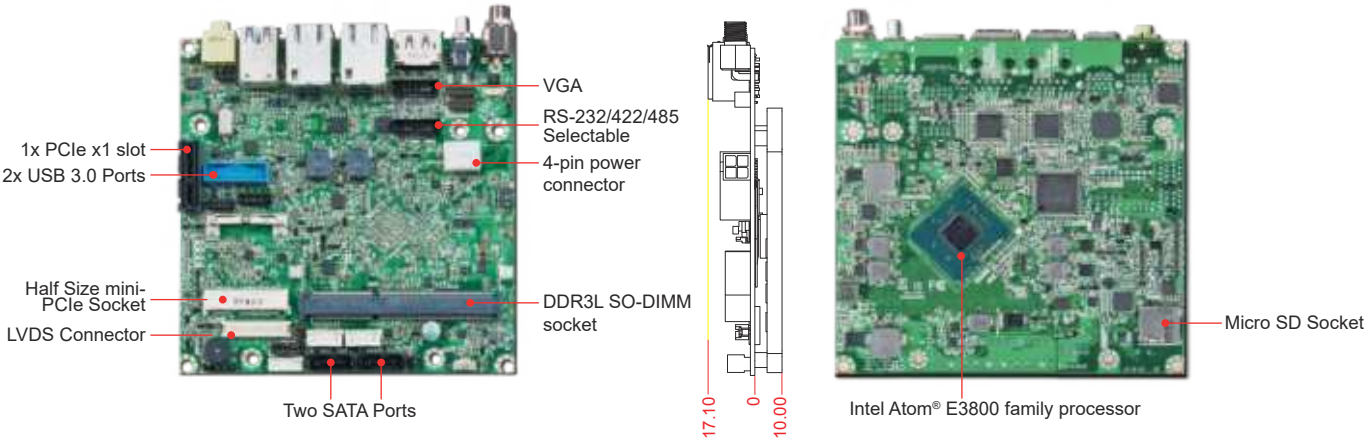
Dimension	120mm(L) x 120mm(W) ; 4.72"(L) x 4.72"(W)
Power Supply	DC 12-24V input
Environment	- Operation Temperature: -40°C~85°C - Storage Temperature: -40°C~85°C - Relative Humidity: 5%~95%, non-condensing
Certification	CE, FCC Class B
MTBF	Over 100,000 hours at 40°C

FC CE Windows 10 IoT RoHS

EC | SATA 3.0 | AMI BIOS | LVDS | Fanless | TPM | 2 GbE | Wide Temperature | Mini-PCIe | DP

NANO-6060

Intel Atom® E3800 family SoC based NANO-ITX. Board with Dual displays, Gigabit Ethernet, Audio, USB 3.0, micro SD and SATA

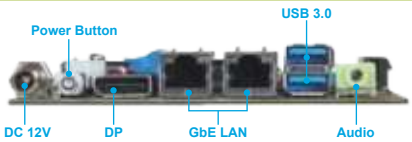


NANO-6060 build with Intel Atom® processor E3800 family that not only outputs under 10W for fan-less applications, but also supports a wide industrial temperature from -40ºC to 85ºC. With its superior up to Quad Core processing power and high capability. Portwell have taken advantage of such technology to furnish a series of products that can meet multiple industrial requirements such as fanless, cost-effective of CPU performance or compact systems.

FEATURES

- Intel® Bay Trial-I SoC based platform
- 1x 204-pin SO-DIMM supports DDR3L up to 4GB
- Multiple displays by VGA, DP, dual channel 24 bit LVDS
- Supports 2x SATA II ports, 1x micro SD socket, and 4x USB 3.0 ports
- 1x half size mini-PCIe socket and PCIe x1 slot for expansion
- Supports DC 12V input

REAR I/O



ORDERING GUIDE

AB1-3A45	**(R).NANO-6060- E3815** Nano-ITX ESB. Intel Atom® E3815 1.46GHz Single Core.w/DDR3L SO-DIMM/VGA/24bit LVDS/DP/single GbE LAN/micro SD
AB1-3A46	**(R).NANO-6060- E3827** Nano-ITX ESB. Intel Atom® E3827 1.75GHz Dual Core.w/DDR3L SO-DIMM/VGA/24bit LVDS/DP/ dual GbE LAN/micro SD
AB1-3A47	**(R).NANO-6060- E3845** Nano-ITX ESB. Intel Atom® E3845 1.91GHz Quad Core.w/DDR3L SO-DIMM/VGA/24bit LVDS/DP/ dual GbE LAN/micro SD

PACKING LIST

One NANO-6060 NANO-ITX Main Board
One Passive Heat Spreader
One Installation CD

GENERAL

Processor	- Intel Atom® E3800 family processor - Cache up to 2MB (for Quad Core) - DPM (Defect Per Million devices) <50 - Support Intel® VT-x techology
BIOS	Phoenix EFI BIOS
Memory	1x DDR3L 1066/1333MT/s non-ECC SO-DIMM up to 4GB
Storage Devices	- 2x SATA II - 1x Micro-SD socket
Watchdog Timer	Programmable by embedded controller
Hardware Monitoring	- Temperature (CPU & System) - Voltage (CPU Vcore,12V, 5V, 3.3V, 1.35V)
Expansion Interface	- 1x PCIe x1 slot - 1x half size mini-PCIe slot

I/O INTERFACE

Audio	- HDA controller integrated in Intel® SoC - Realtek ALC892 HDA codec, Audio Jack on rear I/O with Line-out and on board pin header with Line-in, Line-out, and Mic-in
Ethernet	- 2x Dual Intel® I210IT Gigabit Ethernet controller (for E3827/ E3845 only) - 2x RJ45 connectors on rear I/O (for E3827/ E3845 only) - 1x Single Intel® I210IT Gigabit Ethernet controller and 1xRJ45 connector on rear I/O for E3815
Serial Port	1x RS-232/422/485 on board connector (selected by bios)
USB	- 2x USB 3.0 ports on rear I/O - 2x USB 2.0 and 2x USB 3.0 ports on board with pitch 2.0 header
GPIO	8bit configurable controlled by embedded controller

DISPLAY

Graphic Controller	- Intel® Gen7 graphic engine supports DirectX 11, OpenGL® 4.0 - Video decode hardware acceleration supports for H.264, MPEG2, MVC, VC-1, WMV9 and VP8 formats
Display Interface	- LVDS: Dual channel 24bit LVDS on board connector, resolution up to 1920x1200 @60Hz - VGA: One on-board DB-15 connector, resolution up to 1920x1200 (WUXGA) - DP: One DP port on rear I/O, resolution up to 2560x1600

Mechanical & Environment

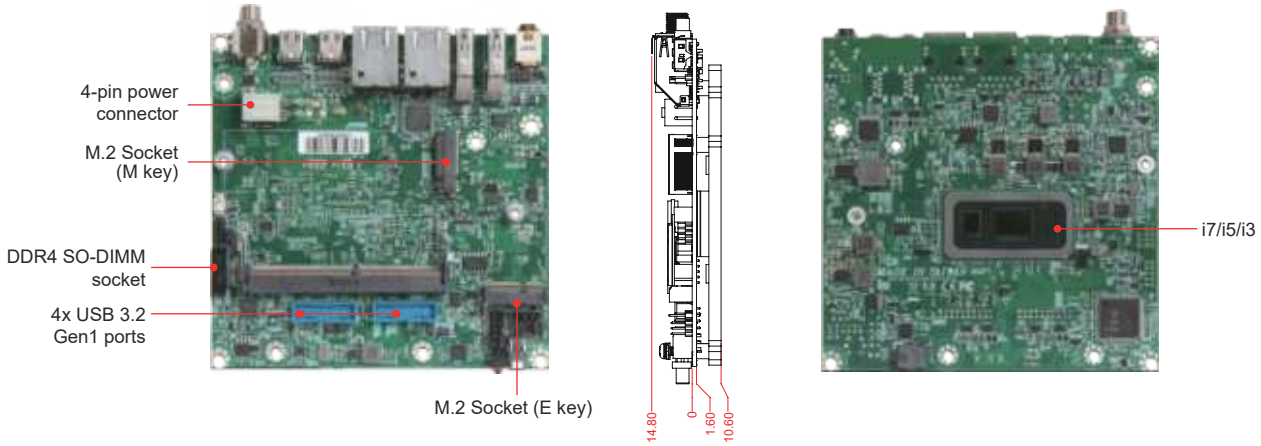
Dimension	120mm(L) x 120mm(W) ; 4.72"(L) x 4.72"(W)
Power Supply	DC 12V input
Environment	- Operation temperature: -40°C~85°C - Storage temperature: -40°C~85°C - Relative humidity : 5%~95%, non-condensing
Certification	CE,FCC Class B
MTBF	Over 100,000hrs at 55°C

Windows 10 IoT

DDR 3L USB 3.0 SATA 2.0 EC Fanless Giga LAN Watch DOG GPIO

NANO-6051

Intel® 8th Generation Core™ i5/i3 Processors based on NANO-ITX Board with mini DP, GbE LAN, USB 3.2, M.2 and Combo Audio jack

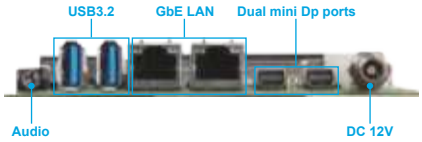


NANO-6051 build with Intel® 8th Generation Core™ i7/i5/i3 Processors and takes advantages of Intel® Core™ mobile processor technologies such as Hyper-Threading, high performance, and low power consumption. Portwell NANO-6051-based systems are ideal for passively cooled and hermetically sealed systems that can be used in various environments. NANO-6051 is an ideal platform with HD graphic output for POS, kiosk, digital signage and transportation applications.

FEATURES

- Intel® 8th Gen Core™ i7, i5 and i3 processor
- Supports one DDR4 2400 non-ECC SO-DIMM up to 32GB
- Supports Dual mini DP ports
- Supports one M.2 M key, one M.2 E key, six USB 3.2 Gen1 ports
- Supports DC 12V input
- Supports TPM 2.0 (On board)

REAR I/O



ORDERING GUIDE

AB1-3J58	**(R).NANO-6051-8145UE** Nano-ITX ESB. Intel Core i3-8145UE 2.2GHz Dual Core.w/DDR4 SO-DIMM/two mini DP/dual GbE LAN/USB/M.2
AB1-3J57	**(R).NANO-6051-8365UE** Nano-ITX ESB. Intel Core i5-8365UE 1.6GHz Quad Core.w/DDR4 SO-DIMM/two mini DP/dual GbE LAN/USB/M.2
AB1-3J56	**(R).NANO-6051-8665UE** Nano-ITX ESB. Intel Core i7-8665UE 1.7GHz Quad Core.w/DDR4 SO-DIMM/two mini DP/dual GbE LAN/USB/M.2

PACKING LIST

One NANO-6051 NANO-ITX Main board
One Passive Hear Spreader
One Installation CD

GENERAL

Processor	- Intel® 8th Gen Core™ i7/i5/i3 processor - 4MB Cache - Support Intel® Hyper-Threading Technology, Virtualization Technology (VT-x), Small Business Advantage
BIOS	AMI uEFI BIOS
Memory	1x DDR4 2400MT/s non-ECC SO-DIMM up to 32GB
Storage Devices	1x M.2 M key 2280 socket
Watchdog Timer	Programmable by embedded controller
Hardware Monitoring	- Temperature (CPU & System) - Voltage (CPU Vcore, 12V, 5V, 3.3V, RAM)
Expansion Interface	- 1x M.2 E key 2230 socket

I/O INTERFACE

Audio	- HDA controller integrated in Intel® SoC - Realtek ALC888S HDA codec - Audio Combo Jack on rear I/O with Line-out/Mic-in and on board pin header with Line-in, Line-out, Mic-in
Ethernet	- Intel® I210AT and Intel® I219LM Ethernet controller - 2x RJ45 connector on rear I/O
Serial Port	1x RS-232/422/485 on board connector (selected by bios)
USB	- 2x USB 3.2 Gen1 ports on rear I/O - 4x USB 3.2 Gen1 ports on board
GPIO	8-bit configurable controlled by embedded controller
Other	TPM 2.0 on board

DISPLAY

Graphic Controller	- Intel® HD Graphics 5500/6000 supports DirectX11.2, OpenGL 4.3 / OpenCL 2.0 - Video decode HW acceleration support for H.264/AVC, VC-1, MPEG2, VP8
Display Interface	2x Mini DP on Rear I/O, up to 3840x2160

Mechanical & Environment

Dimension	120(L) x 120(W) mm; 4.72"(L) x 4.72"(W)
Power Supply	DC 12V input
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 85°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE,FCC Class B
MTBF	Over 100,000 hours at 40°C

Mini-ITX Platform

The Mini-ITX form factor, defined by the chipset manufacturers in Taiwan, is a highly integrated all-in-one x86-based embedded computer board that measures a mere 170mm x 170mm. Its compact size and all-in-one design simplifies and accelerates the implementation of an embedded PC system. Portwell's Mini-ITX computer boards and barebones systems offer a wide selection of microprocessors, power efficient technologies, peripheral I/Os, expansions and mechanical form factors.

Whether you're working on medical instruments, thin network devices or digital media systems, Portwell's Mini-ITX boards and barebone systems are the perfect solutions to help you to deliver your products on time and stay one step ahead of the competition.

With 20 years of experience in the design and manufacture of single board computers, Portwell provides not only one-stop shopping for off-the shelf products, but also custom-built solutions tailor-made to suit your needs.

Portwell's WADE series

Portwell already provides a variety of products based on the Mini-ITX form factor such as Desktop, Mobile and Low Power solutions.

Desktop

Equipped with Intel's latest generation Intel® Core™ i3/i5/i7 processor, it not only meets your high performance requirements but it also provides quality and reliability as supported by our standard and customized service. With its rich display interface, it is capable of supporting several multimedia devices to meet your different needs.

Mobile

Striking a balance between energy efficiency and performance, Portwell's mobile Intel® Core™ 2 Duo product is based on mobile processors built with excellent power. It is a mobile platform that can be easily adapted to quite the system and available for numerous usage in the small size.

Low Power

With a low power consumption target, the Intel® Atom® processor offers customers more than adequate computing power. Furthermore, its fanless design also offers noise reduction and efficient heat dissipation in keeping with Portwell's devotion to green environments.

Mini-ITX Reference Table





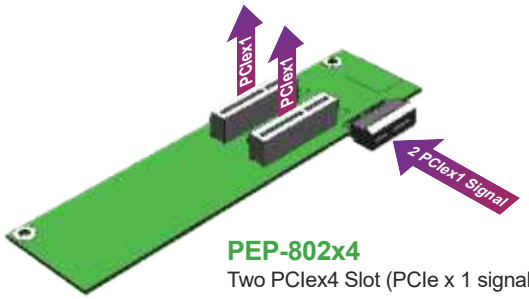
MODEL	WADE-8212-Q470E	WADE-8211-Q370	WADE-8017	WADE-8172	WADE-8171
Form Factor	Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX
CPU	Intel® Core™ i3/i5/i7/i9/Pentium®/ Celeron®	Intel® Core™ i3/i5/i7/ Pentium®/ Celeron®	Intel® 7th and 6th Gen Core™ Processors CPU in LGA1151 package	Intel® Celeron® processor N3350 in FCBGA1296 package	Intel® Atom® N3000 Family
Chipset	Intel® Q470E	Intel® Q370	Intel® Q170/H110/C236 PCH	N/A	N/A
BIOS	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI
Memory	2x DDR4 SO-DIMM up to 64G	2x DDR4 SO-DIMM up to 64G	2x DDR4 DIMM up to 32GB	up to 8 GB DDR3L 1600/1333 MHz memory (non-ECC) on 2x 204-pin SO-DIMM socket	2x DDR3L SO-DIMM up to 8GB
Expansion	1x PCIe x16 1x M.2 Type E(2230) socket 1x M.2 Type B(3042) socket	1x PCIe x16 1x M.2(Key E, 2230) socket	1x PCIe x16 slot 1x PCIe x1 Golden finger 1x M.2 type E socket 1x mini-PCIe socket	1x PCIe x1 slot 1x M.2 socket 1x full/half size Mini PCIe socket with PCIe x1 and USB(shared)	1x PCIe x1 slot 2x mini-PCIe socket
Display	VGA/Dual DP/LVDS	VGA/Dual DP/LVDS	DP/HDMI/VGA	LVDS/HDMI/VGA	VGA/HDMI/LVDS
Audio	Realtek ALC887 HDA codec	Realtek ALC887 HDA codec	Realtek ALC892 HDA codec	Realtek ALC887 HDA codec	Realtek ALC887 HDA codec
LAN	2x GbE	2x GbE	2x GbE	2x GbE	2x GbE
Serial Port	3x RS-232 2x RS-232/422/485	3x RS-232 2x RS-232/422/485	2x RS-232/422/485 4x RS-232	2x RS-232/422/485 4x RS-232	2x RS-232/422/485 4x RS-232
USB	6x USB3.2 Gen1 4x USB2.0	4x USB3.2 Gen1 4x USB2.0	4x USB 3.0 2x USB 2.0	4x USB3.0 4x USB2.0	4x USB 3.0 4x USB 2.0
Storage Device	4x SATA III 1.M.2 (Key M, 2242/2260/2280) socket	4x SATA III 1.M.2 (Key M, 2242/2260/2280) socket	6x SATA (H110 just 4x SATA)	1x SATA III 1x M.2 socke"	2x SATA
GPIO	8 bit	8 bit	8 bit	8 bit	8 bit
Others	N/A	N/A	N/A	N/A	N/A
Dimension	170 x 170mm	170 x 170mm	170 x 170mm	170 x 170mm	170 x 170mm
Page	45	46	47	48	49

Side Expansion Board Series

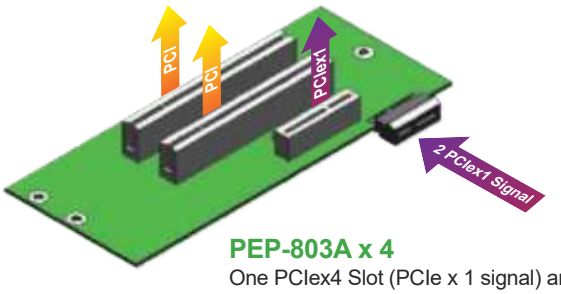
What is side expansion board?

WADE-8017 has one PCIex1 gold finger. This special gold finger is redefined PCIex1 pin definition, and we put two PCIex1 signal inside. Portwell created a new daughter board from the side to combination, we call it SEB(side expansion board)

Bridging PCIe signals through the Gold Finger to the extension board, WADE-8017 can easily support the functions on a two-slot-added Flex-ATX or three-slot-added Micro ATX motherboard. This expansion mechanism also supports other interfaces transmitted via specific circuit design and component selection. Therefore, Portwell can quickly make ready a customized solution with additional, project-required features, such as LAN, Mini-PCIe, etc.



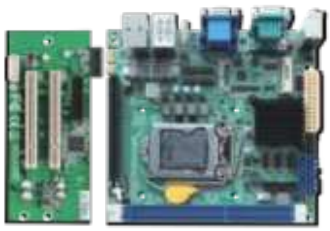
PEP-802x4
Two PCIex4 Slot (PCIe x 1 signal)



PEP-803A x 4
One PCIex4 Slot (PCIe x 1 signal) and Two PCI Slot (via Bridge)

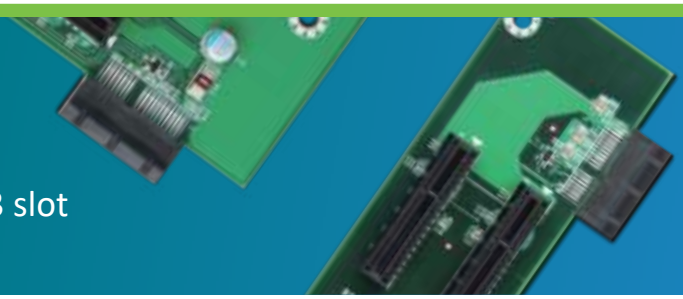
Flex-ATX

Micro-ATX



* Meet Flex-ATX or Micro-ATX Form Factor Scope

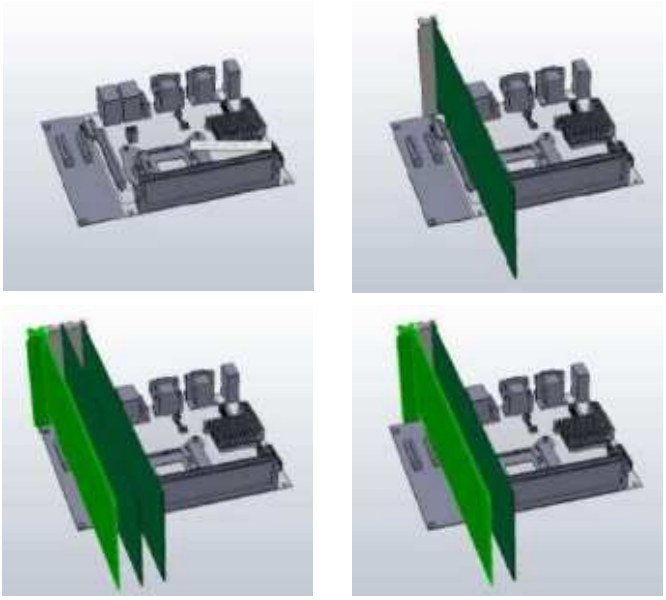
Side Expansion Board (SEB)



Flexibility of Side Expansion Board

- PCIe x1 Gold-Finger (Two PCIe x1 signal)
- Meet Flex-ATX/Micro-ATX scope, provide 2 or 3 slot

SEB Concept



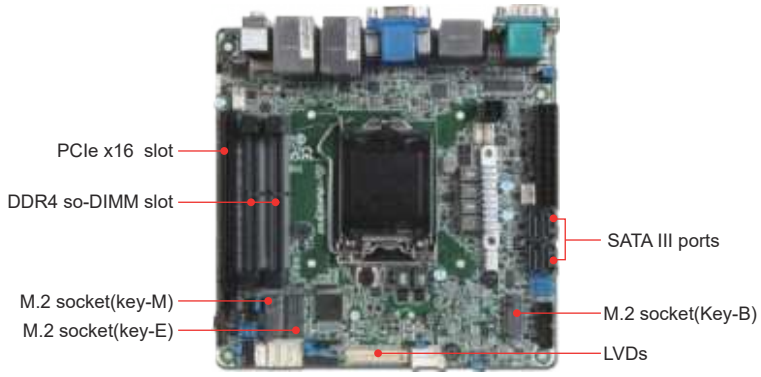
Portwell's WADE-8017, featuring flexible expansion interface, provides a brand-new solution under available resources and limited mainboard space. Different from existing Mini-ITX boards in the marketplace, which utilize a riser card to increase functional interfaces or additional PCIe/PCI slots, the Portwell WADE-8017 leverages an extension board to furnish a flexible platform that facilitates multiple functional expansion choices.

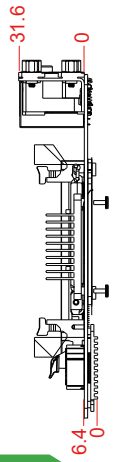
ORDERING GUIDE

AA1-3134Z	(R) PEP-802X4. 2 Slot Riser Card for two PCIex4 for WADE-8015 series
AA1-3141Z	(R) PEP-803AX4. 3 Slot Riser Card for one. PCIex4 and two PCI for WADE-8015 series

WADE-8212-Q470

Leading Desktop Intel® 10th Gen Core™ Processors Mini-ITX with DDR4 SO-DIMM up to 64G, VGA , DP port,HDMI ,LVDS,Two GbE LAN ports, Five COM Ports



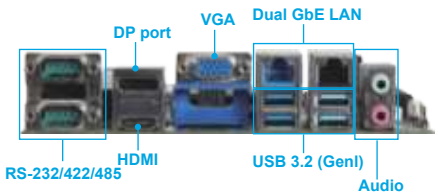


WADE-8212-Q470E is based on Intel® Q470E chipset and Desktop processors including Intel® 10th Gen Core™ i3/i5/i7 SKU. This board supports DDR4, PCIe 3.0, and SATAIII.Those fratures help you to build high performance and stabile system.

FEATURES

- Intel® 10th Gen Core™ Processors support
- Supports two So-DIMMs support DDR4 Non-ECC SDRAM up to 64GB
- Supports dual Ethernet(one port support 1G/one port support 2.5G), five COM Ports, ten USB Ports, four SATA III Ports and Audio
- Supports one PCIe x16(Gen3), one M.2 Key E 2230 with PCIe x1, CNVI and USB2.0 for Wireless, one M.2 Key M 2242/2260/2280 with PCIe x4 and SATA3 for SSD, one M.2 Key B 3042/3052 with USB 3.0 Signal and one SIM Card socket

REAR I/O



ORDERING GUIDE

AB1-3D63	(R).WADE-8212-Q470E Mini-ITX ESB.Q470E w/o ECC LGA1200.w/DDR4 SODIMM /VGA/DP/ HDMI/Dual GbE/COM/Audio/USB

PACKING LIST

One WADE-8212-Q470E Main board
One I/O shield
One Installation CD
One SATA cable
One CPU coolor bracket

GENERAL

Processor	Intel® 10th Gen Core™ Processors CPU in LGA1200 package
Chipset	Intel® Q470E
BIOS	AMI uEFI BIOS
Memory	Supports up to 64GB DDR4 2400/2666/2933MHz Non-ECC SDRAM on two SO-DIMM socket
Storage Devices	Supports four SATAIII port
Watchdog Timer	Programmable watchdog timer, time out period from 1 sec to 255 secs.
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)
Expansion Interface	- 1x PCIe x16 Gen 3 - 1x M.2 Key E 2230 with PCIe x1, CNVI and USB2.0 for Wireless - 1x M.2 Key M 2242/2260/2280 with PCIe x4 and SATA3 for SSD - 1x M.2 Key B 3042/3052 with USB 3.0 Signal - 1x SIM Card socket

I/O INTERFACE

Super I/O	F81966D-I
Audio	- Realtek AL887 High Definition Audio integrated in Intel SoC - Audio Jack on rear I/O with Line-out/ Mic-in
Ethernet	- Intel® I219LM & I225LM Ethernet controller - 2x RJ45 connectors on rear I/O
Serial port	- 2x RS-232/422/485 ports on REAR I/O - 3x RS-232 ports on board pin header
USB	- 4x USB3.2 on rear I/O - 2x USB3.2 on baodr pin header - 4x USB2.0 on baodr pin header
GPIO	8-bit configurable controlled by embedded controller

DISPLAY

Graphic Controller	- Intel® UHD Graphics 630 supports DirectX 12, OpenGL 4.5 - Video decode HW acceleration support for H.264, H.265, MPEG2, VC-1/WMV9, JPEG, VP8, and VP9
Display Interface	- LVDS:Dual channel 2bit LVDS on board, resolution up to 1920 x1200 - DP:DP port on rear I/O, resolution up to 4096x2160 - HDMI:HDMI port on rear I/O, resolution up to 4096x2160 - VGA:One VGA port on rear I/O resolutoin up to 1920x1200

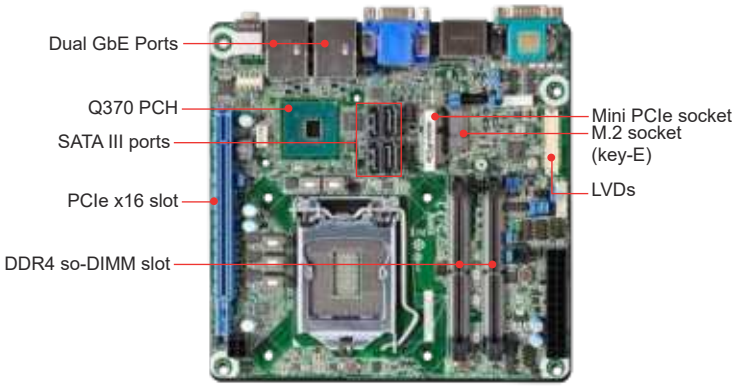
Mechanical & Environment

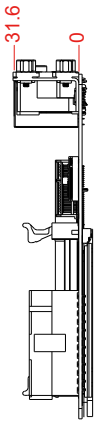
Dimension	170mm(L) x 170mm(W) x 1.6mm(H)
Power Supply	ATX power input
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
MTBF	Over 100,000 hours at 40°C

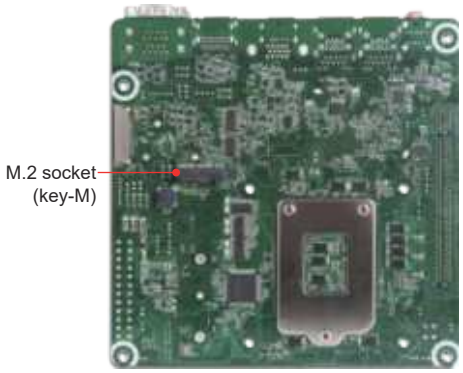
AMI BIOS · USB 3.0 · USB 2.0 · 2 GbE · SATA 6Gb · DP · HDMI · LVDS · Windows 10 IoT · intel partner IoT Industrial Specialist

WADE-8211-Q370

Leading Desktop Intel® 8th Gen Core™ Processors Mini-ITX with DDR4 SO-DIMM up to 64G, VGA ,Dual DP ports ,Two GbE LAN ports, Five COM Ports





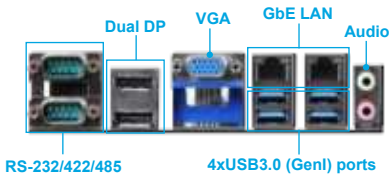


WADE-8211-Q370 is based on Intel® Q370 chipset and Desktop processors including Intel® 8th/9th Gen Core™ i3/i5/i7 SKU. This board supports DDR4, PCIe 3.0, and SA-TAIII.Those fratures help you to build high performance and stabile system.

FEATURES

- Intel® 8th/9th Gen Core™ Processors support
- Supports two SO-DIMMs support DDR4 Non-ECC SDRAM up to 64GB
- Supports dual Ethernet, five COM Ports, eight USB Ports, four SATA III Ports and Audio
- Supports one PCIe x16 (Gen3), one M.2 Key E 2230 with PCIe x1, CNVI and USB2.0 for Wireless, one M.2 Key M 2242/2260/2280 with PCIe x4 and SATA3 for SSD and one mini-PCIe slot

REAR I/O



ORDERING GUIDE

AB1-3D63	(R).WADE-8211-Q370 Mini-ITX ESB.Q370 w/o ECC LGA1151.w/ DDR4 SODIMM /VGA/Dual DP/Dual GbE/ COM/Audio/USB

PACKING LIST

One WADE-8211-Q370 Main board
One I/O shield
One Installation CD
One SATA cable
One CPU coolor bracket

GENERAL

Processor	Intel® 8th/9th Gen Core™ Processors CPU in LGA1151 package
Chipset	Intel® Q370
BIOS	AMI uEFI BIOS
Memory	Supports up to 64GB DDR4 2400/2666MHz Non-ECC SDRAM on two SO-DIMM socket
Storage Devices	Supports four SATAIII port
Watchdog Timer	Programmable watchdog timer, time out period from 1 sec to 255 secs.
Hardware Monitoring	System monitor(Voltage,Fan Speed and Temperature)
Expansion Interface	- 1x PCIe x16 Gen 3 - 1x M.2 Key E 2230 with PCIe x1, CNVI and USB2.0 for Wireless - 1x M.2 Key M 2242/2260/2280 with PCIe x4 and SATA3 for SSD - 1x mini-PCIe slot

I/O INTERFACE

Super I/O	NCT6116D
Audio	- Realtek AL887 High Definition Audio integrated in Intel SoC - Audio Jack on rear I/O with Line-out/ Mic-in
Ethernet	- Intel® I219LM & I210AT Ethernet controller - 2x RJ45 connectors on rear I/O
Serial port	- 2x RS-232/422/485 ports on REAR I/O - 3x RS-232 ports on board pin header
USB	- 4x USB3.0 on rear I/O - 4x USB2.0 on baodr pin header
GPIO	8-bit configurable controlled by embedded controller

DISPLAY

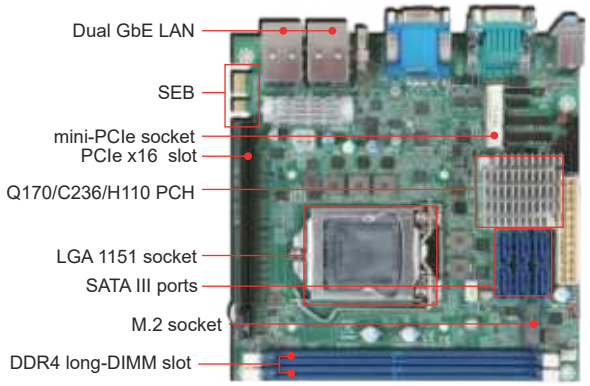
Graphic Controller	- Intel® UHD Graphics 630 supports DirectX 12, OpenGL 4.5 - Video decode HW acceleration support for H.264, H.265, MPEG2, VC-1/WMV9, JPEG, VP8, and VP9
Display Interface	- LVDS:Dual channel 2bit LVDS on board, resolution up to 1920 x1200 - DPI:Dual DP ports on rear I/O, resolution up to 4096x2340 - VGA:One VGA port on rear I/O resolutoin up to 1920x1200

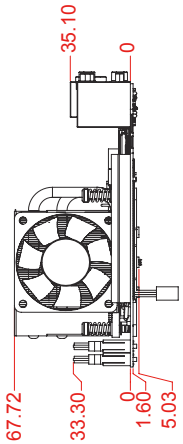
Mechanical & Environment

Dimension	170mm(L) x 170mm(W) x 1.6mm(H)
Power Supply	ATX power input
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
MTBF	Over 100,000 hours at 40°C

WADE-8017

Leading Desktop Intel® 7th and 6th Gen Core™ Processors (former Kaby Lake/Skylake) Mini-ITX with DDR4 SDRAM, Triple Displays, 2x GbE LAN ports, 6x COM Ports



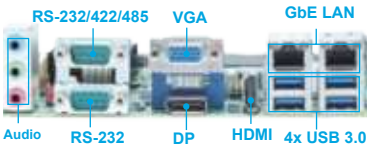


WADE-8017 is based on Intel® Q170/C236/H110 chipset and desktop processors including Intel® 7th and 6th Gen Core™ i3/i5/i7 SKU. This board supports DDR4, PCIe 3.0, and SATA III. Those features help you to build high performance and stability system.

FEATURES

- Intel® 7th and 6th Gen Core™ Processors support
- 2x long-DIMM support DDR4 ECC/Non-ECC SDRAM up to 32GB
- Display : VGA/DP/HDMI
- 1x PCIe x1 Golden finger support SEB 6x SATA III ports support RAID 0/1/5/10 H110 just support 4x SATA port and not support RAID Function
- 1x PCIe x16 (Gen3), one M.2 type E socket (H110 not support)

REAR I/O



ORDERING GUIDE

AB1-3D16	**(R).WADE-8017** Mini-ITX ESB.Q170 w/o ECC LGA1151.w/DDR4 SDRAM /VGA/DP/HDMI/Dual GbE/COM/Audio/USB
AB1-3D75	**(R).WADE-8017-H110** Mini-ITX ESB.H110 w/o ECC LGA1151.w/DDR4 SDRAM /VGA/DP/HDMI/Dual GbE/COM/Audio/USB
AB1-3D76	**(R).WADE-8017-C236.** Mini-ITX ESB.C236 w/ECC LGA1151.w/DDR4 SDRAM /VGA/DP/HDMI/Dual GbE/COM/Audio/USB
AB1-3G16	**(R).WADE-8017-kBL** Mini-ITX ESB.Q170 w/ECC LGA1151.w/DDR4 SDRAM /VGA/DP/HDMI/Dual GbE/COM/Audio/USB
AB1-3G13	**(R).WADE-8017-C236-kBL** Mini-ITX ESB.C236 w/ECC LGA1151.w/DDR4 SDRAM /VGA/DP/HDMI/Dual GbE/COM/Audio/USB
AB1-3G12	**(R).WADE-8017-H110-kBL** Mini-ITX ESB.H110 w/o ECC LGA1151.w/DDR4 SDRAM /VGA/DP/HDMI/Dual GbE/COM/Audio/USB

PACKING LIST

One WADE-8017 motherboard
One Driver CD
One SATA Cable

GENERAL

Processor	Intel® 7th and 6th Gen Core™ Processors CPU in LGA1151 package
Chipset	Intel® Q170/C236/H110
BIOS	AMI UEFI BIOS (SPI ROM)
Memory	Support up to 32GB DDR4 2133/1866 MT/s ECC/Non-ECC SDRAM on 2x 288 pin DIMM socket
Storage Devices	6x SATA III (H110 just support 4x SATA)
Watchdog Timer	Programmable by embedded controller
Hardware Monitoring	System monitor (Voltage, Fan Speed and Temperature)
Expansion Interface	- 1x PCIe 3.0 x16 slot - 1x M.2 Type E socket(H110 not support) - 1x mini-PCIe socket(H110 just support mSATA) - 1x PCIe 2.0 x1 Golden finger

I/O INTERFACE

Super I/O	N/A
Audio	- Audio Jack on rear I/O with Line-in/ Line-out/ Mic-in - Realtek ALC892 HD Audio codec
Ethernet	- Intel® I219LM and Intel® I211AT Ethernet controller - 2x RJ45 connectors on rear I/O
Serial Port	- 1x RS-232/422/485 port on rear I/O - 1x RS-232 port on rear I/O - 4x RS-232 ports on pin header
USB	- 4x USB 3.0 on rear I/O - 2x USB 2.0 on pin header
GPIO	8-bit configurable controlled by embedded controller
Other	Option TPM module with LPC pin header

DISPLAY

Graphic Controller	Intel® Gen9 graphic engine supports DirectX 12, OpenGL 4.4
Display Interface	- DP:1x DP port on rear I/O, up to 4K (4096x2304@60Hz) - HDMI:1x HDMI port on rear I/O, up to 4K (4096x2160@24Hz) - VGA:1x VGA port on rear I/O, up to 1920x1200 @ 60Hz

Mechanical & Environment

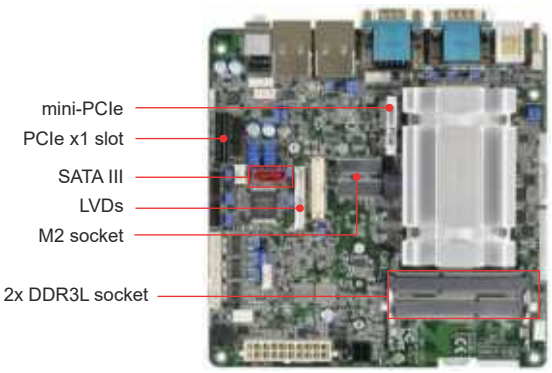
Dimension	170mm(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	24 pin ATX power input (different style)
Environment	- Operation temperature:0˚C~60˚C - Storage temperature:-20˚C~80˚C - Relative humidity:5%~95%,non-condensing
Certification	CE,FCC Class A
MTBF	Over 120,000 hours at 40°C

AMI BIOS | USB 3.0 | Watch DOG | H/W Monitor | 2 GbE | M2 | HDMI | SATA 6Gb | VGA | GPIO | DP | Core™ i7/i5/i3

FC CE Windows 10 IoT RoHS

WADE-8172

Intel® Celeron® Processor N3350 Based Mini-ITX Board with VGA, HDMI, LVDS, Dual GbE, USB 3.0, SATA III, Mini PCIe, M.2

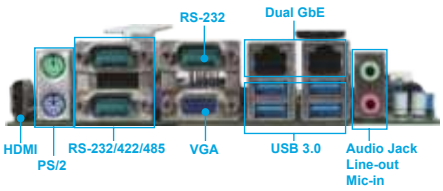


WADE-8172 is based on Intel® Celeron® processor N3350. With dual-channel DDR3L memory and rich I/O sets, WADE-8172 empowers energy-efficient solutions for point-of-sale (POS) and industrial automation applications.

FEATURES

- Intel® Apollo Lake SoC Processor
- Supports Dual Channel DDR3L 1333/1600MHz, 2 x SO-DIMM, up to 8GB system memory
- 1 x HDMI, 1 x D-Sub, 1 x Dual Channel 24-bit LVDS
- 4 xUSB 3.0, 4 x USB 2.0, 1 x SATA3 port
- Supports one PCIe x1(Gen2), one M.2 Key E 2230 with PCIe x1 and USB(Shared) for Wireless, one M.2 Key M 2260/2280 with SATA signal for SSD and one full/half size Mini PCIe socket with PCIe x1 and USB(Shared)

REAR I/O



ORDERING GUIDE

AB1-3F78	**(R).WADE-8172-N3350** Mini-ITX ESB.Intel® Apollo lake SoC Processor N3350 w/DDR3L/ VGA/LVDS/HDMI/dual GbE LAN/SATA

PACKING LIST

One Driver CD
One SATA cable
One I/O shield
One WADE-8172 motherboard

GENERAL

Processor	Intel® Celeron® processor N3350 in FCBGA1296 package, 1.1 GHz (2.4 GHz turbo), 2 MB L2, 6W TDP
Chipset	N/A
BIOS	AMI UEFI BIOS
Memory	Support up to 8 GB DDR3L 1600/1333 MHz memory (non-ECC) on 2x 204-pin SO-DIMM socket
Storage Devices	1x SATA III ports
Watchdog Timer	Programmable watchdog timer, time out period from 1 sec to 255 secs.
Hardware Monitoring	- Temperature (CPU & System) - Voltages (CPU Vcore, 12V, 5V, 3.3V, RAM)
Expansion Interface	- 1x PCIe x1 Gen 2 - 1x M.2 Key E 2230 with PCIe x1 and USB(Shared) for Wireless - 1x M.2 Key M 2260/2280 with SATA signal for SSD - 1x full/half size Mini PCIe socket with PCIe x1 and USB(Shared)

I/O INTERFACE

Super I/O	N/A
Audio	- Intel® High Definition Audio interface Realtek® ALC887 High Definition Audio - 1x jumbo jack support Line-out/Mic-in
Ethernet	2x RJ45 connectors on rear I/O (Realtek® RTL8111G)
Serial port	- 2x RS-232/422/485 on rear I/O (selectable by BIOS) - 1x RS-232 on rear I/O - 3x RS-232 on pin header (2.00 mm pitch)
USB	- 4x USB 3.0 on rear I/O - 4x USB 2.0 on pin header (2.54mm pitch)
GPIO	8 bit GPI/GPO

DISPLAY

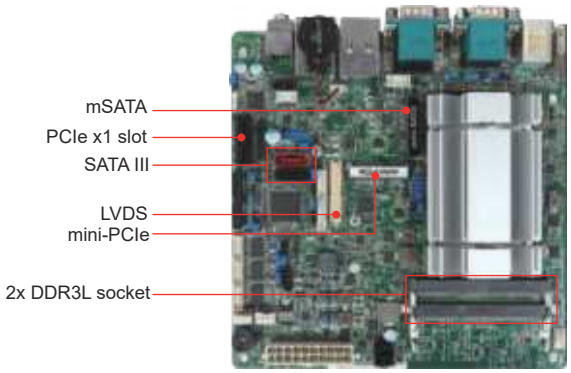
Graphic Controller	Integrated Intel® Generation 9 Graphics Supports DirectX 12, OpenGL 4.2, OpenCL 2.0
Display Interface	- LVDS: dual channel 24bit LVDS on board connector, up to 1920x1200 - HDMI: resolution up to 3840x2160 - VGA: resolution up to 1920 x 1200 , on rear I/O

Mechanical & Environment

Dimension	170mm(L) x 170mm(W); 6.7"(L)x 6.7"(W)
Power Supply	12V & 19~24V DC input or ATX power input
Environment	- Operating temperature: 0°C to 60°C - Storage temperature: -20°C to 80°C - Relative humidity: 5~95%, non-condensing
MTBF	Over 100,000 hours at 40°C

WADE-8171

Intel® Celeron® Processor N3150/N3160 Based Mini-ITX Board with VGA, HDMI, LVDS, Dual GbE, USB 3.0, SATA III, mini-PCIe, and mSATA

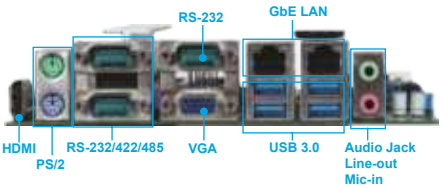


WADE-8171 is based on Intel® Celeron® processor N3160. With dual-channel DDR3L memory and rich I/O sets, WADE-8171 empowers energy-efficient solutions for point-of-sale (POS) and industrial automation applications.

FEATURES

- Intel® Pentium®/Celeron® Braswell SoC Processor
- Supports Dual Channel DDR3L 1333/1600 MT/s, 2 x SO-DIMM, up to 8GB system memory
- 1x HDMI, 1x D-Sub, 1x Dual Channel 24-bit LVDS
- 4x USB 3.0, 4x USB 2.0, 2x SATA III ports
- Supports 1 x mini-PCIe, 1 x mSATA(shared)

REAR I/O



ORDERING GUIDE

AB1-3D63	(R).WADE-8171-N3150 Mini-ITX ESB.Intel® Braswell Quad Core Celeron® 2.08GHz (6W). w/DDR3L/VGA/LVDS/HDMI/dual GbE LAN/SATA

PACKING LIST

1x WADE-8171 motherboard
1x I/O shield
1x SATA cable
1x Driver CD

GENERAL

Processor	Intel® Celeron® processor N3160 in FCBGA1170 package, 1.6 GHz (2.08 GHz turbo), 2 MB, 6W TDP (4C/4T)
Chipset	Integrated
BIOS	AMI UEFI BIOS
Memory	Support up to 8 GB DDR3L 1600/1333 MT/s memory (non-ECC) on 2x 204-pin SO-DIMM socket
Storage Devices	- 2x SATA III ports - 1x mSATA (shared with SATA III)
Watchdog Timer	Programmable watchdog timer, time out period from 1 sec to 255 secs.
Hardware Monitoring	- Temperature (CPU & System) - Voltages (CPU Vcore, 12V, 5V, 3.3V, RAM
Expansion Interface	- 1x PCIe 2.0 x1 slot - 1x full/half-size mini-PCIe socket (USB + PCIe x1 signal) - 1x full size mini-PCIe socket (support mSATA)

I/O INTERFACE

Super I/O	NCT61060
Audio	Intel® High Definition Audio interface Realtek® ALC887 High Definition Audio 1x jumbo jack support Line-out/Mic-in
Ethernet	2x RJ45 connectors on rear I/O (Realtek® RTL8111G)
Serial port	- 2x RS-232/422/485 on rear I/O (selectable by BIOS) - 1x RS-232 on rear I/O - 3x RS-232 on pin header (2.00 mm pitch)
USB	- 4x USB 3.0 ports on rear I/O - 4x USB 2.0 ports on pin header (2.54mm pitch)
GPIO	8-bit GPI/GPO

DISPLAY

Graphic Controller	- Integrated Intel® Generation 8 Graphics - Supports DirectX 11.1, OpenGL® 4.2, OpenCL® 1.2
Display Interface	- LVDS: dual channel 24bit LVDS on board connector, up to 1920x1200 - HDMI: up to 3840x2160 - VGA: up to 1920 x 1200 , on rear I/O

Mechanical & Environment

Dimension	170mm(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	12V DC input
Environment	- Operation temperature: 0°C~60°C - Storage temperature: -20°C~80°C - Relative humidity: 5%~95%, non-condensing
MTBF	Over 120,000hrs at 40°C

SATA 3.0 | LVDS | PS2 KB/MS | HDMI | VGA | 2 GbE | Mini-PCIe | FC | CE | Windows 10 IoT | RoHS

Further Contact

Completed Technical Service-In order to ensure that customers can get the right and speedy service from Portwell, we do offer the following services to meet your needs.

Logistics Service

It is not only for the scalable or world-grade customers, we offer the service to our partners who need the world-wide delivery to save time and expense.

Consulting Service

Our engineering experts provide a free service to discuss with you the projects or technologies that you need in a short period of time. Please visit Portwell web and click the button, then the on-line service will appear for you.

Product Service

We have the experienced product managers who can help you to get the right products in our list and also the related information to complete your solution.

Manufacturing Service

Portwell has the most advanced manufacturing facilities to produce the quality product for your application or business. Please pay a visit to our Portwell engine, you will know how best that we can do for you.

Design Service

If our existing products cannot meet your requirements, a customized design service can be initiated to build the exact products that you demand.

Both Portwell RDC & SIC are set for the completed service to our customers & Partners. Your any requirements or technical issues are welcome to contact us for further solution. Our service can be arranged in the following ways.

Web Service

Portwell already set up the contact for our technology service on the air. Please just visit our web on the internet and left the message for further contact by our people. Besides, you also can get the on-line consulting service via Skype or the phone if the immediate service is needed.

Extended Visits to PE

Some idea or issue is not easy to have the solution within short period of time. Portwell has the necessary facility and dormitory for customers or partners who need to stay with us for a period of time. Please contact us and our service people will give you the message for it.

Direct Contact

Portwell welcomes our customers to visit our Laboratory for the regulation test or design service. We believe that it is the fastest way to solve your questions and achieve the right solution. Just call or mail us; you will have the right service immediately.

Global Service (Telephone)

In addition, you can get immediate support via telephone. Check the web site for phone numbers.
https://www.portwell.com.tw/portwell-worldwide/

Technical Request

For technical support, you could reach our technical request website as follows
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