

Industrial Board Solution Guide





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 resulted in strong growth in market shares and revenue, a firm place on the Taipei stock exchange (TAISDAQ), and has established Portwell as a major worldwide supplier of specialty computing application platforms and services. Portwell, Inc. is a Premier member of the Intel® Internet of Things Solutions Alliance. From modular components to market-ready systems, Intel and the 250+ global member companies of the Intel® Internet of Things

Solutions 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, China, Netherlands, United Kingdom, Germany, Latin America 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 20 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 9001/14000/13485, 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.



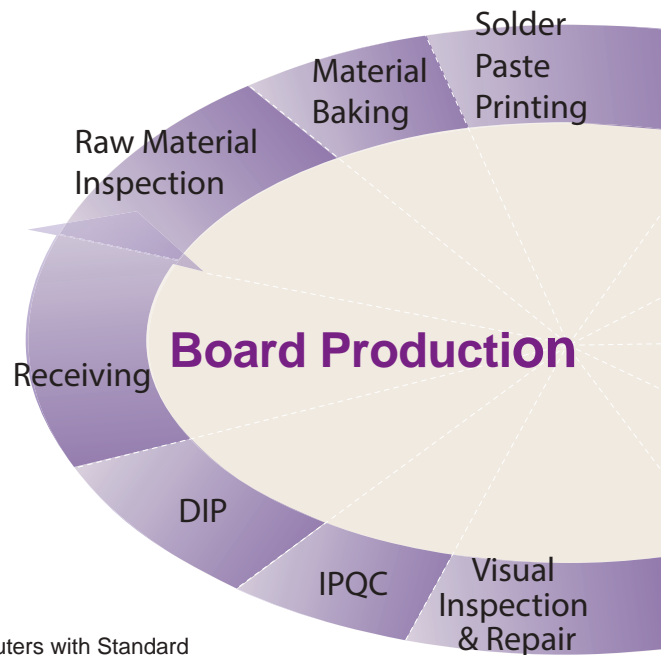
Visual Inspection

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 anomalies. Upon completion, reports regarding production and statistics aid in identifying errors in the production process and ensure product quality.



Certifications

ISO 28000:2007 specifies the requirements for a security management system, including those aspects critical to security assurance of the supply chain.



Certifications

ISO 9000 deals with the fundamentals of quality management systems, including the eight management principles on which the family of standards is based.



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.



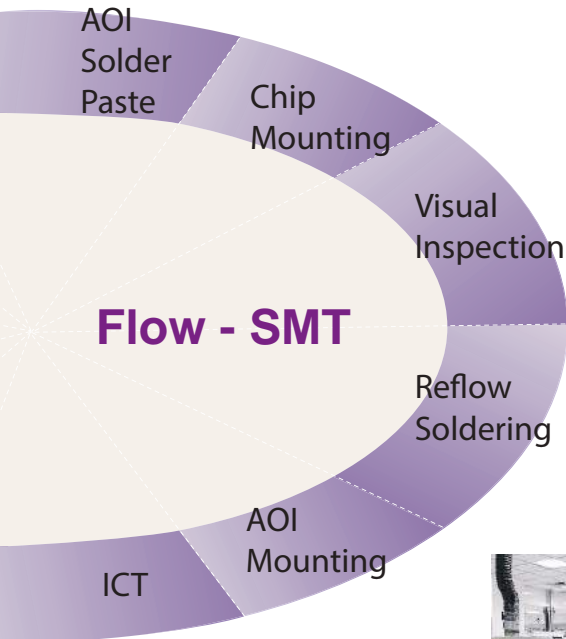
Chips Mounting

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



Certifications

Quality management systems -- Particular requirements for the application of ISO 9001:2008 for automotive production and relevant service part organizations



Certifications

OHSAS 18001:2007 is a standard which represent her highly regards labors' safety, the commitment to employees' health management and continuously improvement to the company and society.



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 :

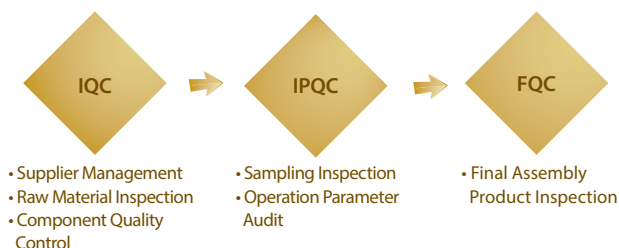
- (1) Suppliers of ESD sensitive components are required to handle and ship them in a protective manner.
- (2) Anti-static packaging is designed to prevent failures due to electrostatic charge build-up.

■ 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.

Quality Assurance
Flow Chart



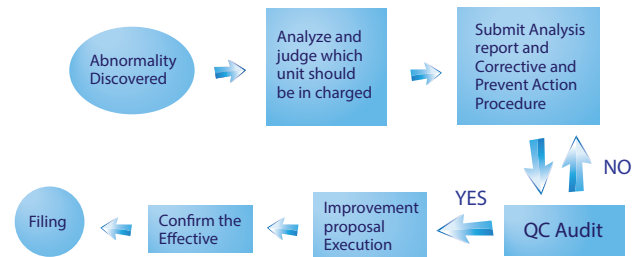
■ Corrective and Preventive Action (CAPA)

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.





Table of Contents

PAGE	1-2	About Portwell	6-8	Table of Contents
	3-4	Board Production Flow - SMT	9	Portwell Solutions
	5	What We Focus On		

SINGLE BOARD COMPUTER

PAGE	10-11	SBC Reference Table
------	-------	---------------------



12 ROBO-8122VG2R

Intel® Xeon® E5-2600Lv4 series processor based on PICMG 1.3 SHB with DDR4 REG SDRAM, VGA, Dual Gigabit Ethernet, and SATA/USB



18 ROBO-8111VG2AR-Q77

Intel® Core™ i7/i5 processor based on PICMG 1.3 SHB with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB



13 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



19 ROBO-8110VG2AR

Intel® Xeon® and Core™ i3 processor based on PICMG 1.3 SHB with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB



14 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



20 ROBO-8110VG2AR-Q67

Intel® Core™ i7 and i5 processor based on PICMG 1.3 SHB with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB



15 ROBO-8112VG2AR

Intel® Xeon® E3-1200v3/ Core™ i3 series processor based on PICMG 1.3 SHB with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB



21 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



16 ROBO-8112VG2AR-Q87

Intel® Core™ i5/i7 series processor based on PICMG 1.3 SHB with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB



22 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



17 ROBO-8111VG2AR

Intel® Xeon® E3-1200v2/Core™ i3 series processor based on PICMG 1.3 SHB with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB



23 ROBO-8780VG2A

Intel® Core™ i3/i5/i7 processor based on PICMG 1.0 SBC with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB

INDUSTRIAL BACKPLANE

PAGE	24-25	PICMG 1.0 Backplane	30	PCI & ISA Backplane
	26-29	PICMG 1.3 Backplane		



Table of Contents

INDUSTRIAL MAIN BOARD

PAGE 31-32 IMB Reference Table



RUBY-D810-H110

33 RUBY-D810-H110

Intel® Core™ i5/i7 processor based µATX with DDR3 SDRAM, Triple display, Dual Gigabit Ethernet, and USB Ports



RUBY-D714VG2AR

37 RUBY-D714VG2AR

Intel® Core™ i5/i7 processor based ATX with DDR3 SDRAM, Triple display, Dual Gigabit Ethernet, and USB Ports



RUBY-D718VG2AR

34 RUBY-D718VG2AR

Leading Desktop Intel® 7th and 6th Gen Skylake-S processor ATX with DDR4 SDRAM, Triple Displays, 2x GbE LAN ports, 6x COM Ports



RUBY-D712VG2AR

38 RUBY-D712VG2AR

Intel® Core™ i5 and i7 processor based ATX with DDR3 SDRAM, Dual Display, Dual Gigabit Ethernet and USB Ports



RUBY-D716VG2AR

35 RUBY-D716VG2AR

Intel® Core™ i5/i7 processor based ATX with DDR3 SDRAM, Triple display, Dual Gigabit Ethernet, and USB Ports



RUBY-D711VG2AR

39 RUBY-D711VG2AR

Intel® Core™ i3 and Xeon® processor based ATX with DDR3 SDRAM, Dual Display, Dual Gigabit Ethernet and USB Ports



RUBY-D715VG2AR

36 RUBY-D715VG2AR

Intel® Core™ i3 and Xeon® processor based ATX with DDR3 SDRAM, Dual Display, Dual Gigabit Ethernet and USB Ports

SMALL PLATFORM

PAGE 40 Small Platform Reference Table



PEB-2773

41 PEB-2773

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



PICO-6260

42 PICO-6260

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

NANO-ITX FORM FACTOR

PAGE 43 NANO Reference Table



NANO-6062

44 NANO-6062

Intel® Apollo Lake Atom® Dual/Quad Core E3900 series SoC based on NANO-ITX. Board with Triple Displays, Gigabit Ethernet, USB 3.0, M.2, SATA III, mini-PCIe, or mSATA



NANO-6050

46 NANO-6050

Intel® 5th Core™ i5/i3 SoC based NANO-ITX with DDR3L SO-DIMM, triple display, Gigabit Ethernet, Audio, USB 3.0, SATA, and mSATA



NANO-6061

45 NANO-6061

Intel® Braswell Pentium®/Celeron® Dual/Quad Core N3000 series SoC based NANO-ITX. Board with triple display, Gigabit Ethernet, Audio, USB 3.0, M.2, SD, SATA, and mSATA



NANO-6060

47 NANO-6060

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



Table of Contents

MINI-ITX FORM FACTOR

PAGE	48	Mini-ITX Platform
	49-51	Mini-ITX Reference Table



WADE-8022

53 WADE-8022

Intel® Core™ i3/i5/i7 mobile processor based Mini-ITX Board with dual Gigabit Ethernet, 4x SATA III ports, 6x COM ports, 1x PCIe x16 expansion slot and 2x mini-PCIe slots with mSATA interface



WADE-8172

54 WADE-8172

Intel® Core™ i5/i7 processor based Mini-ITX with DDR3 SDRAM, Dual Display, Dual Gigabit Ethernet and USB Ports



WADE-8171

55 WADE-8171

Intel® Atom® E3800 SoC based Mini-ITX Board with VGA, DP, DVI, LVDS, Gigabit Ethernet, Audio, USB 3.0, SATA and 2x mini-PCIe slots with mSATA interface



WADE-8079

56 WADE-8079

Intel® Atom® E3800 SoC based Mini-ITX Board with VGA, DP, DVI, LVDS, Gigabit Ethernet, Audio, USB 3.0, SATA and 2x mini-PCIe slots with mSATA interface



WADE-8078

57 WADE-8078

Intel® Atom® E3800 SoC based Mini-TX. Board with VGA, HDMI, Gigabit Ethernet, Audio, USB 3.0, SATA and CFEX



WADE-8210-H110

58 WADE-8210-H110

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



WADE-8017

59 WADE-8017

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

PAGE	52	Side Expansion Board Series
------	----	-----------------------------



WADE-8016

60 WADE-8016

Intel® 4th Gen Core™ i5/i7 processor based Mini-ITX Board with dual Gigabit Ethernet, 2x SATA III ports, 4x COM ports, 1x PCIe x16 expansion slot and 1x CFEX



WADE-8015

61 WADE-8015

Intel® 4th Gen Core™ i5/i7 processor based Mini-ITX Board with dual Gigabit Ethernet, four SATA III ports, 6x COM ports, 1x PCIe x16 expansion slot and 1x mini-PCIe slot with mSATA interface



WADE-8014

62 WADE-8014

Intel® Xeon® E3-1200V2/Core™ i3 processor based Mini-ITX Board with dual Gigabit Ethernet, 4x SATA Ports, 6x COM Ports, 1x PCIe x16 expansion slot and 1x mini-PCIe slot support mSATA interface



WADE-8013

63 WADE-8013

Intel® Core™ i5/i7 processor based Mini-ITX Board with dual Gigabit Ethernet, 4x SATA Ports, 6x COM Ports, 1x PCIe x16 expansion slot and 1x mini-PCIe slot support mSATA interface



WADE-8012

64 WADE-8012

Intel® 2nd Gen Core™ i5/i7 processor based Mini-ITX with dual displays, DDR3 SDRAM, 2x COM Ports and 8x USB Ports



WADE-8011

65 WADE-8011

Intel® Core™ i3 and Xeon® processor based Mini-ITX with dual displays, DDR3 SDRAM, 2x COM Ports and 8x USB Ports

PAGE	66	Further Contact
------	----	-----------------





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 (inch ²)
	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-8122VG2R	ROBO-8113 VG2AR	ROBO-8113 VG2AR-Q170	ROBO-8112VG2AR	ROBO-8112VG2AR-Q87	ROBO-8111VG2AR
Form Factor	Non-Standard PICMG 1.3	PICMG1.3	PICMG1.3	PICMG 1.3	PICMG 1.3	PICMG 1.3
CPU	Dual Intel® E5-2600Lv3 series (under 75W per CPU)	Intel® Xeon® E3/ Core™ i3/i5/i7/Pentium®/ Celeron®	Intel® Core™ i3/i5/i7/ Pentium®/Celeron®	Intel® Xeon® E3-1200V3/ Core™ i3	Intel® Core™ i5/i7	Intel® Xeon® E3-1200v2/Core™ i3
Chipset	Intel® C612	Intel® C236	Intel® Q170	Intel® C226	Intel® Q87	Intel® C216 PCH
BIOS	AMI UEFI	AMI UEFI	AMI UEFI	Phoenix UEFI	Phoenix UEFI	Phoenix UEFI
Memory	8 x DDR4 REG DIMM up to 256GB	2 x DDR4 ECC DIMM up to 32GB	2 x DDR4 non-ECC DIMM up to 32GB	2x DDR3 ECC DIMM up to 16GB	2x DDR3 ECC DIMM up to 16GB	2x DDR3 ECC DIMM up to 16GB
Expansion	Per CPU 1 x PCIe x16 slot or 2x PCIe x8 slot or 4x PCIe x4 slot PCH: 1x PCIe x4 slot or 4x PCIe x1	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	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 1x PCIe x4 slot	4x PCI slots 1x PCIe x16 slot 1x PCIe x4 slot
Display	VGA	VGA/DVI-D/HDMI	VGA/DVI-D/HDMI	VGA/DVI-D/HDMI	VGA/DVI-D/HDMI	VGA/DVI-D/HDMI
Audio	-	Realtek ALC886 HAD codec	Realtek ALC886 HAD codec	Realtek ALC 886-GR HD Audio codec	Realtek ALC 886-GR HD Audio codec	Realtek ALC 886-GR HD Audio codec
LAN	2x GbE (one on board, the other on BP)	2x GbE	2x GbE	2x GbE	2x GbE	2x GbE
Serial Port	2x Tx/Rx signal only on BP	2x RS-232 2x RS-232/422/485	2x RS-232 2x RS-232/422/485	1x RS-232 1x RS-232/422/485	1x RS-232 1x RS-232/422/485	1x RS-232 1x RS-232/422/485
USB	2x USB 3.0 4x USB 2.0	10x USB 3.0 2x USB 2.0	10x USB 3.0 2x USB 2.0	8x USB 2.0 6x USB 3.0	8x USB 2.0 6x USB 3.0	10x USB 2.0 4x USB 3.0
Storage Devices	4x SATA III	6x SATA III	6x SATA III	5x SATA 1x FDD	5x SATA 1x FDD	6x SATA 1x FDD
GPIO	-	8-bit	8-bit	8-bit	8-bit	8-bit
Others	-	PS/2 KB & MS	PS/2 KB & MS	1x Parallel PS/2 KB & MS	1x Parallel PS/2 KB & MS	1x Parallel PS/2 KB & MS
Dimension	338.5 x 126.39mm	338.5x126.39mm	338.5x126.39mm	338.5 x 126.39mm	338.5 x 126.39mm	338.5 x 126.39mm
Page	12	13	14	15	16	17



SBC Reference Table

FULL-SIZE SINGLE BOARD COMPUTER

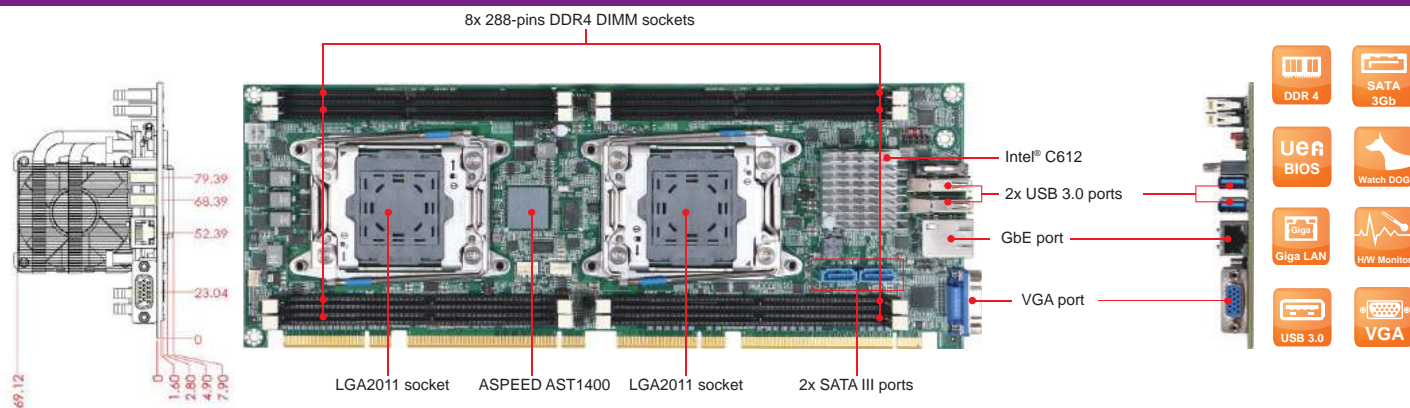


MODEL	ROBO-8111VG2AR-Q77	ROBO-8110VG2AR	ROBO-8110VG2AR-Q67	ROBO-6911VG2AR	ROBO-6911VG2AR-Q170	ROBO-8780VG2A
Form Factor	PICMG 1.3	PICMG 1.3	PICMG 1.3	PICMG1.3 half size	PICMG1.3 half size	PICMG 1.0
CPU	Intel® Core™ i5/i7	Intel® Xeon® E3-1200/ Intel® Core™ i3	Intel® Core™ i5/i7	Intel® Xeon® E3/Core™ i3/i5/i7 processors/ Pentium®/Celeron®	Intel® Core™ i3/i5/ i7 processors/Pentium®/ Celeron®	Intel® Dual Core
Chipset	Intel® Q77	Intel® C206 PCH	Intel® Q67 PCH	Intel® C236	Intel® Q170	Intel® H61
BIOS	Phoenix UEFI	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI
Memory	2x DDR3 DIMM up to 16GB	2x DDR3 ECC DIMM up to 16GB	2x DDR3 DIMM up to 16GB	2x DDR4 ECC SODIMM up to 32GB	2x DDR4 non-ECC SO- DIMM up to 32GB	2x DDR3 DIMM up to 16GB
Expansion	4x PCI slots 1x PCIe x16 slot 1x PCIe x4 slot 1x PCIe x1 slot	4x PCI slots 1x PCIe x16 slot 2x PCIe x8 slot 1x PCIe x8 slot + 2x PCIe x4 slot 1x PCIe x4 slot	4x PCI slots 1x PCIe x16 slot 4x PCIe x1 slots	1x PCIe x16 or 2x PCIe x8 or 1x PCIe x8 + 2x PCIe x4 1x PCIe x4 or 4x PCIe x1	1x PCIe x16 or 2x PCIe x8 or 1x PCIe x8 + 2x PCIe x4 1x PCIe x4 or 4x PCIe x1	4x PCI slots 1x ISA
Display	VGA/DVI-D/HDMI	DVI-I/HDMI	DVI-I/HDMI	DP/DVI-D/VGA	DP/DVI-D/VGA	DVI-D/VGA
Audio	Realtek ALC 886-GR HD Audio codec	Realtek ALC 662 HD Audio codec	Realtek ALC 662 HD Audio codec	Realtek ALC886 HAD codec	Realtek ALC886 HAD codec	Realtek ALC 886-GR HD Audio codec
LAN	2x GbE	2x GbE	2x GbE	2x GbE	2x GbE	2x GbE
Serial Port	1x RS-232 1x RS-232/422/485	1x RS-232 1x RS-232/422/485	1x RS-232 1x RS-232/422/485	1x RS-232/422/485	1x RS-232/422/485	1x RS-232 1x RS-232/422/485
USB	10x USB 2.0 4x USB 3.0	14x USB 2.0	14x USB 2.0	4x USB 3.0	4x USB 3.0	2x USB 3.0 10x USB 2.0
Storage Devices	6x SATA 1x FDD	6x SATA 1x FDD	6x SATA 1x FDD	4x SATA III 1x mSATA socket	4x SATA III 1x mSATA socket	4x SATA 1x FDD
GPIO	8-bit	8-bit	8-bit	-	-	8-bit
Others	1x Parallel PS/2 KB & MS	1x Parallel PS/2 KB & MS	1x Parallel PS/2 KB & MS	-	-	1x Parallel PS/2 KB & MS
Dimension	338.5 x 126.39mm	338.5 x 126.39mm	338.5 x 126.39mm	167.64 x 126.39mm	167.64 x 126.39mm	338.5 x 122mm
Page	18	19	20	21	22	23



ROBO-8122VG2R

Intel® Xeon® E5-2600Lv4 series processor based on PICMG 1.3 SHB with DDR4 REG SDRAM, VGA, Dual Gigabit Ethernet, and SATA/USB



ROBO-8122VG2R is based on Intel® C612 chipset and dual Xeon® processors. It's a server grade SHB. Build with high computing power and PCI express expansion support, it's suitable for Military, industrial automation, networking, Medical and Digital Signage applications.

FEATURES

- Support Intel® 8C ~ 14C Xeon® processors with LGA 2011 package
- Delivers up to 256GB DDR4 Registered memory assured the computer reliability and benefited the data swapping process
- Adopt ASPEDD AST1400 graphic engine offers solid 2D performance by VGA port
- High speed Gigabit Ethernet based on PCI express x 1 interface
- Flexible PCI Express configuration on backplane up to total 36 lanes

ORDERING GUIDE

AB1-3D44	(R).ROBO-8122VG2R PICMG 1.3(PCI-E).LGA2011. Dual Intel® Haswell-EP processor with eight DDR4 REG DIMM sockets.SHB.w/VGA/GbE/SATA III/USB 3.0 ports
----------	---

PACKING LIST

Standard	B6902932 SATA III cable B8981980 PICMG SBC Handling and Installation Notice B8983670 Installation CD
Optional	B9971490 CPU cooler for single processor(for 4U system) B9971510 CPU cooler for single processor(for 2U system)

GENERAL

Processor	- Intel® 8C~14C Xeon® E5-2600Lv3/v4 series processor (50W ~ 75W) with 15~30MB Cache in LGA2011 package (support up to 75W per CPU) - Intel® QPI transfer rates: 6.4, 8 and 9.6GT/s (depends on CPU socket) - DMI x4 Link: 5 GT/s - Supports Intel® Hyper-Threading, Virtualization Technology (VT-x), and QuickPath Technology
Chipset	Intel® C612 PCH
BIOS	AMI UEFI BIOS (SPI ROM)
Memory	- Supports up to 256GB DDR4 2133/1866 SDRAM on Eight 288-pin DIMM sockets - Supports Register
Storage Devices	- 4x SATA III drives (Dual ports via Backplane) - RAID 0, 1
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 per CPU: 1x PCIe x16 or 2x PCIe x8 or 1x PCIe x8 + 2x PCIe x4 by different bios support (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)
Non-standard Gold Finger definition	- Section A/B: PICMG 1.3 Standard PCI Express definition, total 20 lanes - Section D: PCIe x16 from 2nd CPU (Dedicated backplane for ROBO-8122VG2R)

I/O INTERFACE

Super I/O	ITE IT8772E
Audio	N/A
Ethernet	- On-board Intel® WGI217LM + WGI210AT Gigabit Ethernet controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T Ethernet - PCI Express x1 interface based on Gigabit Ethernet - Single RJ-45 connector with two LED indicators for WGI217LM on bracket, the other port route to Golden finger section C on BP for WGI210AT
Serial port	2x Tx/Rx signal route to Golden finger section C on BP (4 pins)
USB	- 4x USB 2.0 ports (through backplane) - 480Mb/s bus capable of high-speed/full-speed/low-speed data ranges - 2x USB 3.0 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
GPIO	N/A

DISPLAY

Graphic Controller	ASPEED AST1400
Display Interface	CRT on bracket:up to 1920x1200@60Hz

Mechanical & Environment

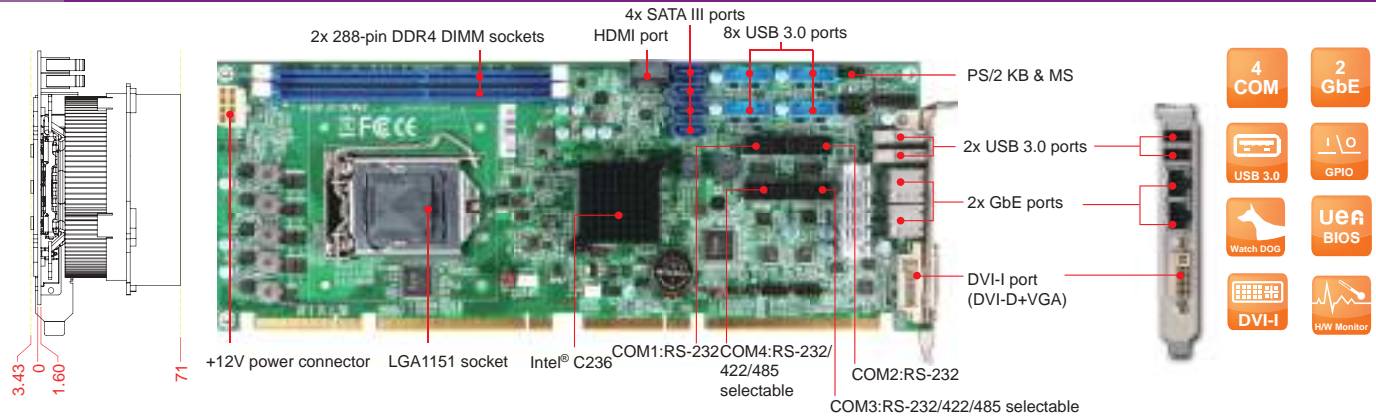
Dimension	338.5mm(L) x 126.39mm(W), 13.33"(L) x 4.98"(W)
Power Supply	Typical: +12V, +5V -Support ATX mode
Environment	Operatin Temperature:0°C ~ 50°C(for 75W CPU limitation) Storage Temperature:-20°C ~ 80°C Relative Humidity:5~90%,non-condensing Thermal Solution depends on chassis design and system fan selection
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C





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 B6903350 DVI-D + VGA cable B6902350 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

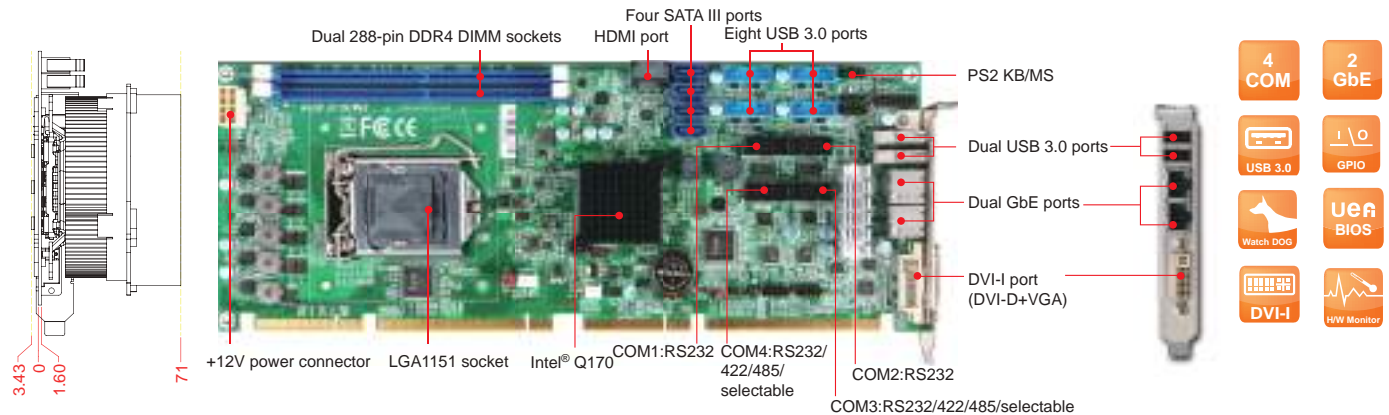
Dimension	- 338.5mm(L) x 126.39mm(W), 13.33"(L) x 4.98" (W) - PCB: 8 layers
Power Supply	- Typical: +12V, +5V - Support ATX mode
Environment	- Operatin Temperature:0~60°C - Storage Temperature:-20~80°C - Relative Humidity:5~90%,non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C





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 to 32GB maximum DDR4 2133 MT/s non-ECC DIMM on two sockets
- Supports multiple display by DVI-I (DVI-D+VGA) and HDMI
- High speed dual Gigabit Ethernet based on PCI express x1, high bandwidth I/O interface
- On-board 6x SATA III ports
- Rich I/O connections such as four serial 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
	B6903350 DVI-D + VGA cable
	B6902350 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 UEFI 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

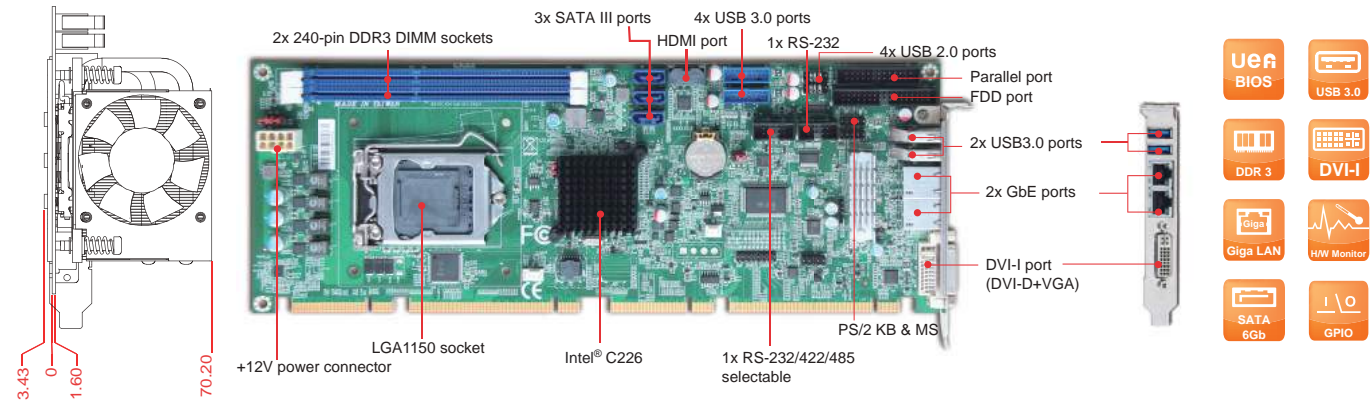
Mechanical & Environment

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



ROBO-8112VG2AR

Intel® Xeon® E3-1200v3/Core™ i3 series processor based on PICMG 1.3 SHB with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB



ROBO-8112VG2AR is based on Intel® C226 chipset and workstation processor sku like Xeon® and Core™ i3. Build with flexible PCI express expansion, it's suitable for Medical, Industrial automation, and Digital Signage applications.

FEATURES

- Supports Intel® Xeon® E3-1200v3 series/ Core™ i3 processors in LGA1150 package
- Delivers up to 16GB maximum DDR3 1333/1600 ECC SDRAM on two DIMM sockets
- Supports triple display by DVI-I (DVI-D+VGA) and HDMI
- Supports iAMT 9.0 on Intel® Xeon® E3-1200v3 series processors
- High speed dual Gigabit Ethernet based on PCI Express x1, high bandwidth I/O interface
- Rich I/O connections such as FDD, two Gigabit Ethernet, serial ports, parallel port, USB 2.0/3.0
- On-board five SATA III ports support RAID 0,1,5,10 (dual ports on backplane)

ORDERING GUIDE

AB1-3954	ROBO-8112VG2AR PICMG 1.3(PCI-E+PCI).LGA1150. Intel® Xeon®/Core™ i3 processors.SHB.w/VGA/Dual GbE/Audio
-----------------	--

PACKING LIST

Standard	B6902932 SATA III cable (Black) B690021S Cable kit for FDD+PRN with bracket B8981980 PICMG SBC Handling and Installation Notice B6903350 DVI-D + VGA cable B6903240 dual head COM port cable with bracket B3751640 Installation CD
Optional	B6902980 PS/2 Keyboard / Mouse Cable with bracket B6902230 USB port cable with bracket AB9-2066 PA-M1AU Multiple Media kit B6903090 USB 3.0 cable with bracket

GENERAL

Processor	- Intel® Core™ i3 and Xeon® E3-1200v3 series processor up to 3.5 GHz (45~95W) with (8MB) Cache in LGA-1150 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® C226 PCH
BIOS	Phoenix UEFI BIOS
Memory	- Supports up to 16GB DDR3 1333/1600 MT/s SDRAM on two 240-pin ECC DIMM sockets - Supports ECC
Storage Devices	- Supports 5x SATA III drive (Dual ports via Backplane) - RAID 0,1,5,10 - 1x FDD channel
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 (Gen2 up to 5.0 GT/s) - 4x PCI devices at 32 bit 33 MHz

I/O INTERFACE

Super I/O	ITE IT8728F
Audio	- Intel® BD82C226 PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC886-GR HDA codec, 5.1 channels
Ethernet	- Intel® WGI217LM + 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 and 1x selectable RS-232/422/485 on board
USB	- 8x USB 2.0 ports (four ports through backplane) - 480Mb/s bus capable of high-speed/full-speed/low-speed data ranges - 6x USB 3.0 ports on board (four 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
Others	1x Parallel port

DISPLAY

Graphic Controller	- Intel® Xeon® and Core™ i3 processors integrated graphics engine - Provides improved 3D multimedia capabilities including Microsoft DirectX 11.1, Shader Model 4.0, MPEG-2 and OpenGL 3.2
Display Interface	Support independent triple display by - CRT on bracket: up to 1920x1200 @ 60Hz - DVI-D on bracket: up to 1920x1200 @ 60Hz - HDMI: up to 4096x2160 @ 24Hz (CRT + DVI-D on bracket by DVI-I port)

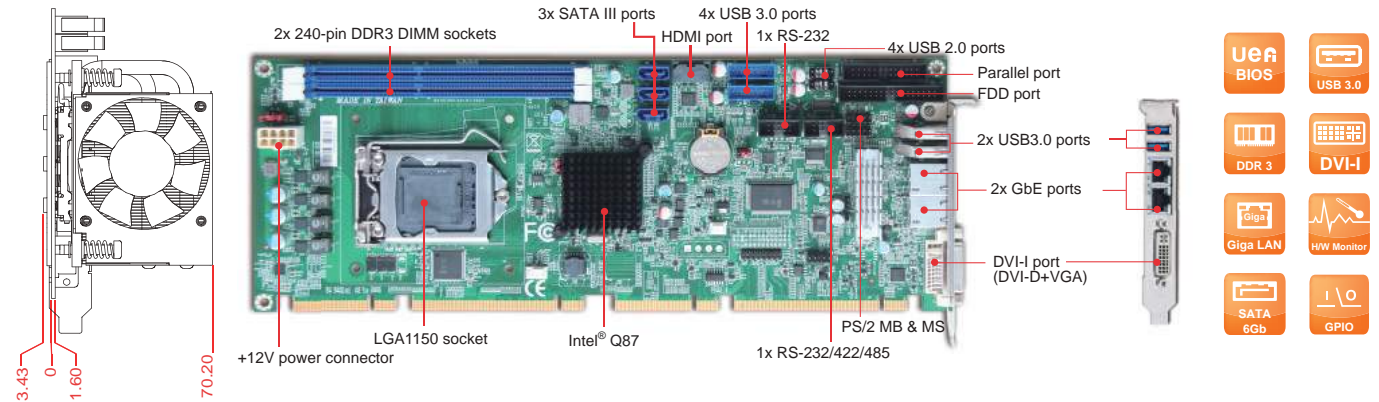
Mechanical & Environment

Dimension	- 338.5mm(L) x 126.39mm(W), 13.33"(L) x 4.98"(W) - PCB: 8 layers
Power Supply	- Typical: +12V @5.29A; +5V @4.94A - Support ATX mode
Environment	- Operation 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



ROBO-8112VG2AR-Q87

Intel® Core™ i5/i7 series processor based on PICMG 1.3 SHB with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB



ROBO-8112VG2AR-Q87 is based on Intel® Q87 chipset and workstation processor sku like Core™ i5/i7. Build with flexible PCI express expansion, it's suitable for Medical, Industrial automation, and Digital Signage applications.

FEATURES

- Supports Intel® Core™ i5/i7 processors in LGA1150 package
- Delivers up to 16GB maximum DDR3 1333/1600 MT/s non-ECC SDRAM on two DIMM sockets
- Supports triple display by DVI-I (DVI-D+VGA) and HDMI
- Supports iAMT 9.0 on Intel® Core™ i5/i7 processors
- High speed dual Gigabit Ethernet based on PCI Express x1, high bandwidth I/O interface
- Rich I/O connections such as FDD, two Gigabit Ethernet, serial ports, parallel port, USB 2.0/3.0"
- On-board five SATA III ports support RAID 0,1,5,10 (dual ports on backplane)

ORDERING GUIDE

AB1-3955	ROBO-8112VG2AR-Q87 PICMG 1.3(PCI-E+PCI).LGA1150. Intel® Core™ i5/i7 processors.SHB.w/VGA/Dual GbE/Audio
----------	--

PACKING LIST

Standard	B6902932 SATA III cable (Black) B690021S Cable kit for FDD+PRN with bracket B8981980 PICMG SBC Handling and Installation Notice B6903350 DVI-D + VGA cable B6903240 dual head COM port cable with bracket B3751640 Installation CD
Optional	B6902980 PS/2 Keyboard / Mouse Cable with bracket B6902230 USB port cable with bracket AB9-2066 PA-M1AU Multiple Media kit B6903090 USB 3.0 cable with bracket

GENERAL

Processor	- Intel® Core™ i5/i7 processors up to 3.1 GHz (35~65W) with (4~8MB) Cache in LGA-1150 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® Q87 PCH
BIOS	Phoenix UEFI BIOS
Memory	- Supports up to 16GB DDR3 1333/1600 MT/s SDRAM on two 240-pin non-ECC DIMM sockets - Supports non-ECC
Storage Devices	- Supports 5x SATA III drive (Dual ports via Backplane) - RAID 0,1,5,10 - 1x FDD channel
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 PCI Express x16 (Gen3 up to 8.0 GT/s) - From PCH: 1x PCIe x4 or 4x PCIe x1 x1 by different bios support (Gen2 up to 5.0 GT/s) - 4x PCI devices at 32 bit 33 MHz

I/O INTERFACE

Super I/O	ITE IT8728F
Audio	- Intel® BD82Q87 PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC886-GR HDA codec, 5.1 channels
Ethernet	- Intel® WGI217LM + 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 and 1x selectable RS-232/422/485 on board
USB	- 8x USB 2.0 ports (four ports through backplane) - 480Mb/s bus capable of high-speed/full-speed/low-speed data ranges - 6x USB 3.0 ports on board (four 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 MB & MS
GPIO	On board programmable 8-bit Digital I/Os
Others	1x Parallel port

DISPLAY

Graphic Controller	- Intel® Core™ i5/i7 processors integrated graphics engine - Provides improved 3D multimedia capabilities including Microsoft DirectX 11.1, Shader Model 4.0, MPEG-2 and OpenGL 3.2
Display Interface	Support independent triple display by - CRT on bracket: up to 1920x1200 @ 60Hz - DVI-D on bracket: up to 1920x1200 @ 60Hz - HDMI: up to 4096x2160 @ 24Hz (CRT + DVI-D on bracket by DVI-I port)

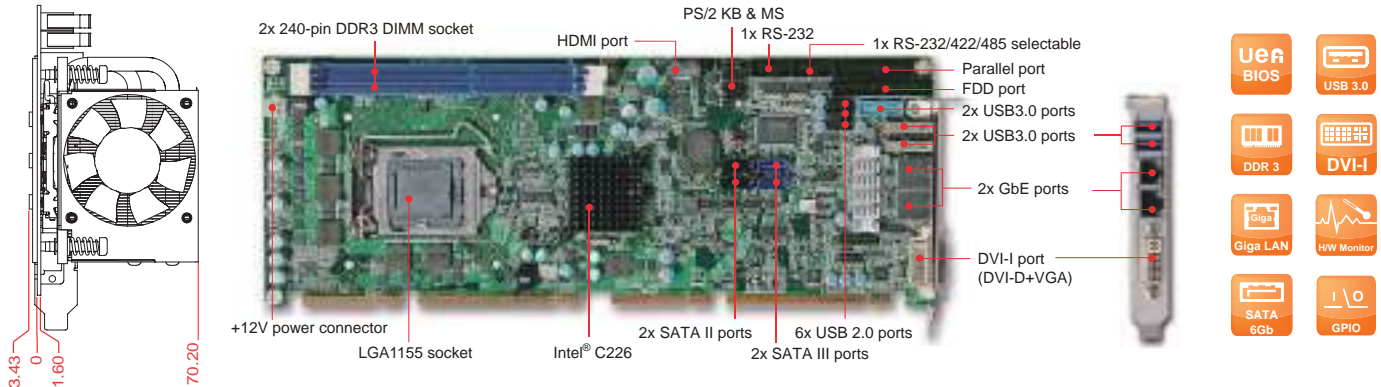
Mechanical & Environment

Dimension	- 338.5mm(L) x 126.39mm(W), 13.33""(L) x 4.98""(W) - PCB: 8 layers
Power Supply	- Typical: +12V @5.29A;+5V@4.94A - Support ATX mode
Environment	- Operation 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



ROBO-8111VG2AR

Intel® Xeon® E3-1200v2/Core™ i3 series processor based on PICMG 1.3 SHB with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB



ROBO-8111VG2AR is based on the Intel® C216 chipset and workstation processor sku. Built with flexible PCI express expansion, it's suitable for medical, Factory Automation, and Digital Signage applications.

FEATURES

- Supports Intel® Xeon® E3-1200v2 series/ Core™ i3 processors in LGA1155 package
- Delivers up to 16GB maximum DDR3 1333/1600 MT/s ECC SDRAM on two DIMM sockets
- Supports multiple display by DVI-I (DVI-D+VGA) and HDMI
- Supports iAMT 8.0 on Intel® Xeon® E3-1200v2 series processors
- High speed dual Gigabit Ethernet based on PCI Express x1, high bandwidth I/O interface
- Rich I/O connections such as FDD, two Gigabit Ethernet, serial ports, parallel port, USB 2.0/3.0
- On-board two SATA II and two SATA III ports support RAID 0,1,5,10

ORDERING GUIDE

AB1-2329	ROBO-8111VG2AR PICMG 1.3(PCI-E+PCI).LGA1155. Xeon® /i3 processors.SHB.w/VGA/Dual GbE/ Audio
-----------------	---

PACKING LIST

Standard	B6901990 SATA II cable B6902930 SATA III cable (Black) B690021S cable kit for FDD+PRN with bracket B6903240 Dual head COM port cable with bracket B6903350 DVI-D + VGA cable B8981980 PICMG SBC Handling and Installation Notice B3751500 Installation CD
Optional	B6902980 PS/2 Keyboard / Mouse cable with bracket B6902230 USB port cable with bracket B6903090 USB 3.0 cable with bracket AB9-2066 PA-M1AU Multiple Media kit

GENERAL

Processor	- Intel® Xeon® E3-1200v2 series and Core™ i3 processor in LGA1155 package - IDMI x4 Link: 5.0 GT/s - Supports Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring, Trusted Execution and SpeedStep Technology (depends on CPU sku)
Chipset	Intel® C216 PCH
BIOS	Phoenix UEFI BIOS
Memory	- Supports up to 16GB DDR3 1333/1600 SDRAM on two 240-pin ECC DIMM sockets - Supports ECC
Storage Devices	- Supports 2x SATA III drives and 4x SATA II drives (Dual SATA II ports via Backplane) - RAID 0,1,5,10 - 1x FDD channel
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 - From PCH: 1x PCIe x4 or 4x PCIe x1 by different bios support - 4x PCI devices at 32 bit 33 MHz

I/O INTERFACE

Super I/O	ITE IT8728F
Audio	- Intel® BD82C216 PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC886-GR HDA codec, 5.1 channels
Ethernet	- Intel® 82579LM+82574L 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 and 1x selectable RS-232/422/485 on board
USB	- 10x USB 2.0 ports (four ports through backplane) - 480Mb/s bus capable of high-speed/full-speed/low-speed data ranges - 4x USB 3.0 ports on board (two ports on board, two 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 KB & MS
GPIO	On board programmable 8-bit Digital I/Os
Others	1x parallel port

DISPLAY

Graphic Controller	- Intel® Xeon® and Core™ i3 processors integrated graphics engine - Provides improved 3D multimedia capabilities including Microsoft DirectX 11, Shader Model 4.0, MPEG-2 and OpenGL 3.1
Display Interface	- CRT on bracket: up to 2048x1536 @75Hz - DVI-D: up to 1920x1200 @60Hz - HDMI: up to 1920x1200 @60Hz (CRT+DVI-D on bracket by DVI-I port)

Mechanical & Environment

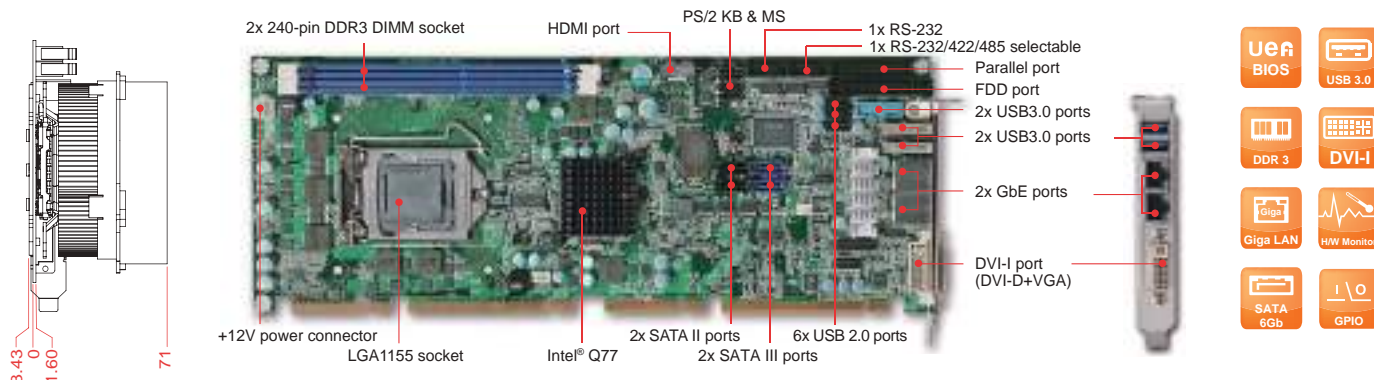
Dimension	- 338.5(L) x 126.39(W)mm; 13.33"(L) x 4.98"(W) - PCB: 12 layers
Power Supply	- Typical: +12V@6.96A; +5V@0.32A - Supports ATX mode
Environment	- Operation Temperature: 0°C~60°C (For 80W CPU limitation) - Storage Temperature: -20°C~80°C - Relative Humidity: 5~90%, non-condensing
Certification	CE, FCC Class A
MTBF	Over 100,000 hours at 40°C





ROBO-8111VG2AR-Q77

Intel® Core™ i7/i5 processor based on PICMG 1.3 SHB with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB3.0



ROBO-8111VG2AR-Q77 is based on Intel® Q77 chipset and Core™ i7/i5 sku processor. It's suitable for Medical, Factory Automation, and Digital Signage applications.

FEATURES

- Supports Intel® Core™ i7/i5 processors in LGA1155 package
- Delivers up to 16GB maximum DDR3 1333/1600 MT/s SDRAM on two DIMM sockets
- Supports multiple display by DVI-I (DVI-D+VGA) and HDMI
- Supports iAMT 8.0 on Intel® Core™ i7/i5 processors
- High speed dual Gigabit Ethernet based on PCI Express x1, high bandwidth I/O interface
- Rich I/O connections such as FDD, two Gigabit Ethernet, serial ports, parallel port, USB 2.0/3.0
- On-board two SATA II and two SATA III ports support RAID 0,1,5,10

ORDERING GUIDE

AB1-2330	ROBO-8111VG2AR-Q77 PICMG 1.3(PCI-E+PCI).LGA1155. i7/i5 processors.SHB.w/VGA/Dual GbE/ Audio
----------	--

PACKING LIST

Standard	B6901990 SATA II cable B6902930 SATA III cable (Black) B690021S cable kit for FDD+PRN with bracket B6903240 Dual head COM port cable with bracket B6903350 DVI-D + VGA cable B8981980 PICMG SBC Handling and Installation Notice B3751500 Installation CD
Optional	B6902980 PS/2 Keyboard / Mouse Cable with bracket B6902230 USB port cable with bracket B6903090 USB 3.0 cable with bracket AB9-2066 PA-M1AU Multiple Media kit

GENERAL

Processor	- Intel® Core™ i7/i5 processor in LGA1155 package - IDMI x4 Link: 5.0 GT/s - Supports Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring, Trusted Execution and SpeedStep® Technology (depends on CPU sku)
Chipset	Intel® Q77 PCH
BIOS	Phoenix UEFI BIOS
Memory	- Supports up to 16GB DDR3 1333/1600 MT/s SDRAM on two 240-pin DIMM sockets
Storage Devices	- Supports 2x SATA III drives and 4x SATA II drives (Dual SATA II ports via Backplane) - RAID 0,1,5,10 - 1x FDD channel
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: 1x PCIe x16 - From PCH: 1x PCIe x4 or 4x PCIe x1 by different bios support - 4x PCI devices at 32 bit 33 MHz

I/O INTERFACE

Super I/O	ITE IT8728F
Audio	- Intel® BD82C216 PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC886-GR HDA codec, 5.1 channels
Ethernet	- Intel® 82579LM+82574L 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 and 1x selectable RS-232/422/485 on board
USB	- 10x USB 2.0 ports (four ports through backplane) - 480Mb/s bus capable of high-speed/full-speed/low-speed data ranges - 4x USB 3.0 ports on board (two ports on board, two 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 KB & MS
GPIO	On board programmable 8-bit Digital I/Os
Others	1x parallel port

DISPLAY

Graphic Controller	- Intel® Core™ i7/i5 processors integrated graphics engine - Provides improved 3D multimedia capabilities including Microsoft DirectX 11, Shader Model 4.0, MPEG-2 and OpenGL 3.1
Display Interface	- CRT on bracket: up to 2048x1536 @75Hz - DVI-D: up to 1920x1200 @60Hz - HDMI: up to 1920x1200 @60Hz(CRT+DVI-D on bracket by DVI-I port)

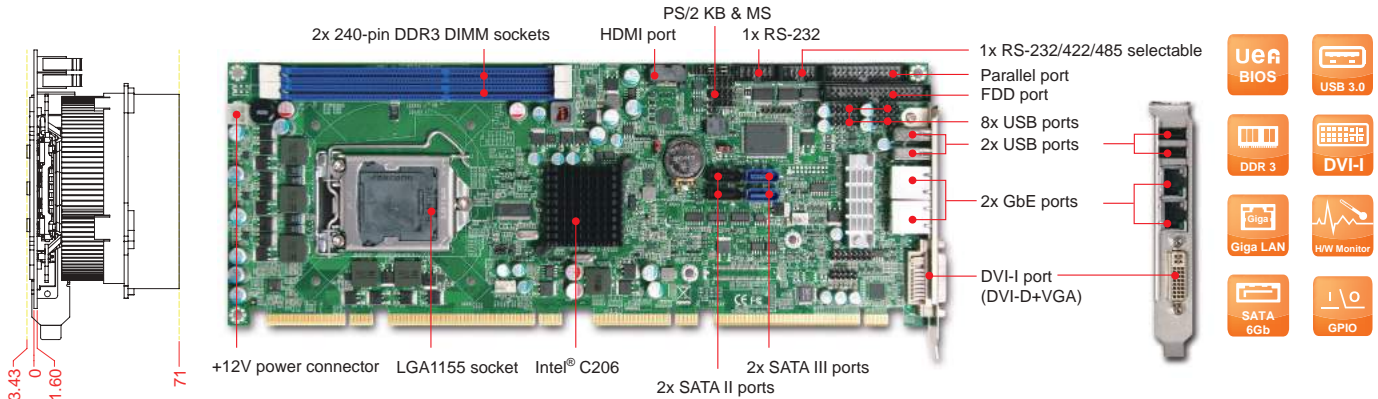
Mechanical & Environment

Dimension	- 338.5(L) x 126.39(W)mm; 13.33"(L) x 4.98"(W) - PCB: 12 layers
Power Supply	- Typical: +12V @4.85A; +5V @3.4A - Supports ATX mode
Environment	- Operation Temperature: 0°C~60°C (with highest performance on 50 °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



ROBO-8110VG2AR

Intel® Xeon® and Core™ i3 processor based on PICMG 1.3 SHB with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB



ROBO-8110VG2AR is based upon the Intel® C206 chipset and workstation processor sku like Xeon® and Core™ i3. Built with flexible PCI express expansion, it's suitable for medical, industrial automation, and Digital Signage applications.

FEATURES

- Supports Intel® Xeon® E3-1200 series and Core™ i3 processors in LGA1155 package
- Delivers up to 16GB maximum DDR3 1333/1066 MT/s ECC SDRAM on two DIMM sockets
- Supports multiple display with DVI-I (DVI-D+ VGA) and HDMI
- Supports iAMT 7.0 on Xeon® E3-1200 series processors
- High speed dual Gigabit Ethernet based on PCI Express x1, high bandwidth I/O interface
- Rich I/O connections such as FDD, two Gigabit Ethernet, serial ports, parallel port, USB 2.0
- On-board two SATA II and two SATA III ports support RAID 0,1,5,10

ORDERING GUIDE

AB1-3600	ROBO-8110VG2AR PICMG 1.3(PCI-E+PCI), LGA1155,Core™ 2 Quad,SHB.w/VGA/Dual GbE/Audio
----------	---

PACKING LIST

Standard	B6901990 SATA II cable
	B6902930 SATA III cable (Black)
	B690021S cable kit for FDD+PRN with bracket
	B6903240 Dual head COM port cable with bracket
	B6903350 DVI-D + VGA cable
	B8981980 PICMG SBC Handling and Installation Notice
	B3751400 Installation CD
Optional	B6902980 PS/2 Keyboard/Mouse Cable with bracket
	B6902230 USB port cable with bracket
	AB9-2066 PA-M1AU Multiple Media kit

GENERAL

Processor	- Intel® Core™ i3 and Xeon® E3-1200 series processor up to 3.4 GHz (65~95W) with (3~8MB) Cache in LGA1155 package - DMI x4 Link: 5.0 GT/s - Supports Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring, Trusted Execution and SpeedStep Technology (depends on CPU sku)
Chipset	Intel® C206 PCH (6.6W)
BIOS	AMI UEFI BIOS
Memory	- Supports up to 16GB DDR3 1066/1333 MT/s SDRAM on two 240-pin ECC DIMM sockets
Storage Devices	- 2x SATA III drives and 4x SATA II drives (Dual SATA II ports via Backplane) - RAID 0,1,5,10 - 1x FDD channel on board box header
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 - From PCH: 1x PCIe x4 or 4x PCIe x1 by different bios support - 4x PCI devices at 32 bit 33 MHz

I/O INTERFACE

Super I/O	ITE IT8728F
Audio	- Intel® BD82C206 PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC662-GR HDA codec, 5.1 channels
Ethernet	- Intel® 82579LM+82574L Gigabit Ethernet controller - Dual RJ-45 connector with two LED indicators
Serial Port	- 1x RS-232 on bracket - 1x Selectable RS-232/422/485 on bracket
USB	- 14x USB 2.0 ports (Four ports through backplane) - 480 Mb/s bus comprehends the high-speed/full-speed/low-speed data ranges
Keyboard & Mouse	2x USB 2.0 ports on bracket dedicated to KB & MS
GPIO	On board programmable 8-bit Digital I/Os
Others	1x parallel port on board box header

DISPLAY

Graphic Controller	- Intel® Xeon® and Core™ i3 processors integrated graphic engine P3000 - Provided improved 3D multimedia capabilities including Microsoft DirectX 10.1, Shader Model 4.0, MPEG-2 and OpenGL 3.0"
Display Interface	- VGA on bracket: up to 2048x1536 @ 75Hz - DVI-D: up to 1920x1200 @ 60Hz - HDMI: up to 1920x1200 @ 60Hz (VGA + DVI-D on bracket by DVI-I port)

Mechanical & Environment

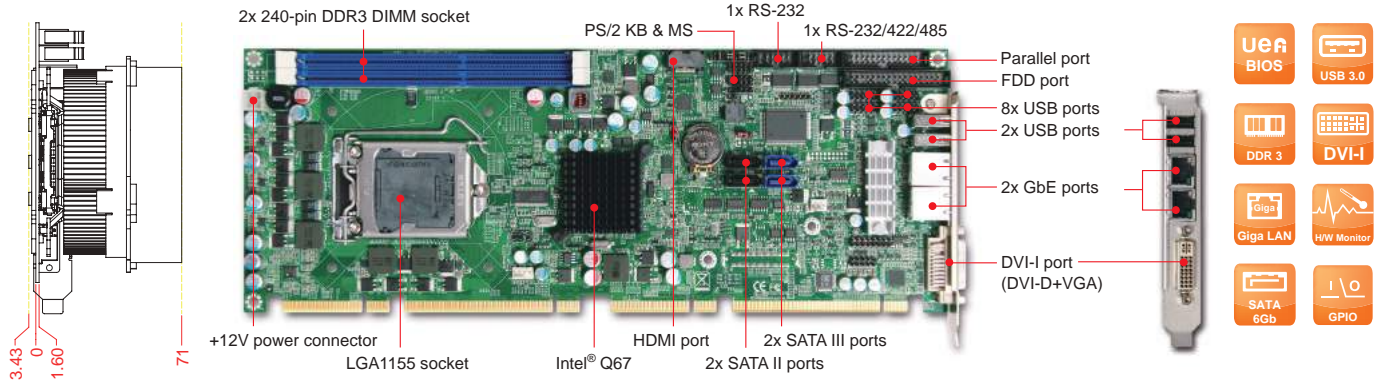
Dimension	- 338.5(L) x 126.39(W)mm; 13.33"(L) x 4.98"(W) - PCB: 8 layers
Power Supply	- Typical: +12V @ 4.85A; +5V @ 3.4A - Supports ATX mode
Environment	- Operation Temperature: 0°C~60°C (with better performance on 50 °C) - Storage Temperature: -20°C~80°C - Relative Humidity: 5~90%, non-condensing
Certification	CE, FCC Class A
MTBF	Over 100,000 hours at 40°C





ROBO-8110VG2AR-Q67

Intel® Core™ i7 and i5 processor based on PICMG 1.3 SHB with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB



ROBO-8110VG2AR-Q67 is based on the Intel® Q67 chipset and desktop processor sku like Intel® Core™ i7 and i5. Built with flexible PCI express expansion, it's suitable for Medical, Industrial Automation, and Digital Signage applications.

FEATURES

- Supports Intel® Core™ i7 and i5 processors in LGA1155 package
- Delivers up to 16GB maximum DDR3 1066/1333 MT/s SDRAM on two DIMM sockets
- Supports multiple display with DVI-I (DVI-D+VGA) and HDMI
- Supports iAMT 7.0 on Core™ i7 and i5 processors
- High speed dual Gigabit Ethernet based on PCI Express x1, high bandwidth I/O interface
- Rich I/O connections such as FDD, two Gigabit Ethernet, serial ports, parallel port, USB 2.0
- On-board two SATA II and two SATA III ports support RAID 0,1,5,10

ORDERING GUIDE

AB1-3774	ROBO-8110VG2AR-Q67 PICMG 1.3(PCI-E+PCI),LGA1155,Core™ 2 Quad,SHB,w/VGA/Dual GbE/Audio
----------	--

PACKING LIST

Standard	B6901990 SATA II cable B6902930 SATA III cable (Black) B690021S cable kit for FDD+PRN with bracket B6903240 Dual head COM port cable with bracket B6903350 DVI-D + VGA cable B8981980 PICMG SBC Handling and Installation Notice B3751400 Installation CD
Optional	B6902980 PS/2 Keyboard / Mouse Cable with bracket B6902230 USB port cable with bracket AB9-2066 PA-M1AU Multiple Media kit

GENERAL

Processor	- Intel® Core™ i7 and i5 processor up to 3.4 GHz (65~95W) with (3~8MB) Cache in LGA1155 package - DMI x4 Link: 5.0 GT/s - Supports Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring, Trusted Execution and SpeedStep® Technology (depends on CPU sku)
Chipset	Intel® Q67 PCH (6.1W)
BIOS	AMI UEFI BIOS
Memory	- Supports up to 16GB DDR3 1066/1333 MT/s SDRAM on two 240-pin DIMM sockets
Storage Devices	- 2x SATA III drives and 4x SATA II drives (Dual SATA II ports via Backplane) - RAID 0,1,5,10 - 1x FDD channel on board box header
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: 1x PCIe x16 - From PCH: 1x PCIe x4 or 4x PCIe x1 by different bios support - 4x PCI devices at 32 bit 33 MHz

I/O INTERFACE

Super I/O	ITE IT8728F
Audio	- Intel® BD82Q67 PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC662-GR HDA codec, 5.1 channels
Ethernet	- Intel® 82579LM+82574L Gigabit Ethernet controller - Dual RJ-45 connector with two LED indicators
Serial Port	- 1x RS-232 on bracket - 1x Selectable RS-232/422/485 on bracket
USB	- 14x USB 2.0 ports (four ports through backplane) - 480 Mb/s bus capable of high-speed/full-speed/low-speed data ranges
Keyboard & Mouse	2x USB 2.0 ports on bracket dedicated to KB & MS
GPIO	On board programmable 8-bit Digital I/Os
Others	1x parallel port on board box header

DISPLAY

Graphic Controller	- Intel® Core™ i7 and i5 processors integrated graphic engine P3000 - Improved 3D multimedia capabilities including Microsoft DirectX 10.1, Shader Model 4.0, MPEG-2 and OpenGL 3.0*
Display Interface	- VGA on bracket: up to 2048x1536 @ 75Hz - DVI-D: up to 1920x1200 @ 60Hz - HDMI: up to 1920x1200 @ 60Hz (VGA + DVI-D on bracket by DVI-I port)

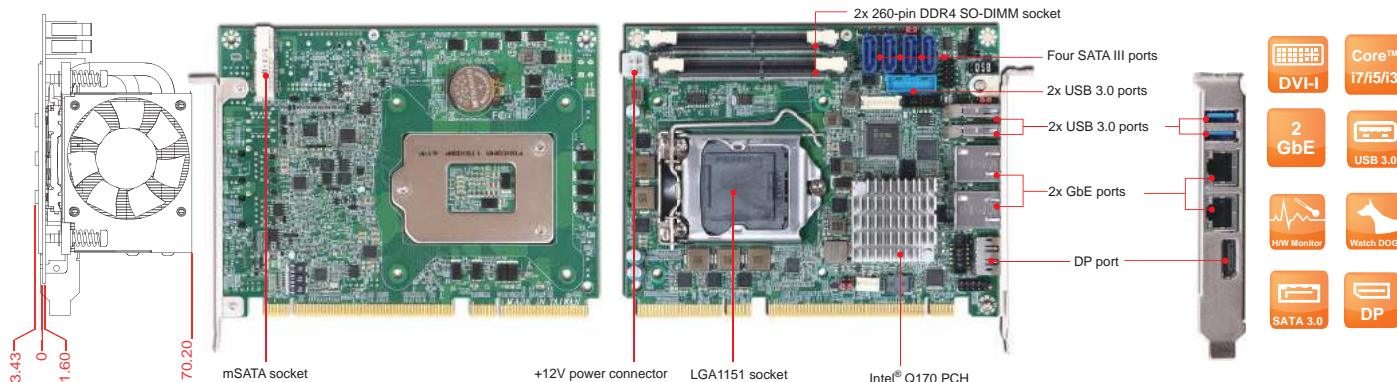
Mechanical & Environment

Dimension	- 338.5(L) x 126.39(W)mm; 13.33"(L) x 4.98"(W) - PCB: 8 layers
Power Supply	- Typical: +12V @ 4.85A ; +5V @ 3.4A - Supports ATX mode
Environment	- Operation Temperature: 0°C~60°C (with better performance on 50 °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



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 to 32GB maximum DDR4 2133 MT/s ECC SODIMM on two sockets
- Supports multiple display by DP on bracket and on-board DVI-I (DVI-D+VGA)
- High speed dual Gigabit Ethernet based on PCI express x1, 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 UEFI BIOS (SPI ROM)
Memory	- Supports up to 32GB DDR4 2133/1066 MT/s SDRAM on two 260-pin ECC or non ECC SODIMM 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	2xUSB3.0 ports on bracket dedicated to KB & MS
GPIO	N/A

DISPLAY

Graphic Controller	Intel® 6 th 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)

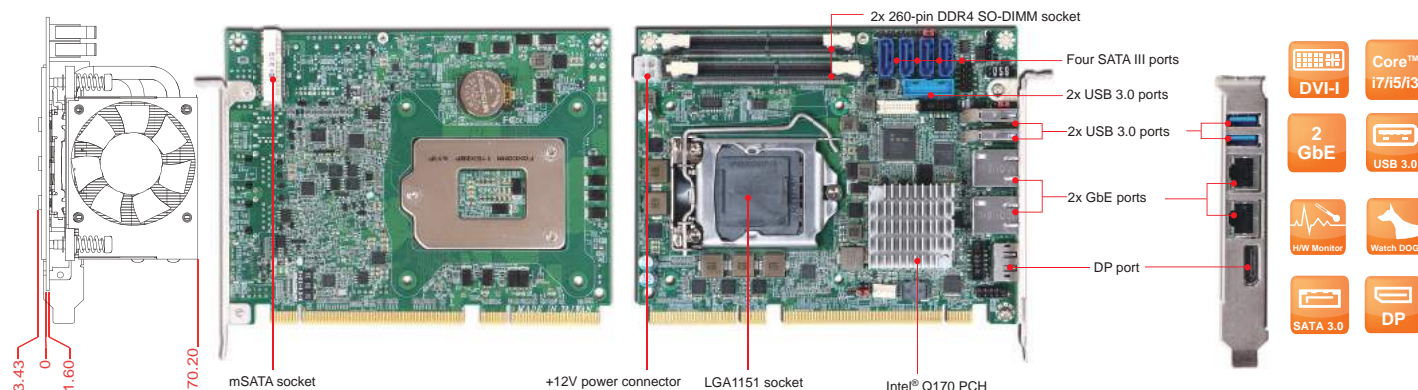
Mechanical & Environment

Dimension	167.64mm(L) x 126.39mm(W), 6.6" (L) x 4.98"(W) -PCB: 12ayers
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



ROBO-6911VG2AR-Q170

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



ROBO-6911VG2AR 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 to 32GB maximum DDR4 2133 MT/s non-ECC SODIMM on two sockets
- Supports multiple display by DP on bracket and on-board DVI-I (DVI-D+VGA)
- High speed dual Gigabit Ethernet based on PCI express x1, 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 UEFI BIOS (SPI ROM)
Memory	- Supports up to 32GB DDR4 2133/1866 MT/s SDRAM on two 260-pin ECC or non ECC SODIMM 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	2xUSB3.0 ports on bracket dedicated to KB & MS
GPIO	N/A

DISPLAY

Graphic Controller	Intel® 6 th 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)

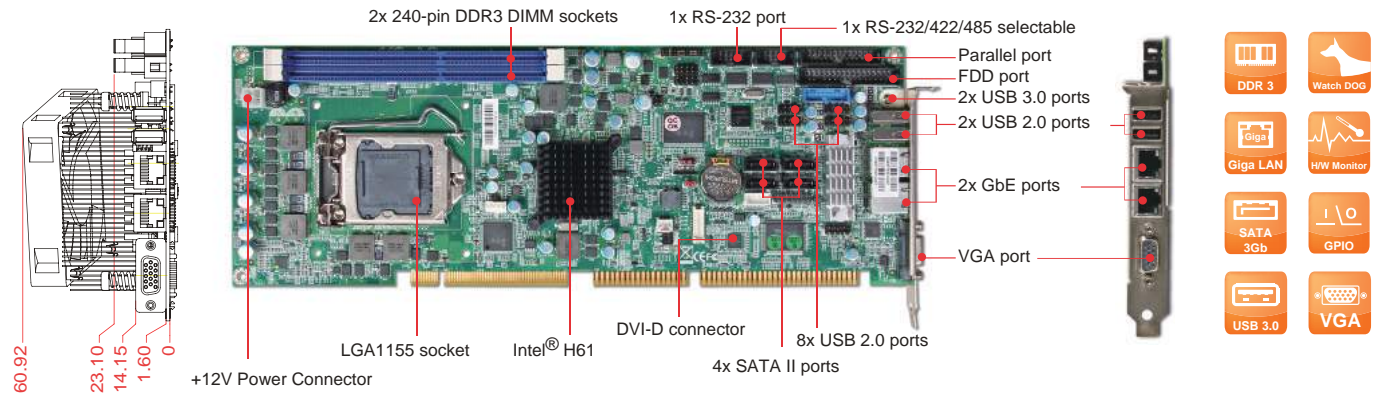
Mechanical & Environment

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



ROBO-8780VG2A

Intel® Core™ i7/i5/i3 processor based on PICMG 1.0 SBC with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB



ROBO-8780VG2A is based on Intel® H61 chipset and Intel® Core™ i3/i5/i7 processors. It supports VGA and on board DVI-D display. It's suitable for Medical, Industrial automation, and Digital Signage applications.

FEATURES

- Supports Intel® Core™ i7/i5/i3 processors in LGA1155 package
- Delivers up to 16GB maximum DDR3 1333/1600 MT/s non-ECC SDRAM on two DIMM sockets
- Supports dual display by VGA and on board DVI-D
- Supports two USB 3.0 ports on board
- High speed Intel® Dual Gigabit Ethernet 82579LM and 82583V based on PCI Express x1, high bandwidth I/O interface
- Rich I/O connections such as FDD, 2x Gigabit Ethernet, serial ports, parallel port
- On-board 4x SATA II ports and 10x USB 2.0 ports (dual ports on bracket)

ORDERING GUIDE

AB1-3798	ROBO-8780VG2A PICMG 1.0(PCI+ISA).LGA1155.SBC.up to Core™ i7 processors. w/VGA/Dual GbE/ Audio/USB 3.0
-----------------	---

PACKING LIST

Standard	B6901990 SATA II cable B690021S cable kit for FDD+PRN with bracket B6903240 Dual head COM port cable with bracket B8981980 PICMG SBC Handling and Installation Notice B3751540 Installation CD
Optional	B6902980 PS/2 Keyboard/Mouse Cable with bracket B6903090 USB 3.0 port cable with bracket AB9-2066 PA-M1AU Multiple Media kit

GENERAL

Processor	- Intel® Core™ i3/i5/i7 processor up to 3.4GHz (65~95W) with (3~8MB) Cache in LGA1155 package - DMI x4 Link: 5.0 GT/s
Chipset	- Intel® BD82H61 PCH (6.1W)
BIOS	AMI UEFI BIOS
Memory	- Supports up to 16GB DDR3 1333/1066 MT/s SDRAM on 2x 240-pin non-ECC DIMM sockets (dual channel)
Storage Devices	- 4x SATA II ports - Supports 16-bit ISA via Golden finger
Watchdog Timer	Programmable via S/W from 0.5 sec. to 255 sec.
Hardware Monitoring	System monitor (fan, temperature, voltage)
Expansion Interface	4x PCI devices at 32-bit 33MHz

I/O INTERFACE

Super I/O	ITE IT8728F
Audio	- Intel® BD82H61 PCH built-in High Definition Audio up to 192-kHz 24-bit - Realtek ALC886-GR HDA codec
Ethernet	- Intel® 82579LM and Intel® 82583V dual Gigabit Ethernet controllers - Dual RJ-45 connectors with two LED indicators on bracket
Serial Port	- 1x RS-232 on board box header - 1x RS-232/422/485 on board box header - 1x internal FDD connector
USB	- 2x USB 3.0 ports on board (5Gbps) - 10x USB 2.0 ports on board (480 Mb/s) - Capable of high-speed/full-speed/low-speed data ranges
Keyboard & Mouse	2x USB 2.0 on bracket dedicated to keyboard & mouse
GPIO	One 10-pin header for 8 programmable input/output
Others	1x parallel port on board box header

DISPLAY

Graphic Controller	- Intel® Core™ i processors integrated Graphics Engine - Providing delivers optimized 3D graphics performance and support for Microsoft DirectX 10.1, Shader Model 4.0, MPEG-2 and OpenGL 3.0
Display Interface	- VGA on bracket: up to 2048x1536 @75Hz - DVI-D on board: up to 1920x1200 @60Hz

Mechanical & Environment

Dimension	- 338.5(L) x 122(W)mm; 13.33"(L) x 4.8"(W) - PCB: 8 layers
Power Supply	- +12V @4.6A; +5V @3.8A - Supports ATX mode
Environment	- Operation Temperature: 0°C~60°C (with better performance on 50°C) - Storage Temperature: -20°C~80°C - Relative Humidity: 5% to 90%, non-condensing
Certification	CE, FCC Class A
MTBF	Over 100,000 hours at 40°C





PICMG 1.0 Backplane

PICMG GENERAL DESCRIPTION

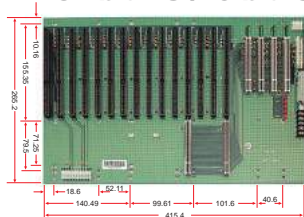
PICMG Backplanes in this section are Single Board Computers (SBCs) and Single Host Board (SHB) companions that feature expansion slots such as ISA, PCI, PCI-X or PCI Express interface. In addition, the backplane also features several power connectors that draw power from power supply to devices on it. Some LEDs are designed on board to indicate status of each power rail.

PICMG 1.0 supports both ISA & PCI, PICMG 1.2 supports dual PCI or PCI-X, and PICMG 1.3 supports PCI Express and PCI expansion. Some bridges or switches can be applied to the backplane to support more devices or different kinds of expansion interfaces. However, PICMG 1.0, 1.2, and 1.3 are not compatible with each other.

PICMG 1.0 BACKPLANE

Passive Backplane: Backplane that only support up to four PCI master

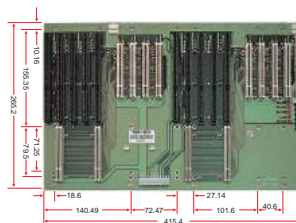
32-bit PCI/16-bit ISA



PBP-19P4

19-slot (4x PCI) PICMG Backplane

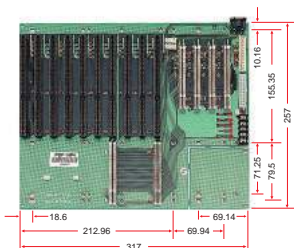
- Fit for 20-slot chassis
- ATX power connector support
- Sufficient ISA slots for CTI application



PBP-18D4

18-slot Dual-system PICMG Backplane

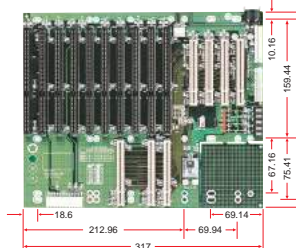
- Fit for 20-slot chassis
- Designed for fault-tolerant computing
- ATX power connector support



PBP-14P4

14-slot (4x PCI) PICMG Backplane

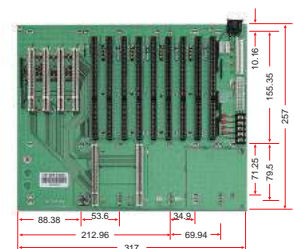
- Fit for 14-slot chassis
- ATX power connector support
- The most popular and reliable PICMG backplane



ACTI-14P4

14-slot (4x PCI) Active PICMG Backplane

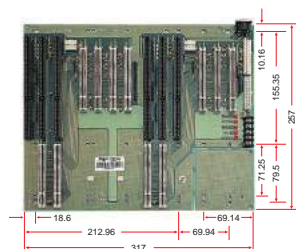
- Fit for 14-slot chassis
- 2.4 mm PCB thickness
- ATX power connector support



PBP-13R4

13-slot (4x PCI) PICMG Backplane

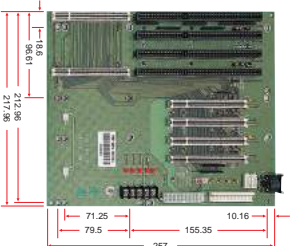
- Fit for 14-slot chassis
- Special design for full-length PCI cards
- ATX power connector support



PBP-13D4

13-slot Dual-system PICMG Backplane

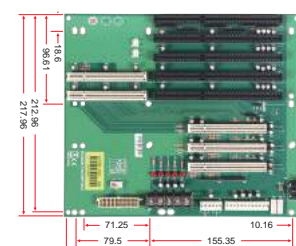
- Fit for 14-slot chassis
- Design for fault-tolerant computing
- ATX power connector support



PBP-08P4

8-slot (4x PCI) PICMG Backplane

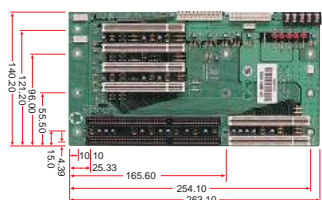
- Fit for node chassis and desktop case
- ATX power connector support



PBP-08P3

8-slot (3x PCI) PICMG Backplane

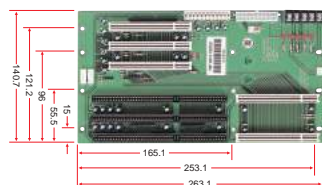
- Fit for node chassis and desktop case



PBP-06P4

6-slot (4x PCI) PICMG Backplane

- Fit for node chassis
- ATX power connector support



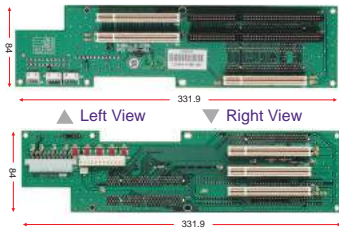
PBP-06P3

6-slot (3x PCI) PICMG Backplane

- Fit for node chassis
- ATX power connector support

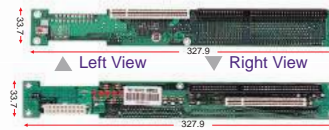


PICMG 1.0 Backplane



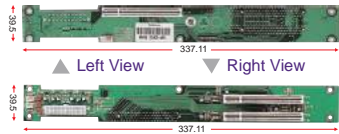
PBP-06V4
Vertical 6-slot (4x PCI) PICMG Backplane

- Fit for 2U chassis
- ATX and AT power connector support



PBP-02V1X
Vertical 2-slot (1x PCI) PICMG Backplane

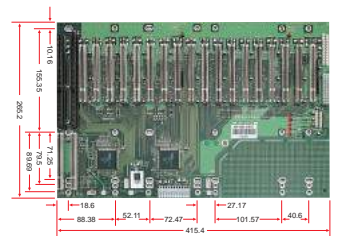
- Fit for 1U chassis
- ATX power connector support



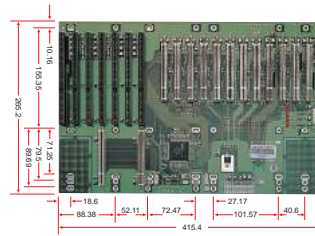
PBP-03P2X
Vertical 3-slot (2x PCI) PICMG Backplane

- Fit for Portwell's 1U chassis
- ATX power connector support

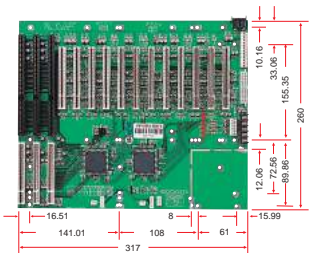
Active Backplane: Backplane that utilizes a bridge to support PCI master beyond four



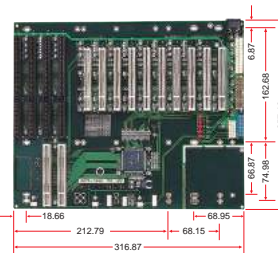
PBP-19AI
19-slot (18x PCI) Active PICMG Backplane



PBP-19AC
19-slot (12x PCI) Active PICMG Backplane

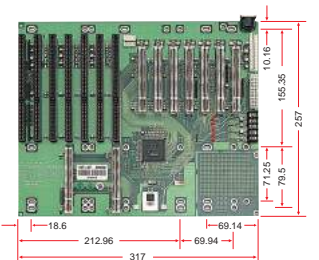


PBP-14AC-B
14-slot (12x PCI) Active PICMG Backplane

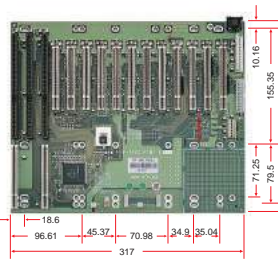


ACTI-14AA
14-slot (10x PCI) Active PICMG Backplane

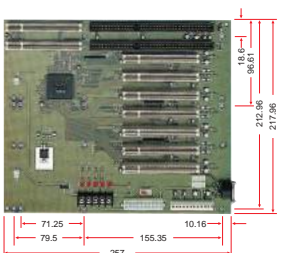
- Fit for 14-slot chassis
- 2.4 mm PCB thickness
- ATX power connector support



PBP-14A7
14-slot (7x PCI) Active PICMG Backplane



PBP-14AC
14-slot (12x PCI) Active PICMG Backplane



PBP-08A7
8-slot (7x PCI) Active PICMG Backplane



PICMG 1.3 Backplane Matrix Table

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

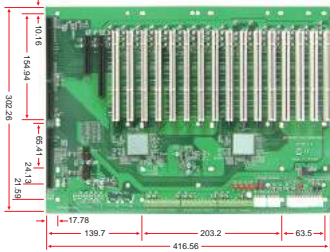
		ROBO-8120	ROBO-8113	ROBO-8113	ROBO-8112	ROBO-8112	ROBO-8111	ROBO-8111	ROBO-8110	ROBO-8110	ROBO-8210
		3420	C236	Q170	C226	Q87	C216	Q77	C206	Q67	QM57
Server Grade	PBPE-19AG64	✱	✱	✱	✱		✱		✱		
	PBPE-14AD64	✱	✱	✱	✱		✱		✱		
	PBPE-06V464	✱	✱	✱	✱		✱		✱		
	PBPE-08P41	✱	✱	✱	✱		✱		✱		
	PBPE-06A364	✱	✱	✱	✱		✱		✱		
	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

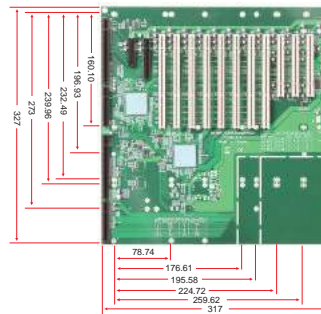
Server Grade Backplane



PBPE-19AG64

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

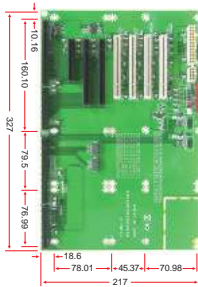
- Fit for 4U up chassis
- Four PCI-X buses support 16 PCI-X expansion slots



PBPE-14AD64

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

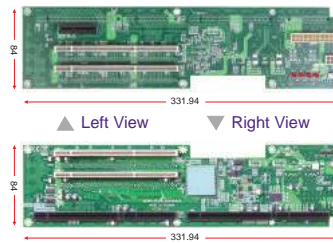
- Fit for 4U chassis
- Four PCI-X buses support eight PCI-X expansion slots



PBPE-08P41

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

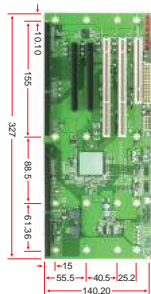
- Fit for Node chassis
- Four USB ports



PBPE-06V464

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

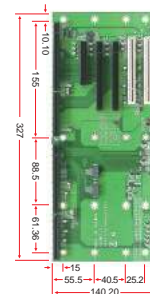
- Fit for 2U chassis
- Dual PCI-X buses support four PCI-X slots



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

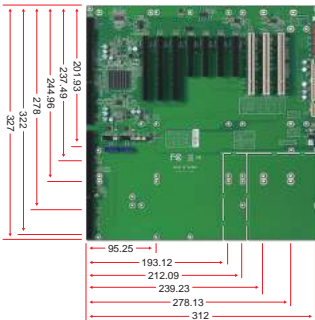


PBPE-06P2

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

- Fit for Node chassis
- Four USB ports

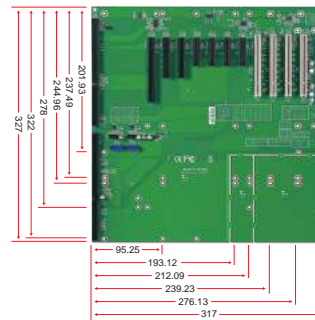
Non-Server Grade Backplane



PBPE-11A3

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

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



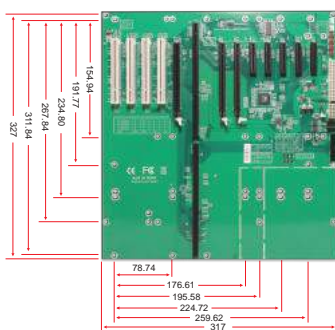
PBPE-12P4

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



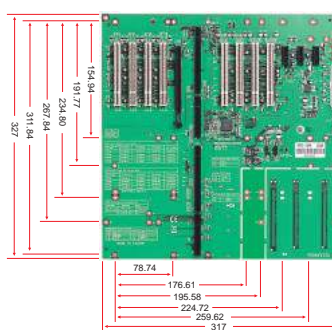
PICMG 1.3 Backplane



PBPE-13A4

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

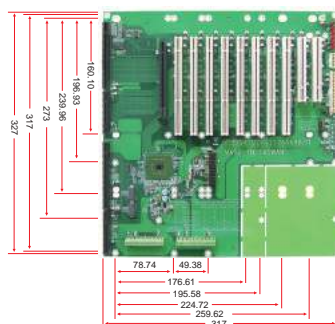
- Fit for 4U chassis
- Four USB 2.0 ports
- Dual SATA II ports



PBPE-13A8

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

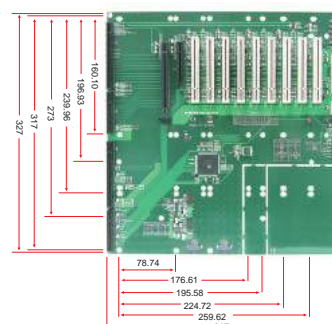
- Fit for 4U chassis
- Four USB ports
- Dual SATA ports
- 24-pin ESP12V power connector



PBPE-12AA64

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

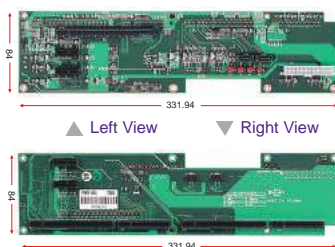
- Fit for 4U chassis
- Four USB ports
- Dual SATA ports
- Two PCI-X buses support eight PCI-X expansion slot



PBPE-12A9

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

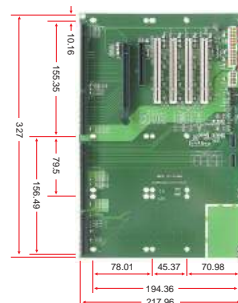
- Fit for 4U chassis
- Four USB ports
- Dual SATA ports



PBPE-06V

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

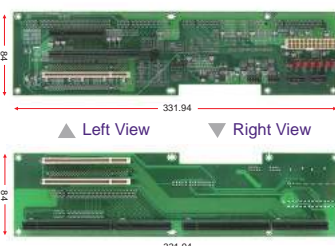
- Fit for 2U chassis
- Four USB ports
- Dual SATA ports
- 24-pin ESP 12V power connector



PBPE-07P4

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

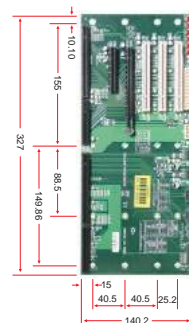
- Fit for Node chassis
- Four USB ports
- Dual SATA ports



PBPE-06V3

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

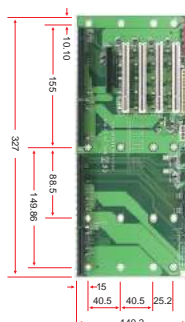
- Fit for 2U chassis
- Four USB ports
- Dual SATA ports



PBPE-06P3

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

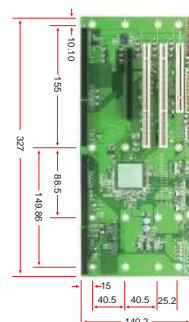
- Fit for Node chassis
- Four USB ports
- Dual SATA ports



PBPE-06P4

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

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



PBPE-05A364

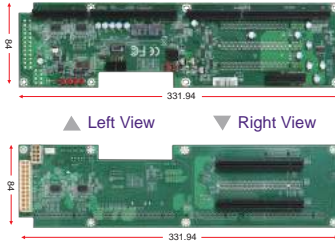
5-slot [PCIe x16 (1), PCI-X (2), PCI (1)]

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



PICMG 1.3 Backplane

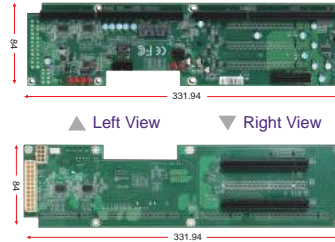
Dedicated for ROBO-8122VG2R Backplane



PBPE-04P

4-slot PCIe x16 (2, x16 signal),
PCIe x4 (1, x4 signal)

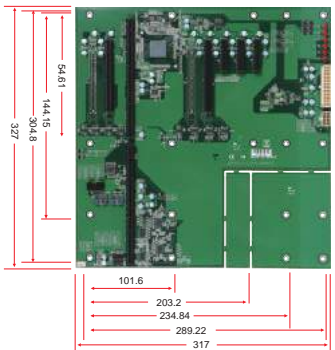
- Fit for 2U chassis
- Four USB ports
- Dual SATA ports
- One RJ45 port (w/o LAN LED)



PBPE-05P

5-slot PCIe x16 (1, x16 signal),
PCIe x8 (2, x8 signal), PCIe x4
(1, x4 signal)

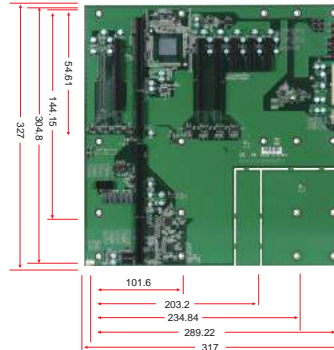
- Fit for 2U chassis
- Four USB ports
- Dual SATA ports
- One RJ45 port (w/o LAN LED)



PBPE-06A

6-slot PCIe x16 (2, x16 signal),
PCIe x4 (3, x4 signal)

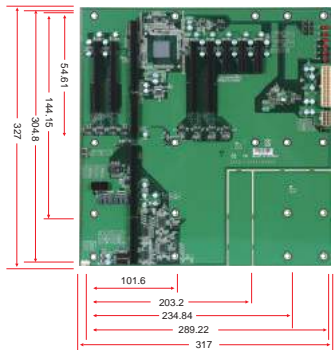
- Fit for 4U chassis
- Four USB ports
- Dual SATA ports
- One RJ45 port (w/o LAN LED)



PBPE-07A

7-slot PCIe x16 (1, x16 signal),
PCIe x8 (2, x8 signal), PCIe x4 (3,
x4 signal)

- Fit for 4U chassis
- Four USB ports
- Dual SATA ports
- One RJ45 port (w/o LAN LED)



PBPE-08A

8-slot PCIe x8 (4, x8 signal),
PCIe x4 (3, x4 signal)

- Fit for 4U chassis
- Four USB ports
- Dual SATA ports
- One RJ45 port (w/o LAN LED)



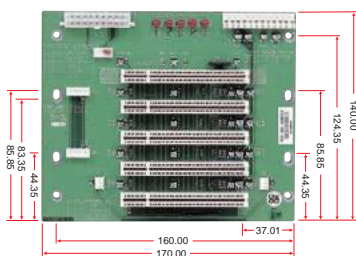
PIC & ISA Backplane

PCI GENERAL DESCRIPTION

- Compact size backplane for half size PCI SBC
- PICMG 1.0 Rev 2.1 Compliant (PCI golden finger only)
- Support AT or ATX type power connector
- 4-layer PCB with power and ground planes to reduce power noise and maintain a lower impedance
- Frame rated PCB at 94-V0
- User friendly design supports external K/B connector, power for chassis fan and power indicator

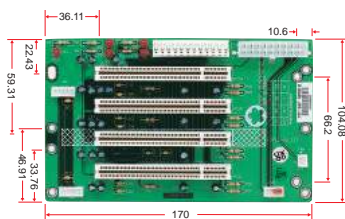
PBP-05P

5-slot Passive PCI Backplane



PBP-04P

4-slot Passive PCI Backplane



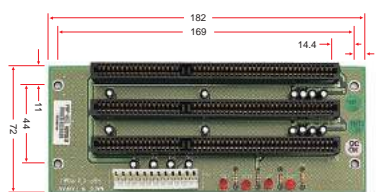
ISA GENERAL DESCRIPTION

- 4-layer PCB with ground and power planes for reducing noise and keeping lower impedance
- Frame Rated PCB at 94-V0
- LED power indicator for +5V, +12V, -5V and 12V
- Heavy duty terminal block connector for industrial power supply wiring(*)
- Equipped with gold-plated socket for good contact
- Easy cut for dual or multi systems(*)
- Plug-in sockets of termination resistors for high-speed signal. (*)

(*) means for most part of products

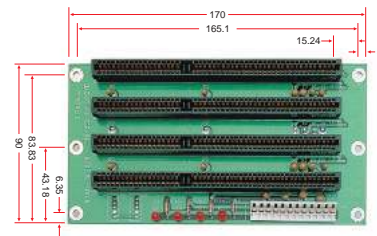
PBP-03I

3-slot Passive ISA Backplane



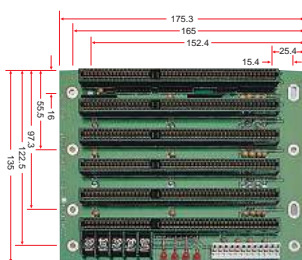
PBP-04I

4-slot Passive ISA Backplane



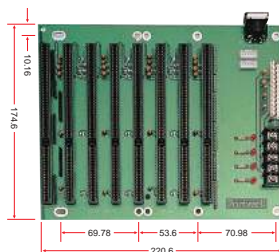
PBP-06I

6-slot Passive ISA Backplane



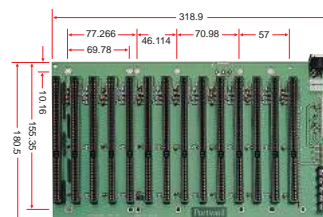
PBP-08I

8-slot Passive ISA Backplane



PBP-14I

14-slot Passive ISA Backplane





IMB Reference Table



MODEL	RUBY-D810-H110	RUBY-D718VG2AR	RUBY-D716VG2AR	RUBY-D715VG2AR
Form Factor	ATX	ATX	ATX	ATX
CPU	Intel® 7 th and 6 th Gen Core™ Processors CPU in LGA1151 package	Intel® 7 th and 6 th Gen Core™ Processors CPU in LGA1151 package	Intel® Core™ i5/i7	Intel® Core™ i3/Xeon® E3 series
Chipset	Intel® H110	Intel® Q170/H110/C236	Intel® Q87 PCH	Intel® C216 PCH
BIOS	AMI UEFI	AMI UEFI	Phoenix UEFI	Phoenix UEFI
Memory	2x DDR4 DIMM up to 32GB	4x DDR4 DIMM up to 64GB	4x DDR3 DIMM up to 32GB	4x DDR3 DIMM up to 32GB
Expansion	1x PCIe x16 slot 1x PCIe x16 slot 1x PCIe x1 slot 4x PCI slots	4x PCI slots 1x PCIe x16 slot 2x PCIe x4 slots	2x PCI slots 1x PCIe x16 slot 2x PCIe x4 slots 2x PCIe x1 slots	4x PCI slots 2x PCIe x16 slots 1x PCIe x4 slot
Display	VGA/DVI-D/HDMI	VGA/DVI-D/HDMI	VGA/DVI-D/HDMI	VGA/DVI-D/HDMI
Audio	Realtek ALC662HAD Audio codec	Realtek ALC886 HDA codec	Realtek ALC886-GR HDA codec	Realtek ALC886-GR HDA codec
LAN	2x GbE	2x GbE	2x GbE	2x GbE
Serial Port	1x RS232/422/485 5x RS232	1x RS-232/422/485 5x RS-232	2x RS-232/422/485 4x RS-232 (Option)	1x RS-232/422/485 5x RS-232
USB	4x USB3.0 6x USB2.0	6x USB3.0 8x USB2.0	4x USB 3.0 8x USB 2.0	4x USB 3.0 6x USB 2.0
Storage Devices	4x SATAIII	6x SATA III (C236 supports 8x SATA III)	5x SATA III 1x CFEX	3x SATA II 2x SATA III 1x CFEX
GPIO	8-bit	8-bit	8-bit	8-bit
Others	-	PS/2 KB & MS	PS/2 KB & MS	PS/2 KB & MS
Dimension	304.8 x 243.8 mm	304.8 x 243.8mm	304.8 x 243.8mm	304.8 x 243.8mm
Page	33	34	35	36



IMB Reference Table

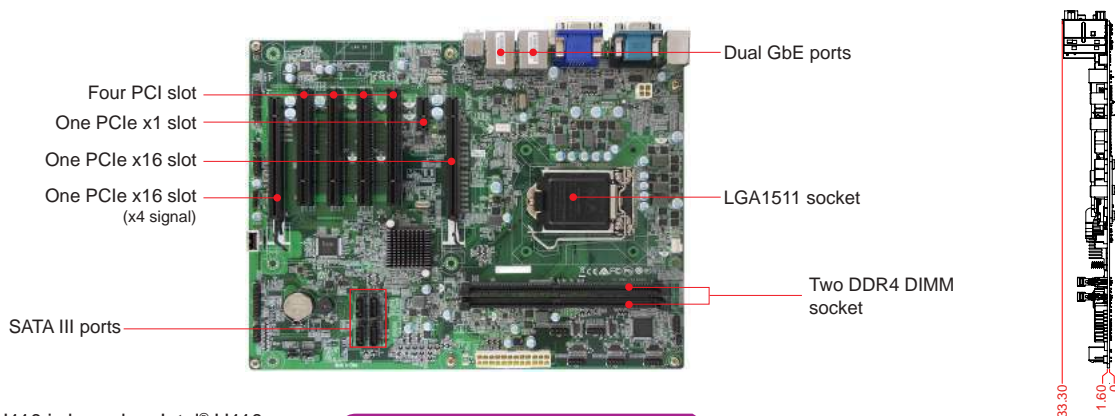


MODEL	RUBY-D714VG2AR	RUBY-D712VG2AR	RUBY-D711VG2AR
Form Factor	ATX	ATX	ATX
CPU	Intel® Core™ i5/i7	Intel® Core™ i5/i7	Intel® Core™ i3/Xeon® E3 series
Chipset	Intel® Q77 PCH	Intel® Q67 PCH	Intel® C206 PCH
BIOS	Phoenix UEFI	AMI UEFI	AMI UEFI
Memory	4x DDR3 DIMM up to 32GB	4x DDR3 DIMM up to 32GB	4x DDR3 ECC DIMM up to 32GB
Expansion	4x PCI slots 2x PCIe x16 slots 1x PCIe x4 slot	4x PCI slots 1x PCIe x16 slot 1x PCIe x4 slot 1x PCIe x1 slot	4x PCI slots 1x PCIe x16 slot 1x PCIe x4 slot 1x PCIe x1 slot
Display	VGA/DVI-D/HDMI	VGA/DVI-D/HDMI	VGA/DVI-D/HDMI
Audio	Realtek ALC886-GR HDA codec	Realtek ALC662-GR HDA codec	Realtek ALC662-GR HDA codec
LAN	2x GbE	2x GbE	2x GbE
Serial Port	1x RS-232/422/485 5x RS-232	2x RS-232/422/485 4x RS-232	2x RS-232/422/485 4x RS-232
USB	4x USB 3.0 6x USB 2.0	8x USB 2.0	8x USB 2.0
Storage Devices	3x SATAII 2x SATAIII	4x SATAII 2x SATAIII	4x SATAII 2x SATAIII
GPIO	8-bit	16-bit	16-bit
Others	PS/2 KB & MS	PS/2 KB & MS	PS/2 KB & MS
Dimension	304.8 x 243.8mm	304.8 x 243.8mm	304.8 x 243.8mm
Page	37	38	39



RUBY-D810-H110

Leading Desktop Intel® 7th and 6th Gen Core™ processor (former Kaby Lake/Sky Lake) ATX with DDR4 SDRAM, Two GbE LAN ports, VGA DVI-D, HDMI, Six COM Ports



RUBY-D810-H110 is based on Intel® H110 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 & 6th Gen Core™ Processors support
- Supports two Long-DIMMs support DDR4 Non- ECC SDRAM up to 32GB
- Supports display output by VGA, DVI, and HDMI
- Supports total six Com ports(one support RS-232/422/485)
- Supports two PCIe x16(x16 & x4 signal), one PCIe x1 and four PCI slots

REAR I/O



ORDERING GUIDE

AB1-3G36	(R).RUBY-D810-H110 ATX.IMB.LGA1151.CPU.H110.DDR4/VGA/ HDMI/DVI/Dual GbE/COM/Audio/USB
----------	---

PACKING LIST

One CPU cooler bracket
One SATA cable
One Installation CD
One RUBY-D810-H110 Main board
One I/O shield



GENERAL

Processor	Intel® 7 th and 6 th Gen Core™ Processors CPU in LGA1151 package
Chipset	Intel® H110
BIOS	AMI UEFI BIOS (SPI ROM)
Memory	Supports up to 32GB DDR4 2133/1866 Non-ECC on two 288 pin DIMM socket
Storage Devices	Supports four SATAIII ports
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 slot - 1x PCIe x16 slot(PCle x4 signal) - 1x PCIe x1 slot - 4x PCI slots

I/O INTERFACE

Super I/O	Fintek F81866AD-I
Audio	Realtek ALC662HAD Audio codec Audio Jack on rear I/O with Line-out / Mic-in
Ethernet	- Intel® I219V and Intel® I210AT Ethernet controller - 2x RJ45 connectors on rear I/O
Serial Port	- 1x RS232/422/485 port on rear I/O - 5x RS232 ports on pin header
USB	- 4x USB3.0 ports on rear I/O - 2x USB2.0 ports on rear I/O - 4x USB2.0 ports on pin header(2 x 5pins, 1 x 5pins, Vertical USB type A)
GPIO	8-bit configurable controlled by embedded controller

DISPLAY

Graphic Controller	- Intel® Core™ i5/i7 processors integrated graphic engine - Provided improved 3D multimedia capabilities including Microsoft DirectX 11.1, Shader Model 4.0, MPEG-2 and OpenGL® 3.2
Display Interface	- VGA: up to 2560x1600 @ 60Hz - DVI-D: up to 1920x1200 @ 60Hz - HDMI: up to 1920x1200 @ 60Hz - Support Triple Display

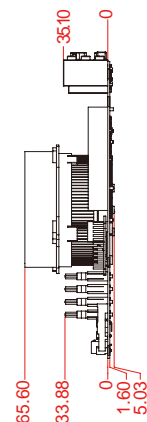
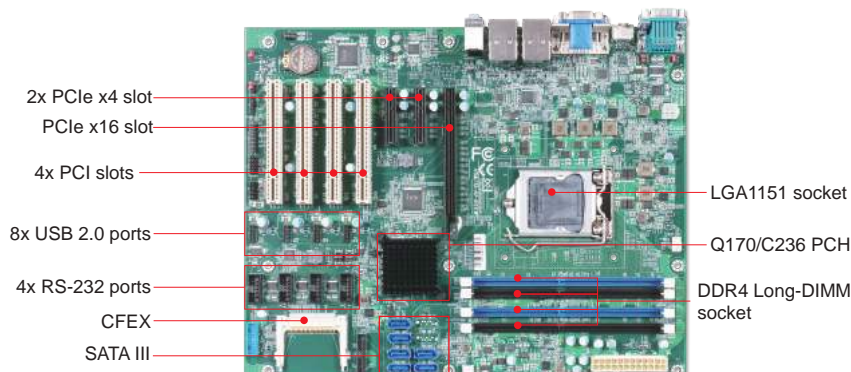
Mechanical & Environment

Dimension	304.8(L) x 243.8(W); 12"(L) x 9.6"(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
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

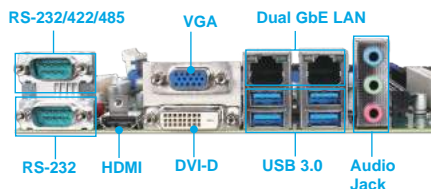


RUBY-D718VG2AR is based on Intel® Q170/C236 chipset and desktop processor SKU like Intel® 7th and 6th Gen Core™ i3, i5 and i7 Processors. Built with PCI and PCIe expansions, it's suitable for Medical, Industrial automation, and Digital Signage application.

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® 7 th and 6 th 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

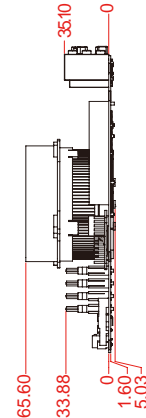
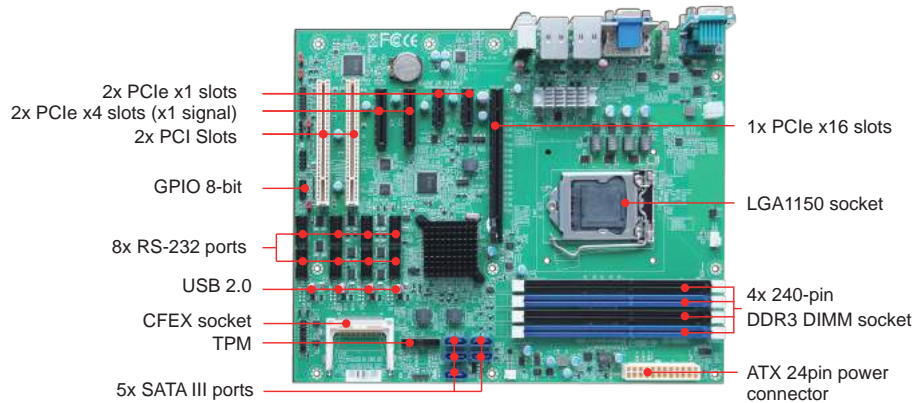
Graphic Controller	Intel® Gen 9 graphic engine supports DirectX 12, OpenGL 4.4
Display Interface	- DVI-D: 1x DVI-D port on rear I/O, up to 1920x1200@60Hz - HDMI: 1x HDMI port on rear I/O, up to 4096x2160 @ 24Hz - VGA: 1x VGA port on rear I/O, up to 1920x1200 @ 60Hz

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

RUBY-D716VG2AR

Intel® Core™ i5/i7 processor based
ATX with DDR3 SDRAM, Triple display,
Dual Gigabit Ethernet, and USB Ports

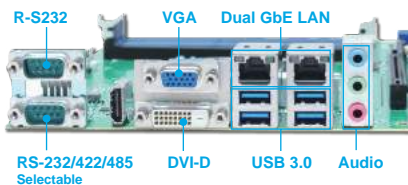


RUBY-D716VG2AR is based on Intel® Q87 chipset and desktop processor sku like Core™ i7 and i5. Build with PCI and PCI Express expansions, it is suitable for Medical, Industrial automation, and digital signage applications.

FEATURES

- Intel® Core™ i5 and i7 processor support
- 4x Long-DIMMs support dual channel DDR3 non-ECC SDRAM up to 32GB
- Triple display by VGA/DVI-D/HDMI
- Rear I/O, USB2.0/3.0 dual Gigabit Ethernet, COM Port and SATA III ports support Intel RAID 0, 1, 5, 10.
- 1x PCIe x16 (Gen3), 2x PCIe x4 (Gen2, x1 signal), 2x PCIe x1 (Gen2), and 2x PCI slot.
- Intel® Active Management Technology 9.0

REAR I/O



ORDERING GUIDE

AB1-3941	RUBY-RUBY-D716VG2AR ATX IMB. LGA1150 CPU. Q87. DDR3/VGA/ DVI-D/HDMI/Dual GbE/COM/Audio/USB
----------	--

PACKING LIST

One RUBY-D716VG2AR ATX Industrial Main Board
One SATA III Cable
One Installation DVD
One I/O shield



GENERAL

Processor	- Intel® Core™ i5/i7 processor up to 3.4 GHz with (3~8MB) Cache in LGA-1150 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® Q87 PCH
BIOS	Pheonix UEFI BIOS
Memory	Support up to 32GB DDR3 1333/1600 MT/s SDRAM on 4x 240-pin DIMM sockets (dual channel)
Storage Devices	- Support 5x SATA III - Support 1x CFEX slot - Support RAID 0,1,5,10
Watchdog Timer	Programmable via S/W from 0.5 sec. to 254.5 sec.
Expansion Interface	- 1x PCIe 3.0 x16 slot - 2x PCIe 2.0 x 4 slot (PCIe x1 signal) - 2x PCIe 2.0 x1 slot - 2x PCI devices at 32 bit 33 MHz

I/O INTERFACE

Embedded Controller	ITE IT8518
Audio	- Intel® Q87 PCH built-in High Definition Audio up to 192-Khz 32-bit - Realtek ALC886-GR HDA codec
Ethernet	- Intel® WGI217LM + WGI210AT GbE controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T Ethernet - PCIe x1 interface based on GbE - 2x RJ-45 connector with two LED indicators
Serial Port	- 4x RS-232 - 2x RS-232/422/485 (support BIOS switch) - 4x RS-232 optional (up to total 10x COM port)
USB	- 4x USB3.0 Ports on real I/O - 8x USB2.0 Ports on board
Keyboard & Mouse	PS/2 on board dedicated to Keyboard & Mouse
GPIO	on board programmable 8-bit Digital I/Os

DISPLAY

Graphic Controller	- Intel® Core™ i5/i7 processors integrated graphic engine - Provided improved 3D multimedia capabilities including Microsoft DirectX 11.1, Shader Model 4.0, MPEG-2 and OpenGL® 3.2
Display Interface	- VGA: up to 2560x1600 @ 60Hz - DVI-D: up to 1920x1200 @ 60Hz - HDMI: up to 1920x1200 @ 60Hz - Support Triple Display

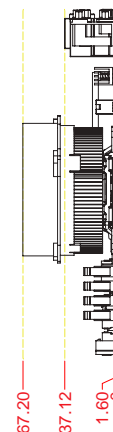
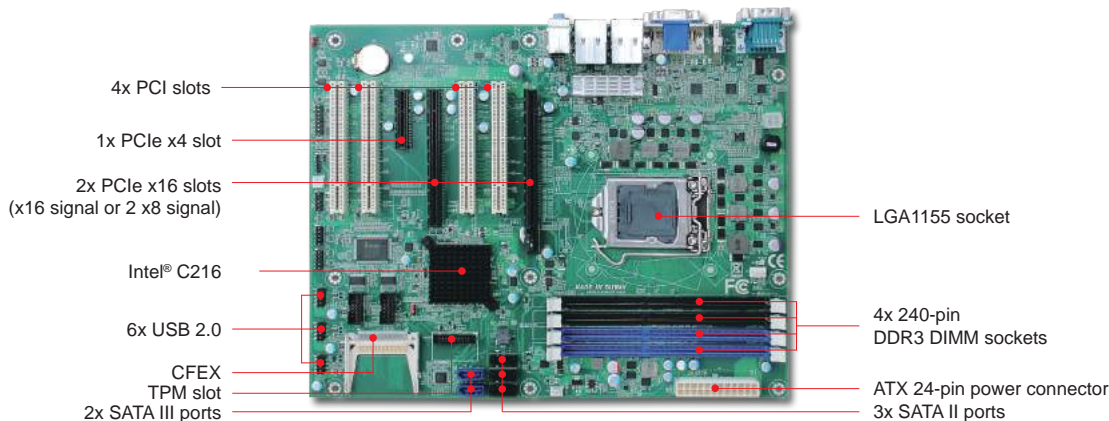
Mechanical & Environment

Dimension	304.8mm(L) x 243.8mm(W); 12"(L) x 9.6"(W) PCB: 6 layers
Power Supply	ATX 24-pin power input
Environment	- Operation Temperature: 0°C~60°C - Storage Temperature: -20°C~80°C - Relative Humidity: 5%~90%, non-condensing
Certification	CE, FCC Class A
MTBF	Over 120,000 hours at 40°C



RUBY-D715VG2AR

Intel® Core™ i3 and Xeon® processor based ATX with DDR3 SDRAM, Dual display, Dual Gigabit Ethernet, and USB Ports

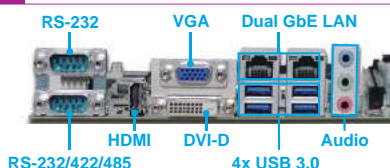


RUBY-D715VG2AR is based on Intel® C216 chipset and workstation sku like Core™ i3 and Xeon® E3-1200 series processors. Built with flexible PCI express expansion and bifurcation feature, it can support two I/O interface cards and can also suitable for Medical, Industrial Automation, and Digital Signage applications.

FEATURES

- Intel® Core™ i3 and Xeon® E3-1200 series processors support
- 4x Long-DIMMs support dual channel DDR3 ECC and non-ECC SDRAM up to 32 GB
- Dual display by VGA/DVI-D/HDMI
- Rear I/O, USB 2.0/3.0, dual Gigabit Ethernet, COM ports and SATA II/III ports support Intel® RAID 0,1,5,10
- 2x PCIe x16 slots (Gen 3, x16 signal or 2 x8 signal), 1x PCIe x4 (Gen 2), and 4x PCI slots
- 1x CFEX socket (supports CFEX card)
- Intel® Active Management Technology 8.0

REAR I/O



ORDERING GUIDE

AB1-3925	RUBY-D715VG2AR ATX IMB. LGA1155 CPU. C216 DDR3/VGA/DVI/HDMI/Dual GbE/COM/Audio/USB
Standard	One SATA II cable One SATA III cable (Black) One Installation CD One I/O shield DVI-D + VGA cable with bracket PICMG SBC Handling and Installation Notice Installation CD

PACKING LIST

One RUBY-D715VG2AR ATX Industrial Main Board
One SATA III Cable
One Installation CD
One I/O shield



GENERAL

Processor	- Intel® Core™ i3 and Xeon® E3-1200 series processor up to 3.4GHz with (3-8MB) Cache in LGA1155 package - DMI x4 Link: 5.0 GT/s - Supports Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring and Trusted Execution (depend on CPU sku)*
Chipset	Intel® C216 PCH chipset
BIOS	Pheonix UEFI BIOS
Memory	Supports up to 32GB DDR3 ECC and non-ECC 1366/1600 MT/s SDRAM on 4x 240-pin DIMM sockets (dual channel)
Storage Devices	- 2x SATA III - 3x SATA II - Supports RAID 0,1,5,10 - 1x CFEX (supports CFEX card)
Watchdog Timer	Programmable via S/W from 0.5 sec. to 255 sec.
Hardware Monitoring	On board fan connector (CPU Cooler x1, System Fan x1); temperature and voltages monitoring
Expansion Interface	- 2x PCIe 3.0 x16 slot (1x PCIe x16 or 2x PCIe x8 signal) - 1x PCIe 2.0 x4 slot - 4x PCI devices at 32-bit 33 MHz

I/O INTERFACE

Super I/O	ITE IT8783F
Audio	- Intel® C216 PCH built-in High Definition Audio up to 192-Khz 32-bit - Realtek ALC886-GR HDA codec - Audio Jack DIP Light Pink/Lime/Light Blue
Ethernet	- Intel® 82579LM and 82583V dual gigabit ethernet controllers - PCIe x1 interface based on gigabit ethernet - 2x RJ-45 connectors with 2x LED indicators at rear I/O panel
Serial Port	- 4x RS-232 - 1x RS-232 and 1x Selectable R-S232/422/485 on rear I/O
USB	- 4x USB 3.0 ports on rear I/O - 6x USB 2.0 ports on board
Keyboard & Mouse	PS/2 on board dedicated to keyboard & mouse
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

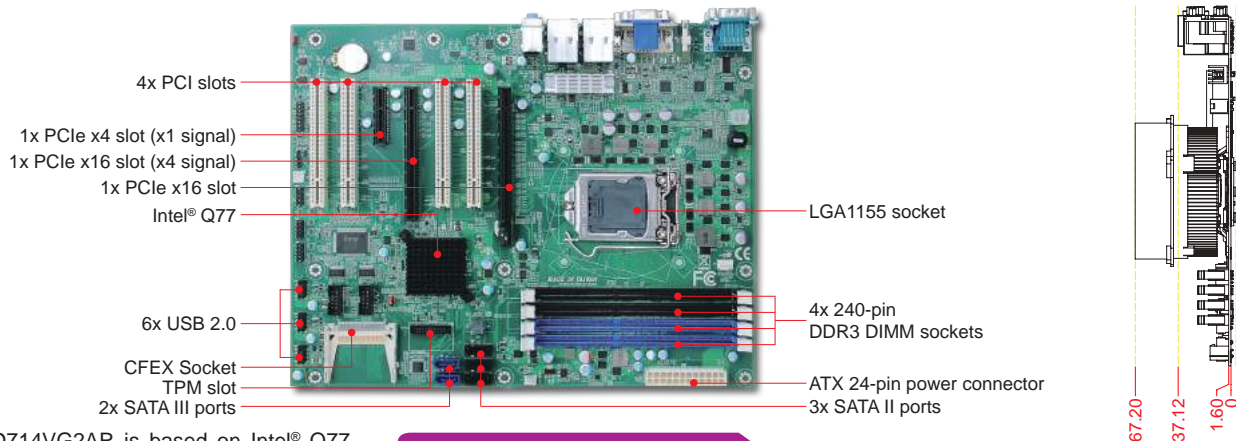
Graphic Controller	- Quad Core™ Processor with Intel® HD Graphics 4000 and Integrated Memory Controller - Provided improved 3D multimedia capabilities including Microsoft DirectX 11, Shader Model 4.0, MPEG-2 and OpenGL® 3.1
Display Interface	- VGA: up to 2560x1600 @60Hz - DVI-D :up to 1920x1200 @60Hz - HDMI: up to 1920x1200 @60Hz

Mechanical & Environment

Dimension	- 304.8mm(L) x 243.8mm(W); 12"(L) x 9.6"(W) - PCB: 6 layers
Power Supply	ATX 24-pin power input
Environment	- Operation Temperature: 0°C~60°C (with highest performance on 50 °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

RUBY-D714VG2AR

Intel® Core™ i5/i7 processor based
ATX with DDR3 SDRAM, Triple display,
Dual Gigabit Ethernet, and USB Ports

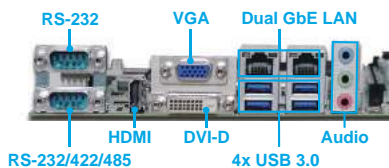


RUBY-D714VG2AR is based on Intel® Q77 chipset and desktop processor sku like Core™ i7 and i5. Built with flexible PCI express expansion and bifurcation feature, it can support two I/O interface cards and can also suitable for Medical, Industrial Automation, and Digital Signage applications.

FEATURES

- Intel® Core™ i7 and i5 Processors support
- 4x Long-DIMMs support dual channel DDR3 non-ECC SDRAM up to 32 GB
- Triple display by VGA/DVI-D/HDMI
- Rear I/O, USB 2.0/3.0, dual Gigabit Ethernet, COM ports and SATA II/III ports support Intel® RAID 0,1,5,10
- 1x PCIe x16 (Gen 3), 1x PCIe x16 (Gen 2, x4 signal), 1x PCIe x4 (Gen 2, x1 signal), and 4x PCI slots
- 1x CFEX Slot (Only support CFEX Card)
- Intel® Active Management Technology 8.0

REAR I/O



ORDERING GUIDE

AB1-3847	RUBY-D714VG2AR ATX IMB, LGA1155 CPU, Q77, DDR3/VGA/DVI/ HDMI/Dual GbE/COM/Audio/USB
----------	---

PACKING LIST

One RUBY-D714VG2AR ATX Industrial Main Board
One SATA III Cable
One Installation CD
One I/O shield

GENERAL

Processor	- Intel® Core™ i7/i5 processor up to 3.4GHz with (3~8MB) Cache in LGA1155 package - DMI x4 Link: 5.0 GT/s - Supports Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring and Trusted Execution (depend on CPU sku)
Chipset	Intel® Q77 PCH chipset
BIOS	Phoenix UEFI BIOS
Memory	Supports up to 32GB DDR3 1333/1600 MT/s SDRAM on 4x 240-pin DIMM sockets (dual channel)
Storage Devices	- 2x SATA III - 3x SATA II - Supports RAID 0,1,5,10 - 1x CFEX(Only support CFEX Card)
Watchdog Timer	Programmable via S/W from 0.5 sec. to 255 sec.
Hardware Monitoring	On board fan connector (CPU Cooler x1, System Fan x1); temperature and voltages monitoring
Expansion Interface	- 1x PCIe 3.0 x16 slot - 1x PCIe 2.0 x16 slot (PCIe x4 signal) - 1x PCIe 2.0 x4 slot (PCIe x1 signal) - 4x PCI devices at 32-bit 33 MHz

I/O INTERFACE

Super I/O	ITE IT8783F
Audio	- Intel® Q77 PCH built-in High Definition Audio up to 192-Khz 32-bit - Realtek ALC886-GR HDA codec - Audio Jack DIP Light Pink/Lime/Light Blue
Ethernet	- Intel® 82579LM and 82583V dual gigabit ethernet controllers - PCIe x1 interface based on Gigabit Ethernet - 2x RJ-45 connectors with 2x LED indicators at rear I/O panel
Serial Port	- 4x RS-232 - 1x RS-232 and 1x Selectable RS-232/422/485 on rear I/O
USB	- 4x USB 3.0 ports on rear I/O - 6x USB 2.0 ports on board
Keyboard & Mouse	PS/2 on board dedicated to keyboard & mouse
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

Graphic Controller	- Quad Core™ Processor with Intel® HD Graphics 4000 and Integrated Memory Controller - Provided improved 3D multimedia capabilities including Microsoft DirectX 11, Shader Model 4.0, MPEG-2 and OpenGL® 3.1
Display Interface	- VGA: up to 2560x1600 @60Hz - DVI-D: up to 1920x1200 @60Hz - HDMI: up to 1920x1200 @60Hz

Mechanical & Environment

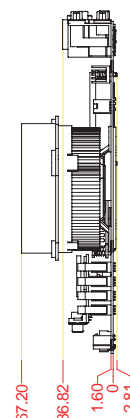
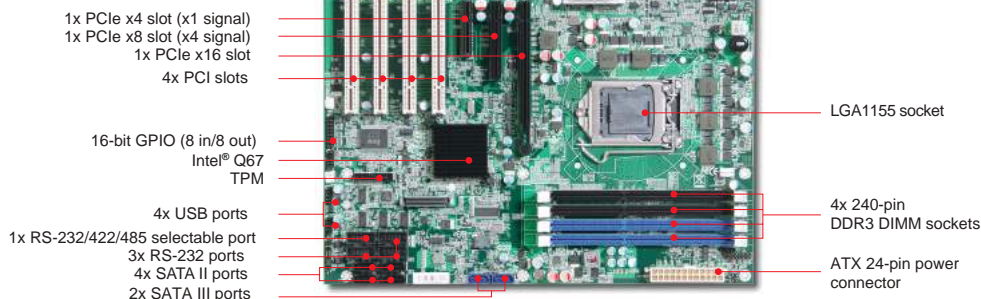
Dimension	- 304.8mm(L) x 243.8mm(W); 12"(L) x 9.6"(W) - PCB: 6 layers
Power Supply	ATX 24-pin power input
Environment	- Operation Temperature: 0°C~60°C (with highest performance on 50 °C) - Storage Temperature: -20°C~80°C - Relative Humidity: 5%~95%, non-condensing
Certification	CE, FCC Class A
MTBF	Over 120,000 hours at 40°C





RUBY-D712VG2AR

Intel® Core™ i5 and i7 processor based
ATX with DDR3 SDRAM, Dual Display,
Dual Gigabit Ethernet and USB Ports

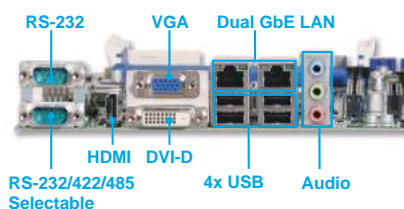


With the Intel® Q67 chipset on board, the RUBY-D712VG2AR supports the latest quad-core 2nd Generation Intel® Core™ i7 and Core™ i5 processors. This model is also ideal for Factory Automation, Medical, Gaming, Digital Signage, Surveillance Security Monitoring and Kiosk with high performance requiring various I/O connectors.

FEATURES

- Intel® Core™ i7 and i5 Processors (Quad Core™ CPU support)
- 4x Long-DIMMs support dual channel DDR3 non-ECC SDRAM up to 32GB
- Dual Display by VGA/DVI/ HDMI
- SATA ports support Intel® RAID 0,1,5,10
- 1x PCIe x16, 1x PCIe x8 (x4 signal), 1x PCIe x4 (x1 signal) and 4x PCI slots
- Intel® Active Management Technology 7.0

REAR I/O



ORDERING GUIDE

AB1-3634	RUBY-D712VG2AR ATX IMB. LGA1155 CPU. Q67. DDR3/VGA/DVI/ HDMI/Dual GbE/COM/Audio/USB
----------	---

PACKING LIST

One RUBY-D712VG2AR ATX Industrial Main Board
One SATA II Cable
One Installation CD
One I/O shield

GENERAL

Processor	- Intel® Core™ i7/i5 processor up to 3.4GHz with (3~8MB) Cache in LGA1155 package - DMI x4 Link: 5.0 GT/s - Supports Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring and Trusted Execution (depend on CPU sku)*
Chipset	Intel® Q67 PCH chipset (6.1W)
BIOS	AMI UEFI BIOS
Memory	Supports up to 32GB DDR3 1333/1066 MT/s SDRAM on 4x 240-pin non-ECC DIMM sockets (dual channel)
Storage Devices	- 2x SATA III - 4x SATA II - RAID 0,1,5,10
Watchdog Timer	Programmable via S/W from 0.5 sec. to 255 min.
Hardware Monitoring	- System monitor (fan, temperature, voltage) - Temperature (CPU & System) - Voltage (CPU Vcore, 5VSB, 12V, 5V, 3.3V)
Expansion Interface	- 1x PCIe 2.0 x4 slot (PCIe x1 signal) - 1x PCIe 2.0 x8 slot (PCIe x4 signal) - 1x PCIe 2.0 x16 slot - 4x PCI 32-bit slots

I/O INTERFACE

Super I/O	ITE IT8728F
Audio	- Intel® BD82Q67 PCH built-in High Definition Audio up to 96-Khz 24-bit - Realtek ALC662-GR HDA codec - Audio Jack DIP Light Pink/Lime/Light Blue
Ethernet	- Intel® 82574L and Intel® 82579LM dual gigabit ethernet controllers - 2x RJ-45 connectors with two LED indicators at rear I/O panel
Serial Port	- 3x RS-232 on board and 1x RS-232/422/485 selectable on board - 1x RS-232 on rear I/O and 1x RS-232/422/485 selectable on rear I/O
USB	- 4x USB 2.0 ports on rear I/O 4x USB 2.0 ports on board with pitch 2.54 header - 480 Mb/s bus comprehends the high-speed/full-speed/low-speed data ranges
Keyboard & Mouse	PS/2 on board dedicated to keyboard & mouse
GPIO	On board programmable 16-bit Digital I/Os

DISPLAY

Graphic Controller	- Intel® HD Graphics 2000/3000 integrated Graphics Engine, provides a visually stunning experience optimized for Blu-ray and HD video HDMI - Chronitel: CH7318B QFN-48
Display Interface	- VGA: up to 2048x1536 @75Hz - DVI-D: up to 1920x1200 @60Hz - HDMI: up to 1920x1200 @60Hz

Mechanical & Environment

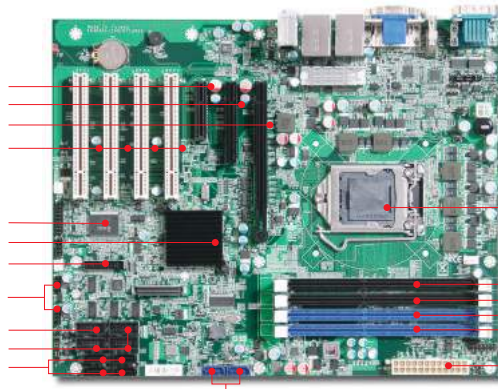
Dimension	304.8mm(L) x 243.8mm(W); 12"(L) x 9.6"(W)
Power Supply	- Typical: +12V(CPU)@3.81A; +12V(System)@2.21A; +5V@2.3A; +3.3V@1.15A - Supports ATX mode
Environment	- Operation Temperature: 0°C~60°C - Storage Temperature: -20°C~80°C - Relative Humidity: 5%~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 120,000 hours at 40°C



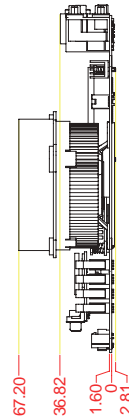
RUBY-D711VG2AR

Intel® Core™ i3 and Xeon® processor based
ATX with DDR3 SDRAM, Dual Display, Dual
Gigabit Ethernet and USB Ports

- 1x PCIe x4 slot (x1 signal)
- 1x PCIe x8 slot (x4 signal)
- 1x PCIe x16 slot
- 4x PCI slots
- 16-bit GPIO (8 in/8 out)
- Intel® C206 TPM
- 4x USB ports
- 1x RS-232/422/485 selectable port
- 3x RS-232 ports
- 4x SATA II ports
- 2x SATA III ports



- LGA1155 socket
- 4x 240-pin DDR3 DIMM sockets
- ATX 24-pin power connector

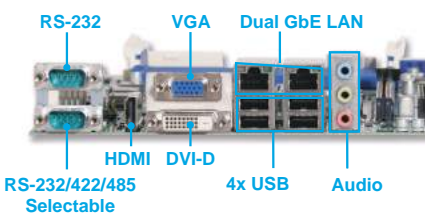


On the basis of Intel® C206 Chipset, RUBY-D711VG2AR supports the latest quad-core 2nd Generation Intel® Core™ i3 and Xeon® processors and provides numerous I/O connectors and also applies high performance in such areas as factory automation, medical, gaming, digital signage, surveillance security monitoring and kiosk.

FEATURES

- Intel® Core™ i3 and Xeon® E3-1200 series Processors (Quad Core™ CPU support)
- 4x Long-DIMMs support dual channel DDR3 ECC SDRAM up to 32GB
- Dual Display by VGA/DVI/HDMI
- SATA ports support Intel® RAID 0,1,5,10
- 1x PCIe x16, 1x PCIe x8 (x4 signal), 1x PCIe x4 (x1 signal) and 4x PCI slots
- Intel® Active Management Technology 7.0

REAR I/O



ORDERING GUIDE

AB1-3633	RUBY-D711VG2AR ATX IMB. C206 w/ECC LGA1155.w/DDR3 DIMMs/ VGA/LVDS/DVI/HDMI/Dual GbE/COM/ Audio/USB
----------	---

PACKING LIST

One RUBY-D711VG2AR ATX Industrial Main Board
One SATA II Cable
One Installation CD
One I/O shield

GENERAL

Processor	- Intel® Core™ i3 and Xeon® E3-1200 series processor up to 3.4GHz with (3~8MB) Cache in LGA1155 package - DMI x4 Link: 5.0 GT/s - Supports Intel® Turbo Boost, Hyper-Threading, Virtualization, Thermal Monitoring and Trusted Execution (depend on CPU sku)
Chipset	Intel® C206 PCH chipset (6.6W)
BIOS	AMI UEFI BIOS
Memory	Supports up to 32GB DDR3 1333/1066 MT/s SDRAM on 4x 240-pin ECC/non-ECC DIMM sockets (dual channel)
Storage Devices	- 2x SATA III - 4x SATA II - RAID 0,1,5,10
Watchdog Timer	Programmable via S/W from 0.5 sec. to 255 min.
Hardware Monitoring	- System monitor (fan, temperature, voltage) - Temperature (CPU & System) - Voltage (CPU Vcore, 5VSB, 12V, 5V, 3.3V)
Expansion Interface	- 1x PCIe 2.0 x4 slot (PCIe x1 signal) - 1x PCIe 2.0 x8 slot (PCIe x4 signal) - 1x PCIe 2.0 x16 slot - 4x PCI 32-bit slots

I/O INTERFACE

Super I/O	ITE IT8728F
Audio	- Intel® BD82C206 built-in High Definition Audio up to 192-Khz 32-bit - Realtek ALC662-GR HDA codec - Audio Jack DIP Light Pink/Lime/Light Blue
Ethernet	- Intel® 82574L and Intel® 82579LM dual gigabit ethernet controllers - 2x RJ-45 connectors with one LED indicators at rear I/O panel
Serial Port	- 3x RS-232 on board and 1x RS-232/422/485 selectable on board - 1x RS-232 on rear I/O and 1x RS-232/422/485 selectable on rear I/O
USB	- 4x USB 2.0 ports on rear I/O and 4x USB 2.0 ports on board with pitch 2.54 header - 480 Mb/s bus comprehends the high-speed/full-speed/low-speed data ranges
Keyboard & Mouse	PS/2 on board dedicated to keyboard & mouse
GPIO	On board programmable 16-bit Digital I/Os

DISPLAY

Graphic Controller	- Intel® HD Graphics 2000/3000 integrated Graphics Engine provides a visually stunning experience optimized for Blu-ray™ and HD video HDMI - Chronitel: CH7318B QFN-48
Display Interface	- VGA: up to 2048x1536 @75Hz - DVI-D: up to 1920x1200 @60Hz - HDMI: up to 1920x1200 @60Hz

Mechanical & Environment

Dimension	304.8mm(L) x 243.8mm(W); 12"(L) x 9.6"(W)
Power Supply	- Typical: +12V(CPU)@3.81A; +12V(System)@2.21A; +5V@2.3A; +3.3V@1.15A - Supports ATX mode
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





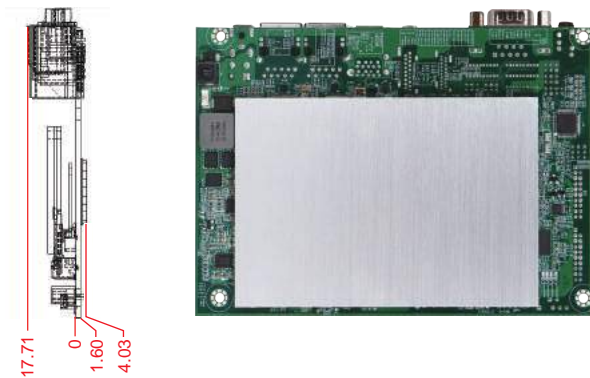
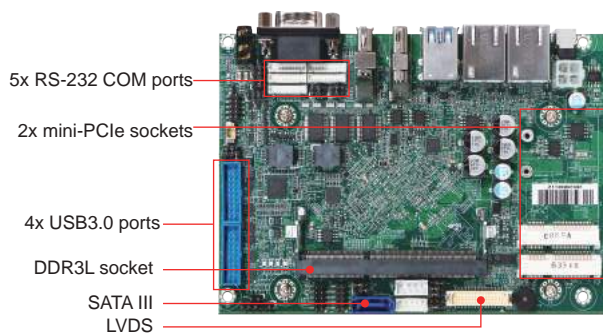
Small Platform Reference Table



MODEL	PEB-2773	PICO-6260
Form Factor	3.5" Embedded	PICO-ITX
CPU	Intel® Atom® E3900 Family	Intel® Atom® E3900 Family
Chipset	N/A	N/A
BIOS	AMI UEFI	AMI UEFI
Memory	1x DDR3L SO-DIMM up to 8GB	Support up to 8GB DDR3L 1333/1600/1866 MH/z SDRAM on one 204 pin SO-DIMM socket
Expansion	2x mini-PCIe sockets	1x mini-PCIe socket (support mSATA) 1x M.2 Type E slot
Display	DP/HDMI/LVDS	LVDS/HDMI
Audio	Realtek ALC892 HDA codec	Realtek ALC887 HDA codec
LAN	2x GbE	1x GbE
Serial Port	1x RS-232/422/485 5x RS-232	1x RS232/422/485 1x RS232
USB	6x USB 3.0	2x USB3.0 2x USB2.0
Storage Devices	1x SATA	1x SATAIII
GPIO	8- bit	8-bit
Others	N/A	N/A
Dimension	146 x 102mm	100 x 72mm
Page	41	42

PEB-2773

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

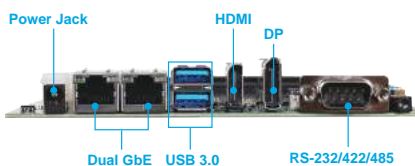


PEB-2773 build with Intel® Atom® processor E3900 series. Not only does it operates with TDP under 12W for fan-less applications, but it also supports industrial temperature range from -40°C to 85°C and wide voltage of power input from 12V to 24V.

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

AB1-3E83	(R).PEB-2773. Intel® Apollo Lake SoC on Board.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	N/A
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 ALC892 HDA codec - Audio jack on rear I/O with Line-in, Line-out, and Mic-in on board pin header
Ethernet	- Dual Intel® I210IT GbE controller - 2x RJ45 connectors on rear I/O
Serial Port	1x RS-232/422/485 with DP9 connector on REAR I/O(selected by bios)
USB	- 2x USB 3.0 ports on rear I/O - 4x USB 3.0 ports on board with pitch 3.0 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

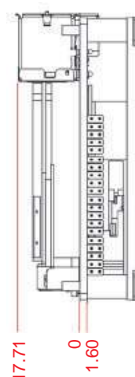
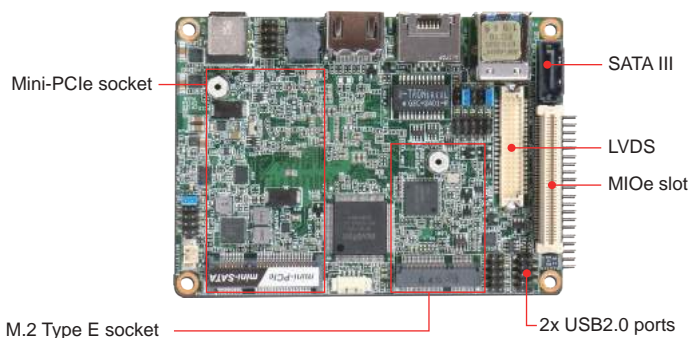
Dimension	146mm(L) x 102(W) mm; 5.75"(L) x 4.02"(W)
Power Supply	DC 12-24V input
Environment	- Operation Temperature: -40°C~80°C - Storage Temperature: -40°C~80°C - Relative Humidity: 5%~95%, non-condensing
MTBF	Over 120,000 hours at 40°C





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 pico-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 consumption and support two com port to allow quick and flexible system expansions. Intel® I211AT Gigabit Ethernet controllers provide dual 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.

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

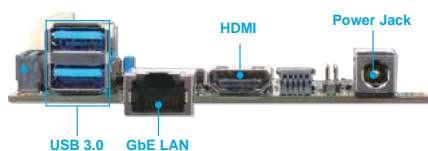
FEATURES

- 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)

I/O INTERFACE

Super I/O	N/A
Audio	- High Definition Audio integrated in Intel® SoC - Supports 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	- 2x USB 3.0 ports on rear I/O - 2x USB 2.0 ports on board with pitch 2.0 header"
GPIO	8-bit configurable controlled by embedded controller

REAR I/O



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

ORDERING GUIDE

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

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





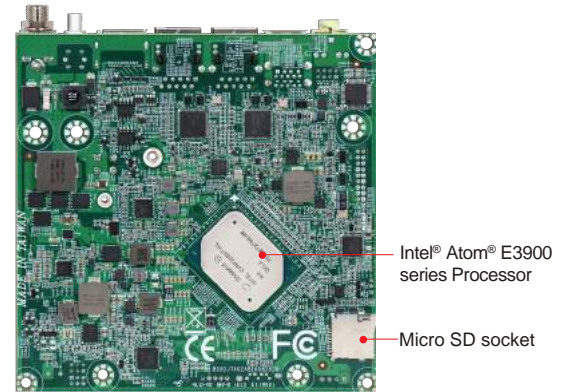
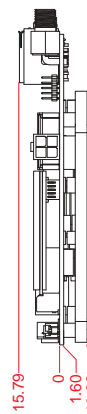
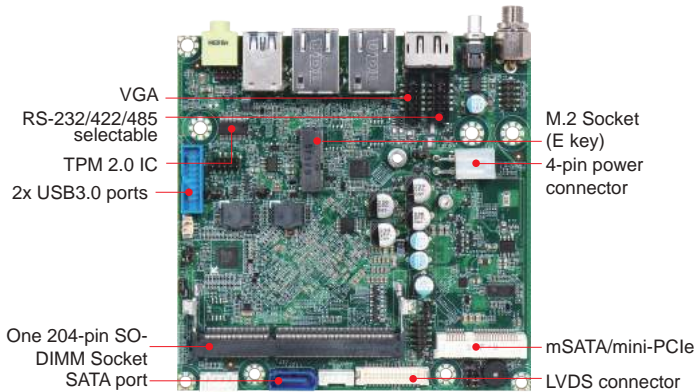
NANO-ITX Reference Table



MODEL	NANO-6062	NANO-6061	NANO-6050	NANO-6060
Form Factor	NANO-ITX	NANO-ITX	NANO-ITX	NANO-ITX
CPU	Intel® Atom® E3900 Family	Intel® Pentium®/Celeron® N3000 Family	Intel® Gen Core™ i5/i3 ULV Processor	Intel® Atom® E3800 Family
Chipset	N/A	N/A	N/A	N/A
BIOS	AMI UEFI	AMI UEFI	AMI UEFI	Phoenix UEFI
Memory	1x DDR3L SO-DIMM up to 8GB	1x DDR3L SO-DIMM up to 8GB	1x DDR3L SO-DIMM up to 8GB	1x DDR3L SO-DIMM up to 4GB
Expansion	1x M.2 socket (E key) 1x mini-PCIe socket	1x M.2 socket (E key)	1x Half Size mini-PCIe socket	1x PCIe x1 slot 1x Half Size mini-PCIe socket
Display	VGA/LVDS/DP	VGA/LVDS/DP	LVDS/ 2x Mini DP	VGA/LVDS/DP
Audio	Realtek ALC892 HDA codec	Realtek ALC892 HDA codec	Realtek ALC892 HDA codec	Realtek ALC892-GR HDA codec
LAN	2x GbE/ 1x GbE	2x GbE	2x GbE	2x GbE/ 1x GbE
Serial Port	1x RS-232/422/485 1x RS-232/422/485	1x RS-232/422/485	1x RS-232/422/485	1x RS-232/422/485
USB	4x USB 3.0	1x USB 2.0 2x USB 3.0	2x USB 2.0 4x USB 3.0	2x USB 2.0 4x USB 3.0
Storage Devices	1x SATA III 1x mSATA 1x Micro-SD socket	1x SATA III 1x mSATA 1x SD socket	1x SATA III 1x mSATA	2x SATA II 1x Micro-SD socket
GPIO	8-bit	8-bit	8-bit	8-bit
Dimension	120x 120mm	120x 120mm	120x 120mm	120x 120mm
Page	44	45	46	47

NANO-6062

Intel® Apollo Lake 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

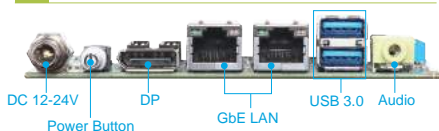


NANO-6062 build with Intel® Atom® processor E3900 series. Not only does it operate with TDP under 12W for fan-less applications, but it also supports industrial temperature range from -40°C to 85°C and wide voltage of power input from 12V to 24V. Support four USB 3.0 ports ensures fast data transmission 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 flexible system expansions. Two Intel® I210IT 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
- Supports DDR3L 1866/1600 MT/s SO-DIMM up to 8GB
- Supports triple displays by VGA, DP, and LVDS
- Supports M.2 socket, SATA III port, mini-PCIe, and mSATA socket
- Supports DC 12-24V input

REAR/I/O



ORDERING GUIDE

AB1-3E89Z	(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
AB1-3G40Z	(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
AB1-3G41Z	(R).NANO-6062-E3930 Nano-ITX ESB. Intel® Atom® Dual Core 1.6GHz (6W). w/DDR3L SO-DIMM/ VGA/ LVDS/ DP/ Singal GbE LAN/ M.2/ SATA III

PACKING LIST

One NANO-6062 NANO-ITX Main Board
One Passive Heat Spreader
One Installation 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 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	- Dual Intel® I210IT GbE controller (E3950/ E3940 only) - Dual RJ45 connectors on rear I/O (E3950/ E3940 only) - Singal Intel® I210IT GbE controller and singal RJ45 (E3930 only)
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	8-bit 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

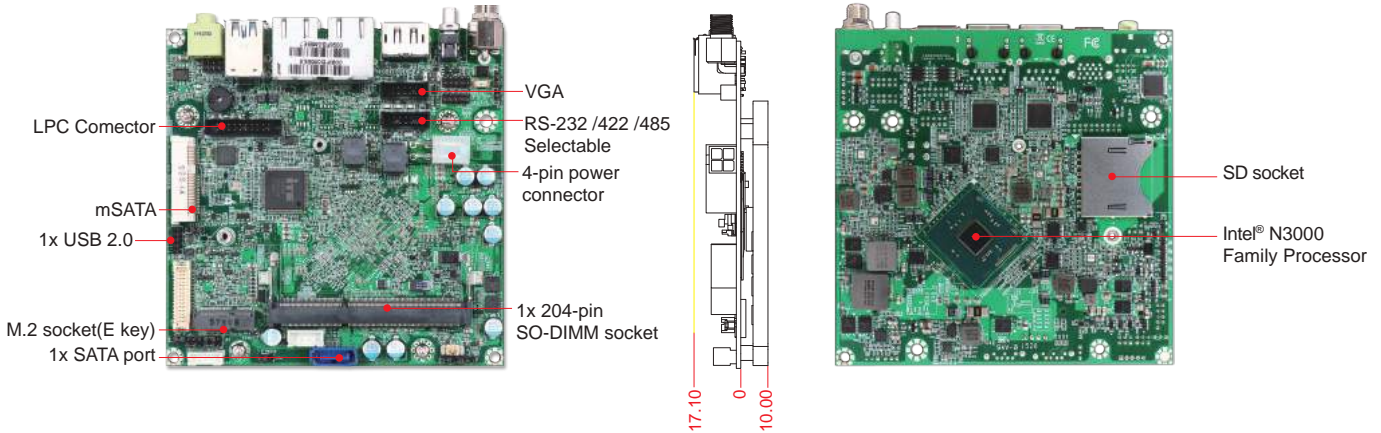
Mechanical & Environment

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



NANO-6061

Intel® Braswell Pentium®/Celeron® Dual/Quad Core N3000 series SoC based on NANO-ITX. Board with Triple Displays, GbE LAN, USB 3.0, M.2, SD, SATA III, and mSATA

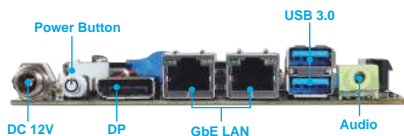


NANO-6061 build with Intel® Celeron® and Pentium® processor N3000 series that not only is it suitable for under 6W fan-less application but also powerful graphic display demand. With its superior up to Quad core processing power and high capability, the new architecture integrates more powerful 3D graphics engine and memory controller making it suitable for critical environments.

FEATURES

- Intel® Pentium®/Celeron® Dual/Quad Core N3000 series SoC
- Supports one DDR3L 1600/1333 MT/s SO-DIMM up to 8GB
- Supports triple displays by VGA, DP, and dual channel 24 bit LVDS
- Supports 1x M.2 socket, SATA III port, and mSATA socket
- Supports 1x SD socket
- Supports DC 12V input

REAR I/O



ORDERING GUIDE

AB1-3D89	(R).NANO-6061-N3710. Nano-ITX ESB. Intel® Pentium® Quad Core 1.6GHz (6W). w/DDR3L SO-DIMM/ VGA/ LVDS/ DP/ GbE LAN/ M.2/ SATA III
AB1-3D88	(R).NANO-6061-N3160. Nano-ITX ESB. Intel® Celeron® Quad Core 1.6GHz (6W). w/DDR3L SO-DIMM/ VGA/ LVDS/ DP/ GbE LAN/ M.2/ SATA III
AB1-3D88	(R).NANO-6061-N3060. Nano-ITX ESB. Intel® Celeron® Dual Core 1.6GHz (6W). w/DDR3L SO-DIMM/ VGA/ LVDS/ DP/ GbE LAN/ M.2/ SATA

PACKING LIST

One NANO-6061 NANO-ITX Main Board
One Passive Heat Spreader
One Installation CD

GENERAL

Processor	- Intel® Pentium® /Celeron® Dual/Quad Core N3710/N3160/N3060 Processor (up to 6W) - With 2MB Cache
BIOS	AMI UEFI BIOS
Memory	1x DDR3L 1600/1333 MT/s SO-DIMM up to 8GB
Storage Devices	- 1x SATA III port - 1x mSATA 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)

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	- Intel® I211AT GbE controller - 2x 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 - 1x USB 2.0 port on board with pitch 2.0 header
GPIO	8-bit configurable controlled by embedded controller

DISPLAY

Graphic Controller	-Intel® Gen 8 Graphics supports DirectX 11.2, OpenGL® 4.2 / OpenCL® 1.2 -Video decode HW acceleration support for H.264, H.265, MPEG2, VC1/WMV, JPEG, VP82, VP
Display Interface	- LVDS: Dual channel 24bit LVDS on board connector, up to 1920x1200 - CRT: 1x DB-15 on board connector, up to 2560x1600 - DP: 1x DP port on rear I/O, up to 3840x2160

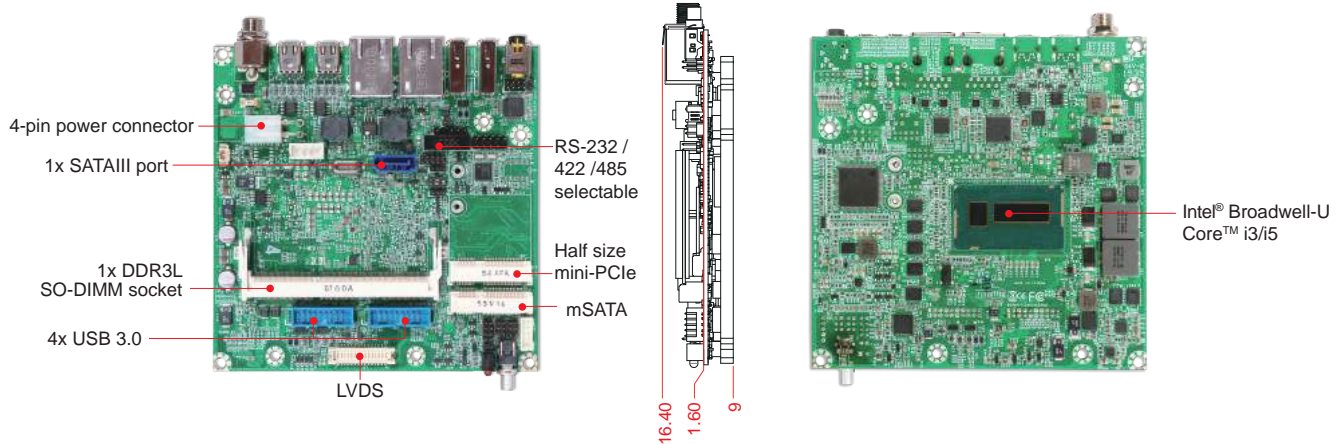
Mechanical & Environment

Dimension	120mm(L) x 120mm(W); 4.72"(L) x 4.72"(W)
Power Supply	DC 12V input
Environment	- Operation Temperature: 0°C~55°C - Storage Temperature: -20°C~85°C - Relative Humidity: 5%~95%, non-condensing
Certification	CE, FCC Class A
MTBF	Over 100,000 hours at 40°C



NANO-6050

Intel® 5th Gen Core™ i5/i3 ULV Processor based on NA-NO-ITX Board with Triple displays, GbE LAN, USB 3.0, mini-PCle, Combo Audio jack, SATA III, and mSATA

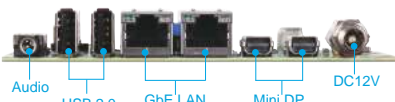


NANO-6050 build with Intel® 5th Gen Core™ i5/i3 ULV processor and takes advantages of Intel® Core™ mobile processor technologies such as Hyper-Threading, high performance, and low power consumption. Portwell NANO-6050-based systems are ideal for passively cooled and hermetically sealed systems that can be used in various environments. NANO-6050 is an ideal platform with HD graphic output for POS, kiosk, digital signage and transportation applications.

FEATURES

- Intel® 5th Gen Core™ i5 and i3 processor
- Supports one DDR3L 1600/1333 MT/s SO-DIMM up to 8GB
- Supports triple displays by Dual mini DP ports, and dual channel 24 bit LVDS
- Supports 1x SATA III, 1x mSATA, and 4x USB 3.0 ports
- Supports 1x half size mini-PCle socket
- Supports DC 12V input
- Supports TPM 2.0 (Option)

REAR I/O



ORDERING GUIDE

AB1-3C88	(R).NANO-6050-5350U. Nano-ITX ESB. Intel® Core™ i5-5350U 1.8GHz Dual Core.w/DDR3L SO-DIMM/ 24bit LVDS/Dual Mini DP/Dual GbE LAN/USB/mSATA
AB1-3C89	(R).NANO-6050-5010U. Nano-ITX ESB. Intel® Core™ i3-5010U 2.1GHz Dual Core.w/DDR3L SO-RAM/ 24bit LVDS/Dual Mini DP/Dual GbE LAN/USB/mSATA

PACKING LIST

One NANO-6050 NANO-ITX Main Board
One Passive Heat Spreader
One Installation CD

GENERAL

Processor	- Intel® 5 th Gen Core™ i5/i3 ULT processor in FCBGA1168 package - With 3MB Cache - Support Intel® Hyper-Threading Technology, Virtualization Technology (VT-x), Small Business Advantage
BIOS	AMI UEFI BIOS
Memory	1x DDR3L 1600/1333 MT/s SO-DIMM up to 8GB
Storage Devices	- 1x SATA III port - 1x mSATA socket
Watchdog Timer	Programmable by embedded controller
Hardware Monitoring	- Temperature (CPU & System) - Voltage (CPU Vcore, 12V, 5V, 3.3V, RAM)
Expansion Interface	1x half size mini-PCle socket

I/O INTERFACE

Audio	- HDA controller integrated in Intel® SoC - Realtek ALC892 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® I218LM GbE controller - Intel® I210IT GbE controller - 2x RJ45 connector on rear I/O
Serial Port	1x RS-232/422/485 on board connector (selected by bios)
USB	- 2x USB 2.0 ports on rear I/O - 4x USB 3.0 ports on board
GPIO	8-bit configurable controlled by embedded controller

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	- LVDS: Dual channel 24bit LVDS on board connector, up to 1920x1200@60Hz - 2x Mini DP on Rear I/O, up to 3840x2160

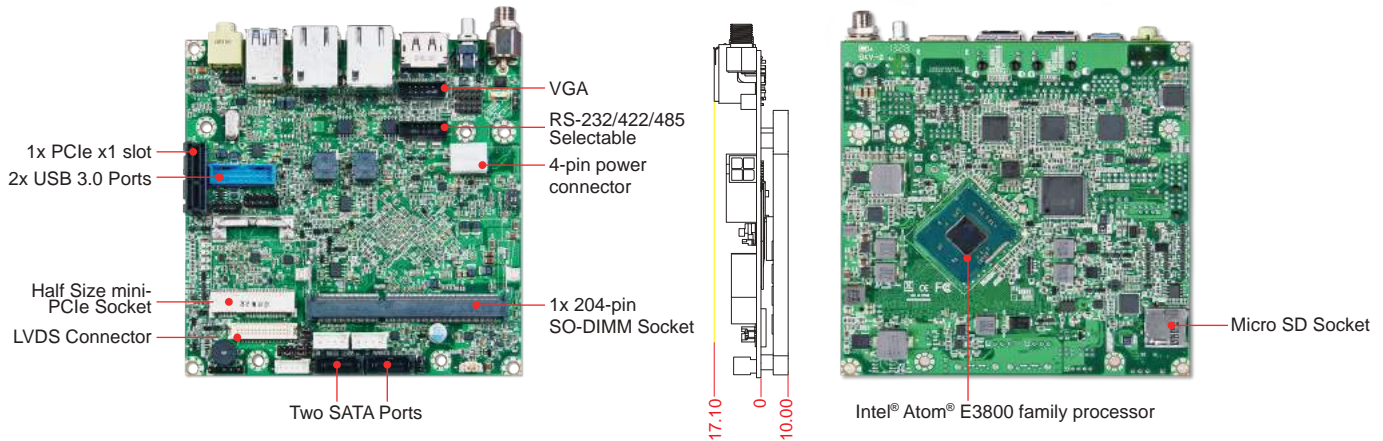
Mechanical & Environment

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



NANO-6060

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

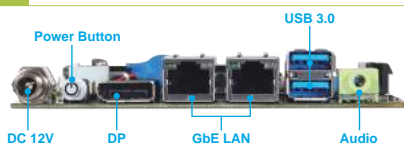


NANO-6060 build with Intel® Atom® processor E3800 family that not only outputs under 10W for fan-less applications, but also supports a wide industrial temperature from -40°C to 85°C. With its superior up to Quad Core processing power and high capability. Portwell have taken advantage of such technology 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 Trail-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	<ul style="list-style-type: none"> - Intel® Atom® E3800 family processor - Cache up to 2MB (for Quad Core) - DPM (Defect Per Million devices) <50 - Support Intel® VT-x technology
BIOS	Phoenix EFI BIOS
Memory	1x DDR3L 1066/1333 MT/s SO-DIMM up to 4GB
Storage Devices	<ul style="list-style-type: none"> - 2x SATA II - 1x Micro-SD socket
Watchdog Timer	Programmable by embedded controller
Hardware Monitoring	<ul style="list-style-type: none"> - Temperature (CPU & System) - Voltage (CPU Vcore, 12V, 5V, 3.3V, 1.35V)
Expansion Interface	<ul style="list-style-type: none"> - 1x PCIe x1 slot - 1x half size mini-PCIe slot

I/O INTERFACE

Audio	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - Dual Intel® I210IT Gigabit Ethernet controller (for E3827/ E3845 only) - 2x RJ45 connectors on rear I/O (for E3827/ E3845 only) - 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	<ul style="list-style-type: none"> - 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	8-bit configurable controlled by embedded controller

DISPLAY

Graphic Controller	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - Operation temperature: -40°C~80°C - Storage temperature: -40°C~80°C - Relative humidity : 5%~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000hrs at 55°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.

Product list: WADE-8017, WADE-8016, WADE-8015, WADE-8013, WADE-8012, WADE-8011

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.

Product list: WADE-8022, WADE-8020

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.

Product list: WADE-8079, WADE-8078, WADE-8077, WADE-8076, WADE-8075



Mini-ITX Reference Table



MODEL	WADE-8022	WADE-8172	WADE-8171	WADE-8079
Form Factor	MINI-ITX	MINI-ITX	MINI-ITX	MINI-ITX
CPU	Intel® 4 th Dual/Quad processor in FCBGA1364	Intel® Celeron® processor N3350 in FCBGA1296 package	Intel® Atom® N3000 Family	Intel® Atom® E3800 family
Chipset	Intel® QM87 PCH	N/A	N/A	N/A
BIOS	AMI UEFI	AMI UEFI	AMI UEFI	Phoenix
Memory	2x DDR3L SO-DIMM up to 16GB	up to 8 GB DDR3L 1600/1333 MHz memory (non-ECC) on 2x 204-pin SODIMM socket	2x DDR3L SO-DIMM up to 8GB	1x DDR3L SO-DIMM up to 8G
Expansion	1x PCIe x16 slot 2x mini-PCIe socket 1x PCIe x1 Golden finger	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	1x PCIe x1 slot 2x mini-PCIe socket
Display	DVI-I/LVDS/DP/HDMI	LVDS/HDM/VGA	VGA/HDMI/LVDS	VGA/DVI/DP/LVDS
Audio	Realtek ALC886-GR HD Audio codec	Realtek ALC887 HDA codec	Realtek ALC887 HDA codec	Realtek ALC892 Audio codec
LAN	2x GbE	2x GbE	2x GbE	2x GbE
Serial Port	5x RS-232 1x RS-232/422/485	2x RS-232/422/485 4x RS-232	2x RS-232/422/485 4x RS-232	3x RS-232 1x RS-232/422/485
USB	4x USB 3.0 6x USB 2.0	4x USB3.0 4x USB2.0	4x USB 3.0 4x USB 2.0	1x USB 3.0 4x USB 2.0
Storage Device	4x SATA	1x SATA III 1x M.2 socke"	2x SATA	2x SATA (1x switch mSATA)
GPIO	8-bit	8-bit	8- bit	8-bit
Others	PS/2 KB & MS	N/A	N/A	PS/2 KB & MS
Dimension	170 x 170mm	170 x 170mm	170 x 170mm	170 x 170mm
Page	53	54	55	56

Mini-ITX Reference Table



MODEL	WADE-8078	WADE-8210-H110	WADE-8017	WADE-8016	WADE-8015
Form Factor	MINI-ITX	MINI-ITX	MINI-ITX	MINI-ITX	MINI-ITX
CPU	Intel® Atom® E3800 family	Intel® 7 th and 6 th Gen Core™ Processors CPU in LGA1151 package	Intel® 7 th and 6 th Gen Core™ Processors CPU in LGA1151 package	Intel® Core™ i5/i7	Intel® Dual Core/Quad Core
Chipset	N/A	Intel® H110	Intel® Q170/H110/C236 PCH	Intel® H81 PCH	Intel® Q87PCH
BIOS	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI	Phoenix
Memory	1x DDR3L ECC SO-DIMM up to 4G	up to 32GB DDR4 2133 Non-ECC SDRAM on two 260 pin SO-DIMM socket	2x DDR4 DIMM up to 32GB	2x DDR3 DIMM up to 16GB	2x DDR3 DIMM up to 16GB
Expansion	1x PCIe x4 slot 1x mini-PCIe socket	1x PCIe x16 1x mini-PCIe socket	1x PCIe x16 slot 1x PCIe x1 Golden finger 1x M.2 type E socket 1x mini-PCIe socket	1x PCIe x16 slot 2x mini-PCIe socket 1x PCIe x1 Golden finger	1x PCIe x16 slot 1x mini-PCIe socket 1x PCIe x1 Golden finger
Display	VGA/HDMI	LVDS/HDMI/VGA	DP/HDMI/VGA	VGA/DVI/HDMI	VGA/DP/HDMI
Audio	Realtek ALC892 Audio codec	Realtek ALC269 HD Audio codec	Realtek ALC892 HD Audio codec	Realtek ALC892 HD Audio codec	Realtek ALC886-GR HD Audio codec
LAN	1x GbE	2x GbE	2x GbE	2x GbE	2x GbE
Serial Port	1x RS-232 1x RS-232/422/485	2x RS-232 4x RS-232	2x RS-232/422/485 4x RS-232	3x RS-232 1x RS-232/422/485	4x RS-232 2x RS-232/422/485
USB	1x USB 3.0 2x USB 2.0	4x USB3.0 4x USB2.0	4x USB 3.0 2x USB 2.0	2x USB 3.0 8x USB 2.0	4x USB 3.0 6x USB 2.0
Storage Device	1x SATA 1x CFEX	2x SATAIII	6x SATA (H110 just 4x SATA)	4x SATA	4x SATA
GPIO	8-bit	8-bit	8-bit	8-bit	8-bit
Others	PS/2 KB & MS	N/A	N/A	PS/2 KB & MS	PS/2 KB & MS
Dimension	170 x 170mm	170 x 170 mm	170 x 170mm	170 x 170mm	170 x 170mm
Page	57	58	59	60	61



Mini-ITX Reference Table



MODEL	WADE-8014	WADE-8013	WADE-8012	WADE-8011
Form Factor	MINI-ITX	MINI-ITX	MINI-ITX	MINI-ITX
CPU	Intel® Dual Core/ Quad Core	Intel® Dual Core/ Quad Core	Intel® Dual Core/ Quad Core	Intel® Dual Core/ Quad Core
Chipset	Intel® C216 PCH	Intel® Q77	Intel® Q67 PCH	Intel® C206 PCH
BIOS	Phoenix	Phoenix	AMI UEFI	AMI UEFI
Memory	2x DDR3 DIMM up to 16GB	2x DDR3 DIMM up to 16GB	2x DDR3 DIMM up to 16GB	2x DDR3 ECC DIMM up to 16GB
Expansion	1x PCIe x16 slot 1x mini-PCIe socket	1x PCIe x16 slot 1x mini-PCIe socket	1x PCIe x16 slot	1x PCIe x16 slot
Display	VGA/DVI-D/HDMI	VGA/DVI-D/HDMI	VGA/DVI/HDMI	VGA/DVI/HDMI
Audio	Realtek ALC886-GR HD Audio codec	Realtek ALC886-GR HD Audio codec	Realtek ALC662-GR HD Audio codec	Realtek ALC662-GR HD Audio codec
LAN	2x GbE	2x GbE	2x GbE	2x GbE
Serial Port	4x RS-232 2x RS-232/422/485	4x RS-232 2x RS-232/422/485	1x RS-232 1x RS-232/422/485	1x RS-232 1x RS-232/422/485
USB	4x USB 3.0 6x USB 2.0	4x USB 3.0 6x USB 2.0	8x USB 2.0	8x USB 2.0
Storage Device	4x SATA	4x SATA	6x SATA	6x SATA
GPIO	16-bit	16-bit	16-bit	16-bit
Others	PS/2 KB & MS	PS/2 KB & MS	PS/2 KB & MS	PS/2 KB & MS
Dimension	170 x 170mm	170 x 170mm	170 x 170mm	170 x 170mm
Page	62	63	64	65

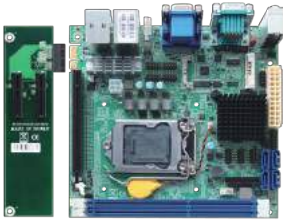
Side expansion Board series

What is side expansion board?

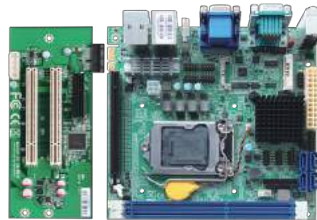
WADE-8015 has one PClex1 gold finger. This special gold finger is re-defined PClex1 pin definition, and we put two PClex1 signal inside. Portwell created a new daughter board from the side to combination, we call it SEB(side expansion board)

Bridging PCIe signals through the Gold Finger to the extension board, WADE-8015 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.

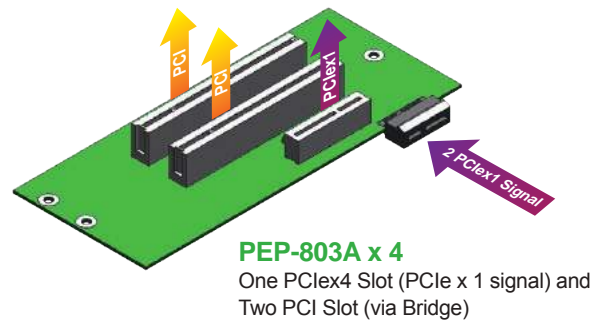
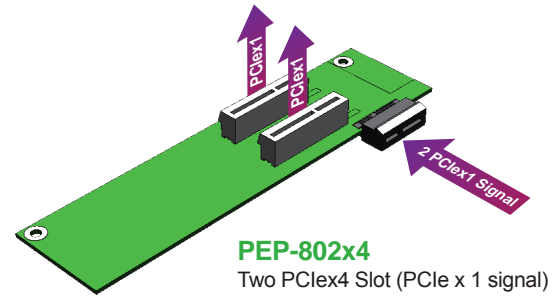
Flex-ATX



Micro-ATX



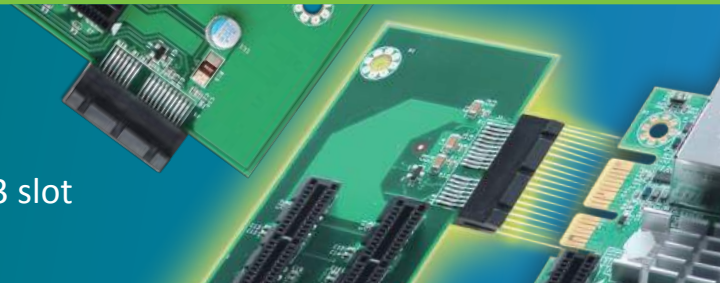
* Meet Flex-ATX or Micro-ATX Form Factor Scope



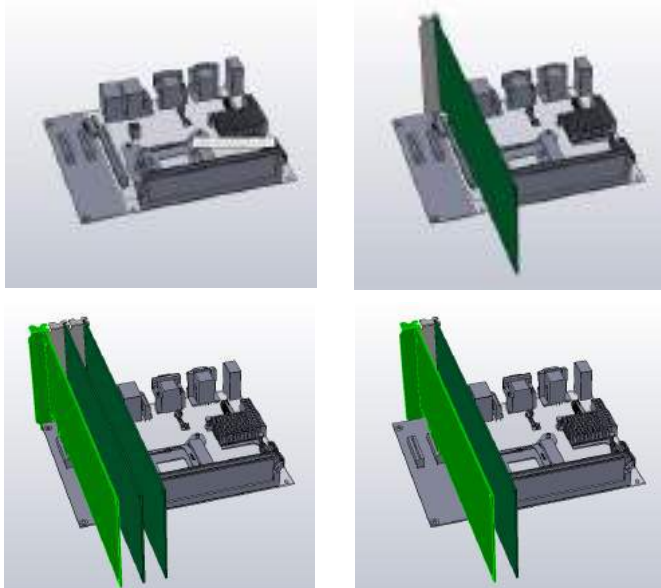
Side Expansion Board (SEB)

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-8015, 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-8015 leverages an extension board to furnish a flexible platform that facilitates multiple functional expansion choices.



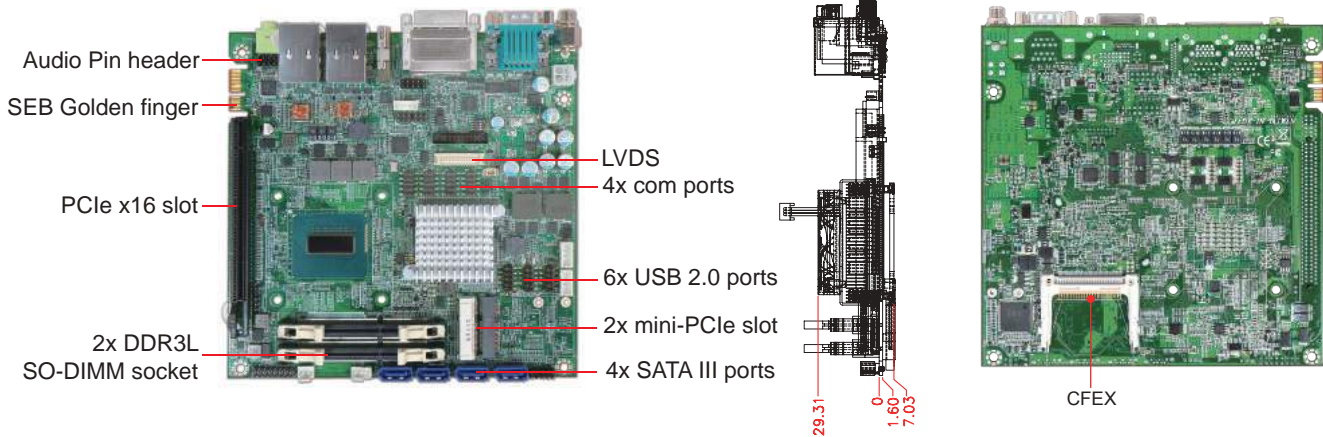
ORDERING GUIDE

AA1-3134Z	(R) PEP-802X4. 2 Slot Riser Card for two PCIe4 for WADE-8015 series
AA1-3141Z	(R) PEP-803AX4. 3 Slot Riser Card for one. PCIe4 and two PCI for WADE-8015 series



WADE-8022

Intel® Core™ i3/i5/i7 mobile processor based Mini-ITX Board with dual Gigabit Ethernet, 4x SATA III ports, 6x COM ports, 1x PCIe x16 expansion slot and 2x mini-PCIe slot with mSATA interface

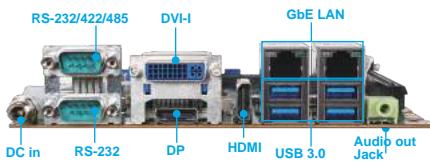


WADE-8022 is based on Intel® QM87 chipset and Mobile processor sku like Core™ i3/i5 and i7(BGA type). WADE-8022 of the Intel® platform will provide high performance and flexibility for functional expansion, such as Gaming, Kiosk, DS, Medical, Defense, Industrial automation and control applications.

FEATURES

- Intel® 4th Dual/Quad processor in FCBGA1364
- Intel® QM87 PCH
- 2x DDR3L SO-DIMM slots up to 16GB (supports 1600/1333 MT/s)
- One PCIe x16 slot (Gen3 support)
- 2x mini-PCIe slot (supports mSATA)
- 1x PCIe x1 Gold finger (2x PCIe x1 signal)
- 6x COM ports (2pcs on rear I/O, 4pcs on board header)
- 4x SATA III Ports (supports RAID 0,1,5,10)
- Total 10x USB ports (4x USB 3.0 Ports & 6x USB 2.0 Ports)

REAR I/O



ORDERING GUIDE

AB1-3A77	(R).WADE-8022 Mini-ITX ESB.Intel® QM87chipset on Board. w/ DDR3L SO-DIMM/DVI-I /DP/HDMI/Dual GbE Lan/COM/Audio/USB
----------	---

PACKING LIST

One WADE-8022 motherboard
One Driver CD
One SATA cable

GENERAL

Processor	- Intel® 4 th Dual/Quad Core™ processor in FCBGA1364 - Cache up to 6MB (for Quad Core) - support Intel® Turbo Boost Technology, Virtualization Technology (VT-x), Hyper-Threading Technology
Chipset	Intel® QM87 PCH
BIOS	AMI UEFI BIOS
Memory	Support up to 16GB DDR3L 1066/1333 MT/s SDRAM on 2x 204pin SO-DIMM
Storage Devices	4x SATA III
Watchdog Timer	Programmable by embedded controller
Expansion Interface	- 1x PCIe 3.0 x16 - 2x mini-PCIe slot(switch function) - 1x PCIe x1 Golden finger(Gen2)

I/O INTERFACE

Super I/O	N/A
Audio	- Intel® QM87 PCH built in HDA controller - Realtek ALC886-GR HAD codec,5.1 channels
Ethernet	On board Intel® WGI217LM & WGI210AT
Serial port	- 1x RS-232 port on rear I/O - 1x RS-232/422/485 selectable port on rear I/O - 4x RS-232 port on pin header
USB	- 6x USB 2.0 ports - 4x USB 3.0 ports
Keyboard & Mouse	PS/2 on board dedicated to keyboard & Mouse
GPIO	8-bit configurable controlled by embedded controller

DISPLAY

Graphic Controller	- Intel® HD Graphics 4600 supports DirectX 11, OCL 1.2, OGL 3.2 -Video decode hardware acceleration supports for H.264, MPEG2, MVC, VC-1, WMV9 and VP8 formats
Display Interface	- DP: up to 2500x1600 - VGA: up to 2048x1536 - DVI: up to 1920x1200 - HDMI: up to 4096x2304 - LVDS: up to 1920x1200

Mechanical & Environment

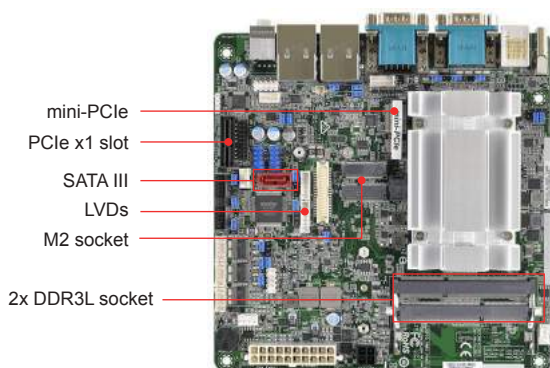
Dimension	170mm(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	12V DC input
Environment	- Operation temperature: 0°C~60°C - Storage temperature: -20°C~80°C - Relative humidity: 5%~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 120,000hrs at 40°C





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

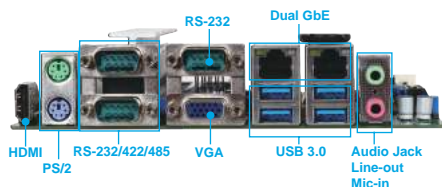


WADE-8172 is based on Intel® Celeron® processor N3350. With dual-channel DDR3L memory and rich I/O sets, WADE-8172 empowers energy-efficient solutions for point-of-sale (POS) and industrial automation applications.

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 x USB 3.0, 4 x USB 2.0, 1 x SATA3 port
- Supports 1x mini-PCIe, 2x M.2 socket(KEY M & KEY E)

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 SODIMM socket
Storage Devices	- 1x SATA III ports - 1x M.2 socket (KEY M 2260/2280) with SATA signal for SSD
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 slot (Gen2, 5GT/s) - 1x M.2 socket (KEY E 2230) with PCIe x1 and USB(shared) for Wireless - 1x full/half size Mini PCIe socket with PCIe x1 and USB(shared)

I/O INTERFACE

Super I/O	N/A
Audio	- Intel® High DefinitionAudio interface Realtek® ALC887 High DefinitionAudio - 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

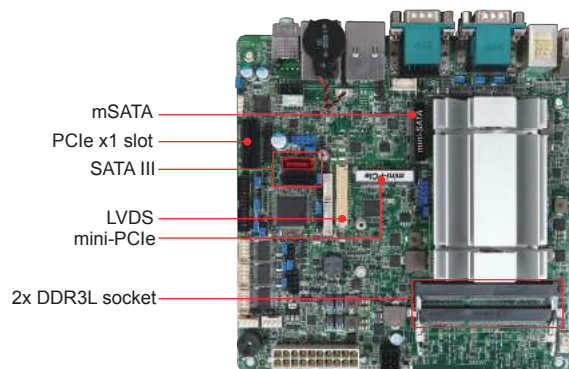
Dimension	170.0 x 170.0 mm (6.7" x 6.7")
Power Supply	12V & 19~24V DC input or ATX power input
Environment	- Operating temperature: 0°C to 60°C - Storage temperature: -20°C to 80°C - Relative humidity: 5~95%, non-condensing
MTBF	Over 100,000 hours at 40°C





WADE-8171

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

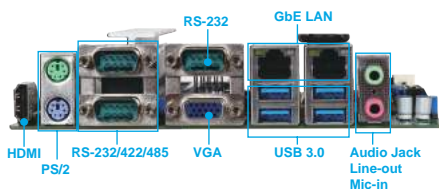


WADE-8171 is based on Intel® Celeron® processor N3160. With dual-channel DDR3L memory and rich I/O sets, WADE-8171 empowers energy-efficient solutions for point-of-sale (POS) and industrial automation applications.

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-PCle, 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-PCle socket (USB + PCIe x1 signal) - 1x full size mini-PCle socket (support mSATA)

I/O INTERFACE

Super I/O	
Audio	Intel® High DefinitionAudio interface Realtek® ALC887 High DefinitionAudio 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

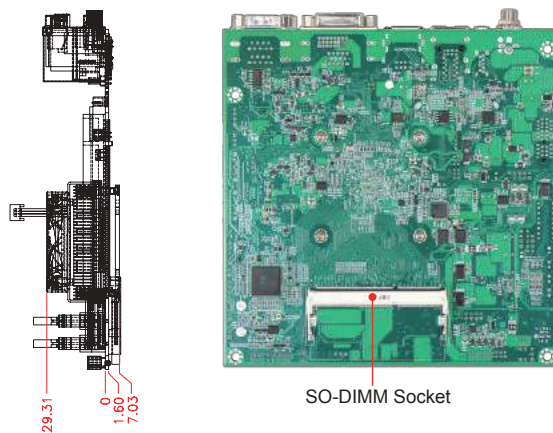
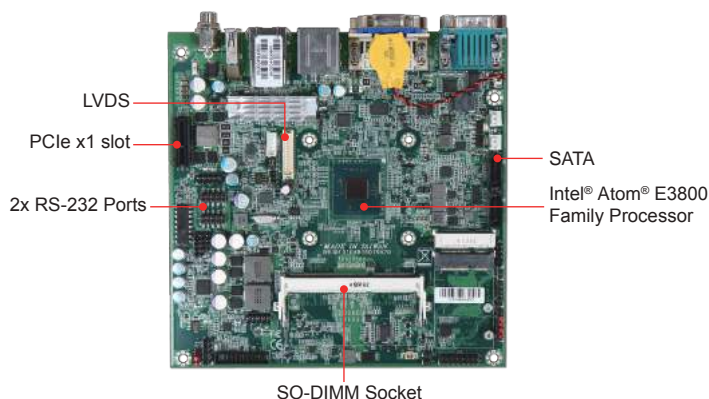
Dimension	170mm(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	12V DC input
Environment	- Operation temperature: 0°C~60°C - Storage temperature: -20°C~80°C - Relative humidity: 5%~95%, non-condensing
MTBF	Over 120,000hrs at 40°C





WADE-8079

Intel® Atom® E3800 SoC based Mini-ITX Board with
VGA, DP, DVI, LVDS, Gigabit Ethernet, Audio, USB
3.0, SATA and 2x mini-PCIe slot with mSATA interface

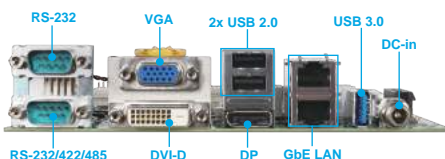


WADE-8079 is based on Intel® Atom® processor E3800 product family with memory and PCI Express controller integrated to support two-channel DDR3L memory and PCI Express 2.0 lanes. Portwell has taken advantage of such technology to furnish a series of products that meets multiple industrial requirements for cost effectiveness, reliable performance and a high level of data integrity and uptime.

FEATURES

- Latest Intel® Atom® embedded processor Expansion Interface provides cost effective solutions with low power and quad core processor technology
- Support 2x DDR3L 1066/1333 MT/s SDRAM, up to 8GB (E3845/ E3826)
- Support 1x DDR3L 1066/1333 MT/s SDRAM, up to 4GB (E3815)
- Supports VGA/DVI/DP&LVDS (Via switch)
- 2x SATA II Ports (1x Switch mini-PCIe)
- Total 5x USB ports (1x USB 3.0 Ports & 4x USB 2.0 Ports)

REAR I/O



ORDERING GUIDE

AB1-3B39	(R).WADE-8079-E3845 Mini-ITX ESB.Intel® Bay Trail(Vallyview-I E3845 QC 1.9GHz processor) on Board .w/DDR3L SO-DIMM/VGA/DVI/DP/Dual GbE Lan/COM/USB
-----------------	---

PACKING LIST

One WADE-8079 motherboard
One Driver CD
One SATA cable

GENERAL

Processor	- Intel® Atom® E3800 family processor - Cache up to 2MB (for Quad Core) - DPM (Defect Per Million devices) <50 - Support Intel® VT-x technology
Chipset	N/A
BIOS	Phoenix(EFI) BIOS
Memory	- support up to 8GB DDR3L 1066/1333 MT/s SDRAM on two 204 pin SO-DIMM socket. (E3845/ E3826) - support up to 4GB DDR3L 1066/1333 MT/s SDRAM on two 204 pin SO-DIMM socket. (E3815)
Storage Devices	- 2x SATA II (1x SATA II switch full size mini-PCIe support mSATA)
Watchdog Timer	Programmable by embedded controller
Expansion Interface	- 1x PCIe 2.0 x1 slot - 1x Half size mini-PCIe(support PCIe & USB signal)

I/O INTERFACE

Super I/O	Fintek F81216DG
Audio	- Realtek ALC892 supports 5.1 channels - Audio Jack Line out on board
Ethernet	2x on board Intel® I210IT
Serial Port	- 1x RS-232 port on rear I/O - 1x RS-232/422/485 selectable port on rear I/O - 2x RS-232 with header
USB	- 1x USB 3.0 Ports on rear I/O - 2x USB 2.0 Ports on rear I/O - 2x USB 2.0 Ports on board
Keyboard & Mouse	PS/2 on board dedicated to Keyboard & Mouse
GPIO	On board programmable 8-bit Digital I/O

DISPLAY

Graphic Controller	- Intel® HD Graphics 4600 supports DirectX 11, OpenCL® 1.2, OpenGL® 3.2 - Video decode hardware acceleration supports for H.264, MPEG2, MVC, VC-1, WMV9 and VP8 formats
Display Interface	- VGA: up to 1920x1200 - DVI: up to 1920x1200 - DP: up to 2560x1600 - LVDS: up to 1600x1200

Mechanical & Environment

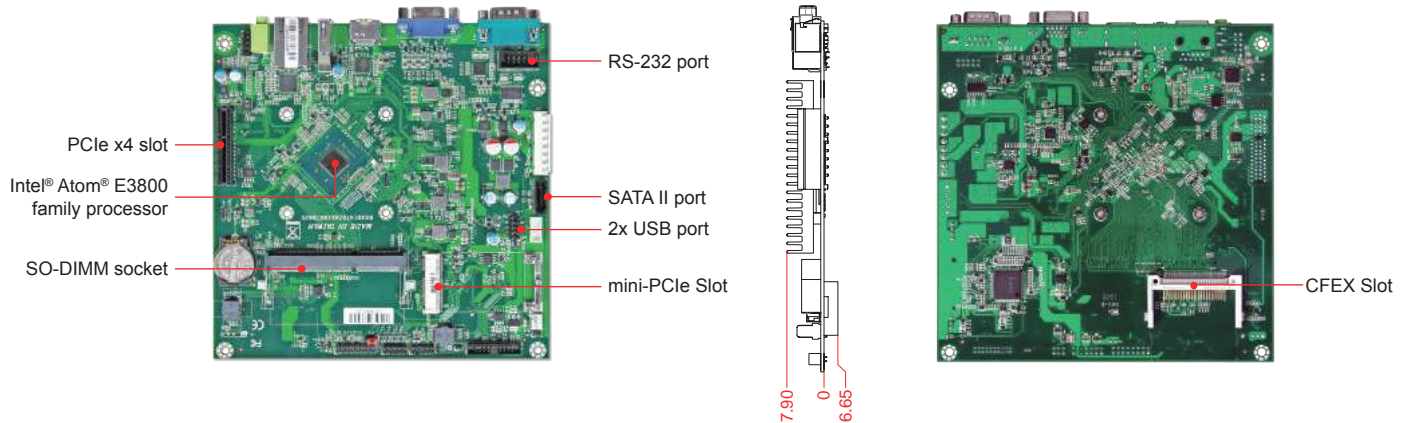
Dimension	170mm(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	12~24V DC input
Environment	- Operation Temperature: 0°C~60°C - Storage Temperature: -20°C~80°C - Relative Humidity: 5%~90%, non-condensing : 5%~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000hrs at 55°C





WADE-8078

Intel® Atom® E3800 SoC based Mini-ITX. Board with VGA, HDMI, Gigabit Ethernet, Audio, USB 3.0, SATA and CFEX

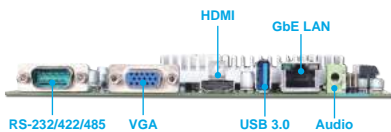


WADE-8078 is the first Portwell off-the-shelf Mini-ITX embedded board product based on the Intel® Atom® processor E3800 product family with memory and PCI Express controller integrated to support one-channel DDR3L memory and PCI Express 2.0 lanes. Portwell has taken advantage of such technology to furnish a series of products that meets multiple industrial requirements for cost effectiveness, reliable performance and a high level of data integrity and uptime.

FEATURES

- Latest Intel® Atom® embedded processor provides cost effective solutions with low power and quad core processor technology
- Supports PCIe x4 Slot (with PCIe x2 Lanes)
- Supports 1x DDR3L ECC 1066/1333 MT/s SDRAM, up to 4GB
- Supports 1x USB 3.0 port

REAR I/O



ORDERING GUIDE

AB1-3A41	(R).WADE-8078- E3845 Mini-ITX ESB.Intel® Bay Trail(Vallyview-I QC 1.9GHz processor) on Board .w/DDR3L SO-DIMM/VGA/HDMI/GbE Lan/COM/Audio/USB
AB1-3A42	(R).WADE-8078- E3827 Mini-ITX ESB.Intel® Bay Trail(Vallyview-I DC 1.75GHz processor) on Board .w/DDR3L SO-DIMM/VGA/HDMI/GbE Lan/COM/Audio/USB
AB1-3A43	(R).WADE-8078- E3815 Mini-ITX ESB.Intel® Bay Trail(Vallyview-I SC 1.46GHz processor) on Board .w/DDR3L SO-DIMM/VGA/HDMI/GbE Lan/COM/Audio/USB

PACKING LIST

One WADE-8078 motherboard
One Driver CD
One SATA cable

GENERAL

Processor	- Intel® Atom® E3800 family processor - Cache up to 2MB (for Quad Core) - DPM (Defect Per Million devices) <50 - Support Intel® VT-x technology
BIOS	AMI UEFI BIOS
Memory	Support up to 4GB DDR3L ECC 1066/1333 MT/s SDRAM on 1x 204pin SO-DIMM
Storage Devices	- 1x SATA II - 1x CFEX - 1x mini-PCIe
Watchdog Timer	Programmable by embedded controller
Expansion Interface	Supports PCIe x4 slot (with PCIe x2 Lanes, Gen2 5GT/s)

I/O INTERFACE

Audio	- Realtek ALC892 supports 5.1 Channels - Audio Jack Line out on board
Ethernet	On board Intel® I210AT
Serial Port	1x RS-232/424/485 Selectable port on rear I/O
USB	- 2x USB 2.0 ports on board - 1x USB 3.0 ports on rear I/O
Keyboard & Mouse	KBC controller integrated in embedded controller
GPIO	8-bit configurable controlled by embedded controller

DISPLAY

Graphic Controller	- Intel® HD Graphics 4600 supports DirectX11, OpenGL® 4.0, OpenGL® 3.2 - Video decode hardware acceleration supports for H.264, MPEG2, MVC, VC-1, WMV9 and VP8 formats
Display Interface	- VGA: up to 2560x1536@24bpp - HDMI: up to 1920x1080@24bpp

Mechanical & Environment

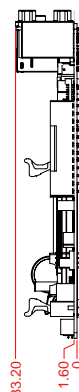
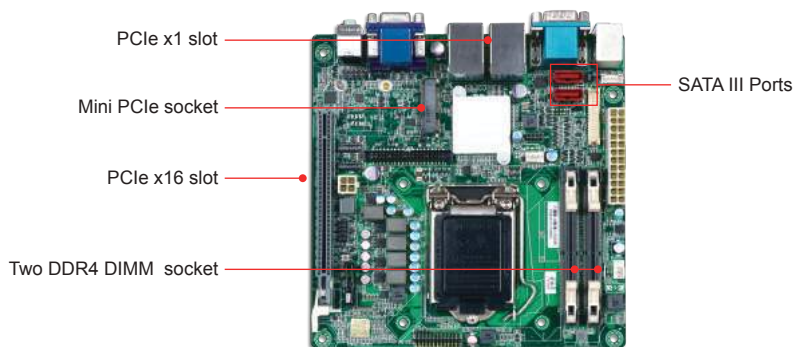
Dimension	170mm(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	ATX (support non-5V satdby)
Environment	- Operation temperature: 0°C~60°C - Storage temperature: -20°C~80°C - Relative humidity : 5%~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000hrs at 55°C





WADE-8210-H110

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

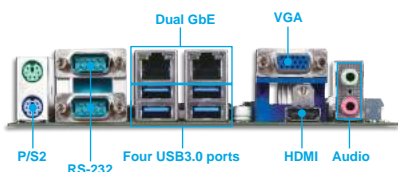


WADE-8210-H110 is based on Intel® H110 chipset and Desktop processors including Intel® 7th and 6th Gen Core™ i3/i5/i7 SKU. This board supports DDR4, PCIe 3.0, and SATAIII. Those features help you to build high performance and stable system

FEATURES

- Intel® 7th and 6th Gen Core™ Processors support
- Supports two So-DIMMs support t DDR4 Non-ECC SDRAM up to 32GB
- Supports dual Ethernet, six COM Ports, eight USB Ports, two SATA III Ports and Audio
- Supports one PCIe x16 slot, and one mini-PCIe socket (mSATA)

REAR I/O



ORDERING GUIDE

AB1-3G39	(R) WADE-8210-H110 Mini-ITX ESB.H110 w/o ECC LGA1151.w/DDR4 SODIMM /VGA/HDMI/Dual GbE/COM/Audio/ USB
----------	---

PACKING LIST

One CPU Cooler bracket
One SATA cable
One Installation CD
One I/O shield
One WADE-8210-H110 Main board

GENERAL

Processor	Intel® 7 th and 6 th Gen Core™ Processors CPU in LGA1151 package
Chipset	Intel® H110
BIOS	AMI UEFI BIOS
Memory	Supports up to 32GB DDR4 2133 Non-ECC SDRAM on two 260 pin SO-DIMM socket
Storage Devices	Supports two 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 - 1x mini-PCIe socket (support mSATA / USB2.0)

I/O INTERFACE

Super I/O	ITE IT8786E-I
Audio	- High Definition Audio integrated in Intel® SoC - Audio Jack on rear I/O with Line-out/ Mic-in
Ethernet	- Realtek 8111H chip - 2x RJ45 connectors on rear I/O
Serial port	- 2x RS-232 on rear I/O - 4x RS-232 on board 2x20 pin header
USB	- 4x USB3.0 on rear I/O - 4x USB2.0 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, resolution up to 1920 x1200 - HDMI: One HDMI port on rear I/O, resolution up to 4K (4096x2160@24Hz) - VGA: One VGA port on rear I/O resolution up to 1920x1200 @ 60Hz

Mechanical & Environment

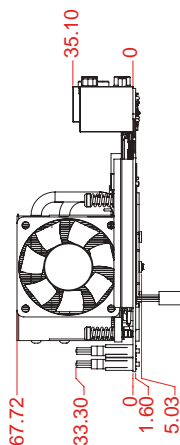
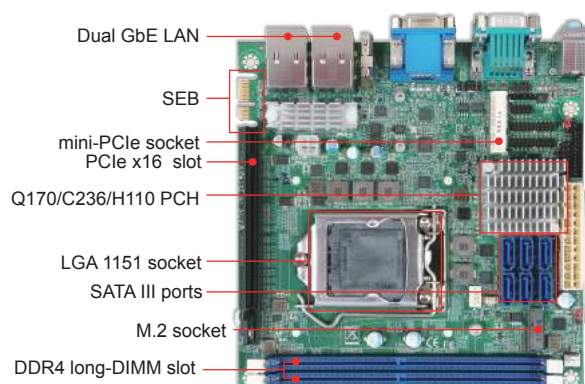
Dimension	170mm(L) x 170mm(W) x 1.6mm(H)
Power Supply	ATX power input
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
Certification	Over 100,000 hours at 40°C
MTBF	Over 120,000hrs at 40°C





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

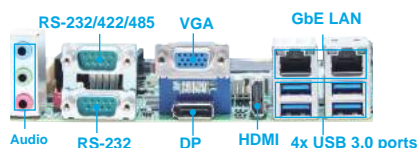


WADE-8017 is based on Intel® Q170/C236/H110 chipset and desktop processors including Intel® 7th and 6th Gen Core™ i3/i5/i7 SKU. This board supports DDR4, PCIe 3.0, and SATAIII. Those features help you to build high performance and stability system.

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® 7 th and 6 th 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

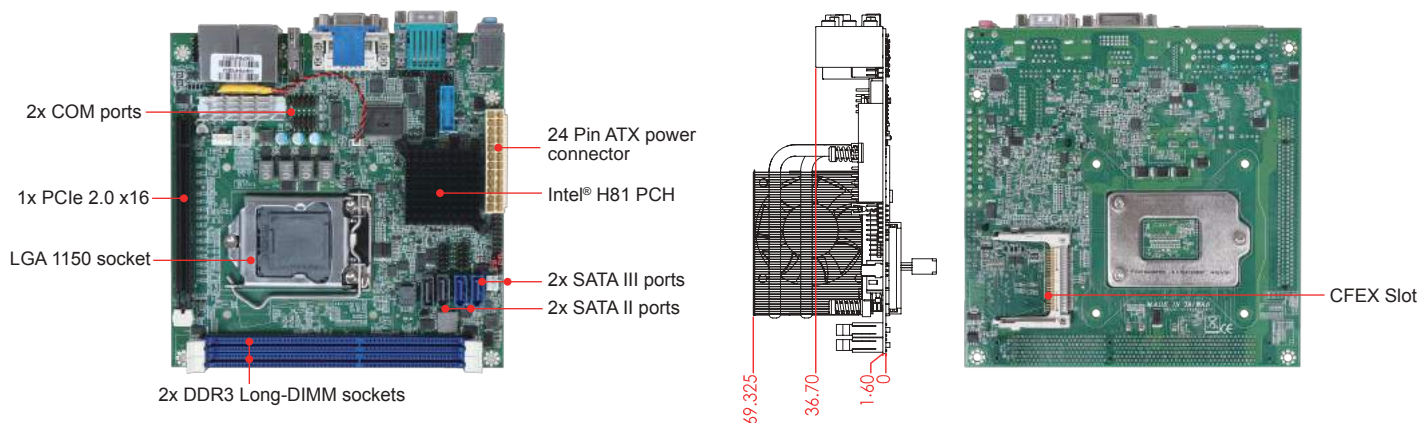
DISPLAY

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





WADE-8016 is based on Intel® H81 chipset and desktop processor sku like Core™ i7 and i5. WADE-8016 of the Intel® platform will provide high performance and flexibility for functional expansion, such as Gaming, Kiosk, DS, Medical, Defense, Industrial automation and control applications.

FEATURES

- Intel® i5/i7 4th Dual/Quad processor in LGA 1150
- Intel® H81 PCH
- 2x DDR3 Long-DIMM slots up to 16GB (support 1333/1600 MT/s)
- 1x PCIe x16 slot (Gen3 support)
- 2x SATA III Ports and 2x SATA II ports(1x SATA II switch CFEX)
- 1x CFEX
- 4x COM ports (2pcs on rear I/O, 2pcs on board header)
- Total 10x USB ports (2x USB 3.0 Ports & 8x USB 2.0 Ports)

REAR I/O



ORDERING GUIDE

AB1-3B38	(R).WADE-8016 Mini-ITX ESB.H81 w/o LGA1150.w/DDR3 SDRAM/VGA/DVI/HDMI/Dual GbE/COM/Audio/ USB
----------	---

PACKING LIST

One WADE-8016 motherboard
One Driver CD
One SATA III cable

GENERAL

Processor	- Intel® 4 th Gen Core™ i5/i7 processor in LGA-1150 package - Cache up to 6MB (for Quad Core) - support Intel® Turbo Boost Technology , Virtualization Technology (VT-x) ,Hyper-Threading Technology
Chipset	Intel® H81 PCH
BIOS	AMI BIOS
Memory	Support up to 16GB DDR3 1333/1600 MT/s SDRAM on 2x 240pin DIMM sockets
Storage Devices	- 2x SATA II - 2x SATA III - 1x CFEX
Watchdog Timer	Programmable watchdog timer, time out period from 0.5 sec to 255 sec.
Expansion Interface	1x PCIe 2.0 x16 slot

I/O INTERFACE

Super I/O	WINBOND W83627UHG
Audio	- Intel® H81 PCH built in HDA controller - Realtek ALC892 supports 5.1 channels
Ethernet	2x onboard RealTek RTL8111G-CG
Serial Port	- 1x RS-232 port on rear I/O - 1x RS-232/422/485 selectable port on rear I/O - 2x RS-232 on pin header
USB	- 2x USB 3.0 Ports on board - 4x USB 2.0 Ports on rear I/O - 4x USB 2.0 Ports on board
Keyboard & Mouse	PS/2 on board dedicated to Keyboard & Mouse
GPIO	On board programmable 8-bit Digital I/O

DISPLAY

Graphic Controller	Intel® HD Graphics 4600 supports DirectX®11, OpenCL® 1.2, OpenGL® 3.2 Video decode hardware acceleration supports for H.264, MPEG2, MVC, VC-1, WMV9 and VP8 formats
Display Interface	- VGA: up to 1920x1200 - DVI: up to 1920x1200 - HDMI: up to 4096x2304

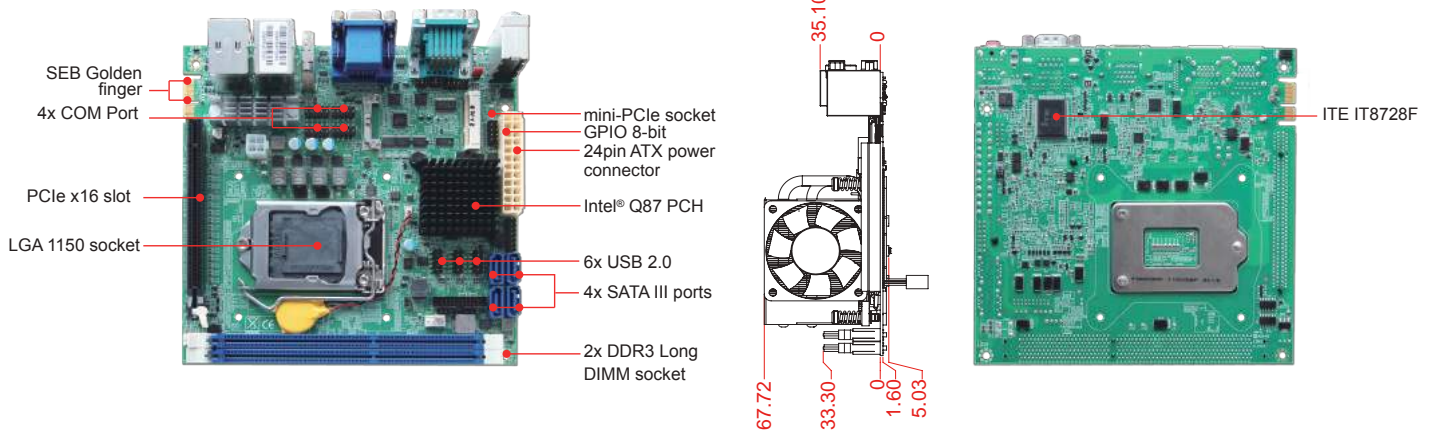
Mechanical & Environment

Dimension	170mm(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	ATX 24-pin power input
Environment	- Operation Temperature: 0°C~60°C - Storage Temperature: -20°C~80°C - Relative Humidity: 5%~90%, non-condensing : 5%~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 120,000 hours at 40°C



WADE-8015

Intel® 4th Gen Core™ i5/i7 processor based Mini-ITX Board with dual Gigabit Ethernet, 4x SATA III ports, 6x COM ports, 1x PCIe x16 expansion slot and 1x mini-PCIe slot with mSATA interface

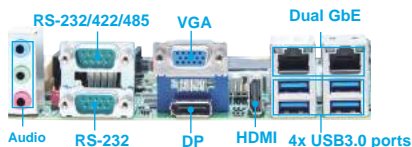


WADE-8015 is based on Intel® Q87 chip-set and desktop processor sku like Core™ i7 and i5. WADE-8015 of the Intel® platform will provide high performance and flexibility for functional expansion, such as Gaming, Kiosk, DS, Medical, Defense, Industrial automation and control applications.

FEATURES

- Intel® i5/i7 4th Dual/Quad processor in LGA 1150
- Intel® Q87 PCH
- 2x DDR3 Long-DIMM slots up to 16GB (support 1600/1333)
- 1x PCIe x16 slot (Gen3 support)
- 1x mini-PCIe slot (support mSATA)
- 1x PCIe x1 Golden finger (2*PCIe x1 signal)
- Audio Jack (support Line-in / Line-out / Mic-in)
- 6x COM ports (2pcs on rear I/O ,4pcs on board header)
- 4x SATA III Ports (support RAID 0,1,5,10)
- Total 10x USB ports (4x USB 3.0 Ports & 6x USB 2.0 Ports)
- Support Triple Display function (DP/VGA/HDMI)

REAR I/O



ORDERING GUIDE

AB1-3910	(R).WADE-8015 Mini-ITX ESB.Q87 w/o ECC LGA1150.w/DDR3 SDRAM /VGA/DP/HDMI/Dual GbE/COM/Audio/ USB
----------	---

PACKING LIST

One WADE-8015 Mini-ITX Motherboard
One installation DVD
One SATA III cable
One I/O shield

GENERAL

Processor	- Intel® 4 th Gen Core™ i5/i7 processor in LGA-1150 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® Q87 PCH
BIOS	Phoenix UEFI BIOS
Memory	Support up to 16GB DDR3 1333/1600 MT/s SDRAM on 2x 240-pin DIMM sockets
Storage Devices	4x SATA III
Watchdog Timer	Programmable via S/W from 0.5 sec. to 254.5 sec.
Hardware Monitoring	- FAN Speed (CPU & System), Temperature (CPU & System) - Beep alarms for field fan out, over/under voltage of DC voltages and over temperature threshold
Expansion Interface	- 1x PCIe 3.0 x16 slot - 1x mini-PCIe slot - 1x PCIe 2.0 x1 Golden finger

I/O INTERFACE

Super I/O	ITE IT8728F
Audio	- Intel® Q87 PCH built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC886-GR HDA codec, 5.1 channels
Ethernet	- Intel® WGI217LM + WGI210AT Gigabit Ethernet controller - 2x 10BASE-T / 100BASE-TX / 1000BASE-T Ethernet - PCIe x1 interface based on Gigabit Ethernet - 2x RJ-45 connector with 2x LED indicators
Serial Port	- 1x RS-232 port on rear I/O - 1x RS-232/422/485 selectable port on rear I/O - 3x RS-232 with header - 1x RS-232/422/485 with header
USB	- 4x USB 3.0 Ports on rear I/O - 6x USB 2.0 Ports on board
Keyboard & Mouse	PS/2 on board dedicated to Keyboard & Mouse
GPIO	On board programmable 8-bit Digital I/O

DISPLAY

Graphic Controller	- Intel® Core™ i5/i7 processors integrated graphic engine - Provided improved 3D multimedia capabilities including Microsoft DirectX 11.1, Shader Model 4.0, MPEG-2 and OpenGL® 3.2
Display Interface	- VGA: 1x connector DB-15 on rear I/O, up to 1920x1200 - DP : 1x connector on rear I/O, support up to 3200x2000 - HDMI : 1x connector on rear I/O, support up to 4096x2304

Mechanical & Environment

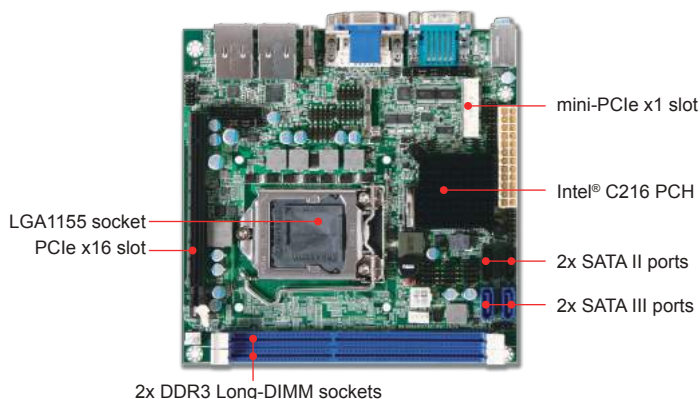
Dimension	170mm(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	ATX 24-pin power input
Environment	- Operation Temperature: 0°C~60°C - Storage Temperature: -20°C~80°C - Relative Humidity: 5%~90%, non-condensing
Certification	CE, FCC Class A
MTBF	Over 120,000 hours at 40°C





WADE-8014

Intel® Xeon® E3-1200V2/Core™ i3 processor based Mini-ITX Board with dual Gigabit Ethernet, 4x SATA Ports, 6x COM Ports, 1x PCIe x16 expansion slot and 1x mini-PCIe slot support mSATA interface



WADE-8014 supports the latest 3rd generation Intel® Core™ processor platform in an LGA1155 package, integrated with the memory and PCI Express controller supporting two-channel DDR3 memory and PCI Express 3.0 lanes to provide great graphics performance.

FEATURES

- Intel® next-Gen Dual/Quad processor in LGA1155 package
- Intel® C216 Chipset
- 2x 240-pin Long-DIMM supports DDR3 SDRAM up to 16GB
- Dual display: VGA/DVI/HDMI
- 1x PCIe x16 expansion slot
- 4x SATA ports (2x SATA II, 2x SATA III)
- 6x COM ports
- 1x mini-PCIe slot supports mSATA interface

REAR I/O



ORDERING GUIDE

AB1-3938	(R).WADE-8014 Mini-ITX ESB.C216 w/ECC PGA1155.w/DDR3 SDRAM /VGA/DVI-D/HDMI/Dual GbE/COM/ Audio/USB 3.0
-----------------	--

PACKING LIST

One WADE-8014 Mini-ITX Main Board
One Installation CD
One SATA Cable
One I/O shield

GENERAL

Processor	- Intel® Xeon® E3-1200V2/Core™ i3 processor in LGA1155 package - FSB: 800/1066MHz - Supports Intel® Hyper-Threading Technology, Intel® Virtualization Technology (VT-x), Intel® Advanced Vector Extensions (AVX)
Chipset	Intel® C216 PCH
BIOS	Phoenix BIOS (SPI ROM)
Memory	Supports dual channel up to 16GB DDR3 1333/1600 MT/s SDRAM on 2x 240-pin and sockets
Storage Devices	- 2x SATA II - 2x SATA III
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
Hardware Monitoring	- FAN Speed (CPU & System), Temperature (CPU & System) - Beep alarms for field fan out, over/under voltage of DC voltages and over temperature threshold
Expansion Interface	- 1x PCIe 3.0 x16 slot (support PCIe x1, x4, x8, x16 mode) - 1x mini-PCIe slot

I/O INTERFACE

Super I/O	ITE IT8728F
Audio	- Intel® C216 built-in High Definition Audio up to 96-kHz 24-bit - Realtek ALC886-GR, 7.1+2 channel - Audio Jack DIP Light Pink/Lime/Light Blue
Ethernet	Intel® 82583V support iAMT 8.0 and Intel® 82574L Dual Gigabit Ethernet controllers
Serial Port	- 1x RS-232 port on rear I/O - 1x RS-232/422/485 selectable port on rear I/O - 3x RS-232 with header - 1x RS-232/422/485 with header
USB	- 4x USB 3.0 ports on rear I/O - 6x USB 2.0 ports on board with two headers
Keyboard & Mouse	1x PS/2 Keyboard & Mouse on board
GPIO	On board programmable 16-bit Digital I/Os

DISPLAY

Graphic Controller	Intel® C216 Integrated 3D GMA support DX10.1, OpenGL® 3.0, MPEG-2, Shader Model 4.0
Display Interface	- VGA: 1x connector DB-15 on rear I/O, up to 2048x1536 - HDMI: 1x connector on rear I/O, up to 1920x1200 - DVI-D: 1x connector on rear I/O, Digital DVI up to 1920x1200

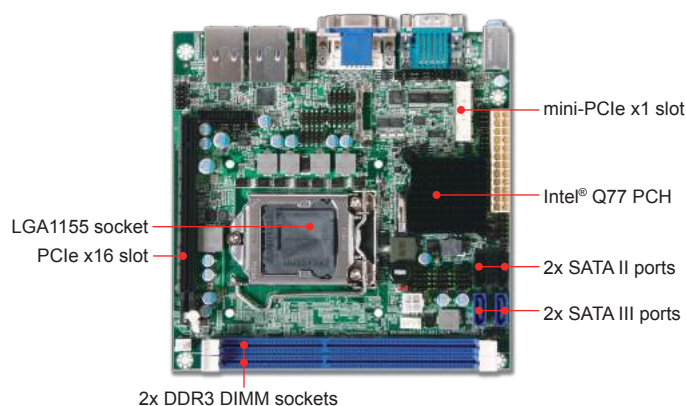
Mechanical & Environment

Dimension	170mm(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	ATX 24-pin 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 100,000 hours at 40°C



WADE-8013

Intel® Core™ i5/i7 processor based Mini-ITX Board with dual Gigabit Ethernet, 4x SATA Ports, 6x COM Ports, 1x PCIe x16 expansion slot and 1x mini-PCIe slot support mSATA interface

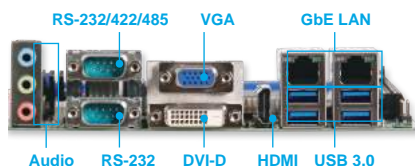


WADE-8013 supports the latest 3rd generation Intel® Core™ processor platform in an LGA1155 package, integrated with the memory and PCI Express controller supporting two-channel DDR3 memory and PCI Express 3.0 lanes to provide great graphics performance.

FEATURES

- Intel® next-Gen Dual/Quad processor in LGA1155 package
- Intel® Q77 Chipset
- 2x 240-pin Long-DIMM supports DDR3 SDRAM up to 16GB
- Dual display: VGA/DVI/HDMI
- 1x PCIe x16 expansion slot
- 5x SATA ports (2x SATA II, 2x SATA III)
- 6x COM ports
- 1x mini-PCIe slot supports mSATA interface

REAR I/O



ORDERING GUIDE

AB1-3790	(R).WADE-8013 Mini-ITX ESB.Q77 w/o ECC PGA1155.w/DDR3 SDRAM /VGA/DVI-D/HDMI/Dual GbE/COM/ Audio/USB 3.0
-----------------	--

PACKING LIST

One WADE-8013 Mini-ITX Main Board
One Installation CD
One SATA Cable
One I/O shield

GENERAL

Processor	- Intel® Core™ i5/i7 processor in LGA1155 package - FSB: 667/800/1066MHz - Supports Intel® Hyper-Threading Technology, Intel® Virtualization Technology (VT-x), Intel® Advanced Vector Extensions (AVX)
Chipset	Intel® Q77 PCH
BIOS	Phoenix BIOS (SPI ROM)
Memory	Supports dual channel up to 16GB DDR3 1333/1600 MT/s SDRAM on 2x 240-pin and sockets
Storage Devices	- 2x SATA II - 2x SATA III
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
Hardware Monitoring	- FAN Speed (CPU & System), Temperature (CPU & System) - Beep alarms for field fan out, over/under voltage of DC voltages and over temperature threshold
Expansion Interface	- 1x PCIe 3.0 x16 slot (support PCIe x1, x4, x8, x16 mode) - 1x mini-PCIe slot

I/O INTERFACE

Super I/O	ITE IT8728F
Audio	- Intel® Q77 built-in High Definition Audio up to 96-kHz 24-bit - Realtek ALC886-GR, 7.1+2 channel - Audio Jack DIP Light Pink/Lime/Light Blue
Ethernet	Intel® 82579LM support iAMT 8.0 and Intel® 82574L Dual Gigabit Ethernet controllers
Serial Port	- 1x RS-232 port on rear I/O - 1x RS-232/422/485 selectable port on rear I/O - 3x RS-232 with header - 1x RS-232/422/485 with header
USB	- 4x USB 3.0 ports on rear I/O - 6x USB 2.0 ports on board with 2x headers
Keyboard & Mouse	1x PS/2 Keyboard & Mouse on board
GPIO	On board programmable 16-bit Digital I/Os

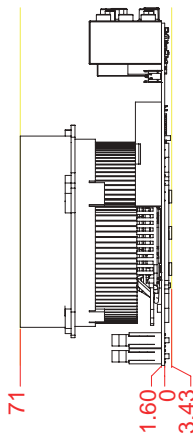
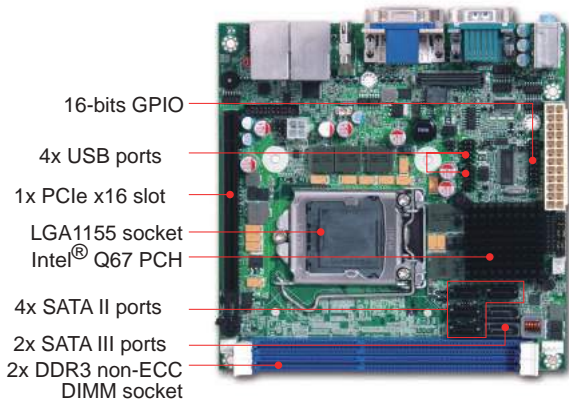
DISPLAY

Graphic Controller	Intel® Q77 Integrated 3D GMA support DX 10.1, OpenGL® 3.0, MPEG-2, Shader Model 4.0
Display Interface	- VGA: 1x connector DB-15 on rear I/O, up to 2048x1536 - HDMI: 1x connector on rear I/O, support up to 1920x1200 - DVI-D: 1x connector on rear I/O, Digital DVI up to 1920x1200

Mechanical & Environment

Dimension	170mm(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	ATX 24-pin 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 100,000 hours at 40°C



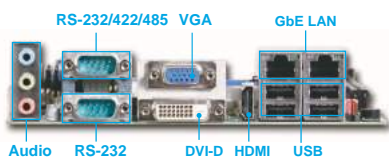


Equipped with second generation Intel® Core™ i5/i7 processors in the LGA1155 socket, Portwell's WADE-8012 Mini-ITX offers superior performance in a small package and is suitable for diverse applications such as Panel PC, Lottery, Medical, Gaming and Digital Signage.

FEATURES

- Intel® Core™ i5/i7 in LGA1155 socket
- Intel® Q67 PCH
- 2x 240pin DIMM sockets support Dual channel DDR3 SDRAM up to 8GB
- Dual Display by VGA/DVI/HDMI
- Intel® Active Management Technology (Intel® AMT 7.0)
- Supports 6x SATA ports (SATA II x4, SATA III x2), 8x USB ports
- RAID 0,1,5,10

REAR I/O



ORDERING GUIDE

AB1-3644	(R).WADE-8012 Mini-ITX ESB.Q67 w/ECC PGA1155.w/DDR3 SDRAM /VGA/DVI-D/HDMI/Dual GbE/COM/ Audio/USB
----------	--

PACKING LIST

One WADE-8012 Mini-ITX Main Board
One Installation CD
One SATA Cable
One I/O shield

GENERAL

Processor	- Intel® 2 nd Gen Core™ i5/i7 processor up to 3.4GHz (65~95W) with (3~8MB) Cache in LGA1155 package - Supports Intel® Hyper-Threading Technology, Intel® Virtualization Technology (VT-x), Intel® Trusted Execution Technology, Enhanced Intel® SpeedStep® Technology
Chipset	Intel® Q67 PCH
BIOS	AMI UEFI BIOS
Memory	Supports dual channel up to 16GB DDR3 1333/1066 MT/s SDRAM on 2x 240-pin non-ECC socket
Storage Devices	- 4x SATA II - 2x SATA III
Watchdog Timer	Programmable via S/W from 0.5 sec. to 255 sec.
Hardware Monitoring	- FAN Speed (CPU & System), Temperature (CPU & System) - Beep alarms for field fan out, over/under voltage of DC voltages and over temperature threshold
Expansion Interface	1x PCIe 2.0 x16 slot (support PCIe x1, x4, x8, x16 mode)

I/O INTERFACE

Super I/O	ITE IT8728F
Audio	- Intel® Q67 built-in High Definition Audio up to 96-kHz 24-bit - Realtek ALC662-GR, 5.1 channels - Audio Jack DIP Light Pink/Lime/Light Blue
Ethernet	Intel® 82579LM supports iAMT 7.0 and Intel® 82574L Dual Gigabit Ethernet controllers
Serial Port	- 1x RS-232 port on rear I/O - 1x RS-232/422/485 selectable port on rear I/O
USB	- 4x USB 2.0 ports on rear I/O - 4x USB 2.0 ports on board with two headers
GPIO	On board programmable 16-bit Digital I/Os

DISPLAY

Graphic Controller	Intel® Q67 Integrated 3D GMA supports DX10.1, OpenGL® 3.0, MPEG-2, Shader Model 4.0
Display Interface	- VGA: 1x connector DB-15 on rear I/O, up to 2048x1536 (QXGA) - HDMI: 1x connector on rear I/O, supports up to 1920 x 1200 - SDVO: 1x on-board connector (PCIe x1 & USB x1 signals) - DVI-D: 1x connector on rear I/O, Digital DVI up to 1920x1200 (WUXGA)

Mechanical & Environment

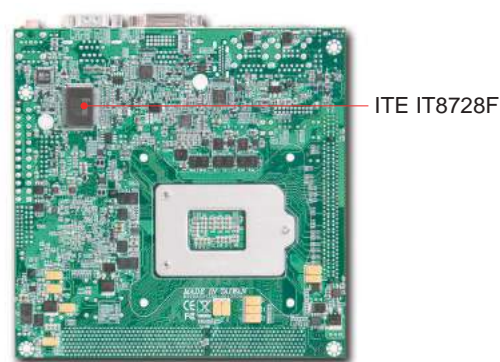
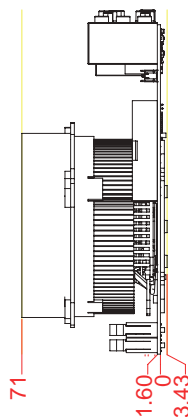
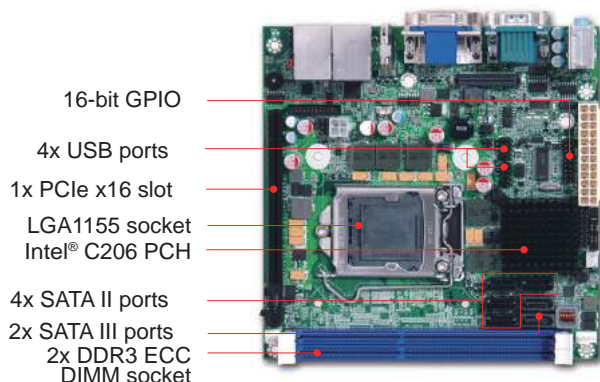
Dimension	170mm(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	- Typical: +12V(CPU)@3.81A; +12V(System)@2.21A; +5V@2.3A; +3.3V@1.15A - Supports ATX mode
Environment	- Operation Temperature: 0°C~60°C - Storage temperature: -20°C~80°C - Relative Humidity: 5%~95%, non-condensing
Certification	CE, FCC Class A
MTBF	Over 100,000 hours at 40°C





WADE-8011

Intel® i3 and Xeon® processor based Mini-ITX with dual displays, DDR3 SDRAM, 2x COM Ports and 8x USB Ports

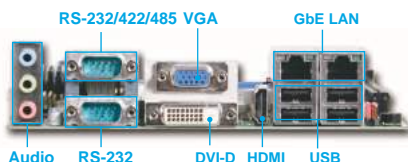


Equipped with second generation Intel® Core™ i3 and Xeon® E3-1200 series processors in the LGA1155 socket, Portwell's WADE-8011 Mini-ITX offers superior performance in a small package and is suitable for diverse applications such as Panel PC, Lottery, Medical, Gaming and Digital Signage.

FEATURES

- Intel® i3 and Xeon® E3-1200 series processor in LGA1155 socket
- Intel® C206 PCH chipset
- 2x 240pin DIMM sockets support dual channel DDR3 SDRAM up to 8GB
- Dual Display by VGA/DVI/HDMI
- Intel® Active Management Technology (Intel® AMT 7.0)

REAR I/O



ORDERING GUIDE

AB1-3643	(R).WADE-8011 Mini-ITX ESB.C206 w/ECC PGA1155.w/DDR3 SDRAM /VGA/DVI-D/HDMI/Dual GbE/COM/ Audio/USB
----------	---

PACKING LIST

One WADE-8011 Mini-ITX Main Board
One Installation CD
One SATA Cable
One I/O shield

GENERAL

Processor	- Intel® Core™ i3 and Xeon® E3-1200 series processor up to 3.4GHz (65~95W) with (3~8MB) Cache in LGA1155 package - Supports Intel® Hyper-Threading Technology, Intel® Virtualization Technology (VT-x), Intel® Trusted Execution Technology, Enhanced Intel® SpeedStep® Technology
Chipset	Intel® BD82C206 PCH
BIOS	AMI UEFI BIOS
Memory	Supports dual channel up to 16GB DDR3 1333/1066 MT/s SDRAM on 2x 240-pin ECC and non-ECC socket
Storage Devices	- 4x SATA II - 2x SATA III
Watchdog Timer	Programmable via S/W from 0.5 sec. to 255 sec.
Hardware Monitoring	- FAN Speed (CPU & System), Temperature (CPU & System) - Beep alarms for field fan out, over/under voltage of DC voltages and over temperature threshold
Expansion Interface	1x PCIe 3.0 x16 slot (support PCIe x1, x4, x8, x16 mode)

I/O INTERFACE

Super I/O	ITE IT8728F
Audio	- Intel® C206 built-in High Definition Audio up to 96-kHz 24-bit - Realtek ALC662-GR, 5.1 channels - Audio Jack DIP Light Pink/Lime/Light Blue
Ethernet	Intel® 82579LM support iAMT 7.0 and Intel® 82574L Dual Gigabit Ethernet controllers
Serial Port	- 1x RS-232 port on rear I/O - 1x RS-232/422/485 selectable port on rear I/O
USB	- 4x USB 2.0 ports on rear I/O - 4x USB 2.0 ports on board with 2x headers
GPIO	On board programmable 16-bit Digital I/Os

DISPLAY

Graphic Controller	Intel® C206 Integrated 3D GMA support DX10.1, OpenGL® 3.0, MPEG-2, Shader Model 4.0
Display Interface	- VGA: 1x connector DB-15 on rear I/O, up to 2048x1536 (QXGA) - HDMI: 1x connector on rear I/O, supports up to 1920 x 1200 - SDVO: 1x on-board connector (PCIe x1 & USB x1 signals) - DVI-D: 1x connector on rear I/O, Digital DVI up to 1920x1200 (WUXGA)

Mechanical & Environment

Dimension	170mm(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	- Typical: +12V(CPU)@3.81A; +12V(System)@2.21A; +5V@2.3A; +3.3V@1.15A - Supports ATX mode
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 100,000 hours at 40°C





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.



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.



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.



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.



Live Chat (Skype)

You can get the on-line consulting service via Skype if an immediate response is needed.

<http://www.portwell.com.tw/support/LiveChat.php>



Global Service (Telephone)

In addition, you can get immediate support via telephone. Check the web site for phone numbers.

<http://www.portwell.com.tw/contact/worldwide.html>



E-Mail

Portwell's technical support department can be reached by e-mail as follows

TSD@portwell.com.tw



No. 242, Bo'AI St., Shu-Lin Dist.
New Taipei City 238, Taiwan
Tel: +886-2-77318888
Fax: +886-2-77319888
E-mail: info@portwell.com.tw
<http://www.portwell.com.tw>

M180424