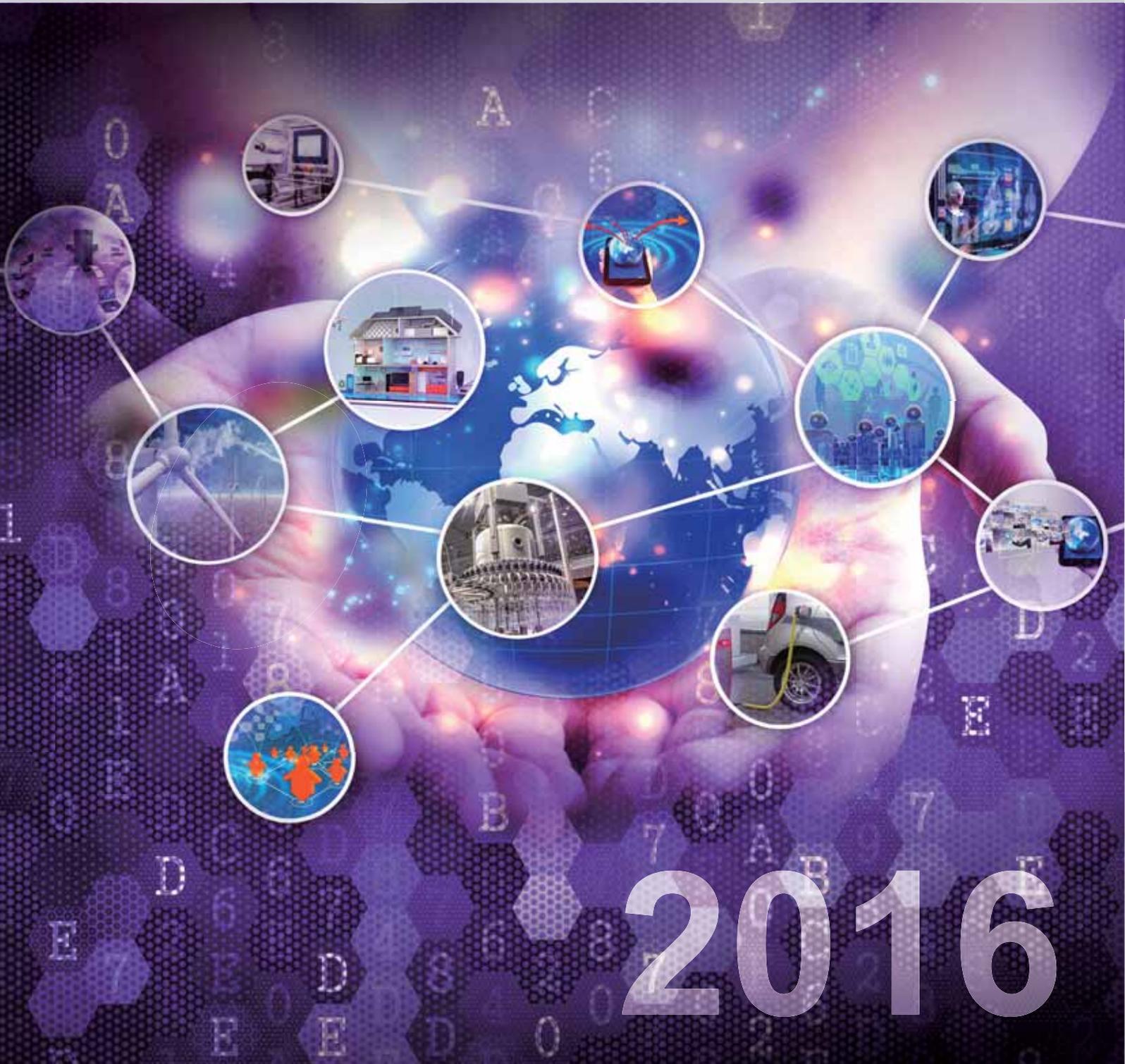


Industrial Board Solution Guide



2016

↘ 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.



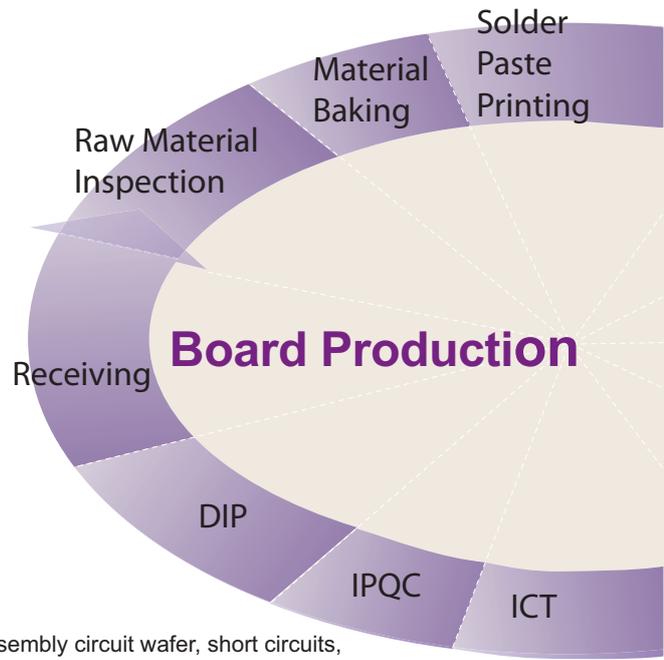
In-Circuit Testing (ICT)

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.



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.



Certifications

Portwell has been certified with ISO 9001 and TAF compliance by TUV NORD and UCS organizations since 2006. This certifies that Portwell implements an ISO-9001 quality system and is committed to continuous improvement.



Certifications

Portwell has been certified with ISO 14001 compliance by TUV NORD since 2010. Portwell follows the ISO 14001 standard as a fundamental principle. The overall goal is the concept of continuous improvement as well as commitment to the Plan-Do-Check-Act methodology.

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.



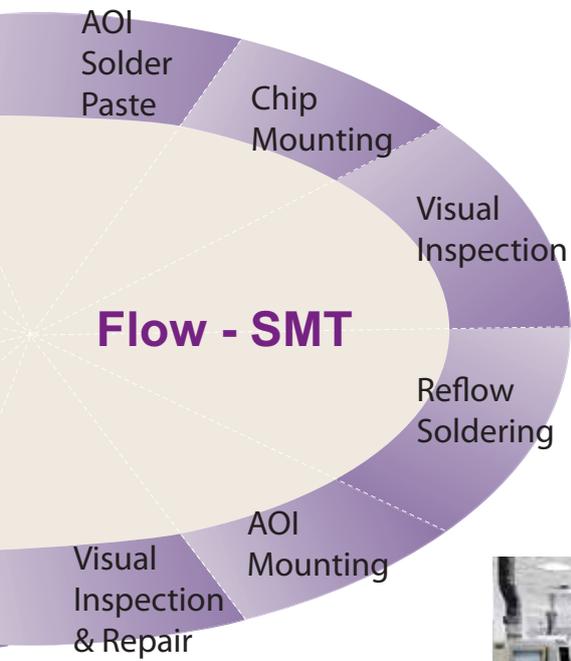
Reflow Soldering

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



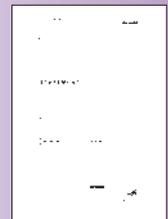
AOI - Mounting

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



Certifications

Portwell has been ISO 13485 certified by TUV NORD since 2010. In addition to Portwell's headquarters in Taiwan, her branch office in the U.S has also achieved the same certification which reflects Portwell's dedication to continuous improvement in the design and manufacturing of medical computing devices.



Certifications

Portwell is applying for ISO 14064-1:2006 certification which specifies the principles and requirements necessary at the organization level for quantification and reporting of greenhouse gas (GHG) emissions and removals. This includes requirements for the design, development, management, reporting and verification of an organization's GHG inventory.



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 :

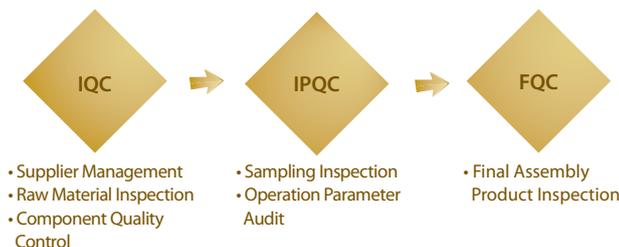
- (1) Suppliers of ESD sensitive components are required to handle and ship them in a protective manner.
- (2) Anti-static packaging is designed to prevent failures due to electrostatic charge build-up.

■ 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



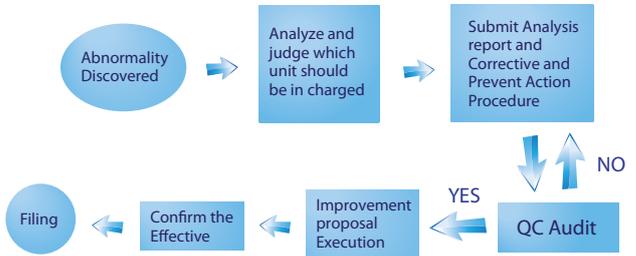
■ Corrective and Preventive Action (CAPA)

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.





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SINGLE BOARD COMPUTER

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	5	What We Focus On		

PAGE 11-12 SBC Reference Table



ROBO-8122VG2R

13 ROBO-8122VG2R

Intel® Xeon® E5-2600Lv3 series processor based on PCIMG 1.3 SHB with DDR4 REG SDRAM, VGA, Dual Gigabit Ethernet, and SATA/USB



ROBO-8111VG2AR-Q77

20 ROBO-8111VG2AR-Q77

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



ROBO-8120VG2R

14 ROBO-8120VG2R

Intel® Xeon® C5500/ C3500 series processor based on PCIMG 1.3 SHB with DDR3 SDRAM, VGA, Dual Gigabit Ethernet and USB



ROBO-8110VG2AR

21 ROBO-8110VG2AR

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



ROBO-8113VG2AR

15 ROBO-8113VG2AR

Intel® Xeon® and Core™ i3 processor based on PCIMG 1.3 SHB with DDR4 SDRAM, HDMI, DVI-I, Dual Gigabit Ethernet, Audio and USB



ROBO-8110VG2AR-Q67

22 ROBO-8110VG2AR-Q67

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



ROBO-8113VG2AR-Q170

16 ROBO-8113VG2AR-Q170

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



ROBO-8210VG2AR

23 ROBO-8210VG2AR

Intel® Core™ i7/i5 processor based on PCIMG 1.3 SHB with DDR3 SDRAM, DVI-I, Dual Gigabit Ethernet, Audio and USB



ROBO-8112VG2AR

17 ROBO-8112VG2AR

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



ROBO-6911VG2AR

24 ROBO-6911VG2AR

Intel® 6th Skylake-S processor based on PCIMG 1.3 half size SHB with DDR4 SODIMM, DP, DVI-I, Dual Gigabit Ethernet, mSATA, Audio, USB



ROBO-8112VG2AR-Q87

18 ROBO-8112VG2AR-Q87

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



ROBO-8780VG2A

25 ROBO-8780VG2A

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



ROBO-8111VG2AR

19 ROBO-8111VG2AR

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



ROBO-6712VGA

26 ROBO-6712VGA

Intel® Atom™ D525 processor based on PCIMG 1.0 half size SBC with DDR3 SODIMM, VGA, single Gigabit Ethernet, Audio and USB



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PAGE 27-28 PICMG 1.0 Backplane
29-31 PICMG 1.3 Backplane

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INDUSTRIAL MAIN BOARD

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RUBY-D720VG2AR

35 RUBY-D720VG2AR

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



RUBY-D714VG2AR

39 RUBY-D714VG2AR

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



RUBY-D718VG2AR

36 RUBY-D718VG2AR

Leading Desktop Intel® 6th Skylake-S processor ATX with DDR4 SDRAM, Triple Displays, Two GbE LAN ports, Six COM Ports



RUBY-D712VG2AR

40 RUBY-D712VG2AR

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



RUBY-D716VG2AR

37 RUBY-D716VG2AR

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



RUBY-D711VG2AR

41 RUBY-D711VG2AR

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



RUBY-D715VG2AR

38 RUBY-D715VG2AR

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



RUBY-M710VG2AR

42 RUBY-M710VG2AR

Intel® Core™ i5/i7/P4500 processor based ATX with DDR3 SDRAM, Dual Display, Dual Gigabit Ethernet and USB Ports

3.5" & ECX FORM FACTOR

PAGE 43 ESB Reference Table



PEB-2772

44 PEB-2772

Intel® Cedar Trail Atom™ processor based 3.5' embedded Board with DDR3 SDRAM, Gigabit Ethernet, Two SATA Ports, Four COM ports and 12V DC input



PEB-2770/2780

46 PEB-2770/2780

3.5" Embedded size, based on Intel® 45nm Low Power Pineview processor with DDR2 SODIMM, dual display by VGA/LVDS, Dual GbE, Audio, COM and USB



PEB-2771/2781

45 PEB-2771/2781

3.5" Embedded size, based on Intel® 45nm Low Power Pineview processor with DDR3 SODIMM, dual display by VGA/LVDS, Dual GbE, Audio, COM and USB

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NANO-ITX FORM FACTOR

PAGE 47 NANO Reference Table



NANO-6061

48 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-5050

51 NANO-5050

Intel® Atom™ D2550 processor based NANO-ITX Board with dual display, Gigabit Ethernet, Audio, USB, CF-SATA and SATA



NANO-6050

49 NANO-6050

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



NANO-6040

52 NANO-6040

Intel® Atom™ E6X0T processor based NANO-ITX Board with dual display, Gigabit Ethernet, Audio, USB, CAN, SD and SATA



NANO-6060

50 NANO-6060

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

MINI-ITX FORM FACTOR

PAGE 53 Mini-ITX Platform
54-56 Mini-ITX Reference Table

PAGE 57 Side Expansion Board Series



WADE-8022

58 WADE-8022

Intel® Core™ i3/i5/i7 mobile processor based Mini-ITX Board with dual Gigabit Ethernet, four SATA III ports, Six COM ports, one PCIe x16 expansion slot and Dual Mini-PCIe slot with mSATA interface



WADE-8077

62 WADE-8077

Intel® Cedar Trail Atom™ processor based Mini-ITX Board with dual display, dual Gigabit Ethernet, Two SATA Ports, Two COM Ports (optional up to 4 COM ports) and Six USB Ports



WADE-8020

59 WADE-8020

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



WADE-8075/76

63 WADE-8075/76

Intel® Dual Core™ Atom™ D525 1.8GHz/N455 1.67GHz processor based Mini-ITX with DC12V input, DDR3 SDRAM, Dual Display, Dual Gigabit Ethernet, Three SATA, Four COM and Six USB Ports



WADE-8079

60 WADE-8079

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



WADE-8017

64 WADE-8017

Leading Desktop Intel® 6th Skylake-S processor Mini-ITX with DDR4 SDRAM, Triple Displays, Two GbE LAN ports, Six COM Ports



WADE-8078

61 WADE-8078

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



WADE-8016

65 WADE-8016

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



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WADE-8015

66 WADE-8015

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



WADE-8014

67 WADE-8014

Intel® Xeon® E3-1200V2/Core™ i3 processor based Mini-ITX Board with dual Gigabit Ethernet, Four SATA Ports, Six COM Ports, One PCI-Express x16 expansion slot and one Mini-PCIe slot support mSATA interface



WADE-8013

68 WADE-8013

Intel® Core™ i5/i7 processor based Mini-ITX Board with dual Gigabit Ethernet, Four SATA Ports, Six COM Ports, One PCI-Express x16 expansion slot and one Mini-PCIe slot support mSATA interface



WADE-8012

69 WADE-8012

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



WADE-8011

70 WADE-8011

Intel® i3 and Xeon® processor based Mini-ITX with dual displays, DDR3 SDRAM, Two COM Ports and Eight USB Ports



WADE-1120A

71 WADE-1120A

The fan-less compact Mini-ITX Bare Bone Chassis



WADE-2221A

72 WADE-2221A

Rugged and Stylish Industrial Mini-ITX Bare Bone Chassis



WADE-2231Q

73 WADE-2231Q

Rugged and Stylish Industrial Mini-ITX Bare-Bones Chassis



WADE-2232Q

74 WADE-2232Q

Rugged and Stylish Industrial Mini-ITX Bare-Bones Chassis



ARTO-220-ITX

75 ARTO-220-ITX

1.5U Advanced, Stylish and Compact Mini-ITX Bare-Bones Chassis



WADE-1042

76 WADE-1042

1U Height Bare Bone server with four drive bays for RAID and two expansion slots

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Portwell Embedded Board Solutions

Portwell Embedded Solutions meet your demand perfectly



Portwell Embedded product lines provide a wide range of selections from server grade to energy efficiency scale including Modules, 3.5", NANO-ITX, Mini-ITX, μ ATX, 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-8120VG2R	ROBO-8113VG2AR	ROBO-8113VG2AR-Q170	ROBO-8112VG2AR	ROBO-8112VG2AR-Q87	ROBO-8111VG2AR
Form Factor	PICMG 1.3	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® Dual/Quad Core™ Xeon®	Intel® Xeon® E3-1200V5/ Core™ i3	Intel® Core™ i5/i7	Intel® Xeon® E3-1200V3/ Core™ i3	Intel® Core™ i5/i7	Intel® Xeon® E3-1200v2/Core™ i3
Chipset	Intel® C612	Intel® 3420	Intel® C236	Intel® Q170	Intel® C226	Intel® Q87	Intel® C216 PCH
BIOS	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI	Phoenix UEFI	Phoenix UEFI	Phoenix UEFI
Memory	8 x DDR4 REG DIMM up to 256GB	4x DDR3 ECC, REG DIMM up to 32GB	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 1xPCI Express x16 or 2xPCI Expressx8 or 4xPCI Express x4 PCH: 1x PCI Express x4 or 4x PCI Express x1	4x PCI slots 1x PCIe x16 slot 2x PCIe x8 slots 4x PCIe x4 slots	4x PCI slots 1x PCIe x16 slot or 2x PCIe x8 slot or 1x PCIe x8 slots + 2 PCIe x4 1xPCIe x4 slot	4x PCI slots 1x PCIe x16 slot 1x PCIe x4 slot	4x PCI slots 1x PCIe x16 slot or 2x PCIe x8 slot or 1x PCIe x8 slots + 2 PCIe x4 1xPCIe 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	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	2x GbE
Serial Port	2x Tx/Rx signal only on BP	1x RS232 1x RS232/422/485	2xRS232 2xRS232/422/485	2xRS232 2xRS232/422/485	1x RS232 1x RS232/422/485	1x RS232 1x RS232/422/485	1x RS232 1x RS232/422/485
USB	2xUSB3.0 4xUSB2.0	12x USB 2.0	10xUSB3.0 2xUSB2.0	10xUSB3.0 2xUSB2.0	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 SATAIII	6x SATA 1x FDD	6x SATAIII	6x SATAIII	5x SATA 1x FDD	5x SATA 1x FDD	6x SATA 1x FDD
GPIO	-	8-bit	8-bit	8-bit	8-bit	8-bit	8-bit
Others	-	PS/2 KB&MS	PS2/KB/MS	PS2/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	338.5x126.39mm	338.5x126.39mm	338.5 x 126.39mm	338.5 x 126.39mm	338.5 x 126.39mm
Page	13	14	15	16	17	18	19

SBC Reference Table

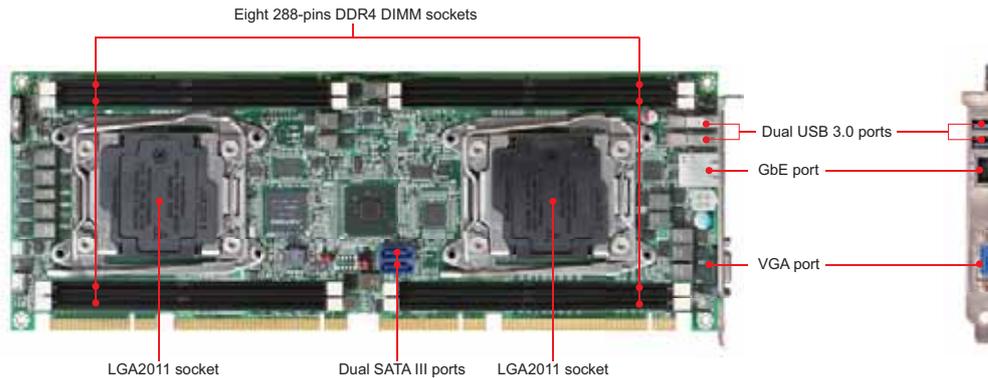
FULL-SIZE SINGLE BOARD COMPUTER



MODEL	ROBO-8111VG2AR-Q77	ROBO-8110VG2AR	ROBO-8110VG2AR-Q67	ROBO-8210VG2AR	ROBO-6911VG2AR	ROBO-8780VG2A	ROBO-6712VGA
Form Factor	PICMG 1.3	PICMG 1.3	PICMG 1.3	PICMG 1.3	PICMG1.3 half size	PICMG 1.0	PICMG 1.0 half size
CPU	Intel® Core™ i5/i7	Intel® Xeon® E3-1200/ Intel® Core™ i3	Intel® Core™ i5/i7	Intel® Core™ 2 Duo/ Celeron®	Intel® Skylake-S Xeon® /Core™ i3/i5/ i7 processors	Intel® Dual Core™	Intel® Atom™ D525
Chipset	Intel® Q77	Intel® C206 PCH	Intel® Q67 PCH	Intel® QM57	Intel® C236 or Q170	Intel® H61	Intel® ICH8M
BIOS	Phoenix UEFI	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI	AMI UEFI	Phoenix UEFI
Memory	2x DDR3 DIMM up to 16GB	2x DDR3 ECC DIMM up to 16GB	2x DDR3 DIMM up to 16GB	2x DDR3 DIMM up to 8GB	2 x DDR4 ECC or non-ECC SODIMM up to 32GB	2x DDR3 DIMM up to 16GB	1x DDR3 SODIMM up to 2GB
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	4x PCI slots 1x PCIe x16 slot 2x PCIe x8 slots 1x Mini-PCIe socket	1xPCI Express x16 or 2xPCI Expressx8 or 1x PCI Express x8 + 2x PCI Express x4 1x PCI Express x4 or 4x PCI Express x1	4x PCI slots 1x ISA	4x PCI slots
Display	VGA/DVI-D/HDMI	DVI-I/HDMI	DVI-I/HDMI	DVI-I	DP/DVI-I	DVI-D/VGA	VGA/LVDS
Audio	Realtek ALC 886-GR HD Audio codec	Realtek ALC 662 HD Audio codec	Realtek ALC 662 HD Audio codec	Realtek ALC 662 HD Audio codec	Realtek ALC886 HAD codec	Realtek ALC 886-GR HD Audio codec	Realtek ALC 662 HD Audio codec
LAN	2x GbE	2x GbE	2x GbE	2x GbE	2x GbE	2x GbE	1x GbE
Serial Port	1x RS232 1x RS232/422/485	1x RS232 1x RS232/422/485	1x RS232 1x RS232/422/485	1x RS232 1x RS232/422/485	1x RS232/422/485	1x RS232 1x RS232/422/485	1x RS232 1x RS232/422/485
USB	10x USB 2.0 4x USB 3.0	14x USB 2.0	14x USB 2.0	12x USB 2.0	4xUSB3.0	2x USB 3.0 10x USB 2.0	6x USB 2.0
Storage Devices	6x SATA 1x FDD	6x SATA 1x FDD	6x SATA 1x FDD	6x SATA 1x FDD	4x SATAIII 1x mSATA socket	4x SATA 1x FDD	3x SATA 1x IDE 1x CF 1x FDD
GPIO	8-bit	8-bit	8-bit	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	-	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	338.5 x 126.39mm	167.64 x 126.39mm	338.5 x 122mm	185 x 122mm
Page	20	21	22	23	24	25	26

ROBO-8122VG2R

Intel® Xeon® E5-2600Lv3 series processor based on PCIMG 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. Built 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® 6C~12C Xeon® processors with LGA 2011 package
- Delivers up to 256GB DDR4 ECC 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
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PACKING LIST

Standard	B6902932 SATA III cable B8981980 PICMG SBC Handling and Installation Notice B8983670 Installation CD
Optional	B8307810 All in one CPU cooler

GENERAL

Processor	- Intel® 6C~12C Xeon® E5-2600Lv3 series processor (50~75W) 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 sku) - 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 SATAIII 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 PCI Express x16 or 2x PCI Express x8 or 1x PCI Express x8 + 2x PCI Express x4 by different bios support (Gen3 up to 8.0 GT/s) - From PCH: 1x PCI Express x4 or 4x PCI Express x1 by different bios support (Gen 3 up to 8.0 GT/s)
Gold Finger definition	- Section A/B: PICMG 1.3 Standard PCI Express definition, total 20 lanes - Section D: PCI Express 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 gold finger section C on BP for WGI210AT
Serial port	2x Tx/Rx signal route to gold 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: Resolution up to 1920x1200@60Hz

Mechanical & Environment

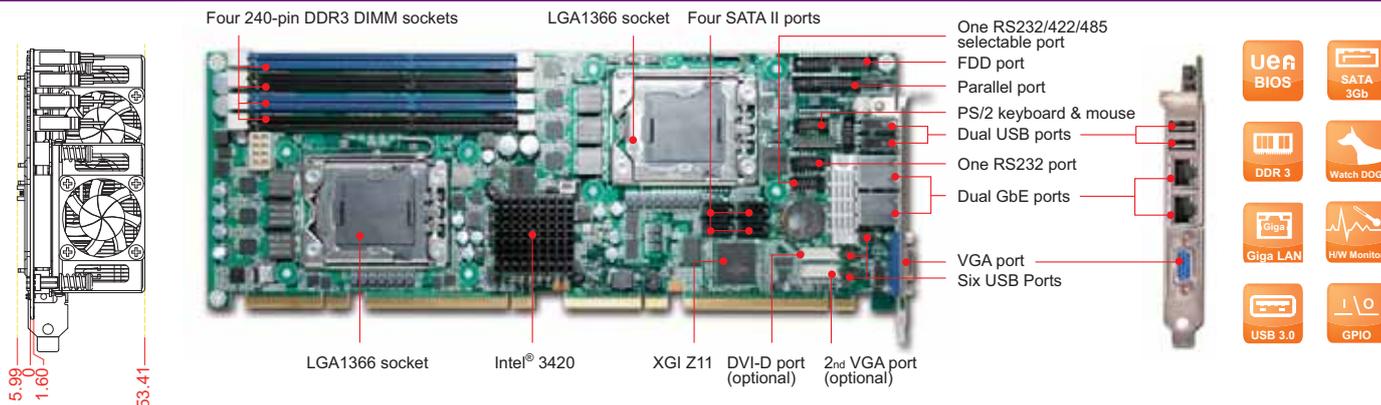
Dimension	338.5mm(L) x 126.39mm(W), 13.33"(L) x 4.98"(W)
Power Supply	Typical: +12V, +5V -Support ATX mode
Environment	Operatin Temperature:0~55°C (for 75W CPU limitation) Storage Temperature:-20~80°C Relative Humidity:5~90%,non-condensing Thermal Solution depends on chassis design and system fan selection
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C





ROBO-8120VG2R

Intel® Xeon® C5500/C3500 series processor based on PICMG 1.3 SHB with DDR3 SDRAM, VGA, Dual Gigabit Ethernet, Audio and USB



ROBO-8120VG2R is based on Intel® 3420 chipset and dual Xeon® processors. It's a server grade SHB built with high computing power and flexible PCI express expansion support, it's suitable for military, industrial automation, and Digital Signage applications.

FEATURES

- Supports Intel® Dual/Quad Core™ Xeon® processors with LGA1366 package
- Delivers up to 32GB DDR3 maximum ECC registered memory assured the computer reliability and benefited the data swapping process
- Adopts the XGI Z11 graphics engine and offers solid 2D performance
- Supports VGA display on bracket and optional 2nd VGA or DVI-D interface
- Rich & powerful I/O expansion covers PCIe Gen 2.0 for one PCI Express x16 or two PCI Express x8 or four PCI Express x4
- High speed dual Gigabit Ethernet based on PCI Express x1 interface provides Wake-On-LAN function
- Rich I/O connectors such as FDD, two Gigabit Ethernet, serial ports, parallel port, USB 2.0, and SATA ports

ORDERING GUIDE

AB1-3479	ROBO-8120VG2R PICMG 1.3(PCI-E+PCI). LGA1366.Jasper Forest Single/Dual/Quad Core processors. SHB.w/VGA/Dual GbE
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PACKING LIST

Standard	B6900960 cable kit for 1 serial + 1 parallel port w/ bracket B6900074 FDD Cable B6901990 SATA II cable B8981980 PICMG SBC Handling and Installation Notice B3751380 Installation CD B8303921 single processor cooler
Optional	B6901970 two USB port cable w/bracket B6901610 one DVI-D + one VGA cable with bracket

GENERAL

Processor	- Intel® Single/Dual/Quad Core™ Xeon® C5500/C3500 series processor up to 2.53 GHz (23~85W) with 2~8MB LLC Cache in LGA1366 package (Only support single processor on C3500 series) - Intel® QPI transfer rates: 4.8 and 5.87 GT/s (depends on CPU sku) - DMI x4 Link: 2.5 GT/s - Supports Intel® Hyper-Threading, Virtualization Technology (VT-x), and QuickPath Technology
Chipset	- Intel® 3420 (4.8W) - Supports Intel® Rapid Storage Technology
BIOS	AMI UEFI BIOS
Memory	Supports up to 32GB DDR3 1333/1066/800 SDRAM on four 240-pin DIMM sockets, support ECC, registered
Storage Devices	- 6x SATA II drivers (Dual SATA 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	- 1x PCI Express x16 Gen 1 up to 2.5 GT/s - 2x PCI Express x8 Gen 1 up to 2.5 GT/s - 4x PCI Express x4 Gen 1 up to 2.5 GT/s - 4x PCI devices at 32-bit 33 MHz (Optional for PCI Express Gen 2 support)

I/O INTERFACE

Super I/O	Winbond W83627DHG
Audio	N/A
Ethernet	- Intel® WG82574L gigabit ethernet controller x2 - Dual RJ-45 connector with two LED indicators on bracket
Serial Port	- 1x RS232 port on rear I/O - 1x Selectable RS232/422/485 on board box header
USB	- 12x 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 keyboard & mouse
GPIO	On board programmable 8-bit Digital I/Os
Others	1x parallel port on board box header

DISPLAY

Graphic Controller	XGI Z11
Display Interface	- VGA on bracket: Resolution up to 1600x1200 @16M colours 70Hz - Optional second VGA or DVI-D display interface

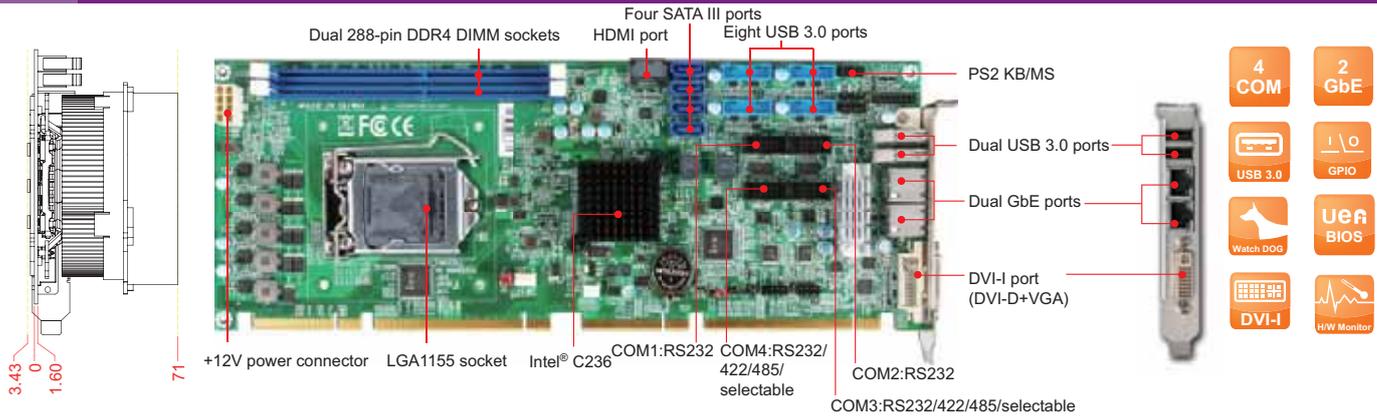
Mechanical & Environment

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: 0~60 °C (For 80W CPU limitation) - 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

Intel® Xeon® and Core™ i3 processor based on PCIMG 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® 6th Skylake-S Xeon® / Core™ i3 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

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
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PACKING LIST

Standard	Optional
B6902932 SATA III cable	B6902980 PS/2 Keyboard / Mouse Cable with bracket
B8981980 PICMG SBC Handling and Installation Notice	B6902230 USB port cable with bracket
B6903350 DVI-D + VGA cable	AB9-2066 PA-M1AU Multiple Media kit
B6902350 dual head COM port cable with bracket	B6903090 USB 3.0 cable with bracket
B8983660 Installation CD	

GENERAL

Processor	- Intel® Xeon® E3-1200v5 series / Core™ i3 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 uFEI 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 PCI Express x16 or 2x PCI Express x8 or 1x PCI Express x8 + 2x PCI Express x4 by jumper setting (Gen3 up to 8.0 GT/s) - From PCH: 1x PCI Express x4 or 4x PCI Express x1 by different bios support (Gen 3 up to 8.0 GT/s)

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 RS232 ports - 2x RS232/422/485 selectable - LPC to COM port IC: Fintek F81216DG
USB	- 2x 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 keyboard/mouse
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

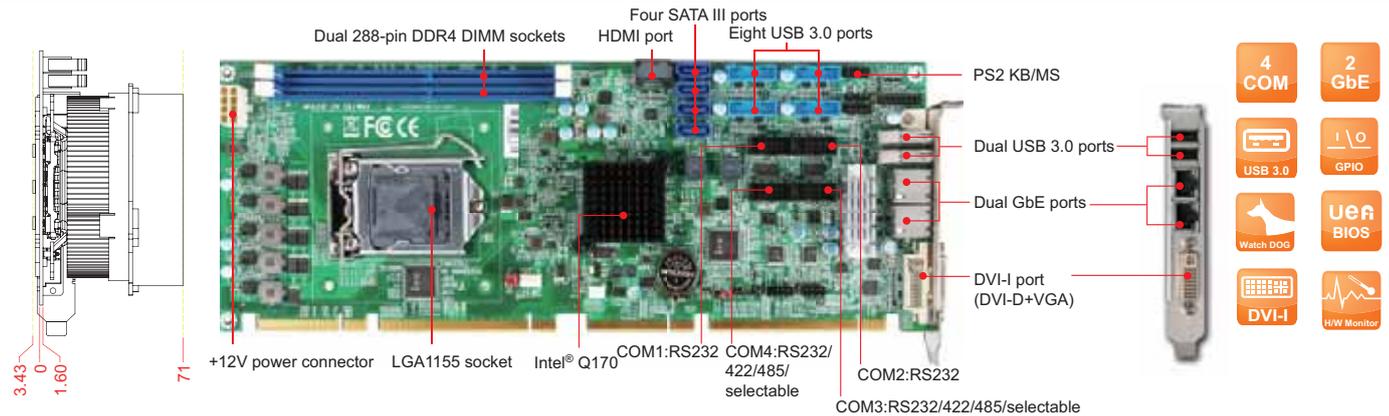
Mechanical & Environment

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™ i5/i7 processor based on PCIMG 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 6th Skylake-S Core i5/i7 processors in LGA 1151 package
- Delivers up to 32GB maximum DDR4 2133 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 x 1, high bandwidth I/O interface
- On-board six SATAIII ports
- Rich I/O connections such as four serial ports, USB 3.0/2.0, SATA III ports

ORDERING GUIDE

AB1-3D41	(R).ROBO-8113VG2AR PICMG 1.3(PCI-E+PCI).LGA1151. Intel Xeon/Core i3 processors.SHB.w/VGA/Dual GbE/Audio/four COM ports
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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
	AB9-2066 PA-M1AU Multiple Media kit
	B6903090 USB 3.0 cable with bracket

GENERAL

Processor	- Intel® XCore™ i5/i7 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 PCI Express x16 or 2x PCI Express x8 or 1x PCI Express x8 + 2x PCI Express x4 by jumper setting (Gen3 up to 8.0 GT/s) - From PCH: 1x PCI Express x4 or 4x PCI Express x1 by different bios support (Gen 3 up to 8.0 GT/s)

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® WG1219LM + WG1210AT 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 RS232 ports - 2x RS232/422/485 selectable - LPC to COM port IC: Fintek F81216DG
USB	- 2x 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 keyboard/mouse
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: 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

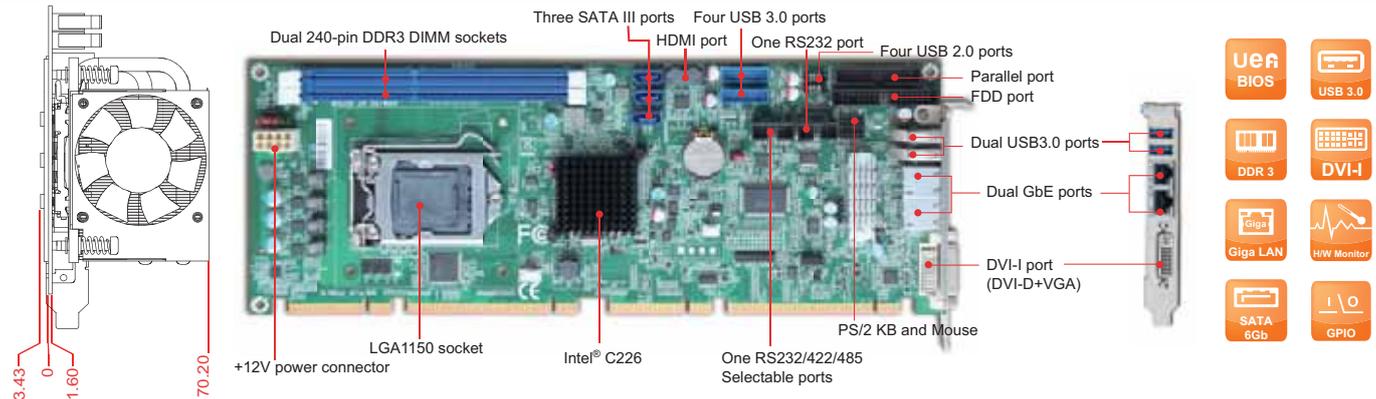
Mechanical & Environment

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-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
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PACKING LIST

Standard	
	B6902930 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 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 PCI Express x16 or 2x PCI Express x8 or 1x PCI Express x8 + 2x PCI Express x4 by jumper setting (Gen3 up to 8.0 GT/s) - From PCH: 1x PCI Express x4 or 4x PCI Express 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 RS232 and 1x selectable RS232/422/485 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 keyboard/mouse
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: Resolution 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

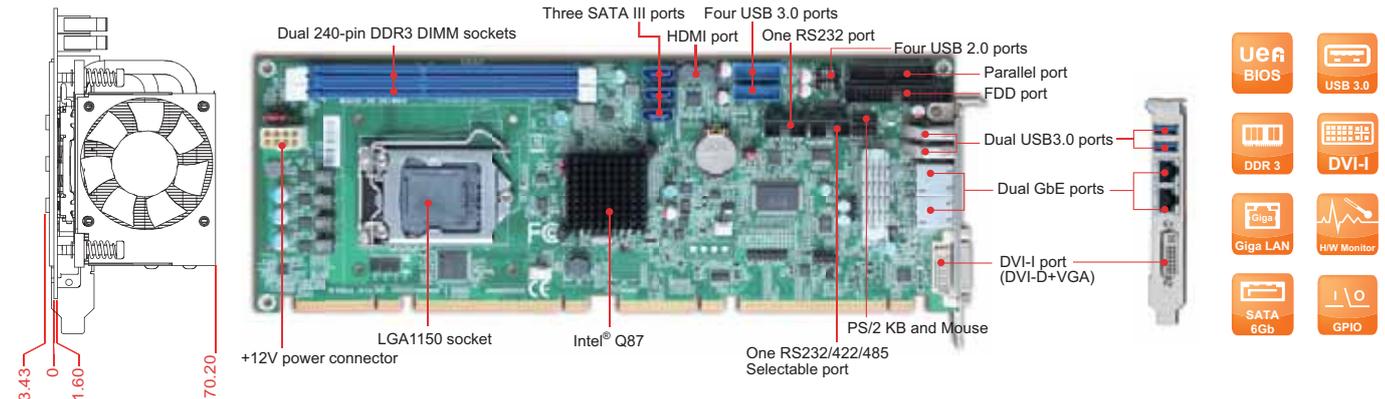
Dimension	- 338.5mm(L) x 126.39mm(W), 13.33""(L) x 4.98""(W) - PCB: 8 layers
Power Supply	- Typical: +12V@5.29A;+5V@4.94A - Support ATX mode
Environment	- Operation Temperature: 0~60 °C - Storage Temperature: -20~80 °C - Relative Humidity: 5~90%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C





ROBO-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 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
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PACKING LIST

Standard	B6902930 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 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 PCI Express x4 or 4x PCI Express 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 RS232 and 1x selectable RS232/422/485 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 keyboard/mouse
GPIO	On board programmable 8-bit Digital I/Os
Others	1x Parallel port

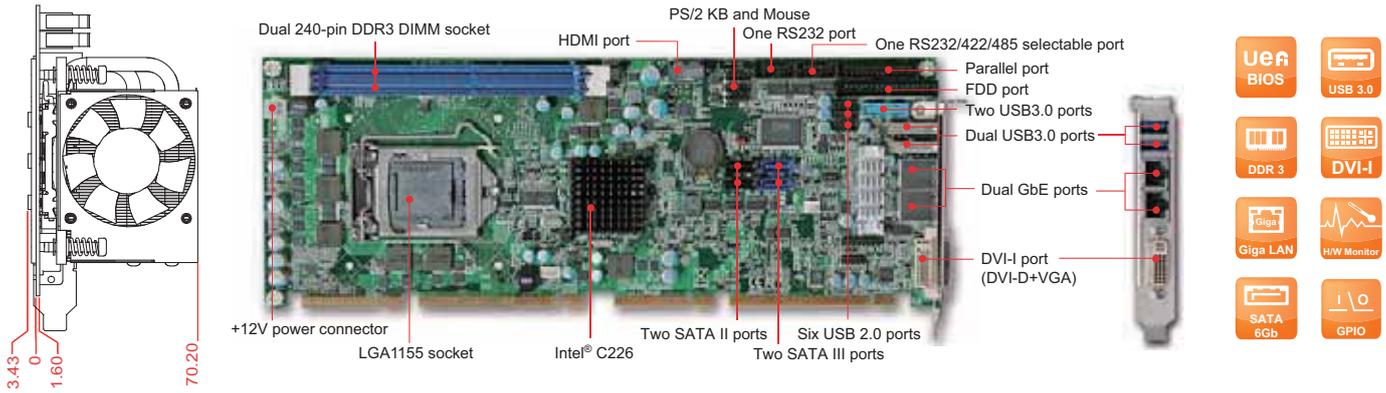
DISPLAY	
Graphic Controller	- Intel® Core™ i5/i7 processors integrated graphics engine - Provides improved 3D multimedia capabilities including Microsoft DirectX 11.1, Shader Model 4.0, MPEG-2 and OpenGL 3.2
Display Interface	Support independent triple display by - CRT on bracket: Resolution up to 1920x1200 @ 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: 0~60 °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-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 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
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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 PCI Express x16 or 2x PCI Express x8 or 1x PCI Express x8 + 2x PCI Express x4 by jumper setting - From PCH: 1x PCI Express x4 or 4x PCI Express 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 RS232 and 1x selectable RS232/422/485 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 keyboard & mouse
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: Resolution 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

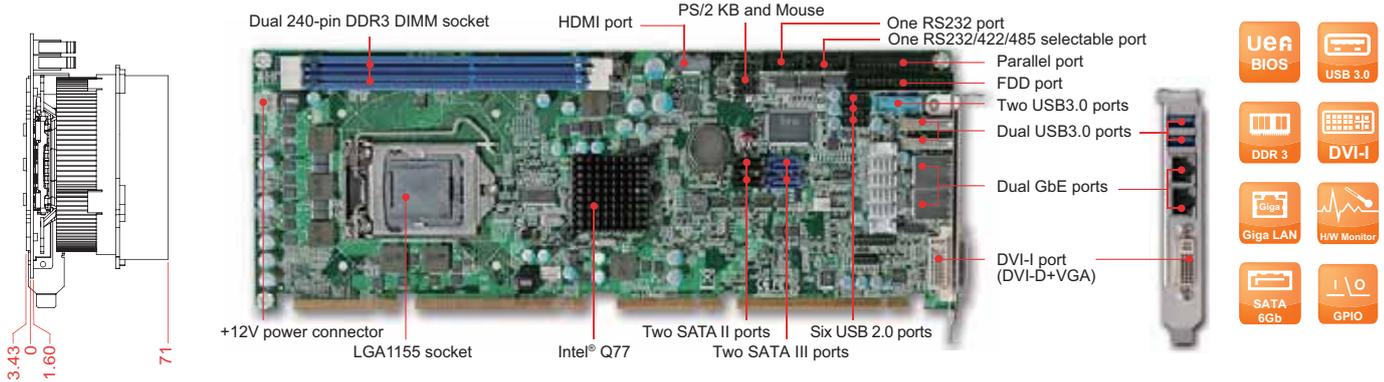
Dimension	- 338.5(L) x 126.39(W)mm; 13.33"(L) x 4.98"(W) - PCB: 12 layers
Power Supply	- Typical: +12V@6.96A; +5V@0.32A - Supports ATX mode
Environment	- Operation Temperature: 0-60 °C (For 80W CPU limitation) - Storage Temperature: -20-80 °C - Relative Humidity: 5-90%, non-condensing
Certification	CE,FCC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





ROBO-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 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
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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 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 PCI Express x16 - From PCH: 1x PCI Express x4 or 4x PCI Express 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 RS232 and 1x selectable RS232/422/485 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 keyboard & mouse
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: Resolution up to 2048x1536 @75Hz - DVI-D: up to 1920x1200 @60Hz - HDMI: up to 1920x1200 @60Hz(CRT+DVI-D on bracket by DVI-I port)

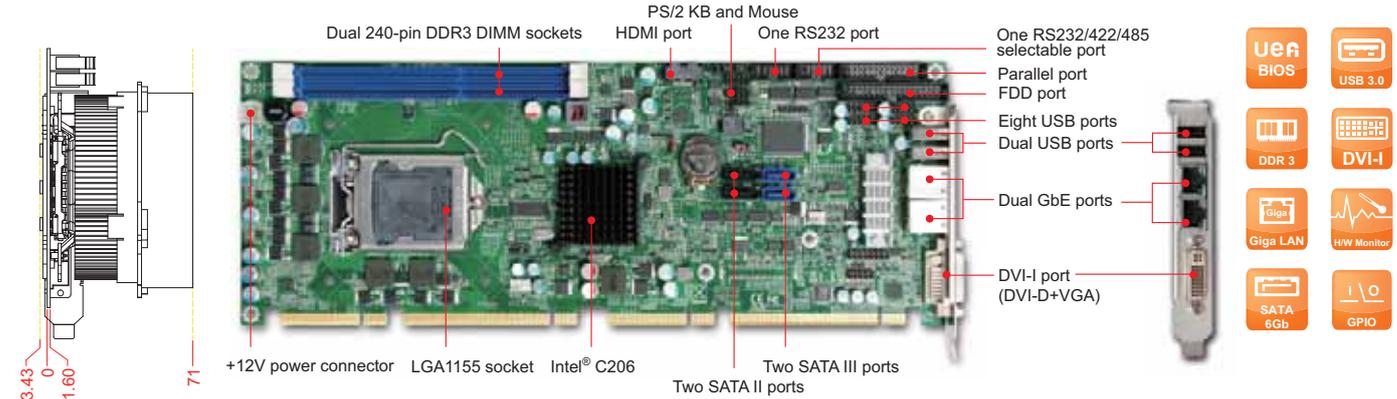
Mechanical & Environment

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: 0~60 °C (with highest performance on 50 °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-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 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
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PACKING LIST

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

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 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 PCI Express x16 or 2x PCI Express x8 or 1x PCI Express x8 + 2x PCI Express x4 by jumper setting - From PCH: 1x PCI Express x4 or 4x PCI Express 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 RS232 on bracket - 1x Selectable RS232/422/485 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 keyboard & mouse
GPIO	On board programmable 8-bit Digital I/Os
Others	1x parallel port on board box header

DISPLAY

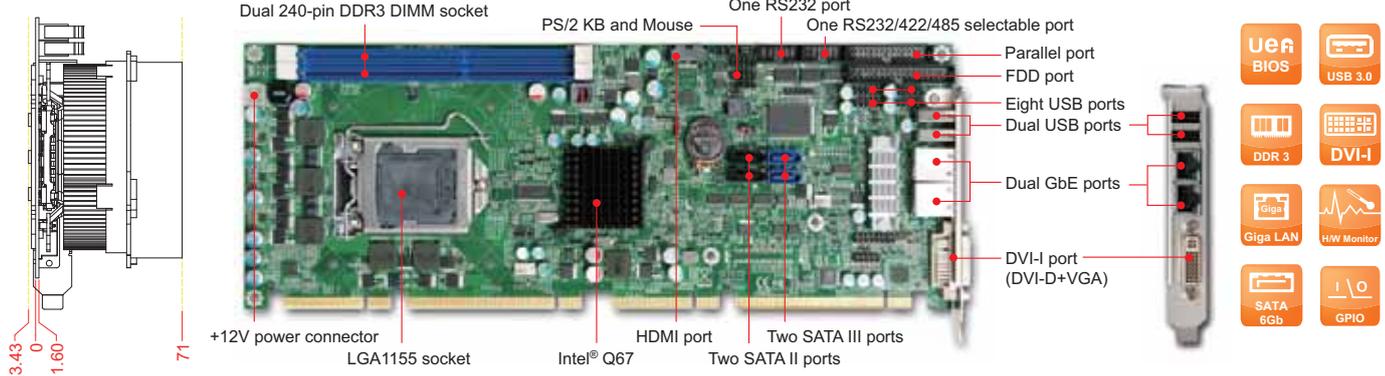
Graphic Controller	- Intel® Xeon® and Core™ i3 processors integrated graphic engine P3000 - Provided improved 3D multimedia capabilities including Microsoft DirectX 10.1, Shader Model 4.0, MPEG-2 and OpenGL 3.0"
Display Interface	- VGA on bracket: Resolution up to 2048x1536 @ 75Hz - DVI-D: up to 1920x1200 @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: 0~60 °C (with better performance on 50 °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-8110VG2AR-Q67



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 1333/1066 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
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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 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 PCI Express x16 - From PCH: 1x PCI Express x4 or 4x PCI Express 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 RS232 on bracket - 1x Selectable RS232/422/485 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 keyboard & mouse
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: Resolution up to 2048x1536 @ 75Hz - DVI-D: up to 1920x1200 @60Hz - HDMI: up to 1920x1200 @60Hz (VGA + DVI-D on bracket by DVI-I port)

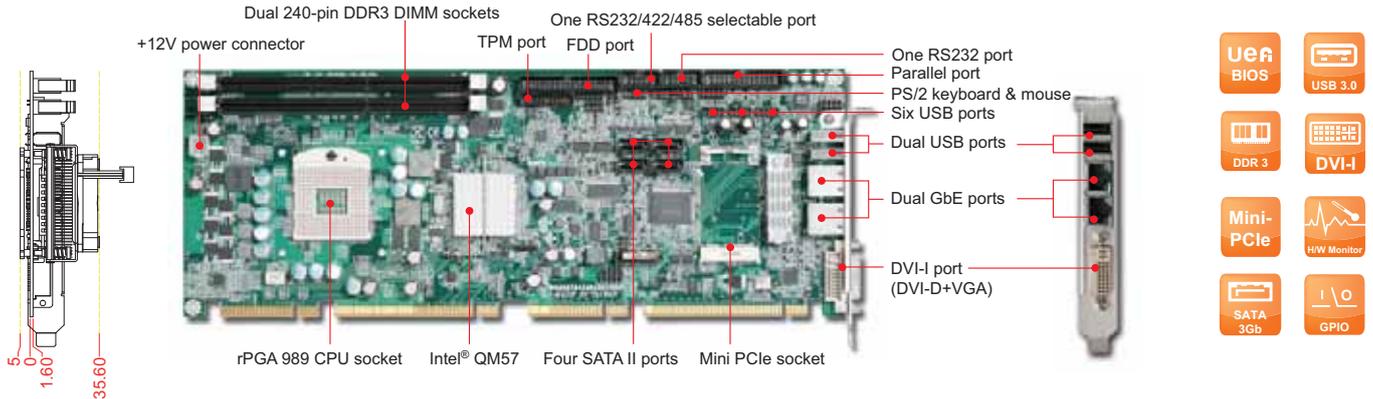
Mechanical & Environment

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: 0~60 °C (with better performance on 50 °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-8210VG2AR

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



ROBO-8210VG2AR adopts the QM57 chipset and Intel® Core™ i7/i5 and Celeron® processors. Built with high performance and lower power consumption than desktop platform, it's suitable for Medical, Industrial Automation and Kiosk applications.

FEATURES

- Supports Intel® i7-620M/i5-520M/P4500 processors in rPGA988 package
- Delivers up to 8GB maximum DDR3 1066/800 on two DIMM sockets
- Supports dual display by DVI-I port on bracket
- Supports iAMT 6.0 and external TPM via TPM module
- 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
- Four on-board SATA ports support RAID 0,1,5,10

ORDERING GUIDE

AB1-3521	ROBO-8210VG2AR PICMG 1.3(PCI-E+PCI),rPGA988A package. Intel QM57 w/ PGA type Core i7/i5 processors.SHB.w/VGA/Dual GbE/Audio
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PACKING LIST

Standard	B690021S cable kit for FDD+PRN with bracket B6903240 Dual head COM port cable with bracket B6901990 SATA II cable B8981980 PICMG SBC Handling and Installation Notice B6902890 DVI-D + VGA cable B8303170 CPU cooler (up to 35W) B3751340 Installation CD
Optional	B6901442 PS/2 Keyboard/Mouse Cable with bracket AB9-2066 PA-M1AU Multiple Media kit B6902230 USB port cable with bracket

GENERAL

Processor	- Intel® Core™ i7-620M/i5-520M/P4500 Processors up to 3.33G (35W) with 2MB~4MB Cache in rPGA989 package - DMI x4 Link: 2.5 GT/s - Supports Intel® Hyper-Threading, Virtualization Technology (VT-x)
Chipset	Intel® BD82QM57 PCH (3.5W)
BIOS	AMI UEFI BIOS
Memory	Supports up to 8GB DDR3 1066/800 SDRAM on dual 240-pin DIMM sockets
Storage Devices	- 6x SATA II drivers (Dual SATA 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	- 1x PCI Express x16 Gen 1 up to 2.5 GT/s - 2x PCI Express x8 Gen 1 up to 2.5 GT/s - 4x PCI devices at 32-bit 33MHz (Option for PCI Express Gen 2 support) - 1x Mini-PCIe socket

I/O INTERFACE

Super I/O	ITE IT8721F
Audio	- Intel® BD82QM57 built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC662-GR HDA codec, 5.1 channels
Ethernet	- Intel® 82577LM + 82583V gigabit ethernet controller - Dual RJ-45 connector with two LED indicators on bracket
Serial Port	- 1x RS232 on board box header - 1x Selectable RS232/422/485 on board box header
USB	- 12x 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 keyboard & mouse
GPIO	On board programmable 8-bit Digital I/Os
Others	1x parallel port on board box header

DISPLAY

Graphic Controller	- GMCH integrated Intel Graphic Media Accelerator (GMA) HD - Provides improved 3D multimedia capabilities including Microsoft DirectX 10, Shader Model 4.0,OpenGL 2.1, MPEG-2 hardware acceleration - Intel Dynamic Video Memory Technology (DVMT) 5.0 shares system memory up to 1Gb
Display Interface	- VGA on bracket: Resolution up to 2048x1536 @75Hz - DVI-D: Resolution up to 1920x1200 @60Hz

Mechanical & Environment

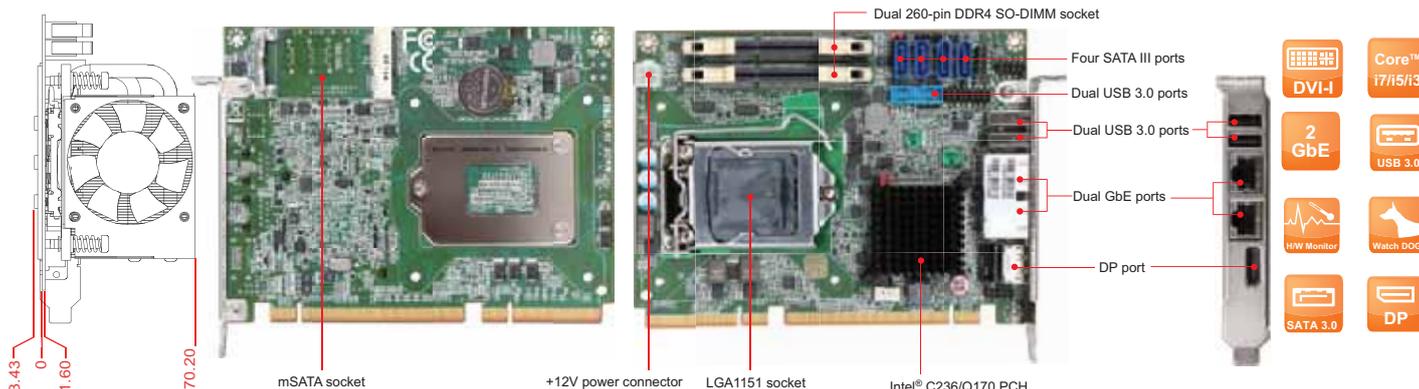
Dimension	- 338.5(L) x 126.39(W)mm; 13.33"(L) x 4.98"(W) - PCB: 8 layers
Power Supply	- Typical: +12V@3.86A; +5V@6.44A - Supports ATX mode
Environment	- Operation Temperature: 0~55 °C - Storage Temperature: -20~80 °C - Relative Humidity: 5~90%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 120,000 hours at 40°C





ROBO-6911VG2AR

Intel® 6th Skylake-S processor based on PCIMG 1.3 half size SHB with DDR4 SODIMM, DP, DVI-I, Dual Gigabit Ethernet, mSATA, Audio, USB



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

FEATURES

- Support Intel® 6th Skylake-S processor in LGA1151
- Delivers up to 32GB maximum DDR4 2133 ECC or 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

AB1-3D38	(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
AB1-3D39	(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

PACKING LIST

Standard	B6902932 SATA III cable B8981980 PICMG SBC Handling and Installation Notice B8983650 Installation CD
Optional	B6902230 USB port cable with bracket AB9-2066 PA-M1AU Multiple Media kit B6903090 USB 3.0 cable with bracket

GENERAL

Processor	- Intel® Xeon® E3-1200v5 series (C236) / Core™ i3 (C236) / i5 (Q170) / i7 (Q170) 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 or Q170
BIOS	AMI uEFI BIOS (SPI ROM)
Memory	- Supports up to 32GB DDR4 2133/1866 SDRAM on two 260-pin ECC or non ECC SODIMM sockets - Supports ECC on C236, non-ECC on Q170
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	- From CPU (Xeon/Core™ i3): 1x PCI Express x16 or 2x PCI Express x8 or 1x PCI Express x8 + 2x PCI Express x4 by jumper setting (Gen3 up to 8.0 GT/s) - From CPU (Core™ i5/i7): 1x PCI Express x16 (Gen3 up to 8.0 GT/s) - From PCH: 1x PCI Express x4 or 4x PCI Express 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 RS232/422/485 selectable by bios
USB	- 4x USB3.0 ports (2 ports on bracket)
Keyboard & Mouse	2xUSB3.0 ports on bracket dedicated to keyboard & mouse
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

Graphic Controller	Intel® 6th Skylake-S processors integrated graphics engine
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 by on-board DVI-I connector) - DP: up to 4096X2304@60Hz (on bracket)

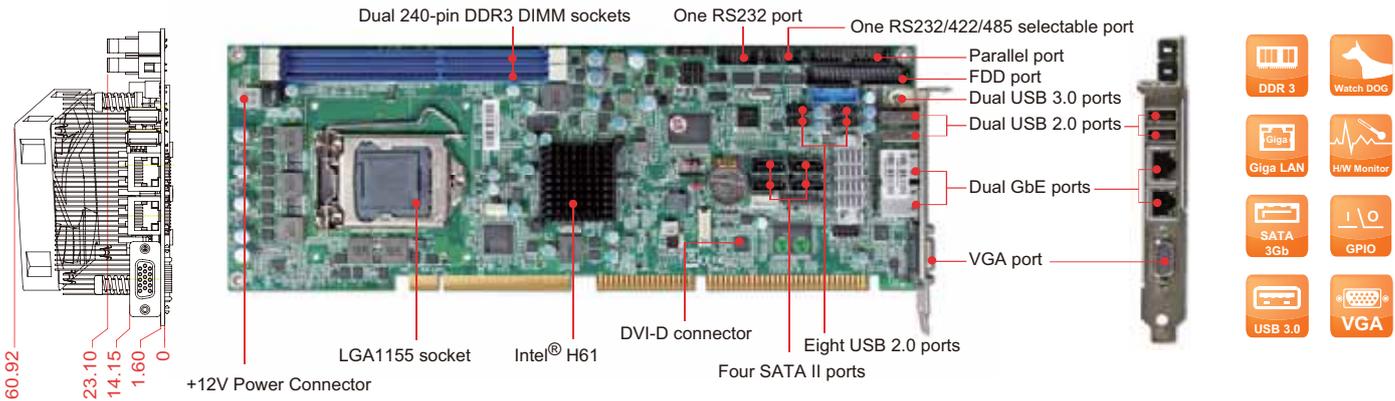
Mechanical & Environment

Dimension	167.64mm(L) x 126.39mm(W), 6.6" (L) x 4.98"(W) -PCB: 10 layers
Power Supply	Typical: +12V, +5VSB -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-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 1333/1066 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, two Gigabit Ethernet, serial ports, parallel port
- On-board four SATA II ports and ten 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
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PACKING LIST

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

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 EFI 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 support 3Gb/s data transfer rate on board - Supports 16-bit ISA via golden finger
Watchdog Timer	Programmable via S/W from 0.5 sec. to 255 min.
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 RS232 on board box header - 1x RS232/422/485 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	Two 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: Resolution up to 2048x1536 @75Hz - DVI-D on board: Resolution up to 1920x1200 @60Hz

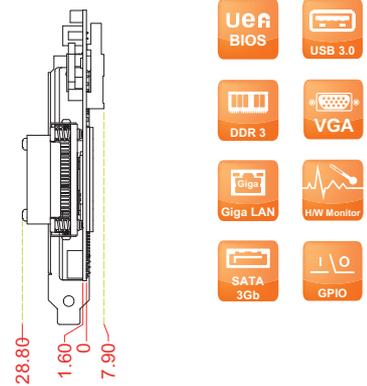
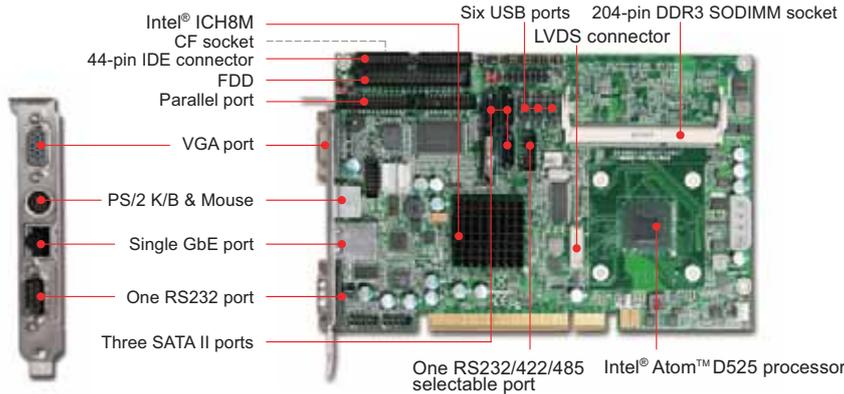
Mechanical & Environment

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 to 60°C (with better performance on 50°C) - Storage Temperature: -20°C to 80°C - Relative Humidity: 5% to 90%, non-condensing
Certification	CE, FCC Class A
MTBF	Over 100,000 hours at 40°C



ROBO-6712VGA

Intel® Atom™ D525 processor based on PICMG 1.0 half size SBC with DDR3 SODIMM, VGA, single Gigabit Ethernet, Audio and USB



ROBO-6712VGA has a built in Intel® Atom™ D525 and ICH8M chipset which enhances performance and supports a better graphics engine, making it most suitable for Industrial Automation, Lottery, and Digital Signage applications.

FEATURES

- Supports Intel® Atom™ D525 processor and ICH8M chipset
- One 204-pin SODIMM support DDR3 800 SDRAM up to 2GB
- Supports Dual independent display: VGA/18-bit LVDS
- High speed single Gigabit Ethernet based on PCI Express x1, high bandwidth I/O interface
- Equipped with I/O connections such as FDD, two serial ports, parallel port, USB 2.0, three SATA II and one CF socket

ORDERING GUIDE

AB1-3684Z	ROBO-6712VGA Half-sized PCI SBC.Intel ATOM D525 processor.DDR3.w/LVDS/VGA/GbE/Audio
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PACKING LIST

Standard	
	B6900600 FDD Cable
	B6900224 IDE cable
	B6901990 SATA II cable
	B6900960 cable kit for 1 serial + 1 parallel port w/ bracket
	B690003S Cable Assy 4F-4F
	B3751460 Installation CD
	B8304630 CPU cooler
Optional	
	B6902230 USB port cable with bracket
	AB9-2066 PA-M1AU Multiple Media kit

GENERAL

Processor	- Intel® Atom™ D525 up to 1.8GHz (35W) with 1MB L2 Cache in FCBGA package - DMI x4 Link: 2.5 GT/s - Supports Intel® Hyper-Threading Technology
Chipset	Intel® ICH8M (3.3W)
BIOS	Phoenix UEFI BIOS
Memory	Supports up to 2GB DDR3 800 SDRAM on one 204-pin SODIMM sockets
Storage Devices	- 3x SATA II drivers - 1x 44-pin IDE device - 1x Type II CompactFlash® socket supports Ultra DMA133/100/66/33 MB/s - 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	4x PCI devices at 32-bit 33MHz

I/O INTERFACE

Super I/O	Winbond W83627UHG
Audio	- Intel® ICH8M built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC662-VC2 LQFP48 codec, 5.1 channels
Ethernet	- Intel® 82567V gigabit ethernet controller - One RJ-45 connector with two LED indicators on bracket
Serial Port	- 1x RS232 on bracket - 1x RS232/422/485 selectable on board box header
USB	- 6x USB 2.0 ports - 480 Mb/s bus comprehends the high-speed/full-speed/low-speed data ranges
Keyboard & Mouse	One 6-pin mini-DIN connector for keyboard & mouse on bracket
GPIO	On board programmable 8-bit Digital I/Os
Others	1x parallel port on board box header

DISPLAY

Graphic Controller	- Intel® ICH8M Integrated GMA 3150 Graphics supports full hardware acceleration of video decode standards MPEG-2 - Intel® Dynamic Video Memory Technology (Intel® DVMT 4.0)
Display Interface	- VGA on bracket: Resolution up to 2048x1536 (QXGA) - LVDS: One channel 18-bit LVDS

Mechanical & Environment

Dimension	- 185(L) x 122(W)mm; 7.3"(L) x 4.8"(W) - PCB: 8 layers
Power Supply	- Typical: +12V@2A; +5V@5.4A - Supports AT, ATX mode
Environment	- Operation Temperature: 0~60 °C - Storage Temperature: -20~80 °C - Relative Humidity: 5~90%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 120,000 hours at 40°C



PICMG 1.0 Backplane

PICMG GENERAL DESCRIPTION

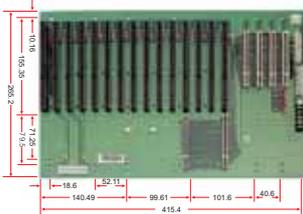
PICMG Backplanes in this section are Single Board Computers (SBCs) and Single Host Board (SHB) companions that feature expansion slots such as ISA, PCI, PCI-X or PCI Express interface. In addition, the backplane also features several power connectors that draw power from power supply to devices on it.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

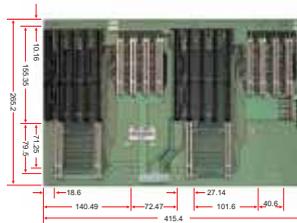
PICMG 1.0 BACKPLANE

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

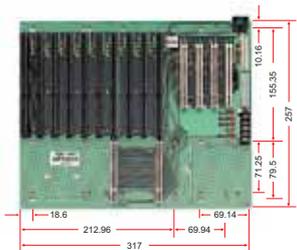
32-bit PCI/16-bit ISA



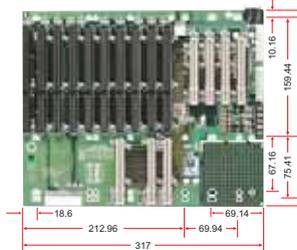
PBP-19P4
19-slot (4x PCI) PICMG Backplane
 - Fit for 20-slot chassis
 - ATX power connector support
 - Sufficient ISA slots for CTI application



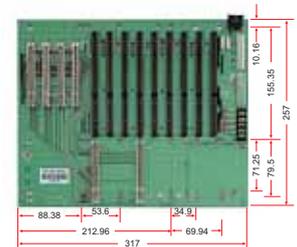
PBP-18D4
18-slot Dual-system PICMG Backplane
 - Fit for 20-slot chassis
 - Designed for fault-tolerant computing
 - ATX power connector support



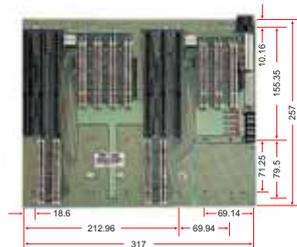
PBP-14P4
14-slot (4x PCI) PICMG Backplane
 - Fit for 14-slot chassis
 - ATX power connector support
 - The most popular and reliable PICMG backplane



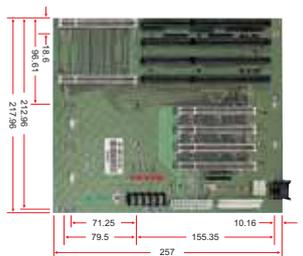
ACTI-14P4
14-slot (4x PCI) Active PICMG Backplane
 - Fit for 14-slot chassis
 - 2.4 mm PCB thickness
 - ATX power connector support



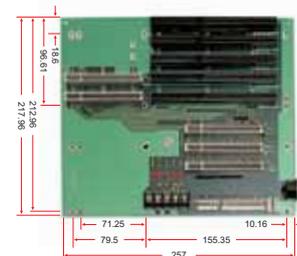
PBP-13R4
13-slot (4x PCI) PICMG Backplane
 - Fit for 14-slot chassis
 - Special design for full-length PCI cards
 - ATX power connector support



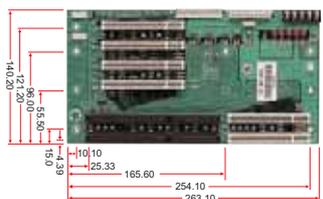
PBP-13D4
13-slot Dual-system PICMG Backplane
 - Fit for 14-slot chassis
 - Design for fault-tolerant computing
 - ATX power connector support



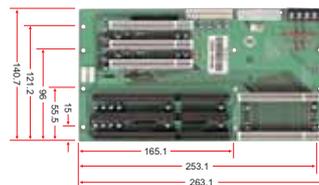
PBP-08P4
8-slot (4x PCI) PICMG Backplane
 - Fit for node chassis and desktop case
 - ATX power connector support



PBP-08P3
8-slot (3x PCI) PICMG Backplane
 - Fit for node chassis and desktop case

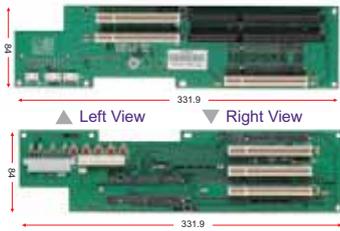


PBP-06P4
6-slot (4x PCI) PICMG Backplane
 - Fit for node chassis
 - ATX power connector support

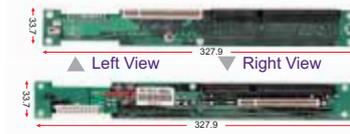


PBP-06P3
6-slot (3x PCI) PICMG Backplane
 - Fit for node chassis
 - ATX power connector support

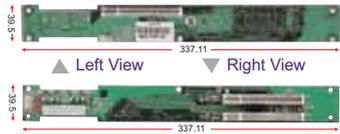
PICMG 1.0 Backplane



PBP-06V4
Vertical 6-slot (4x PCI) PICMG Backplane
 - Fit for 2U chassis
 - ATX and AT power connector support

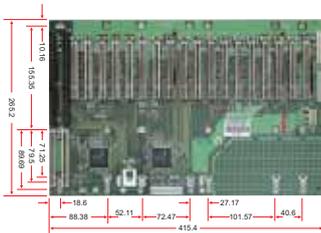


PBP-02V1X
Vertical 2-slot (1x PCI) PICMG Backplane
 - Fit for 1U chassis
 - ATX power connector support

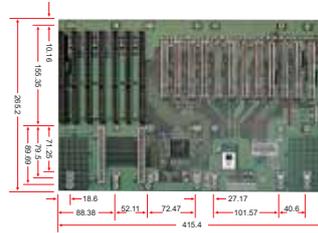


PBP-03P2X
Vertical 3-slot (2x PCI) PICMG Backplane
 - Fit for Portwell's 1U chassis
 - ATX power connector support

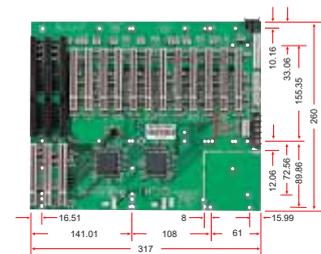
Active Backplane: Backplane that utilizes a bridge to support PCI master beyond four



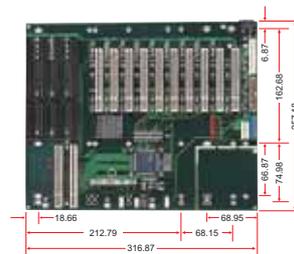
PBP-19AI
19-slot (18x PCI) Active PICMG Backplane



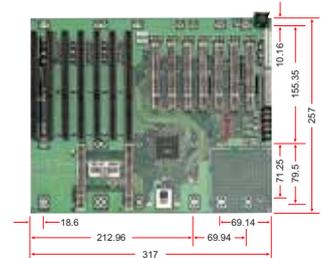
PBP-19AC
19-slot (12x PCI) Active PICMG Backplane



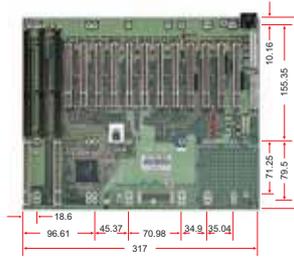
PBP-14AC-B
14-slot (12x PCI) Active PICMG Backplane



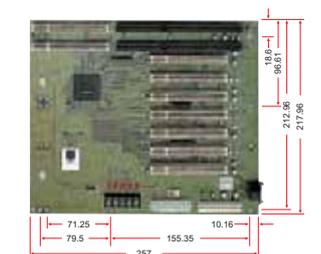
ACTI-14AA
14-slot (10x PCI) Active PICMG Backplane
 - Fit for 14-slot chassis
 - 2.4 mm PCB thickness
 - ATX power connector support



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

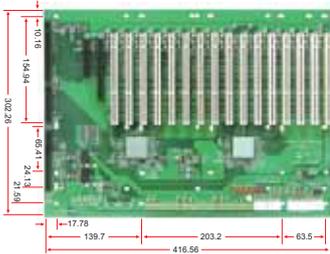
*Remark: [] → means real signal, ex. [x4] is for x4 signal but slot may not be x4 slot; [x8] is for x8 signal but slot may not be x8 slot

		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

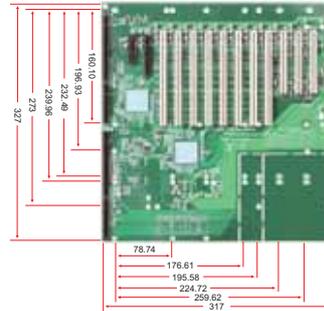
Server Grade Backplane



PBPE-19AG64

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

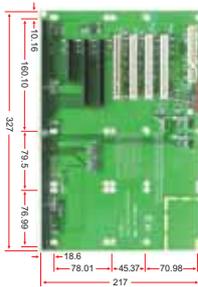
- Fit for 4U up chassis
- Four PCI-X buses support 16 PCI-X expansion slots



PBPE-14AD64

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

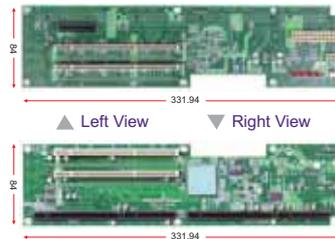
- Fit for 4U chassis
- Four PCI-X buses support eight PCI-X expansion slots



PBPE-08P41

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

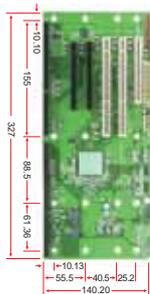
- Fit for Node chassis
- Four USB ports



PBPE-06V464

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

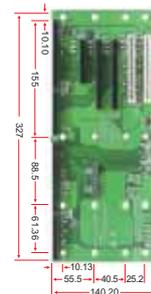
- Fit for 2U chassis
- Dual PCI-X buses support four PCI-X slots



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

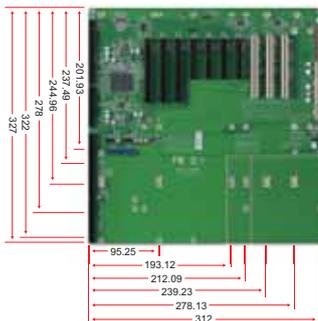


PBPE-06P2

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

- Fit for Node chassis
- Four USB ports

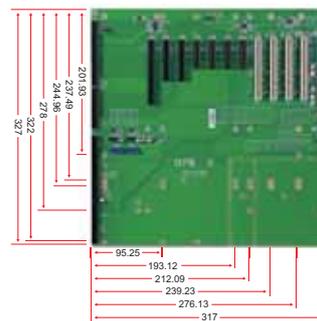
Non-Server Grade Backplane



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

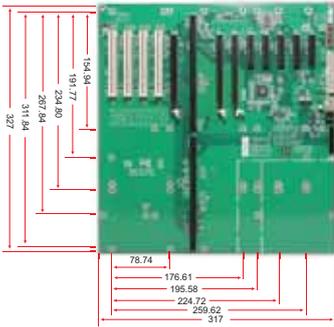


PBPE-12P4

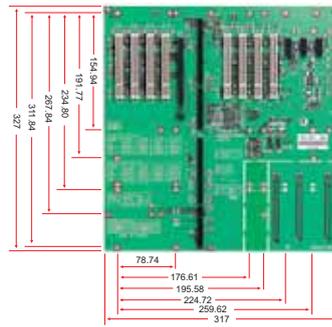
12-Slot [PCIe x16 (1, x8 signal), PCIe x8 (2, x4 signal), PCIe x4 (4, x1 signal), PCI (4)]

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

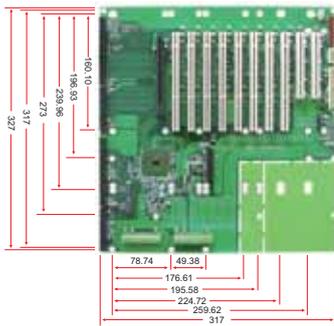
PICMG 1.3 Backplane



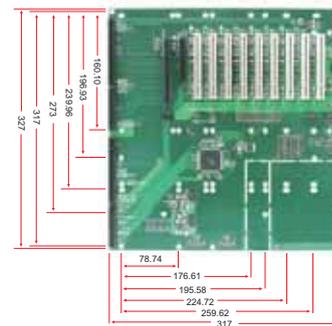
PBPE-13A4
13-slot [PCIe x16(1), PCIe x16(2, x1 signal), PCIe x4(5, x1 signal), PCI(4)]
 - Fit for 4U chassis
 - Four USB 2.0 ports
 - Dual SATA II ports



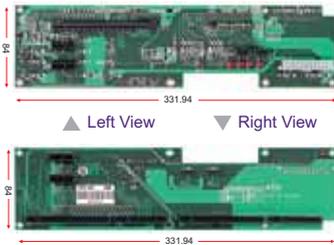
PBPE-13A8
13-slot [PCIe x1 (3), PCIe x16 (1), PCI (8)]
 - Fit for 4U chassis
 - Four USB ports
 - Dual SATA ports
 - 24-pin ESP12V power connector



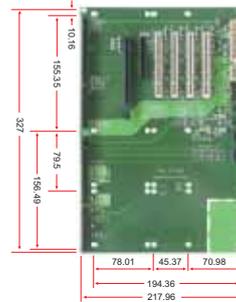
PBPE-12AA64
12-slot [PCI-X (8), PCIe x16 (1), PCI (2)]
 - Fit for 4U chassis
 - Four USB ports
 - Dual SATA ports
 - Two PCI-X buses support eight PCI-X expansion slot



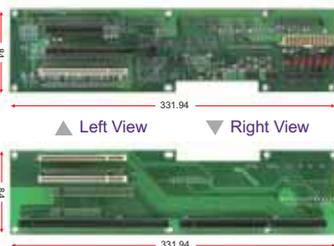
PBPE-12A9
12-slot [PCIe x16 (1), PCIe x8 (1, x4 signal), PCI (9)]
 - Fit for 4U chassis
 - Four USB ports
 - Dual SATA ports



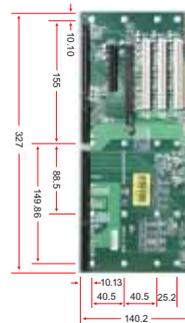
PBPE-06V
Vertical 6-slot [PCIe x1 (4), PCIe x16 (1)]
 - Fit for 2U chassis
 - Four USB ports
 - Dual SATA ports
 - 24-pin ESP 12V power connector



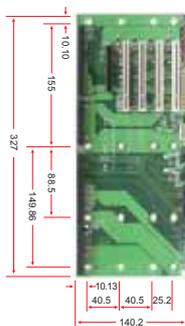
PBPE-07P4
7-slot [PCIe x8 (1, x4 signal), PCIe x16 (1), PCI (4)]
 - Fit for Node chassis
 - Four USB ports
 - Dual SATA ports



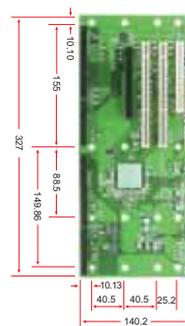
PBPE-06V3
Vertical 6-slot [PCIe x8 (1, x4 signal), PCIe x16 (1), PCI (3)]
 - Fit for 2U chassis
 - Four USB ports
 - Dual SATA ports



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

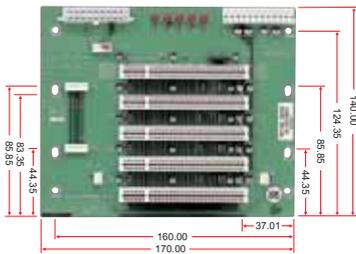
PCI & ISA Backplane

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

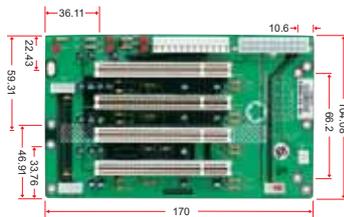
PBP-05P

5-slot Passive PCI Backplane



PBP-04P

4-slot Passive PCI Backplane



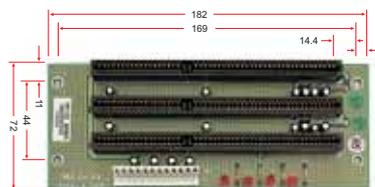
ISA GENERAL DESCRIPTION

- 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

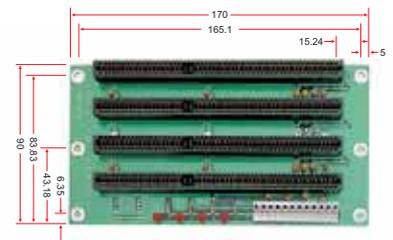
PBP-03I

3-slot Passive ISA Backplane



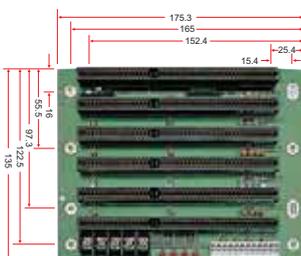
PBP-04I

4-slot Passive ISA Backplane



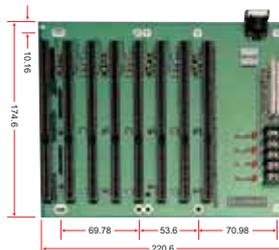
PBP-06I

6-slot Passive ISA Backplane



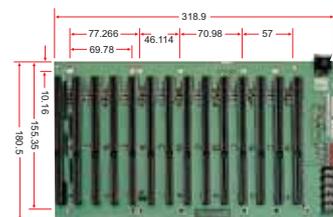
PBP-08I

8-slot Passive ISA Backplane



PBP-14I

14-slot Passive ISA Backplane



IMB Reference Table



MODEL	RUBY-D720VG2AR	RUBY-D718VG2AR	RUBY-D716VG2AR	RUBY-D715VG2AR
Form Factor	µATX	ATX	ATX	ATX
CPU	Intel® Core™ i5/i7	Intel® Core™ i3/i5/i7	Intel® Core™ i5/i7	Intel® Core™ i3/Xeon® E3 series
Chipset	Intel® Q87 PCH	Intel® Q170/C236	Intel® Q87 PCH	Intel® C216 PCH
BIOS	AMI UEFI	AMI UEFI	Phoenix UEFI	Phoenix UEFI
Memory	4x DDR3 DIMM up to 32GB	4x DDR4 DIMM up to 64GB	4x DDR3 DIMM up to 32GB	4x DDR3 DIMM up to 32GB
Expansion	2x PCI slots 1x PCIe x16 slot 1x PCIe x8 slot 1x PCIe x1 Gold Finger	1x PCIe x16 slot 2x PCIe x4 slots 4x PCI 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 ALC892 HDA 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 RS-232/422/485 5x RS-232	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 USB 3.0 8x USB 2.0	6x USB3.0 8x USB2.0	4x USB 3.0 8x USB 2.0	4x USB 3.0 6x USB 2.0
Storage Devices	5x SATA III 1x CFEX	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	PS/2 KB&MS
Dimension	243.8 x 243.8mm	304.8x243.8mm	304.8 x 243.8mm	304.8 x 243.8mm
Page	35	36	37	38



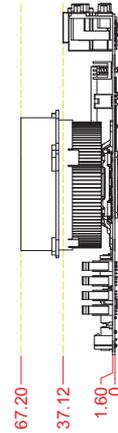
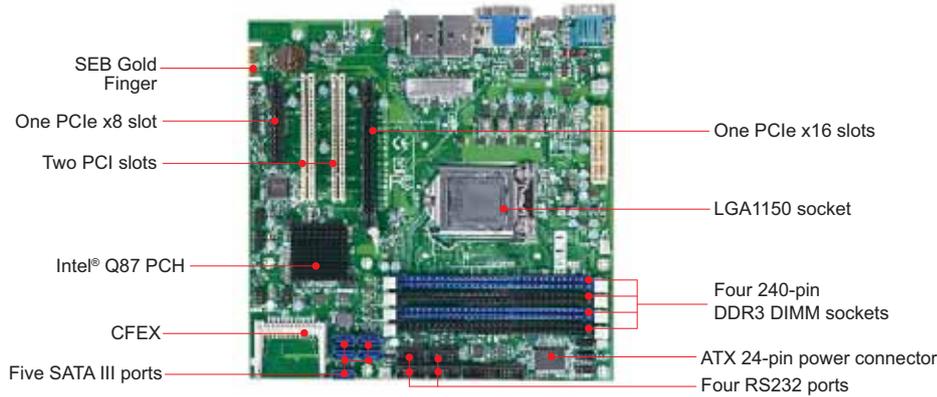
IMB Reference Table



MODEL	RUBY-D714VG2AR	RUBY-D712VG2AR	RUBY-D711VG2AR	RUBY-M710VG2AR
Form Factor	ATX	ATX	ATX	ATX
CPU	Intel® Core™ i5/i7	Intel® Core™ i5/i7	Intel® Core™ i3/Xeon® E3 series	Intel® Core™ i5/i7
Chipset	Intel® Q77 PCH	Intel® Q67 PCH	Intel® C206 PCH	Intel® QM57 PCH
BIOS	Phoenix UEFI	AMI UEFI	AMI UEFI	AMI UEFI
Memory	4x DDR3 DIMM up to 32GB	4x DDR3 DIMM up to 32GB	4x DDR3 ECC DIMM up to 16GB	2x DDR3 DIMM up to 8GB
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	4x PCI slots 1x PCIe x16 slot 1x PCIe x4 slot 1x PCIe x1 slot 1x Mini-PCIe socket
Display	VGA/DVI-D/HDMI	VGA/DVI-D/HDMI	VGA/DVI-D/HDMI	VGA/ DVI-D/ LVDS/ HDMI
Audio	Realtek ALC886-GR HDA codec	Realtek ALC662-GR HDA codec	Realtek ALC662-GR HDA codec	Realtek ALC888-GR HDA codec
LAN	2x GbE	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	1x RS-232/422/485 5x RS-232
USB	4x USB 3.0 6x USB 2.0	8x 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	6x SATAII
GPIO	8-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	304.8 x 243.8mm	304.8 x 243.8mm	304.8 x 243.8mm	304.8 x 243.8mm
Page	39	40	41	42

RUBY-D720VG2AR

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

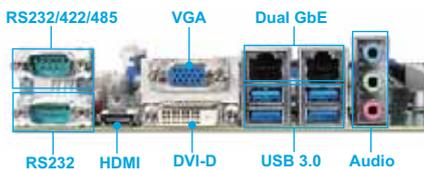


RUBY-D720VG2AR is based on Intel® Q87 chipset and desktop processor sku like Core™ i7 and i5. Build with PCI and PCI Express expansions, it is suitable for Medical, Industrial automation, and digital signage applications.

FEATURES

- Intel® Core™ i5 and i7 processor support
- Four Long-DIMMs support dual channel DDR3 SDRAM up to 32GB
- Rear I/O, USB2.0/3.0 dual Gigabit Ethernet, COM Port and SATA III ports support Intel RAID 0, 1, 5, 10.
- One PCIe x16 (Gen3), One PCIe x8 (Gen2, x4 signal), One PCIe x1 gold finger and two PCI slot.
- Intel® Active Management Technology 9.0

REAR I/O



ORDERING GUIDE

AB1-3B15	(R).RUBY-D720VG2AR Micro-ATX.IMB.LGA1150.CPU.Q87.DDR3/ VGA/HDMI/DVI/Dual GbE/COM/Audio/USB
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PACKING LIST

One RUBY-D720VG2AR ATX Industrial Main Board
One Installation DVD
One SATA III cable
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	AMI BIOS
Memory	Support up to 32GB DDR3 1333/1600 SDRAM on four 240-pin DIMM sockets (dual channel)
Storage Devices	- Support 5x SATA drives - 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 PCI Express x16 Gen3 up to 8.0 GT/s - 1x PCI Express x8 (PCIe x4 signal Gen2 up to 5.0 GT/s) - 2x PCI devices at 32 bit 33 MHz - 1x PCIe x1 gold 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 ALC892 HDA codec
Ethernet	- Intel® WGI218LM + WGI210AT gigabit ethernet controller - Dual 10BASE-T / 100BASE-TX / 1000BASE-T Etherne - Dual RJ-45 connector with two LED indicators
Serial Port	- 1x RS232 on rear I/O - 1x RS232/422/485 selectable port on rear I/O - 4x RS232 with header
USB	- 4x USB 3.0 Ports on rear I/O - 8x 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	- 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: Resolution up to 2560x1600 @ 60Hz - DVI-D: up to 1920x1200 @ 60Hz - HDMI: up to 1920x1200 @ 60Hz - Support Triple Display

Mechanical & Environment

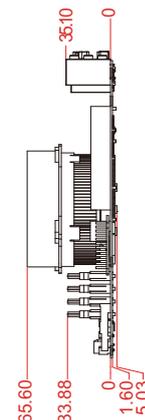
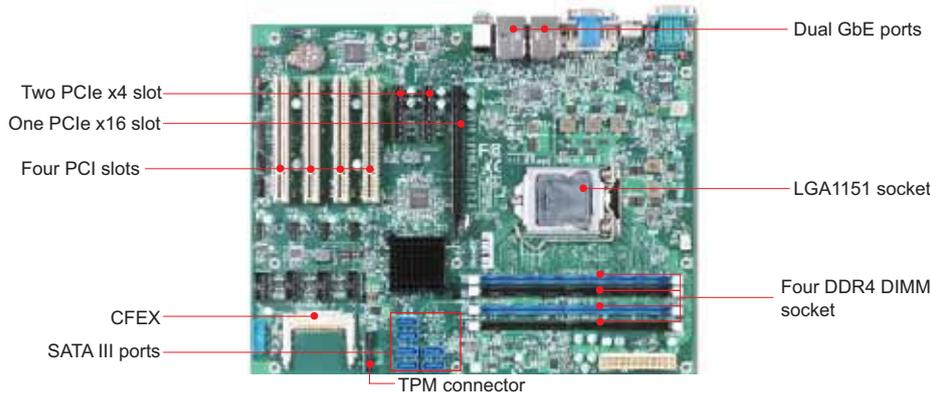
Dimension	- 243.8(L) x 243.8(W); 9.6"(L) x 9.6"(W) - PCB: 6 layers
Power Supply	ATX 24-pin power input
Environment	- Operation Temperature: 0-60 °C (with highest performance on 50 °C) - Storage Temperature: -20-80 °C - Relative Humidity: 5-90%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 120,000 hours at 40°C





RUBY-D718VG2AR

Leading Desktop Intel® 6th Gen Core™ processor ATX with DDR4 SDRAM, Triple Displays, Two GbE LAN ports, Six COM Ports

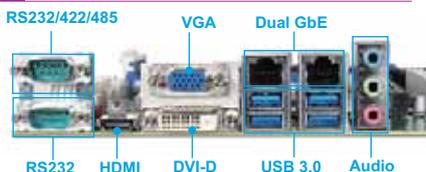


Portwell's RUBY-D718VG2AR features the Intel® Q170 chipset and the 6th generation Intel® Core™ processors in an LGA1151 socket. The processors support two-channel DDR4 DIMMs and PCI Express 3.0 to provide fast memory and I/O performance. On the other hand, it equipped six COM ports is capable of providing multiple controls for legacy systems. RUBY-D718VG2AR is suitable for medical, industrial automation, and digital signage application.

FEATURES

- Intel® 6th generation Core™ processors
- Supports four DDR4 2133/1866 Long-DIMM up to 64GB
- Supports Triple display by VGA, DVI-D, and HDMI
- Supports six SATA III ports
- Supports six Com ports
- Supports one PCIe x16, two PCIe x4, and four PCI

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.IMBLGA1151.CPU.C236 w/ECC 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® 6 th Gen Core™ Processors in LGA1151 package
Chipset	Intel® Q170 / C236 PCH
BIOS	AMI uEFI BIOS (SPI ROM)
Memory	Four DDR4 2133/1866 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 x16 Gen3 - 2x PCIe x4 Gen3 - 4x PCI

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

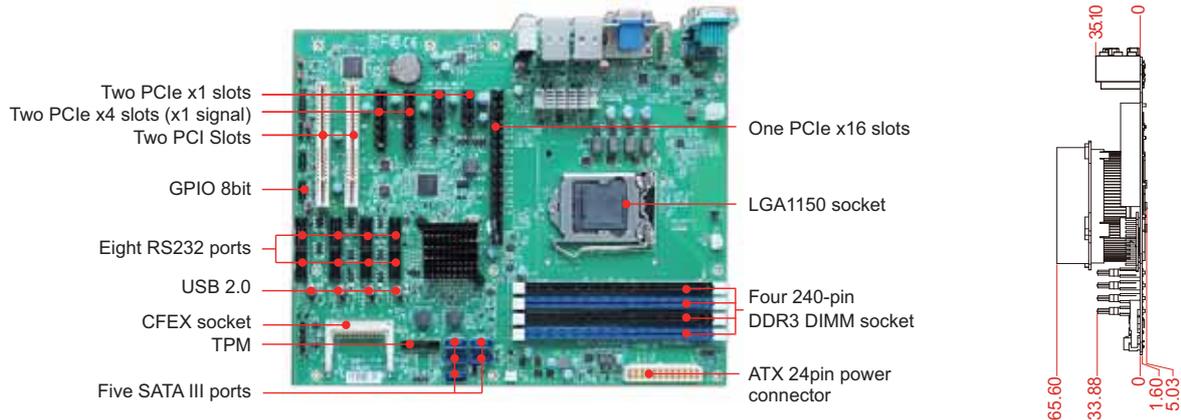
Graphic Controller	Intel® Gen 9 graphic engine supports DirectX 12, OpenGL 4.4
Display Interface	- DVI-D: one DVI-D port on rear I/O, up to 1920x1200@60Hz - HDMI: one HDMI port on rear I/O, up to 4096x2160 @ 24Hz - VGA: one VGA port on rear I/O, up to 1920x1200 @ 60Hz

Mechanical & Environment

Dimension	- 304.8(L) x 243.8(W);12"(L) x 9.6"(W)
Power Supply	24 Pin ATX power input
Environment	- Operation temperature: 0~60°C - Storage temperature: -20~80°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

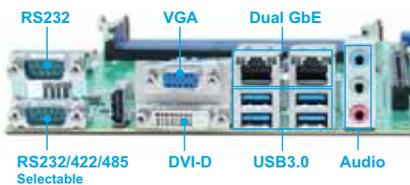


RUBY-D716VG2AR is based on Intel® Q87 chipset and desktop processor sku like Core™ i7 and i5. Build with PCI and PCI Express expansions, it is suitable for Medical, Industrial automation, and digital signage applications.

FEATURES

- Intel® Core™ i5 and i7 processor support
- Four 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.
- One PCIe x16 (Gen3), Two PCIe x4 (Gen2, x1 signal), Two PCIe x1 (Gen2), and two 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
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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	Phoenix UEFI BIOS
Memory	Support up to 32GB DDR3 1333/1600 SDRAM on four 240-pin DIMM sockets(dual channel)
Storage Devices	- Support 5x SATA drives - 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 PCI Express x16 Gen3 up to 8.0 GT/s - 2x PCI Express x4 (PCIe x1 signal Gen2 up to 5.0 GT/s) - 2x PCI Express x1 (Gen2 up to 5.0 GT/s) - 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 - PCI Express x1 interface based on GbE - Dual RJ-45 connector with two LED indicators
Serial Port	- 4x RS232 - 2x RS232/422/485 (support BIOS switch) - 4x RS232 optional (up to total 10 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: Resolution up to 2560x1600 @ 60Hz - DVI-D: up to 1920x1200 @ 60Hz - HDMI: up to 1920x1200 @ 60Hz - Support Triple Display

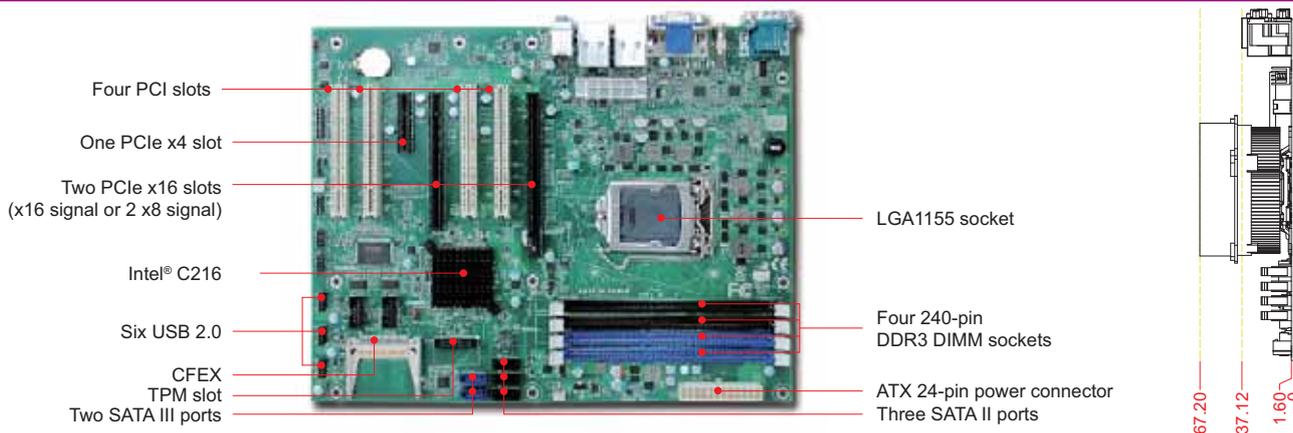
Mechanical & Environment

Dimension	304.8(L) x 243.8(W); 12"(L) x 9.6"(W) PCB: 6 layers
Power Supply	ATX 24-pin power input
Environment	- Operation Temperature: 0~60 °C - Storage Temperature: -20~80 °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
- Four 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
- Two PCIe x16 slots (Gen 3, x16 signal or 2 x8 signal), one PCIe x4 (Gen 2), and four PCI slots
- One 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	Phoenix UEFI BIOS
Memory	Supports up to 32GB DDR3 ECC and non-ECC 1333/1600 SDRAM on four 240-pin DIMM sockets (dual channel)
Storage Devices	- 2x SATA support 6Gb/s data transfer rate - 3x SATA support 3Gb/s data transfer rate - 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 PCI Express x16 slots (Gen 3, 8.0 GT/s, x16 signal or 2 x8 signal) - 1x PCI Express x4 slot (Gen 2, 5.0 GT/s) - 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 - PCI Express x1 interface based on gigabit ethernet - Dual RJ-45 connectors with two LED indicators at rear I/O panel
Serial Port	- 4x RS232 - 1x RS232 and 1x Selectable RS232/422/485 on rear I/O
USB	- 4x USB 3.0 ports on rear I/O (5 Gbps) - 6x USB 2.0 ports on board (480 Mb/s)
Keyboard & Mouse	PS/2 on board dedicated to keyboard & mouse
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

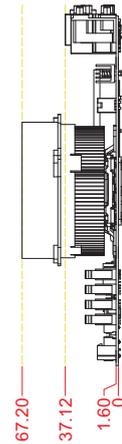
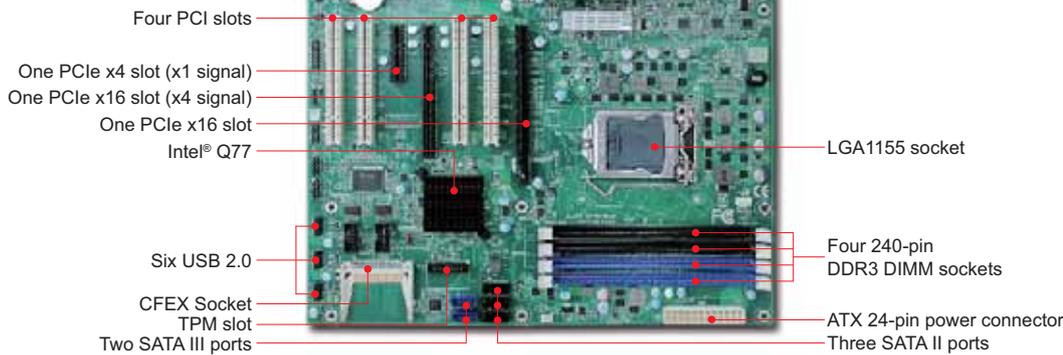
Graphic Controller	- Quad Core™ Processor with Intel® HD Graphics 4000 and Integrated Memory Controller - Provided improved 3D multimedia capabilities including Microsoft DirectX 11, Shader Model 4.0, MPEG-2 and OpenGL 3.1
Display Interface	- VGA: Resolution up to 2560x1600 @60Hz - DVI-D: up to 1920x1200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

Mechanical & Environment

Dimension	- 304.8(L) x 243.8(W)mm; 12"(L) x 9.6"(W) - PCB: 6 layers
Power Supply	ATX 24-pin power input
Environment	- Operation Temperature: 0~60 °C (with highest performance on 50 °C) - Storage Temperature: -20~80 °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
- Four 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
- One PCIe x16 (Gen 3), one PCIe x16 (Gen 2, x4 signal), one PCIe x4 (Gen 2, x1 signal), and four PCI slots
- One CFXE Slot (Only support CFXE 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
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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 SDRAM on four 240-pin DIMM sockets (dual channel)
Storage Devices	- 2x SATA support 6Gb/s data transfer rate - 3x SATA support 3Gb/s data transfer rate - Supports RAID 0, 1, 5, 10 - 1xCFXE(Only support CFXE 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 PCI Express x16 slot (Gen3, 8.0 GT/s) - 1x PCI Express x16 slot (with x4 signal Gen 2, 5.0 GT/s) - 1x PCI Express x4 slot (with x1 signal Gen 2, 5.0 GT/s) - 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 - PCI Express x1 interface based on gigabit ethernet - Dual RJ-45 connectors with two LED indicators at rear I/O panel
Serial Port	- 4x RS232 - 1x RS232 and 1x Selectable RS232/422/485 on rear I/O
USB	- 4x USB 3.0 ports on rear I/O (5 Gbps) - 6x USB 2.0 ports on board (480 Mb/s)
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: Resolution up to 2560x1600 @60Hz - DVI-D: up to 1920x1200 @60Hz - HDMI: up to 1920x1200 @60Hz

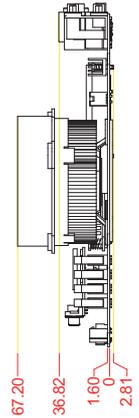
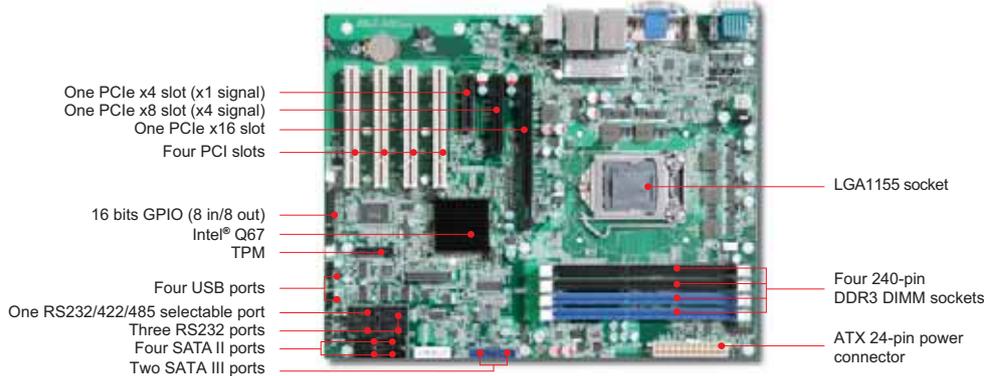
Mechanical & Environment

Dimension	- 304.8(L) x 243.8(W)mm; 12"(L) x 9.6"(W) - PCB: 6 layers
Power Supply	ATX 24-pin power input
Environment	- Operation Temperature: 0~60 °C (with highest performance on 50 °C) - Storage Temperature: -20~80 °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)
- Four 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
- One PCIe x16, one PCIe x8 (x4 signal), one PCIe x4 (x1 signal) and four 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
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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 support 6Gb/s data transfer rate - 4x SATA support 3Gb/s data transfer rate - 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 PCI Express x4 slot (Gen2, 5.0 GT/s) - 1x PCI Express x8 slot (Gen2, 5.0 GT/s) - 1x PCI Express x16 slot (Gen2, 5.0 GT/s) - 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 RS232 on board and 1x RS232/422/485 selectable on board - 1x RS232 on rear I/O and 1x RS232/422/485 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: Resolution up to 2048x1536 @75Hz - DVI-D: up to 1920x1200 @60Hz - HDMI: up to 1920x1200 @60Hz

Mechanical & Environment

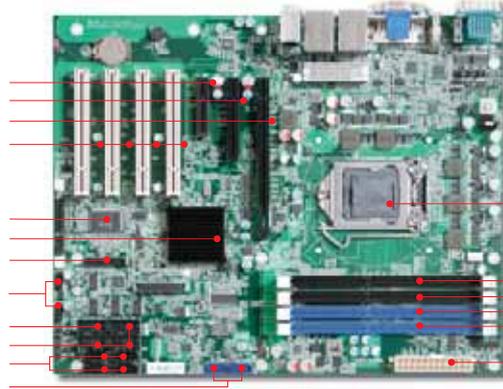
Dimension	304.8(L) x 243.8(W)mm; 9.6"(L) x 12"(W)
Power Supply	- Typical: +12V(CPU)@3.81A; +12V(System)@2.21A; +5V@2.3A; +3.3V@1.15A - Supports ATX mode
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE,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

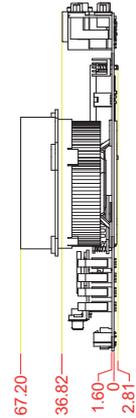
- One PCIe x4 slot (x1 signal)
- One PCIe x8 slot (x4 signal)
- One PCIe x16 slot
- Four PCI slots
- 16 bits GPIO (8 in/8 out)
- Intel® C206
- TPM
- Four USB ports
- One RS232/422/485 selectable port
- Three RS232 ports
- Four SATA II ports
- Two SATA III ports



LGA1155 socket

Four 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)
- Four 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
- One PCIe x16, one PCIe x8 (x4 signal), one PCIe x4 (x1 signal) and four PCI slots
- Intel® Active Management Technology 7.0

REAR I/O



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 support 6Gb/s data transfer rate - 4x SATA support 3Gb/s data transfer rate - 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 PCI Express x4 slot (Gen2, 5.0 GT/s) - 1x PCI Express x8 slot (Gen2, 5.0 GT/s) - 1x PCI Express x16 slot (Gen2, 5.0 GT/s) - 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 RS232 on board and 1x RS-232/422/485 selectable on board - 1x RS232 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

ORDERING GUIDE

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

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

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: Resolution up to 2048x1536 @75Hz - DVI-D: up to 1920x1200 @60Hz - HDMI: up to 1920x1200 @60Hz

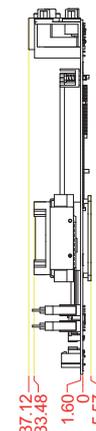
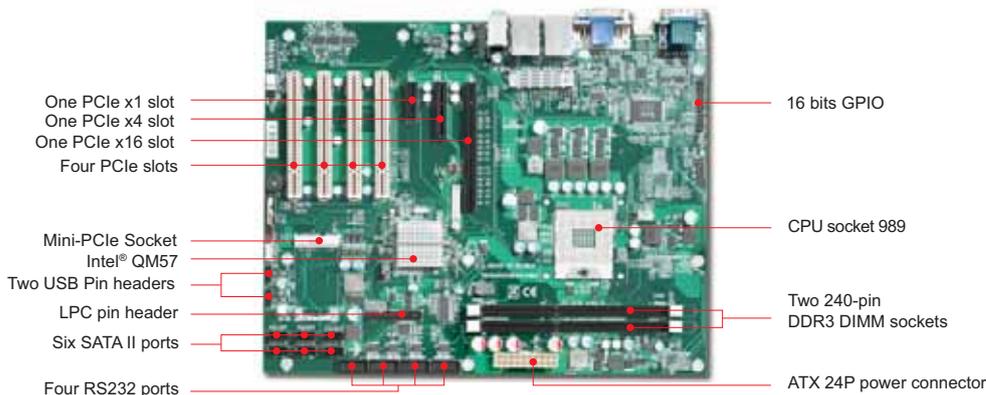
Mechanical & Environment

Dimension	304.8(L) x 243.8(W)mm; 9.6"(L) x 12"(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 to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE, FCC Class A
MTBF	Over 120,000 hours at 40°C



RUBY-M710VG2AR

Intel® Core™ i5/i7/P4500 processor based ATX with DDR3 SDRAM, Dual Display, Dual Gigabit Ethernet and USB Ports

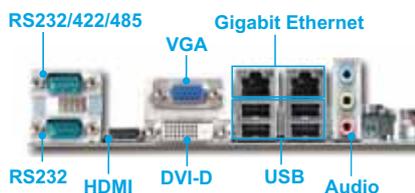


Built with latest mobile Intel® QM57 Express chipset which supports Intel® Core™ i5/ i7 processor, RUBY-M710VG2AR is based on the industrial ATX mother board making it the ideal solution for a Green PC. It can also be adopted in POS, medical, gaming, lottery, digital signage, surveillance security monitoring and kiosk.

FEATURES

- Intel® Core™ i7/i5/P4500 Processor (Quad Core CPU support)
- Intel® QM57 Chipset
- Two Long-DIMMs support dual channel DDR3 SDRAM up to 8GB
- Dual Display by VGA/DVI/HDMI/LVDS
- Intel® Active Management Technology (Intel® AMT 6.0)

REAR I/O



ORDERING GUIDE

AB1-3586	RUBY-M710VG2AR ATX IMB.QM57 w/o ECC PGA989.w/DDR3 DIMMs/VGA/LVDS/DVI/HDMI/Dual GbE/COM/ Audio/USB
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PACKING LIST

One RUBY-M710VG2AR ATX Main Board
One SATA II Cable
One Installation CD

GENERAL

Processor	- Intel® Core™ i7/i5/P4500 (1.6GHz/35W) Processor with 4/3/2MB L2 Cache in socket 989 - Supports Intel® Virtualization Technology (VT-x), Enhanced Intel SpeedStep® Technology, Thermal Monitoring Technologies, Intel® Fast/Flex Memory Access (P4500 only), Execute Disable Bit, Intel® HT Technology (i7/ i5 only)
Chipset	Intel® QM57 PCH (3.5W)
BIOS	AMI UEFI BIOS
Memory	Supports up to 8GB DDR3 800/1066 MHz SDRAM on two 240-pin DIMM sockets with dual channel mode
Storage Devices	- 6x SATA support 3Gb/s data transfer rate - RAID 0,1,5,10
Watchdog Timer	Programmable via S/W from 0.5 sec. to 254.5 min.
Hardware Monitoring	- System monitor (fan, temperature, voltage) - Temperature (CPU & System) - Voltage (CPU Vcore, 5VSB, 12V, 5V, 3.3V)
Expansion Interface	- 1x PCI Express x16 slot (Gen1, 2.5 GT/s) - 1x PCI Express x4 slot (Gen1, 2.5 GT/s) - 1x PCI Express x1 slot (Gen1, 2.5 GT/s) - 1x Mini-PCI Expressx1 socket (Gen1, 2.5 GT/s) - 4x PCI 32-bit slots

I/O INTERFACE

Super I/O	ITF IT8721F
Audio	- Intel® QM57 built-in High Definition Audio up to 192-Khz 24-bit -Realtek ALC888-GRLQFP48 codec -Audio Jack DIP Light Pink/Lime/Light Blue
Ethernet	- Intel® 82574L&82577LM dual Gigabyte Ethernet Controller Intel® 82574L & 82577LM - 2X RJ-45 connectors with two LED indicators
Serial Port	- 1x RS232/422/485 port on rear I/O - 1x RS232 on rear I/O and 4x RS232 on board
USB	- 4x USB 2.0 ports on rear I/O - 4x USB 2.0 ports on board with pitch 2.0 header - 480 Mb/s bus comprehends the high-speed/full-speed/low-speed data ranges
Keyboard & Mouse	1x PS/2 Keyboard & Mouse on board
GPIO	On board programmable 16-bit Digital I/Os

DISPLAY

Graphic Controller	- Intel® QM57 Graphics and Memory Controller Hub integrated Intel® Gen 6.0 integrated Graphics - Chronitel: HDMI level shifter
Display Interface	- VGA: Resolution up to 2048x1536 @75Hz - DVI-D: up to 1920x1200 @60Hz - LVDS: up to 1600x1200 @66Hz - HDMI: up to 1920x1200 @60Hz

Mechanical & Environment

Dimension	304.8(L) x 243.8(W)mm; 12"(L) x 9.6"(W)
Power Supply	- Typical: +12V(CPU)@3.5A; +12V(System)@2A; +5V@4A; +3.3V@1.5A - Supports ATX mode
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5% to 90%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 80,000 hours at 40°C





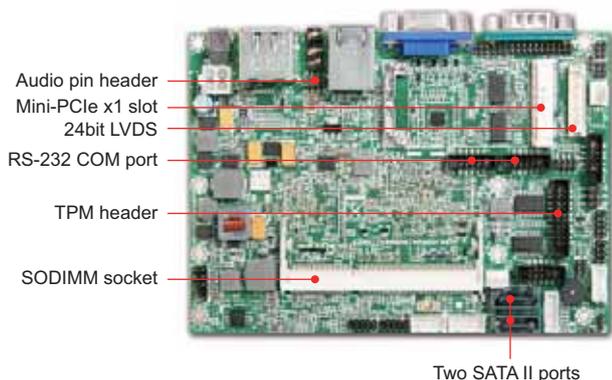
ESB Reference Table



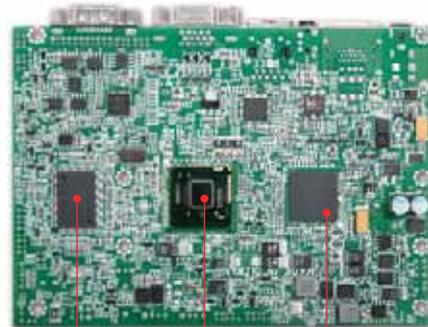
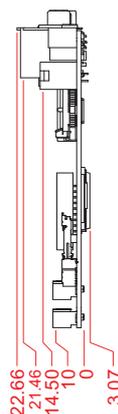
MODEL	PEB-2772	PEB-2771/2781	PEB-2770/2780
Form Factor	3.5" Embedded	3.5" Embedded	3.5" Embedded
CPU	Intel® Atom™ D2550	Intel® Atom™ D525 /N455	Intel® Atom™ processor D510/Z450
Chipset	Intel® NM10	Intel® ICH8M	Intel® ICH8M
BIOS	Phoenix	AMI Core™ 8	AMI Core™ 8
Memory	1x DDR3 SODIMM up to 4GB	1x DDR3 SODIMM up to 2GB	1x DDR2 SODIMM up to 2GB
Expansion	1x Mini-PCIe x1 socket	1x Mini-PCIe x1 socket	1x PCIe x1 slot
Display	VGA/HDMI/LVDS	VGA/LVDS	VGA/LVDS
Audio	Realtek ALC886 Audio codec	Realtek ALC892-GR HD Audio codec	Realtek ALC262-VC2-GR HD Audio codec
LAN	1x GbE	2x GbE	2x GbE
Serial Port	2x RS232 2x RS232/422/485	2x RS232 2x RS232/422/485	2x RS232 2x RS232/422/485
USB	6x USB 2.0	6x USB 2.0	6x USB 2.0
Storage Devices	2xSATA	2x SATA 1x CF	2x SATA 1x IDE 1x CF
GPIO	8-bit	8-bit	8-bit
Others	PS/2 KB&MS	PS/2 KB&MS	PS/2 KB&MS
Dimension	146 x 102mm	146 x 102mm	146 x 102mm
Page	44	45	46

PEB-2772

Intel® Cedar Trail Atom™ Processor based 3.5' embedded Board with DDR3 SDRAM, Gigabit Ethernet, Two SATA Ports, Four COM ports and 12V DC input



Two SATA II ports



Winbond W83627UHG
Intel® D2550 Intel® NM10

PEB-2772 takes advantage of the processor's performance and furthermore Portwell design the CPU/chipset on the backside of the board which is good for system thermal design. Customer could take this advantage to have an easy and perfect thermal solution which could solve the thermal of CPU.

FEATURES

- Intel® Atom™ D2550 processor
- Intel® NM10 Chipset
- One 204-pin SODIMM supports single channel DDR3 SDRAM up to 4GB
- Dual display: VGA/LVDS(24-bit)/HDMI
- One Mini-PCIe slot
- Two SATA 3Gb ports
- Four COM ports (3x RS232, 1x RS232/422/485)
- 12V DC input

REAR/I/O



ORDERING GUIDE

AB1-3791	(R).PEB-2772VGM Intel® Cedar Trail 1.86G D2550+NM10 on Board.EBC.w/DDR3/VGA/HDMI/GbE/COM/Audio/USB
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PACKING LIST

One PEB-2772 Main Board
One Thermal Kit
One Installation CD
One SATA Cable

GENERAL

Processor	- Intel® Atom™ D2550(1.86GHz, 10W) processor in FCBGA559 package - Supports Intel® Hyper-Threading Technology, Intel® 64
Chipset	Intel® NM10 Express chipset
BIOS	Phoenix BIOS
Memory	Supports up to 4GB DDR3 800/1066 MHz SDRAM on one 204-pin SODIMM socket
Storage Devices	2x SATA II supporting up to 3.0Gb/s data transfer rate
Watchdog Timer	Programmable via S/W from 1 sec. to 255 min.
Hardware Monitoring	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion Interface	1x Mini-PCIe slot (Gen 1, 2.5 GT/s)

I/O INTERFACE

Super I/O	Winbond W83627UHG
Audio	- Intel® NM10 built-in High Definition Audio up to 96-kHz 24-bit - Realtek ALC886, 7.1+2 channel - Audio Jack on rear I/O (Line out) - Line in /Line out /Mic in on board pin header
Ethernet	- Intel® 82583V Gigabit Ethernet controller - 1x RJ45 connector on rear I/O
Serial Port	- 1x RS232 port with DB9 connector on rear I/O - 2x RS232 with on board pin headers - 1x RS232/422/485 with on board pin header
USB	- 1x USB 2.0 ports on rear I/O - 5x USB 2.0 ports on board with pitch 2.0 header - 480 Mb/s bus comprehends the high-speed/full-speed/low-speed data ranges
Keyboard & Mouse	1x PS/2 Keyboard & Mouse on board header
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

Graphic Controller	- Intel® Graphics Technology provides a visually stunning experience optimized for Blu-ray and HD video with Windows Vista support - Supports DirectX 9 compliant Pixel Shader v3.0 and OGL 3.0
Display Interface	- VGA: analog resolution up to 1920x1200 on rear I/O - HDMI: resolution up to 1920x1200 on rear I/O - LVDS: Digital 24-bits LVDS resolution up to 1440x900 on board

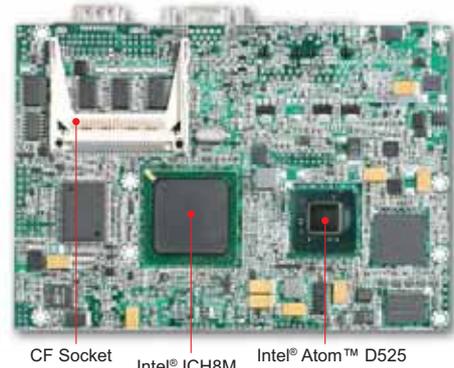
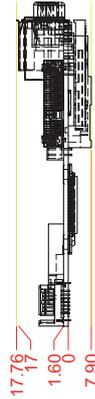
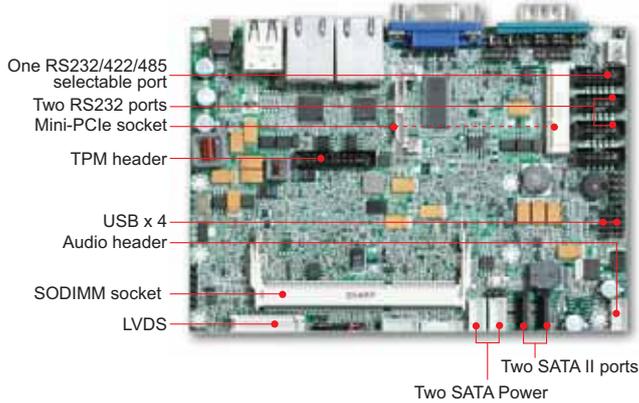
Mechanical & Environment

Dimension	146(L) x 102(W)mm; 5.75"(L) x 4.02"(W)
Power Supply	DC-12V input
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C



PEB-2771/2781

3.5" Embedded size, based on Intel® 45nm Low Power Pineview processor with DDR3 SODIMM, dual display by VGA/LVDS, Dual GbE, Audio, COM and USB

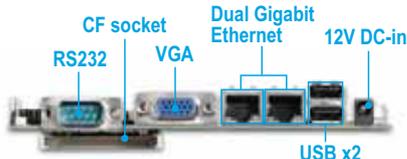


The PEB-2771/2781 takes advantage of the latest Intel® Atom™ technologies. It supports DDR3 SDRAM, dual gigabit ethernet and one expansion Mini PCI Express x1 socket. Based on Intel® Atom™ solutions, the fanless PEB-2771/2781 executes high performance with low power dissipation. Therefore, it's applied to Panel PC, Kiosk, DS, Medical, Military and industrial automation.

FEATURES

- Intel® Atom™ processor D525 and ICH8M chipset
- One 204-pin SODIMM supports DDR3 800MHz SDRAM up to 2GB (PEB-2781 support DDR3 667MHz SDRAM)
- Dual independent display: VGA/24-bit LVDS
- Dual Gigabit Ethernet
- Storage: One Compact Flash/Two SATA ports
- 12V DC input
- One Mini-PCIe socket

REAR/IO



ORDERING GUIDE

AB1-3563	PEB-2771VG2ATM Intel® Pineview 1.8G D525 on Board.EBC.w/DDR3/VGA/Dual GbE/COM/Audio/USB
AB1-3564	PEB-2781VG2ATM Intel® Pineview 1.66G N455 on Board.EBC.w/DDR3/VGA/Dual GbE/COM/Audio/USB

PACKING LIST

One PEB-2771/2781 Main Board
One Thermal Kit
One Installation CD
One SATA Cable
One ATX Power Cable

GENERAL

Processor	- Intel® Atom™ Processor D525 (1.80Ghz, 13W)/N455 (1.66Ghz, 6.5W) with 1M/512K L2 Cache in FCBGA559 package - DMI: 2.5 GT/s - Supports Intel® Hyper-Threading Technology, Intel® 64 Architecture, SpeedStep® Technology (N455 only), Thermal Monitoring Technology (N455 only)
Chipset	Intel® ICH8M (2.4W) supports Intel® AHCI Technology.
BIOS	AMI Core 8 BIOS
Memory	- PEB-2771 support up to 2G DDR3 800 MHz SDRAM on one 204-pin SODIMM socket - PEB-2781 support up to 2G DDR3 667 MHz SDRAM on one 204-pin SODIMM socket
Storage Devices	- 2x SATA II support 3.0Gb/s data transfer rate - 1x CompactFlash socket supports Ultra DMA100/66/33 MB/s
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
Hardware Monitoring	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion Interface	1x Mini PCIeExpress x1 socket (Gen 1, 2.5 GT/s)

I/O INTERFACE

Super I/O	Winbond W83627UHG
Audio	- Intel® ICH8M built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC892-GR HDA codec, 7.1+2 channels - Audio on board header with Line-out and Mic-in
Ethernet	- Intel® WG82567V gigabit phy and 82583V Gigabit Ethernet controllers - 2x RJ45 connectors on rear I/O
Serial Port	- 1x RS232/422/485 port with DB9 connector on rear I/O - 2x RS232 with on board pin headers - 1x RS232/422/485 with on board pin header
USB	- 2x USB 2.0 ports on rear I/O - 4x USB 2.0 ports on board with pitch 2.0 header - 480 Mb/s bus comprehends the high-speed/full-speed/low-speed data ranges
Keyboard & Mouse	1x PS/2 Keyboard & Mouse on board header
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

Graphic Controller	- Intel® ICH8M Integrated GMA 3150 Graphics supports full hardware acceleration of video decode standards MPEG-2 - Supports Intel® Dynamic Video Memory Technology (Intel® DVMT 4.0) - XILINX XC3S200AN LVDS Transmitter
Display Interface	- LVDS: Dual channel 24-bit LVDS - VGA: One DB-15 connector on rear I/O, resolution up to 2048 x 1536 (QXGA)

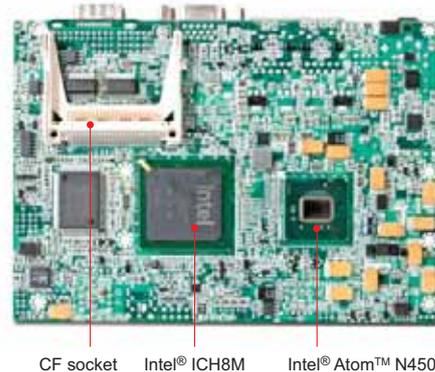
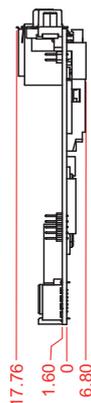
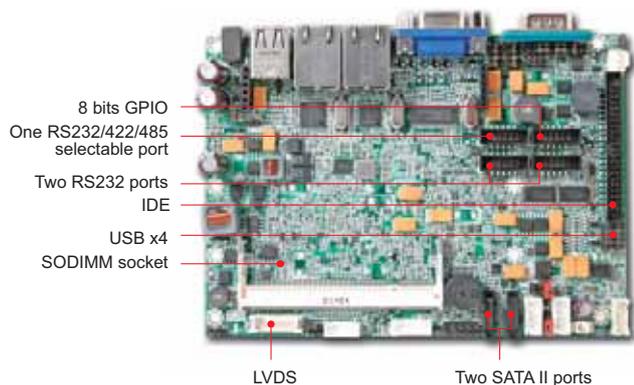
Mechanical & Environment

Dimension	146(L) x 102(W)mm; 5.75"(L) x 4.02"(W)
Power Supply	DC-12V input
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 120,000 hours at 40°C



PEB-2770/2780

3.5" Embedded size, based on Intel® 45nm Low Power Pineview processor with DDR2 SODIMM, dual display by VGA/LVDS, Dual GbE, Audio, COM and USB

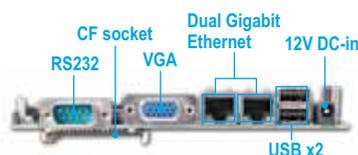


The PEB-2770/2780 takes advantage of the latest Intel® Atom™ technologies. It supports DDR2 SDRAM, dual gigabit ethernet and one expansion PCI Express x1 female header. Based on Intel® Atom™ solutions, the fanless PEB-2770/2780 executes high performance with low power dissipation. Therefore, it's applied to Panel PC, Kiosk, DS, Medical, Military and industrial automation.

FEATURES

- Intel® Atom™ processor D510/N450 and ICH8M chipset
- MPEG2 Decode in HW; Dual independent display: VGA/18-bit LVDS
- Dual Gigabit Ethernet
- Customization (Extension card): BTB connector with PCIe x1 signal
- Storage: One SATA/One CompactFlash/Two SATA ports
- 12V DC input

REAR/IO



ORDERING GUIDE

AB1-3588	PEB-2770VG2A Intel® Pineview 1.66G D510 on Board without Thermal module.EBC.w/VGA/Dual GbE/COM/Audio/USB
AB1-3589	PEB-2780VG2A Intel® Pineview 1.66G N450 on Board without Thermal module.EBC.w/VGA/Dual GbE/COM/Audio/USB

PACKING LIST

One PEB-2770/2780 Main Board
One Thermal Kit
One Installation CD
One SATA Cable
One ATX Power Cable

GENERAL

Processor	- Intel® Atom™ Processor D510 (1.66Ghz, 13W)/N450 (1.66Ghz, 5.5W) with 1M/512K L2 Cache in FCBGA437 package - DMI: 2.5 GT/s - Supports Intel® Hyper-Threading Technology, Intel® 64 Architecture, SpeedStep™ Technology (N450 only), Thermal Monitoring Technology (N450 only)
Chipset	Intel® ICH8M (2.4W) supports Intel® AHCI Technology.
BIOS	AMI Core 8 BIOS
Memory	Supports up to 2GB DDR2 667 MHz SDRAM on one 200-pin SODIMM socket
Storage Devices	- 2x SATA II supports 3.0Gb/s data transfer rate - 1x CompactFlash socket supports Ultra DMA100/66/33 MB/s - 1x IDE connector supports Ultra DMA100/66/33 MB/s
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
Hardware Monitoring	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion Interface	1x PCIExpressx1 female header (Gen 1, 2.5 GT/s)

I/O INTERFACE

Super I/O	Winbond W83627UHG
Audio	- Intel® ICH8M built-in High Definition Audio up to 192-kHz 32-bit - Realtek ALC262-VC2-GR HDA codec, 5.1 channels - Audio on board header with Line-in, Line-out and Microphone
Ethernet	- Intel® WG82567V gigabit phy and 82583V Gigabit Ethernet controllers - 2x RJ45 connectors on rear I/O
Serial Port	- 1x RS232/422/485 port with DB9 connector on rear I/O - 2x RS232 with on board pin headers - 1x RS232/422/485 with on board pin header
USB	- 2x USB 2.0 ports on rear I/O - 4x USB 2.0 ports on board with pitch 2.0 header - 480 Mb/s bus comprehends the high-speed/full-speed/low-speed data ranges
Keyboard & Mouse	1x PS/2 Keyboard & Mouse on board header
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

Graphic Controller	- Intel® D510/N450 integrated Generation 3.5/2.5 graphics, supports DX9 Graphics up to 400MHz/200MHz - Supports Intel® Dynamic Video Memory Technology (Intel® DVM T 3.0)
Display Interface	- LVDS: Single channel 18-bit LVDS, resolution up to 1366x768, 18bpp - VGA: One DB-15 connector on rear IO, resolution up to 2048 x 1536 (QXGA)

Mechanical & Environment

Dimension	146(L) x 102(W)mm; 5.75"(L) x 4.02"(W)
Power Supply	DC-12V input
Environment	- Operation Temperature: 0°C to 60°C - Storage Temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 120,000 hours at 40°C



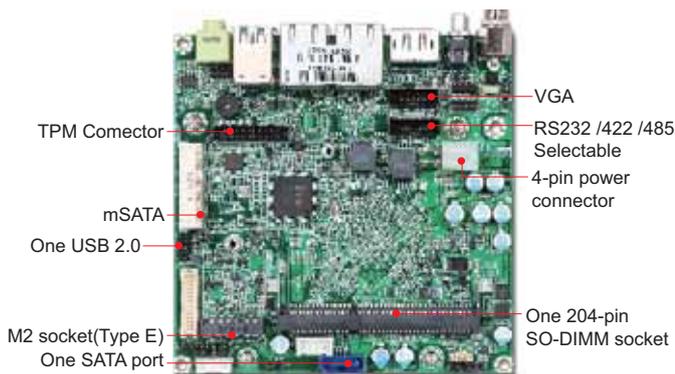
NANO-ITX Reference Table



MODEL	NANO-6061	NANO-6050	NANO-6060	NANO-5050	NANO-6040
Form Factor	NANO-ITX	NANO-ITX	NANO-ITX	NANO-ITX	NANO-ITX
CPU	Intel® Pentium®/Celeron® N3000 Family	Intel® 5 th Gen Core® i5/i3 ULT Processor	Intel® Atom™ E3800 Family	Intel® Atom™ D2550/N455	Intel® Atom™ E6X0T
Chipset	N/A	N/A	N/A	Intel® NM10	Intel® EG20T
BIOS	AMI UEFI	AMI UEFI	Phoenix UEFI	Phoenix UEFI	AMI UEFI
Memory	1x DDR3L SODIMM up to 8GB	1x DDR3L SODIMM up to 8GB	1x DDR3L SODIMM up to 4GB	1x DDR3 SODIMM up to 4GB	DDR2 on board up to 2GB
Expansion	1x M.2 socket (Type E)	1x Half Size Mini-PCIe socket	1x PCIe x1 slot 1x Half Size Mini-PCIe socket	1x PCIe x1 slot 1x Mini-PCIe x1 socket	1x PCIe x1 slot 1x Mini-PCIe x1 socket
Display	VGA/LVDS/DP	LVDS/ 2x Mini DP	VGA/LVDS/DP	VGA/LVDS/DP	VGA/LVDS
Audio	Realtek ALC892 HDA codec	Realtek ALC892 HDA codec	Realtek ALC892-GR HDA codec	Realtek ALC886-GR HDA codec	Realtek ALC892-GR HDA codec
LAN	2x GbE	2x GbE	2x GbE/ 1x GbE	1x 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	1x USB 2.0 2x USB 3.0	2x USB 2.0 4x USB 3.0	2x USB 2.0 4x USB 3.0	6x USB 2.0	6x USB 2.0
Storage Devices	1x SATA III 1x mSATA 1x SD socket	1x SATA III 1x mSATA	2x SATA II 1x Micro-SD socket	1x SATA II 1x CF-SATA	2x SATA II 1x SD socket
GPIO	8-bit	8-bit	8-bit	8-bit	8-bit
Dimension	120x 120mm	120x 120mm	120 x 120mm	120 x 120mm	120 x 120mm
Page	48	49	50	51	52

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.

REAR I/O



FEATURES

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

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 N3000 series Processor (up to 6W) - With 2MB Cache
BIOS	AMI uEFI BIOS
Memory	One DDR3L 1600/1333 SO-DIMM up to 8GB
Storage Devices	- One SATA III port - One 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 (Type E)

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: one DB-15 on board connector, up to 2560x1600 - DP: one DP port on rear I/O, up to 3840x2160

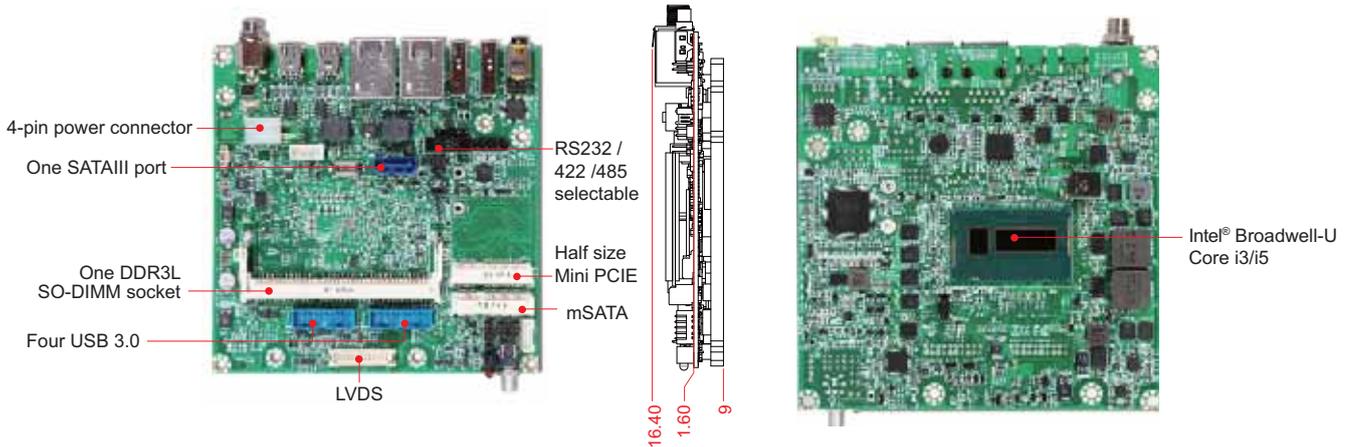
Mechanical & Environment

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



NANO-6050

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

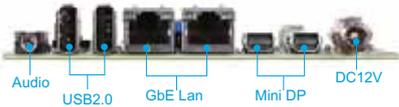


NANO-6050 build with Intel® 5th Gen Core™ i5/ i3 ULT processor and takes advantages of Intel® Core™ mobile processor technologies such as Hyper-Threading, high performance, and low power consumption. Portwell NANO-6050-based systems are ideal for passively cooled and hermetically sealed systems that 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 SO-DIMM up to 8GB
- Supports Triple display by Dual mini DP ports , and dual channel 24 bit LVDS
- Supports one SATA III, one mSATA, and four USB 3.0 ports
- Supports one 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	One DDR3L 1600/1333 SO-DIMM up to 8GB
Storage Devices	- One SATA III port - One mSATA socket
Watchdog Timer	Programmable by embedded controller
Hardware Monitoring	- Temperature (CPU & System) - Voltage (CPU Vcore, 12V, 5V, 3.3V, RAM)
Expansion Interface	One 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® I218AT 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

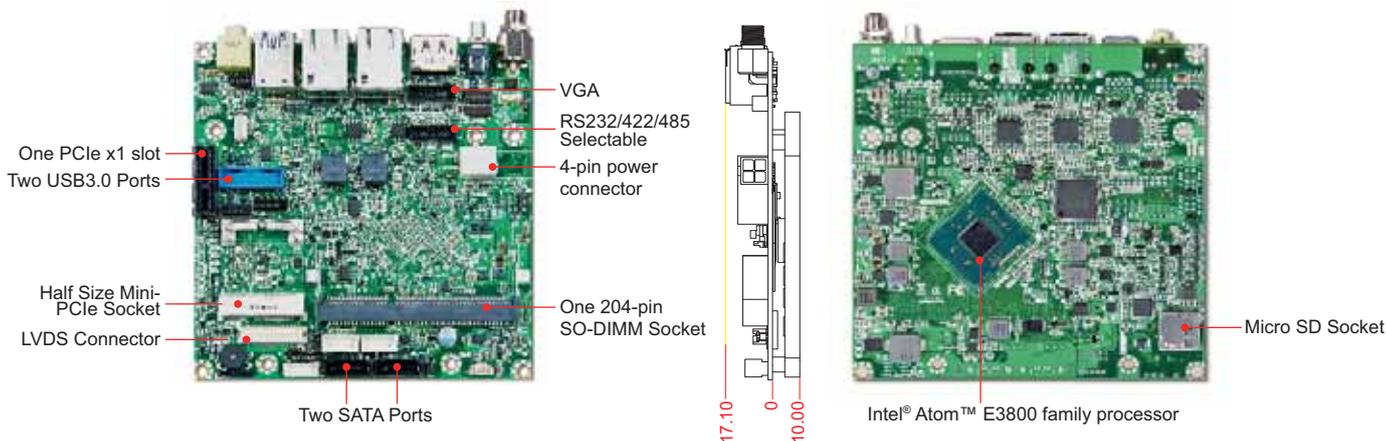
Mechanical & Environment

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



NANO-6060

Intel® Atom™ E3800 family SoC based NANO-ITX. Board with dual display, 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..

REAR I/O



FEATURES

- Intel® Valleyview-I SoC based platform
- One 204-pin SODIMM supports DDR3L up to 4GB
- Multiple display by VGA, DP, dual channel 24 bit LVDS
- Supports two SATA 2.0 ports, one micro SD socket, and four USB 3.0 ports
- One half size Mini-PCIe socket and PCIe x1 slot for expansion
- Supports DC 12V input

ORDERING GUIDE

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

PACKING LIST

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

GENERAL

Processor	- Intel® Atom™ E3800 family processor - Cache up to 2MB (for Quad Core) - DPM (Defect Per Million devices) <50 - Support Intel® VT-x technology
BIOS	Phoenix EFI BIOS
Memory	Support up to 4GB DDR3L 1066/1333 SDRAM on one 204pin SO-DIMM
Storage Devices	- Two SATA 2.0 - One 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 PCI Expressx1 slot - 1x half size Mini-PCIe slot

I/O INTERFACE

Audio	- HDA controller integrated in Intel® SoC - Realtek ALC892 HDA codec, Audio Jack on rear I/O with Line-out and on board pin header with Line-in, Line-out, and Mic-in
Ethernet	- 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 RS232/422/485 on board connector (selected by bios)
USB	- 2x USB 3.0 ports on rear I/O - 2x USB 2.0 and 2x USB 3.0 ports on board with pitch 2.0 header
GPIO	8bit configurable controlled by embedded controller

DISPLAY

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

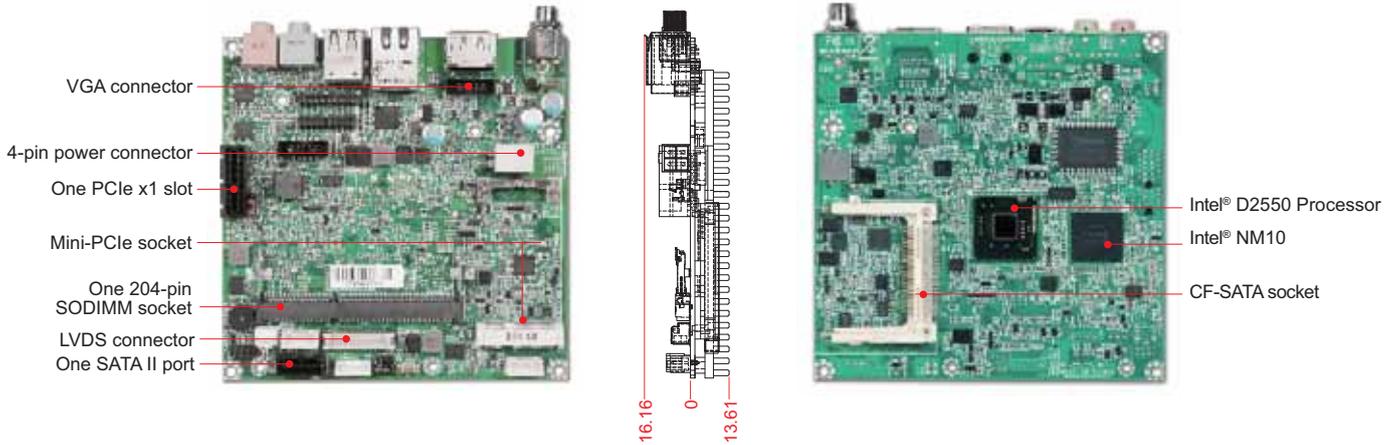
Mechanical & Environment

Dimension	120(L) x 120(W)mm; 4.72"(L) x 4.72"(W)
Power Supply	DC 12V input
Environment	- Operation temperature: -40~80°C - Storage temperature: -40~80°C - Relative humidity : 5~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000hrs at 55°C



NANO-5050

Intel® Atom™ D2550 processor based NANO-ITX Board with dual display, Gigabit Ethernet, Audio, USB, CF-SATA and SATA

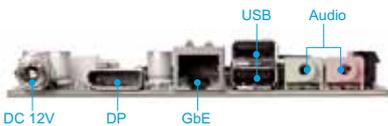


NANO-5050 adopts latest Intel® Atom™ D2550 CPU and NM10 chipset which is for the low power compact size system. The new architecture integrates the 3D graphics engine and memory controller. It's suitable for Medical and Networking applications.

FEATURES

- Intel® Atom™ D2550 1.86GHz processor based on Intel® NM10 platform
- One 204-pin SODIMM supports DDR3 up to 4GB
- Multiple display by VGA, DP, single channel 24 bit LVDS
- Supports one CF-SATA socket and one SATA port
- One Mini-PCIe socket and PCIe x1 slot for expansion
- Supports DC 12V input

REAR I/O



ORDERING GUIDE

AB1-3863	(R).NANO-5050 Nano-ITX ESB. Intel® ATOM D2550 1.86GHz.w/ DDR3 SO-DIMM/VGA/LVDS/DP/GbE LAN/CF-SATA
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PACKING LIST

One NANO-5050 NANO-ITX Main Board
One passive Heatsink
One Installation CD

GENERAL

Processor	- Intel® Atom™ Processor D2550 (1.86GHz, 10W) with 1MB L2 Cache in FCBGA559 package - FSB: 400/533MHz - Supports Intel® Hyper-Threading Technology
Chipset	Intel® NM10 Express chipset
BIOS	Phoenix uFEI BIOS (SPI ROM)
Memory	Supports up to 4GB DDR3 800/1066 MHz SDRAM on one 204-pin SODIMM socket
Storage Devices	- 1x CF-SATA (supports CF and CF-SATA card) - 1x SATA supports 3Gb/s data transfer rate
Watchdog Timer	- Programmable via S/W from 1 sec. to 255 sec.
Hardware Monitoring	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion Interface	- 1x PCI Expressx1 slot (Gen 1, 2.5 GT/s) - 1x Mini-PCIe slot (Gen 1, 2.5 GT/s)

I/O INTERFACE

Super I/O	Winbond W83627DHG-PT
Audio	- Intel® NM 10 built-in High Definition Audio up to 96-kHz 24-bit - Realtek ALC886-GRHDA codec, Audio Jack on rear I/O with Line-out and Mic-in
Ethernet	- Intel® 82583V Gigabit Ethernet controller - 1x RJ45 connector on rear I/O
Serial Port	1x RS232/422/485 on board connector
USB	- 2x USB 2.0 ports on rear I/O - 4x USB 2.0 ports on board with pitch 2.0 header - 480 Mb/s bus comprehends the high-speed/full-speed/low-speed data ranges
GPIO	On board programmable 8-bit Digital I/Os

DISPLAY

Graphic Controller	- Intel® Atom™ D2550 integrated Intel® GMA 3650 supports full hardware acceleration of video decode standards, such as DirectX 9
Display Interface	- LVDS: Single channel 24bit LVDS on board connector, resolution up to 1440x900 - VGA: One on-board DB-15 connector, resolution up to 1920x1200 (WUXGA) - DP: One DP port on rear I/O, resolution up to 2560x1600

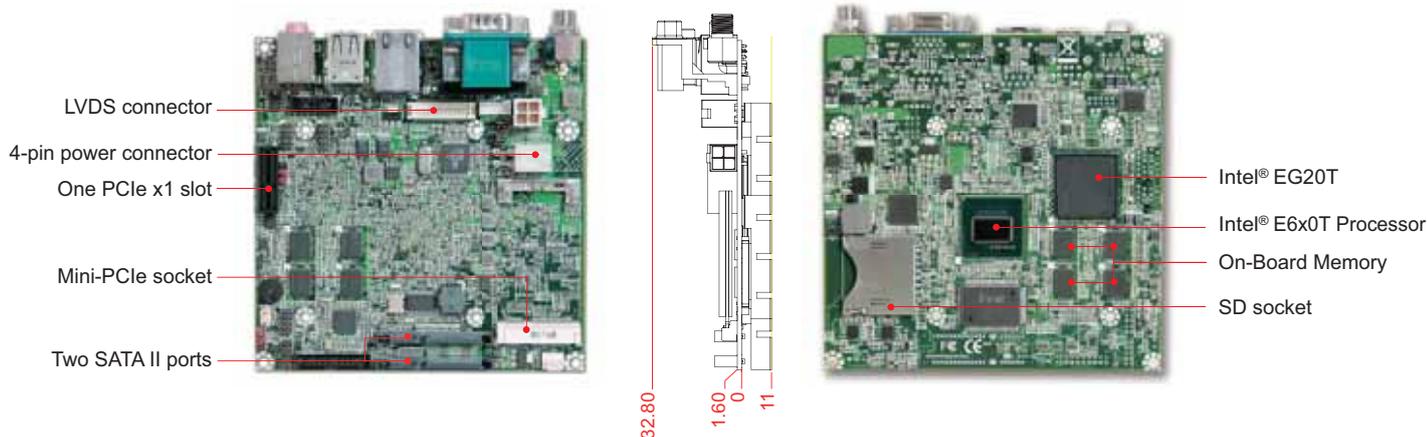
Mechanical & Environment

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



NANO-6040

Intel® Atom™ E6X0T processor based
NANO-ITX Board with dual display,
Gigabit Ethernet, Audio, USB, CAN,
SD and SATA

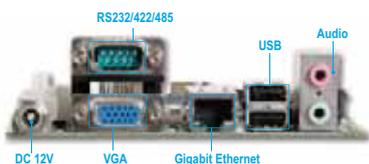


NANO-6040 adopts Intel's latest wide temperature Atom™ processors, which is for the small ultra low power form factor. The new architecture integrates the 3D graphics engine and memory controller making it suitable for critical environments. The board also comes equipped with a CAN bus connector for vehicle application.

FEATURES

- Intel® Atom™ E6X0T processor based on Intel® EG20T platform
- Dual independent display: VGA and single channel 18/24-bit LVDS
- One SD socket, two SATA II ports, one Gigabit Ethernet
- Supports iTPM function for more secure platforms
- One Mini-PCIe socket and PCIe x1 slot for Expansion
- Supports DC 12V input

REAR/I/O



ORDERING GUIDE

AB1-3745	(R).NANO-6040-1600-1024 Nano-ITX ESB.Intel® Tunnel Creek E680T 1.6GHz.w/1GB SDRAM/VGA/LVDS/GbE LAN/ Audio/USB
AB1-3746	(R).NANO-6040L-1000-1024 Nano-ITX ESB.Low profile type.Intel® Tunnel Creek E640T 1.0GHz.w/1GB SDRAM/VGA/ LVDS/GbE LAN/Audio/USB
AB1-3747	(R).NANO-6040L-1600-1024 Nano-ITX ESB.Low profile type.Intel® Tunnel Creek E680T 1.6GHz.w/1GB SDRAM/VGA/ LVDS/GbE LAN/Audio/USB

PACKING LIST

One NANO-6040 NANO-ITX Main Board
One passive Heatsink
One Installation CD

GENERAL

Processor	- Intel® Atom™ E620T (600MHz,3.3W), E640T (1.0GHz, 3.6W), E660T(1.33GHz, 3.6W), E680T (1.6GHz, 4.5W) with 512K L2 Cache in FCBGA676 - FSB: 400MHz - Supports Intel® Virtualization Technology (VT-x), Intel® Thermal Monitoring Technology, Enhanced Intel SpeedStep® Technology, Hyper-Threading Technology
Chipset	Intel® Platform Controller Hub EG20T (1.55W)
BIOS	AMI UEFI BIOS
Memory	Supports up to 2GB DDR2 667/800 MHz on-board SDRAM
Storage Devices	- 2x SATA II support 3.0Gb/s data transfer rate - 1x SD socket supports 24MHz (SDIO Revision 1.1)
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
Hardware Monitoring	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion Interface	1x PCI Expressx1 slot (Gen 1, 2.5 GT/s) 1x Mini PCI Express socket (Gen 1, 2.5 GT/s)

I/O INTERFACE

Super I/O	ITE IT8783F
Audio	- Intel® processor built-in High Definition Audio up to 192-kHz 24-bit - Realtek ALC892-GR HDA codec - Audio Jack on rear I/O with Line-out and Mic-in (NANO-6040) - Audio Jack on rear I/O with Line-out (NANO-6040L) - Audio on board header with Line-out and Mic-in
Ethernet	- Intel® WG82574IT Gigabit Ethernet controller - 1x RJ45 connector on rear I/O
Serial Port	- 1x RS232/422/485 port with DB-9 connector on rear I/O (NANO-6040) - W/o serial port on rear I/O (NANO-6040L)
USB	- 2x USB 2.0 ports on rear I/O - 4x USB 2.0 ports on board with pitch 2.0 header - 480 Mb/s bus handles high-speed/full-speed/low-speed data ranges
GPIO	On board programmable 8-bit Digital I/Os
Others	TPM header, I2C header, CAN bus header

DISPLAY

Graphic Controller	- Intel® processors integrated graphic engine supports frequency up to 400MHz, OpenGL ES2.0, OpenVG 1.1 - Chrontek CH7317B-TF SDVO to RGB DAC
Display Interface	- LVDS: single channel 18/24-bit LVDS up to 1280x768 (WXGA) - CRT: resolution up to 1280 x1024 (SXGA)

Mechanical & Environment

Dimension	120(L) x 120(W)mm; 4.72"(L) x 4.72"(W)
Power Supply	DC-12V input
Environment	- Operation Temperature: -40°C to 80°C - Storage Temperature: -40°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE,FCC Class A
MTBF	126,104 hours at 40°C





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-8020	WADE-8079	WADE-8078
Form Factor	MINI-ITX	MINI-ITX	MINI-ITX	MINI-ITX
CPU	Intel® 4 th Dual/Quad processor in FCBGA1364	Intel® Core™ i5/i7	Intel® Atom™ E3800 family	Intel® Atom™ E3800 family
Chipset	Intel® QM87 PCH	Intel® QM57 PCH	N/A	N/A
BIOS	AMI UEFI	AMI UEFI	Phoenix	AMI UEFI
Memory	2x DDR3L SODIMM up to 16GB	2x DDR3 SODIMM up to 8GB	1x DDR3L SODIMM up to 8G	1x DDR3L ECC SODIMM up to 4G
Expansion	1x PCIe x16 slot 2x Mini-PCIe socket 1x PCIe x1 Gold Finger	1x PCI slot 1x PCIe x1 slot 1x Mini PCIe socket	1x PCIe x1 slot 2x Mini-PCIe socket	1x PCIe x4 slot 1x Mini PCIe socket
Display	DVI-I/LVDS/DP/HDMI	VGA/DVI/LVDS/HDMI	VGA/DVI/DP/LVDS	VGA/HDMI
Audio	Realtek ALC886-GR HD Audio codec	Realtek ALC888 HD Audio codec	Realtek ALC892 Audio codec	Realtek ALC892 Audio codec
LAN	2x GbE	2x GbE	2x GbE	1x GbE
Serial Port	5x RS232 1x RS232/422/485	3x RS232 1x RS232/422/485	3x RS232 1x RS232/422/485	1x RS232 1x RS232/422/485
USB	4x USB 3.0 6x USB 2.0	8x USB 2.0	1x USB 3.0 4x USB 2.0	1x USB 3.0 2X USB 2.0
Storage Device	4x SATA	6x SATA	2x SATA (1x switch mSATA)	1x SATA 1x CFEX
GPIO	8-bit	16-bit	8-bit	8-bit
Others	PS/2 KB&MS	SMBus pin header	PS/2 KB&MS	PS/2 KB&MS
Dimension	170 x 170mm	170 x 170mm	170 x 170mm	170 x 170mm
Page	58	59	60	61

Mini-ITX Reference Table



MODEL	WADE-8077	WADE-8075/76	WADE-8017	WADE-8016	WADE-8015
Form Factor	MINI-ITX	MINI-ITX	MINI-ITX	MINI-ITX	MINI-ITX
CPU	Intel® Atom™ D2550	Intel® Atom™ D525/N455	Intel® Core™ i3/i5/i7	Intel® Core™ i5/i7	Intel® Dual Core™/Quad Core™
Chipset	Intel® NM10	Intel® ICH8M	Intel® Q170/H110/C236 PCH	Intel® H81 PCH	Intel® Q87PCH
BIOS	Phoenix	AMI UEFI	AMI UEFI	AMI UEFI	Phoenix
Memory	1x DDR3 SODIMM up to 4GB	2x DDR3 SODIMM up to 4GB/2GB	2xDDR4 ECC/ Non-ECC Long DIMM up to 32GB	2x DDR3 DIMM up to 16GB	2x DDR3 DIMM up to 16GB
Expansion	1x PCIe x1 slot 1x Mini-PCIe x1 socket	1x PCI slot 1x PCIe x1 slot 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	VGA/LVDS	DP/HDMI/VGA	VGA/DVI/HDMI	VGA/DP/HDMI
Audio	Realtek ALC662-GR HD Audio codec	Realtek ALC892 HD Audio codec	Realtek ALC892 HD Audio codec	Realtek ALC892 HD Audio codec	Realtek ALC886-GR HD Audio codec
LAN	2x GbE	2x GbE	2x GbE	2x GbE	2x GbE
Serial Port	2x RS232	3x RS232 1x RS232/422/485	2x RS232/422/485 4x RS232	3xRS232 1xRS232/422/485	4xRS232 2xRS232/422/485
USB	6x USB 2.0	6x USB 2.0	4x USB3.0 2x USB2.0	2x USB 3.0 8x USB 2.0	4x USB 3.0 6x USB 2.0
Storage Device	2x SATA	3x SATA 1x CF 1x FDD	6x SATA (H110 just 4x SATA)	4x SATA	4x SATA
GPIO	8-bit	16-bit	8-bit	8-bit	8-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	170 x 170mm
Page	62	63	64	65	66



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 RS232 2x RS232/422/485	4x RS232 2x RS232/422/485	1x RS232 1x RS232/422/485	1x RS232 1x RS232/422/485
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	67	68	69	70

Side expansion Board series

What is side expansion board?

WADE-8015 has one PClex1 gold finger. This special gold finger is redefined 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.

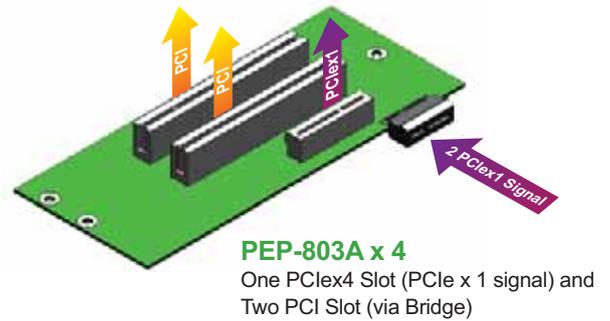
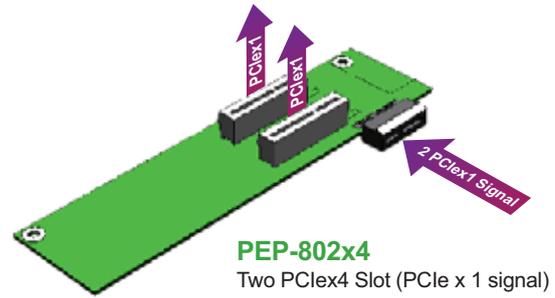
Flex-ATX



Micro-ATX



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

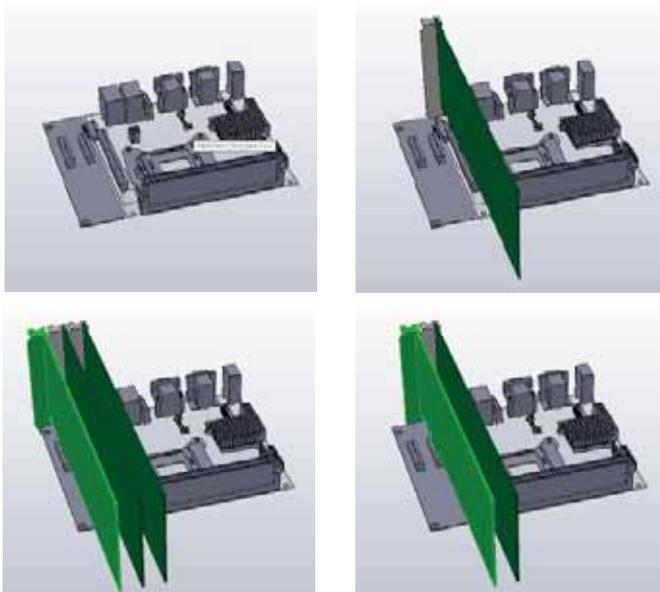


Side Expansion Board (SEB)

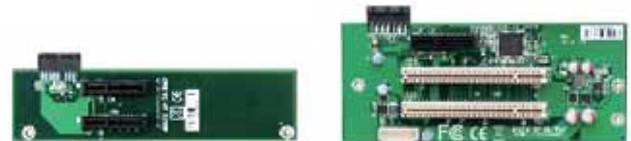
Flexibility of Side Expansion Board

- 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.

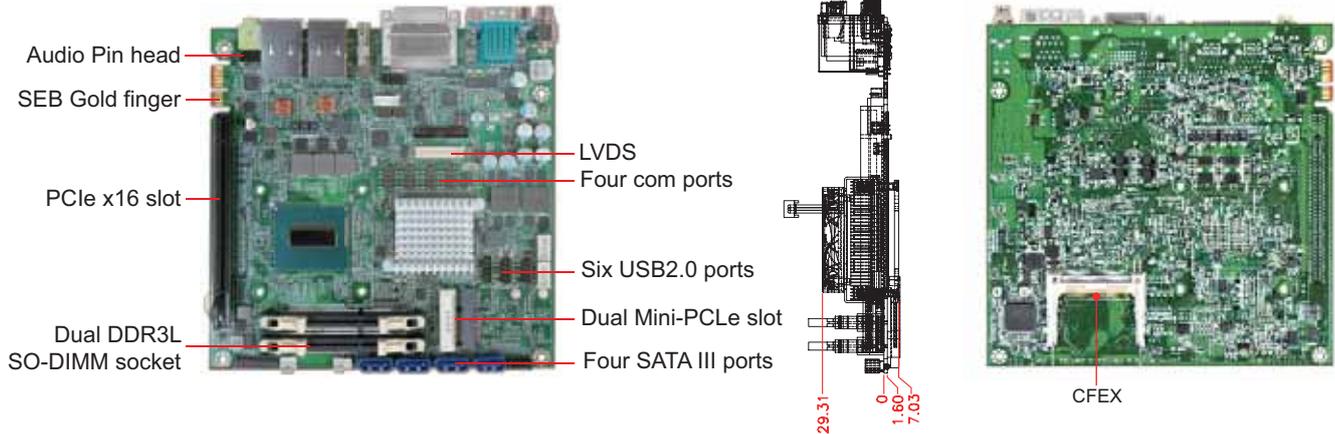


ORDERING GUIDE

AA1-3134Z	(R) PEP-802X4. 2 Slot Riser Card for two PClex4 for WADE-8015 series
AA1-3141Z	(R) PEP-803AX4. 3 Slot Riser Card for one. PClex4 and two PCI for WADE-8015 series

WADE-8022

Intel® Core™ i3/i5/i7 mobile processor based Mini-ITX Board with dual Gigabit Ethernet, four SATA III ports, Six COM ports, one PCIe x16 expansion slot and Dual Mini-PCIe slot with mSATA interface

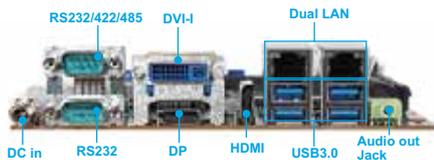


WADE-8022 is based on Intel® QM87 chipset and Mobile processor sku like Core™ i3/i5 and i7(BGA type). WADE-8022 of the Intel platform will provide high performance and flexibility for functional expansion, such as Gaming, Kiosk, DS, Medical, Defense, Industrial automation and control applications.

FEATURES

- Intel® 4th Dual/Quad processor in FCBGA1364
- Intel® QM87 PCH
- Two DDR3L SO-DIMM slots up to 16GB (supports 1600/1333)
- One PCIe x16 slot (Gen3 support)
- Dual Mini-PCIe slot (supports mSATA)
- One PCIe x1 Gold Finger (Two PCIe x1 signal)
- Six COM ports (2pcs on rear I/O, 4pcs on board header)
- Four SATA III Ports (supports RAID 0,1,5,10)
- Total Ten USB ports (4xUSB3.0 Ports & 6xUSB2.0 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
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PACKING LIST

One WADE-8022 motherboard
One Driver CD
One SATA cable

GENERAL

Processor	- Intel® 4 th Dual/Quad 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 SDRAM on two 204pin SO-DIMM
Storage Devices	4x SATA 3.0 support up to 6Gb/s data transfer rate
Watchdog Timer	Programmable by embedded controller
Expansion Interface	- 1x PCI Express x16 slot (Gen3) - 2x Mini-PCIe slot(switch function) - 1x PCI Express x1 Golden Finger

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	Onboard Intel® WGI217LM & WGI210AT
Serial port	- 1x RS232 port on rear I/O - 1x RS232/422/485 selectable port on rear I/O - 4x RS232 port on pin header
USB	- 6 ports USB2.0 - 4 ports USB3.0
Keyboard & Mouse	PS/2 on board dedicated to keyboard & Mouse
GPIO	8bit 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: resolution up to 2500x1600 - VGA: resolution up to 2048x1536 - DVI:resolution up to 1920x1200 - HDMI: resolution up to 4096x2304 - LVDS: resolution up to 1920x1200

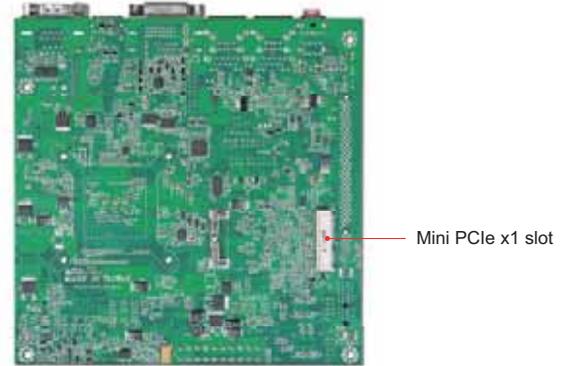
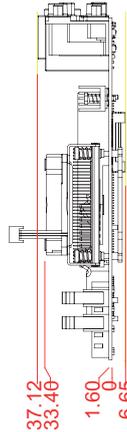
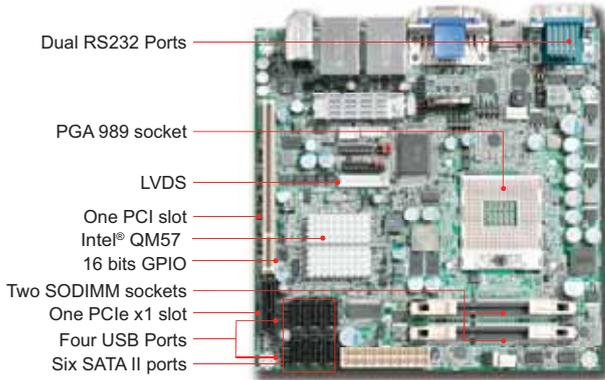
Mechanical & Environment

Dimension	170mm(L) x 170mm(W) x 1.6mm(H)
Power Supply	12V DC input
Environment	- Operation temperature: 0~60°C - Storage temperature: -20~80°C - Relative humidity: 5~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 120,000hrs at 40°C



WADE-8020

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



The WADE-8020 is built with the Intel® mobile QM57 chipset which works well with Intel® Core™ i5/i7 mobile processor technologies capable of supporting dual channel DDR3 memory. These features make the WADE-8020 the ideal solution for POS, Lottery, Medical, Gaming, High Resolution Digital Signage, Surveillance Security Monitoring, and Kiosk applications.

FEATURES

- Intel® Core™ i5/i7 processor (Quad-Core CPU support)
- Intel® QM57 PCH
- Two 204-pin SODIMMs support dual channel DDR3 SDRAM up to 8GB
- One PCI-Express x1 and one PCI Expansion slot
- One Mini-PCIe socket (with USB+PCIe x1 signal)
- Three RS232 ports and one RS232/422/485 port
- Six SATA II ports
- Dual Display by VGA/DVI/HDMI/LVDS (24 bits)
- Intel® Active Management Technology (Intel® AMT) 6.0

REAR I/O



ORDERING GUIDE

AB1-3587	(R).WADE-8020 Mini-ITX ESB.QM57 w/o ECC PGA989.w/DDR3 SO-DIMM/VGA/LVDS/DVI/HDMI/Dual GbE/COM/Audio/USB
AA1-3050	PEP-5311R 1 Slot Riser Card for Right Expansion.1xPCI.For WADE-8141/8041+C34

PACKING LIST

One WADE-8020 Mini-ITX Main Board
One Installation CD
One SATA Cable
One I/O shield

GENERAL

Processor	- Intel® Core™ i5/i7 or Celeron® processor with 4/3/2MB L2 Cache in PGA989 - package supports Intel® Virtualization Technology (VT-x), Enhanced Intel® SpeedStep® Technology, Thermal Monitoring Technologies
Chipset	Intel® BD82QM57 PCH (3.5W)
BIOS	AMI UEFI BIOS
Memory	Supports dual channel up to 8GB DDR3 1066/1333 MHz SDRAM on two 204-pin SODIMM socket
Storage Devices	- 6x SATA supports up to 3.0Gb/s data transfer rate - RAID 0,1,5,10
Watchdog Timer	Programmable via S/W from 1 sec. to 255 min.
Hardware Monitoring	Monitoring Temperature, Voltage and cooling fan status.
Expansion Interface	- 1x PCI Express x1 slot (Gen 1, 2.5 GT/s) - 1x PCI 32-bit slot at 33MHz - 1x Mini-PCIe slot

I/O INTERFACE

Super I/O	ITE IT8721F
Audio	- Intel® QM57 built-in High Definition Audio up to 192-kHz 24-bit - Realtek ALC888, 5.1 channels - Audio Jack DIP Light Pink/Lime/Light Blue
Ethernet	Intel® 82574L and Intel® 82577LM Dual Gigabit Ethernet controllers support iAMT 6.0
Serial Port	- 1x RS232 port on rear I/O - 1x RS232/422/485 selectable port on rear I/O - 2x RS232 port on pin header
USB	- 4x USB 2.0 ports on rear I/O - 4x USB 2.0 ports on board with header - 480 Mb/s bus is capable of high-speed/full-speed/low-speed data ranges
GPIO	On board programmable 16-bit Digital I/Os

DISPLAY

Graphic Controller	- Intel® QM57 integrated Intel® HD Graphics (GMA HD) supports full hardware acceleration of video decoding standards, such MPEG2, MPEG4 - Supports Intel® Gen 6.0 integrated Graphics Engine
Display Interface	- VGA: dual channel 24-bit VGA, analog resolution up to 2048x1536(QXGA) - LVDS: dual channel 24-bit LVDS, Digital LVDS resolution up to 1600x1200(UXGA) - HDMI: dual channel 24-bit HDMI, Digital HDMI resolution up to 1920x1200(WUXGA) - DVI: dual channel 24-bit DVI, Digital DVI resolution up to 1920x1200 (WUXGA)

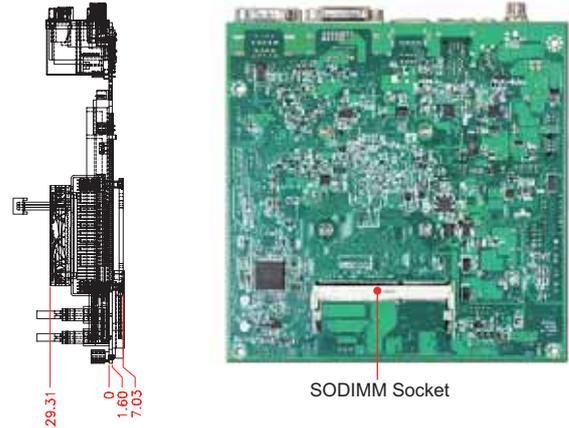
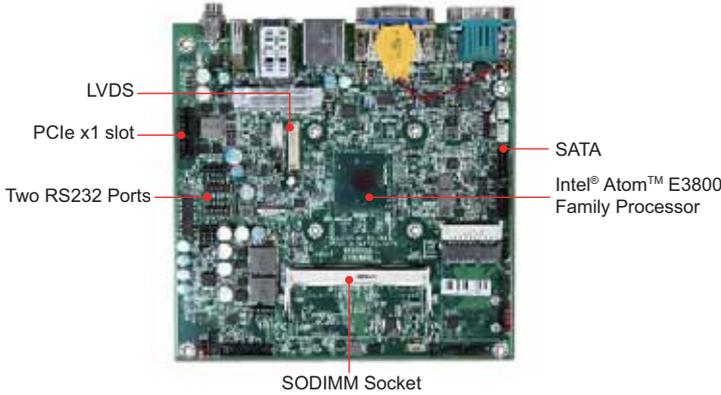
Mechanical & Environment

Dimension	170(L) x 170(W)mm; 6.69"(L) x 6.69"(W)
Power Supply	- Typical: +12(CPU)@1.25A; +12V(System)@0.33A; +5V@3.55A - Supports ATX mode
Environment	- Operation Temperature: 0°C to 60°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 120,000 hours 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 Dual Mini-PCIe slot with mSATA interface

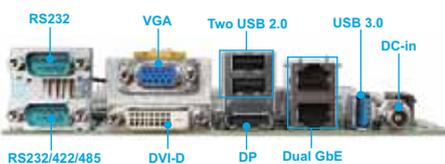


WADE-8079 is based on Intel® Atom™ processor E3800 product family with memory and PCI Express controller integrated to support two-channel DDR3L memory and PCI Express 2.0 lanes. Portwell has taken advantage of such technology to furnish a series of products that meets multiple industrial requirements 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 two DDR3L 1066/1333MT/s SDRAM, up to 8GB (E3845/ E3826)
- Support one DDR3L 1066/1333MT/s SDRAM, up to 4GB (E3815)
- Supports VGA/DVI/DP&LVDS (Via switch)
- 2x SATA II Ports (1x Switch Mini-PCIe)
- Total 5 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
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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 SDRAM on two 204 pin SO-DIMM socket. (E3845/ E3826) - support up to 4GB DDR3L 1066/1333 SDRAM on two 204 pin SO-DIMM socket. (E3815)
Storage Devices	- 2x SATA II support up to 3Gb/s data transfer rate(1x SATA II switch full size Mini-PCIe support mSATA)
Watchdog Timer	Programmable by embedded controller
Expansion Interface	- 1x PCIe x1 slot - 1x Half size Mini-PCIe(support PCIe & USB signal)

I/O INTERFACE

Super I/O	Winbond F81216DG
Audio	- Realtek ALC892 supports 5.1 channels - Audio Jack Line out on board
Ethernet	Two on board Intel I210IT
Serial Port	- 1x RS232 port on rear I/O - 1x RS232/422/485 selectable port on rear I/O - 2x RS232 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 8bit Digital I/O

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	- VGA: resolution up to 1920x1200 - DVI: resolution up to 1920x1200 - DP: resolution up to 2560x1600 - LVDS: resolution up to 1600x1200

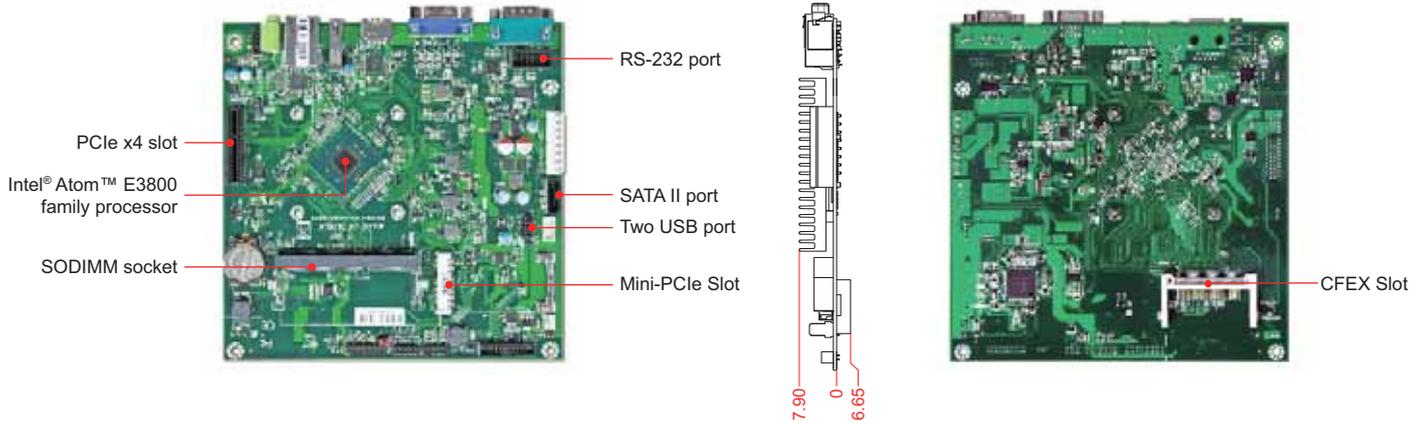
Mechanical & Environment

Dimension	170mm(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	12~24V DC input
Environment	- Operation Temperature: 0~60 °C - Storage Temperature: -20~80 °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-TX.
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 one DDR3L ECC 1066/1333MT/s SDRAM, up to 4GB
- Supports one 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 SDRAM on one 204pin SO-DIMM
Storage Devices	- 1x SATA II - 1x CFEX - 1x Mini-PCle
Watchdog Timer	Programmable by embedded controller
Expansion Interface	Supports PCIe x4 slot (with PCIe x2 Lanes)

I/O INTERFACE

Audio	- Realtek ALC892 supports 5.1 Channels - Audio Jack Line out on board
Ethernet	On board Intel I210AT
Serial Port	1x RS232/424/485 Selectable port on rear I/O
USB	- 2x USB2.0 ports on board - 1x USB3.0 ports on rear I/O
Keyboard & Mouse	KBC controller integrated in embedded controller
GPIO	8bit 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: resolution up to 2560x1536@24bpp - HDMI: resolution up to 1920x1080@24bpp

Mechanical & Environment

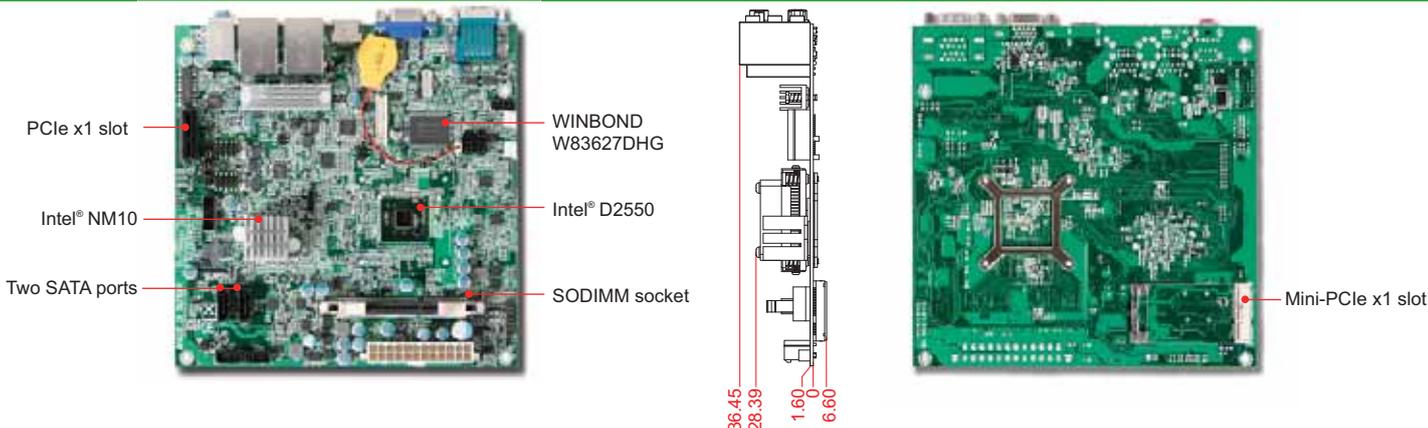
Dimension	170mm(L) x 170mm(W) x 1.6mm(H)
Power Supply	ATX (support non-5V satdby)
Environment	- Operation temperature: 0~60°C - Storage temperature: -20~80°C - Relative humidity : 5~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000hrs at 55°C





WADE-8077

Intel® Cedar Trail Atom™ processor based Mini-ITX Board with dual display, dual Gigabit Ethernet, two SATA Ports, Two COM Ports (optional up to 4 COM ports) and six USB Ports

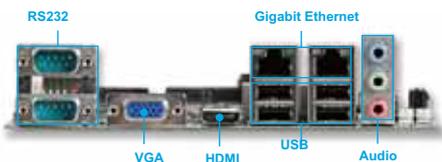


WADE-8077 is designed to provide high performance and flexibility for functional expansion and is ideal for applications in Gaming, Kiosk, Digital Signage, and Industrial Automation and control.

FEATURES

- Intel® Atom™ D2550 processor
- Intel® NM10 Chipset
- One 204-pin SODIMM supports single channel DDR3 SDRAM up to 4GB
- Dual display: VGA /LVDS (24-bit dual channel)/HDMI
- One Mini-PCIe and one PCI Express x1 expansion slot
- Two SATA II ports
- Two COM ports (optional up to 4 COM ports)
- 2.6W AMP function (optional)

REAR I/O



GENERAL

Processor	Intel® Atom™ D2550 (1.86GHz, 10W) processor in FCBGA559 package
Chipset	Intel® NM10 Express chipset
BIOS	Phoenix BIOS (SPI ROM)
Memory	Supports single channel up to 4GB DDR3 800/1066 MHz SDRAM on one 204-pin SODIMM socket
Storage Devices	2x SATA II supporting up to 3.0Gb/s data transfer rate
Watchdog Timer	Programmable via S/W from 1 sec. to 255 min.
Hardware Monitoring	- FAN Speed (CPU & System), Temperature (CPU & System), Voltage - Beep alarms for field fan out, over/under voltage of DC
Expansion Interface	- 1x PCI Express x1 slot (Gen 1, 2.5 GT/s) - 1x Mini-PCIe slot (Gen 1, 2.5 GT/s)

I/O INTERFACE

Super I/O	WINBOND W83627DHG
Audio	- Intel® NM10 built-in High Definition Audio up to 96-kHz 24-bit - Realtek ALC662, 5.1 channels - Audio Jack DIP Light Pink/Lime/Light Blue
Ethernet	RTL8111F Dual Gigabit Ethernet
Serial Port	- 2x RS232 on rear I/O - 1x RS232 with header (optional) - 1x RS232/422/485 selectable with header (optional)
USB	- 4x USB 2.0 ports on rear I/O - 2x USB 2.0 ports on board with header
Keyboard & Mouse	1x PS/2 Keyboard & Mouse on board
GPIO	On board programmable 8-bit Digital I/Os

ORDERING GUIDE

AB1-3799	(R) WADE-8077 Mini-ITX ESB. Intel® Cedar Trail 1.86G D2550 on Board+NM10. w/DDR3 SO-DIMM/VGA/HDMI/24bits LVDS/Dual GbE/COM/Audio/USB
AB1-3880	(R) WADE-8077-WS Mini-ITX ESB. Intel® Cedar Trail 1.86G D2550 on Board+NM10. w/o heat-sink. w/DDR3 SO-DIMM/VGA/HDMI/24bits LVDS/Dual GbE/COM/Audio/USB
AB1-3861	(R) WADE-8077-A2C Mini-ITX ESB. Intel® Cedar Trail 1.86G D2550 on Board+NM10. w/2.6W AMP. w/DDR3 SO-DIMM/VGA/HDMI/24bits LVDS/Dual GbE/COM/Audio/USB

PACKING LIST

One WADE-8077 Mini-ITX Main Board
One Installation CD
One SATA Cable
One I/O shield

DISPLAY

Graphic Controller	- Intel® Graphics Technology provides a visually stunning experience optimized for Blu-ray and HD video with Windows Vista support - Supports DirectX 9 compliant Pixel Shader v3.0 and OpenGL 3.0
Display Interface	- VGA: analog resolution up to 1920x1200 on rear I/O - HDMI: resolution up to 1920x1200 on rear I/O - LVDS: Digital 24-bits LVDS resolution up to 1920x1200 on board

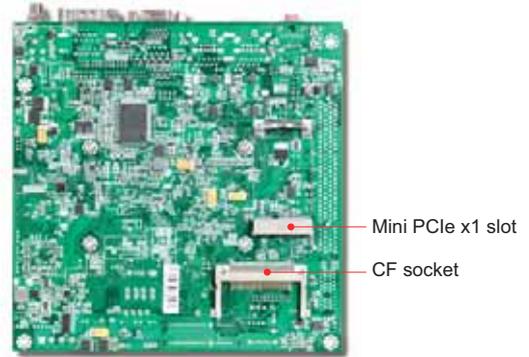
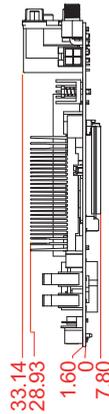
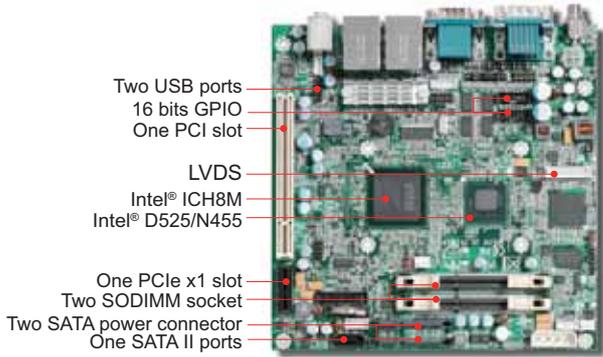
Mechanical & Environment

Dimension	170(L) x 170(W)mm; 6.69"(L) x 6.69"(W)
Power Supply	ATX 24-pin power input
Environment	- Operation Temperature: 0°C to 60°C - Storage temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE, FCC Class A
MTBF	Over 140,000 hours at 40°C



WADE-8075/76

Intel® Dual Core™ Atom™ D525 1.8GHz/N455 1.67GHz processor based Mini-ITX with DC12V input, DDR3 SDRAM, Dual display, Dual Gigabit Ethernet, Three SATA, Four COM and Six USB ports



Based on Intel® mobile ICH8M chipset, the WADE-8075/76 takes advantages of Intel® Atom™ D525/N455 technologies. WADE-8075/76 which features low power, is capable of providing dual displays such as LVDS and VGA. In addition, the fanless, low power WADE-8075/76 is the best solution for POS, Medical, Gaming and Digital Signage applications.

FEATURES

- Intel® Atom™ D525 1.8GHz/N455 1.67GHz processor
- Intel® ICH8M Chipset
- Two 204-pin SODIMMs support single channel DDR3 SDRAM up to 4GB
- Dual Display by VGA/LVDS (24 bits or 18 bits)
- One PCI-Express x1, one PCI expansion slot and one Mini-PCIe socket (with USB + PCIe x1 signal)
- Three RS232 ports and one RS232/422/485 port

REAR I/O



ORDERING GUIDE

AB1-3584	(R).WADE-8075 Mini-ITX ESB.Intel® Pineview 1.8G D525 on Board+ICH8M. w/DDR3 SO-DIMM/VGA/24bits LVDS/Dual GbE/COM/Audio/USB
AB1-3585	(R).WADE-8076 Mini-ITX ESB.Intel® Pineview 1.67G N455 on Board+ICH8M. w/DDR3 SO-DIMM/VGA/18bits LVDS/Dual GbE/COM/Audio/USB
AA1-3102Z	PEP-5C1RX1 One PCI-E x1 Slot Riser Card for Right Expansion. PCI(no signal) +PCIe connectors.

PACKING LIST

One WADE-8075/76 Mini-ITX Main Board
One Installation CD
One SATA Cable
One SATA Power Cable
One I/O shield

GENERAL

Processor	- Intel® Atom™ D525 (1.8GHz, 13W) N455 (1.67GHz, 6.5W) processor in PGA 478 package - FSB 800MHz - Supports Intel® Hyper-Threading Technology, Intel® 64, Execute Disable Bit, Enhanced Intel SpeedStep® Technology (N455 only)
Chipset	Intel® ICH8M Graphics and Memory Controller (13.5W) and ICH8M
BIOS	AMI UFEI BIOS
Memory	Support single channel up to 4GB DDR3 667/800 MHz SDRAM on two 204-pin SODIMM socket (WADE-8076 support up to 2G 667 MHz SDRAM on one 204-pin SODIMM socket)
Storage Devices	- 1x SATA port 3.0Gb/s data transfer rate - 2x SATA ports with power support - 1x Compact Flash socket supports Ultra DMA100/66/33 MB/s
Watchdog Timer	Programmable via S/W from 1 sec. to 255 min.
Hardware Monitoring	FAN Speed (CPU & System), Temperature (CPU & System), Voltage, Auto throttling control when CPU overheats
Expansion Interface	- 1x PCI Express x1 slot (Gen 1, 2.5 GT/s) - 1x PCI 32-bit slot - 1x Mini-PCIe slot (Gen 1, 2.5 GT/s)

I/O INTERFACE

Super I/O	Winbond W83310DG
Audio	- Intel® ICH8M built-in High Definition Audio up to 192-kHz 24-bit - Realtek ALC892, 5.1 channels - Audio Jack DIP Light Pink/Lime
Ethernet	RTL8111D Dual Gigabit Ethernet
Serial Port	- 2x RS232 5V/12V selectable port on rear I/O - 1x RS232 5V/12V selectable with header - 1x RS232/422/485 5V/12V selectable port on rear I/O
USB	- 4x USB 2.0 ports on rear I/O - 2x USB 2.0 ports on board with header
Keyboard & Mouse	1x PS/2 Keyboard & Mouse on board
GPIO	On board programmable 16-bit Digital I/Os

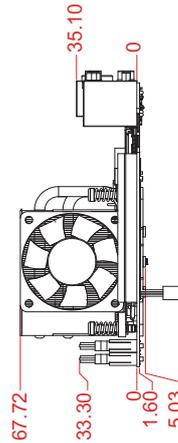
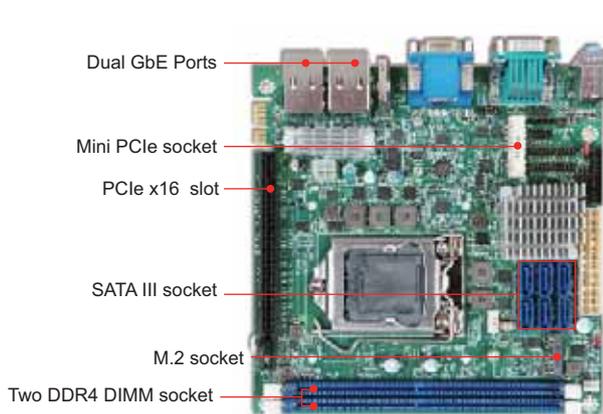
DISPLAY

Graphic Controller	- Intel® ICH8M Integrated GMA 3150 Graphics supports full hardware acceleration of video decoding standards MPEG-2 - Intel® Dynamic Video Memory Technology (Intel® DVMT 4.0)
Display Interface	- Dual Channel 24-bit (WADE-8075) - Single Channel 18-bit (WADE-8076) - VGA: analog resolution up to 2048x1536 (QXGA) - LVDS: Digital LVDS resolution up to 1280x1024 (UXGA)

Mechanical & Environment

Dimension	170(L) x 170(W)mm; 6.69"(L) x 6.69"(W)
Power Supply	DC-12V input
Environment	- Operation Temperature: 0°C to 60°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 140,000 hours at 40°C





WADE-8017 is based on Intel® Q170/H110/C236 chipset and desktop processors including Intel® 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® 6th Gen Core™ Processors support
- Two long-DIMM support DDR4 ECC/Non-ECC SDRAM up to 32GB
- Display : VGA/DP/HDMI
- One PCIe x1 Golden Finger support SEB
Six SATA III ports support RAID 0/1/5/10 (H110 just support 4x SATA)
- One 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-C236 Mini-ITX ESB.C236.w/ECC LGA1151 w/DDR4 SDRAM/VGA/DP/HDMI/Dual GbE/COM/Audio/USB
AB1-3D76	(R)WADE-8017-H110 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® 6 th Gen Core™ Processors CPU in LGA1151 package
Chipset	Intel® Q170/H110/C236 PCH
BIOS	AMI uFEI BIOS (SPI ROM)
Memory	Support up to 32GB DDR4 2133/1866 ECC/Non-ECC SDRAM on two 288 pin DIMM socket
Storage Devices	6x SATA III support up to 6Gb/s data transfer rate (H110 just support 4x SATA)
Watchdog Timer	Programmable by embedded controller
Hardware Monitoring	System monitor (Voltage,Fan Speed and Temperature)
Expansion Interface	- 1x PCIe x16 Gen3 - 1x M.2 Type E socket(H110 not support) - 1x Mini-PCIe socket(H110 just support mSATA) - 1x PCIe 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 RS232/422/485 port on rear I/O - 1x RS232 port on rear I/O - 4x RS232 port on pin header
USB	- 4x USB3.0 on rear I/O - 2x USB2.0 on pin Header
GPIO	8-bit configurable controlled by embedded controller

DISPLAY

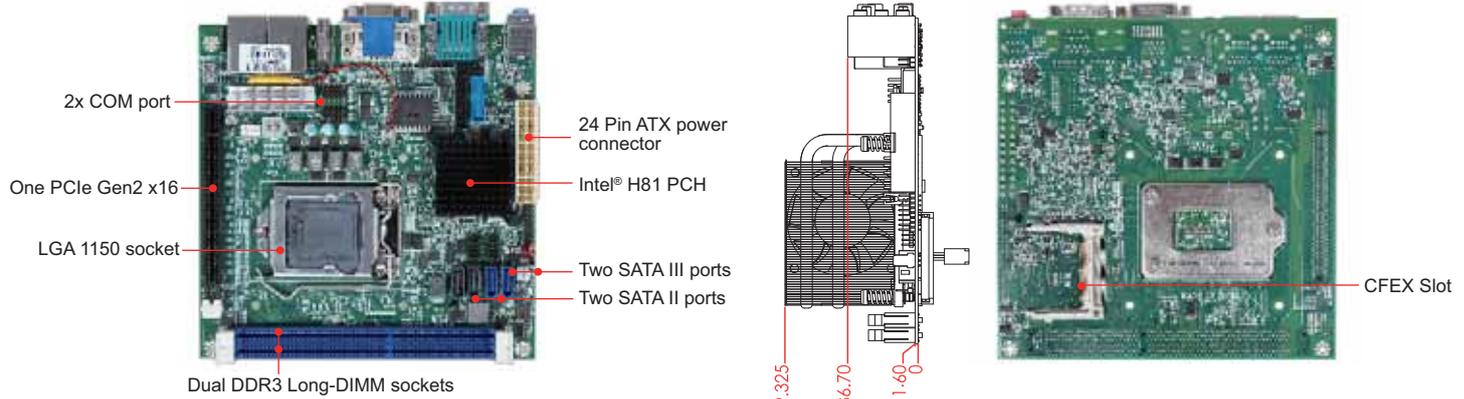
Graphic Controller	- Intel® Gen9 graphic engine supports DirectX 12, OpenGL 4.4
Display Interface	- DP:One DP port on rear I/O, resolution up to 4K (4096x2304@60Hz) - HDMI:One HDMI port on rear I/O, resolution up to 4K (4096x2160@24Hz) - VGA:One VGA port on rear I/O resolution up to 1920x1200 @ 60Hz

Mechanical & Environment

Dimension	170mm(L) x 170mm(W) x 1.6mm(H)
Power Supply	24 pin ATX power input (different style)
Environment	- Operation temperature:0~60°C - Storage temperature:-20~80°C - Relative humidity:5~95%,non-condensing
Certification	CE,FCC Class A
MTBF	Over 120,000 hours at 40°C

WADE-8016

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



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
- Two DDR3 Long-DIMM slots up to 16GB (support 1600/1333)
- One PCIe x16 slot (Gen3 support)
- 2 SATA III Ports and 2 SATA II ports(1x SATA II switch CFEX)
- One CFEX
- 4 COM ports (2pcs on rear I/O, 2pcs on board header)
- Total Ten USB ports (2xUSB3.0 Ports & 8xUSB2.0 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
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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 1333/16600 SDRAM on two 240pin DIMM sockets
Storage Devices	- 2x SATA II support up to 3Gb/s data transfer rate - 2x SATA III support up to 6Gb/s data transfer rate - 1x CFEX
Watchdog Timer	Programmable watchdog timer, time out period from 0.5 sec to 255 secs.
Expansion Interface	- 1x PCI Express x16 slot (Gen2)

I/O INTERFACE

Super I/O	Winbond W83627UHG
Audio	- Intel® H81 PCH built in HDA controller - Realtek ALC892 supports 5.1 channels
Ethernet	Two onboard RealTek RTL8111G-CG
Serial Port	- 1x RS232 port on rear I/O - 1x RS232/422/485 selectable port on rear I/O - 2x RS232 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 8bit Digital I/O

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	- VGA: resolution up to 1920x1200 - DVI: resolution up to 1920x1200 - HDMI: resolution up to 4096x2304

Mechanical & Environment

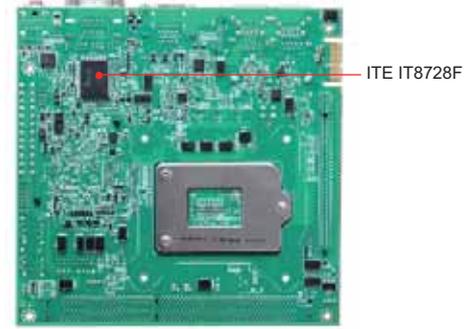
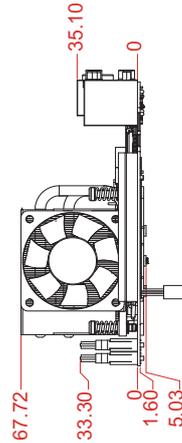
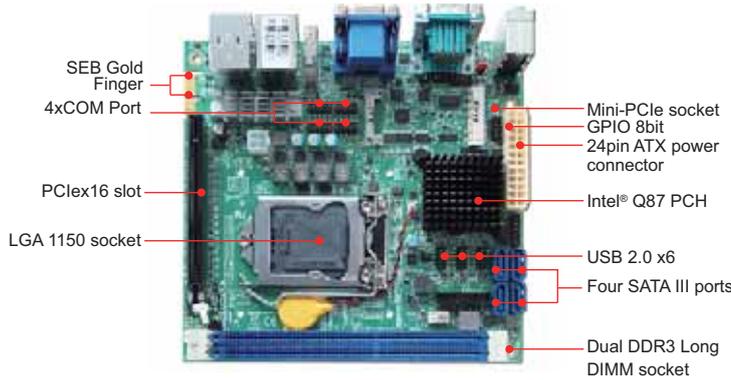
Dimension	170mm(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	ATX 24-pin power input
Environment	- Operation Temperature: 0~60 °C - Storage Temperature: -20~80 °C - Relative Humidity: 5~90%, non-condensing : 5~95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 120,000 hours at 40°C





WADE-8015

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



WADE-8015 is based on Intel® Q87 chipset 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
- Two DDR3 Long-DIMM slots up to 16GB (support 1600/1333)
- One PCIe x16 slot (Gen3 support)
- One Mini-PCIe slot (support mSATA)
- One PCIe x1 Gold Finger (2*PCIe x1 signal)
- Audio Jack (support Line-in / Line-out / Mic-in)
- Six COM ports (2pcs on rear I/O ,4pcs on board header)
- Four SATA III Ports (support RAID 0,1,5,10)
- Total Ten USB ports (4xUSB3.0 Ports & 6xUSB2.0 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
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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 SDRAM on two 240-pin DIMM sockets
Storage Devices	4x SATA III support up to 6.0 Gb/s data transfer rate
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 PCI Express x16 Gen3 up to 8.0 GT/s - 1x Mini-PCIe slot - 1x PCI Express 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 - 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 RS232 port on rear I/O - 1x RS232/422/485 selectable port on rear I/O - 3x RS232 with header - 1x RS232/422/485 with header
USB	- 4x USB3.0 Ports on rear I/O - 6x USB2.0 Ports on board
Keyboard & Mouse	PS/2 on board dedicated to Keyboard & Mouse
GPIO	On board programmable 8bit 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: one connector DB-15 on rear I/O, analog resolution up to 1920x1200 - DP : one connector on rear I/O, support up to 3200x2000 resolution - HDMI : one connector on rear I/O, support up to 4096x2304 resolution

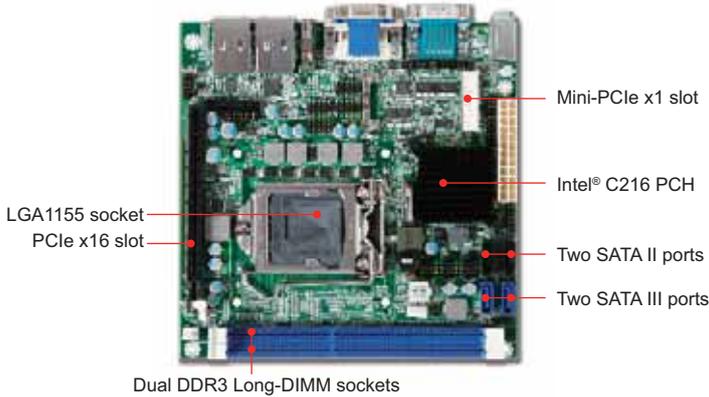
Mechanical & Environment

Dimension	170(L) x 170mm(W); 6.69"(L) x 6.69"(W)
Power Supply	ATX 24-pin power input
Environment	- Operation Temperature: 0~60 °C - Storage Temperature: -20~80 °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, Four SATA Ports, Six COM Ports, One PCI-Express x16 expansion slot and one 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
- Two 240-pin Long-DIMM supports DDR3 SDRAM up to 16GB
- Dual display: VGA/DVI/HDMI
- One PCI Express x16 expansion slot
- Four SATA ports (2x SATA II, 2x SATA III)
- Six COM ports
- One 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
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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 two 240-pin and sockets
Storage Devices	- 2x SATA II supporting up to 3.0Gb/s data transfer rate - 2x SATA III supporting up to 6.0Gb/s data transfer rate
Watchdog Timer	Programmable via S/W from 1 sec. to 255 min.
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 PCI Express x16 slot (Gen 3, 8.0GT/s) (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 RS232 port on rear I/O - 1x RS232/422/485 selectable port on rear I/O - 3x RS232 with header - 1x RS232/422/485 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: One connector DB-15 on rear I/O, analog resolution up to 2048x1536 - HDMI: One connector on rear I/O, support up to 1920x1200 resolution - DVI-D: One connector on rear I/O, Digital DVI resolution up to 1920x1200

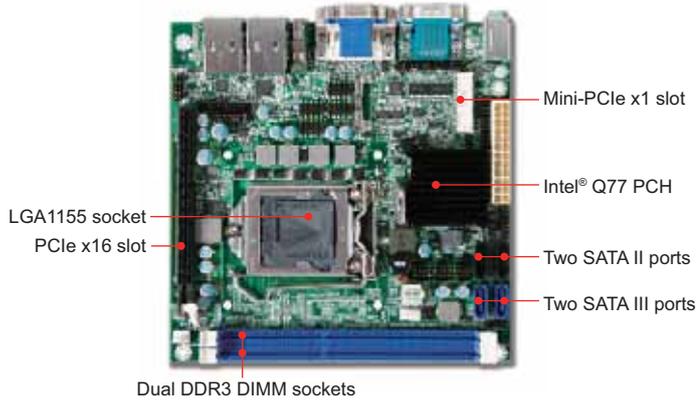
Mechanical & Environment

Dimension	170(L) x 170(W) mm; 6.69"(L) x 6.69"(W)
Power Supply	ATX 24-pin power input
Environment	- Operation Temperature: 0°C to 60°C - Storage temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE, FCC Class A
MTBF	Over 100,000 hours at 40°C



WADE-8013

Intel® Core™ i5/i7 processor based Mini-ITX Board with dual Gigabit Ethernet, Four SATA Ports, Six COM Ports, One PCI-Express x16 expansion slot and one 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
- Two 240-pin Long-DIMM supports DDR3 SDRAM up to 16GB
- Dual display: VGA/DVI/HDMI
- One PCI Express x16 expansion slot
- Four SATA ports (2x SATA II, 2x SATA III)
- Six COM ports
- One 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
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PACKING LIST

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

GENERAL

Processor	- Intel® 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 two 240-pin and sockets
Storage Devices	- 2x SATA II supporting up to 3.0Gb/s data transfer rate - 2x SATA III supporting up to 6.0Gb/s data transfer rate
Watchdog Timer	Programmable via S/W from 1 sec. to 255 min.
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 PCI Expressx16 slot (Gen 3, 8.0GT/s) (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 RS232 port on rear I/O - 1x RS232/422/485 selectable port on rear I/O - 3x RS232 with header - 1x RS232/422/485 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® Q77 Integrated 3D GMA support DX10.1, OpenGL 3.0, MPEG-2, Shader Model 4.0
Display Interface	- VGA: One connector DB-15 on rear I/O, analog resolution up to 2048x1536 - HDMI: One connector on rear I/O, support up to 1920x1200 resolution - DVI-D: One connector on rear I/O, Digital DVI resolution up to 1920x1200

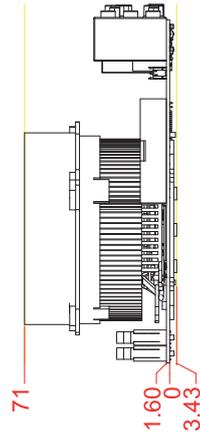
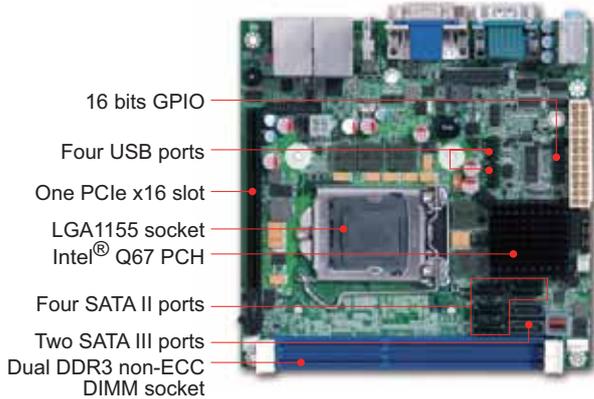
Mechanical & Environment

Dimension	170(L) x 170(W) mm; 6.69"(L) x 6.69"(W)
Power Supply	ATX 24-pin power input
Environment	- Operation Temperature: 0°C to 60°C - Storage temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C



WADE-8012

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



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
- Two 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 Six SATA ports (SATA II x4, SATA III x2), Eight 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
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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 two 240-pin non-ECC socket
Storage Devices	- 4x SATA support up to 3.0Gb/s data transfer rate - 2x SATA support up to 6.0Gb/s data transfer rate
Watchdog Timer	Programmable via S/W from 0.5 sec. to 255 min.
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 PCI Express x16 slot (Gen 2, 5.0 GT/s) (supports 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 RS232 port on rear I/O - 1x RS232/422/485 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: One connector DB-15 on rear I/O, analog resolution up to 2048x1536 (QXGA) - HDMI: One connector on rear I/O, supports up to 1920 x 1200 resolution - SDVO: One on-board connector (PCIe x1 & USB x1 signals) - DVI-D: One connector on rear I/O, Digital DVI resolution up to 1920x1200 (WUXGA)

Mechanical & Environment

Dimension	170(L) x 170(W)mm; 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 to 60°C - Storage temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE,FCC Class A
MTBF	Over 100,000 hours at 40°C

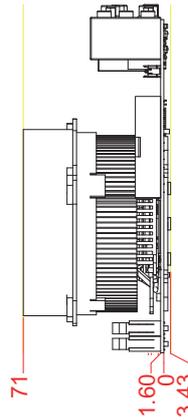
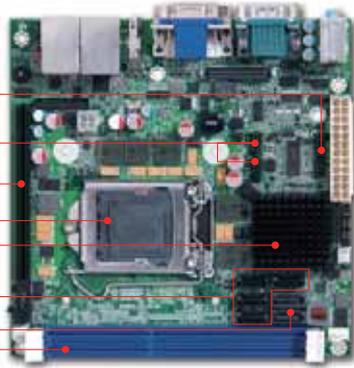




WADE-8011

Intel® i3 and Xeon® processor based Mini-ITX with dual displays, DDR3 SDRAM, Two COM Ports and Eight USB Ports

- 16 bits GPIO
- Four USB ports
- One PCIe x16 slot
- LGA1155 socket
- Intel® C206 PCH
- Four SATA II ports
- Two SATA III ports
- Dual DDR3 ECC DIMM socket



ITE IT8728F

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
- Two 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
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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 two 240-pin ECC and non-ECC socket
Storage Devices	- 4x SATA support up to 3.0Gb/s data transfer rate - 2x SATA support up to 6.0Gb/s data transfer rate
Watchdog Timer	Programmable via S/W from 0.5 sec. to 255 min.
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 PCI Express x16 slot (Gen 2, 5.0 GT/s) (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 RS232 port on rear I/O - 1x RS232/422/485 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® C206 Integrated 3D GMA support DX10.1, OpenGL 3.0, MPEG-2, Shader Model 4.0
Display Interface	- VGA: One connector DB-15 on rear I/O, analog resolution up to 2048x1536 (QXGA) - HDMI: One connector on rear I/O, supports up to 1920 x 1200 resolution - SDVO: One on-board connector (PCIe x1 & USB x1 signals) - DVI-D: One connector on rear I/O, Digital DVI resolution up to 1920x1200 (WUXGA)

Mechanical & Environment

Dimension	170(L) x 170(W)mm; 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 to 60°C - Storage temperature: -20°C to 80°C - Relative Humidity: 5% to 95%, non-condensing
Certification	CE, FCC Class A
MTBF	Over 100,000 hours at 40°C





The WADE-1120A is designed to efficiently dissipate any internal heat, eliminating the need for a ventilation fan. It is the perfect system solution for any embedded application that operates in a harsh environment. WADE-1120A is designed with either a built-in WADE-8041 board or similar Mini-ITX

board as the barebone system. Its unique tool-free design allows the integrator or field service professional to release the top cover easily and quickly. Complete with memory, DOM or Compact flash, WADE-1120A is ready to go to work.

FEATURES

- Integrated with WADE-8041 or similar Mini-ITX board
- Small form factor with fan-less ventilation mechanism
- Rugged design for harsh environment
- Unique tool-free design for quick top cover release

POWER SUPPLY

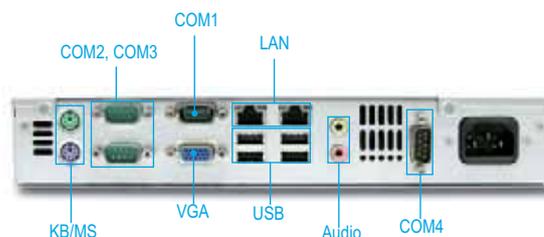
FSP055-50LM optional

Maximum Output	55W ATX power supply
Input Voltage	90V ~ 265V AC, full range
Input Frequency	47 ~ 63 Hz
Input Current	2.0A(RMS)@115V, 1.0A(RMS)@230V
Efficiency	>74%
Holdup time	17ms. at 115V/60Hz or 230V/50Hz
Over Voltage Protection	3.3V@3.5~4.5V; 5V@5.5~6.82V; 12V@13.4~16.5V
MTBF	121,330 hrs
Certification	UL, cUL, TUV, CE, FCC
Dimension (WxDxH)	183 x 50 x 37.6 mm; 7.2" x 2" x 1.5"

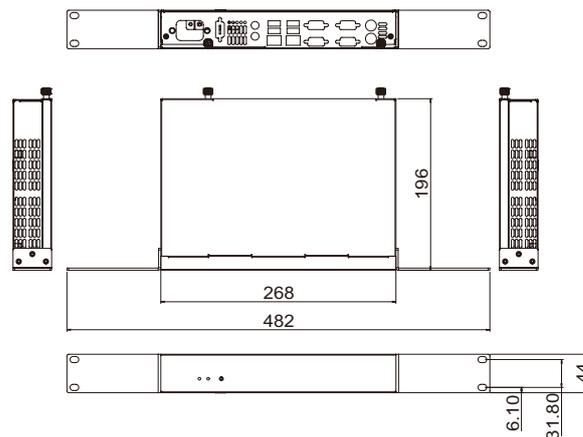
MECHANICAL & ENVIRONMENTAL

Operation Temperature	0~50°C
Storage Temperature	-20~80°C
Relative Humidity	5~95% non-condensing
Dimension	268 x 196 x 44 (mm)
Weight	2.2 Kg

REAR I/O



ENGINEERING DRAWING



ORDERING GUIDE

■ WADE-1120A-55X

The Fan-free Designed Compact Node Chassis built with 55W ATX PSU

* Rack-mount kit available (option)



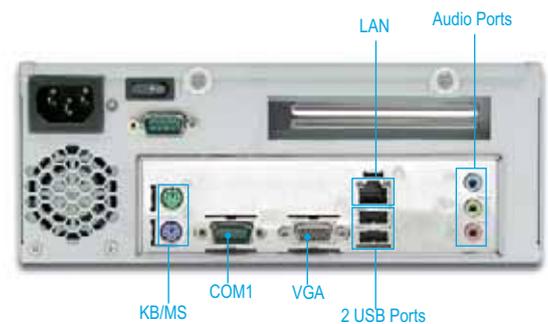
The WADE-2221A is a rugged and stylish barebone system suitable for embedded applications that stand alone or are rackmounted. Its effective ventilation is achieved by the mesh design of the front panel. No actual tool is needed to release the top cover of chassis, simplifying integration and field service.

This barebone system includes a WADE series board, 150-watt or 180-watt power supply, 2.5" drive bay and one PCI expansion slot. A 2U rackmount tray is specially designed to hold two units side-by-side and converts them to the rackmount platform.

FEATURES

- Integrated with various Mini-ITX board
- One PCI expansion slot
- Tool-free mechanism to open the top cover
- Rugged and stylish design
- Quick 2.5" HDD installation by releasing the top cover
- Two side-by-side units to form two systems in 2U rackmount form factor

REAR I/O



POWER SUPPLY

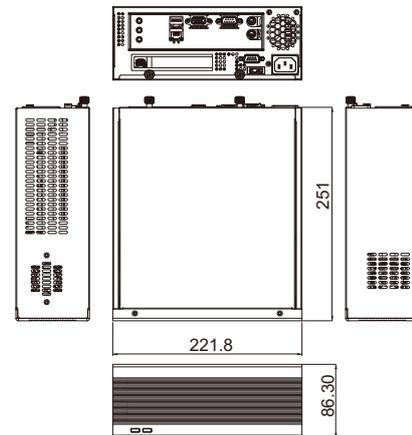
ORION-A1801P optional

Input Voltage	90V ~ 264V AC, full range
Input Frequency	47 ~ 63 Hz
Input Current	6A@115V, 3A@230V
Efficiency	>75%
Holdup Time	16ms. at full load@25°C
Over Voltage Protection	+5V@5.7~6.5V; +3.3V@3.9~4.3V; +12V@13.6~+15V
Over Power/ Load Protection	Output power over to 110%~150%
MTBF	>130,000 hrs
EMI & Safety Approval	UL, TUV, BSMI, NEMCO, FCC, CE
Temperature/Humidity	Operating: 0 ~ 40°C, 20 ~ 90%RH Storage: -20 ~ 60°C, 5 ~ 95%RH
Dimension (WxDxH)	81.5 x 150 x 40.5 mm; 3.2" x 5.9" x 1.6"

MECHANICAL & ENVIRONMENTAL

Operation Temperature	0~50°C
Storage Temperature	-20~80°C
Relative Humidity	5~95% non-condensing
Dimension	251 x 221.8 x 86.3 (mm)
Weight	2.2 Kg

ENGINEERING DRAWING



ORDERING GUIDE

- **WADE-2221A-150X**
Rugged and stylish industrial Mini-ITX Bare-bones Chassis with 150W active PFC PSU
- **WADE-2221A-180X**
Rugged and stylish industrial Mini-ITX Bare-bones Chassis with 180W active PFC PSU

WADE-2231Q

Rugged and Stylish Industrial Mini-ITX Bare-Bones Chassis



The WADE-2231Q is a rugged and stylish barebones system suitable for embedded applications that stand alone or are rackmounted. Its effective ventilation is achieved by the mesh design of the front panel. No actual tool is needed to release

the top cover of chassis, simplifying integration and field service. This barebone system includes a WADE series board, 180-watt power supply, 3.5" drive bay and one PCI expansion slot.

FEATURES

- Bare-bones Chassis for Mini-ITX board
- Tool-free mechanism to open the top cover
- Rugged and stylish design
- Quick 3.5" HDD installation by releasing the top cover

POWER SUPPLY

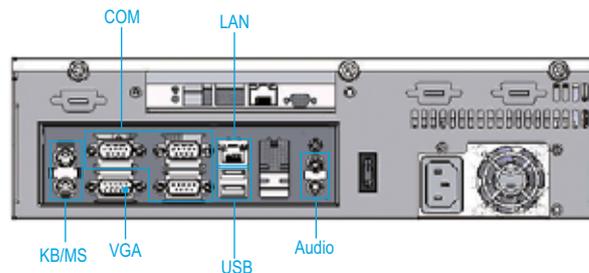
ORION-A1801P optional

Input Voltage	90V ~ 264V AC, full range
Input Frequency	47 ~ 63 Hz
Input Current	6A@115V, 3A@230V
Efficiency	>75%
Holdup Time	16ms. at full load@25°C
Over Voltage Protection	+5V@5.7~6.5V; +3.3V@3.9~4.3V; +12V@13.6~+15V
Over Power/ Load Protection	Output power over to 110%~150%
MTBF	>130,000 hrs
EMI & Safety Approval	UL, TUV, BSMI, NEMCO, FCC, CE
Temperature/Humidity	Operating: 0 ~ 40°C, 20 ~ 90%RH Storage: -20 ~ 60°C, 5 ~ 95%RH
Dimension (WxDxH)	81.5 x 150 x 40.5 mm; 3.2" x 5.9" x 1.6"

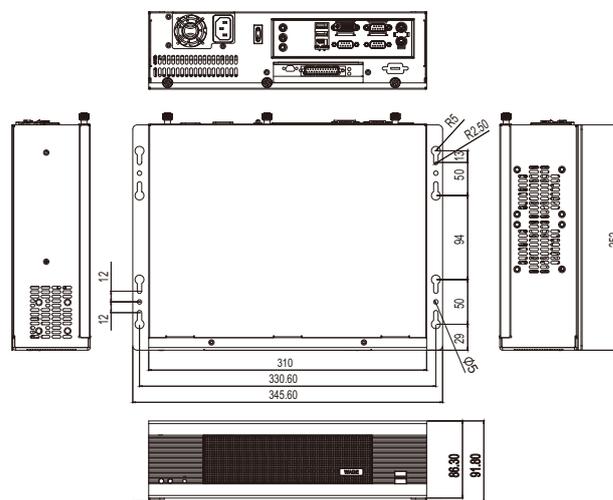
MECHANICAL & ENVIRONMENTAL

Operation Temperature	0~50°C
Storage Temperature	-20~80°C
Relative Humidity	5~95% non-condensing
Dimension	310 x 252 x 86.3 (mm)
Weight	3.0 Kg

REAR I/O



ENGINEERING DRAWING



ORDERING GUIDE

- **WADE-2231Q-4410R-180X**
Rugged and stylish industrial Mini-ITX Bare-bones Chassis with PER-4410R, PCI-E x 16 riser card & 180W PSU
- **WADE-2231Q-518R-180X**
Rugged and stylish industrial Mini-ITX Bare-bones Chassis with PEP-518R, 1 slot PCI riser card & 180W PSU



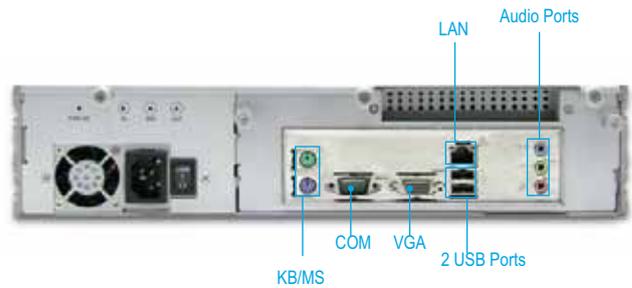
The compact and slim ARTO-220-ITX is design to fit Mini-ITX MB applications operating where space is at a premium. It also features a tool-free mechanical design to quickly release the top cover of the chassis for ease of integration and

field service. The barebone system includes a WADE series board, 3.5" drive bay, one PCI expansion slot and a 250-watt power supply.

FEATURES

- Bare-bones chassis for Mini-ITX board
- Compact, slim and stylish ID design
- One 3.5" HDD bay and 250W PSU
- One PCI expansion slot

REAR I/O



POWER SUPPLY

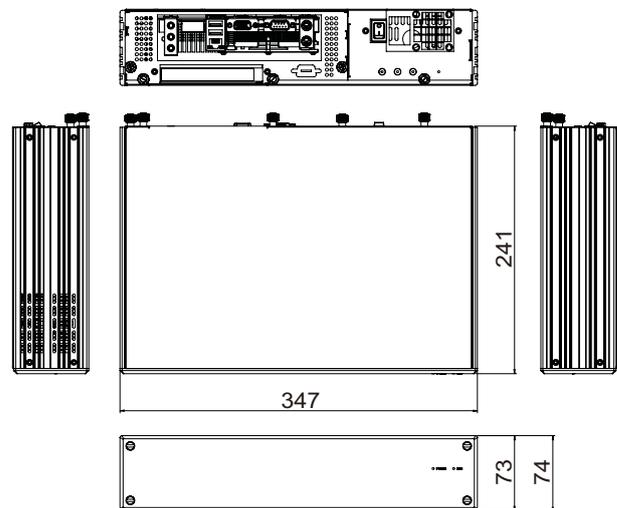
FSP250-50PLB optional

Input Voltage	90V ~ 264V AC, full range
Input Frequency	47 ~ 63 Hz
Input Current	5A@115V, 3A@230V
Efficiency	>68%
Holdup Time	17ms. at full load@25°C
Over Voltage Protection	+5V@5.7~6.5V; +3.3@3.7~4.5V; +12V@13.3~+5.6V
Over Power/ Load Protection	Output power over to 110%~160%
MTBF	105,405 hrs
EMI & Safety Approval	UL, cUL, TVU, CE, FCC
Temperature/Humidity	Operating: 0 ~ 50°C, 20 ~ 85%RH Storage: -20 ~ 70°C, 10m ~ 90%RH
Dimension (WxDxH)	100 x 190 x 40.5 mm; 3.9" x 7.5" x 1.6"

MECHANICAL & ENVIRONMENTAL

Operation Temperature	0~50°C
Storage Temperature	-20~80°C
Relative Humidity	5~95% non-condensing
Dimension	347 x 241 x 74 (mm)
Weight	3.5 Kg

ENGINEERING DRAWING



ORDERING GUIDE

■ ARTO-220-ITX-250X

1.5U Advanced Mini-ITX based Chassis with PEP-581R, 1 slot PCI, rise card & 250W Active PFC PSU



WADE-1042

1U Height Bare Bone server with four drive bays for RAID and two expansion slots



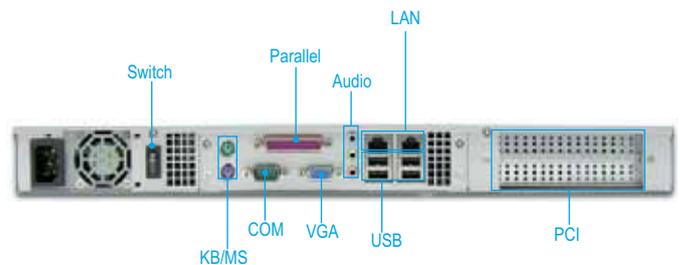
The WADE-1042 uses a 1U rack-mount form factor and is designed for network or communication applications. Its four drive bays support RAID configuration through the SATA interfaces on

the board. Applications will benefit from WADE-1042's compact size, expansion capability, RAID configuration and 250-watt power supply.

FEATURES

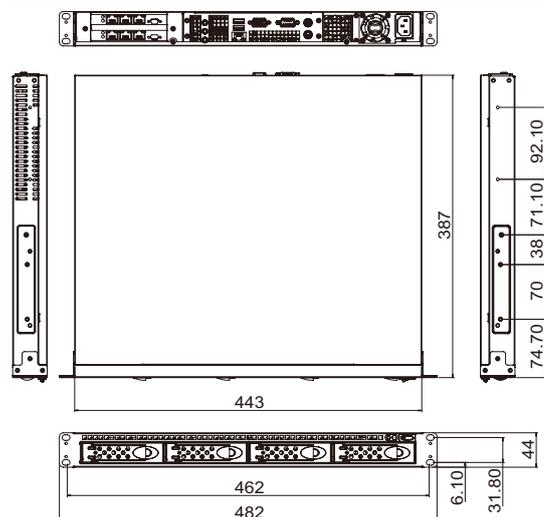
- Bare-bone s chassis for Mini-ITX board
- Compact, slim and stylish ID design
- Four 3.5" HDD bays and 180W PSU
- Two PCI expansion slot

REAR I/O



POWER SUPPLY	FSP220-60LE optional
Input Voltage	90V ~ 264V AC, full range
Input Frequency	47 ~ 63 Hz
Input Current	5A@115V, 3A@230V
Efficiency	>68%
Holdup Time	20ms. at full load@25°C
Over Voltage Protection	+5V@5.5~6.8V; +3.3@3.7~4.8V; +12V@13.4~15.6V
Over Power/ Load Protection	Output power over to 110%~140%
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CE, FCC, CB, CSA, SEMKO, FIMKO, NEMCO, DIMCO
Temperature/Humidity	Operating: 0 ~ 50°C, 20 ~ 85%RH Storage: -40 ~ 70°C, 10m ~ 90%RH
Dimension (WxDxH)	150 x 81.6 x 40.6 mm; 5.9" x 3.2" x 1.6"

ENGINEERING DRAWING



MECHANICAL & ENVIRONMENTAL	
Operation Temperature	0~50°C
Storage Temperature	20~80°C
Relative Humidity	5~95% non-condensing
Dimension	443 x 387 x 44 (mm)
Weight	6.5 Kg

ORDERING GUIDE

- **WADE-1042-582L-220X**
Advance Mini-ITX based Chassis for Rack-Mount with PEP-582L, 2 slots PCI, riser card & 220W Active PFC PSU



Riser Card Selection Guide

WADE ESB	Riser Card	WADE-2221A	ARTO-220-ITX	WADE-2232Q
WADE-8066	PER-4210R			
	PEP-581R			
	PEP-582R			
	PEP-5311R			
WADE-8056	PEP-581R			
	PEP-582R			
	PEP-5311R			
WADE-8556	PEP-581R			
	PEP-582R			
	PEP-5311R			
WADE-8656	PER-4410R			
WADE-8065	PEP-581R			
	PEP-582R			
	PEP-5311R			
WADE-8055	PEP-581R			
	PEP-582R			
	PEP-5311R			
WADE-8044	PEP-581R			
	PEP-582R			
	PEP-5311R			

Further Contact

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



Logistics Service

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



Consulting Service

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



Product Service

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



Manufacturing Service

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



Design Service

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

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

Web Service

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

Extended Visits to PE

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

Direct Contact

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



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>



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