

Module Platform Solution Guide

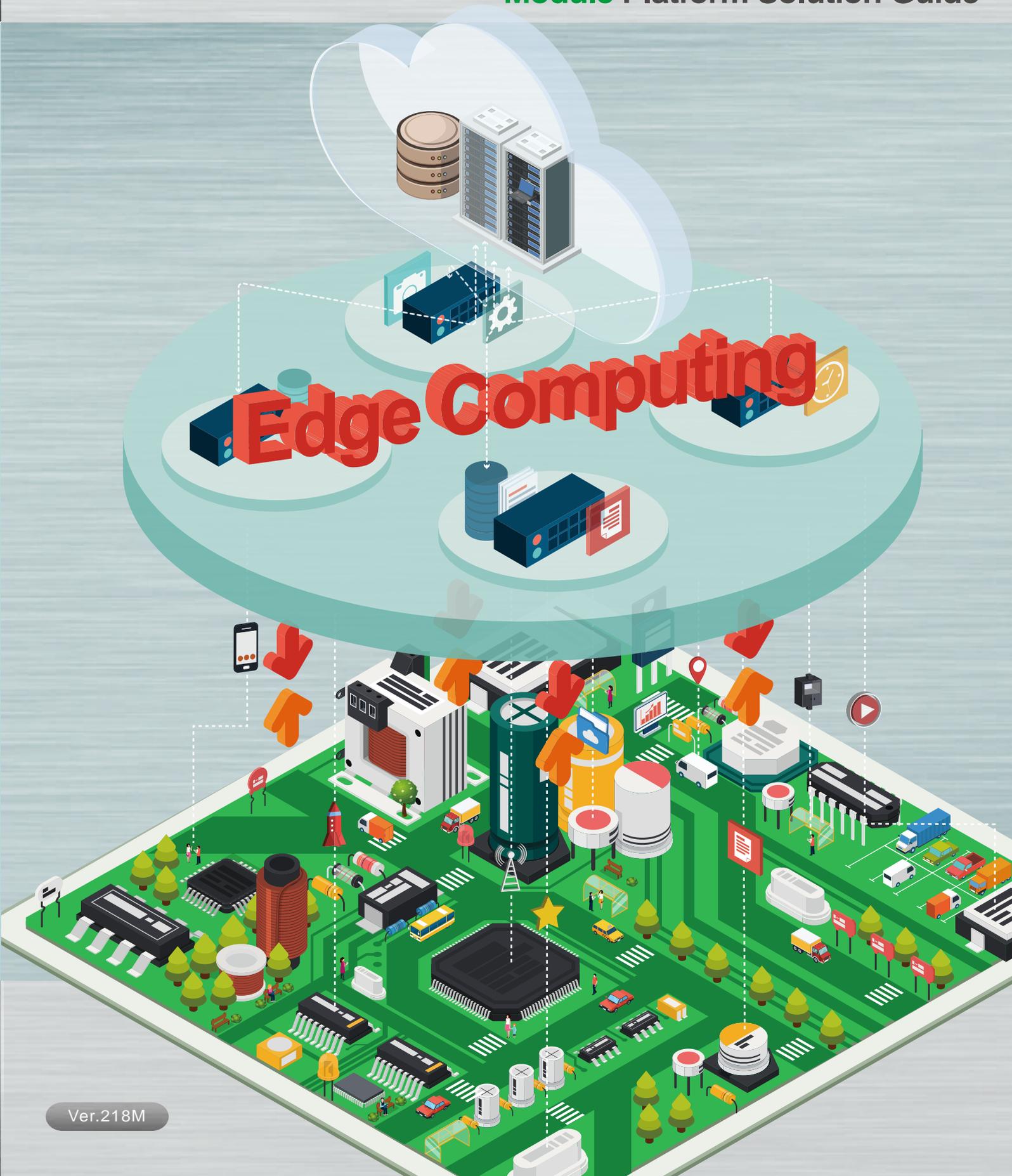




Table of Contents

COMPUTER OF MODULE

PAGE	1	Table of Contents
	2	About Portwell
	3-4	Module
PAGE	7-8	PCOM/Interface

5	Intellegence
6	Technology
9-10	PCOM Solution Guide



11-12 PCOM-BA00
Intel® Atom™ E3800 series SoC based on Type 10 Mini COM Express® module with DDR3L SDRAM, NANDrive, DDI support, and USB3.0



13-14 PCOM-BA01
Intel® Atom™ E3900 series SoC based on Type 10 Mini COM Express® Rev3.0 module with LPDDR4 SDRAM,eMMC, DDI support, and USB3.0



15-16 PCOM-B632VG
Intel® Atom™ E3800 series SoC based on Type 6 COM Express® module with DDR3L SO-DIMM sockets,VGA, eDP, DDI, GbE, and SATA 3 Gb/s



17-18 PCOM-B634VG
Intel® Pentium® / Xeon® D-1500 series Processor based on Type 6 COM Express® 2.0 module with DDR4 ECC/Non-ECC 3x SO-DIMM sockets, VGA, DDI, PCIe 16, 10GbE, USB 3.0, and SATA 6 Gb/s



19-20 PCOM-B637VG
Intel® 6th Generation Core™ Skylake-S / Kabylake-S processors based on Type VI Basic-COM Express 2.0 module with DDR4 SDRAM on Two SO-DIMM slots, VGA, eDP, DP, Gigabit Ethernet, PCIe, SATA and USB



21-22 PCOM-B638VG
Intel® Kabylake-U/Skylake-U Core™ i7/i5/i3 processor based on Type VI Compact-COM Express 2.0 module with DDR4 SDRAM on SO-DIMM slots, VGA, LVDS, Display-port, Gigabit Ethernet, PCIe, SATA, USB, and OTG



23-24 PCOM-B639VG
Intel® Core™ Kabylake-H/Skylake-H Processor based on Type VI COM Express module with DDR4 SDRAM, VGA, LVDS, Gigabit Ethernet, SATA 3.0 and USB



25-26 PCOM-B641VG
Intel® Atom™ E3900 series SoC based on Type 6 COM Express® Rev3.0 module with DDR3L 2x SO-DIMM sockets, VGA, eDP/LVDS, DDI, GbE, and SATA 6 Gb/s



27-28 PCOM-B700G
Intel® Pentium® / Xeon® D-1500 series Processor based on Type 7 COM Express® Rev3.0 module with DDR4 ECC/Non-ECC 3x SO-DIMM sockets, 1x PCIe 3.0 x16, 1x PCIe 3.0 x4, and 8x PCIe 2.0 x1, TPM 2.0, and 2x KR, TPM 2.0, and 2x KR



29-30 PCOM-B701G
Intel® C3000 series Processor based on Type 7 COM Express® Rev3.0 module with DDR4 ECC/Non-ECC 3x SO-DIMM sockets, 20x PCIe Lanes, 4x KR/KX, GbE, NC-SI, TPM 2.0, and SATA 6 Gb/s



31-32 PCOM-C640
PCOM-C640 is NANO-ITX carrier board with triple display, Gigabit Ethernet, Audio, USB 3.0, SATA. It's a powerful carrier which is suitable for system



33-34 PCOM-C605
PCOM-C605 is Mini-ITX Form Factor Evaluation Carrier Board COMExpress Revision 2.0 Type VI Module



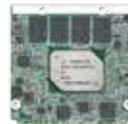
35-36 PCOM-C700G
ATX Form Factor Evaluation Carrier Board for Type 7 COM Express® Rev3.0 module with 4x 10GbE Support



37-38 PSMC-M1011
SMARC module by SMARC 2.0 based on Intel® Atom™ / Pentium® / Celeron® processors ("Apollo Lake") with LPDDR4 SDRAM up to 8GB, 24bit LVDS, DP, HDMI



39-40 PQ7-M106
Qseven Module Based on Intel® Atom™ Processor E3800 Series with DDR3L SDRAM up to 8GB, LVDS/eDP and eMMC



41-42 PQ7-M108
Qseven module by Qseven 2.1 based on Intel® Atom™ / Pentium® / Celeron® processors ("Apollo Lake") with LPDDR4 SDRAM up to 8GB, 24bit LVDS, DP/HDMI



43-44 PEM-E203VLA
Intel® ATOM® E3800 series processor based on form factormodule ETX® 3.0 specification with DDR3 optional ECC/Non-ECC Memory down, VGA, LVDS, Gigabit Ethernet, IDE,PCI, ISA, Parallel Port, SATA and USB



45-46 PEM-E205VLA
Vortex DX3 processor based on ETX 3.02 module with DDR3 Memory down, VGA, LVDS, PCI, ISA, IDE and USB

47	Signal integrity is tested and assured
48	Power & energy use confirmed stable and efficient
49	Our modules are resistant to rapidly changing electrical currents
50	Our modules are compliant with EMS standards
51	A farm of chambers for module testing
52	Bringing thermal validation expertise to module development
53	Silence is a signature of our modules
54	The noise emission meet ISO Standards
55	Breaking the module to be stronger
56	Super-aging our modules to unveil weaknesses
57	Undergo shipping simulation to ensure intact transportation
58	Portwell superior service

About Portwell

Portwell, Inc. was founded in 1993 and entered the Industrial PC market in 1995 by developing single-board computers. Today, our continuous development of leading-edge products has not only resulted in strong growth in market shares and revenue but established Portwell as a major. Portwell, Inc. is an Associate 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, Inc. has worldwide operations in the U.S.A., Taiwan, Japan, Korea, China, Netherlands, United Kingdom, Germany,



Portwell Engine (PE) Building

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 25 years experience in the design and manufacturing of specialty computer boards and systems, Portwell not only provides a one-stop resource for off-the-shelf products, but also supplies custom-built solutions and a global logistics services to suit your needs.

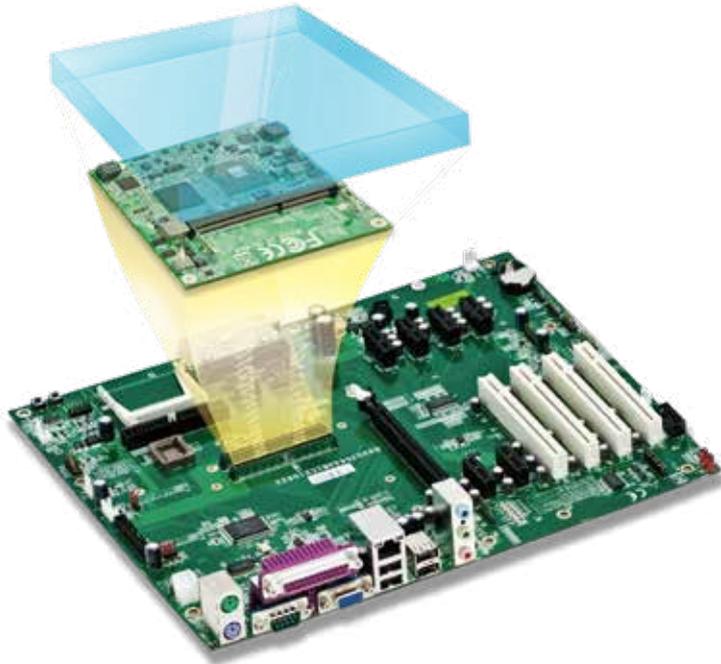
Portwell OEM and ODM solutions satisfy your needs in retail automation, medical equipment, industrial automation, infotainment, communication, and network

security markets. Encouraged by our flexible business support, manufacturing excellence, and compliance with high quality and environmental standards such as ISO 14001/14064/13485/9001, OHSAS 18001 and TS 16949, 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.



Focus on your core competencies

Design for Extreme Reliability Time To Market



COM 
Express

ETX[®] 3.0
Long Term Support

 **SMARC**

Baseboard — SAFE, RELIABLE, SECURE

Portwell designs competence for your market! As a worldwide technology leader in the embedded industry and also a leading outsourcing partner for OEMs in different markets, Portwell's boards can give you the most dependable, powerful and economic basis to meet your carrier board design. You may take a big step forward into a successful future with our proactive project management and ISO 9001:2000 certificate. Portwell provides one-stop shopping so that you can get to the markets faster with complete assemblies including housings and keep your products available for many years with life cycle management.

Module — Solutions That Grow With You

The CPU module delivers the core functionality while all of the application-specific features are designed into the baseboard creating a semi-custom embedded PC solution.

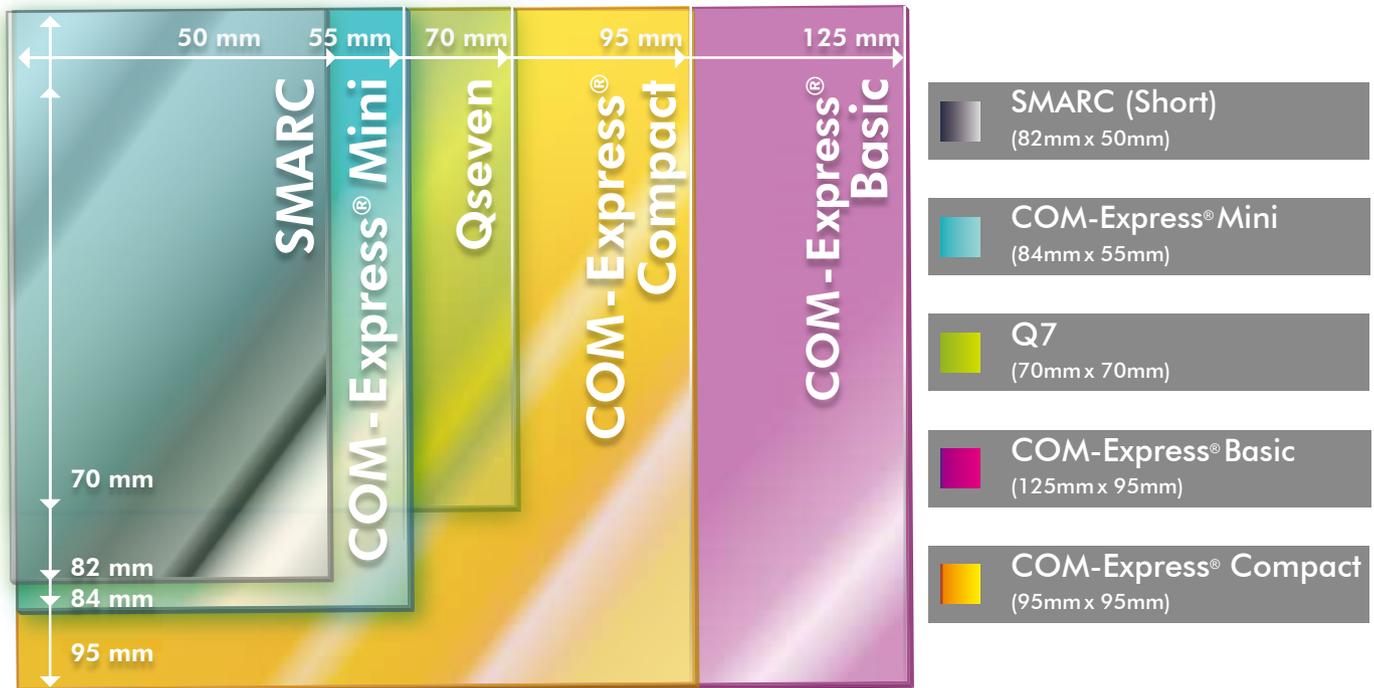
How to enable faster time-to-market and cost-effective customization alternatives? COM (Computer-On-Module) is the answer.

COMs are not only highly integrated component SBCs that support system expansion and application-specific customizations but also improving form, fit and function, minimizing current and future design risks. As well as providing lower product lifecycle costs through module scalability and interchangeability.

Module

Computer-On-Module

Various off-the-shelf core module with additional functionality that is required for specific applications



COM-Express® —

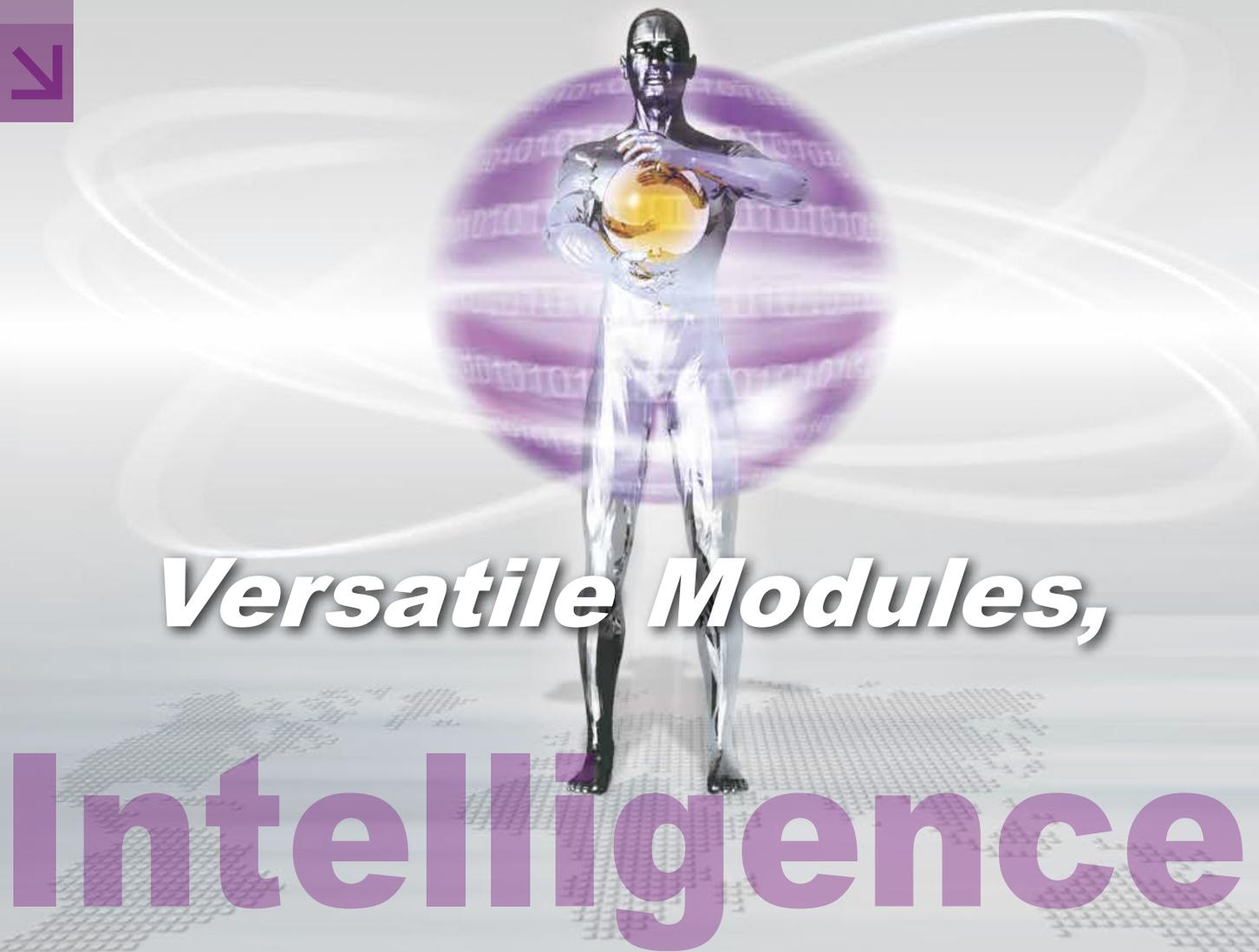
COM Express® defines standardized form factors and pin-outs for Computer-on-Modules. The standard includes the mini form factor (84 x 55mm), the compact form factor (95 x 95mm) and the basic form factor (125 x 95mm). To serve industry requirements, the Digital Display Interfaces (DisplayPort, HDMI) and super-fast USB 3.0 were recently added to the pin-out definitions for COM Express® modules.

Qseven® —

This standard platform has been developed with performance and flexibility in mind, allowing various processor configurations to maximize passive cooling technology. With a maximum power consumption of around 12W specified in the standard, the new form factor is expected to appeal to manufacturers of applications that require fanless operation.

SMARC—

The SMARC ("Smart Mobility ARChitecture") is a versatile small form factor computer Module definition targeting applications that require low power, low costs, and high performance. Module sizes are defined: 82mm x 50mm and 82mm x 80mm with 314 edge fingers that mate with a low profile 314 pin 0.5mm pitch right angle connector.



Versatile Modules,

Intelligence

What Portwell distributed Intelligence?

Portwell provides remote technology to oversee the world. Portwell distributed intelligence is essential for increasing the capabilities – Remote diagnostic and repair , helping to increase equipment availability. Software reliability by isolating application code and helping to prevent dangerous interactions and security by preventing any node from executing malicious software.

Start-Up Intelligent Technology by Portwell Computer-On-Module Solution

With energy demand growing, the smart grid provides opportunities for utility operators to transform their electrical networks. By using Portwell technologies, which provide higher levels of scalability, performance, energy-efficiency and serviceability, next-generation equipment can offer utilities improved energy management and lower operating costs.

Technology



**Intelligent
Start!!**

Instant Solution!

Flexible and Scalable Modular Platforms

Each element on the grid will demand a particular set of features; however, most elements can often be designed using a single-processor architecture with exceptional scalability, upgradeability and flexibility.

- Large processor selection: With a wide choice of processors, it's straightforward to scale designs to meet the right price-performance.
- Single code base: Equipment manufacturers can easily upgrade designs when the processor family is completely code compatible.
- I/O flexibility: Open modular systems, supporting multiple standard busses, allow designers to satisfy a wide range of I/O requirements.
- Reliable supplier: Chip manufacturers, with a reputation for delivering long life cycle products, help preserve equipment manufacturers' development investments.

Easy to increase Embedded Computing Requirements

Regulatory and market realities are requiring a new way of thinking for utilities, and the use of standards-based building blocks to build out the grid will drive greater plant efficiency, higher renewable energy production and more advanced conservation programs.

PCOM Interface

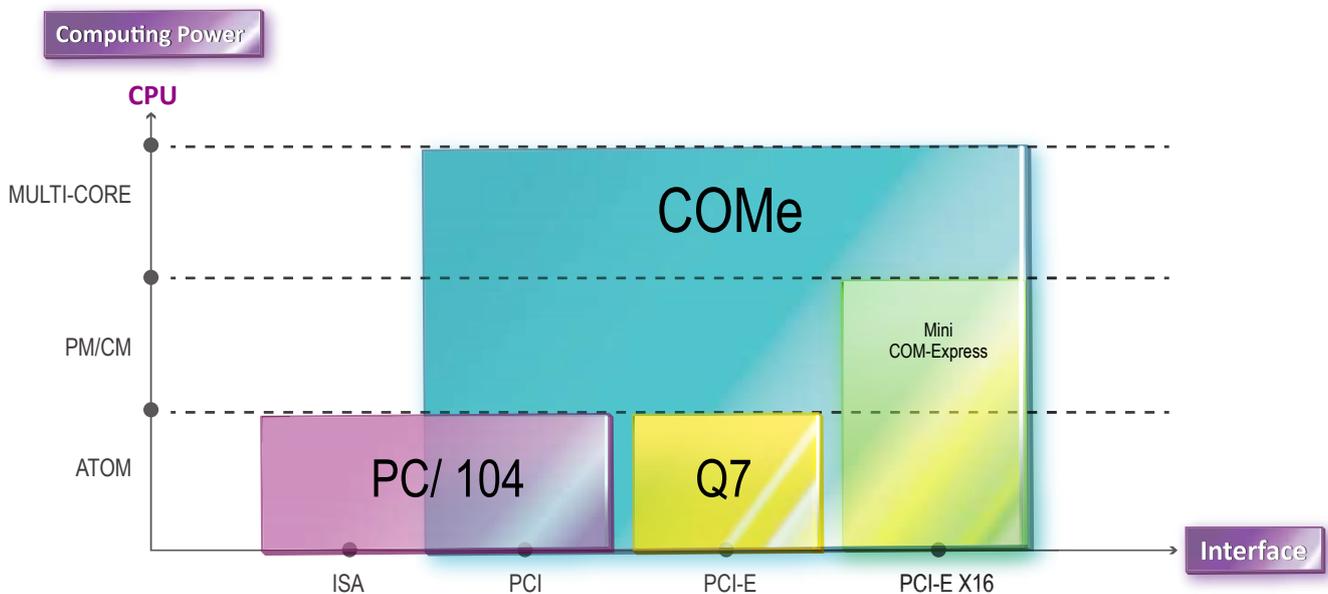
COM Express® specification adopted in July, 2005, redefined electrical, mechanical and thermal requirements for a highly integrated Computer On Module (COM) supporting rich combinations of high-speed I/O interfaces while keeping key legacy interface technologies enabling a smooth migration of interface technologies at once. The primary new technology behind COM Express® R3.0 is the support of a few new interfaces such as USB 3.0 and Digital Display Interfaces (DDI). The new technology also provides additional PCI Express lanes, high definition audio, and SPI for BIOS access. The new PCOM Interface has additional pin definitions such as Pulse Width Modulation (PWM) for fan control and TPM support for security and management. The evolution of the PCOM Module has adopted a Mini module of 84 x 55mm which is also more energy efficient under 12W.

Naming Guide - Line of Portwell Com Express

PCOM Series	PCOM	Portwell COM Express
Carrier or Module	X ₁	B Module Board, Portwell Design
		C Carrier board, Portwell Desing
COM Express Pin Type	X ₂	1 Type 1 Pin-Out
		2 Type 2 Pin-Out
		3 Type 3 Pin-Out
		4 Type 4 Pin-Out
		5 Type 5 Pin-Out
		6 Type 6 Pin-Out
		7 Type 7 Pin-Out
		A Type 10 Pin-Out

PCOM Series	PCOM	Portwell COM Express
Serial Number	X ₃ ~X ₄	0-9 TBD
VGA support	Y ₅	V VGA support
		L LVDS support
Ethernet	Y ₆	G Gigabit Ethernet
		L Fast Ethernet
TPM support	Y ₇	T TPM support
Customized abbreviation	YY	

EX: PCOM-X₁X₂X₃X₄Y₅Y₆Y₇-YY



COM Express[®] Standard

Types	Connector Rows	PCI Express	PEG	SATA Ports	LAN Ports	USB 2.0 Ports	USB 3.0 Ports	Display Interface
Type 6	AB & CD	Up to 24	1	4	1x GbE	8	4	VGA LVDS/eDP PEG 3x DDI
Type 7	AB & CD	Up to 32	NA	2	1x GbE 4x 10GbE	4	4	NA
Type 10	AB	Up to 4	NA	2	1x GbE	8	2	LVDS/eDP 1x DDI

System I/O

PCI-E Lanes	LVDS/VGA
Serial	TV-Out/DDI
SATA/SAS	Express Card
USB 2.0	HDA
LAN	LPC

System I/O

PCI-E Lanes	PATA Port
PCI-E Graphics (PEG)	LAN Port
SDVO	DDI Interface
PCI Bus	USB 3.0

System Management

SDIO	Watchdog Timer
GPIO	Speaker Out
SMBUS	Reset
I2C	

Power Management

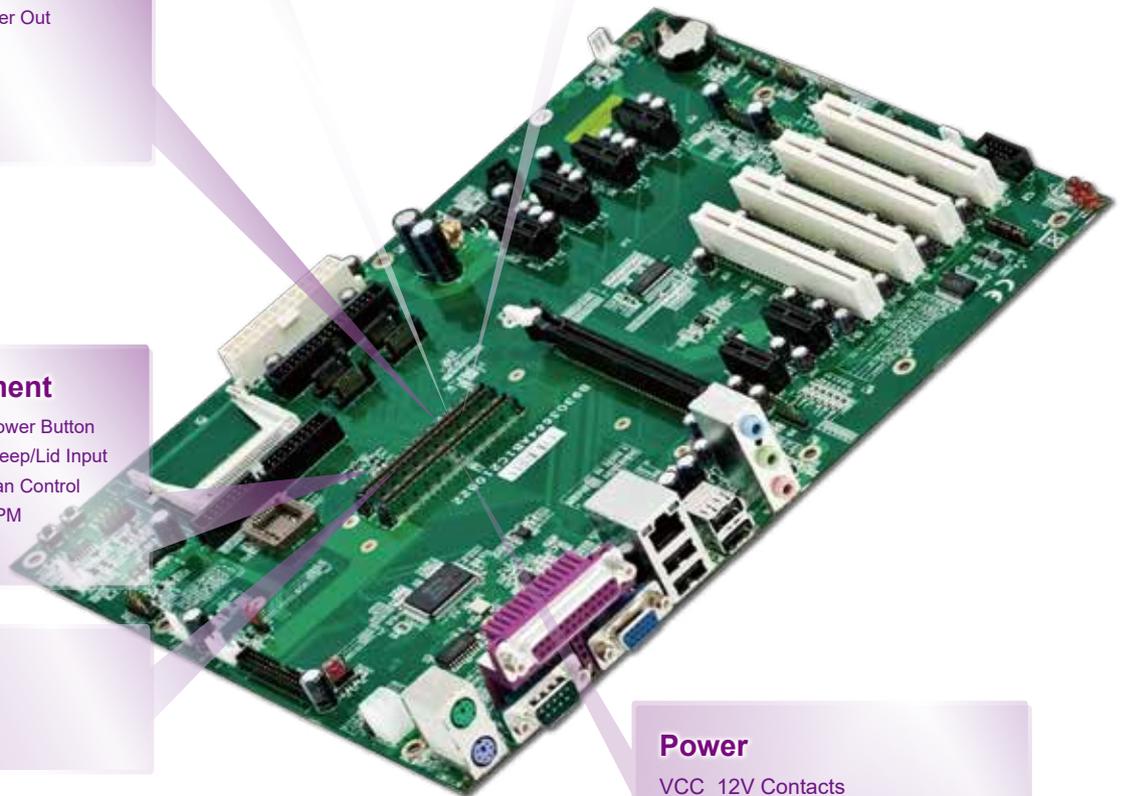
Thermal Protection	Power Button
Low Battery Alarm	Sleep/Lid Input
Suspend/Wake Signals	Fan Control
Optimal Power	TPM
VCC_5V_SBY Contacts	

Power

VCC_12V Contacts

Power

VCC_12V Contacts



PCOM Solution Guide



	PCOM-BA00	PCOM-BA01	PCOM-B632VG	PCOM-B634VG	PCOM-B637VG	PCOM-B638VG
Form Factor (mm)	COM Express® Mini (84 x 55mm)	COM Express® Mini (84 x 55mm)	COM Express® Compact (95 x 95mm)	COM Express® Basic (125 x 95mm)	COM Express® Basic (125 x 95mm)	COM Express® Compact (95 x 95mm)
COM Type	Type 10	Type 10	Type 6	Type 6	Type 6	Type 6
CPU/ Clock/ Cache	<ul style="list-style-type: none"> * Intel® E3845/ E3827/ E3825/ E3815 * 1.33 GHz to 1.91GHz * 1MB to 2MB cache 	<ul style="list-style-type: none"> * Intel® E3950/ E3940/E3930/ N4200/N3350 * 1.1 GHz to 1.6GHz * 2MB cache 	<ul style="list-style-type: none"> * Intel® E3845/ E3827/E3826/ E3825/E3815 * 1.33GHz up to 1.91GHz * 1MB to 2MB cache 	<ul style="list-style-type: none"> * Intel® Xeon® D Processor * D1577/D1548/ D1539/D1527/ D1519/D1517/ D1508 * Up to 16 CPU Cores * 12M L2 Cache 	<ul style="list-style-type: none"> * Intel® 6th Generation Core™ 35W Desktop processor * i7-6700TE/i5-6500TE/i3-6100TE * Up to 4 CPU cores * 3MB to 8MB cache 	<ul style="list-style-type: none"> * Intel® 6th Generation Core™ ULT * Intel® Celeron® 3955U/ i3-6100U/ i5-6300U/ i7-6600U * Up to 2 CPU cores * 2MB to 4MB cache
Chipset	SoC	SoC	SoC	SoC	Q170/H110/C236	SoC
Memory	<ul style="list-style-type: none"> * DDR3L 1067/1333 MT/s * Non-ECC/ ECC * Single Channel 	<ul style="list-style-type: none"> * LPDDR4 2133 MT/s * Non-ECC * Dual Channel 	<ul style="list-style-type: none"> * DDR3L 1067/1333 MT/s * Non-ECC * Single Channel 	<ul style="list-style-type: none"> * DDR4 2400 MT/s * 3 SO-DIMM Sockets * Non-ECC/ ECC * Dual Channel 	<ul style="list-style-type: none"> * DDR4 2133 MT/s * Non-ECC/ ECC * Dual Channel 	<ul style="list-style-type: none"> * DDR4 2133 MT/s * Non-ECC * Dual Channel
USB	1x USB 3.0 4x USB 2.0	2x USB 3.0 8x USB 2.0 OTG x 1 port (Optional)	1x USB 3.0 4x USB 2.0	4x USB 3.0 7x USB 2.0	4 x USB 3.0 8 x USB 2.0	3 x USB 3.0 8 x USB 2.0 (One Optional OTG)
PCI Express	3x PCIe 2.0 x1 (Optional to 4 x PCIe x1)	4x PCIe 2.0 x1	3x PCIe 2.0 x1	1x PCIe 3.0 x16 8x PCIe 2.0 x1	1 x PCIe 3.0 x16 8 x PCIe 3.0 x1	1 x PCIe 3.0 x4 5 x PCIe 3.0 x1
Ethernet	LAN I210-IT	LAN I210-IT	LAN I210IT	Intel® I210IT 2x KR(10GbE)	Intel® I219LM	Intel® I219LM
Sound	Intel® High Definition Audio	Intel® High Definition Audio	Intel® High Definition Audio	Intel® High Definition Audio	Intel® High Definition Audio	Intel® High Definition Audio
Graphic Controller	Intel® HD Graphic	* Intel® HD Graphics 505 * Intel® HD Graphics 500	Intel® HD Graphic	SM750	Intel® HD Graphics 530	Intel® HD Graphics 520
Carrier Board	PCOM-CA00 (Type 10)	PCOM-CA00 (Type 10)	PCOM-C605 (Type 6)	PCOM-C609 (Type 6)	PCOM-C605 (Type 6)	PCOM-C605 (Type 6)

PCOM Solution Guide



PCOM-B639VG	PCOM-B641VG	PCOM-B700G	PCOM-B701G	PCOM-C640	PCOM-C605	PCOM-C700G
COM Express® Basic (125 x 95mm)	COM Express® Compact (95 x 95mm)	COM Express® Basic (125 x 95mm)	COM Express® Basic (125 x 95mm)	NANO-ITX (120 x 120mm)	Mini-ITX (170 x 170mm)	ATX (305 x 244mm)
Type 6	Type 6	Type 7	Type 7	Type 6	Type 6	Type 7
* Intel® 6 th Generation Core™ * G3902E/ G3900E i3-6100E i3-6102E i5-6442EQ i5-6440EQ i7-6820EQ i7-6822EQ * Up to 4 CPU cores * 2MB to 8MB cache	* Intel® E3950/ E3940/E3930/ N4200/N3350 * 1.1 GHz to 1.6GHz * 2MB cache	* Intel® Xeon® D1577/D1557/ D1548/D1539/ D1527/D1519/ D1517/D1508/ D1507 * Up to 16 CPU Cores * 12M L2 Cache	* Intel® Atom® Processor C3308/ C3508/C3708/ C3808/C3958 * Up to 16 CPU Cores * 4MB to 16MB Cache	N/A	N/A	N/A
SoC	SoC	SoC	SoC	N/A	N/A	N/A
* DDR4 2133 MT/s * Non-ECC/ECC * Dual Channel	* DDR3L 1866 MT/s * Non-ECC * Dual Channel	* DDR4 2400 MT/s * 3 SO-DIMM Sockets * Non-ECC/ ECC * Dual Channel	* DDR4 2400 MT/s * 3 SO-DIMM Sockets * Non-ECC/ ECC * Dual Channel	N/A	N/A	N/A
4 x USB 3.0 8 x USB 2.0	3x USB 3.0 8x USB 2.0 OTG x 1 port (Optional)	4x USB 3.0 4x USB 2.0	4 x USB2.0 4 x USB3.0	2 x USB 3.0 1 x USB 2.0	1 x USB2.0 2 x USB3.0	4 x USB3.0
1 x PCIe 3.0 x16 8 x PCIe 3.0 x1	1x PCIe 2.0 x4	1x PCIe 3.0 x16 10x PCIe 2.0 x1	1x PCIe 3.0 x8 12x PCIe 2.0 x1	1x PCIe x1	1x PCIe x1	1x PCIe x4 8x PCIe x1 1x PCIe x16
Intel® I219LM	LAN I210-IT	Intel® I210IT 2x KR(10GbE)	Intel® I210IT 4x KR/KX (10GbE)	2 x GbE	2 x GbE	2x GbE 4x 10GbE
Intel® High Definition Audio	Intel® High definition Audio	TPM 2.0 (Option)	TPM 2.0 (Option) eMMC (Option)	N/A	N/A	BMC
Intel® HD Graphics 530	* Intel® HD Graphics 505 * Intel® HD Graphics 500	N/A	N/A	N/A	N/A	N/A
PCOM-C605 (Type 6)	PCOM-C605 (Type 6)	PCOM-C700 (Type 7)	PCOM-C700 (Type 7)	N/A	N/A	PCOM-B700G PCOM-B701G

PCOM-BA00

Intel® Atom® E3800 series SoC based on Type 10 Mini COM Express® module with DDR3L SDRAM, NANDrive, DDI, and USB3.0 support



FEATURES

- Atom® Bay Trail SoC E3800 series processor with industrial support.
- On Board DDR3L DRAM and up to 4GB
- Three PCI Express lanes (optional to four lanes)
- Support one USB3.0, four USB2.0
- Support NANDrive storage by SATA channel



PCOM-BA00 is a Mini COM Express by 84mm x 55mm with Intel® Bay Trail E3800 series SoC supports PCI Express, dual display, NANDrive storage features.

By low power consumption, wide-temp support, better computing, and cost effective, Portwell promotes with confidence PCOM-BA00 as vertical solution to aim at versatile applications, such as Automation, Military, Networking, Transportation, and so on.

General

General					
Product	PCOM-BA00				
Form Factor	Type 10, Mini Form Factor COM Express(84 x 55mm)				
Processor	Intel® Atom®				
	E3845	E3827	E3826	E3825	E3815
Core	4	2	2	2	1
Freq.	1.91 GHz	1.75 GHz	1.46 GHz	1.33 GHz	1.46 GHz
Turbo	N/A				
Cache	2MB	1MB	1MB	1MB	512KB
Processor Graphics	Intel® HD Graphics for Intel Atom® Processor Z3700 Series				
Graphics Base Frequency	542 MHz	542 MHz	533 MHz	533 MHz	400 MHz
Graphics Max Dynamic Frequency	792 MHz	792 MHz	667 MHz	533 MHz	400 MHz
HW Encoding	H.264 and MPEG2				
HW Decoding	H.264, MPEG2, MVC, VC-1, WMV9, JPEG/MJPEG, and VP8				
HW Acceleration	DirectX 11, OCL 1.2, OGL ES Hali/2.0/1.1, OGL 3.2				
Processor TDP	10W	8W	7 W	6W	5W
BIOS	AMI BIOS				
ECC Memory Supported	YES				
Memory	Supports up to 4GB DDR3L 1067/1333 MT/s SDRAM				

I/O Interface

I/O Interface			
SATA	2x SATA III		
USB	1 x USB 3.0 4 x USB 2.0		
Ethernet	Intel® Ethernet Controller I210IT		
Serial I/O	GPIO	8 x GPIO	
	I ² C	Baud rate: 400KHz	
	SMBus	Baud rate: 100KHz	
	UART	2x UART	
PEG	N/A		
PCI Express	3 x PCIe x1 (Optional to 4 x PCIe x1)		
Display	VGA	VGA	2560 x 1536 @ 24bpp
	LVDS	eDP	2560 x 1600 @ 24bpp
	HDMI	DP	2560 x 1600 @ 24bpp
		HDMI	1920 x 1080p@ 24bpp
Security	Intel® AES		

MECHANICAL & ENVIRONMENT

Dimension	84 x 55mm
Power DC IN	+4.75VDC ~ +20VDC , AT / ATX mode
Storage Temperature	-40°C to 80°C
Operation Temperature	-40°C to 80°C
Certification	Contact us
MTBF	Over 120,000 hours at 40°C
Vibration	Random 5Hz to 2KHz, 7.7 grms, 10min in each of 3 axes
OS	Windows 7/WES7/8/WES8/Embedded Compact7 Linux Fedora/Tizen/Yocto RTOS Windriver

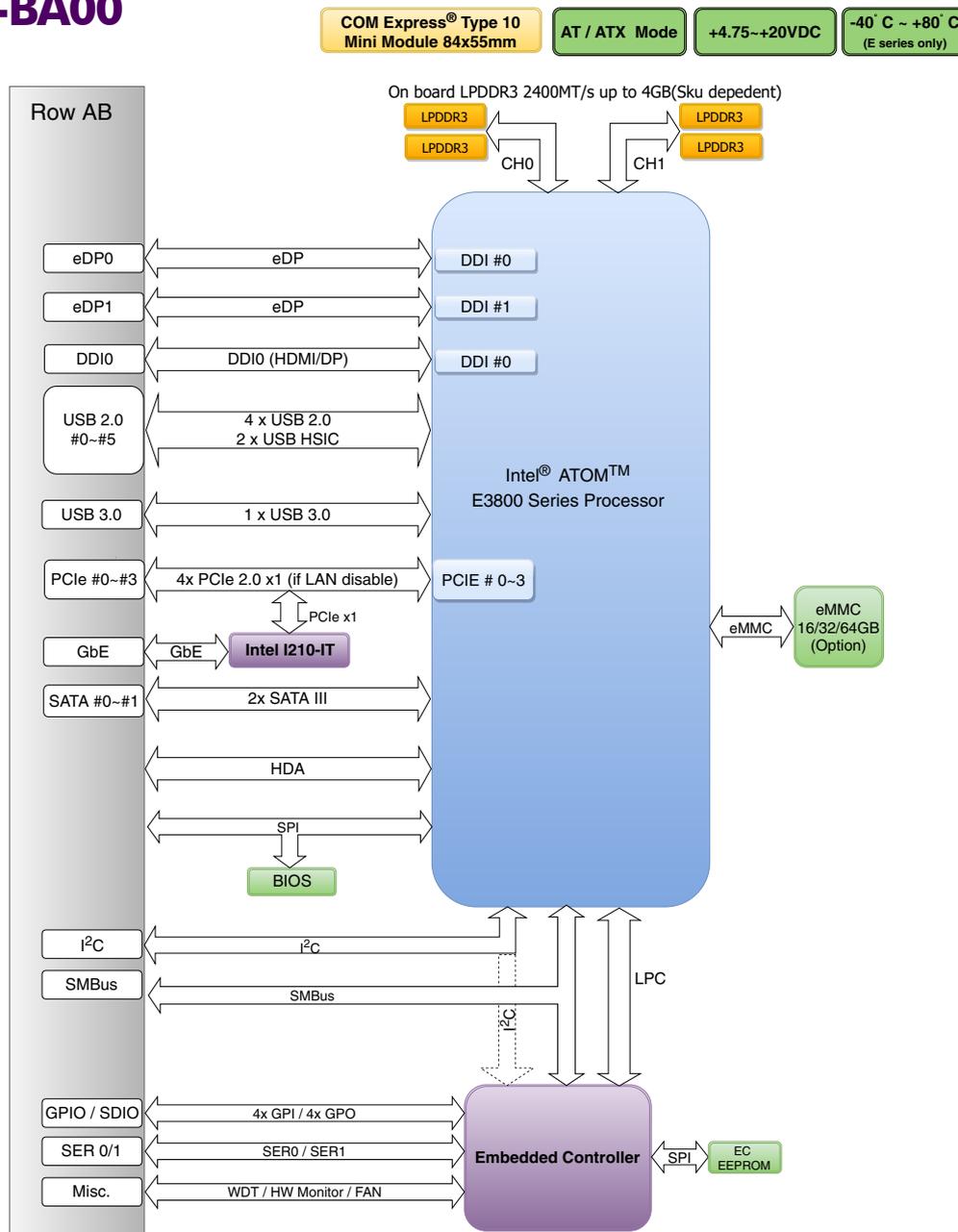
ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-BA00-E3805-2G	AB1-3C19	Available
PCOM-BA00-E3815-2G	AB1-3B49	Available
PCOM-BA00-E3825-2G	AB1-3B47	Available
PCOM-BA00-E3827-2G	AB1-3B50	Available
PCOM-BA00-E3845-2G	AB1-3B51	Available
PCOM-BA00-E3845-4G	AB1-3B48	Available

Accessory	Ordering P/N	Status
PCOM-CA00 (Carrier Board)	AB1-3917	Available

BLOCK DIAGRAM

PCOM-BA00



PCOM-BA01

Intel® Atom® E3900 series SoC based on Type 10 Mini COM Express® Rev3.0 module with DDR3L SDRAM, eMMC, DDI support, and USB3.0



FEATURES

- Intel® Atom® E3900 Series ultra low power processor
- 1 DDI, LVDS/eDP display interface
- 4K resolution (*HDMI 3840x2160 @30Hz)
- Support eMMC storage (Option)
- Support -40°C to +85°C wide temperature



PCOM-BA01, a Type 10 COM Express Mini (84mm x 55mm) module based on the 14nm Intel® Atom® processor E3900 product family (6W~12W). The Mini form factor PCOM-BA01 COM Express module supports on board LPDDR4 SDRAM, making it faster than its predecessor.

General

Product	PCOM-BA01				
Form Factor	COM Express Rev3.0 Mini Type 10				
Processor	Intel® Atom®			Intel® Pentium®	
	E3950	E3940	E3930	N4200	N3350
Core	4	4	2	4	2
Freq.	1.60 GHz	1.60 GHz	1.30 GHz	1.10 GHz	1.10 GHz
Turbo	2.00 GHz	1.80 GHz	1.80 GHz	2.50 GHz	2.40 GHz
Cache	2MB	2MB	2MB	2MB	2MB
Processor Graphics	Intel® HD Graphics 505	Intel® HD Graphics 500	Intel® HD Graphics 500	Intel® HD Graphics 505	Intel® HD Graphics 500
Graphics Base Frequency	500 MHz	400 MHz	400 MHz	200 MHz	200 MHz
Graphics Max Dynamic Frequency	650 MHz	600 MHz	550 MHz	750 MHz	650 MHz
HW Encoding	HEVC/H.265, H.264, MVC, VPS, VP9, JPEG/JPEG				
HW Decoding	HEVC/H.265, H.264, MVC, VPS, MPEG2, VC-1, WMV9, JPEG/JPEG				
HW Acceleration	Gen9LP, DX 9.3/10/11.1/12, OpenGL 4.3, OGL ES 3.0, OpenCL 1.2, PAVP 2.0				
Processor TDP	12W	9.5W	6.5W	6W	6W
BIOS	AMI BIOS				
ECC Memory Supported	No				
Memory	On Board LPDDR4 DRAM and up to 8GB				

I/O Interface

SATA	2x SATA III			
USB	8 x USB2.0 2 x USB3.0 1 x OTG (Option)			
Ethernet	Intel® Ethernet Controller I210IT			
Serial I/O	GPIO		8 x GPIO	
	I ² C		Baud rate: 400KHz	
	SMBus		Baud rate: 100KHz	
	UART		2x UART	
PEG	N/A			
PCI Express	1x PCIe4 or 4x PCIe x1			
Display	LVDS	eDP	1920x1600@60Hz	
	HDMI	DP	4096x2160@60Hz	
		HDMI	3840x2160@30Hz (Optional)	
Security	Intel® AES			

MECHANICAL & ENVIRONMENT

Dimension	84 x 55mm
Power DC IN	+4.75VDC ~ +20VDC , AT / ATX mode
Storage Temperature	-40°C to 80°C
Operation Temperature	-40°C to 80°C
Certification	Contact us
MTBF	Over 120,000 hours at room ambient 40° C
Vibration	Random 5Hz to 2KHz, 7.7 grms, 10min in each of 3 axes
OS	Win 7/8, WES 7/8 Linux Tizen/Fedora/Yocto RTOS Windriver

ORDERING GUIDE

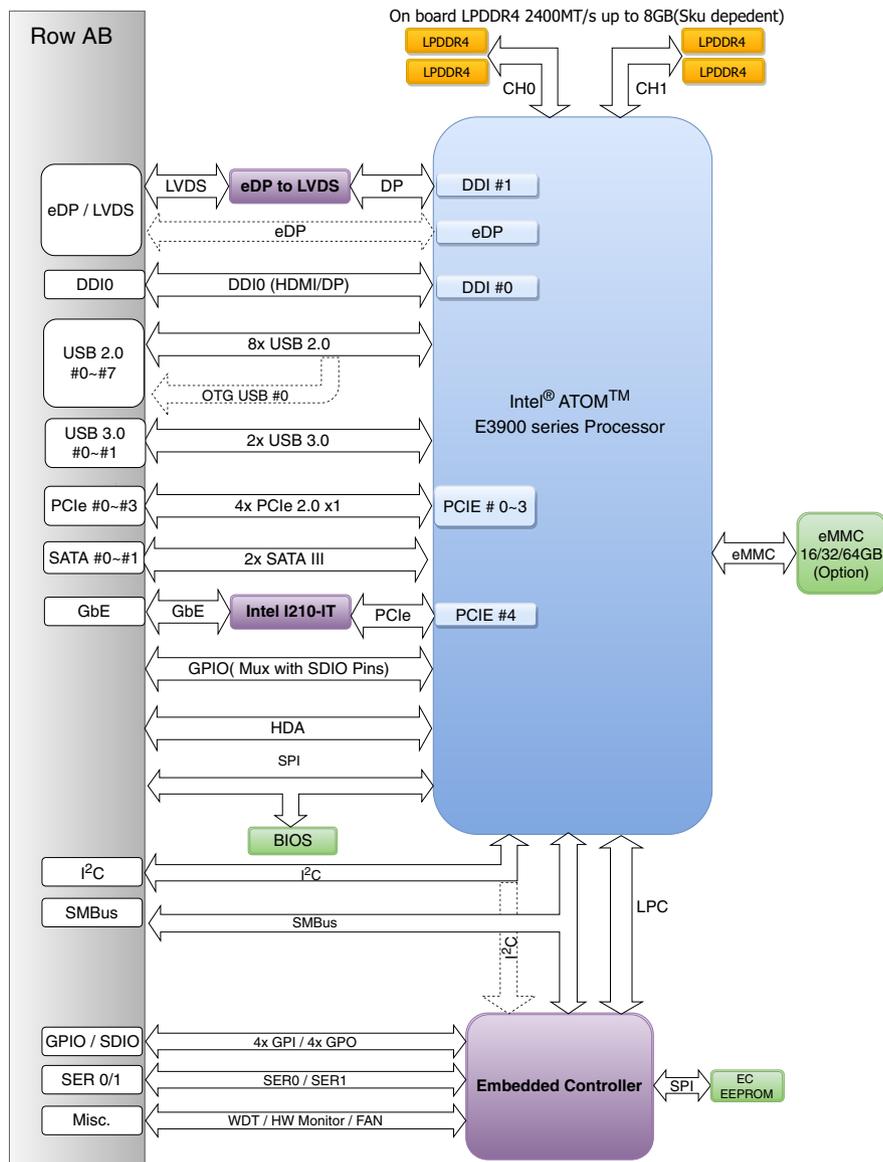
Product	Ordering P/N	Status
PCOM-BA01-E3950-4G	AB1-3G73	Available
PCOM-BA01-E3940-4G	AB1-3G74	Available
PCOM-BA01-E3930-4G	Contact us	Available
PCOM-BA01-N4200-4G	Contact us	Available
PCOM-BA01-N3350-4G	Contact us	Available
PCOM-BA01-E3950-8G	Contact us	Available
PCOM-BA01-E3940-8G	Contact us	Available
PCOM-BA01-E3930-8G	AB1-3G27	Available
PCOM-BA01-N4200-8G	Contact us	Available
PCOM-BA01-N3350-8G	Contact us	Available

BLOCK DIAGRAM

PCOM-BA01

Accessory	Ordering P/N	Status
PCOM-CA00 (uATX ATX Carrier Board)	AB1-3917	Available

COM Express® Type 10 Mini Module 84x55mm
AT / ATX Mode
+4.75~+20VDC
-40° C ~ +80° C (E series only)



PCOM-B632VG

Intel® Atom® E3800 series SoC based on Type 6 COM Express® module with DDR3L SO-DIMM sockets, VGA, eDP, DDI, GbE, and SATA 3 Gb/s



FEATURES

- Atom® Bay Trail SoC E3800 series processor with industrial support
- Supports up to four PCI Express lanes, four x 1 lanes can be configured to one x 4 lane
- Supports one DDR3L 1067MT/s SDRAM, UP to 8GB
- Supports one USB3.0 port



PCOM-B632VG is designed to offer good EMC protection by latest mobile platform, SoC(System-On-Chip) integrated remote technology and embedded controller. Also PCOM-B632VG provides high performance for various display, eDP and HDMI.

The PCOM-B632VG COM Express® module has been enhanced by Portwell in response to market demand for an even lower power platform to take advantage of the Intel® Atom® processor's already compact design. In fact, since its initial inception, Portwell's expanding Intel Atom processorbased COM Express product portfolio has now grown to include industrial temperature range support. Portwell versatile COM Express modules adapt to these changes by enabling designers to partition commodity hostprocessors from proprietary baseboards, thereby minimizing current and future design risks during the initial phase of development.

General

Product	PCOM-B632VG				
Form Factor	Type 6, Compact Form Factor Com Express (95 x 95mm)				
Processor	Intel® Atom®				
	E3845	E3827	E3826	E3825	E3815
Core	4	2	2	2	1
Freq.	1.91 GHz	1.75 GHz	1.46 GHz	1.33 GHz	1.46 GHz
Turbo	N/A				
Cache	2MB	1MB	1MB	1MB	512KB
Processor Graphics	Intel® HD Graphics for Intel Atom® Processor Z3700 Series				
Graphics Base Frequency	542 MHz	542 MHz	533 MHz	533 MHz	400 MHz
Graphics Max Dynamic Frequency	792 MHz	792 MHz	667 MHz	533 MHz	400 MHz
HW Encoding	H.264 and MPEG2				
HW Decoding	H.264, MPEG2, MVC, VC-1, WMV9, JPEG/MJPEG, and VP8				
HW Acceleration	DirectX 11, OCL 1.2, OGL ES Hali/2.0/1.1, OGL 3.2				
Processor TDP	10W	8W	7 W	6W	5W
BIOS	Phoenix UEFI BIOS				
ECC Memory Supported	No				
Memory	Supports up to 8GB DDR3L 1066/1333 MT/s SDRAM				

I/O Interface

SATA	2x SATA II		
USB	4 x USB 2.0 1 x USB3.0		
Ethernet	Intel® Ethernet Controller I210IT		
Serial I/O	GPIO	8 x GPIO	
	I2C	Baud rate: 400KHz	
	SMBus	Baud rate: 100KHz	
	UART	2x UART	
PEG	N/A		
PCI Express	3x PCIe x1 Gen2 (Optional to 4x PCIe x1)		
Display	VGA	VGA	2560 x 1536 @ 24bpp
	LVDS	eDP	2560 x 1600 @ 24bpp
	HDMI	DP	2560 x 1600 @ 24bpp
		HDMI	1920 x 1080p @ 24bpp
Security	Intel® AES		

MECHANICAL & ENVIRONMENT

Dimension	95mm x 95mm
Power DC IN	+8VDC ~ +16VDC
Storage Temperature	-40°C to 80°C
Operation Temperature	-40°C to 80°C
Certification	Contact us
MTBF	Over 120,000 hours at room ambient 40°C
Vibration	Random 5Hz to 2KHz, 7.7 grms, 10min in each of 3 axes
OS	Windows 7(32/64)/Windows10(64) Linux Wind River/Yocto RTOS

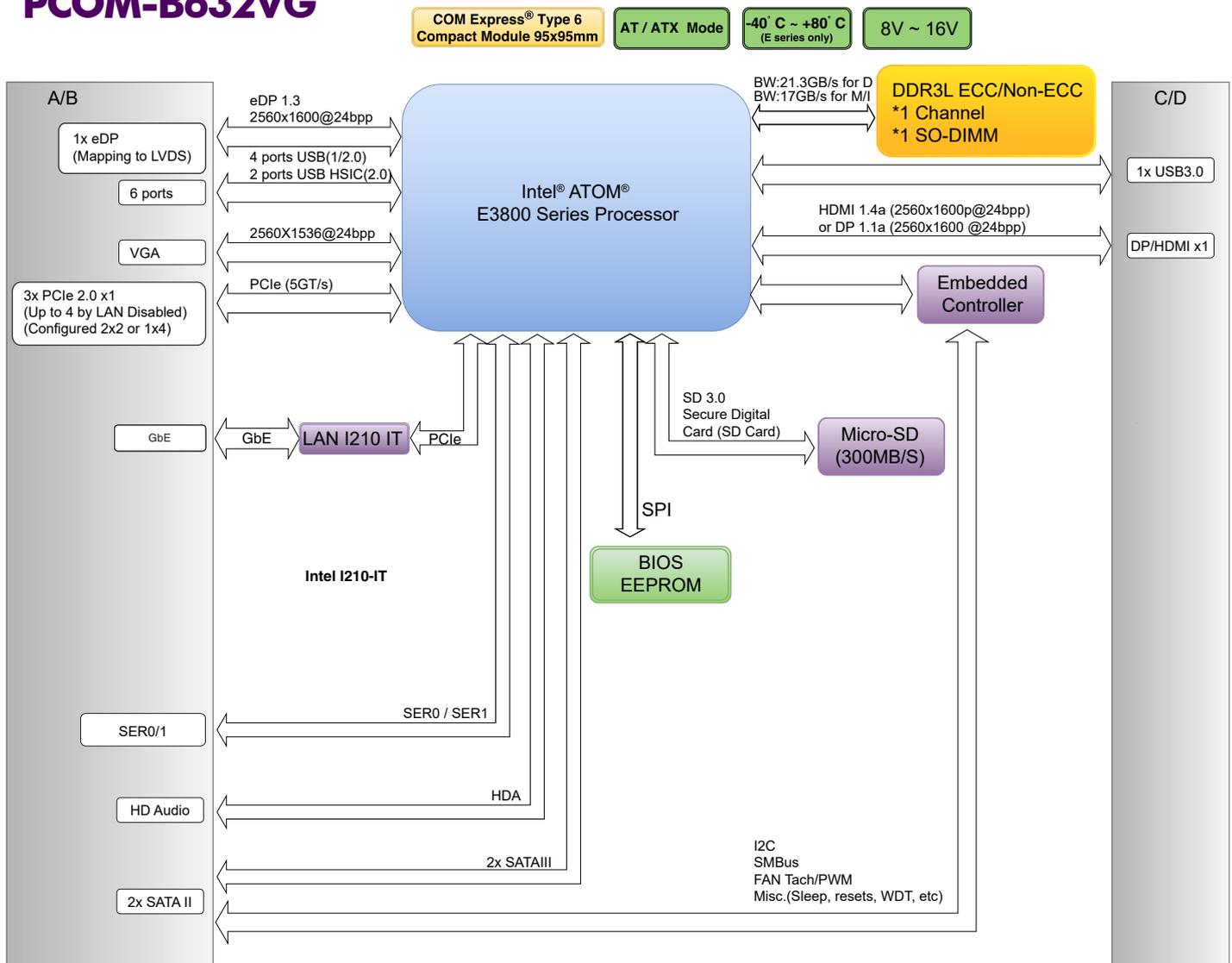
ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-B632VG-E3845-	AB1-3A36	Available
PCOM-B632VG-E3827	AB1-3A33	Available
PCOM-B632VG-E3826	AB1-3A34	Available
PCOM-B632VG-E3825-	AB1-3A35	Available
PCOM-B632VG-E3815	AB1-3A40	Available

Accessory	Ordering P/N	Status
Heat Sink	B8308040	Available
Heat Spreader	B8307650	Available
PCOM-C605 (MINI-ITX Carrier Board)	AB1-3998	Available
PCOM-C640 (NANO-ITX Carrier Board)	AB1-3D18Z	Available
PCOM-C600 (uATX ATX Carrier Board)	AB1-3761Z	Available

BLOCK DIAGRAM

PCOM-B632VG



PCOM-B634VG

Intel® Pentium® / Xeon® D-1500 series Processor based on Type 6 COM Express® 2.0 module with DDR4 ECC/Non-ECC 3x SO-DIMM sockets, VGA, DDI, PCIe 16, USB 3.0, and SATA 6 Gb/s



FEATURES

- Intel® Pentium® / Xeon® D-1500 series Processor 14nm process (Broadwell-DE)
- Support DDR4-2133/2400 SDRAM on three SO-DIMM sockets, up to 48GB
- One VGA, One HDMI, and Two 10GbE Interfaces
- 7x USB 2.0, 4x USB 3.0, 4x SATA III, 8x PCIe x1 Gen 2.0, and 1x PCIe x16 Gen 3.0



Portwell PCOM-B634VG is designed with Intel® new Xeon processor with 16 CPU cores and DDR4 ECC/Non-ECC SO-DIMM support which provide high CPU computing, excellent Ethernet performance. Extend PCIe Gen3 ports in PCOM-B634 can support high speed IO card for more application. With VGA and legacy interface support, customer can upgrade system easy and fast.

General

Product	PCOM-B634					
Form Factor	Type 6, Basic Form Factor Com Express (125 x 95mm)					
Processor	Intel® Xeon®			Intel® Pentium®		
	D1577	D1548	D1527	D1519	D1517	D1508
Core	16	8	4	4	4	2
Freq.	1.30 GHz	2.00 GHz	2.20 GHz	1.50 GHz	1.60 GHz	2.20 GHz
Turbo	2.10 GHz	2.60 GHz	2.70 GHz	2.10 GHz	2.20 GHz	2.60 GHz
Cache	24 MB	12 MB	6 MB	6 MB	6 MB	3 MB
Processor Graphics	SM750					
Graphics Base Frequency	N/A					
Graphics Max Dynamic Frequency						
HW Encoding						
HW Decoding						
HW Acceleration	N/A					
Processor TDP	45 W	45 W	35 W	25 W	25 W	25 W
BIOS	AMI UEFI BIOS					
ECC Memory Supported	Yes					
Memory	Supports up to 48GB DDR4 2133/2400 MT/s SDRAM					

I/O Interface

SATA	4x SATA III	
USB	4 x USB2.0 4 x USB3.0	
Ethernet	Intel® Ethernet Controller I210LM for 1GbE. 2x KR for 10GbE	
Serial I/O	GPIO	8 GPIO (4 GPI and 4 GPO)
	I ² C	Baud Rate : 400KHz
	SMBus	Baud Rate : 100KHz
	UART	2 Serial Port (TX and RX)
PEG	N/A	
PCI Express	1x PCIe 3.0 x16 8x PCIe 2.0 x1	
Display	VGA: 1920x1440@24bpp	
Security	TPM 2.0 (Infineon SLB9665) , Intel® AES	

MECHANICAL & ENVIRONMENT

Dimension	125x95mm
Power DC IN	+12VDC
Storage Temperature	-40°C~+80°C
Operation Temperature	-40°C~+80°C
Certification	Contact us
MTBF	Over 100,000 hours at 40°C at both 35° C and 55° C
Vibration	Random 5Hz to 2KHz, 7.7 grms, 10min in each of 3 axes
OS	Windows 64 bit OS support RHEL/SUSE/Fedora/Ubuntu/CentOS/Xen & KVM/Yocto/ FreeBSD

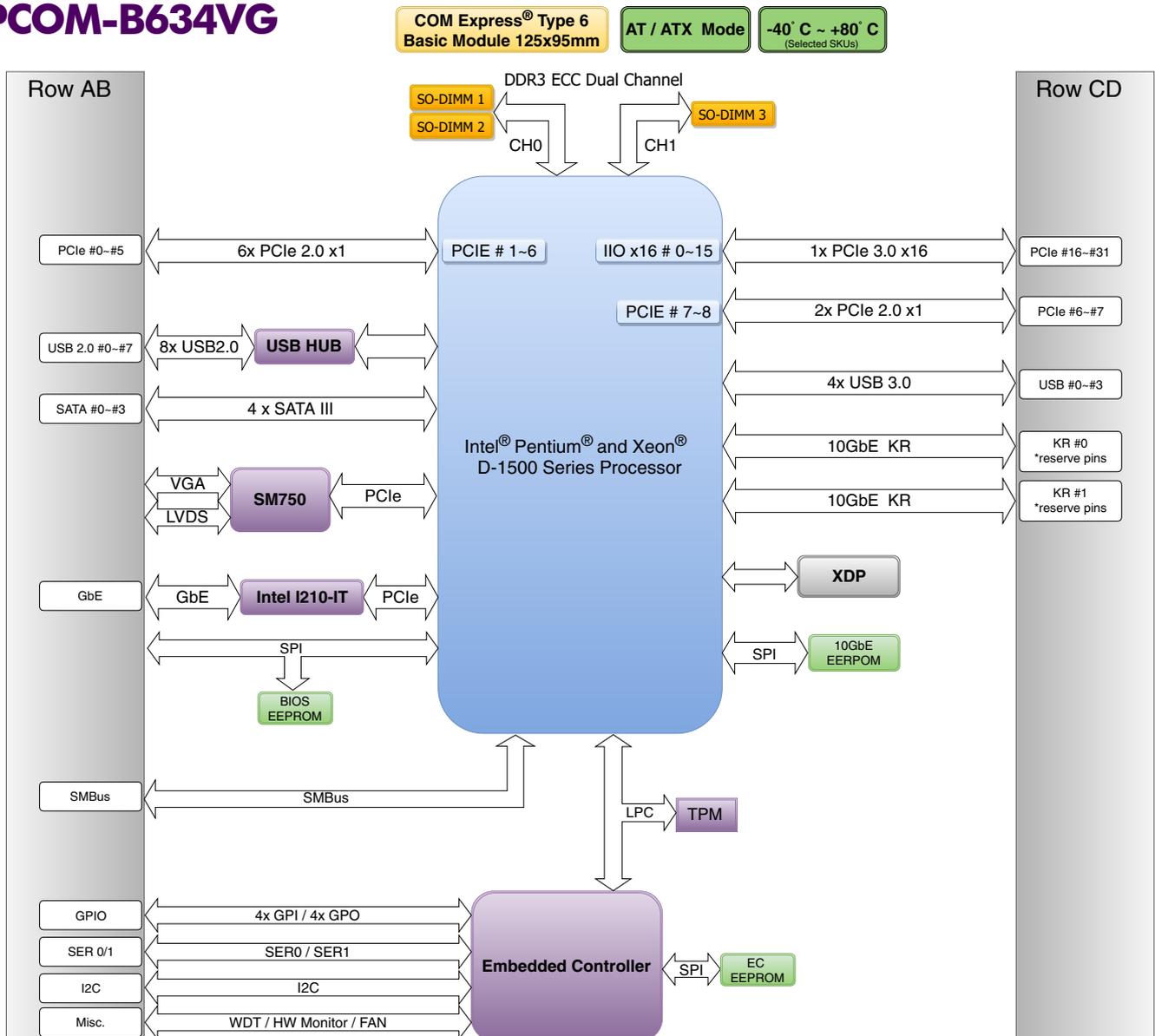
ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-B634VG-D-1577	AB1-3D94	Available
PCOM-B634VG-D-1548	AB1-3D95	Available
PCOM-B634VG-D-1527	AB1-3D96	Available
PCOM-B634VG-D-1519	AB1-3D97	Available
PCOM-B634VG-D-1517	AB1-3D98	Available
PCOM-B634VG-D-1508	AB1-3D99	Available

Accessory	Ordering P/N	Status
PCOM-B634VG Cooler	B9971410	Available
PCOM-C609 (uATX ATX Carrier Board)	AB1-3D19	Available

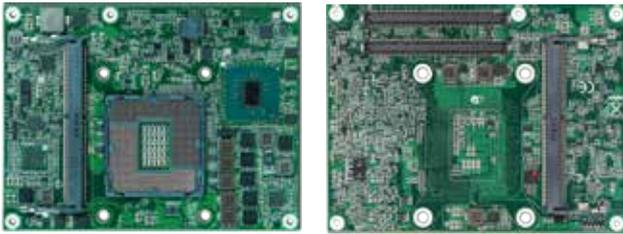
BLOCK DIAGRAM

PCOM-B634VG



PCOM-B637VG

Intel® 6th Generation Core™ Kaby Lake-S / Skylake-S processors based on Type VI Basic-COM Express 2.0 module with DDR4 SDRAM on Two SO-DIMM slots, VGA, eDP, DP, Gigabit Ethernet, PCIE, SATA and USB



FEATURES

- Intel® 6th GEN Core™ Processors Support (Kaby Lake-S / Skylake-S 35W)
- Support 2x DDR4-2133 ECC/Non-ECC SO-DIMMs, up to 32GB
- Support USB 2.0/3.0, SATA III, 7x PCIe 3.0 x1 and 1x PCIe 3.0 x16
- One VGA, three Displayport
- Wide voltage support, from 6V to 18V



PCOM-B637VG is Portwell's first module with desktop CPU. It provides customers four important factors, high performance with affordable cost, DDR 4 memory support, Gen 3 PCIe support, and 30% faster graphic performance. The desktop CPU on module is a new idea which offers customer higher computing power but lower cost comparing to mobile solutions. The DDR4 support is also another important point for higher performance. PCOM-B637VG can support both ECC and Non-ECC DDR4 by different PCH SKUs. This is good for different applications. The Gen 3 PCIe support provides faster PCIe speed so that the performance of PCIe devices will be better. It is crucial for Networking and Medical related applications. PCOM-B637VG provides one PCIe x16, eight PCIe x1 (Option to one PCIe x4), four USB 3.0, and four SATA3.

General

Product	PCOM-B637VG								
Form Factor	Type 6, Basic Form Factor Com Express (125 x 95mm)								
Processor	Intel® Pentium®			Intel® Core™					
	G4400T	G4500T	i3-6100T	i3-6300T	i5-6600T	i5-6500T	i5-6400T	i7-6700T	i7-6700TE
Core	2	2	2	2	4	4	4	4	4
Freq.	2.90 GHz	3.00 GHz	3.20 GHz	3.30 GHz	2.70 GHz	2.50 GHz	2.20 GHz	2.80 GHz	2.40 GHz
Turbo	NA	NA	NA	NA	3.50 GHz	3.10 GHz	2.80 GHz	3.60 GHz	3.40 GHz
Cache	3MB	3MB	3MB	4MB	6MB	6MB	6MB	8MB	8MB
Processor Graphics	Intel® HD Graphics 510	Intel® HD Graphics 530							
Graphics Base Frequency	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz
Graphics Max Dynamic Frequency	950 MHz	950 MHz	950 MHz	950 MHz	1.1 GHz	1.1 GHz	950 MHz	1.1 GHz	1.0 GHz
HW Encoding	N/A								
HW Decoding									
HW Acceleration									
Processor TDP	35W	35W	35W	35W	35W	35W	35W	35W	35W
BIOS	AMI BIOS								
ECC Memory Supported	Depend on chipset. H110 (Non-ECC), Q170 (Non-ECC), C236 (ECC)								
Memory	2 SODIMM DDR4 ECC / Non-ECC up to 32GB 2133MHz								

I/O Interface

SATA	4x SATA III		
USB	4 x USB 3.0 8 x USB 2.0		
Ethernet	Intel® I219LM		
Serial I/O	GPIO		8 GPIO
	I ² C		Baud Rate : 400KHz
	SMBus		Baud Rate : 100KHz
	UART		2x UART
PEG	1x PCies x16 Gen3		
PCI Express	8x PCIe Gen2, can be configured to x1,x2,x4		
Display	VGA	VGA	1920 x 1200 @ 60Hz
	LVDS	LVDS	4096x2304@60Hz
	HDMI	DP	4096x2304@60Hz
		HDMI	4096x2304@24Hz
Security	TPM		

MECHANICAL & ENVIRONMENT

Dimension	125 x 95mm
Power DC IN	Normal: +12V DC Wide range: +8 VDC ~ +18 VDC AT/ ATX Mode
Storage Temperature	0°C to 60°C
Operation Temperature	0°C to 60°C
Certification	Contact us
MTBF	Over 100,000 hours at both 35° C and 55° C
Vibration	Random 5Hz to 2KHz, 7.7 grms, 10min in each of 3 axes
OS	Windows 7/ 8/ 8.1/ 10/ Microsoft Windows 2008 R2 SP1/ 2012/ 2012 R2 Linux Fedora 22/ Ubuntu 15.04

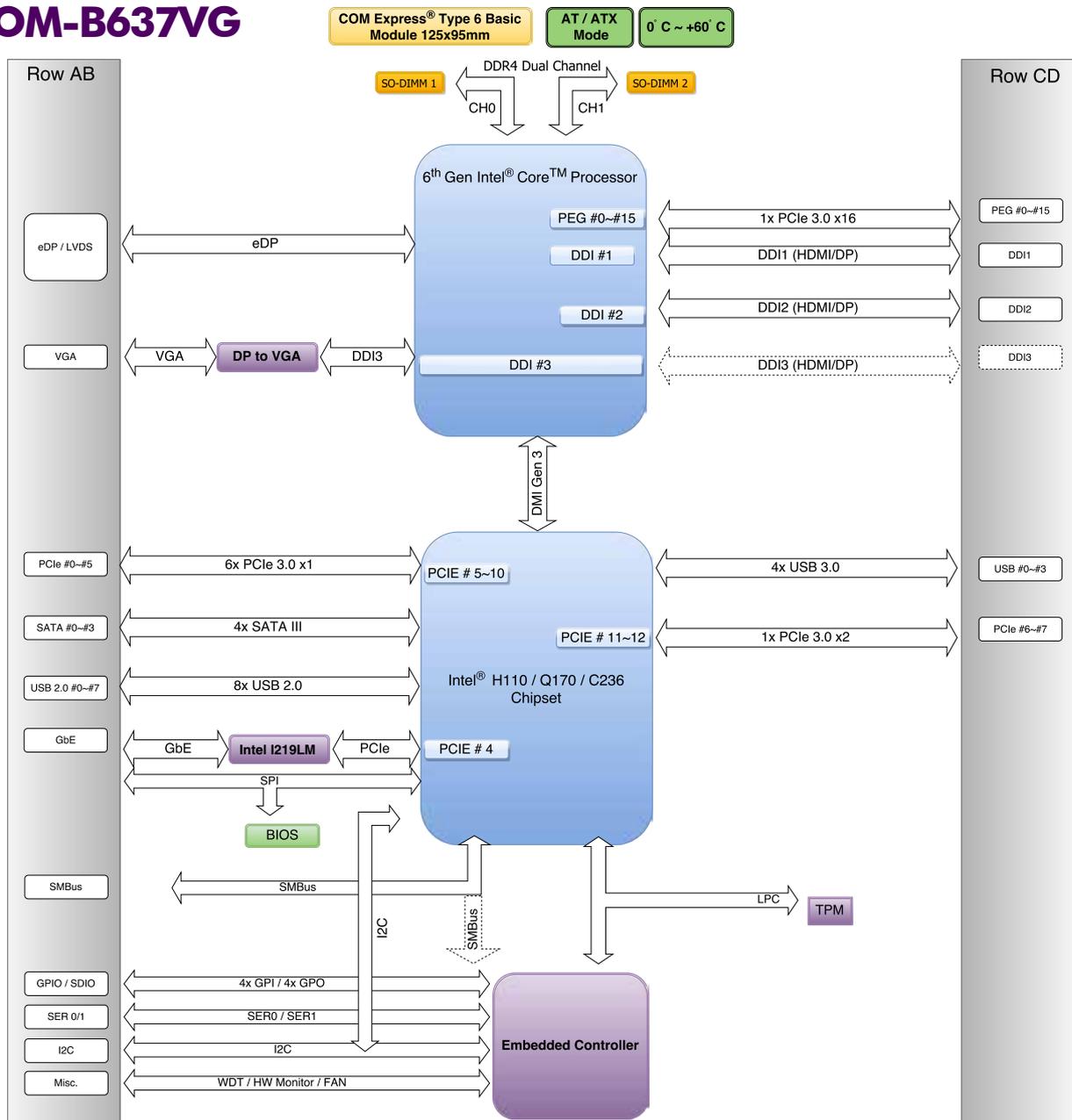
ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-B637VG-Q170	AB1-3E37	Available
PCOM-B637VG-H110	AB1-3E34	Available
PCOM-B637VG-C236	AB1-3E36	Available

Accessory	Ordering P/N	Status
PCOM-C605 carrier board	AB1-3998	Available
PCOM-B637VG Cooler	B9971421	Available
PCOM-B637VG Heat Sink	B8308650	Available

BLOCK DIAGRAM

PCOM-B637VG



PCOM-B638VG

Intel® Kaby Lake-U/Skylake-U Core™ i7/i5/i3 processor based on Type VI Compact-COM Express 2.0 module with DDR4 SDRAM on SO-DIMM slots, VGA, LVDS, Display-port, Gigabit Ethernet, PCIE, SATA, USB, and OTG



FEATURES

- Kaby Lake-U / Skylake-U is the 7th / 6th Generation Intel® Core™ Processor with 14nm and brand new architecture provide more performance
- Support DDR4-2133 MT/S Non-ECC SDRAM on one SO-DIMM slots, up to 16 GB
- Two SO-DIMM slots, up to 32GB
- One VGA, two DDI(one default optional) and LVDS
- Wide voltage support, from 6V to 18V



PCOM-B638VG brings three important factors, DDR4 memory support, Gen3 PCIe support, and 30% faster graphic performance. The Gen3 PCIe support provides faster PCIe speed so that the performance of PCIe expansion card will be better. It is crucial for Networking and Medical related applications. The enhanced graphic performance brings 4K support. The OTG support gives customer more flexibilities on developing new applications in different usages.

General

General				
Product	PCOM-B638VG			
Form Factor	Type 6, Compact Form Factor Com Express (95 x 95mm)			
Processor	Intel® Celeron®	Intel® Core™		
	3955U	i3-6100U	i5-6300U	i7-6600U
Core	2	2	2	2
Freq.	2.00 GHz	2.30 GHz	2.40 GHz	2.60 GHz
Turbo	NA	NA	3.00 GHz	3.4 GHz
Cache	2MB	3MB	3MB	4MB
Processor Graphics	Intel® HD Graphics 510	Intel® HD Graphics 520	Intel® HD Graphics 520	Intel® HD Graphics 520
Graphics Base Frequency	300 MHz	300 MHz	300 MHz	300 MHz
Graphics Max Dynamic Frequency	900 MHz	1.00 GHz	1.00 GHz	1.05 GHz
HW Encoding				
HW Decoding	N/A			
HW Acceleration				
Processor TDP	15W	15W	15W	15W
BIOS	AMI BIOS			
ECC Memory Supported	NO			
Memory	2 SODIMM DDR4 up to 32GB 2133MHz			

I/O Interface

SATA	2 x SATA III (Port 0/1) 1 x SATA III (Port 2) (Optional)		
USB	8 x USB2.0 (Port 0~7) USB OTG (Optional) (Port 7) 4 x USB3.0 (Port 0/1/2/3)		
Ethernet	Intel® I219LM		
Serial I/O	GPIO	8 GPIO	
	I ² C	Baud Rate : 400KHz	
	SMBus	Baud Rate : 100KHz	
	UART	2x UART	
PEG	1x PCies x4 Gen3		
PCI Express	1x PCIe x4 Gen2		
	1x PCIe x1 Gen2		
Display	VGA	VGA	1920x1200@60 Hz
	LVDS	LVDS	1920x1600@60Hz
	HDMI	DP	4096x2160@60Hz
		HDMI	3840x2160@30Hz (Optional)
Security	TPM		

MECHANICAL & ENVIRONMENT

Dimension	95 x 95mm
Power DC IN	Normal: +12V DC Wide range: +8 VDC ~ +18 VDC AT/ ATX mode
Storage Temperature	0°C to 60°C
Operation Temperature	0°C to 60°C
Certification	Contact us
MTBF	Over 100,000 hours at 40° C
Vibration	Random 5Hz to 2KHz, 7.7 grms, 10min in each of 3 axes
OS	Windows 7/ 8/ 8.1/ 10/ Microsoft Windows 2008 R2 SP1/ 2012/ 2012 R2 Linux Fedora 22/ Ubuntu 15.04

BLOCK DIAGRAM

ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-B638VG-6600U	AB1-3E39	Available
PCOM-B638VG-6300U	AB1-3E38	Available
PCOM-B638VG-6100U	AB1-3E32	Available
PCOM-B638VG-3955U	AB1-3E77	Available
PCOM-B638VG-7600U	AB1-3G88	Available
PCOM-B638VG-7300U	AB1-3G87	Available
PCOM-B638VG-7100U	AB1-3G86	Available
PCOM-B638VG-3965U	AB1-3G85	Available

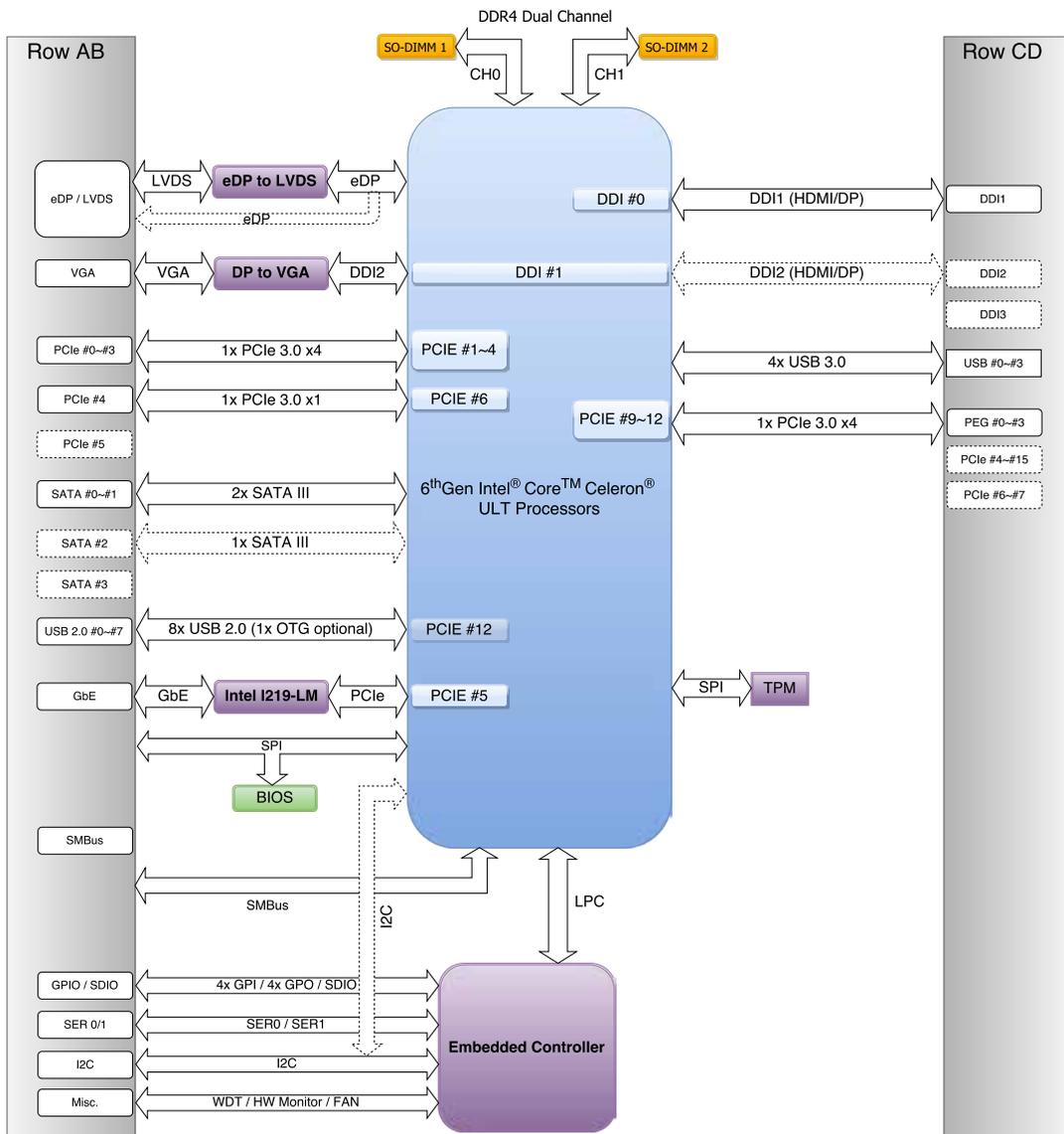
Accessory	Ordering P/N	Status
PQ7-C605 carrier board	AB1-3998	Available
PCOM-B638VG Cooler	B9971380	Available
PCOM-B638VG Heat Sink	B8308660	Available
PCOM-B638 Heat Spreader	B8308500	Available

PCOM-B638VG

COM Express® Type 6
Compact Module 95x95mm

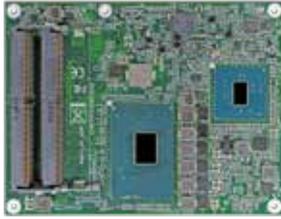
AT / ATX
Mode

0° C ~ +60° C



PCOM-B639VG

Intel® Core™ Kaby Lake-H/Skylake-H Processor based on Type VI COM Express module with DDR4 SDRAM, VGA, LVDS, Gigabit Ethernet, SATA 3.0 and USB



FEATURES

- Kaby Lake-H / Skylake-H is the 7th / 6th Generation Intel® Core™ Processor with 14nm and brand new architecture provide more performance
- Support DDR4-2133 MT/S ECC/Non-ECC SDRAM on two SO-DIMM slots, up to 16 GB
- Support faster I/O interfaces on 8x PCIe Gen3 lanes (four x 1 can be configured to on x4 lane)
- One VGA, three DDI(one default optional)
- and one embedded display port wide voltage support, from 6V to 18V



PCOM-B639VG brings three important factors, DDR 4 memory support, Gen 3 PCIe support, and 30% faster graphic performance. The DDR4 is trend and it supports both ECC and Non-ECC with the same pin definition. In other words, customer can use both ECC and Non-ECC memories depending their application and demand. In order to achieve that, all the PCH SKUs are considered in development stage to make sure that customer has various models to meet different requirements in cost, performance, and memory type. The Gen 3 PCIe support provides faster PCIe speed so that the performance of PCIe expansion card will be better. It is crucial for Networking and Medical related applications. The enhanced graphic performance brings 4K support.

General

Product	PCOM-B639VG													
Form Factor	Type 6, Basic Form Factor Com Express (125 x 95mm)													
Processor	Intel® Celeron®		Intel® Core™											
	G3902E	G3900E	i3-6100E	i3-6102E	i5-6442EQ	i5-6440EQ	i7-6820EQ	i7-6822EQ	7100E	7102E	7440EQ	7442EQ	7820EQ	
Core	2	2	2	2	4	4	4	4	2	2	4	4	4	
Freq.	1.60 GHz	2.40 GHz	2.70 GHz	1.90 GHz	1.90 GHz	2.70 GHz	3.40 GHz	3.50 GHz	2.80 GHz	2.90 GHz	2.10 GHz	2.90 GHz	2.10 GHz	3.00 GHz
Turbo	NA	NA	NA	NA	2.70 GHz	3.40 GHz	3.50 GHz	2.80 GHz	NA	NA	3.60 GHz	2.90 GHz	3.70 GHz	
Cache	2MB	2MB	3MB	3MB	6MB	6MB	8MB	8MB	3MB	3MB	6MB	6MB	8MB	
Processor Graphics	Intel® HD Graphics 510	Intel® HD Graphics 510	Intel® HD Graphics 530	Intel® HD Graphics 630										
Graphics Base Frequency	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	350 MHz	
Graphics Max Dynamic Frequency	950 MHz	950 MHz	950 MHz	950 MHz	1.00 GHz	1.00 GHz	1.00 GHz	1.00 GHz	950 MHz	950 MHz	1.00 GHz	1.00 GHz	1.00 GHz	
HW Encoding														
HW Decoding	N/A													
HW Acceleration														
Processor TDP	25W	35W	35W	25W	25W	45W	45W	25W	35W	25W	45W	25W	45W	
BIOS	AMI BIOS													
ECC Memory Supported	YES	YES	YES	YES	NO	NO	NO	NO	YES	YES	NO	NO	NO	
Memory	2 SODIMM DDR4 ECC / Non-ECC up to 32GB 2133MHz													

I/O Interface

SATA	4 x SATA III		
USB	8 x USB2.0 4 x USB3.0		
Ethernet	Intel® I219LM		
Serial I/O	GPIO		8 GPIO
	I ² C		Baud Rate : 400KHz
	SMBus		Baud Rate : 100KHz
	UART		2x UART
PEG	1x PCies x16 Gen3		
PCI Express	8 x PCIe x1 Gen3		
Display	VGA	VGA	1920 x 1200@60Hz
	LVDS	LVDS	1920 x 1200@60Hz
	HDMI	DP	3840x2160@60Hz
		HDMI	3840x2160@60Hz
Security	TPM		

MECHANICAL & ENVIRONMENT

Dimension	125 x 95mm
Power DC IN	Normal: +12V DC Wide range: +8 VDC ~ +18 VDC AT/ATX mode
Storage Temperature	0°C to 60°C
Operation Temperature	0°C to 60°C
Certification	Contact us
MTBF	Over 100,000 hours at 40° C
Vibration	Random 5Hz to 2KHz, 7.7 grms, 10min in each of 3 axes
OS	Windows 7/ 8/ 8.1/ 10/ Microsoft Windows 2008 R2 SP1/ 2012/ 2012 R2 Linux Fedora 22/ Ubuntu 15.04

Accessory	Ordering P/N	Status
PQ7-C605 carrier board	AB1-3998	Available
Cooler	B9971391	Available
Heat Sink	B8308670	Available
Heat Spreader	B8308510	Available

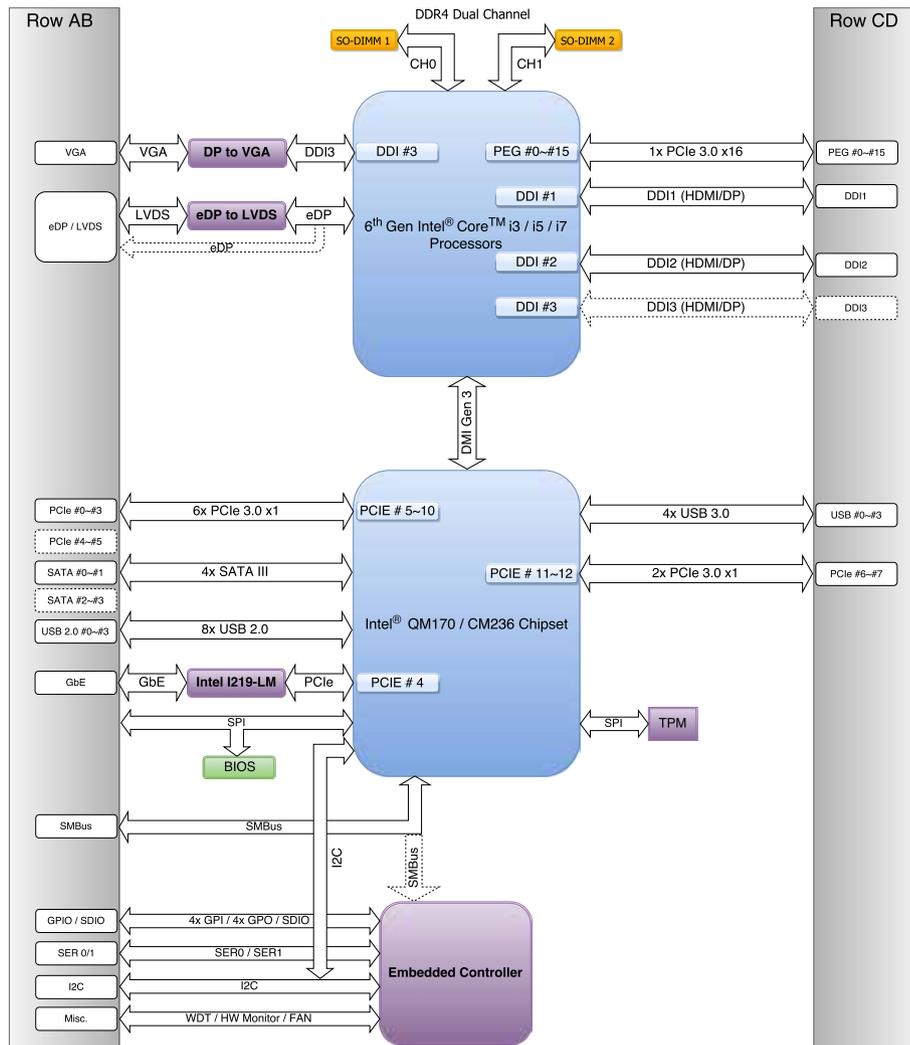
ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-B639VG-6822EQ	AB1-3E06	Available
PCOM-B639VG-6820EQ	AB1-3E31	Available
PCOM-B639VG-6442EQ	AB1-3E28	Available
PCOM-B639VG-6440EQ	AB1-3E29	Available
PCOM-B639VG-6102EQ	AB1-3E26	Available
PCOM-B639VG-6100EQ	AB1-3E27	Available
PCOM-B639VG-G3902E	AB1-3E35	Available
PCOM-B639VG-G3902E	AB1-3E25	Available
PCOM-B639VG-G3900E	AB1-3G48	Available
PCOM-B639VG-7820EQ	AB1-3G46	Available
PCOM-B639VG-7442EQ	AB1-3G47	Available
PCOM-B639VG-7440EQ	AB1-3G44	Available
PCOM-B639VG-7102E	AB1-3G45	Available
PCOM-B639VG-7100EZ	AB1-3E38	Available

BLOCK DIAGRAM

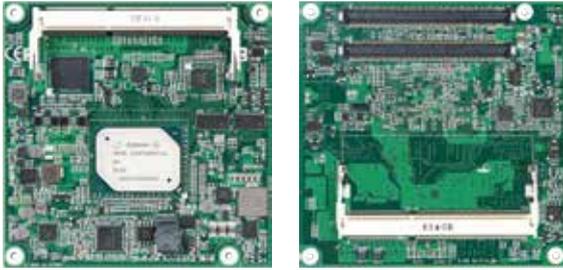
PCOM-B639VG

COM Express® Type 6 Basic Module 125x95mm AT / ATX Mode +8 ~ +18VDC 0 ~ +60° C



PCOM-B641VG

Intel® Atom® E3900 series SoC based on Type 6 COM Express® Rev3.0 module with DDR3L 2x SO-DIMM sockets, VGA, eDP/LVDS, DDI, GbE, and SATA 6 Gb/s



FEATURES

- Intel® Atom® E3900 Series ultra low power processor
- Support DDR3L-1866 MT/s SDRAM on two SO-DIMM sockets
- 8x USB 2.0 or 4x USB2.0 + 4x USB 3.0
- Wide voltage support, from 8V to 18V



PCOM-B641VG, COM Express® Type 6 Compact Module designed with 6th Generation Intel® ATOM® processors, supporting wide operation temperature -40°C to +85°C (on E series processors only).

General

General					
Product	PCOM-B641VG				
Form Factor	COM Express® Type 6 Compact Rev. 3.0				
Processor	Intel® Celeron® N3350	Intel® Pentium® N4200	Intel® ATOM® E3930	Intel® ATOM® E3940	Intel® ATOM® E3950
Core	2	4	2	4	4
Freq.	1.10 GHz	1.10 GHz	1.30 GHz	1.60 GHz	1.60 GHz
Turbo	2.40 GHz	2.50 GHz	1.80 GHz	1.80 GHz	2.00 GHz
Cache	2 MB	2 MB	2 MB	2 MB	2 MB
Processor Graphics	Intel® HD Graphics 500	Intel® HD Graphics 505	Intel® HD Graphics 500	Intel® HD Graphics 500	Intel® HD Graphics 505
Graphics Base Frequency	200.00 MHz	200.00 MHz	400.00 MHz	400.00 MHz	500.00 MHz
Graphics Max Dynamic Frequency	650.00 MHz	750.00 MHz	550.00 MHz	600.00 MHz	650.00 MHz
HW Encoding	HEVC/H.265, H.264, MVC, VP8, VP9, JPEG/MJPEG				
HW Decoding	HEVC/H.265, H.264, MVC, VP8, VP9, MPEG2, VC-1, WMV9, JPEG/MJPEG				
HW Acceleration	Gen9 LP, DX 9.3/10/11.1/12, OpenGL 4.3, OGL ES 3.0, OpenCL 1.2, PAVP 2.0, HDCP 1.4/2.0				
Processor TDP	6 W	6 W	6.5W	9.5W	12W
BIOS	AMI Aptio5 UEFI BIOS				
ECC Memory Supported	No				
Memory	2x DDR3L SO-DIMM sockets Dual channel Up to 1866 MT/s				

I/O Interface

SATA	2x SATA III		
USB	8x USB 2.0 / 1 OTG (optional) or 4x USB 2.0 + 3x USB 3.0		
Ethernet	1 GbE (I210-IT)		
Serial I/O	GPIO		8 GPIO (4 GPI and 4 GPO)
	I ² C		Baud Rate : 400KHz
	SMBus		Baud Rate : 100KHz
	UART		2 Serial Port (TX and RX)
PEG	N/A		
PCI Express	1x PCIe 2.0 x4 (1x4 / 2x2 / 4x1)		
Display	Default	Options	Resolution
	VGA	VGA	Up to 1920x1200 @ 60Hz
		DDI2	DP Up to 4096x2160 @ 60Hz
	LVDS	eDP 1.3	Up to 3840x2160 @ 60Hz
		LVDS	Up to 1920x1200 @ 60Hz
DDI1-DP	DP 1.2 / HDMI 1.4b	DP Up to 4096x2160 @ 60H HDMI Up to 3840x2160 @ 30Hz	
Security	TPM 2.0 (Infineon SLB9670) , Intel® AES		

MECHANICAL & ENVIRONMENT

Dimension	95 x 95mm
Power DC IN	Nominal : +12V DC Wide range : +8VDC ~ +18VDC AT / ATX Mode
Storage Temperature	-40°C to 80°C
Operation Temperature	-40°C to 80°C
Certification	Contact us
MTBF	Over 120,000 hours at 40°C
Vibration	Random 5Hz to 2KHz, 7.7 grms, 10min in each of 3 axes
OS	Windows 10 Linux CentOS 6

ORDERING GUIDE

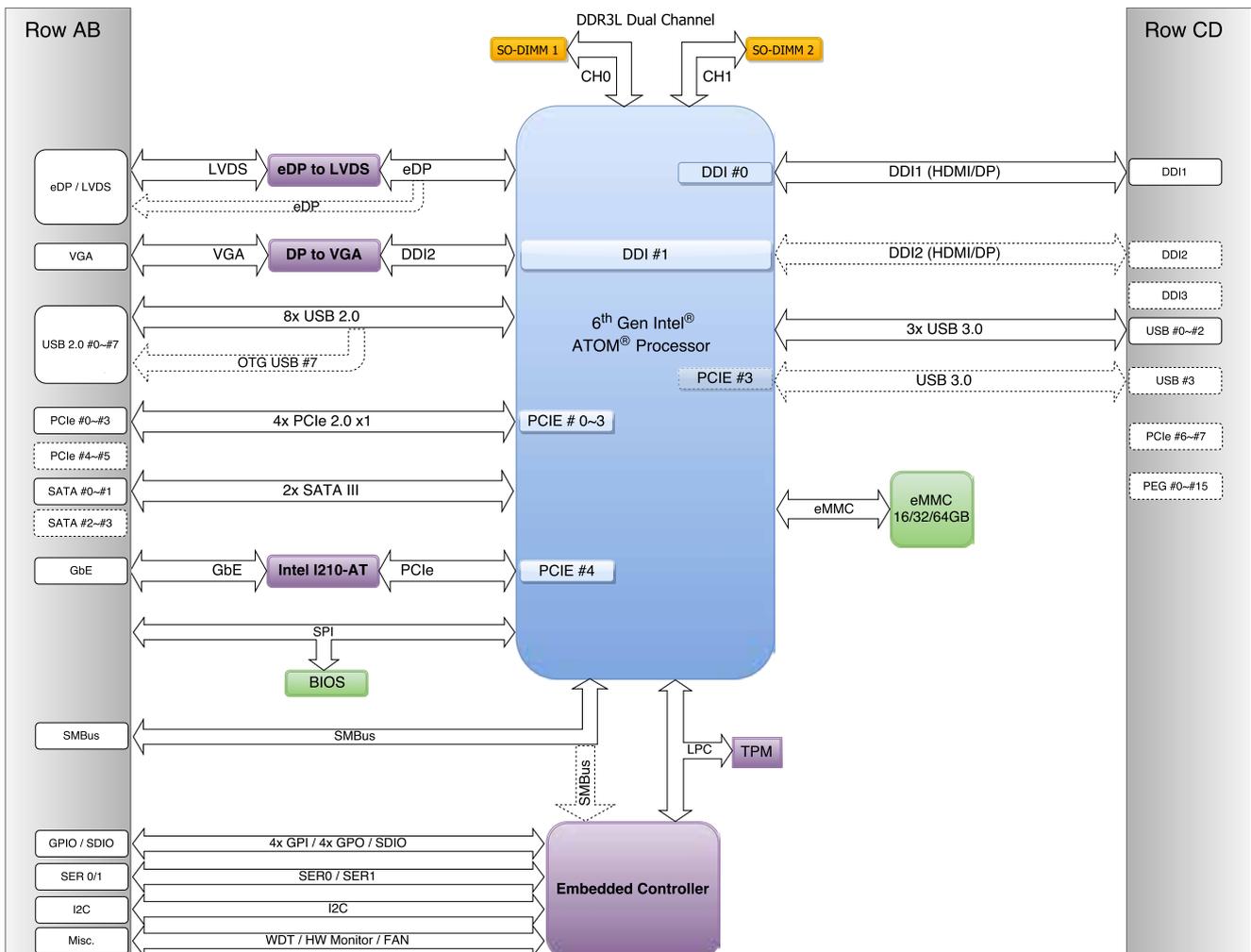
Product	Ordering P/N	Status
PCOM-B641-E3950	AB1-3F71	Available
PCOM-B641-E3940	AB1-3F39	Available
PCOM-B641-E3930	AB1-3F38	Available
PCOM-B641-N4200	AB1-3F28	Available
PCOM-B641-N3350	AB1-3F72	Available

Accessory	Ordering P/N	Status
Heat Sink for E3900 Series	B8308491	Available
Heat Sink for N Series	B9971521	Available
PCOM-C605 (MINI-ITX Carrier Board)	AB1-3998	Available
PCOM-C640 (NANO-ITX Carrier Board)	AB1-3D18	Available
PCOM-C600 (uATX ATX Carrier Board)	AB1-3761	Available

BLOCK DIAGRAM

PCOM-B641VG

COM Express® Type 6 Compact Module 95x95mm AT / ATX Mode +12VDC -40°C ~ +80°C (E series only)



PCOM-B700G

Intel® Pentium® / Xeon® D-1500 series Processor based on Type 7 COM Express® Rev3.0 module with DDR4 ECC/Non-ECC 3x SO-DIMM sockets, 1x PCIe 3.0 x16, 1x PCIe 3.0 x4, and 8x PCIe 2.0 x1, TPM 2.0, and 2x KR



FEATURES

- Intel® Pentium® / Xeon® D-1500 series Processors
- Support DDR4-2133 MT/s ECC/Non-ECC SDRAM on three SO-DIMM sockets, up to 48GB
- Support USB 2.0/3.0, 2x SATA III, 8x PCIe 2.0 x1, 1x PCIe 3.0 x4, and 1x PCIe 3.0 x16



PCOM-B700G, a COM Express® Type 7 Basic Module designed with Intel® Pentium® and Xeon® D-1500 series processors. PCOM-B700G targets for Networking, Micro server applications. 10GbE LAN feature and three DDR4 SODIMM sockets support up to 2133MHz and 48GB memory.

General

Product	PCOM-B700G									
Form Factor	COM Express® Type 7 Basic Rev. 3.0									
Processor	Intel® Pentium®				Intel® Xeon®					
	D1507	D1508	D1517	D1519	D-1527	D-1537	D-1539	D-1548	D-1557	D-1577
Core	2	2	4	4	4	8	8	8	12	16
Freq.	1.20 GHz	2.20 GHz	1.60 GHz	1.50 GHz	2.20 GHz	1.70 GHz	1.60 GHz	2.00 GHz	1.50 GHz	1.30 GHz
Turbo	1.20 GHz	2.60 GHz	2.20 GHz	2.10 GHz	2.70 GHz	2.30 GHz	2.20 GHz	2.60 GHz	2.10 GHz	2.10 GHz
Cache	3 MB	3 MB	6 MB	6 MB	6 MB	12 MB	12 MB	12 MB	18 MB	24 MB
Processor Graphics	N/A									
Graphics Base Frequency										
Graphics Max Dynamic Frequency										
HW Encoding										
HW Decoding										
HW Acceleration										
Processor TDP	20 W	25 W	25 W	25 W	35 W	35 W	35 W	45 W	45 W	45 W
BIOS	AMI Aptio5 UEFI BIOS									
ECC Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

I/O Interface

SATA	2x SATA III	
USB	4x USB 2.0 4x USB 3.0	
Ethernet	Intel® Ethernet Controller I219AT for 1xGbE. 2x KR for 10GbE	
Serial I/O	GPIO	8 GPIO (4 GPI and 4 GPO)
	I ² C	Baud Rate : 400KHz
	SMBus	Baud Rate : 100KHz
	UAR	2 Serial Port (TX and RX)
PEG	1x PCIe 3.0 x16 (1x16 / 2x8 / 4x4 / 1x8 + 2x4)	
PCI Express	8x PCIe 2.0 x1 (8x1 / 4x2 / 2x4 / 1x4 + 2x2) 1x PCIe 3.0 x4 (1x4 / 2x2 / 4x1)	
Security	TPM 2.0 (Infineon SLB9665 , optional) , Intel® AES	

MECHANICAL & ENVIRONMENT

Dimension	125mm x 95mm (4.92" x 3.74")	
Power DC IN	Nominal : +12V DC AT / ATX Mode	
Storage Temperature	0°C ~ +60°C	
Operating Temperature	0°C ~ +60°C Extended : -40°C ~ +80°C (Processor dependent)	
Certification	Contact us	
MTBF	Over 100,000 hours at 40°C	
Vibration	Contact us	
OS	Windows 7/8/8.1/10 Linux Fedora 22 / Ubuntu 15.04 / CentOS 7	
Accessory	Ordering P/N	Status
PCOM-B634VG Cooler	B9971410	Available
PCOM-C609 (uATX ATX Carrier Board)	AB1-3D19	Available

ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-B700G-D1577	AB1-3G83	Available
PCOM-B700G-D1557	Contact us	Available
PCOM-B700G-D1548	AB1-3F53	Available
PCOM-B700G-D1539	AB1-3F52	Available
PCOM-B700G-D1537	AB1-3F52	Available
PCOM-B700G-D1527	AB1-3F51	Available
PCOM-B700G-D1519	AB1-3G80	Available
PCOM-B700G-D1517	AB1-3G77	Available
PCOM-B700G-D1508	AB1-3G78	Available
PCOM-B700G-D1507	AB1-3G79	Available
Accessory	Ordering P/N	Status
PCOM-B700G Cooler	B9971570	Available
PCOM-C700 (ATX Carrier Board)	AB1-3F19	Available

BLOCK DIAGRAM

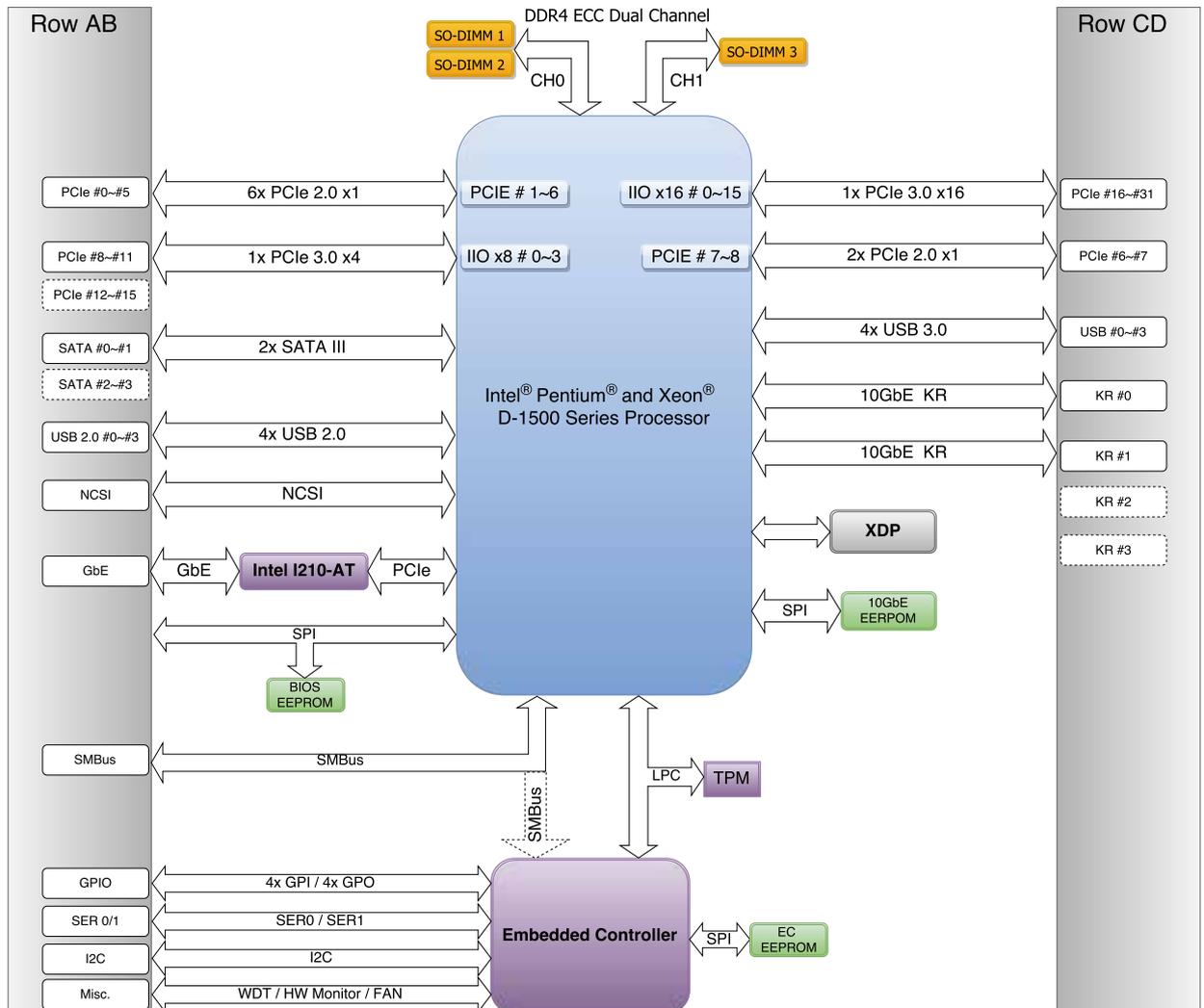
PCOM-B700G

COM Express® Type 7
Basic Module 125x95mm

AT / ATX Mode

+12VDC

-40°C ~ +80°C
(Selected SKUs)



PCOM-B701G

Intel® C3000 series Processor based on Type 7 COM Express® Rev3.0 module with DDR4 ECC/Non-ECC 3x SO-DIMM sockets, 20x PCIe Lanes, 4x KR/KX, GbE, NC-SI, TPM 2.0, and SATA 6 Gb/s



FEATURES

- New Type 7 Specification with Denverton server platform
- Support DDR4-2133 ECC/Non-ECC SDRAM on three SO-DIMM sockets, up to 48GB
- Four KR/KX(for10GbE) and one GbE Interfaces
- 4x USB 3.0/2.0, 2x SATA III, 12x PCIe x1 Gen 2.0, 1x PCIe x8 Gen 3.0
- Wide-Temp (-40°C to +85°C) support on selected SKUs



Portwell PCOM-B701G is designed with Intel® Atom® C3000 Processor and base on new Type 7 pin definition. It's built in with 10GbE Ethernet KR interface and DDR4 ECC SO-DIMM support which provide high CPU computing, excellent Ethernet performance. Extend PCIe Gen3 ports in PCOM-B701G can support high speed IO card for more applications. In the meantime, it's compatible with Type 6 carrier

General

Product	PCOM-B701G				
Form Factor	Type 7, Basic Form Factor Com Express (125 x 95mm)				
Processor	Intel® Atom®				
	C3308	C3508	C3708	C3808	C3958
Core	2	4	8	12	16
Freq.	1.60 GHz	1.60 GHz	1.70 GHz	2.00 GHz	2.00 GHz
Turbo	2.10 GHz	1.60 GHz	1.70 GHz	2.00 GHz	2.00 GHz
Cache	4 MB	8 MB	16 MB	12 MB	16 MB
Processor Graphics	N/A				
Graphics Base Frequency					
Graphics Max Dynamic Frequency					
HW Encoding					
HW Decoding					
HW Acceleration					
Processor TDP	9.5W	11.5W	17W	25W	31W
BIOS	AMI UEFI BIOS				
ECC Memory Supported	YES				
Memory	Supports up to 128GB DDR4 2400 MT/s SDRAM				

I/O Interface

SATA	4 x SATA III	
USB	4 x USB2.0 4 x USB3.0	
Ethernet	Intel® I210IT 4 x KR/KX(10GbE)	
Serial I/O	GPIO	8 x GPIO
	I ² C	Baud rate: 400KHz
	SMBus	Baud rate: 100KHz
	UART	2x UART
PEG	1 PCIe x8 (PEG) up to Gen3 (8.0 GT/s) configuration x4, x8, x16	
PCI Express	8 x PCIe 2.0 x2	
Display	N/A	
Security	TPM 2.0 (Option)	

MECHANICAL & ENVIRONMENT

Dimension	125x95mm
Power DC IN	12V DC IN
Storage Temperature	-40°C ~ 80°C
Operating Temperature	-40°C ~ 80°C
Certification	Contact us
MTBF	Over 100,000 hours at both 35°C and 55°C
Vibration	Random 5Hz to 2KHz, 7.7 grms, 10min in each of 3 axes
OS	Windows 7/8/8.1/10 Microsoft Windows 2008 R2 SP1/2012/2012 R2 Fedora 22 (kernel 4.0.4-301) Ubuntu 15.04 (kernel 3.11.6.4)

ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-B701G-C3308	AB1-3G90	Available
PCOM-B701G-C3508	AB1-3G91	Available
PCOM-B701G-C3708	AB1-3G92	Available
PCOM-B701G-C3808	AB1-3G89	Available

Accessory	Ordering P/N	Status
PCOM-B701G Heatsink	Contact us	Available
PCOM-C700 (ATX Carrier Board)	AB1-3F19	Available

BLOCK DIAGRAM

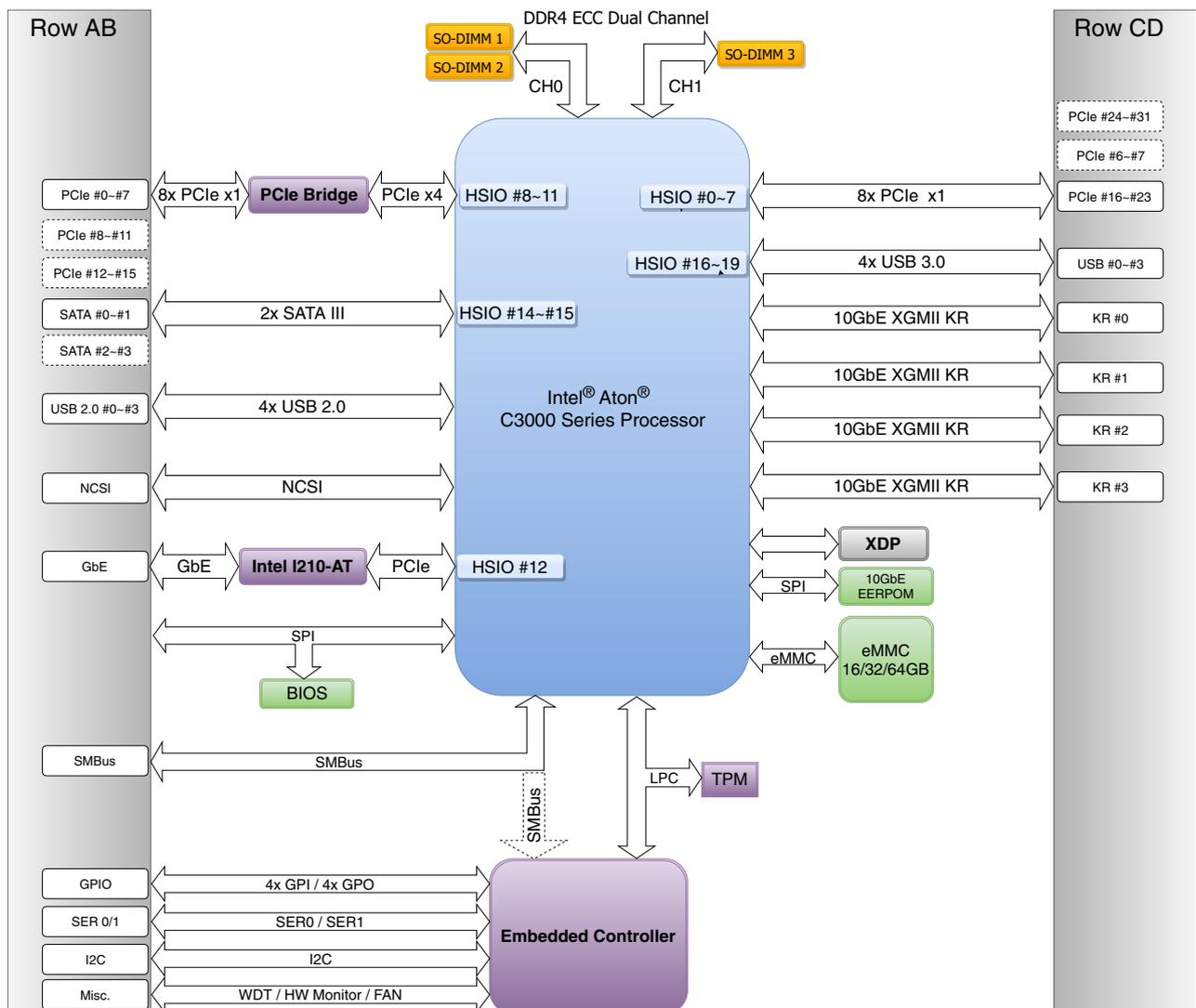
PCOM-B701G

COM Express® Type 7
Basic Module 125x95mm

AT Mode

+12VDC

-40°C ~ +80°C



PCOM-C640

PCOM-C640 is NANO-ITX carrier board with triple display, Gigabit Ethernet, Audio, USB 3.0, SATA. It's a powerful carrier which is suitable for system.



FEATURES

- COM Express carrier board is compatible with the Portwell Type VI COM Express modules
- NANO-ITX form factor can meet most standard mounting spaces and provide more expansions and displays.
- Support Rear I/O, DP, RJ45, USB 2.0 & 3.0

Portwell PCOM-C640 is a NANO-ITX form factor carrier with COM Express Type VI row connectors. It's suitable for evaluation testing of Portwell's Type VI COM Express modules for 1U Server system. We also provide carrier board design guide for your own carrier board development as a reference. With PCOM-C640 carrier board, Portwell now has various carriers in different form factors to help customers on developing new platform for both board and system perspectives. Customers can easily begin to develop on new application with Portwell's COM Express Type VI module.

General

Product	PCOM-C640		
Form Factor	NANO-ITX (120 x 120mm)		
Processor	Depends on Module		
Core			
Freq.			
Turbo			
Cache			
Processor Graphics			
Graphics Base Frequency			
Graphics Max Dynamic Frequency			
HW Encoding			
HW Decoding			
HW Acceleration			
Processor TDP			
BIOS			
ECC Memory Supported			
Memory			

I/O Interface

SATA	2x SATA III		
USB	1 x USB2.0 2 x USB3.0		
Ethernet	2 x GbE		
Serial I/O	GPIO	8 GPIO	
	I ² C	base on module design	
	SMBus	base on module design	
	UART	2x UART	
PEG	N/A		
PCI Express	1x PCIe x1		
Display	CRT	CRT	2560 x 1600
	LVDS	LVDS	1920x1200
	HDMI	DP	3840 x 2160
		HDMI	N/A
Security	N/A		

MECHANICAL & ENVIRONMENT

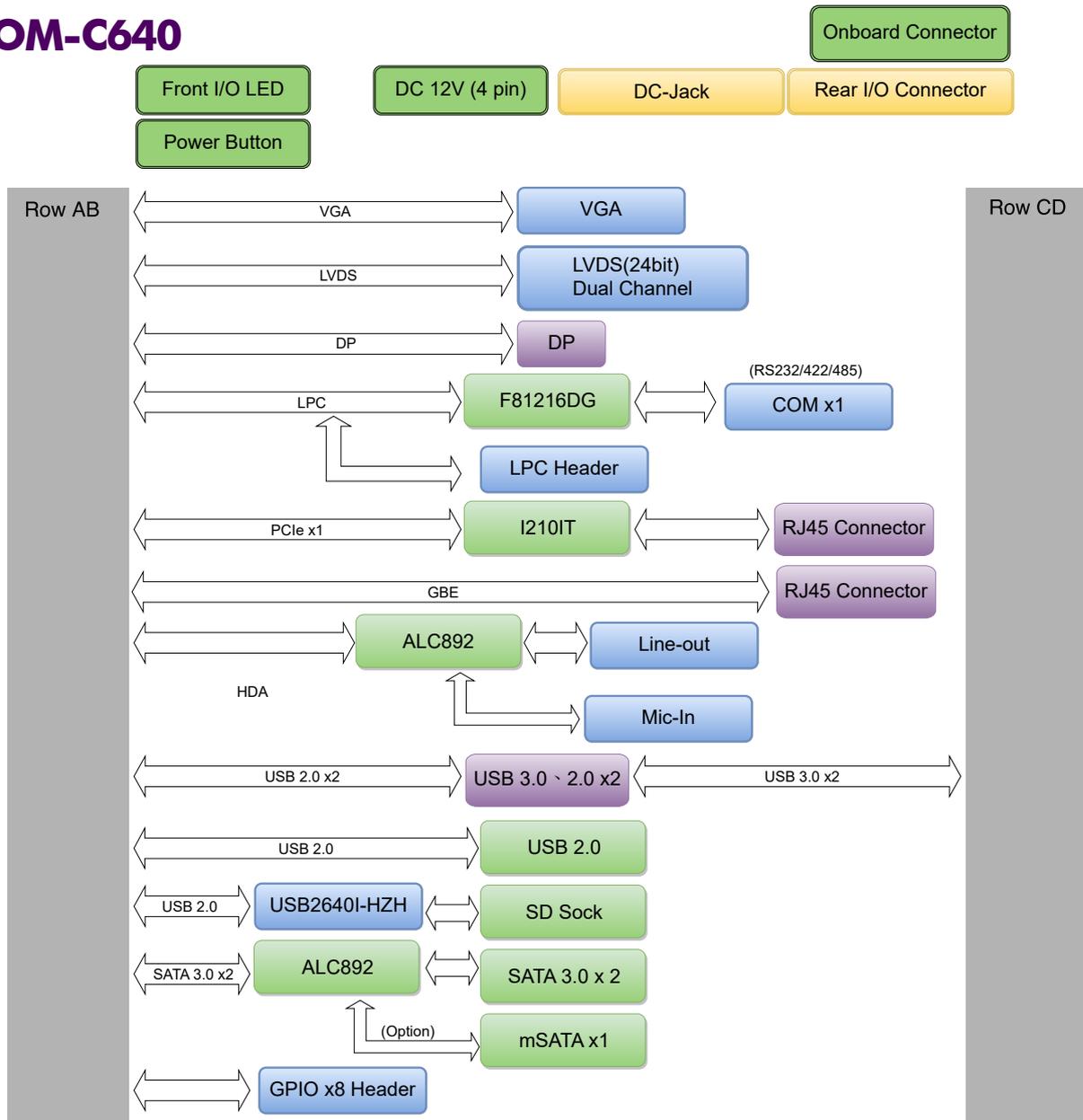
Dimension	120 x 120mm
Power DC IN	12V DC IN
Storage Temperature	-20°C to 80°C
Operation Temperature	0°C to 55°C
Certification	Contact us
MTBF	Over 100,000 hours at 40° C
Vibration	N/A
OS	Depend on Module

ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-C640	AB1-3D18	Available

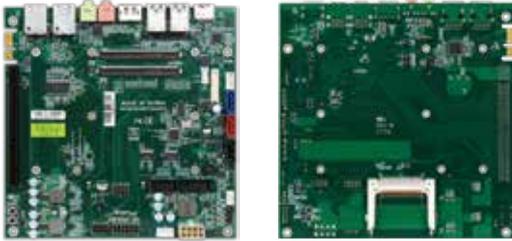
BLOCK DIAGRAM

PCOM-C640



PCOM-C605

PCOM-C605 is Mini-ITX Form Factor Evaluation Carrier Board COMExpress Revision 2.0 Type VI Module



FEATURES

- COM Express® carrier board is compatible with the Portwell Type VI COM Express® modules
- Mini-ATX form factor meets most standard mounting spaces and provides more expansions slots

Portwell PCOM-C605 is designed with Mini-ITX form factor with COM Express Type VI row connectors, suitable for evaluation testing of Portwell's Type VI COM Express modules on PCI-E, PEG, VGA/LVDS, USB, SATA, and CFEX with SATA and SPI interface. We also provide carrier board design guides for your own carrier board development reference.

This new version of the PCOM-C605 Reference Carrier Board is 100% compatible with the recently released PICMG COM Express Carrier Design Guide and provides a full complement of I/O interfaces, debugging tools, and peripheral devices such as Super I/O and audio code that may be required on the custom carrier board. The full schematics and mechanical drawings of the PCOM-C605 are available for testing to allow customers to immediately begin their own carrier board design effort. A complete Starter Kit is also available, which includes the COM Express module of choice, the PCOM-C605 reference carrier board, thermal solution, documentation.

General

Product	PCOM-C605
Form Factor	Mini-ITX (170 x 170mm)
Processor	Depends on Module
Core	
Freq.	
Turbo	
Cache	
Processor Graphics	
Graphics Base Frequency	
Graphics Max Dynamic Frequency	
HW Encoding	
HW Decoding	
HW Acceleration	
Processor TDP	
BIOS	
ECC Memory Supported	
Memory	

I/O Interface

SATA	1 x SATA II 2 x SATA III 1 x CFEX		
USB	4 x USB 3.0/2.0		
Ethernet	2 x GbE		
Serial I/O	GPIO	8 GPIO	
	I ² C	base on module design	
	SMBus	base on module design	
	UAR	1x UAR	
PEG	1 x PCIe x16		
PCI Express	2 x PCIe x1 Golden Finger		
Display	VGA	VGA	2560 x 1600
	LVDS	LVDS	1920x1200
	HDMI	DP	3840 x 2160
		HDMI	3840 x 2160
Security	N/A		

MECHANICAL & ENVIRONMENT

Dimension	120 x 120mm
Power DC IN	12V DC IN
Storage Temperature	-40°C to 80°C
Operation Temperature	-40°C to 80°C
Certification	Contact us
MTBF	Over 100,000 hours at 40° C
Vibration	N/A
OS	Depend on Module

ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-C605	AB1-3998	Available

BLOCK DIAGRAM

PCOM-C605

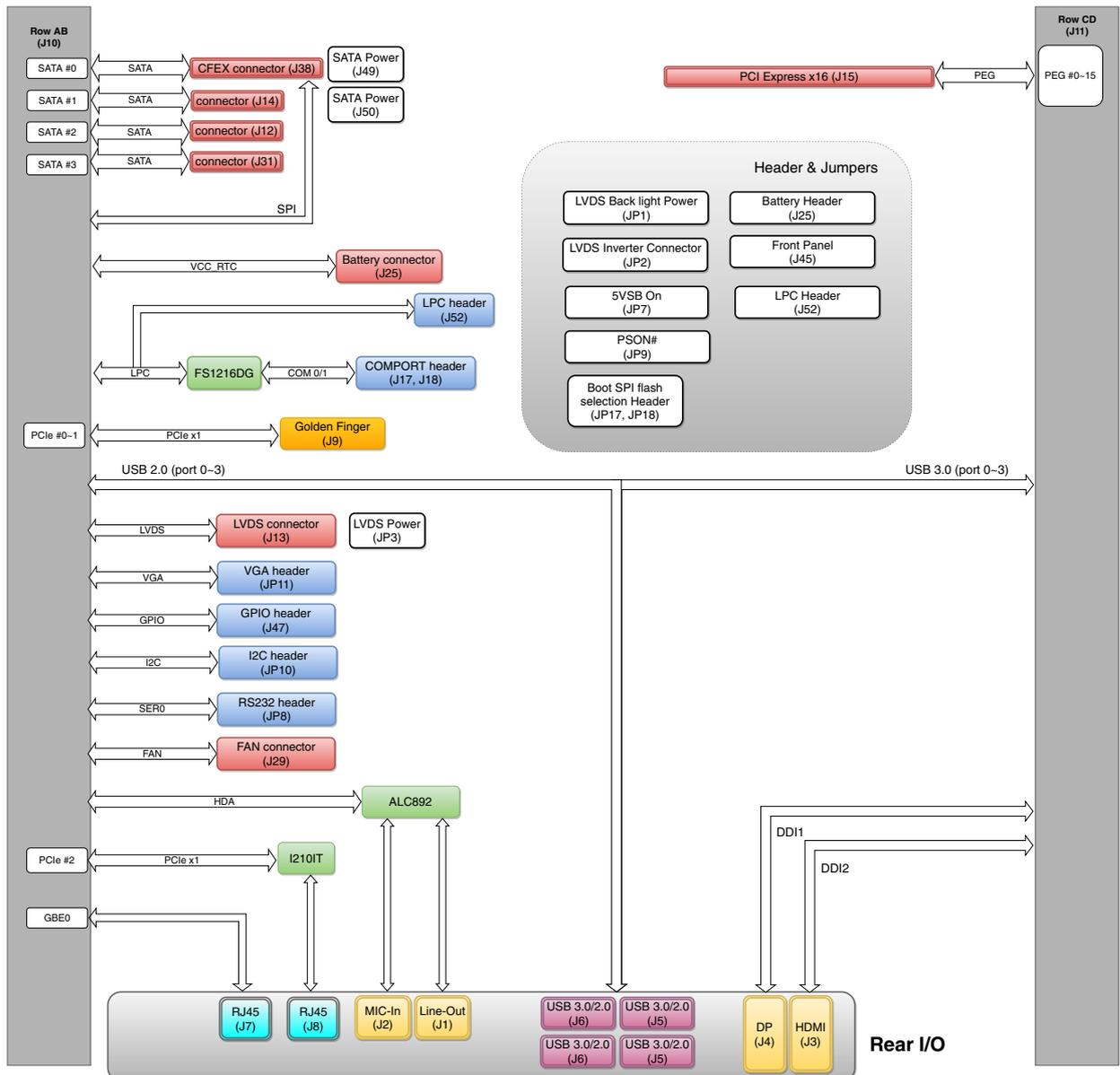
COM Express Type 6 Carrier Board

Mini-ITX Form Factor

-40 ~ +80°C

ATX PSU Connector

12V DC in



PCOM-C700G

ATX Form Factor Evaluation Carrier Board for
Type 7 COM Express® Rev3.0 module with
4x 10GbE Support



FEATURES

- 4x 10GbE Support
- Consoles Redirection Support
- BMC AST2500 Support

Portwell PCOM-C700 is designed with ATX form factor with COM Express Type VII row connectors; it's suitable for evaluation testing of Portwell's Type VII COM Express modules with 4x USB 3.0, 28x PCIe lanes, 4x 10 Gigabit Ethernet, and BMC AST2500 support. Portwell is able to provide carrier board design guide for customer to design their carrier board as a reference. This can shorten customer's carrier board developing time and make the development quickly and easily. The PCOM-C700 provides COM Express Type VII support in addition to suit wide range of device connectivity for prototype and flexibility.

General

Product	PCOM-C700
Form Factor	Type 7, ATX (305 × 244 mm)
Processor	Depends on Module
Core	
Freq.	
Turbo	
Cache	
Processor Graphics	
Graphics Base Frequency	
Graphics Max Dynamic Frequency	
HW Encoding	
HW Decoding	
HW Acceleration	
Processor TDP	
BIOS	
ECC Memory Supported	
Memory	

I/O Interface

SATA	2 x SATA III	
USB	4 x USB3.0 (Depend on Module)	
Ethernet	4x 10GbE 1x Gbe	
Serial I/O	GPIO	8 GPIO
	I ² C	Base on module design
	SMBus	Base on module design
	UART	2 x UART
PEG	1x PCIe x16	
PCI Express	1x PCIe x4 8x PCIe x1	
Display	VGA	2560 x 1536 @ 24bpp
Security	N/A	

MECHANICAL & ENVIRONMENT

Dimension	305x244mm
Power DC IN	12V DC IN
Storage Temperature	-40°C to 80°C
Operating Temperature	-40°C to 80°C
Certification	Contact us
MTBF	Over 100,000 hours at 40° C
Vibration	N/A
OS	Depends on Module

ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-C700.Support TYPE VII. ATX Form Factor.COM Express Carrier Board	AB1-3F19Z	available

BLOCK DIAGRAM

PCOM-C700G

ZR0

COM Express Type 7
Carrier Board

ATX Form
Factor

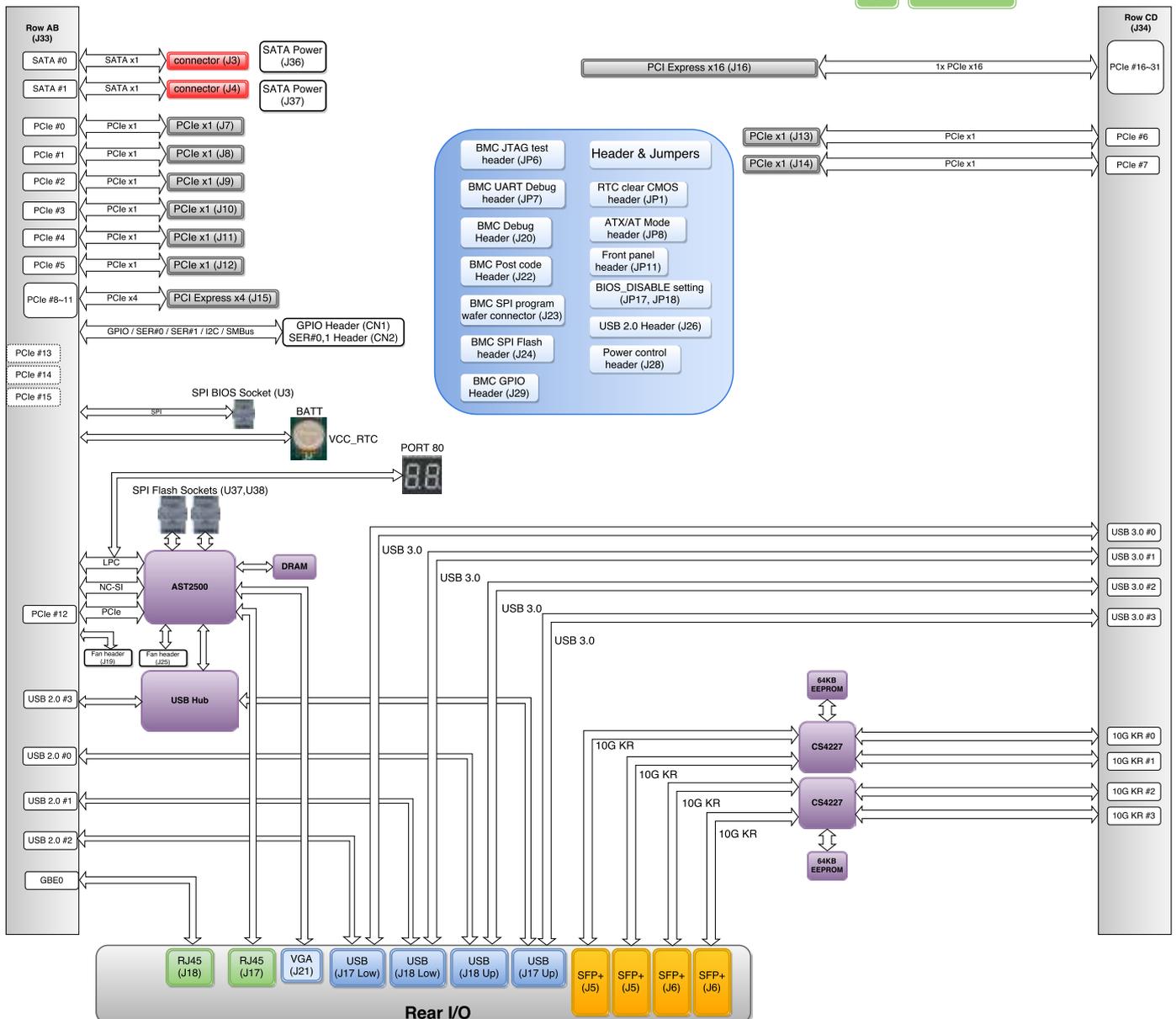
-40° C ~ +80° C

SW2
PWR
BTN

SW1
RST
BTN

12V
DC in

ATX PSU Connector



PSMC-M1011

SMARC module by SMARC 2.0 based on Intel® Atom® / Pentium® / Celeron® processors (Apollo Lake) with LPDDR4 SDRAM up to 8GB, 24bit LVDS, DP, HDMI



FEATURES

- Intel® Atom® / Pentium® / Celeron® processors (Apollo Lake)
- On Board LPDDR4 SDRAM and up to 8GB
- Triple display support (18/24-bit LVDS, DP++, HDMI)
- Four PCI Express lanes, two USB 3.0 and six USB 2.0
- One SATA 3.0, on Board eMMC 5.0



PSMC-M1011 is designed with Intel® Atom®/ Pentium®/ Celeron® processors (Apollo Lake) processors featured with higher graphic performance and wider memory bandwidth than the previous platform.

Based on Intel Apollo Lake industrial grade processor support, industrial components selecting, and with wide-voltage input design adding on board, PSMC-M1011 not only aims at various applications(i.e. automation, fire security, transportations), but is also set to support kinds of harsh environment with a stable power input.

General

General					
Product	PSMC-M1011				
Form Factor	SMARC™ 2.0, 82x50mm				
Processor	Intel® Atom®			Intel® Pentium®	
	E3950	E3940	E3930	N4200	N3350
Core	4	4	2	4	2
Freq.	1.60 GHz	1.60 GHz	1.30 GHz	1.10 GHz	1.10 GHz
Turbo	2.00 GHz	1.80 GHz	1.80 GHz	2.50 GHz	2.40 GHz
Cache	2MB	2MB	2MB	2MB	2MB
Processor Graphics	Intel® HD Graphics 505	Intel® HD Graphics 500	Intel® HD Graphics 500	Intel® HD Graphics 505	Intel® HD Graphics 500
Graphics Base Frequency	500 MHz	400 MHz	400 MHz	200 MHz	200 MHz
Graphics Max Dynamic Frequency	650 MHz	600 MHz	550 MHz	750 MHz	650 MHz
HW Encoding	HEVC, H.264, MVC, VP8, MJPEG				
HW Decoding	HEVC, H.264, MVC, MPEG2, VP9, VC1, WMV9, MJPEG				
HW Acceleration	Intel® Gen 9 LP Graphics supporting DirectX 12, OpenGL 4.3 OpenCL 2.0, OpenGL ES 3.0				
Processor TDP	12W	9.5W	6.5W	6W	6W
BIOS	AMI Aptio5 BIOS				
ECC Memory Supported	YES				
Memory	On Board LPDDR4 DRAM and up to 8GB				

I/O Interface

SATA	2x SATA III				
USB	6x USB2.0 (w/1x OTG) 2x USB 3.0 (w/1x OTG)				
Ethernet	2x 10/100/1000 GbE (Intel® I210AT (Commercial) / I210IT (Industrial))				
Serial I/O	GPIO			12 GPIO	
	I ² C			Baud rate: 400KHz	
	SMBus			Baud rate: 100KHz	
	UART			2x UART	
PEG	N/A				
PCI Express	4 x PCIe x1 Gen2 2x PCIe CLK to Golden Finger when using dual LAN ports				
Display	LVDS		eDP		3840 x 2160p @ 60Hz
	HDMI		DP		4096 x 2160 @ 60Hz
			HDMI		3840 x 2160p @ 30Hz
Security	TPM 2.0 (Option)				

PSMC-M1011

MECHANICAL & ENVIRONMENT

Dimension	82x50mm
Power DC IN	+5VDC ± 5% AT / ATX Mode
Storage Temperature	Commercial: 0°C to +60°C Industrial: -40°C to +85°C
Operating Temperature	Commercial: 0°C to +60°C Industrial: -40°C to +85°C
Certification	Contact us
MTBF	Contact us
Vibration	Contact us
OS	Windows 10 Enterprise Windows 10 IoT Linux

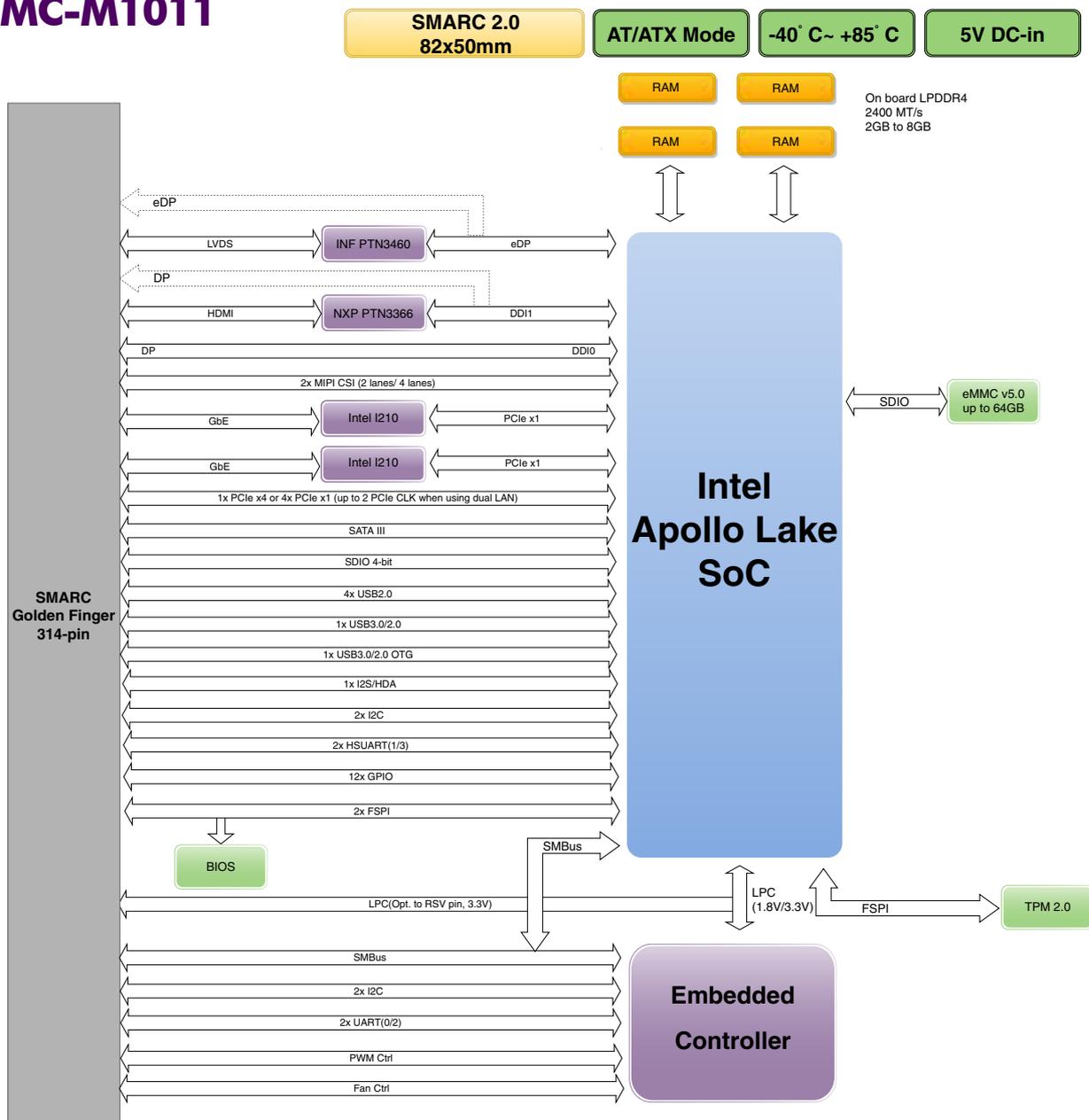
ORDERING GUIDE

Product	Ordering P/N	Status
PSMC-M1011-E3950-4G-8G	AB7-3051Z	Available
PSMC-M1011-N3350-4G-8G	Contact us	Available
PSMC-M1011-N4200-4G-8G	Contact us	Available
PSMC-M1011-Exxx-xG-xG	Contact us	Available

Accessory	Ordering P/N	Status
PSMC-M1011 Heat Spreader (APL-N)	B8309290	Available
PSMC-M1011 Heat Sink Set (APL-N)	B8309280	Available
PSMC-M1011 Heat Spreader (APL-I)	B8309270	Available
PSMC-M1011 Heat Sink Set (APL-I)	B8309260	Available
PSMC-C301	AB7-3078	Available

BLOCK DIAGRAM

PSMC-M1011



PQ7-M106

Qseven Module Based on Intel® Atom® Processor E3800 Series with DDR3L SDRAM up to 8GB, LVDS/eDP and eMMC



FEATURES

- Intel® Atom® Processor E3800 Series(Bay Trail)
- On Board DDR3L SDRAM up to 8GB
- eMMC up to 64GB
- DP/HDMI and LVDS
- GbE, 2x SATA 3Gb/s, 1x USB 3.0, 6x USB 2.0, 3x PCIe x1



PQ7-M106 is designed with Intel® Atom® Processor E3800 Series and qualified components for wide-temp support. This series also supports LVDS, Dual-Channel DDR3L, as well as eMMC soldered on board to be a cost effective collection.

General

General				
Product	PQ7-M106			
Form Factor	Qseven® 2.0, 70 x 70 mm			
Processor	Intel® Atom®			
	E3845	E3827	E3825	E3815
Core	4	2	2	1
Freq.	1.91 GHz	1.75 GHz	1.33 GHz	1.46 GHz
Turbo	N/A	N/A	N/A	N/A
Cache	2MB	1MB	1MB	512KB
Processor Graphics	Intel® HD Graphics for Intel Atom® Processor Z3700 Series	Intel® HD Graphics for Intel Atom® Processor Z3700 Series	Intel® HD Graphics for Intel Atom® Processor Z3700 Series	Intel® HD Graphics for Intel Atom® Processor Z3700 Series
Graphics Base Frequency	542 MHz	542 MHz	533 MHz	400 MHz
Graphics Max Dynamic Frequency	792 MHz	792 MHz	533 MHz	400 MHz
HW Encoding	H.264			
HW Decoding	H.264, JPEG, MJPEG, MVC, MPEG-2, WMV9, VC1			
HW Acceleration	DX*11, OpenGL* 3.0 (OGL 3.0), OpenCL* 1.2 (OCL 1.2), OpenGLES* 2.0(OGLES* 2.0)			
Processor TDP	10W	8W	6W	5W
BIOS	AMI Aptio5 BIOS			
ECC Memory Supported	NO			
Memory	On Board DDR3L Non-ECC up to 8GB			

I/O Interface

SATA	2x SATA II		
USB	6 x USB2.0 with 1x Opt. to USB3.0		
Ethernet	1x Gbe (Intel® I210IT)		
Serial I/O	LPC	1x LPC	
	I ² C	Baud rate: 400KHz	
	SMBus	Baud rate: 100KHz	
	UART	1x UART	
PEG	N/A		
PCI Express	1x PCIe x4 8x PCIe x1		
Display	LVDS	eDP	2560x1600
	HDMI	DP	2560x1600
		HDMI	1920x1080
Security	N/A		

MECHANICAL & ENVIRONMENT

Dimension	70 x 70mm
Power DC IN	5V DC ±5%
Storage Temperature	-40°C to 85°C
Operating Temperature	-40°C to 85°C
Certification	Contact us
MTBF	NA
Vibration	NA
OS	Windows 7/8/8.1/10

ORDERING GUIDE

Product	Ordering P/N	Status
PQ7-M106-E3845-4G-8G	AB7-3031Z	Available
PQ7-M106-E3827-4G-8G	Contact us	Available
PQ7-M106-E3825-2G-4G	Contact us	Available
PQ7-M106-E3815-2G-NA	AB7-3045Z	Available
PQ7-M106-E3805-2G-4G	Contact us	Available
Other Memory/Storage Configuration	Contact us	Available

Accessory	Ordering P/N	Status
Heat Spreader	B8308530	Available
Heat Sink Kit	B8309050	Available
PQ7-C201	AB1-3B45	Available

BLOCK DIAGRAM

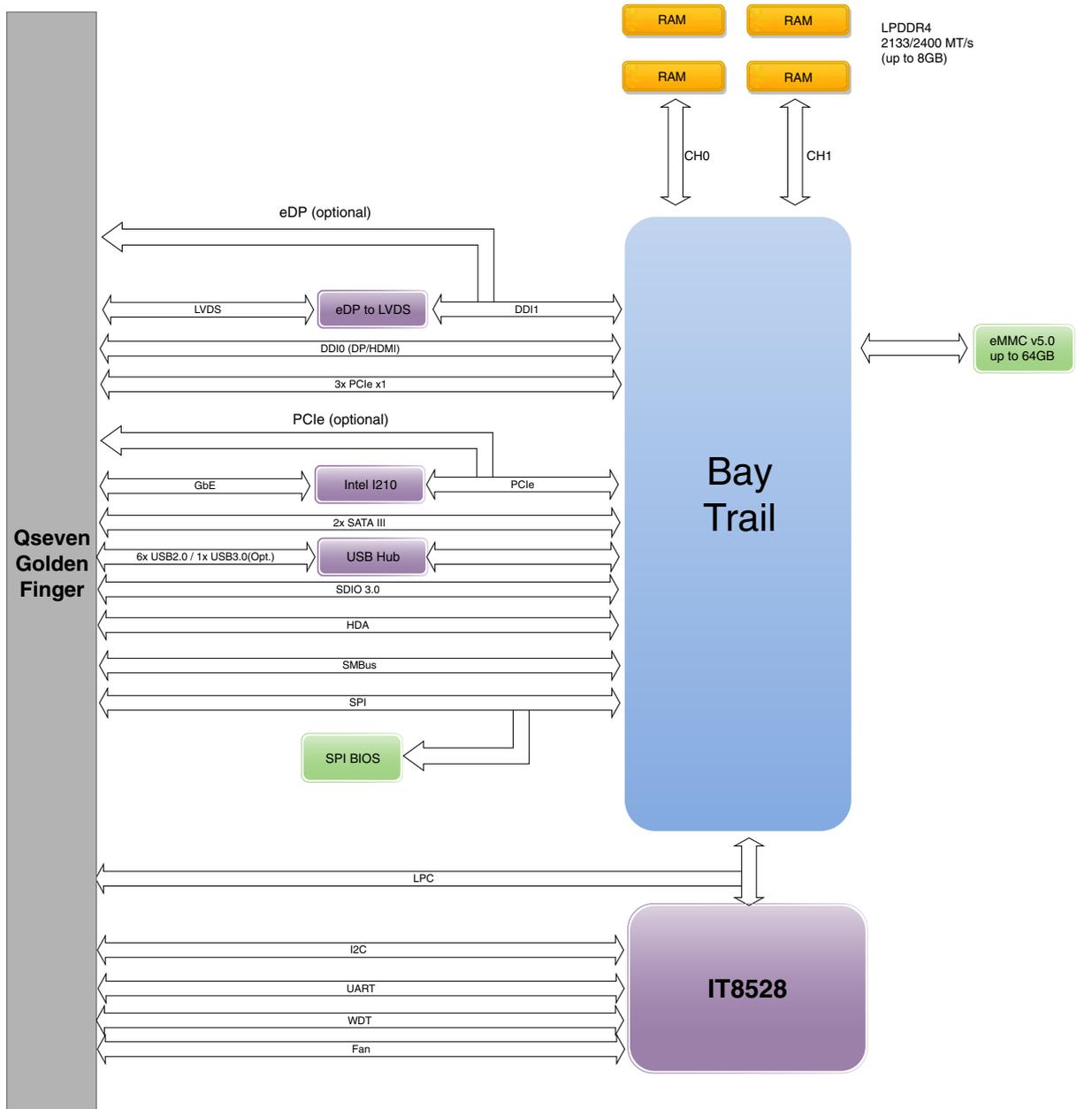
PQ7-M106

QSEVEN 2.0
70x70mm

AT/ATX Mode

-40° C ~ +85° C

5V±5% DC-in



PQ7-M108

Qseven module by Qseven 2.1 based on Intel® Atom® / Pentium® / Celeron® processors (Apollo Lake) with LPDDR4 SDRAM up to 8GB, 24bit LVDS, DP/HDMI



FEATURES

- On Board LPDDR4 DRAM and up to 8GB
- 24-bit LVDS, HDMI/DP output
- Four PCI Express lanes
- Support three USB 3.0 or four USB 2.0
- On Board eMMC 5.0 (Optional)



PQ7-M108 is designed with Intel® Atom®/ Pentium®/ Celeron® processors (Apollo Lake) which featured with higher graphic performance and wider memory bandwidth than the previous platform.

Benefit from Intel Apollo Lake industrial grade processor design, the operating temperature supports -40°C to 85°C. With qualified industrial-grade components selecting, PQ7-M108 is aimed to be widely applied on automation, security, transportations and so to different kinds of harsh environment applications.

General

Product	PQ7-M108				
Form Factor	Qseven® 2.1, 70 x 70 mm				
Processor	Intel® Atom®			Intel® Pentium®	
	E3950	E3940	E3930	N4200	N3350
Core	4	4	2	4	2
Freq.	1.60 GHz	1.60 GHz	1.30 GHz	1.10 GHz	1.10 GHz
Turbo	2.00 GHz	1.80 GHz	1.80 GHz	2.50 GHz	2.40 GHz
Cache	2MB	2MB	2MB	2MB	2MB
Processor Graphics	Intel® HD Graphics 505	Intel® HD Graphics 500	Intel® HD Graphics 500	Intel® HD Graphics 505	Intel® HD Graphics 500
Graphics Base Frequency	500 MHz	400 MHz	400 MHz	200 MHz	200 MHz
Graphics Max Dynamic Frequency	650 MHz	600 MHz	550 MHz	750 MHz	650 MHz
HW Encoding	HEVC, H.264, MVC, VP8, MJPEG				
HW Decoding	HEVC, H.264, MVC, MPEG2, VP9, VC1, WMV9, MJPEG				
HW Acceleration	Intel® Gen 9 LP Graphics supporting DirectX 12, OpenGL 4.3 OpenCL 2.0, OpenGL ES 3.0				
Processor TDP	12W	9.5W	6.5W	6W	6W
BIOS	AMI Aptio5 BIOS				
ECC Memory Supported	YES				
Memory	On Board LPDDR4 DRAM and up to 8GB				

I/O Interface

SATA	2x SATA III			
USB	3 x USB 3.0 4 x USB 2.0			
Ethernet	1x 10/100/1000 GbE (Intel® I210-AT/IT)			
Serial I/O	GPIO			N/A
	I ² C			Baud rate: 400KHz
	SMBus			Baud rate: 100KHz
	UART			1x UART
PEG	N/A			
PCI Express	4 x PCIe x1 Gen2			
Display	LVDS	eDP		3840 x 2160p @ 60Hz
	HDMI	DP		4096 x 2160 @ 60Hz
		HDMI		3840 x 2160p @ 30Hz
Security	N/A			

PQ7-M108

MECHANICAL & ENVIRONMENT

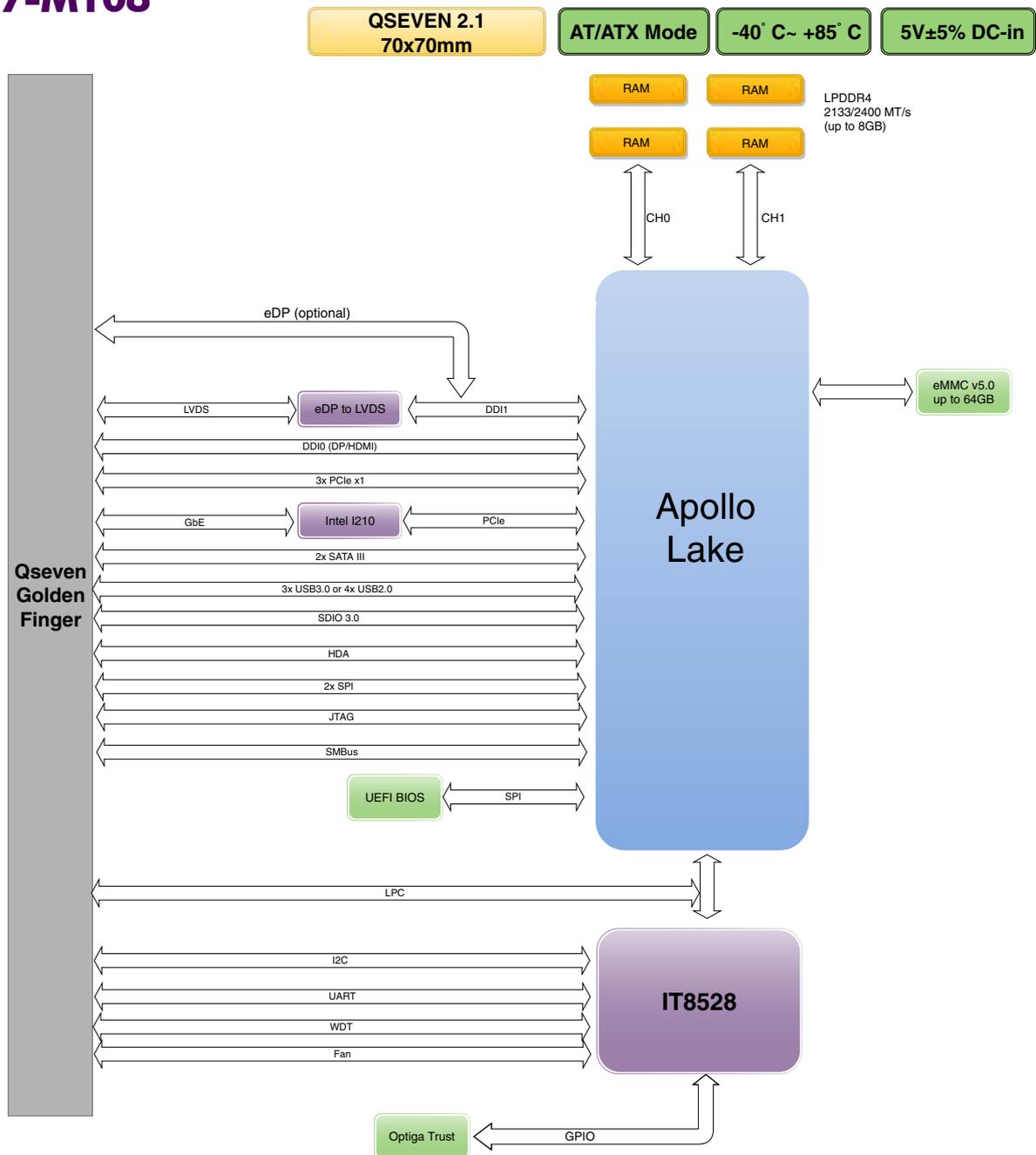
Dimension	70 x 70mm
Power DC IN	+5VDC ± 5%
Storage Temperature	-40°C to 85°C
Operating Temperature	-40°C to 85°C
Certification	Contact us
MTBF	Contact us
Vibration	Contact us
OS	Windows 10 IoT Enterprise/ Windows 10 IOT Core

ORDERING GUIDE

Product	Ordering P/N	Status
PQ7-M108-N3350-4G-8G	AB7-3019Z	Available
PQ7-M108-N4200-4G-8G	AB7-3054Z	Available
PQ7-M108-E39xx-xG-xG	Contact us	Available
Accessory	Ordering P/N	Status
Heat Spreader	B8308940 (for N3350/N4200) B8309030 (for E3930/E3940/E3950)	Available
Heat Sink Set	B8308970 (for N3350/N4200) B8308980 (for E3930/E3940/E3950)	Available
PQ7-C201	AB1-3B45	Available

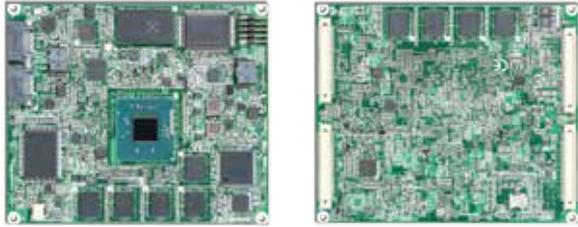
BLOCK DIAGRAM

PQ7-M108



PEM-E203VLA

Intel® ATOM® E3800 series processor based on form factor module ETX® 3.0 specification with DDR3L optional ECC/ Non-ECC Memory down, VGA, LVDS, Gigabit Ethernet, IDE, PCI, ISA, Parallel Port, SATA and USB



FEATURES

- ETX tailor-made modular architecture speeds up time-to-market
- 10W TDP for easy fan-less design
- SATA and IDE interface provide best cost effective functions for market
- Support VGA, LVDS and Display-port interface
- On Board DDR3L optional ECC/Non-ECC Memory up to 4GB



Portwell PEM-E203VLA is designed with Intel® ATOM® E3800 series processor. PEM-E203 supports dual 24bit LVDS, and 10W TDP processor is suitable for supermarket, healthy and industrial weighing scale applications which has equipped with dual monitors nowadays. PEM-E203 is capable of driving thermal printer, barcode scanner etc. via Serial and USB interfaces for achieving self-service along with weighing scale.

General

Product	PEM-E203VLA			
Form Factor	ETX 3.01, 114x95 mm			
Processor	Intel® Atom®			
	E3845	E3827	E3825	E3815
Core	4	2	2	1
Freq.	1.91 GHz	1.75 GHz	1.33 GHz	1.46 GHz
Turbo	N/A			
Cache	2MB	1MB	1MB	512KB
Processor Graphics	Intel® HD Graphics for Intel Atom® Processor Z3700 Series			
Graphics Base Frequency	542 MHz	542 MHz	533 MHz	400 MHz
Graphics Max Dynamic Frequency	792 MHz	792 MHz	533 MHz	400 MHz
HW Encoding	H.264			
HW Decoding	H.264, JPEG, MVC, MPEG-2, WMV9, VC1			
HW Acceleration	DX x11, OpenGL x3.0 (OGL 3.0), OpenCL x1.2 (OCL 1.2), OpenGLES x2.0(OGLES x2.0)			
Processor TDP	10W	8W	6W	5W
BIOS	AMI Aptio5 BIOS			
ECC Memory Supported	Yes			
Memory	On Board DDR3L optional ECC/Non-ECC Memory up to 4GB (Intel® Valleyview I-series is up to 8GB for E3845 & E3827 only)			

I/O Interface

SATA	2x SATA II (Option to 1x NAND-Flash)		
USB	4x USB2.0		
Ethernet	1x Realtek® RTL811F-CG FastEthernet Wake-on-LAN and remote wake-up support		
Serial I/O	GPIO	N/A	
	I²C	Baud rate: 400KHz	
	SMBus	Baud rate: 100KHz	
	UART	2x UART	
PEG	N/A		
PCI Express	N/A		
Display	VGA	VGA	2048 x 1536
	LVDS	eDP	1600 x 1200
	HDMI	DP	N/A
		HDMI	N/A
Security	Contact us		

PEM-E203VLA

MECHANICAL & ENVIRONMENT

Dimension	114 x 95 mm
Power DC IN	5V,3V, 5VSB, VBAT, AT/ATX mode
Storage Temperature	-40°C~ +80°C
Operating Temperature	-40°C~ +80°C
Certification	Contact us
MTBF	Over 120,000 hours at both 35° C and 55° C
Vibration	Random 5Hz to 2KHz, 7.7 grms, 10min in each of 3 axes
OS	Windows 7 / Windows Embedded Standard 7/ Windows 8 / Fedora 18 / Ubuntu 13

ORDERING GUIDE

Product	Ordering P/N	Status
PEM-E203VLA-E3815-2G	AB1-3C29	Available
PEM-E203VLA-E3825-2G	AB1-3C52	Available
PEM-E203VLA-E3827-2G	AB1-3B58	Available
PEM-E203VLA-E3845-2G	AB1-3C28	Available
PEM-E203VLA-E3845-4G	AB1-3D67	Available

Accessory	Ordering P/N	Status
PEM-C200	AB1-3246	Available
Heat spreader	B8307620	Available
Heat Sink	B8308990	Available

BLOCK DIAGRAM

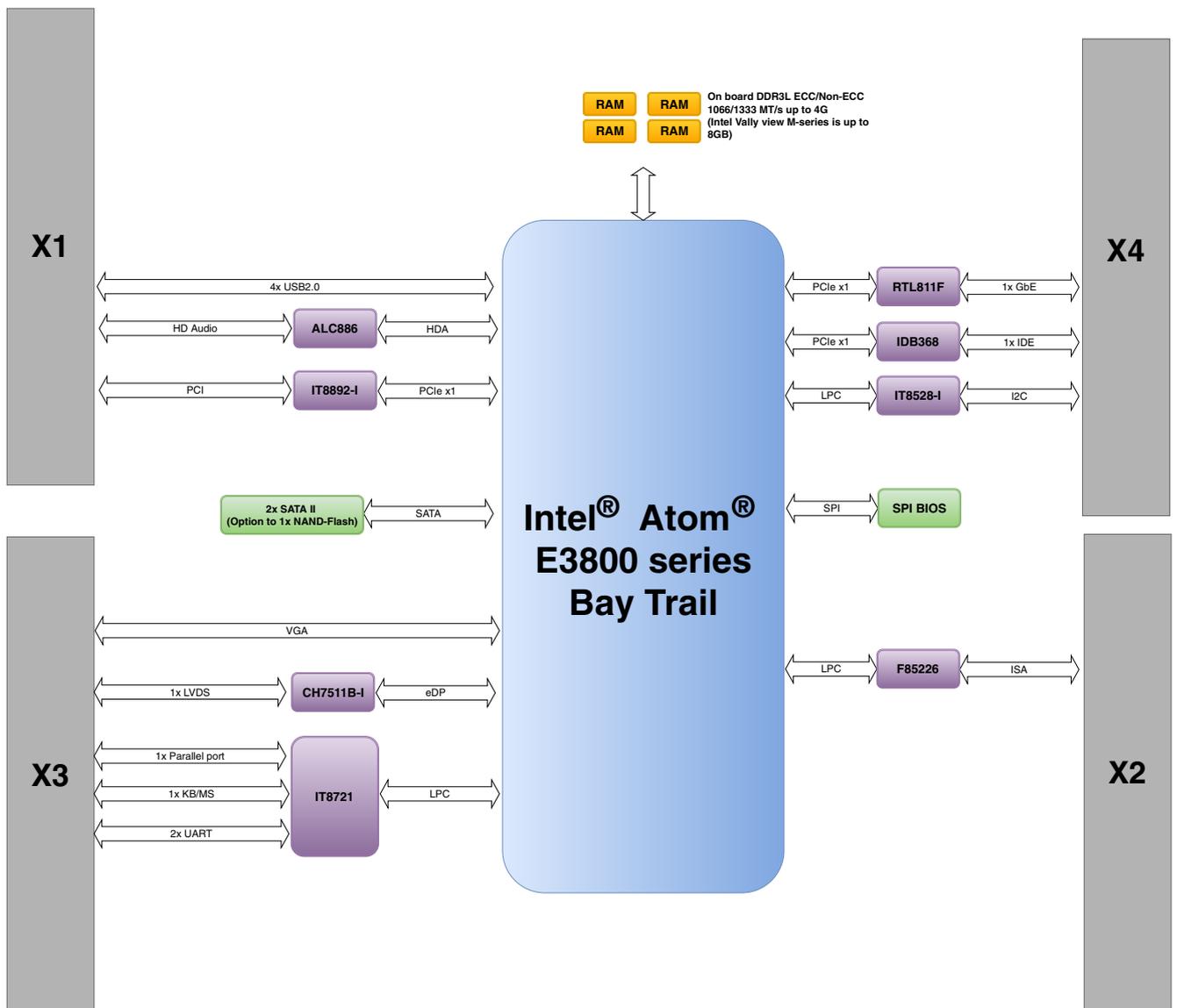
PEM-E203VLA

ETX[®] 3.01
114x95 mm

AT/ATX Mode

-40°C~ +80°C

5V DC-in



PEM-E205VLA

Vortex DX3 processor based on ETX 3.02 module with DDR3 Memory down, VGA, LVDS, PCI, ISA, IDE and USB



FEATURES

- Support DDR3 Memory-down, up to 2GB
- One VGA and LVDS, FastEthernet interface
- Support industrial temperature -40°C~85°C



Portwell PEM-E205VLA is designed with DMP 1.0 GHz Dual-Core processor, with less than 5W overall TDP, PCI and dual 24bit LVDS support it is suitable for industrial and transportation applications. Expansion for the PEM-E205VLA ETX module includes ISA interface with controllers integrated into processor-enhancing capabilities to support 8/16-bit ISA device with Zero-Wait-State. In addition, the module supports dual displays, VGA and LVDS with greater graphic performance compared to its previous generation. The resolution for one display interface supports up to 1920x1440@60Hz with 234MHz video clock, and the other, 1920x1200, 1x DVO (24bits) and 1x D-SUB or 2x DVO (12bits x2).

General

Product	PEM-E205VLA
Form Factor	ETX 3.02, 114x95 mm
Processor	Vortex86DX3 SoC
Core	2
Freq.	1 GHz
Turbo	N/A
Cache	256KB
Processor Graphics	GPU integrated in Vortex 86DX3
Graphics Base Frequency	N/A
Graphics Max Dynamic Frequency	N/A
HW Encoding	Contact us
HW Decoding	H.264
HW Acceleration	Contact us
Processor TDP	5W
BIOS	AMI BIOS
ECC Memory Supported	Yes
Memory	Yes
Memory	On board DDR3 memory up to 2GB (optional with ECC)

I/O Interface

SATA	2x SATA II (Option to 1x NAND-Flash) 1x IDE		
USB	4x USB2.0		
Ethernet	1x RTL8119I GbE controller		
Serial I/O	GPIO	N/A	
	I ² C	Baud rate: 400KHz	
	SMBus	Baud rate: 100KHz	
	UART	2x UART	
PEG	N/A		
PCI Express	N/A		
Display	VGA	VGA	1920x1440@ 60Hz
	LVDS	eDP	1920x1200
	HDMI	DP	NA
		HDMI	NA
Security	Contact us		

PEM-E205VLA

MECHANICAL & ENVIRONMENT

Dimension	114x95 mm
Power DC IN	5V,3V, 5VSB, VBAT, AT/ATX mode
Storage Temperature	-40°C~ +80°C
Operating Temperature	-40°C~ +80°C
Certification	Contact us
MTBF	Over 120,000 hours at both 35° C and 55° C
Vibration	Random 5Hz to 2KHz, 7.7 grms, 10min in each of 3 axes
OS	Windows for Workgroups 3.11 / Windows XP Embedded Standard 2009 and higher / Windows 7 Embedded Linux (Kernel >= 2.4)/ RTOS32 MS DOS 6.22 / FreeDOS

ORDERING GUIDE

Product	Ordering P/N	Status
PEM-E205VLA	AB1-3D65	Available

Accessory	Ordering P/N	Status
PEM-C200	AB1-3246	Available
Heat spreader	B8308090	Available
Heat Sink	B8308090	Available

BLOCK DIAGRAM

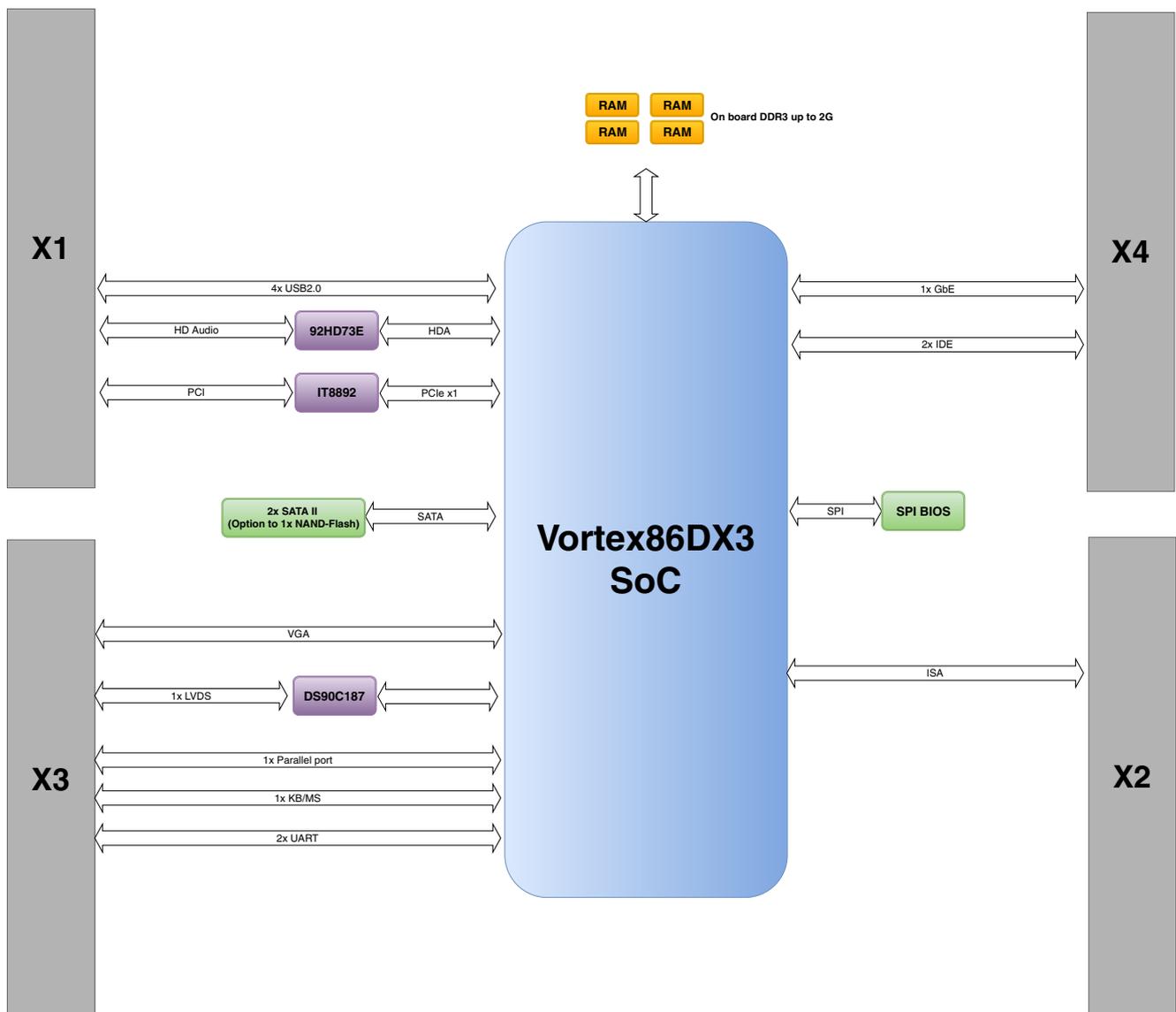
PEM-E205VLA

ETX® 3.0
114x95 mm

AT/ATX Mode

-40°C~ +80°C

5V DC-in



Signal integrity is tested and assured

The Signal Integrity Lab (SI) concentrates its efforts on ensuring reliable quality of our PCB design. With advanced software, Portwell can repair discrepancies via Signal Integrity (SI), Power Integrity (PI) and EMI (Electromagnetic Interference) before gerber out. The benefits of SI not only reduces re-spin versions but also minimizes cost to achieve a faster time-to-market.

The Mission of SIL is as follows.

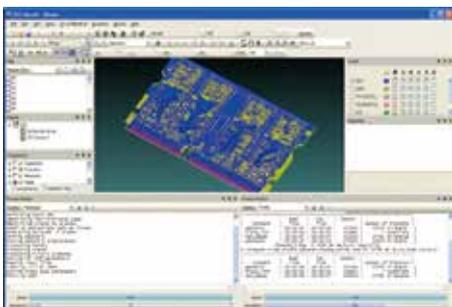
- Ensure high-speed signal quality.
- Reduce PCB turn-around time to fix SI, PI and EMC issue in advance.
- Minimize cost on board design (size, layer no., stackup, etc).
- Provide board stack-up design and PCB material selection.
- Export layout guidelines of high-speed signals.
- Signal validation and correlation.
- Sharing SI/PI/EMI knowledge know-how with part-ners by design collaboration.



For better collaboration design with customers, we adopt world leading simulation tools in the industry field. Such as

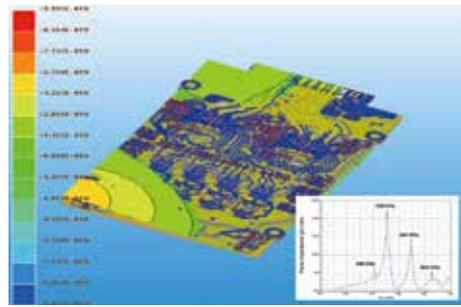
Ansyes (Ansoft) Siwave 5.0

1. Hybrid 2D Full Wave EM Field Solver.
2. Analyze entire PCB and IC packages.
3. ID signal and power integrity problems.



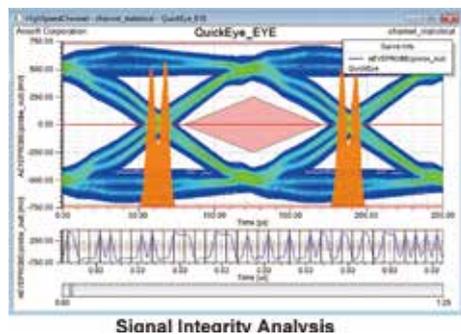
Ansyes (Ansoft) PI Advisor

1. Optimizes power distribution
2. Quickly determines the optimal capacitors
3. Minimizes production costs, non-recurring engineering costs, and time to market.



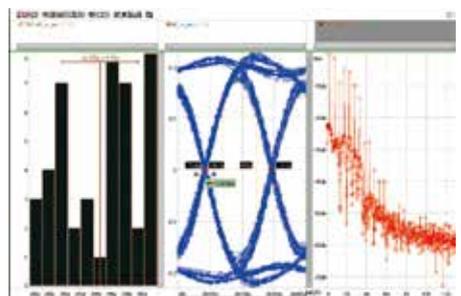
Ansyes (Ansoft) Designer SI 6.0

1. Leverages multiple signal integrity simulation methods.
2. Utilizes optimization algorithms, Design of Experiments, tuning and post-processing for key comp.
3. Utilizes electromagnetic simulation and circuit tools.



Synopsys HSPICE

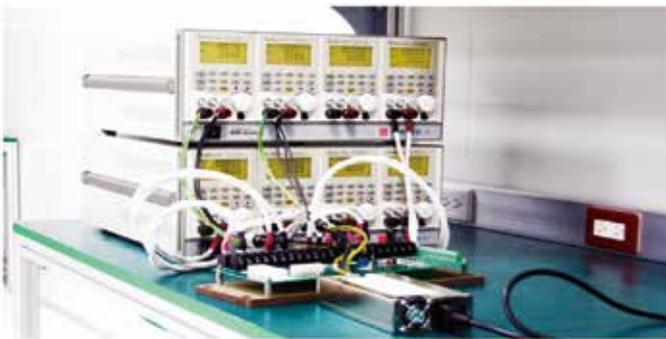
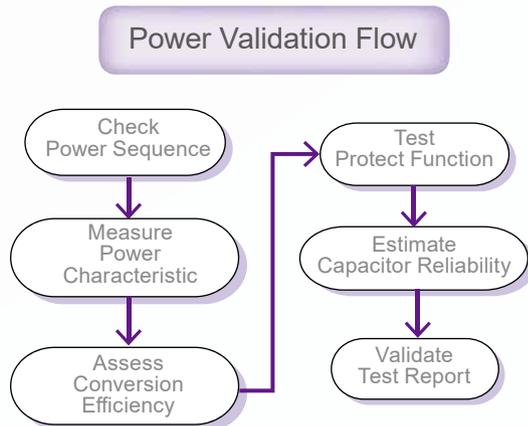
1. Uses the Gold Standard for accurate circuit simulation.
2. Provides Yield-Process variability and device reliability simulation.
3. Applies high speed simulation with harmonic balance and shooting algorithms.



Power & energy, stable & efficient

Power Lab

Since the development of the Industrial PC it has been widely used in communications, medical, aerospace, automation & control applications and more. The power design quality and reliability is very important during product development which may affect the system operation stability and power efficiency consumption. The role of the Power Lab is to help engineers verify the power sequence, measure heat loss, etc. in order to improve the power design.

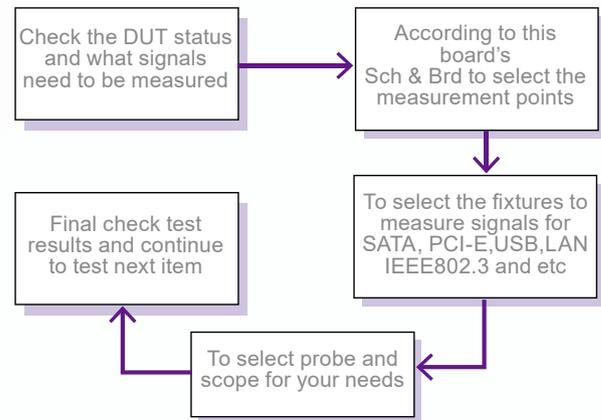


Electronic R&D Lab

The Electronic R&D Lab fulfills hardware engineers' needs by utilizing different measurement equipment which help investigate high speed signals required in Data Quality Assurance (DQA) during the test stage to ensure all hardware functionalities are compliant with the design guide.



Engineering Validation Flow



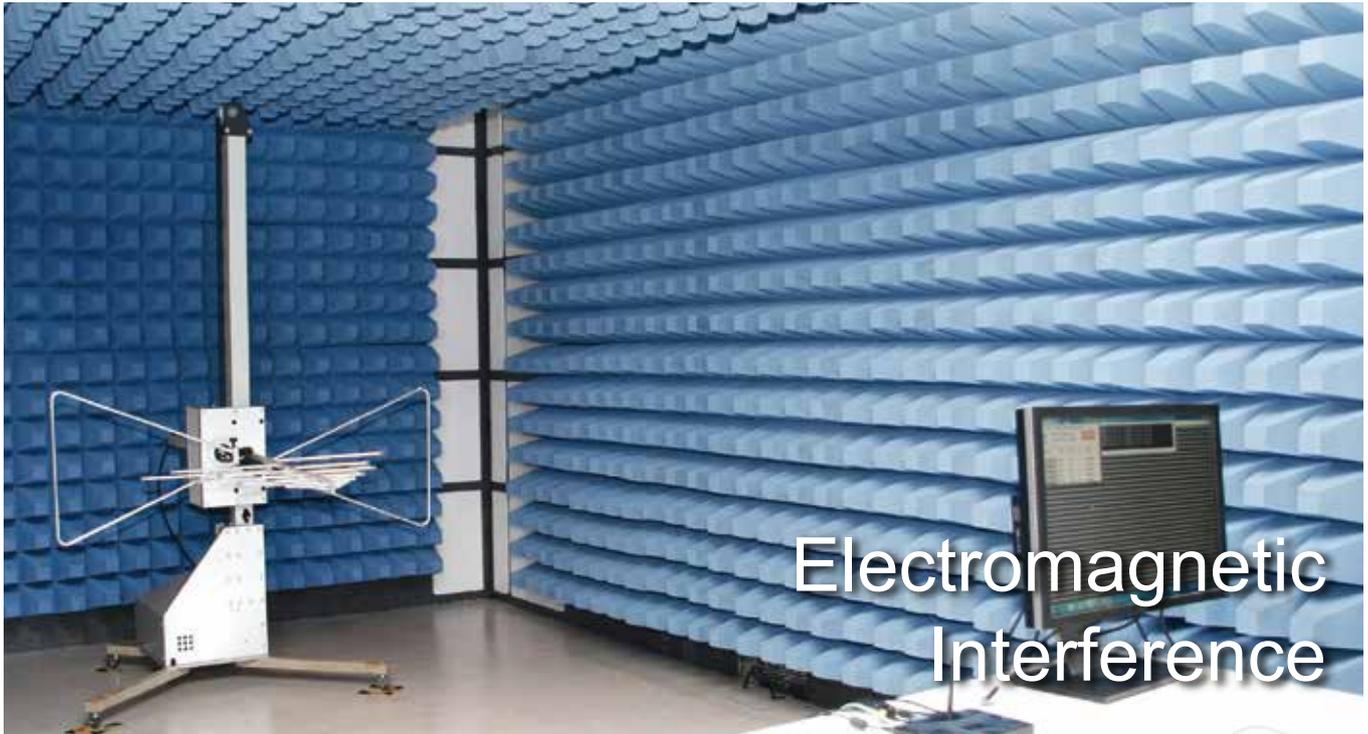
On / Off Lab

ON/OFF Lab is built to ensure our products are designed with the highest quality. By testing On and Off we can validate the system power sequence which is one of the most important test methods to ensure the reliability and compatibility.

Portwell's On/Off Lab features replay equipment that monitors power input for boards or systems and provides advanced remote control so engineers can monitor the test status of 16 systems via WAN, LAN or the Internet which proves to be an efficient method during project development.



Our modules are resistant to rapidly changing electrical currents



Electromagnetic Interference

Electromagnetic interference (also called radio frequency interference or RFI) is a disturbance that affects an electrical circuit due to either electromagnetic induction or electromagnetic radiation emitted from an external source. The disturbance may interrupt, obstruct, or otherwise degrade or limit the effective performance of the circuit. The source may be any object, artificial or natural, that carries rapidly changing electrical currents. Problems with EMI can be minimized by ensuring that all electronic equipment is operated with a good electrical ground system. In addition, cords and cables connecting the peripherals in an electronic or computer system should be shielded

to keep unwanted RF energy from entering or leaving. Specialized components such as line filters, capacitors, and inductors can be installed in power cords and interconnecting cables to reduce the EMI susceptibility of some systems.

Placing a large amount of electrical and electronic systems into a very confined space poses the issue of keeping the EMI of these systems from interfering with each other through radiated and conducted emissions. With most systems now fully electronic, the need to contain EMI is more vital than ever starting from the design stage.

Features of Portwell EMI LAB



The EMI test receiver we utilize combines two instruments into one; measuring EMC disturbances in accordance with the latest standards and also serving as a full-featured spectrum analyzer for diverse lab applications.

Key Features

- Frequency range from 9 kHz to 3 GHz covering almost all commercial EMC standards.
First-ever combination of an EMI test receiver and spectrum analyzer in the economy class.
- All major functions of an advanced EMI test receiver, including fully automated test sequences.
Weighting detectors: max./min. peak, average, RMS, quasi-peak as well as average with meter
- time constant and rms average in accordance with the latest version of CISPR 16-1-1

Our modules compliants with EMS standards

EMS

EMS tests including CS & RS are the reliability tests against electric fields, magnetic fields, power cords, control cables, signal cables, ground interference and static electricity discharges, electricity discharge and electromagnetic wave.

ESD

Electrostatic discharge (ESD) is the sudden and momentary electric current that flows between two objects at different electrical potentials. One of the causes of ESD events is static electricity. A system will suffer permanent damage when static electricity is generated through turbo-charging or electrostatic induction that occurs when an electrically charged object is placed near a conductive object isolated from grounding.

Features of Portwell ESD Facility

- Meets the requirements in EN/IEC 61000-4-2.
- Up to 30KV output in both contact and air discharges. A lightweight discharge gun.
- Easily changeable capacitor and resistor units.
- Self-explanatory control panel.
- Optional remote control Windows software offers
- more comprehensive control than local operation.



2 SURGE:

Surge test generates a sudden rise in power to simulate the effect of lightning shock to the power system. Utilizing this test ensures self-protection and also determines weaknesses during sudden power surges.

*Compliance with IEC 61000-4-5 SURGE 4.1KV / 2KA and 61000-4-9 (Magnetic field SURGE)

3 DIPS:

Dips simulates sudden drops in power and measures the immunity of products to such power interferences. This test allows us to improve upon design flaws by measuring the sustainability to such power drops.

*Compliance with IEC 61000-4-11 DIPS / VARIATION, IEC 61000-4-8 (50/60 Hz Magnetic field 50A/m) with the additional MF1000-1 antenna (1x1m)

1 Electrical Fast Transient (EFT) or Burst:

Every On/Off action with electronic devices generates interference to the whole power system. EFT simulates these possible circumstances to examine the immunity of an operating system in order to make improvements.

*Compliance with IEC 61000-4-4 EFT 4.4KV



4 Conducted Susceptibility Test System (CST)

The CS test examines the immunity in terms of conduction. By sending a high frequency signal, it simulates interference to test the immunity of the power core or signal. By utilizing different voltage level settings, weak points can be determined for design correction.

*Compliance with IEC/EN 61000-4-6 (IEC-Frequency range from 150 kHz ~ 80MHz)

5 Conducted Immunity Test System (CIT)

Conducted Immunity tests are performed to determine the ability of a device to withstand the presence of RF signals on the cables or power cords attached to the device.

*Compliance with IEC/EN 61000-4-6

A farm of chambers for module testing



Advanced Chamber Farm

The environmental test is a very important certification to all industrial products needed for mission critical environments. At Portwell, we test all our products, developed or integrated, against these conditions. Our readily available equipment always allows us to meet customer deadlines and provide detailed test results compliant with industrial standards. While there are many applications and choices in the ever-changing IPC industry, Portwell is the most competent and qualified to adapt to these changes and remain as an industrial leader. Though the quantity scale is a concern of our customers, advanced functionalities

satisfies them due to the savings of cost and time. For example, a remote monitoring system enables our customers to conduct environmental tests by way of our equipment. Meanwhile, our experienced engineers can effortlessly help our customers achieve desired results without additional costs.

Features of Portwell Chamber Zone

As a leading worldwide industrial platform provider, we know the importance of environmental testing. We build our Chamber Zones with the following features.

- Scalable – More than 30 chamber devices can be installed in the zone.
- Independent – Well controlled and separated space for each individual chamber in order to sustain steady operations and security of a project.
 - Advanced – 30 check points for every tested object to collect detailed data.
 - Green – we recycle and use well-filled water for the environmental test.
- Remote Control & Monitoring
- Manipulation of chambers and testing objects
- Allows instant acquisition of the testing data

IEC 68-2-X Certification

IEC 68-2-1	Low-temp. Test, 60°C, 96 hrs	IEC 68-2-3	Humidity Test, 40°C, 93+2/-3% R.H., 96 hrs
IEC 68-2-2	High-temp. Test, -10°C, 96 hrs	IEC 68-2-14	Temp. cycle Test, -10°C ~ 60°C, 48 hrs



Bringing thermal validation expertise to module development

Programmable Temperature & Humidity Chamber

Portwell's Programmable Temperature and Humidity Chamber Farm houses 12 programmable constant temperature and humidity testing machines, with the abilities to run from -60°C up to 150°C. Moreover, the air flow control is compliant with IEC 68-2 standard. Portwell vigorously applies these extreme conditions to their products in order to ensure their durability and accuracy while under such conditions. Therefore, Portwell can assure their customers superior and stable performance in any environment.



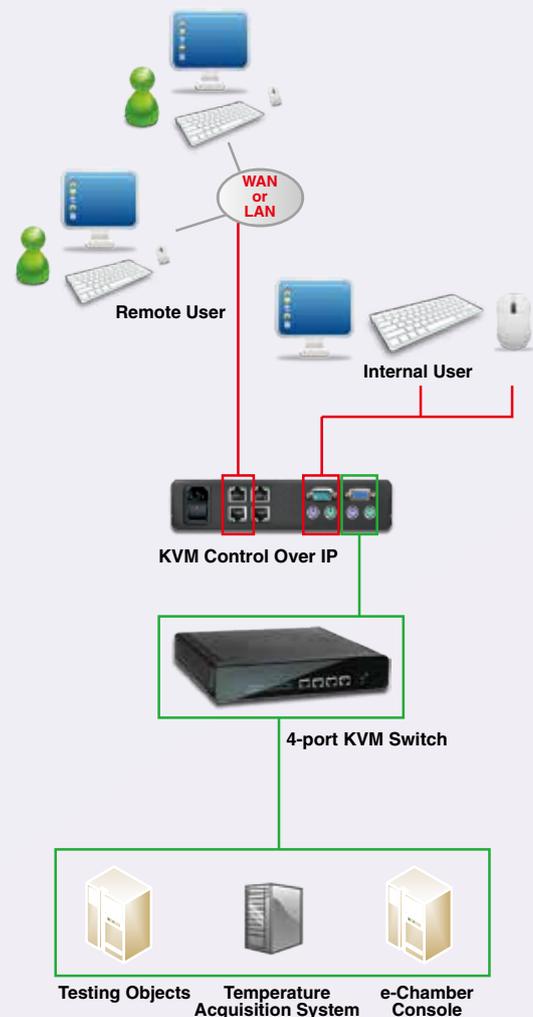
Features:

- **Air Flow Control**
Comply with IEC 68-2 standard, lower wind is under 0.5m/s.
- **With/without Duct**
Available upon request.
- **Humidity Control**
Can be controlled under 40°C / 10% RH.
- **Web Monitoring**
Can be arranged by the dedicated program.

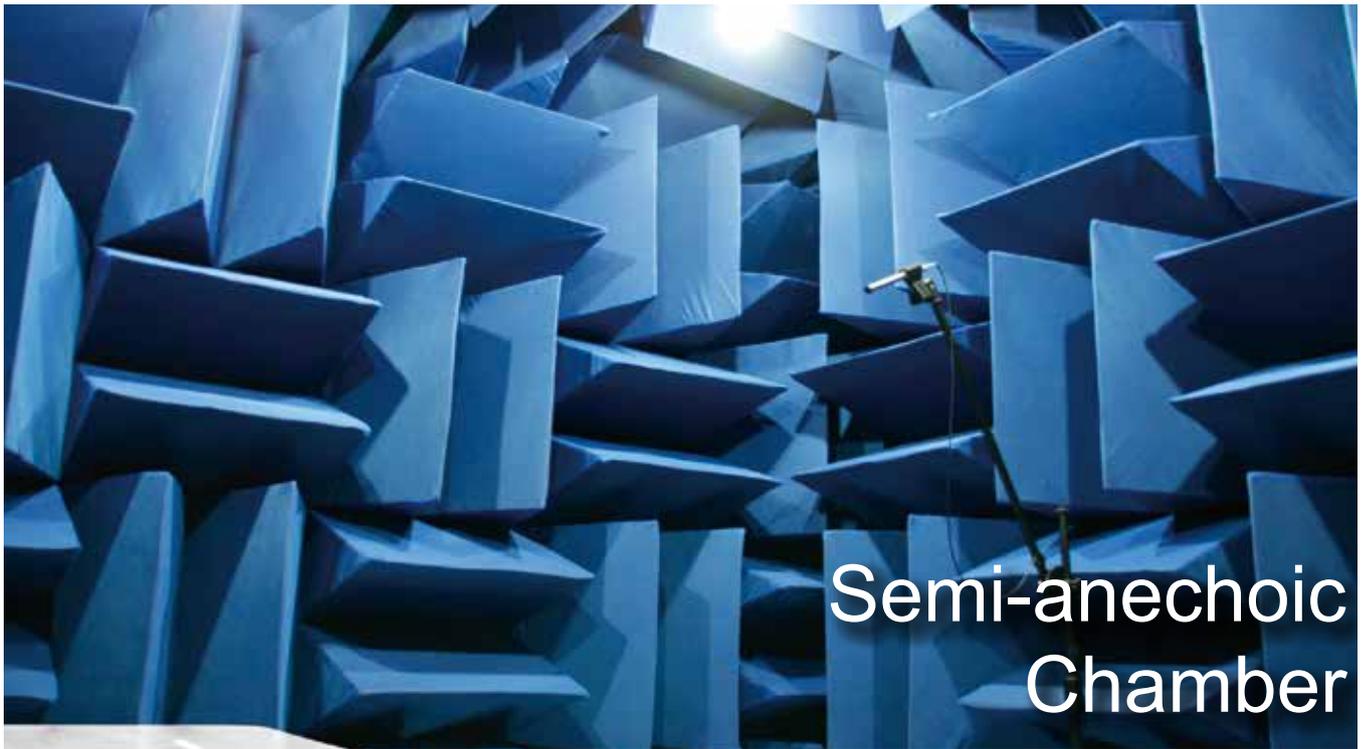
Web Monitoring Console

In order to serve those customers unable to stay at our facility for the environmental test, Portwell developed web-based tests to meet the customer demands via the internet by remote control access.

Provide us with your testing object and our engineers will arrange your object in an assigned chamber and set the remote control console with you. This service allows you to manage your tests right from your computer.



Silence is a signature of our modules



Anechoic chambers are commonly used in acoustics to conduct experiments in nominally "free field" conditions. All sound energy will be traveling away from the source with almost none reflected back. Common anechoic chamber experiments include measuring the transfer function of a loudspeaker or the directivity of noise radiation from industrial machinery. In general, the interior of an anechoic chamber is very quiet, with typical noise levels in the 10–20 dBA range. Full anechoic chambers aim to absorb energy in all directions. Semi-anechoic chambers have a solid

floor that acts as a work surface for supporting heavy items, such as cars, washing machines, or industrial machinery, rather than the mesh floor grille over absorbent tiles found in full anechoic chambers. This floor is damped and floating on absorbent buffers to isolate it from outside vibration or electromagnetic signals. A recording studio may utilize a semi-anechoic chamber to produce high-quality music, free of outside noise and unwanted echoes.



Structure	Semi-anechoic Room
Space	3.95 x 3.95 x 2.5 (m2)
Separated	Floating Ground with Zin plated steel
Material	Polymer Absorption wedge
Door	Fully sealed Pressure Door, Outdoor Open, lock inside
Regulation	ISO 3745
Power filter	1kW 110V
Cable	Belden
Instruments	CRAS Microphone, IEA, analyser and system.

Chamber Type	1/3 Octave Band Frequency(Hz)	Tolerance (dB)
Anechoic Chamber	≤ 630	± 1.5
	800-5,000	± 1.0
	≥6,300	± 1.5
Semi-Anechoic Chamber	≤ 630	± 2.5
	800-5,000	± 2.0
	≥6,300	± 2.5

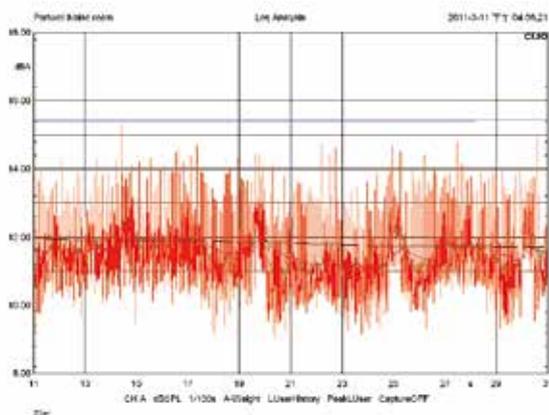
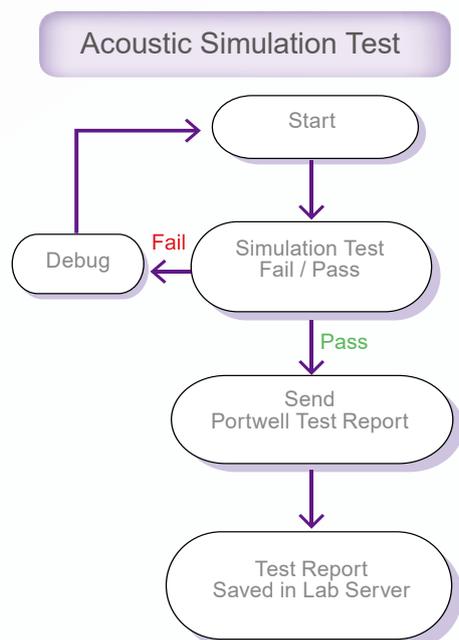
The noise emission meet ISO Standards

Goals of Semi-Acoustic Chamber

In Portwell Semi-Acoustic Chamber we follow the simulation procedure demonstrated below to validate our system noise levels. Our method is to provide dimension, space, wedged material, placement of EUT and microphones in the chamber in accordance with ISO 7779 standards which help us verify that the noise levels of our products fall within universal criteria.

Our goals are:

- Ensure medical related products can comply with noise requirements.
- Service customer to verify their products can meet local noise standards.



Portwell semi-acoustic chamber is based on ISO 3745 which states that indoor background noise remain under 15dB(A) while outside noise is under or equal to 70dB(A); thus we can detect accurate results for product evaluation.

ISO 3745:1977

Specifies two laboratory methods. First, it establishes requirements for the test room as well as the source location, operating conditions and instrumentation. Secondly, it specifies techniques for obtaining an estimate of the surface sound pressure level from which the weighted sound power level of the source and the sound power level in octave or one-third octave bands may be calculated.

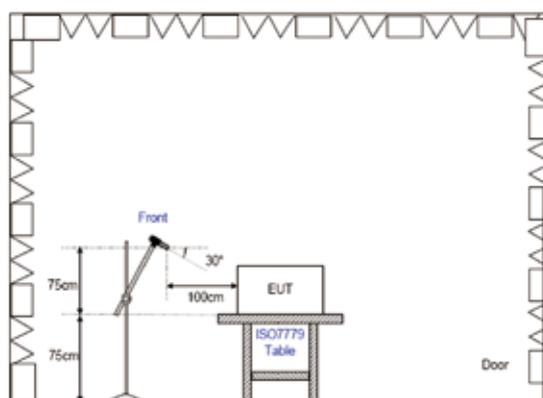


Fig. 2 Location of EUT and microphone position (Side view)

All the dimensions, space, material of wedges, placement of EUT and microphone within our semi-acoustic chamber follow ISO 7779 standards which ensure our products meet universal criteria.

ISO 3745:1977

ISO 7779:2010 specifies procedures for measuring and reporting the noise emission of information technology and telecommunications equipment. The basic emission quantity is the A-weighted sound power level which may be used for comparing equipment of the same type but from different manufacturers, or for comparing different equipment. Portwell Semi-Acoustic Chamber follows ISO 7779 when determining sound power levels of a machine.

Breaking the module to make it even stronger



A Highly Accelerated Life Test (HALT), is a stress testing methodology for accelerating product reliability during the engineering development process. It is commonly performed to identify and help resolve design weaknesses with progressively more severe environmental stresses. Another feature of HALT testing is that it characterizes the equipment under stress, and identifies the equipment's safe operating limits and design margins. Some common forms of failure acceleration for industrial products are power cycling, temperature cycling and random vibration. HALT serves to improve the reliability of a product and is an empirical method used to identify the limiting failure and the stresses at which these failures occur.

The major advantages of HALT are: a) it can be conducted during the development phase of a product in order to weed out design problems and marginal components thereby eliminating costs for warranty returns; b) it also is conducted as internal qualification testing which significantly reduce costs prior to sending the equipment for formal qualification.

During a HALT test the tested equipment has to be functional and operational while monitored so that if the equipment fails while being stressed, the failure will be detected. The failure may only

Typhoon 4.0	
WORK SPACE	UPPER TABLE POSITION : 53.8" w x 54" d x 34.6" h (1366 x 1372 x 879mm) LOWER TABLE POSITION : 53.8" w x 54" d x 53.6" h (1366 x 1372 x 1362mm)
OUTER DIMENSIONS	69.2" w x 78.8" d x 103.9" h (1759 x 2003 x 2640mm)
TEMPERATURE RANGE	+200 °C TO -100 °C, +250°C TO -100°C
THERMAL RAMP	70 °C - 100 °C/min average
TABLE SIZE	48" x 48" (1220 x 1220mm)
ACCELERATION	5 - 75 gRMS (Bare Table) TABLE CAPACITY 600 lbs (272kg) Recommended
TABLE CAPACITY	600 lbs (272kg) Recommended
POWER REQUIREMENTS	380V, 400V, 440V, 480V, 3Φ, 50/60Hz, 100A
ACTUATORS	12 Lubricant free



be present while the stress is applied and may not cause permanent degradation that would be apparent after the stress is removed. All failures during HALT testing are subject to failure analysis and root cause analysis.

Super-aging our modules to unveil weaknesses



Stresses are delivered in an ordered sequence:

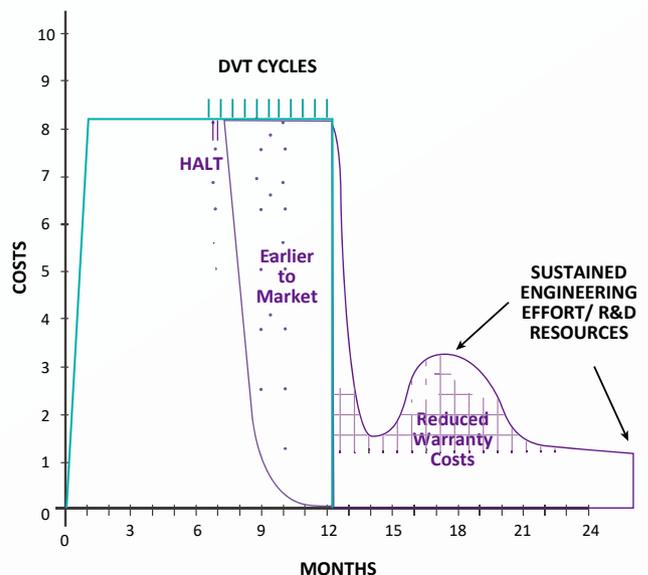
- Temperature Step Stress
 1. Cold Step Stress
 2. Hot Step Stress
- Rapid Temperature Transition Cycling
- Vibration Step Stress
- Combined Environment
 1. Rapid Temperature Transition Cycling and
 2. Vibration Step Stress

Portwell chooses a Typhoon 4.0 system which is designed specifically for the task of performing Highly Accelerated Stress Screening (HASS) and HALT on large products. With the Lowest Total Cost of Ownership within the AST industry, the 48" x 48" vibration table is capable of supporting hundreds of pounds of products and fixtures, while delivering low frequency ranges necessary to induce failure. For high temperature applications in simulating harsh conditions, this system is available as the Inferno™ which can deliver temperatures up to 250°C.

When validating the HALT test we follow the step by step procedure which helps us to analyze time of failures so that our engineers can make the necessary revisions.

Features of Portwell HALT Lab

- Increase Product Reliability
- Reduce Design Verification Time and Expense
 - Remove Costly Manufacturing Defects
- Reduce Warranty Costs
- Increase Sales Revenues with Reputation for Quality



Undergo shipping simulation to ensure intact transportation

Vibration

Vibration is capable of damaging electronic components and component soldering. In our Vibration Chamber, we simulate variable vibration conditions that could potentially damage our products during their transportation, installation or operation. Therefore we rigorously test every product and gather accurate statistical analysis as proof of the outstanding level of tolerance and endurance in every Portwell product.

Vibration tester conducts either Sine or Random vibration.

Sine Vibration complies with IEC-68-2-6 and simulates the product on a ship to verify Resonance Search and Resonance Dwell. Random Vibration complies with IEC-68-2-36 and simulates the product in transportation situations in order to test the packaged product's vibration endurance.



* Compliance with IEC-68 Comply the IEC-68 environmental regulation. The max magnetic force is 1000kgF.



* Compliance with IEC-68.

Drop

This test focuses on package design. The drop test is conducted in order to test whether the packaged product remains intact and 100% functional after being dropped. This test simulates the accidents that occur during shipping and handling. Therefore, we also focus on the design of our packages to ensure you receive the product as if it just came off the shelf.



* Complies with IEC-68.

Shock

The test purpose is to evaluate whether the limit of the products' strength is consistent with those in the product line. When the tested item is shocked and the mechanically fragile part is found, mechanical R&D engineers can amend the supporting structure and analyze the properties of material to effectively prevent possible damage in the future.

The tested item is unpackaged. Three-axis & 6-face (each face tested 3 times) should be conducted to pass specified shock conditions of 15G peak acceleration and a pulse duration for 11 ms. (3 times for each face under operation condition)

Portwell superior service

Completed Technical Service

In order to ensure customers receive fast and appropriate service from Portwell, we 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 prepared for complete service to our customers & partners. Should you have any requirements or technical issues, please contact us. Our services can be arranged in the following ways.

Web Service

Please visit us on the web and leave a message. We also provide an on-line consulting service via Skype. And if immediate assistance is needed, contact us by phone.

Extended Visits to PE

Sometimes it is difficult to find the solution in a short period of time. Therefore, Portwell provides a dormitory for our customers and partners to stay until we reach the necessary solutions. Please contact us and our staff will arrange a place for you to stay.

Direct Contact

Portwell welcomes our customers to visit our laboratory to witness our regulation tests and design service. This is the best way to answer all your questions and help you find the right solution.



Live Chat (Skype)

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

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



Global Service (Telephone)

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

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



E-Mail

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

TSD@portwell.com.tw

Edge to Edge



www.portwell.com.tw



Portwell, Inc. Headquarters

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

Americas

American Portwell (Fremont, CA)

44200 Christy St., Fremont, CA 94538,
USA
Tel: +1-510-403-3399
Fax: +1-510-403-3184
E-mail: info@portwell.com
<http://www.portwell.com>

Portwell Latin America (Brazil)

Rua Engenheiro Roberto Fischer, 208,
Sala No. 3-Parque Industrial software
CEP 81250-025-CIC-Curitiba-Brazil
Tel: +55(41)-3121-7200
Tel: +55(41)-3121-7201
<http://www.portwell.com.br>

China

Shanghai Portwell

(201612), Room 1303-1, Building 33,
No.258, Xinhuan Highway, Songjiang
District, Shanghai
Tel: +86-21-5771-2505
Fax: +86-21-5772-2965
E-mail: info@portwell.com.cn
<http://www.portwell.com.cn>

Japan

Portwell Japan, Inc. (Tokyo)

〒112-0011 4-27-10, Sengoku,
Bunkyo-ku, Tokyo, Japan
Tel: +81-3-6902-9225
Fax: +81-3-6902-9226
E-mail: info@portwell.co.jp
<http://www.portwell.co.jp>

Portwell Japan, Inc. (Osaka)

〒532-0004 Ste.501 Nippo Shin-osaka
Dai-2 Bldg, 1-8-33 Nishi-Miyahara,
Yodogawa-ku Osaka Japan
Tel: +81-6-4807-7721
Fax: +81-6-4807-7720
E-mail: info@portwell.co.jp
<http://www.portwell.co.jp>

Korea

Portwell Korea, Inc.

O-BIZ Tower 1901, No. 126,
Beolmal-ro, Dongan-gu, Anyang-si,
Gyeonggi-do, Korea, 431-060
Tel: +82-31-450-3043
Fax: +82-31-450-3044
E-mail: info@portwell.co.kr
<http://www.portwell.co.kr>

Europe

European Portwell

Schillingweg 3, 2153 PL
Nieuw Vennep, The Netherlands
Tel: +31-252-620790
E-mail: info@portwell.eu
<http://www.portwell.eu>

Portwell Deutschland GmbH

Otto-Hahn-Str. 48, D-63303 Dreieich
Tel: +49-6103-3008-0
Fax: +49-6103-3008-199
E-mail: info@portwell.eu
<http://www.portwell.de>

Portwell UK Ltd.

Office TH2
Trident House, Trident Park Basil
Hill Road, Didcot, OX11 7HJ, UK
Tel: +44-1235-750760
Fax: +44-1235-750761
E-mail: info@portwell.eu
<http://www.portwell.eu>

India

Portwell India Technology

2nd Floor, 5M-665, 5th Main Road,
OMBR Layout, Banaswadi,
Bangalore -560043, India
Tel: +91-80-41684255
E-mail: info@portwell.in
<http://www.portwell.in>