Module Platform Solution Guide

Ver.222M

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COMPUTER OF MODULE

About Portwell

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

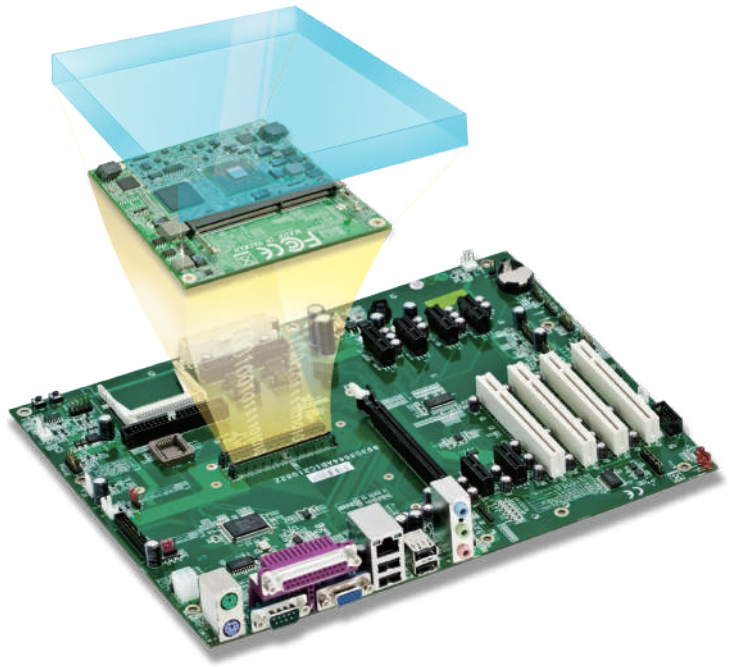
Portwell Engine (PE) Building

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

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

Focus on your core competencies

Design for Extreme Reliability
Time To Market



COM Express

QSEVEN

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.

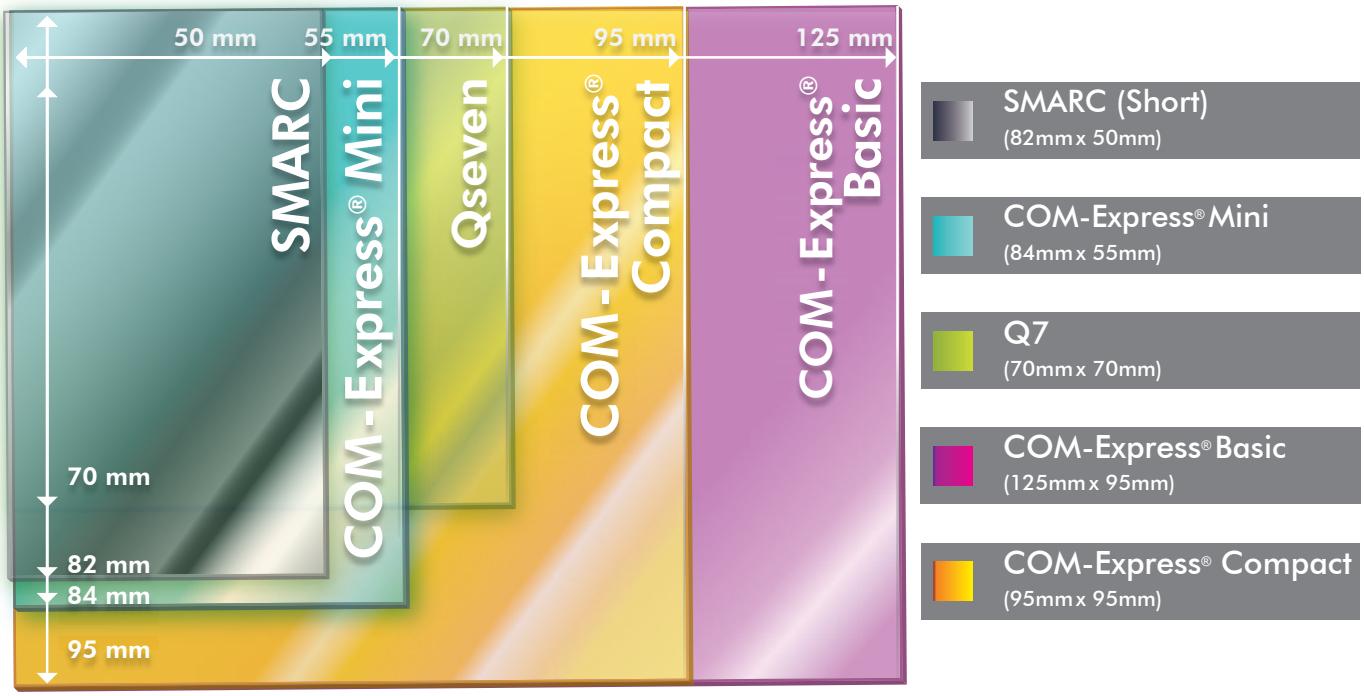
How to enable faster time-to-market and cost-effective customization alternatives? COM (Computer-On-Module) is the answer.

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® –

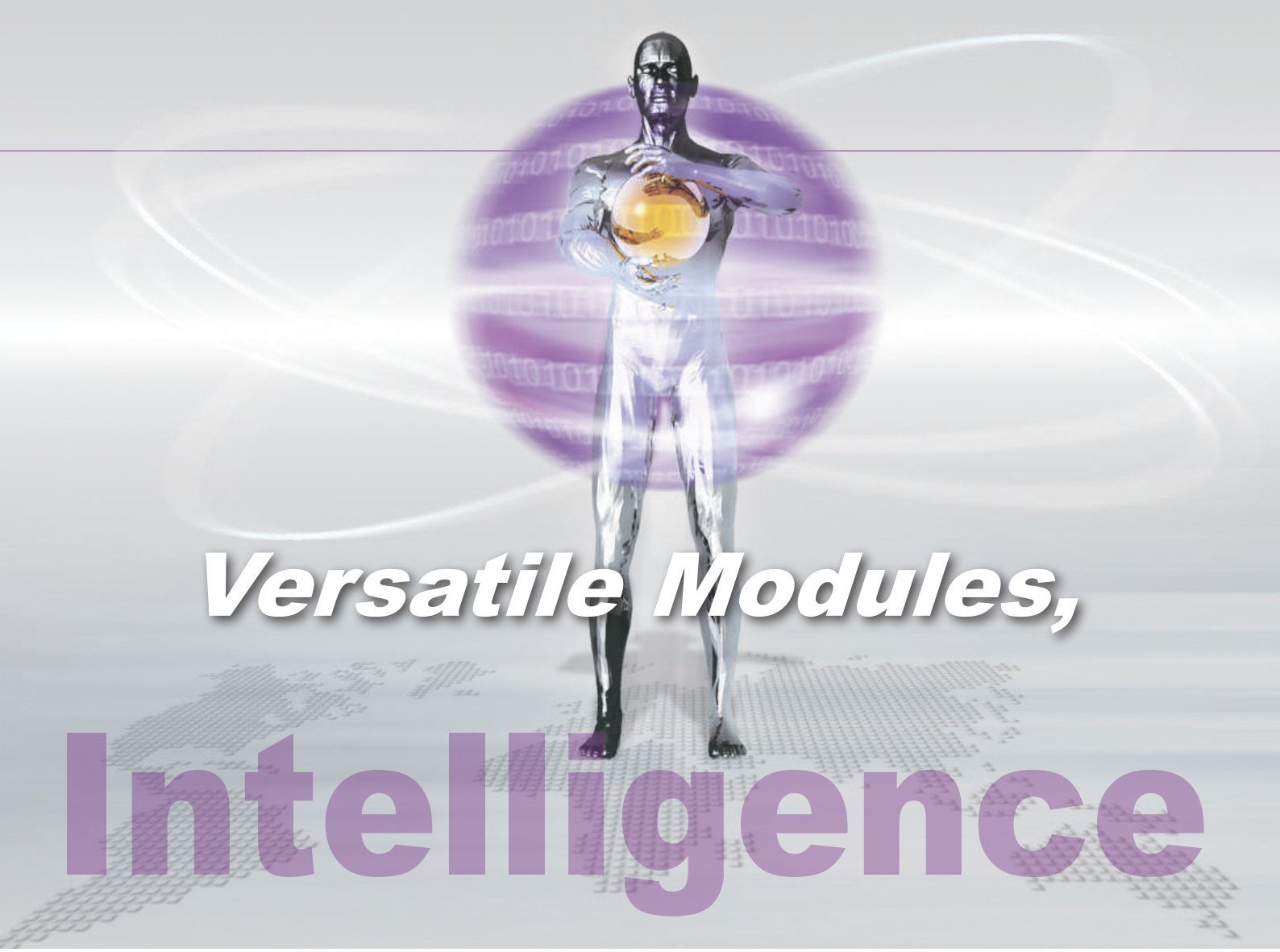
COM Express® defines standardized form factors and pin-outs for Computer-on-Modules. The standard includes the mini form factor (84 x 55mm), the compact form factor (95 x 95mm) and the basic form factor (125 x 95mm). To serve industry requirements, the Digital Display Interfaces (DisplayPort, HDMI) and 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.

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

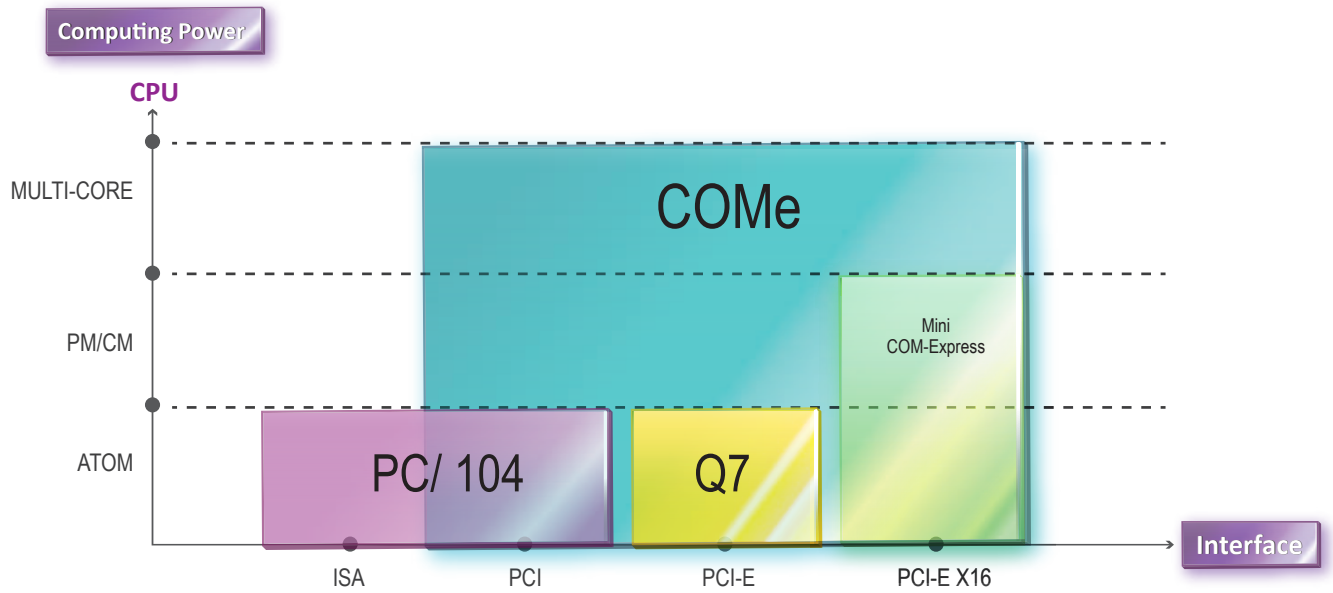
COM Express® specification adopted in July, 2005, redefined electrical, mechanical and thermal requirements for a highly integrated Computer On Module (COM) supporting rich combinations of high-speed I/O interfaces while keeping key legacy interface technologies enabling a smooth migration of interface 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
Seriial 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-$X_1X_2X_3X_4Y_5Y_6Y_7$-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

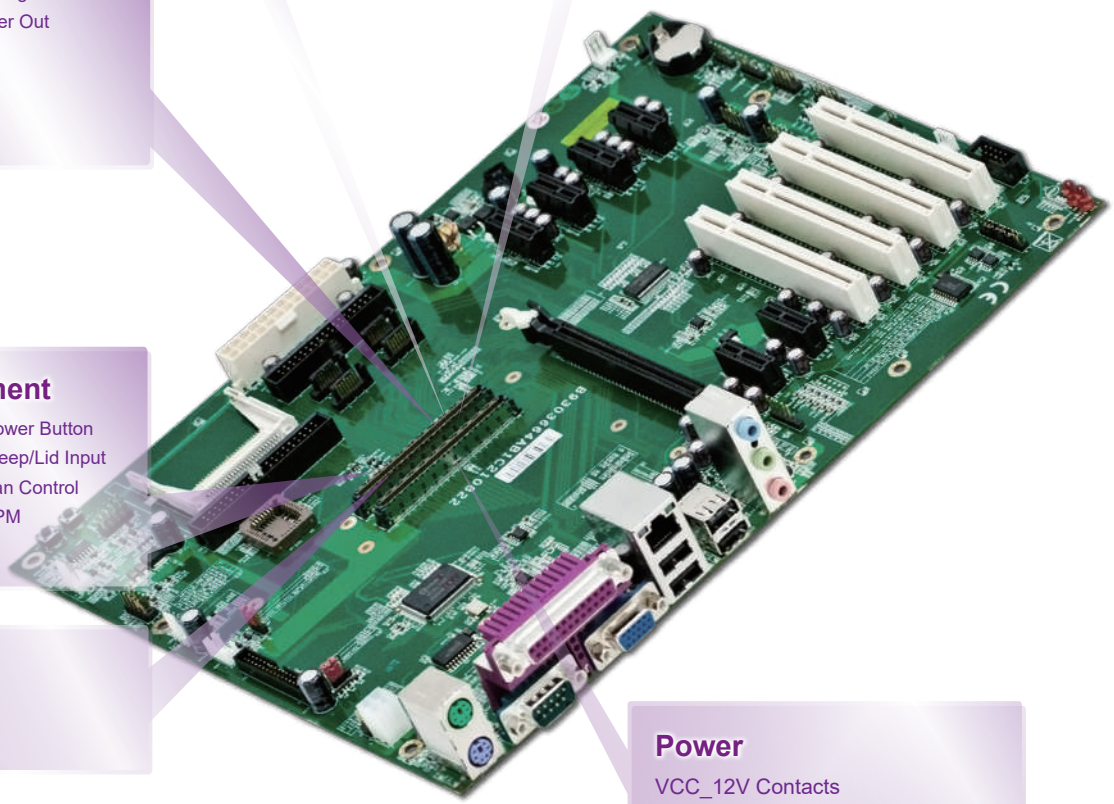
PCI-E Lanes
Serial
SATA/SAS
USB 2.0
LAN
LVDS/VGA
TV-Out/DDI
Express Card
HDA
LPC

System I/O

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

System Management

SDIO
GPIO
SMBUS
I2C
Watchdog Timer
Speaker Out
Reset



Power Management

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

Power

VCC_12V Contacts

Power

VCC_12V Contacts

PCOM Solution Guide





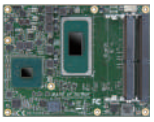


	PCOM-BA00	PCOM-BA01	PCOM-BA02	PCOM-B632VG	PCOM-B638VG	PCOM-B641VG	PCOM-B645
Form Factor (mm)	COM Express® Mini (84 x 55mm)	COM Express® Mini (84 x 55mm)	COM Express® Mini (84 x 55mm)	COM Express® Compact (95 x 95mm)	COM Express® Compact (95 x 95mm)	COM Express® Compact (95 x 95mm)	COM Express® Compact (95 x 95mm)
COM Type	Type 10	Type 10	Type 10	Type 6	Type 6	Type 6	Type 6
CPU/ Clock/ Cache	* Intel® E3845/ E3827/ E3825/ E3815 / E3805 * 1.33 GHz to 1.91 GHz * 1MB to 2MB cache	* Intel® E3950/ E3940/ E3930/ N4200/ N3350 * 1.80 GHz to 2.50 GHz (Turbo) * 2MB cache	* Intel Atom® Embedded level series * Intel Atom®x6211E * Intel® Atom® x6413E * Intel Atom® x6425E * Up to 3.00 GHz turbo frequency * 1.5MB cache	* Intel® E3845/ E3827/ E3826/ E3825/ E3815 * 1.33GHz up to 1.91GHz * 1MB to 2MB cache	* Intel® Core™ i7-7600U * Intel® Core™ i5-7300U * Intel® Core™ i3-7100U * Intel® Core™ i7-6600U * Intel® Core™ i5-6300U * Intel® Core™ i3-6100U * Intel® Celeron® Processor 3965U * Intel® Celeron® Processor 3955U * 3.00 GHz to 3.90 GHz (Turbo) * 2MB to 4MB cache	* Intel® E3950/ E3940/E3930/ N4200/N3350 * 1.80 GHz to 2.50 GHz (Turbo) * 2MB cache	* Intel Atom® x6000 series/ Pentium® N, J Series Processors * J6426 * x6211E * x6413E * x6425E * x6425RE * Up to 4 CPU cores * 1.3GHz to 3.0GHz * 1.5MB cache
Chipset	SoC	SoC	SoC	SoC	SoC	SoC	SoC
Memory	* DDR3L 1067/1333 MT/s * Non-ECC/ ECC * Single Channel	* LPDD4 2133 MT/s * Non-ECC * Dual Channel	* LPDDR4 3200 MT/s * Non-ECC/ECC * Dual Channel * Support In Band ECC	* DDR3L 1067/1333 MT/s * Non-ECC * Single Channel	* DDR4 SO-DIMM up to 32GB 2133 MT/s * Non-ECC * Dual Channel	* DDR3L 1866 MT/s * Non-ECC * Dual Channel	* DDR4 3200 MT/ s * In-Band ECC(selected skus) * Dual Channel, up to 32GB in total
USB	1x USB 3.0 4x USB 2.0	2x USB 3.0 8 x USB 2.0, (Option 1 x OTG)	2x USB 3.2 Gan2 8x USB 2.0	1x USB 3.0 4x USB 2.0	4x USB 3.0 8x USB 2.0	2x USB 3.0 8 x USB 2.0, (Option 1 x OTG)	2x USB 3.2 Gen2(optional up to 4x) 8x USB 2.0
PCI Express	3 x PCIe 2.0 x 1 (Option 4 x PCIe 2.0 x1)	4 x PCIe 2.0 x 1	4x PCIe 3.0 x 1	3x PCIe 2.0 x1	4x PCIe 3.0 x 1 5x PCIe 3.0 x 1	4 x PCIe 2.0 x 1	6x PCIe 3.0 x1 (2x PCIe 3.0 x 1 can be configure to 2x USB 3.2 Gen2)
Ethernet	Intel® I210IT	Intel® I210IT/ AT	PHY GPY-215 supported 1.0/2.5 GbE	Intel® I210IT	I219LM	Intel® I210IT	MaxLinear GPY215
Sound	Intel® High Definition Audio	Intel® High Definition Audio	Intel® High Definition Audio	Intel® High Definition Audio	HD Audio	Intel® High Definition Audio	Intel® High Definition Audio
Graphic Controller	Intel® HD Graphics	* Intel® HD Graphics 505 * Intel® HD Graphics 500	Intel® HD Graphics	Intel® HD Graphic	HD Audio	* Intel® HD Graphics 505 * Intel® HD Graphics 500	Intel® UHD Graphics Gen 11th
Carrier Board	PCOM-CA00 (Type 10)	PCOM-CA00 (Type 10)	PCOM-CA00 (Type 10)	PCOM-C60B (Type 6)	PCOM-C605 (Mini-ITX) PCOM-C60B (ATX)	PCOM-C60B (Type 6)	PCOM-C60B (Type 6)

PCOM Solution Guide



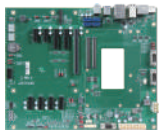


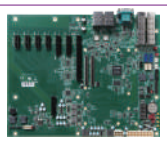


	PCOM-B653VGL	PCOM-B654GL	PCOM-B655VGL	PCOM-B656VGL	PCOM-B657VGL	PCOM-B700G-NS	PCOM-B701GT
Form Factor (mm)	COM Express® Compact (95 x 95mm)	COM Express® Basic (125 x 95mm)	COM Express® Basic (125 x 95mm)	COM Express® Compact (95 x 95mm)	COM Express® Basic (125 x 95mm)	COM Express® Basic (125 x 95mm)	COM Express® Basic (125 x 95mm)
COM Type	Type 6	Type 6	Type 6	Type 6	Type 6	Type 7	Type 7
CPU/ Clock/ Cache	* Intel® 8th Generation CoreTM ULT i7-8665UE i5-8365UE i3-8145UE Celeron® 4305UE * Up to 4 CPU cores * 2MB to 8MB cache	* Intel® 8th Generation Core™ 35W Desktop processor i7-8700T i5-8500T i3-8100T * Celeron® G4900T * Up to 6 CPU cores * 2MB to 12MB cache	* Intel® 10th Generation Core™ 35W Desktop processor i9-10900TE i7-10700TE i5-10500TE i3-10100TE * Up to 10 CPU cores * 6MB to 20MB cache	* Intel® 11th Generation Core™ i7-1185GRE/ i7- 1185G7E i5-1145GRE/ i5-1145G7E i3-1115GRE/ i3-1115G4E * Celeron® 6305E * Up to 4 CPU cores * 4MB to 12MB cache	* 11th Generation Intel® Core™ i7 Processors * Core™ i7-11850HE * Core™ i5-11500HE * Core™ i3- 11100HE * Celeron® 6600HE * Xeon® W-11865MRE * Xeon® W-11555MRE * Xeon® W-11155MRE * Xeon® W-11865MLE * Xeon® W-11555MLE * Xeon® W-11155MLE * Up to 8 CPU cores * 8MB to 24MB cache	* Intel® Xeon® D-1600 Series Processor D-1649N D-1633N D-1623N D-1627 * Up to 8 CPU cores * 6MB to 12MB cache	* Intel Atom® Processor C3308 C3338 C3508 C3538 C3708 C3758 C3808 * Up to 12 CPU cores * 4MB to 16MB cache
Chipset	SoC	Q370/C246	Q470E/W480E	SoC	QM580E/RM590E	SoC	SoC
Memory	* DDR4 2400MT/s * Non-ECC * Dual Channel	* DDR4 2400MT/s * Non-ECC/ECC * Dual Channel	* DDR4 2933MT/s * Non-ECC/ECC * Dual Channel	* DDR4 3200 MT/s * Non-ECC * Dual Channel	* DDR4 3200MT/s * Non-ECC/ECC * Dual Channel	* DDR4 2400MT/s * Non-ECC/ECC * Dual Channel	* DDR4 1866/2133/2400 MT/s * Non-ECC/ECC * Single/Dual Channel
USB	4x USB 3.1 Gen2 8x USB 2.0	4x USB 3.2 Gen2 8x USB 2.0	4x USB 3.2 Gen2 8x USB 2.0	4x USB 3.1 Gen2 8x USB 2.0	4x USB 3.2 Gen2 8x USB 2.0	4 x USB 3.2 Gen1/ USB 2.0	4x USB 3.0 4x USB 2.0
PCI Express	1x PCIe 3.0 x4 (PEG) 1x PCIe 3.0 x4 1x PCIe 3.0 x1 1x PCIe 3.0 x1(optional)	1x PCIe 3.0 x16 8x PCIe 3.0 x1	1x PCIe 3.0 x16 8x PCIe 3.0 x1	1x PCIe Gen3 x4 2x PCIe Gen3 x2	1x PCIe 4.0 x16 8x PCIe 3.0 x1	8x PCIe 2.0 24x PCIe 3.0	Up to 1x PCIe Gen3 x8 3x PCIe Gen3 x2 3x PCIe Gen3 x1 3x PCIe Gen2 x1
Ethernet	Intel® I219LM	Intel® I219LM	Intel® I219LM	Intel® I210IT	Intel® I225LM/IT	Intel® I210AT/IT Up to 4x KR (10GbE)	Intel® I210IT Up to 4x KR (10GbE)
Sound	Intel® High Definition Audio	Intel® High Definition Audio	Intel® High Definition Audio	Intel® High Definition Audio	Intel® High Definition Audio	N/A	N/A
Graphic Controller	* Intel® UHD Graphics 620 * Intel® UHD Graphics 610	* Intel® UHD Graphics 630 * Intel® UHD Graphics 610	* Intel® UHD Graphics 630	* Intel® Iris® Xe Graphics * Intel® UHD Graphics	Intel® UHD Graphics for 11th Gen Intel® Processors	N/A	N/A
Carrier Board	PCOM-C60B (Type 6)	PCOM-C60B (Type 6)	PCOM-C60B (Type 6)	PCOM-C60B (Type 6)	PCOM-C60B (Type 6)	PCOM-C701 PCOM-C701-BMC (Type 7)	PCOM-C701 PCOM-C701-BMC (Type 7)

PCOM Solution Guide



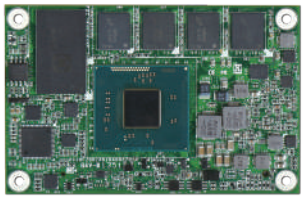



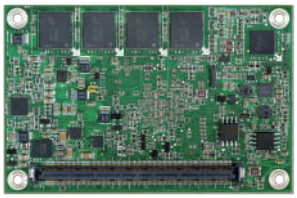



PCOM-B702G	PCOM-B704GT	PCOM-CA00	PCOM-C60B	PCOM-C605	PCOM-C615	PCOM-C701
COM Express® Compact (95 x 95mm)	COM Express® Basic (125 x 95mm)	Micro-ATX (244 x 244 mm)	ATX (305 x 244mm)	Mini-ITX (170 x 170mm)	PICMG 1.3 (338.5 x 126.39mm)	ATX (305 x 244mm)
Type 7	Type 7	Type 10	Type 6	Type 6	Type 6	Type 7
* Intel Atom® Processors C3308 C3338 C3508 C3558 * Up to 4 CPU cores * 4MB to 8MB cache	* Intel® Xeon® D-1700 Series Processor D-1746TER D-1735TR D-1732TE D-1715TER D-1712TR * Up to 10 CPU cores * 10MB to 15MB cache	Depends on Module	Depends on Module	Depends on Module	Depends on Module	Depends on Module
SoC	N/A	Depends on Module	N/A	N/A	N/A	N/A
* DDR4 1866/2133 MT/s * Non-ECC/ECC * Single/Dual Channel	* DDR4 2933MT/s * Non-ECC/ECC * Dual Channel	Depends on Module	Depends on Module	Depends on Module	Depends on Module	Depends on Module
2x USB 3.0 4x USB 2.0	4 x USB 3.2 Gen1 USB 2.0	2x USB 3.0 ports 8x USB 2.0 ports	4x USB 3.1 Gen2 8x USB 2.0	4x USB 3.0 4x USB 2.0	2 x USB3.1 Gen2 2 x USB3.1 Gen1 4 x USB2.0(through backplane)	4x USB 3.0 4x USB 2.0
Up to 1x PCIe Gen3 x4 4x PCIe Gen3 x1	16x PCIe 3.0 16x PCIe 4.0	4x PCIe 3.0 x 1	1x PCIe x16 8x PCIe x1	1 x PCIe x 16 (Gen3) 2 x PCIe x 1 Golden Finger	1x PCIe x16 4x PCIe x1	1x PCIe Gen3 x16 3x PCIe Gen3 x4 4x PCIe Gen3 x1
Intel® I210IT Up to 4x KR (10GbE)	Intel® I210IT Up to 4x KR (10GbE)	1x LAN port supported 1.0/2.5 GbE	1x GbE	2 x GbE	2x GbE	Inphi CS4227 1x GbE, 4x 10GbE SFP+
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
PCOM-C701 PCOM-C701-BMC (Type 7)	PCOM-C701 PCOM-C701-BMC (Type 7)	N/A	N/A	N/A	N/A	N/A

PCOM-BA00

Intel Atom® E3800 series SoC based on Type 10 Mini COM-Express® module with DDR3L SDRAM, NANDrive and USB 3.0





FEATURES

- Intel Atom® Processor E3800 Series (Bay Trail)
- On Board DD3L SDRAM up to 4GB, On Board SSD up to 64GB
- Low Power Consumption (3 to 10W)
- Supports Wide Operating Temperature and Wide Voltage
- Support VGA, LVDS, DP, eDP and USB 3.0

PCOM-BA00, a Type 10 Mini COM Express® (84 x 55 mm) module which based on Intel® Bay Trail Atom® E3800 series SoC. In this architecture, it could provide VGA, LVDS, eDP and DP multiple displays, and expandability I/O interfaces, including 3 x PCIe 2.0 x 1, 1 x USB 3.0, 4 x USB 2.0, 2 serial ports and 2 x SATA II devices. With ultra low power consumption(3 to 10W), wide-temp support, it could provide very energy saving and high effective performance. Portwell want to promotes PCOM-BA00 as vertical solution to aim in the different versatile applications.

General

Product	PCOM-BA00				
Form Factor	Type 10, Mini Form Factor COM-Express® (84 x 55 mm)				
Processor	Intel®				
	E3845	E3827	E3825	E3815	E3805
Core	4	2	2	1	2
Freq.	1.91 GHz	1.75 GHz	1.33 GHz	1.46 GHz	1.33 GHz
Turbo	N/A				
Cache	2MB	1MB	1MB	512KB	1MB
Processor Graphics	Intel® HD Graphics for Intel Atom® Processor Z3700 Series, not Include E3805				N/A
Graphics Base Frequency	542 MHz	542 MHz	533 MHz	400 MHz	533 MHz
Graphics Max Dynamic Frequency	792 MHz	792 MHz	533 MHz	400 MHz	533 MHz
HW Encoding	H.264 and MPEG2				
HW Decoding	H.264, MPEG2, MVC, VC-1, WMV9, JPEG/MKPEG, VP8				
HW Acceleration	Gen7LP, DirectX 11, OpenGL 3.2, OpenCL 1.2, OGL ES Halti/2.0/1.1				
Processor TDP	10W	8W	6W	5W	3W
BIOS	AMI BIOS				
ECC Memory Supported	YES				
Memory	On board DDR3L SDRAM up to 4GB 1333 MT/s				

I/O Interface

SATA	2x SATA II		
USB	1 x USB 3.0 4 x USB 2.0		
Ethernet	Intel® Ethernet Controller I210T		
Serial I/O	GPIO	8 GPIO	
	I²C	Baud Rate: 400KHz	
	SMBus	Baud Rate: 100KHz	
	UART	2 Serial Port (Tx/Rx)	
PEG	N/A		
PCI Express	3 x PCIe 2.0 x 1 (Option 4 x PCIe 2.0 x1)		
Display	Default	Options	Resolution
	DP	DP	up to 2560x 1600 @ 60Hz
		VGA	up to 2560x 1600 @ 60Hz
		HDMI	up to 1920x 1080 @ 60Hz
	eDP	eDP	up to 2560x 1600 @ 60Hz
		LVDS(24bit, dual channel)	up to 1920x 1200 @ 60Hz
Security	Intel® AES		

PCOM-BA00

MECHANICAL & ENVIRONMENT

Dimension	84 x 55 mm
Power DC IN	+4.75VDC to +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	Contact us
OS	Windows 7, WES7/8, Embedded Compact7 Linux Fedora/Tizen/Yocto RTOS Windriver

ORDERING GUIDE

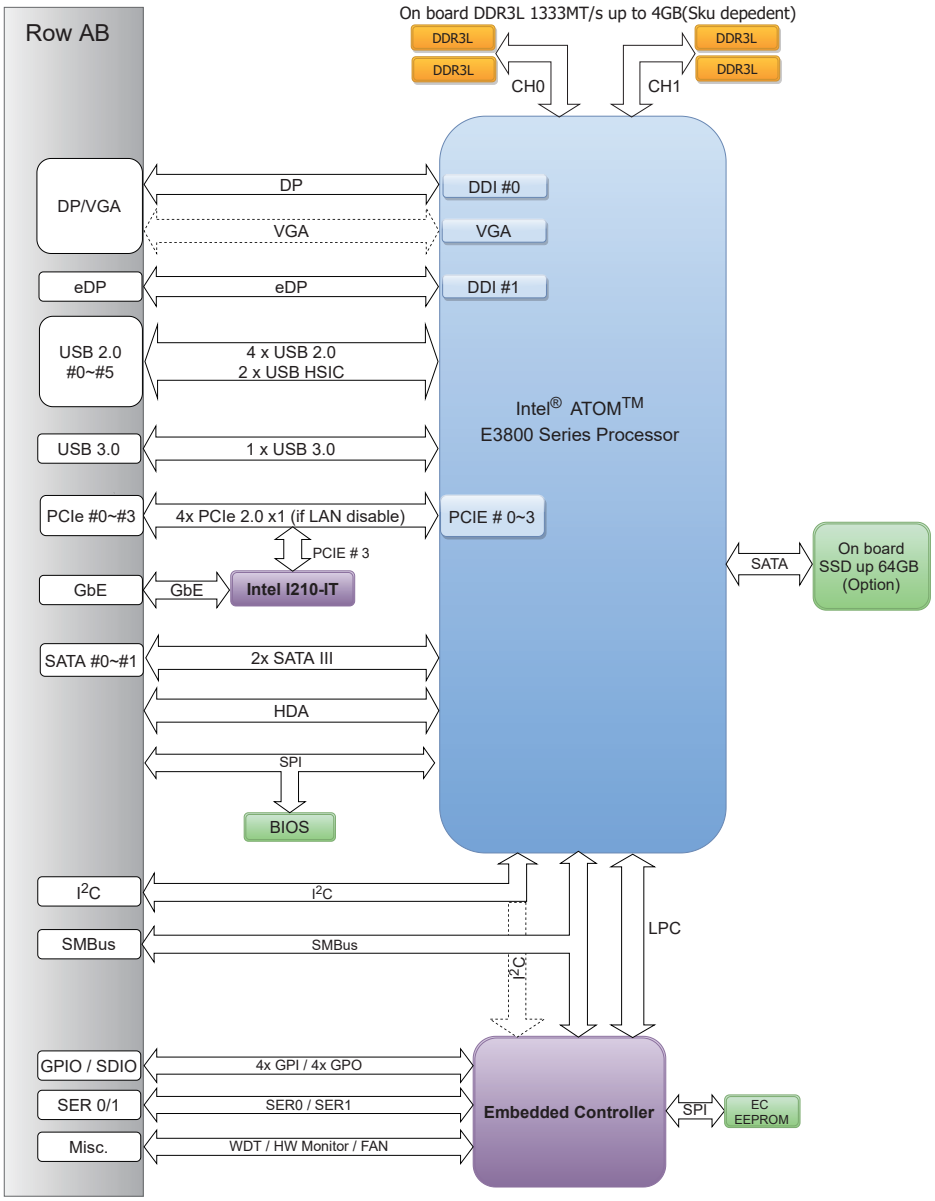
Product	Ordering P/N	Status
PCOM-BA00-E3845-2G	AB1-3B51	Available
PCOM-BA00-E3827-2G	AB1-3B50	Available
PCOM-BA00-E3825-2G	AB1-3B47	Available
PCOM-BA00-E3815-2G	AB1-3B49	Available
PCOM-BA00-E3805-2G	AB1-3C19	Available
PCOM-BA00-E3845-4G	AB1-3B48	Available

Accessory	Ordering P/N	Status
Heat Spreader	B8306940	Available
PCOM-CA00 (uATX Carrier Board)	AB1-3917	Available

BLOCK DIAGRAM

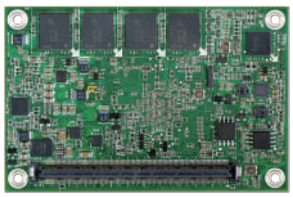
PCOM-BA00

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



PCOM-BA01

Intel Atom® E3900 series SoC based on Type 10 Mini COM-Express® module with LPDDR4 SDRAM, NANDrive and USB 3.0



FEATURES

- Intel Atom® Processor E3900 Series (Apollo Lake)
- On Board LPDDR4 SDRAM up to 8GB, On Board eMMC up to 64GB
- Low Power Consumption (6 to 12W)
- Supports Wide Operating Temperature and Wide Voltage
- Support LVDS, eDP, DP, HDMI and Turbo mode up to 2.5GHz

PCOM-BA01, a Type 10 Mini COM Express® (84 x 55 mm) module which based on Intel® Apollo Lake Atom® E3900 series SoC. In this architecture, it could provide VGA, LVDS, and high quantity HDMI, eDP, DP with 4K resolution. And it also provide turbo mode up to 2.5GHz, with extending 4 x PCIe 2.0 x 1, 2 x USB 3.0, 8 x USB 2.0, and 2 x SATA III devices. With ultra low power consumption(6 to 12W), wide-temp support, it could provide very energy saving and high effective performance. Portwell want to promotes PCOM-BA01 as vertical solution to aim in the different versatile applications.

General

Product	PCOM-BA01				
Form Factor	Type 10, Mini Form Factor COM-Express® (84 x 55 mm)				
Processor	Intel® Atom®			Intel® Pentium®	Intel® Celeron®
	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 505	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, JPEGMJPEG				
HW Decoding	HEVC/H.265, H.264, MVC, VPS, MPEG2, VC-1, WMV9, JPEGMJPEG				
HW Acceleration	Gen9LP, DirectX 12, OpenGL 4.3, OpenCL 1.2, PAVP 2.0, OGL ES 3.0				
Processor TDP	12W	9.5W	6.5W	6W	6W
BIOS	AMI BIOS				
ECC Memory Supported	No				
Memory	On board LPDDR4 SDRAM up to 8GB 2133 MT/s				

I/O Interface

SATA	2 x SATA III		
USB	2 x USB 3.0 8 x USB 2.0, (Option 1 x OTG)		
Ethernet	Intel® Ethernet Controller I210T		
Serial I/O	GPIIO	8 GPIO	
	I²C	Baud Rate: 400KHz	
	SMBus	Baud Rate: 100KHz	
	UART	2 Serial Port (Tx/Rx)	
PEG	N/A		
PCI Express	4 x PCIe 2.0 x 1, or 1 x PCIe 2.0 x 4		
Display	Default	Options	Resolution
	DP	DP	up to 4096x 2160 @ 60Hz
		HDMI	up to 3840x 2160 @ 30Hz
	eDP	LVDS(24bit, dual channel)	up to 1920x 1200 @ 60Hz
		eDP	up to 4096x 2160 @ 60Hz
Security	Intel® AES		

PCOM-BA01

MECHANICAL & ENVIRONMENT

Dimension	84 x 55 mm
Power DC IN	+4.75VDC to +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	Contact us
OS	Windows 10 Linux Fedora/Tizen/Yocto RTOS Windriver

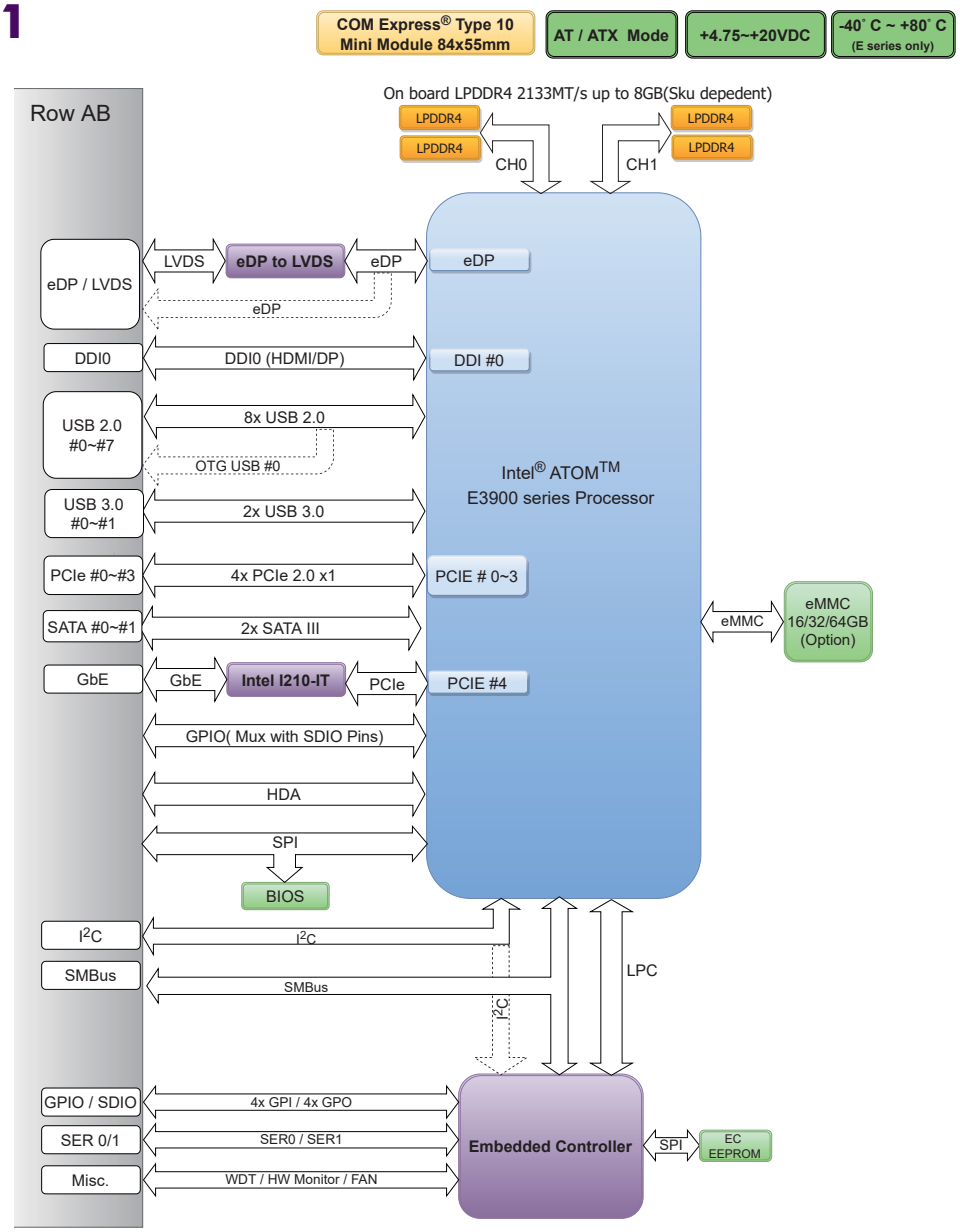
ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-BA01-E3950-4G	AB1-3G73	Available
PCOM-BA01-E3940-4G	AB1-3G74	Available
PCOM-BA01-E3930-4G	AB1-3H32	Available
PCOM-BA01-N4200-4G	AB1-3H13	Available
PCOM-BA01-N3350-4G	AB1-3K20	Available
PCOM-BA01-E3950-8G	AB1-3F36	Available
PCOM-BA01-E3940-8G	AB1-3K21	Available
PCOM-BA01-E3930-8G	AB1-3G27	Available
PCOM-BA01-N4200-8G	AB1-3H91	Available
PCOM-BA01-N3350-8G	AB1-3K22	Available

Accessory	Ordering P/N	Status
Heat Sink (E-sku)	B8309590	Available
Heat Sink (N-sku)	B8309960	Available
PCOM-CA00 (uATX Carrier Board)	AB1-3917	Available

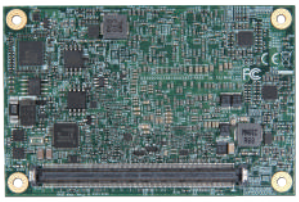
BLOCK DIAGRAM

PCOM-BA01



PCOM-BA02GL

Intel Atom® x6000 series SoC based on Type 10 mini COM-Express® module with LPDDR4 SDRAM



FEATURES

- Intel Atom® Processor x6000 Series (Elkhart Lake)
- On board LPDDR4 SDRAM up to 16GB
  On board eMMC up to 64GB
- Low Power Consumption (6W to 12W), 4K Display resolution
- Support wide temperature -40°C ~ 85°C (Selected SKU)
- Support Intel® TCC/TSN with 2.5GbE (Selected SKU)

RoHS

PCOM-BA02GL, a Type 10 Mini COM Express® (84 x 55 mm) module which based on Intel® Elkhart Lake Atom® x6000 and Pentium® N and J Series Processors. In this architecture, it could provide LVDS, and high quantity HDMI, eDP, DP with 4K resolution. And it also provides turbo mode up to 3.0GHz, with extending 4x PCIe 3.0 x1, 2x USB 3.2 Gen2, 8x USB 2.0, and 2x SATA III devices. With ultra low power consumption(6W to 12W), wide-temp support, it could provide very energy saving and high effective performance. Portwell want to promotes PCOM-BA02GL as vertical solution to aim in the different versatile applications, such as automation, military, hospitality, transportation and so on.

General

Product	PCOM-BA02GL			
Form Factor	Type 10, Mini Form Factor COM-Express® (84 x 55 mm)			
Processor	Intel® Atom			
	x6211E	x6413E	x6425E	x6425E
Core	2	4	4	4
Freq.	1.3 GHz	1.5 GHz	2.0 GHz	2.0 GHz
Turbo	3.0 GHz	3.0 GHz	3.0 GHz	3.0 GHz
Cache	1.5MB	1.5MB	1.5MB	1.5MB
Processor Graphics	Intel® UHD Graphics for 10th Gen Intel® Processors			
Graphics Base Frequency	350 MHz	500 MHz	500 MHz	500 MHz
Graphics Max Dynamic Frequency	750 MHz	750 MHz	750 MHz	750 MHz
HW Encoding	H.264, H.265/HEVC, VP9, JPEG/MPEG			
HW Decoding	H.264, MPEG2, V1-1/WMV9, H.265/HEVC, VP8/9, JPEG/MPEG			
HW Acceleration	Gen 11 LP, DirectX 12, OpenGL4.5, OpenGL ES 3.2, Vulkan			
Processor TDP	6W	9W	12W	12W
BIOS	AMI BIOS			
In-Band ECC	Yes	Yes	Yes	Yes
Memory (on board LPDDR4)	4GB 3200 MT/s	8GB 3200 MT/s	8GB 3200 MT/s	16GB 3200 MT/s
Storage (on board eMMC)	16GB	16GB	32GB	32GB
Temperature Range	-40 ~ 85 °C	-40 ~ 85 °C	-40 ~ 85 °C	-40 ~ 85 °C

I/O Interface

SATA	2 x SATA III		
USB	2 x USB 3.2 Gen2 8 x USB 2.0		
Ethernet	2.5 GbE with GPY215 (optional support TSN/TCC on selected SKU)		
Serial I/O	GPIO	8 GPIO	
	I²C	Baud Rate: 400KHz	
	SMBus	Baud Rate: 100KHz	
	UART	2 Serial Port (Tx/Rx)	
PEG	N/A		
PCI Express	4 x PCIe 3.0 x 1		
Display	Default	Options	Resolution
	DDI	DP	up to 4096x 2160 @ 60Hz
		HDMI	up to 4096x 2160 @ 60Hz
	LVDS / eDP	LVDS(24bit, dual channel)	up to 2560x 1600 @ 60Hz
		eDP	up to 4096x 2160 @ 60Hz
Security	TPM 2.0, Intel®AES		

PCOM-BA02GL

MECHANICAL & ENVIRONMENT

Dimension	84 x 55 mm
Power DC IN	4.75V to 20V, AT/ATX Mode
Storage Temperature	-40°C to 85°C
Operation Temperature	0°C to 60°C -40°C to 85°C (Selected SKU)
Certification	TBD
MTBF	TBD
Vibration	TBD
OS	Win 10 IoT Enterprise Ubuntu , Yocto

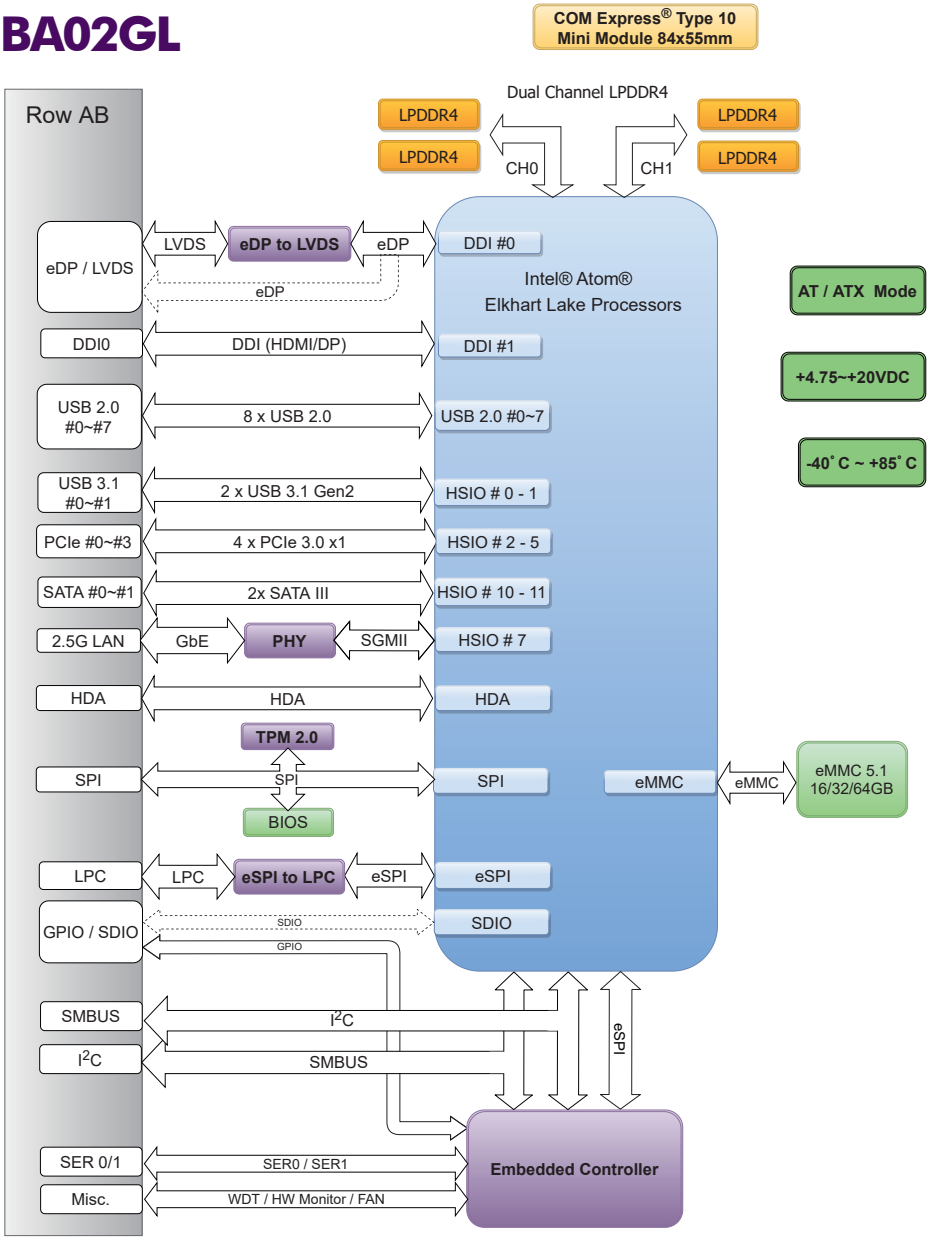
ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-BA02GL-x6211E-4G-16G	AB1-3L79	Available
PCOM-BA02GL-x6413E-8G-16G	AB1-3L76	Available
PCOM-BA02GL-x6425E-8G-32G	AB1-3K47	Available
PCOM-BA02GL-x6425E-16G-32G	AB1-3R26	In Development

Accessory	Ordering P/N	Status
Heatsink (Atom)	B830B480	Available
Heatsink (Pentium/Celeron)	B830B490	Available
Heatspreader (Atom)	B830B500	Available
Heatspreader (Pentium/Celeron)	B830B510	Available
PCOM-CA00(Micro-ATX Carrier board)	AB1-3917	Available

BLOCK DIAGRAM

PCOM-BA02GL



PCOM-B632VG

Intel Atom® Bay Trail series SoC based on Type 6 COM Express® module with DDR3L 1x SO-DIMM Socket

FEATURES

- Intel Atom® Bay Trail E3800 series processors
- DDR3L SO-DIMM up to 4GB 1333 MT/s
- Multiple Displays VGA, eDP, DP, HDMI
- Support Industrial temperture -40 °C to 85 °C
- Support low power consumption(5 to 10W), USB 3.0, SD Card

PCOM-B632VG, a type 6 compact COM Express® (95 x 95 mm) module which was based on Intel Atom® Bay Trail E3800 series SoC. In this architecture, it could provide VGA, eDP and DP multiple displays, and expandability I/O interfaces, included 3x PCIe 2.0 x 1, 1x USB 3.0, 4x USB 2.0, 2x serial ports and 2x SATA II devices. With ultra low power consumption design(5 to 10W), wide-temp support, it could provide very energy saving solution to different market, such as retail, transportation and automation.

General

Product	PCOM-B632VG				
Form Factor	Type 6, Compact Form Factor COM Express® (95 x 95 mm)				
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/MKPEG, VP8				
HW Acceleration	Gen7LP, DirectX 11, OpenGL 3.2, OpenCL 1.2, OGL ES Halti/2.0/1.1				
Processor TDP	10W	8W	7W	6W	5W
BIOS	Phoenix BIOS				
ECC Memory Supported	No				
Memory	DDR3L SO-DIMM up to 4GB 1333 MT/s				

I/O Interface

SATA	2x SATA II		
USB	1x USB 3.0 4x USB 2.0		
Ethernet	Intel® Ethernet Controller I210T		
Serial I/O	GPIO	8 GPIO	
	I²C	Baud Rate: 400KHz	
	SMBus	Baud Rate: 100KHz	
	UART	2 Serial Port (Tx/Rx)	
PEG	N/A		
PCI Express	3x PCIe 2.0 x 1 (Option 4x PCIe 2.0 x 1)		
Display	Default	Options	Resolution
	VGA	VGA	up to 2560x 1600 @ 60Hz
	DDI0	DP	up to 2560x 1600 @ 60Hz
		HDMI	up to 1920x 1080 @ 60Hz
	DDI1	eDP	up to 2560x 1600 @ 60Hz
Security	Intel®AES		

PCOM-B632VG

MECHANICAL & ENVIRONMENT

Dimension	95 x 95 mm
Power DC IN	Normal : +12V Wide Range : +8VDC - +16VDC AT/ATX Mode
Storage Temperature	-40°C to 85°C
Operation Temperature	-40°C to 85°C
Certification	Contact us
MTBF	Over 120,000 hours at 40°C
Vibration	Contact us
OS	Windows 7, WES7/8, Embedded Compact7 Linux Fedora/Tizen/Yocto RTOS Windriver

ORDERING GUIDE

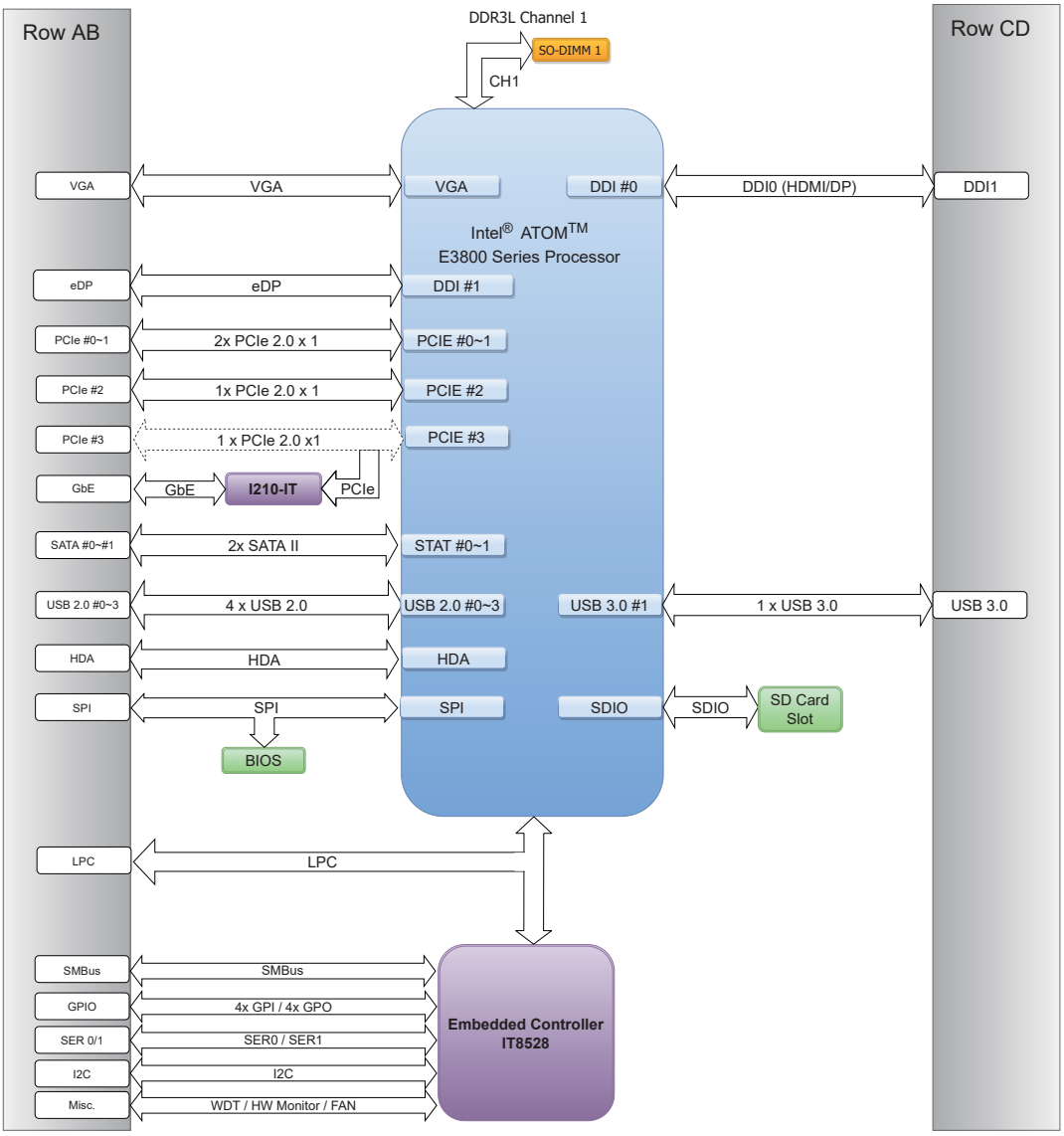
Product	Ordering P/N	Status
PCOM-B632VG-E3845	AB1-3A36	Available
PCOM-B632VG-E3827	AB1-3A33	Available
PCOM-B632VG-E3826	AB1-3A34	Available
PCOM-B632VG-E3825	AB1-3A35	Available
PCOM-B632VG-E3815	AB1-3A40	Available

Accessory	Ordering P/N	Status
Heat Sink	B8308040	Available
Heat Spreader	B8307650	Available
PCOM-C605(Mini-iTX Carrier Board)	AB1-3998	Available
PCOM-C60B(ATX Carrier Board)	AB1-3G22Z	Contact us

BLOCK DIAGRAM

PCOM-B632VG

COM Express® Type 6 Compact Module 95x95mm | AT / ATX Mode | 12 VDC | -40° C ~ +85° C



PCOM-B638VG

Intel® Core™ Kaby Lake-U/Skylake-U i7/i5/i3 series processor based on Type 6 Compact COM-Express® module with 2x DDR4 SD-DIMM Socket

FEATURES

- Intel® Core™ Kaby Lake-U/Skylake-U i7/i5/i3 7000, 6000 series processors
- DDR4 SDRAM up to 32GB 2133 MT/s
- Multiple Displays VGA, LVDS/eDP, DP, HDMI
- Widely voltage support 6V to 18V

PCOM-B638VGL, a type 6 compact COM Express® (95 x 95 mm) module which based on Intel® Kaby Lake-U/Skylake-U® i7/i5/i3 and Celeron® processors. In this architecture, PCOM-B638VG could provide VGA, LVDS, and high quantity HDMI, eDP, DP displays, also included turbo mode up to 3.4GHz, and expandability I/O interfaces such as 5x PCIe 3.0 x 1, 4x USB 3.0, 8x USB 2.0, and 3x SATA III devices. With this ultra low power consumption required (15W), PCOM-B638VG could provide a very energy saving solution to different vertical market, such as automation, healthcare, transportation and retails.

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	N/A	N/A	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	HEVC, VP8, VP92, VDENC			
HW Decoding	HEVC, VP8, VP92, VDENC			
HW Acceleration	DX11/12, OCL 2.x, OGL 4.3/4.4, ES 2.0			
Processor TDP	15W	15W	15W	15W
BIOS	AMI BIOS			
ECC Memory Supported	NO			
Memory	DDR4 SDRAM up to 32GB 2133 MT/s			

I/O Interface

SATA	2x SATA III 1x SATA III(Option)		
USB	4x USB 3.0 8x USB 2.0		
Ethernet	Intel® Ethernet Controller I219LM		
Serial I/O	GPIO	8 GPIO	
	I²C	Baud Rate : 400KHz	
	SMBus	Baud Rate : 100KHz	
	UART	2 Serial Port (Tx/Rx)	
PEG	4x PCIe 3.0 x 1		
PCI Express	5x PCIe 3.0 x 1		
Display	Default	Options	Resolution
	eDP	LVDS(24bit, dual channel)	up to 2560x 1600 @ 60Hz
		eDP	up to 4096x 2304 @ 24Hz
	DDI1	DP	up to 3840x 2160 @ 24Hz
		HDMI	up to 4096x 2160 @ 24Hz
	DDI2	VGA	up to 2560x 1600 @ 60Hz
		DP	up to 3840x 2160 @ 24Hz
		HDMI	up to 4096x 2160 @ 24Hz
Security	TPM 2.0, Intel®AES		

PCOM-B638VG

MECHANICAL & ENVIRONMENT

Dimension	95 x 95mm
Power DC IN	Normal : +12V Wide range : +6VDC - +18VDC AT/ATX Mode
Storage Temperature	-20°C to 85°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

ORDERING GUIDE

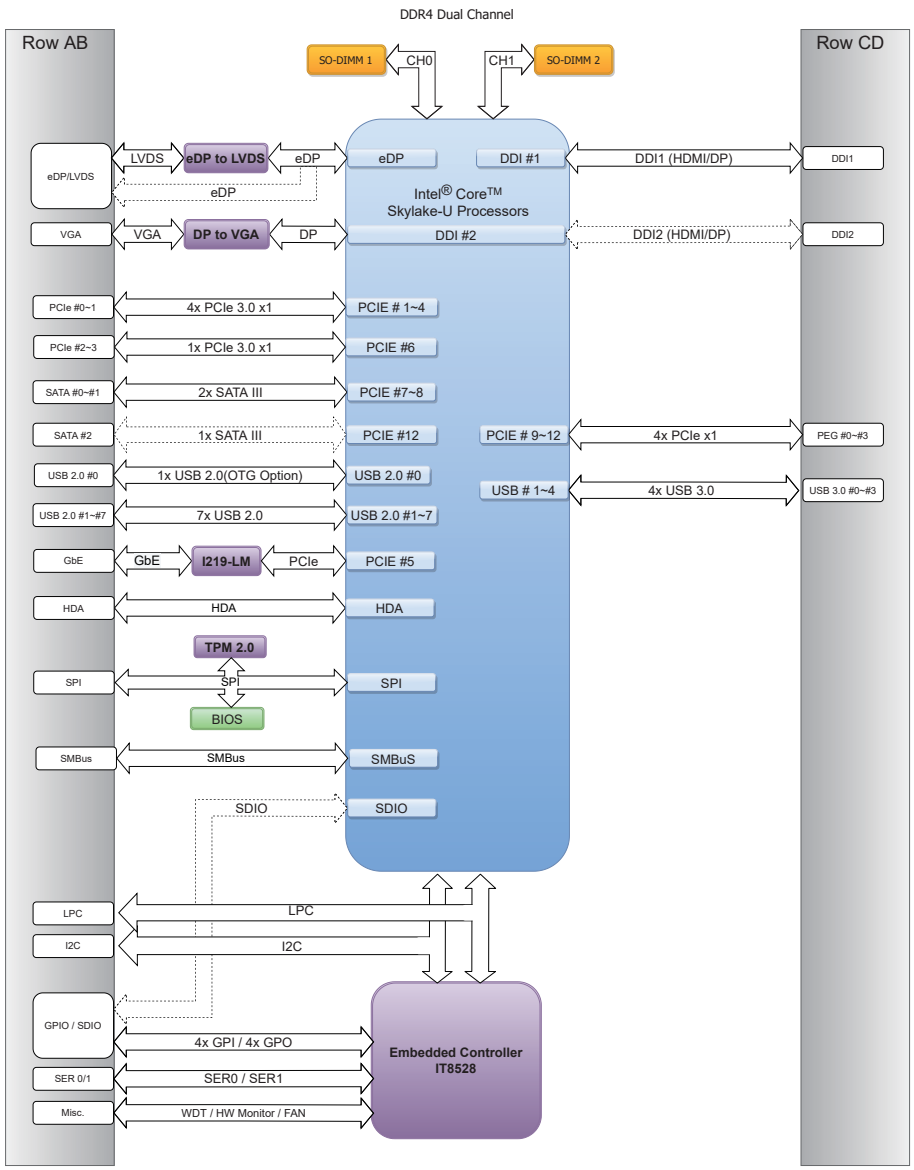
Product	Ordering P/N	Status
PCOM-B638VG-6600U	AB1-3E39	Available
PCOM-B638VG-6300U	AB1-3E38	Available
PCOM-B638VG-6100U	AB1-3E32	Available
PCOM-B638VG-3955U	AB1-3E77	Available
PCOM-B638VG-7600U	AB1-3G88	Available
PCOM-B638VG-7300U	AB1-3G87	Available
PCOM-B638VG-7100U	AB1-3G86	Available
PCOM-B638VG-3965U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

Accessory	Ordering P/N	Status
Cooler	B9971380	Available
Heat Sink	B8308660	Available
Heat Spreader	B8308500	Available
PCOM-C605(Min-ITX Carrier board)	AB1-3998	Available
PCOM-C60B(ATX Carrier board)	AB1-3G22Z	Contact us

BLOCK DIAGRAM

PCOM-B638VG

COM Express® Type 6 Compact Module 95x95mm | AT / ATX Mode | 12 VDC | 0° C~ +60° C



PCOM-B641VG

Intel Atom® Apollo Lake series SoC based on Type 6 Compact COM Express® module with 2x DDR3L SO-DIMM Socket

FEATURES

- Intel Atom® Apollo Lake E3900 series processors
- DDR3L SO-DIMM up to 16GB 1866 MT/s
- Multiple Displays VGA, LVDS/eDP, DP, HDMI
- Support Industrial temperture -40°C to 85°C
- Support low power consumption(6 to 12W), TPM 2.0

PCOM-B641VG, a type 6 compact COM Express® (95 x 95 mm) module which based on Intel Atom® Apollo Lake E3900 series SoC. In this architecture, it could provide VGA, LVDS, and high quantity HDMI, eDP, DP with 4K resolution, and three independent displays. PCOM-B641VG also provides turbo mode up to 2.5GHz, including extended 4x PCIe 2.0 x 1, 3x USB 3.0, 8x USB 2.0, and 2x SATA III devices. With ultra low power consumption design(6 to 12W), wide-temp support, PCOM-B641VG could provide very energy saving and high effective performance. Portwell planned to promote PCOM-B641VG as vertical solution to aim in the different versatile applications, such as Automation, Military, Networking, Transportation and so on.

General

Product	PCOM-B641VG				
Form Factor	Type 6, Compact Form Factor COM Express® (95 x 95 mm)				
Processor	Intel® Celeron®	Intel® Pentium®	Intel® Atom®		
	N3350	N4200	E3930	E3940	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	2MB	2MB	2MB	2MB	2MB
Processor Graphics	Intel® HD Graphics 500	Intel® HD Graphics 505	Intel® HD Graphics 500	Intel® HD Graphics 505	Intel® HD Graphics 505
Graphics Base Frequency	200 MHz	200 MHz	400 MHz	400 MHz	500 MHz
Graphics Max Dynamic Frequency	650 MHz	750 MHz	550 MHz	600 MHz	650 MHz
HW Encoding	HEVC/H.265, H.264, MVC, VPS, VP9, JPEGMJPEG				
HW Decoding	HEVC/H.265, H.264, MVC, VPS, MPEG2, VC-1, WMV9, JPEGMJPEG				
HW Acceleration	Gen9LP, DirectX 12, OpenGL 4.3, OpenCL 1.2, PAVP 2.0, OGLES 3.0,				
Processor TDP	6W	6W	6.5W	9.5W	12W
BIOS	AMI BIOS				
ECC Memory Supported	No				
Memory	DDR3L SO-DIMM up to 16GB 1866 MT/s				

I/O Interface

SATA	2 x SATA III		
USB	3x USB 3.0 8x USB 2.0, (1x OTG Option)		
Ethernet	Intel® Ethernet Controller I210T		
Serial I/O	GPIO	8 GPIO	
	I²C	Baud Rate: 400KHz	
	SMBus	Baud Rate: 100KHz	
	UART	2 Serial Port (Tx/Rx)	
PEG	N/A		
PCI Express	4x PCIe 2.0 x 1		
Display	Default	Options	Resolution
	eDP	LVDS(24bit, dual channel)	up to 1920x 1200 @ 60Hz
		eDP	up to 4096x 2160 @ 60Hz
	DDI0	DP	up to 4096x 2160 @ 60Hz
		HDMI	up to 3840x 2160 @ 30Hz
	DDI1	VGA	up to 1920x 1200 @ 60Hz
		DP	up to 3840x 2160 @ 30Hz
Security	TPM 2.0, Intel®AES		

PCOM-B641VG

MECHANICAL & ENVIRONMENT

Dimension	95 x 95mm
Power DC IN	Normal : +12V Wide range : +9VDC - +18VDC AT/ATX Mode
Storage Temperature	-40°C to 85°C
Operation Temperature	-40°C to 85°C
Certification	Contact us
MTBF	Over 120,000 hours at 40°C
Vibration	Contact us
OS	Windows 7/10, WES7/8 Linux Fedora/Tizen/Yocto RTOS Windriver

ORDERING GUIDE

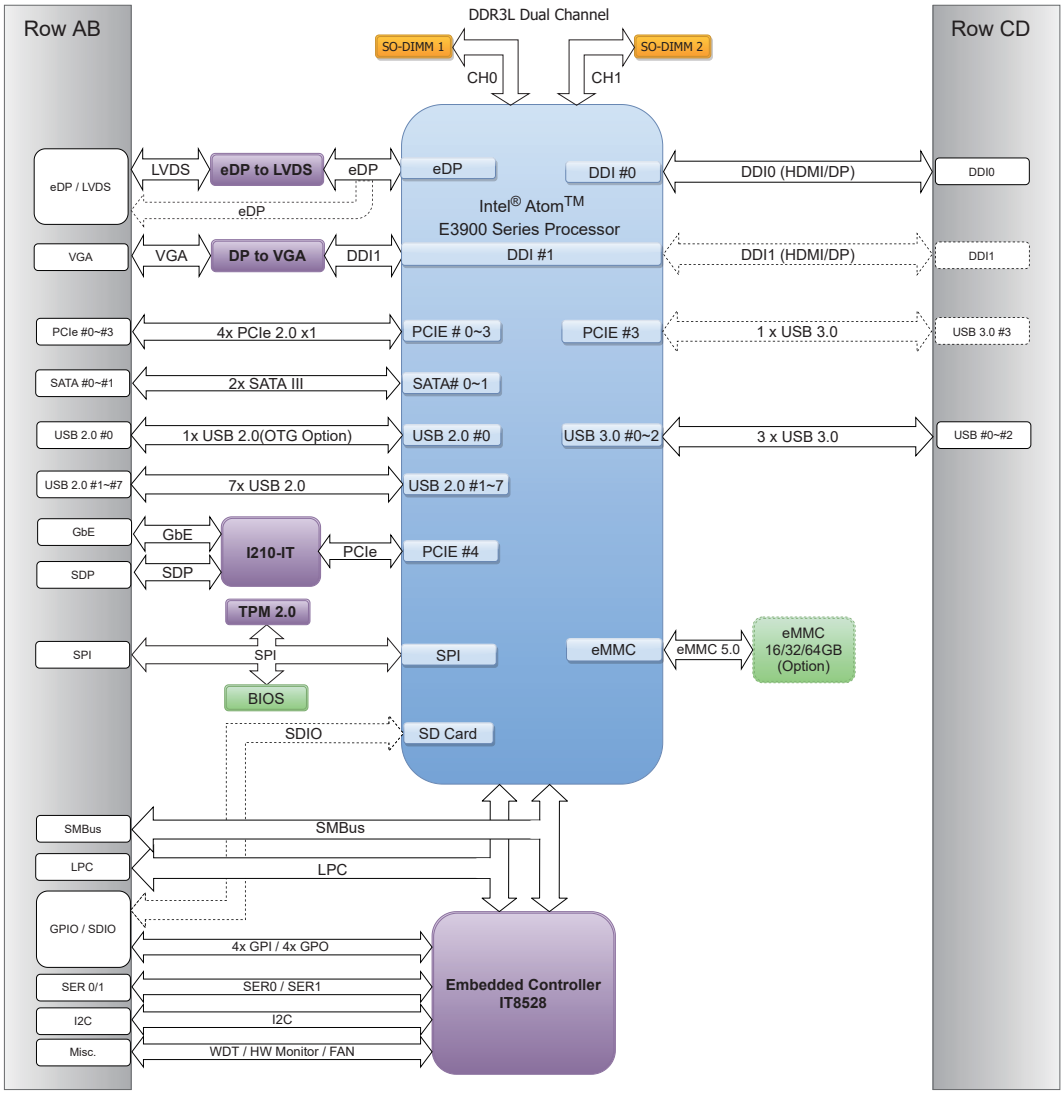
Product	Ordering P/N	Status
PCOM-B641-E3950	AB1-3F71	Available
PCOM-B641-E3940	AB1-3F39	Available
PCOM-B641-E3930	AB1-3F38	Available
PCOM-B641-N4200	AB1-3F28	Available
PCOM-B641-N3350	AB1-3F72	Available

Accessory	Ordering P/N	Status
Heat Sink (N-sku)	B9971521	Available
Heat Sink (E-sku)	B8308491	Available
Heat Spreader (N-sku)	B8308911	Available
Heat Spreader (E-sku)	B8308901	Available
PCOM-C605 (Mini-iTX Carrier Board)	AB1-3998	Available
PCOM-C60B (ATX Carrier Board)	AB1-3G22Z	Contact us

BLOCK DIAGRAM

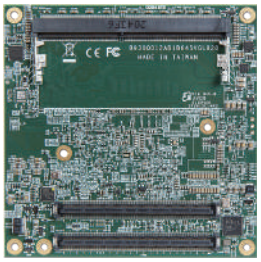
PCOM-B641VG

COM Express® Type 6 Compact Module 95x95mm | AT / ATX Mode | 12 VDC | -40° C ~ +85° C



PCOM-B645VGL

Intel Atom® Elkhart Lake series SoC based on Type 6 Compact COM Express® module with 2x DDR4 SO-DIMM Socket



FEATURES

- Intel Atom® Elkhart Lake x6000 series processors
- DDR4 SO-DIMM up to 32GB 3200 MT/s with In-Band ECC
- Multiple Displays VGA, LVDS/eDP, DP, HDMI
- Support Industrial temperture -40°C to 85°C
- Support Intel® TCC/TSN with 2.5GbE

PCOM-B645VGL, a type 6 compact COM Express® (95 x 95 mm) module which is based on Intel Atom® Elkhart Lake x6000, Pentium® N, J Series processors. In this architecture, PCOM-B645VGL provides VGA, LVDS, and eDP, DP, HDMI with 4K resolution, and supports three indepent displays. And it also provides turbo mode up to 3.0GHz, with extending 6x PCIe 3.0, 2x USB 3.2 Gen2, 8x USB 2.0, and 2x SATA III. With ultra low power consumption(4.5 to 12W), wide-temp support, it could provide very energy saving and high efficient performance. PCOM-B645VGL aims in different versatile applications, such as automation, healthcare, retail, transportation.

General

Product	PCOM-B645VGL				
Form Factor	Type 6, Compact Form Factor COM Express® (95 x 95 mm)				
Processor	Intel® Pentium	Intel® Atom®			
	J6426	x6211E	x6413E	x6425E	x6425RE
Core	4	2	4	4	4
Freq.	2.0 GHz	1.3 GHz	1.5 GHz	2.0 GHz	1.9 GHz
Turbo	3.0 GHz	3.0 GHz	3.0 GHz	3.0 GHz	N/A
Cache	1.5MB	1.5MB	1.5MB	1.5MB	1.5MB
Processor Graphics	Intel® UHD Graphics for 11th Gen Intel® Processors				
Graphics Base Frequency	400 MHz	350 MHz	500 MHz	500 MHz	400 MHz
Graphics Max Dynamic Frequency	850 MHz	750 MHz	750 MHz	750 MHz	N/A
HW Encoding	H.264, H.265/HEVC, VP9, JPEG/MPEG				
HW Decoding	H.264, MPEG2, V1-1/WMV9, H.265/HEVC, VP8/9, JPEG/MPEG				
HW Acceleration	Gen 11 LP, DirectX 12, OpenGL4.5, OpenGL ES 3.2, Vulkan				
Processor TDP	10W	6W	9W	12W	12W
BIOS	AMI BIOS				
In-Band ECC	No	Yes	Yes	Yes	Yes
Memory	2x DDR4 SO-DIMM 3200 MT/s up to 32GB in total				

I/O Interface

SATA	2 x SATA III		
USB	2x USB 3.2 Gen2(optional up to 4x), 8x USB 2.0		
Ethernet	GPY215		
Serial I/O	GPIO	8 GPIO	
	I²C	Baud Rate: 400KHz	
	SMBus	Baud Rate: 100KHz	
	UART	2 Serial Port (Tx/Rx)	
PEG	N/A		
PCI Express	6x PCIe 3.0 (2x PCIe 3.0 x 1 can be configure to 2x USB 3.2 Gen2)		
Display	Default	Options	Resolution
	DDI0	LVDS(24bit, dual channel)	up to 1920x 1200 @ 60Hz
		eDP	up to 4096x 2160 @ 60Hz
	DDI1	DP	up to 4096x 2160 @ 60Hz
		HDMI	up to 4096x 2160 @ 60Hz
	DDI2	VGA	up to 1920x 1200 @ 60Hz
		DP	up to 4096x 2160 @ 60Hz
		HDMI	up to 4096x 2160 @ 60Hz
Security	TPM 2.0, Intel®AES		

PCOM-B645VGL

MECHANICAL & ENVIRONMENT

Dimension	95 x 95 mm
Power DC IN	Normal : +12V AT/ATX Mode
Storage Temperature	-40°C to 85°C
Operation Temperature	-40°C to 85°C
Certification	Contact us
MTBF	TBD
Vibration	TBD
OS	Windows 10/Windows 10 IoT Enterprise Linux/Yocto/Android

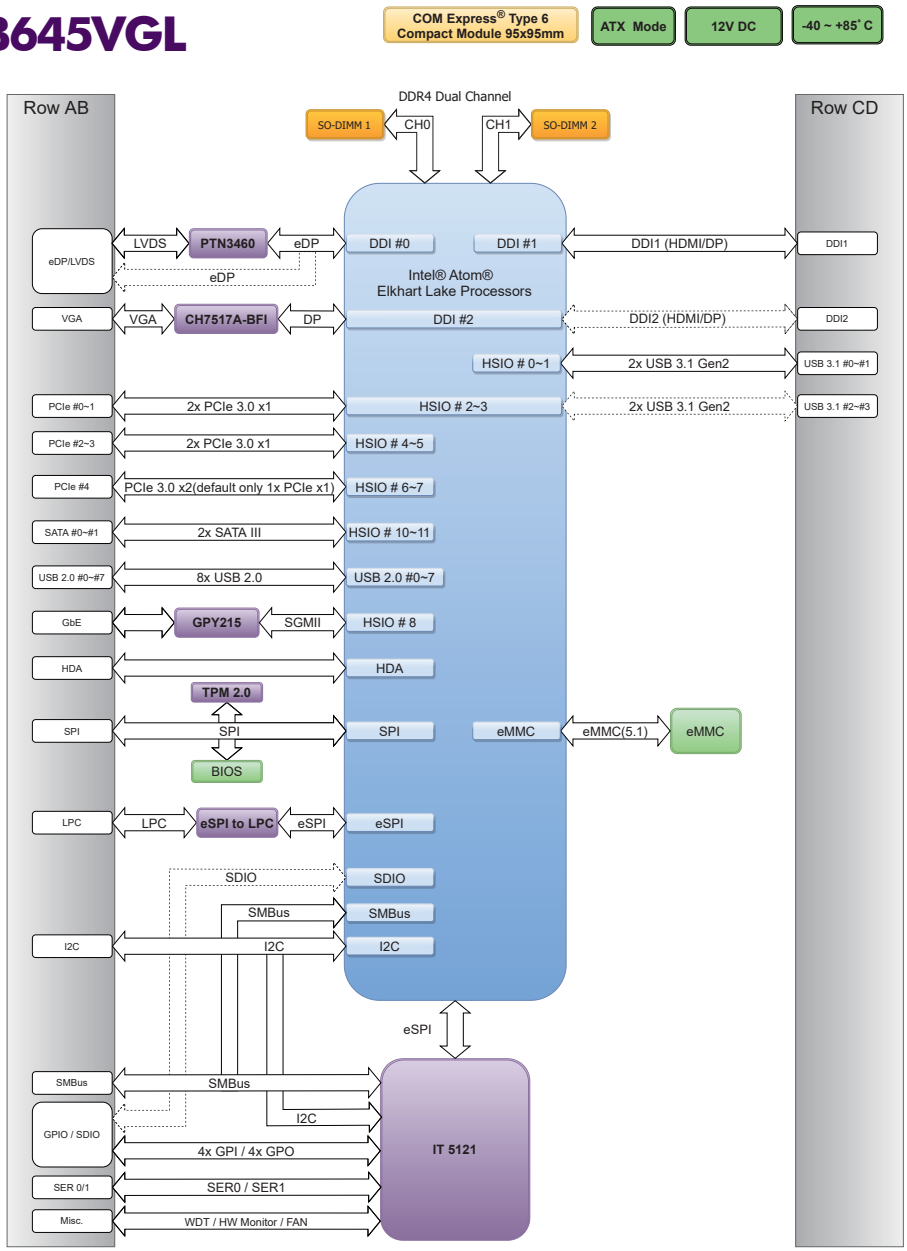
ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-B645VGL-J6426	AB1-3L84	Available
PCOM-B645VGL-x6211E	AB1-3L83	Available
PCOM-B645VGL-x6413E	AB1-3L82	Available
PCOM-B645VGL-x6425E	AB1-3K43	Available
PCOM-B645VGL-x6425RE	AB1-3L81	Available

Accessory	Ordering P/N	Status
Heat Sink (J/N-sku)	B830B390	Available
Heat Sink (X-sku)	B830B380	Available
Heat Spreader (J/N-sku)	B830B460	Available
Heat Spreader (X-sku)	B830B470	Available
PCOM-C60B(ATX Carrier board)	AB1-3G22Z	Contact us

BLOCK DIAGRAM

PCOM-B645VGL



PCOM-B653VGL

Intel® Whiskey Lake-U Core™ Processor based on Type VI COM Express module with dual DDR4 SO-DIMM, DDI, eDP, Gigabit Ethernet, SATA 3.0, and USB 3.1

FEATURES

- Intel® Core™ i3/i5/i7/Celeron Processors 14nm process(Whiskey Lake U)
- Support 2xDDR4-2400 Non-ECC SO-DIMMs, up to 32G
- Support USB2.0/3.1, 2x SATAIII, 10x PCIe 3.0 LANEs
- Support VGA, LVDS/eDP, and Display port

Portwell PCOM-B653VGL is designed with Intel® Whiskey Lake-U processor with Type 6 pin definition. It brings three important factors including DDR4 memory support, PCIe Gen3 support, and USB 3.1 Gen2 support. Extend PCIe Gen3 ports in PCOM-B653VGL can support high speed IO card for more applications. In the meantime, it's compatible with COMe 3.0 Type 6 carrier board.

General

Product	PCOM-B653VGL			
Form Factor	COM Express® Type 6 Compact Form Factor (95 x 95mm)			
Processor	Intel® Core™			Intel® Celeron®
	i7-8665UE	i5-8365UE	i3-8145UE	4305UE
Core	4	4	2	2
Freq.	1.70 GHz	1.60 GHZ	2.20 GHz	2.00 GHz
Turbo	4.40 GHz	4.10 GHz	3.90 GHz	2.00 GHz
Cache	8MB	6MB	4MB	2MB
Processor Graphics	Intel® UHD Graphics 620	Intel® UHD Graphics 620	Intel® UHD Graphics 620	Intel® UHD Graphics 610
Graphics Base Frequency	300 MHz	300 MHz	300 MHz	300 MHz
Graphics Max Dynamic Frequency	1.15 GHz	1.05 GHz	1.00 GHz	1.00 GHz
HW Encoding	H.264 AVC, MPEG2, HEVC, VP8/9, JPEG			
HW Decoding	H.264 AVC, VC1, MPEG2, VP8/9, JPEG			
HW Acceleration	DX 11.3/12, OpenGL 4.5, OpenCL 2.1			
Processor TDP	15W	15W	15W	15W
BIOS	AMI BIOS			
ECC Memory Supported	NO			
Memory	2x SO-DIMM DDR4 up to 32GB 2400MHz			

I/O Interface

SATA	2 x SATA III (Port 0/1)		
USB	4x USB 3.1 Gen2 (Port 0~3) 8x USB 2.0 (Port 0~7)		
Ethernet	Intel® I219LM		
Serial I/O	GPIO	8 bit GPIO	
	I²C	Baud Rate：400KHz	
	SMBus	Baud Rate：100KHz	
	UART	Only RX/TX signal	
PEG	1x PCIe Gen3 x4		
PCI Express	1x PCIe Gen3 x4 1x PCIe Gen3 x1 1x PCIe Gen3 x1 (Option)		
Display	Default	Options	Resolution
	VGA	VGA	Up to 1920x1200 @ 60Hz
		DDI2	DP up to 4096x2160 @ 60Hz
	LVDS	eDP	Up to 3840x2160 @ 60Hz
		24bit dual channel LVDS	Up to 1920x1200 @ 60Hz
	DDI-DP	DP1.2	DP up to 4096x2160 @ 60Hz
Security	TPM 2.0(Infineon SLB9670), Intel® AES		

PCOM-B653VGL

MECHANICAL & ENVIRONMENT

Dimension	95 x 95mm
Power DC IN	Normal: +12V DC Wide range: +6VDC~ +18VDC AT/ATX mode
Storage Temperature	-20°C to 80°C
Operation Temperature	0°C to 60°C
Certification	Contact us
MTBF	Over 100,000 hours ar 40°C
Vibration	Contact us
OS	Windows 10 Red Hat, Ubuntu, CentOS

ORDERING GUIDE

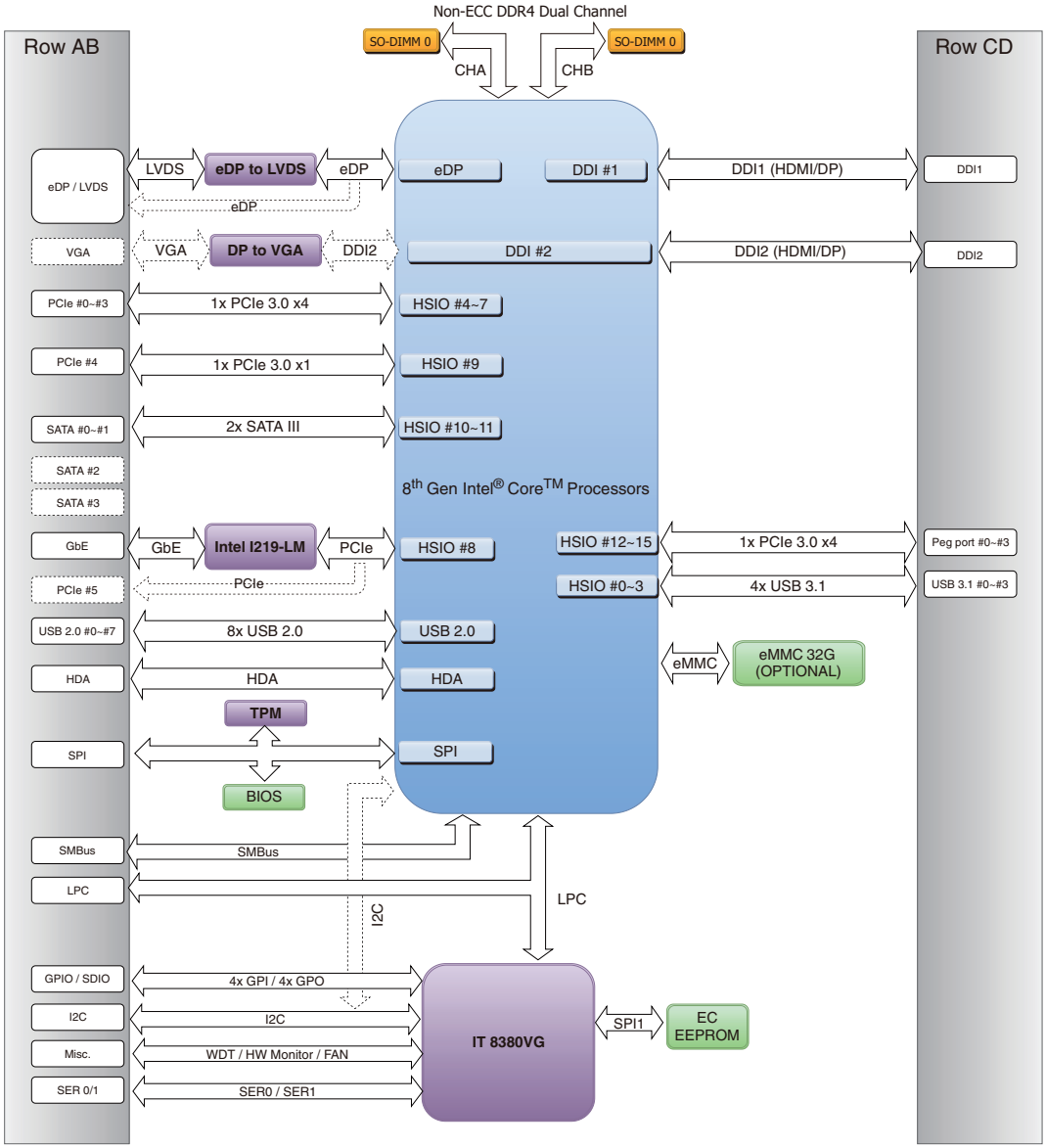
Product	Ordering P/N	Status
PCOM-B653VGL-8665UE	AB1-3K06	Available
PCOM-B653VGL-8365UE	AB1-3K04	Available
PCOM-B653VGL-8145UE	AB1-3K05	Available
PCOM-B653VGL-4305UE	AB1-3K19	Available

Accessory	Ordering P/N	Status
PCOM-C605 (Mini-ITX Carrier Board)	AB1-3998	Available
Cooler	B9971820	Available

BLOCK DIAGRAM

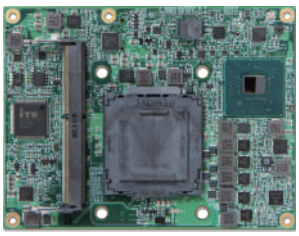
PCOM-B653VGL

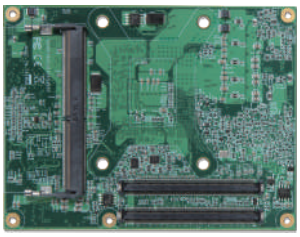
COM Express® Type 6 Compact Module 95x95mm | AT / ATX Mode | 0° C ~ +60° C



PCOM-B654GL

Intel® Coffee Lake-S Core™ Processor based on Type VI COM Express module with dual DDR4 SO-DIMM, DDI, LVDS, Gigabit Ethernet, SATA III, and USB 3.2 Gen2





FEATURES

- Intel® Core™ i7/i5/i3/Celeron 14nm process(Coffee Lake-S)
- Support 2x DDR4-2400 Non-ECC/ECC SO-DIMMs, up to 2x 16GB (The bottom side SO-DIMM thickness is 5.2mm, no support 5.0mm carrier connector)
- Support USB2.0/3.2 Gen2, 4x SATAIII, 1x PCIe 3.0 x16, and 8x PCIe 3.0 x1
- Support LVDS, and 3x Display port/HDMI

PCOM-B654GL is Intel® Coffee Lake-S platform COM Express module. It is compatible with COMe 3.0 Type 6 carrier board. The desktop CPU on module offers customer higher computing power but lower cost comparing to mobile solutions. PCOM-B654GL supports both ECC and Non-ECC DDR4 by different PCH SKUs(Q370/C246), which can be adapted to different applications. This module provides one PCIex16, eight PCIex1 (Option to one PCIex4), four USB 3.2 Gen2, and four SATA III.

General

Product	PCOM-B654GL			
Form Factor	COM Express Type 6 Basic module (125 X 95mm)			
Processor	Intel® Core™			Intel® Celeron®
	i7-8700T	i5-8500T	i3-8100T	G4900T
Core	6	6	4	2
Freq.	2.40 GHz	2.10 GHz	3.10 GHz	2.90 GHz
Turbo	4.00 GHz	3.50 GHz	--	--
Cache	12MB	9MB	6MB	2MB
Processor Graphics	Intel® UHD Graphics 630	Intel® UHD Graphics 630	Intel® UHD Graphics 630	Intel® UHD Graphics 610
Graphics Base Frequency	350 MHz	350 MHz	350 MHz	350 MHz
Graphics Max Dynamic Frequency	1.20 GHz	1.10 GHz	1.10 GHz	1.00 GHz
HW Encoding	H.264/AVC, H.265/HEVC, MPEG2, JPEG, VP8, VP9			
HW Decoding	H.264/AVC, VP8, VP9, H.265/HEVC, MPEG2, JPEG/MJPEG, VC-1/WMV9			
HW Acceleration	DirectX 11/12/OpenGL 4.5/OpenCL 2.1			
Processor TDP	35 W	35 W	35 W	35 W
BIOS	AMI BIOS			
ECC Memory Supported	NO		YES(only with C246 PCH)	
Memory	2x SO-DIMM DDR4 up to 32GB 2400MT/s			

*PCOM-B654GL only supports Intel® 8th Generation 35W processors

I/O Interface

SATA	4 x SATA III (Port 0~3)		
USB	4x USB 3.2 Gen2 (Port 0~3) 8x USB 2.0 (Port 0~7)		
Ethernet	Intel® I219LM		
Serial I/O	GPIO	8 bit GPIO (default 4 input/4 output)	
	I²C	Baud Rate：400KHz	
	SMBus	Baud Rate：100KHz	
	UART	TX/RX signal only	
PEG	1x PCIe Gen3 x16 (can be configured to 2x8,1x8. 2x4)		
PCI Express	8x PCIe Gen3 x1 (ocan be configured to x2, x4)		
Display	Default	Options	Resolution
	LVDS	LVDS (24bit, dual channel)	up to 1920x1200@60Hz
	DDI	DP 1.2	up to 4096x2304@60Hz
		HDMI 1.4	up to 4096x2304@24Hz
Security	TPM 2.0(Infineon SLB9670), Intel® AES		

PCOM-B654GL

MECHANICAL & ENVIRONMENT

Dimension	125 x 95mm
Power DC IN	Normal: +12V DC Wide range: +9VDC~ +18VDC AT/ATX mode
Storage Temperature	-20°C to 80°C
Operation Temperature	0°C to 60°C
Certification	Contact us
MTBF	Over 100,000 hours ar 40°C
Vibration	Contact us
OS	Windows 10 Red Hat, Ubuntu, CentOS

ORDERING GUIDE

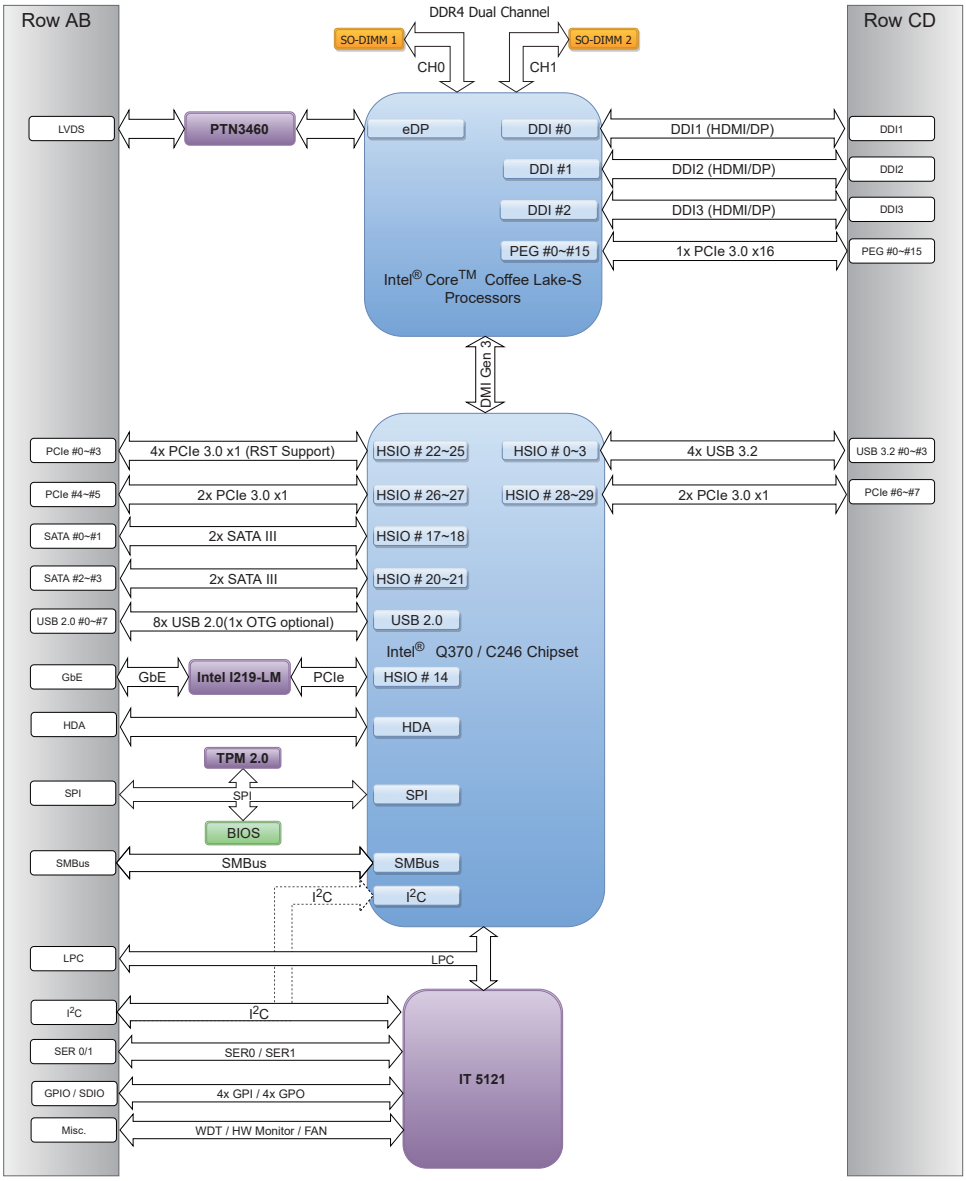
Product	Ordering P/N	Status
PCOM-B654GL-C246	AB1-3J46	Available
PCOM-B654GL-Q370	AB1-3J47	Available

Accessory	Ordering P/N	Status
PCOM-C605 (Mini-ITX Carrier Board)	AB1-3998	Available
PCOM-C60B (ATX Carrier Board)	AB1-3G22Z	Contact us
Cooler	B9971811	Available

BLOCK DIAGRAM

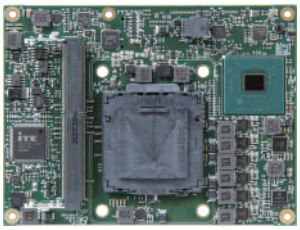
PCOM-B654VGL

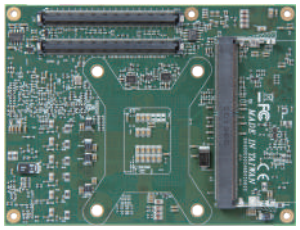
COM Express® Type 6 Basic Module 125x95mm | AT / ATX Mode | 12 VDC | 0 ~ +60° C



PCOM-B655VGL

Intel® Comet Lake-S Core™ Processor based on Type VI COM Express module with dual DDR4 SO-DIMM, DDI, LVDS, VGA, Gigabit Ethernet, SATA III, and USB 3.2 Gen2





FEATURES

- Intel® Core™ i9/i7/i5/i3 14nm process(Comet Lake-S)
- Support 2x DDR4-2933 Non-ECC/ECC SO-DIMMs, up to 2x 32GB (The bottom side SO-DIMM thickness is 5.2mm, no support 5.0mm carrier connector)
- Support USB2.0/3.2 Gen2, 4x SATAIII, 1x PCIe 3.0 x16, and 8x PCIe 3.0 x1
- Support LVDS, VGA, and 3x Display port/HDMI

PCOM-B655VGL is Intel® Comet Lake-S platform COM Express module. It is compatible with COMe 3.0 Type 6 carrier board. The desktop CPU on module offers customer higher computing power but lower cost comparing to mobile solutions. PCOM-B655VGL supports both ECC and Non-ECC DDR4 by different PCH SKUs(Q470E/W480E), which can be adapted to different applications. This module provides one PCIex16, eight PCIex1 (Option to one PCIex4), four USB 3.2 Gen2, and four SATA III.

General

Product	PCOM-B655VGL			
Form Factor	COM Express Type 6 Basic module (125 X 95mm)			
Processor	Intel® Core™			
	i9-10900TE	i7-10700TE	i5-10500TE	i3-10100TE
Core	10	8	6	4
Freq.	1.80 GHz	2.00 GHz	2.30 GHz	2.30 GHz
Turbo	4.50 GHz	4.40 GHz	3.70 GHz	3.60 GHz
Cache	20 MB Intel® Smart Cache	16 MB Intel® Smart Cache	12 MB Intel® Smart Cache	6 MB Intel® Smart Cache
Processor Graphics	Intel® UHD Graphics 630	Intel® UHD Graphics 630	Intel® UHD Graphics 630	Intel® UHD Graphics 630
Graphics Base Frequency	350 MHz	350 MHz	350 MHz	350 MHz
Graphics Max Dynamic Frequency	1.20 GHz	1.15 GHz	1.15 GHz	1.10 GHz
HW Encoding	H.264/AVC, H.265/HEVC, MPEG2, JPEG, VP8, VP9			
HW Decoding	H.264/AVC, VP8, VP9, H.265/HEVC, MPEG2, JPEG/MJPEG, VC-1/WMV9			
HW Acceleration	DirectX 11/12/OpenGL 4.5/OpenCL 2.1			
Processor TDP/cTDP	35 W	35 W	35 W	35 W
BIOS	AMI BIOS			
ECC Memory Supported	NO			YES(only with W480E PCH)
Memory	DDR 4 SO-DIMM up to 64GB 2933MT/s		DDR 4 SO-DIMM up to 64GB 2666MT/s	

*PCOM-B655VGL only supports Intel® 10th Generation 35W processors

I/O Interface

SATA	4 x SATA III (Port 0~3)		
USB	4x USB 3.2 Gen2 (Port 0~3) 8x USB 2.0 (Port 0~7)		
Ethernet	Intel® I219LM		
Serial I/O	GPIO	8 bit GPIO (default 4 input/4 output)	
	I²C	Baud Rate : 400KHz	
	SMBus	Baud Rate : 100KHz	
	UART	TX/RX signal only	
PEG	1x PCIe Gen3 x16 (can be configured to 2x8,1x8. 2x4)		
PCI Express	8x PCIe Gen3 x1 (can be configured to x2, x4)		
Display	Default	Options	Resolution
	LVDS	LVDS (24bit, dual channel)	1920 x 1200@60Hz
		eDP	2880 x 1800@60Hz
	DDI	DP 1.2	4096 x 2304@60Hz
		HDMI 1.4	4096 x 2160@30Hz
	VGA	VGA	1920 x 1200@60Hz
Security	TPM 2.0(Infineon SLB9670), Intel® AES		

PCOM-B655VGL

MECHANICAL & ENVIRONMENT

Dimension	125 x 95mm
Power DC IN	Normal: +12V DC AT/ATX mode
Storage Temperature	-20°C to 80°C
Operating Temperature	0°C to 60°C
Certification	Contact us
MTBF	TBD
Vibration	TBD
OS	Windows 10 Ubuntu, CentOS

ORDERING GUIDE

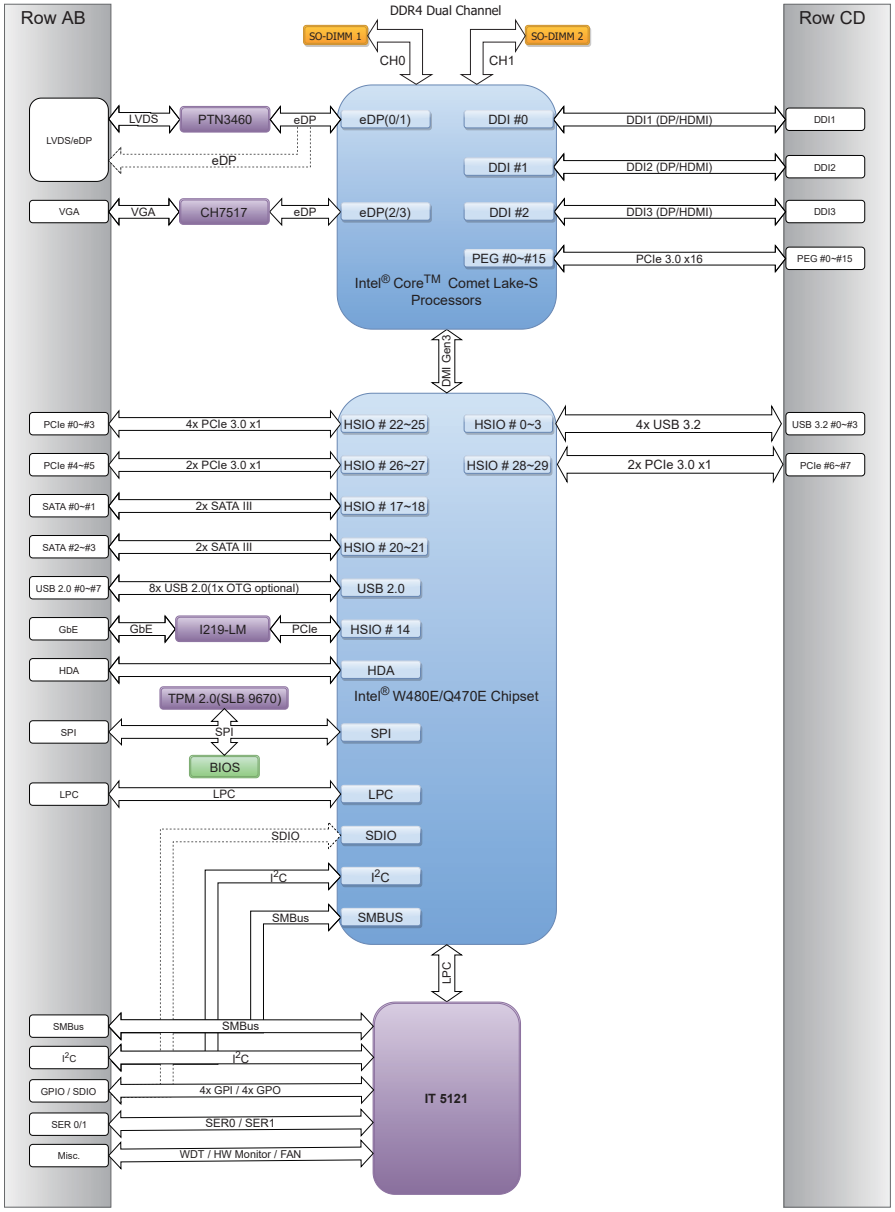
Product	Ordering P/N	Status
PCOM-B655VGL-W480E	AB1-3K44	Contact us
PCOM-B655VGL-Q470E	AB1-3K80	Contact us

Accessory	Ordering P/N	Status
PCOM-C60B (ATX Carrier Board)	AB1-3G22Z	Contact us
Cooler	B9971950	Contact us

BLOCK DIAGRAM

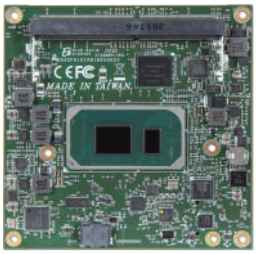
PCOM-B655VGL

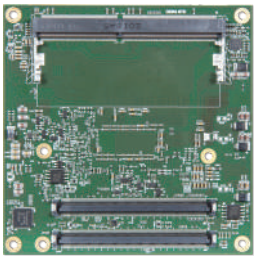
COM Express® Type 6 Basic Module 125x95mm | AT / ATX Mode | 12 VDC | 0 ~ +60° C



PCOM-B656VGL

Intel® Tiger Lake-UP3 Core™ Processor based on Type VI COM Express module with dual DDR4 SO-DIMM, DDI, eDP, Gigabit Ethernet, SATA 3.0, and USB 3.2





FEATURES

- Intel® Core™ i3/i5/i7/Celeron Processors 10nm process(Tiger Lake UP3)
- Support 2xDDR4-3200 Non-ECC SO-DIMMs, up to 32G per DIMM
- Support USB2.0/3.2, 2x SATAIII, 1x PCIe4.0 x4 and 5x PCIe 3.0 LANEs
- Support Display Port, HDMI, VGA, and LVDS/eDP

Portwell PCOM-B656VGL is designed with Intel® Tiger Lake-UP3 processor with Type 6 pin definition. It brings three important factors including DDR4 memory, PCIe Gen4, and USB 3.2 Gen2 x1 support. Extend PCIe Gen3 ports in PCOM-B656VGL can support high speed I/O card for more applications. In the meantime, it's compatible with COMe 3.0 Type 6 carrier board.

General

Product	PCOM-B656VGL			
Form Factor	Type 6, Compact Size Form Factor Express® (95 X 95mm)			
Processor	Intel® Core™			Intel® Celeron®
	i7-1185G7E i7-1185GRE	i5-1145G7E i5-1145GRE	i3-1115G4E i3-1115GRE	6305E
Core	4	4	2	2
Base Freq. @ TDP/cTDP	2.8/1.8/1.2 GHz	2.6/1.5/1.1 GHz	3.0/2.2/1.7 GHz	1.80 GHz
Turbo	4.4 GHz	4.1 GHz	3.9 GHz	N/A
Cache	12MB	8MB	6MB	4MB
Processor Graphics	Intel® Iris® Xe Graphics	Intel® Iris® Xe Graphics	Intel® Iris® Xe Graphics	Intel® UHD Graphics
Graphics Max Dynamic Frequency	1.35 GHz	1.30 GHz	1.25 GHz	1.25 GHz
HW Encoding	VP9 8/10 bit, H.265/HEVC 8/10 bit, H.264/AVC, MPEG2			
HW Decoding	AV1, VP9 8/10/12 bit, H.265/HEVC 8/10/12 bit, H.264/AVC, MPEG2			
Processor TDP/cTDP	28/15/12W	28/15/12W	28/15/12W	15W
BIOS	AMI BIOS			
ECC Memory Supported	NO			
Memory	2x SO-DIMM DDR4 up to 32GB 3200MHz per DIMM			

I/O Interface

SATA	2 x SATA III (Port 0~1)		
USB	4x USB 3.2 Gen2 (Port 1~4) 8x USB 2.0 (Port 0~7)		
Ethernet	Intel® I225LM 0°C to 60°C up to 2500BASE-T Intel® I225IT -40°C to 70°C up to 2500BASE-T Intel® I225IT -40°C to 85°C up to 1000BASE-T		
Serial I/O	GPIO	4x GPI & 4x GPO	
	I²C	Baud Rate : 400KHz	
	SMBus	Baud Rate : 100KHz	
	UART	Only RX/TX signal	
PEG	1x PCIe Gen4 x4		
PCI Express	1x PCIe Gen3 x4 / 2x PCIe Gen3 x2 / 4x PCIe Gen3 x1 / 1x PCIe Gen3 x2 + 2x PCIe Gen3 x1 (Port 0~3) 1x PCIe Gen3 x1 (Port 4) with I225 LAN 1x PCIe Gen3 x2 / 2x PCIe Gen3 x1 (Port 6,7) w/o USB 3.2		
Display	Default	Options	Resolution
	DDI1	DP1.4	Up to 5120x3200 @ 60Hz 24 bpp
		HDMI	Up to 4096x2304 @ 60Hz 24 bpp
	DDI2	DP1.4	Up to 5120x3200 @ 60Hz 24 bpp
		HDMI	Up to 4096x2304 @ 60Hz 24 bpp
	LVDS	eDP	Up to 4096x2304 @ 60Hz 24 bpp
		24bit dual channel LVDS	Up to 1920x1200 @ 60Hz
	VGA	VGA	Up to 1920x1200 @ 60Hz
Security	TPM 2.0(Infineon SLB9670), Intel® AES		

PCOM-B656VGL

MECHANICAL & ENVIRONMENT

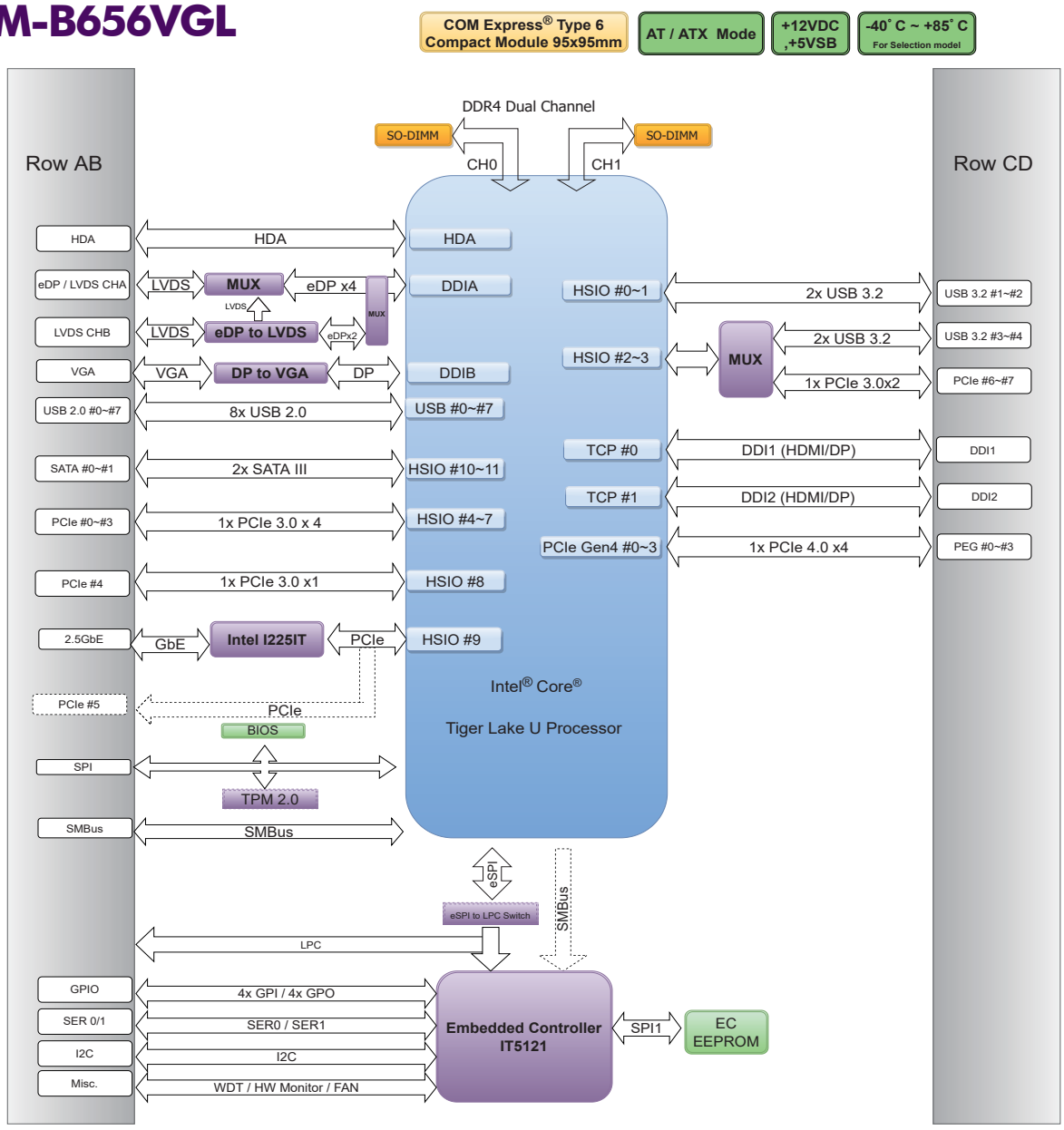
Dimension	95 x 95mm
Power DC IN	Normal: +12V DC, +5VSB DC AT/ATX mode
Storage Temperature	-40°C to 85°C
Operating Temperature	0°C to 60°C -40°C to 85°C (Selection Model)
Certification	Contact us
MTBF	Over 100,000 hours at 40°C
Vibration	Contact us
OS	Windows 10 Red Hat, Ubuntu, CentOS

ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-B656VGL-1185G7E	AB1-3L45	Available
PCOM-B656VGL-1185GRE	AB1-3L28	Available
PCOM-B656VGL-1145G7E	AB1-3L47	Available
PCOM-B656VGL-1145GRE	AB1-3L48	Available
PCOM-B656VGL-1115G4E	AB1-3L49	Available
PCOM-B656VGL-1115GRE	AB1-3L46	Available
PCOM-B656VGL-6305E	AB1-3L50	Available
Accessory	**Ordering P/N**	**Status**
PCOM-C60B (ATX Carrier Board)	AB1-3G22	Available
Cooler	B9972040	Available
Heat Sink	B830B270	Available
Heat Spreder	B830B280	Available

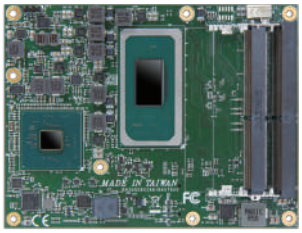
BLOCK DIAGRAM

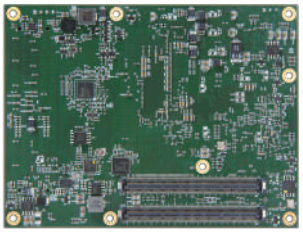
PCOM-B656VGL



PCOM-B657VGL

COM Express Type-VI Basic module with Intel® 11th Gen H Processor DDR4 SO-DIMM, DDI, PCIe Gen 4.0, USB 3.2 Gen2x1, 2.5 Gigabit TSN Ethernet, discrete TPM 2.0, eDP/LVDS, SATA III and VGA





FEATURES

- 11 Gen Intel® Core™ ,Celeron®, and Xeon® W-11000E Series processors in 10nm Super Fin Process technology
- AI/DL Instruction sets (Intel® VNNI, AVX-512, INT8, FP16), Up to 8C/16T@45W and 25W with wide temperature SKUs support
- 2x DDR4-3200 ECC/Non-ECC SO-DIMMs, up to 2x 32GB and 1x PCIe Gen 4.0 x16, and 8x PCIe Gen 3.0 x1
- 4x USB2.0/3.2 Gen 2x1, 4x USB2.0, 4x SATAIII, 3x DDI, eDP/LVDS, and VGA Support

PCOM-B657VGL is COM Express module based on Intel® 11th Gen H Processor. It is compatible with COMe 3.0 standard. The platform adopt 10nm++ process and VNNI instruction set, offers advance computing power with 45~25W theraml and industrial use condition for wide range applications. PCOM-B657VGL supports PCIe Gen 4.0 x16, and both ECC and Non-ECC DDR4 by different SKUs, which is best for mission critical use conditions and AI edge computing with TSN enabled. This module provides 8x PCIe x1 (Option to 2x PCIe x4 and support PCIe storage), four USB 3.2 Gen2 x1, and four SATA III. The fully integrated and flexible I/O capacity also mapped to wide range of industrial applications.

General

Product	PCOM-B657VGL Series (Embedded / Industrial SKUs)									
Form Factor	COM Express Type 6 Basic Module (125 X 95mm)									
SKU Type	General Embedded (0°C to 60°C)				Industrial 45W/35W (-40°C to 85°C)			Industrial 25W (0°C to 60°C)		
	i7-11850HE	i5-11500HE	i3-11100HE	Celeron 6600HE	W-11865MRE	W-11555MRE	W-11155MRE	W-11865MLE	W-11555MLE	W-11155MLE
Cores/Threads	8C/16T	6C/12T	4C/8T	2C/2T	8C/16T	6C/12T	4C/8T	8C/16T	6C/12T	4C/8T
Freq.	2.6 GHz	2.6 GHz	2.4 GHz	2.6 GHz	2.6 GHz	2.6 GHz	2.4 GHz	1.5 GHz	1.9 GHz	1.8 GHz
Turbo/1C	4.70 GHz	4.50 GHz	4.40 GHz	N/A	4.70 GHz	4.50 GHz	4.40 GHz	4.50 GHz	4.40 GHz	3.1 GHz
Intel® Smart Cache	24 MB	12 MB	8 MB	8 MB	24 MB	12 MB	8 MB	24 MB	12 MB	8 MB
Intel® UHD Gfx EU	32 EU	32 EU	16 EU	16 EU	32 EU	32 EU	16 EU	32 EU	32 EU	16 EU
Graphics Base Freq.	350 MHz									
Graphics Max Freq.	1350 MHz		1250 MHz	1100 MHz	1350 MHz		1250 MHz	1350 MHz		1250 MHz
HW Encoding	One VEBox:H.264/AVC, H.265/HEVC, JPEG, VP9									
HW Decoding	Two VDBoxes:H.264/AVC, VP9, H.265/HEVC, AV1, VC1, MPEG2, JPEG/MPEG, MPEG2									
HW Acceleration	DirectX 11/12, Open GL 4.5, OpenCL 2.1									
Processor TDP	45W / 35W			35W	45W / 35W			25W		
PCH	QM580E				RM590E					
Ethernet	Intel® I225LM				Intel® I225IT -40°C to 70°C up to 2500BASE-T -40°C to 85°C up to 1000BASE-T			Intel® I225LM		
ECC Memory Support	No				Yes					
BIOS	AMI BIOS									
Memory Type/Speed	DDR 4 SO-DIMM up to 64GB 3200MT/s									

I/O Interface

SATA	4 x SATA III (Port 0~3)		
USB	4x USB 3.2 Gen 2 x1 (Port 0~3) 8x USB 2.0 (Port 0~7)		
Serial I/O	GPIO	8 bit GPIO (default 4 input/4 output)	
	I²C	Baud Rate: 400KHz	
	SMBus	Baud Rate: 100KHz	
	UART	TX/RX signal only	
PEG	1x PCIe Gen 4.0 x16 (can be configured to 1 x16, 2 x8 or 1 x8 + 2 x4)		
PCI Express	8x PCIe Gen 3.0 x1 (can be configured to 8 x1, 4 x1 + 1 x4, or 2 x4) Support Intel® RST for PCIe Storage for both x4 Link		
Display	Default	Options	Resolution
	LVDS / eDP (Default LVDS)	LVDS (24bit, dual channel)	1920 x 1200 @60Hz
		eDP 1.4b HBR3	2880 x 1800 @60Hz
	DDI	DP 1.4 HBR3	7680 x 4320 @30Hz
		HDMI 2.0b	3840 x 2160 @60Hz
	VGA	VGA	1920 x 1200 @60Hz
Security	TPM 2.0 (Infineon SLB9670), Intel® AES-NI, Intel® SHA Extensions, Intel® DAL		

PCOM-B657VGL

MECHANICAL & ENVIRONMENT

Dimension	125 x 95mm
Power DC IN	Normal: +12V DC AT/ATX mode
Storage Temperature	-40°C to +85°C
Operation Temperature	0°C to 60°C (General Embedded SKU) 0°C to 60°C (Industrial 25W SKU) -40°C to +85°C (Industrial 45W/35W SKU)
Certification	Contact us
MTBF	TBD
Vibration	TBD
OS	Windows 10 Ubuntu, CentOS, Yacto

Accessory	Ordering P/N	Status
Cooler (spring loaded copper slog)	B9972030	Available
Cooler (Aluminum)	B9972050	Available
Heatsink (spring loaded copper slog)	B830B680	Available
Heatsink (Aluminum)	B830B670	Available

ORDERING GUIDE

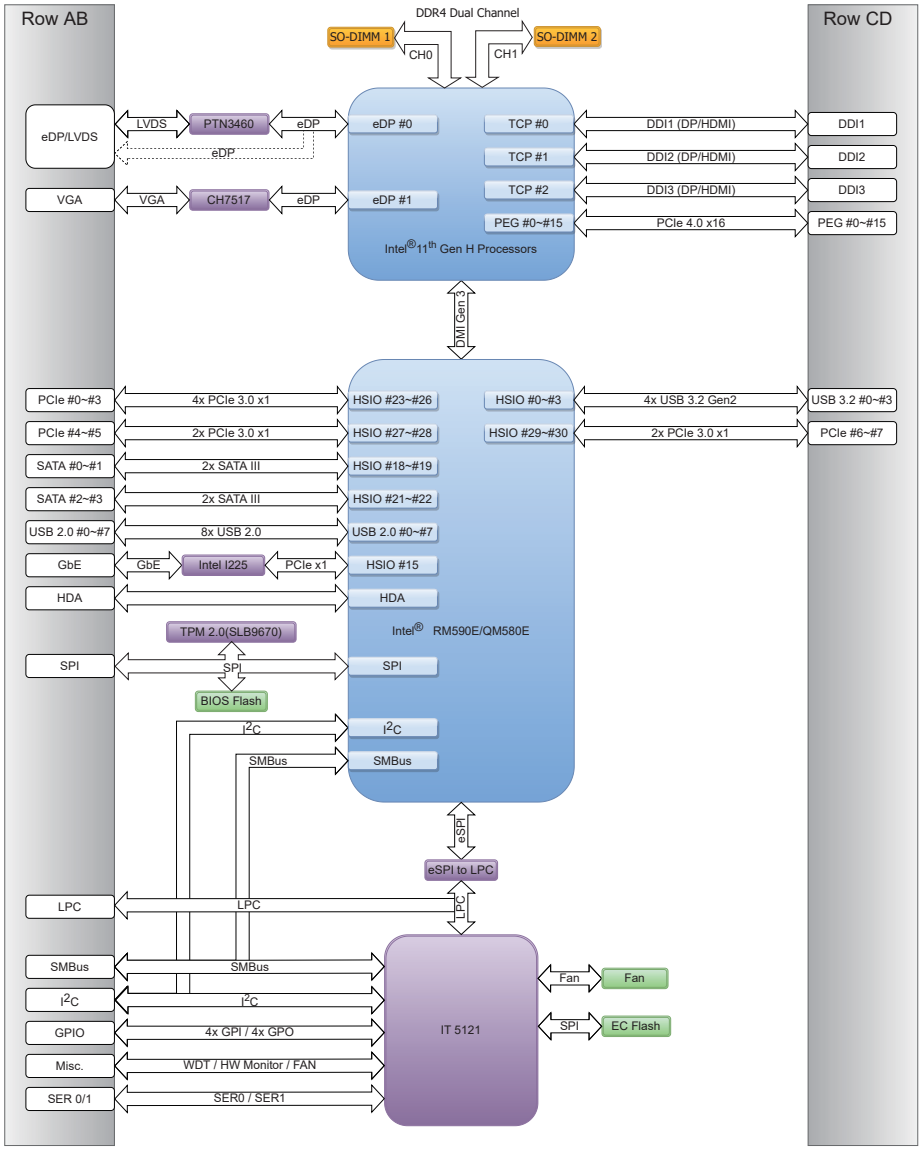
Product	Ordering P/N	Status
PCOM-B657VGL-11850HE	AB1-3L58	Available
PCOM-B657VGL-11500HE	AB1-3L67	Available
PCOM-B657VGL-11100HE	AB1-3L65	Available
PCOM-B657VGL-6600HE	AB1-3L66	Available
PCOM-B657VGL-11865MRE	AB1-3L57	Available
PCOM-B657VGL-11555MRE	AB1-3L64	Available
PCOM-B657VGL-11155MRE	AB1-3L63	Available
PCOM-B657VGL-11865MLE	AB1-3L59	Available
PCOM-B657VGL-11555MLE	AB1-3L62	Available
PCOM-B657VGL-11155MLE	AB1-3L61	Available

Accessory	Ordering P/N	Status
Heatspreader(whole copper)	B830B650	Contact Us
Heatspreader (Aluminum)	B830B660	Contact Us
Carrier (Mini-ITX)PCOM-C605	AB1-3998	Available
Evaluation Carrier (ATX)PCOM-C60B	AB1-3G22	Available

BLOCK DIAGRAM

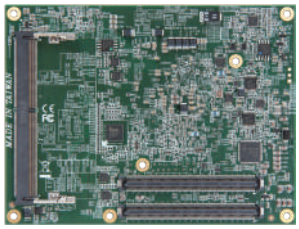
PCOM-B657VGL

COM Express® Type 6 Basic Module 125x95mm | AT / ATX Mode | +12VDC +5VSB | -40° C ~ +85° C



PCOM-B700G-NS

Intel® Xeon® D-1600 series SoC based on Type 7 Basic COM Express® module



FEATURES

- Intel® Xeon® D-1600 Series Processor (Hewitt Lake)
- 3x DDR4 SO-DIMM
- TDP 35w to 45w consumption
- Support -40°C to 85 °C wide temperature(Selected SKU)
- Support Intel® QuickAssist Technology (Intel® QAT)

PCOM-B700G-NS, a Type 7 COM Express® basic size(125 x 95 mm) module which based on Intel® Hewitt Lake Xeon® D-1600 series processors. In this architecture, it could provide up to 8 cores and up to 16 threads processors within the TDP from 35w to 45w, and 4x 10G KR ports and up to 30 Gbps of cryptography offload with Intel® QuickAssist Technology (Intel® QAT), it's also extending 24x PCIe 3.0 and 8x PCIe 2.0 lanes, 4x USB 3.2 Gen1, and 2x SATA III ports. A selected SKU (D-1649N) support wide-temperature range. PCOM-B700G-NS offer an effective upgrade path for solutions already using the previous D-1500 COM Express modules. Portwell want to promotes PCOM-B700G-NS as vertical solution to aim in the different versatile applications, such as edge computing, automation, military, transportation and so on.

General

Product	PCOM-B700G-NS				
Form Factor	Type 7, Basic Form Factor COM-Express® (125 x 95 mm)				
Processor	Intel® Xeon®				
	D-1649N	D-1633N	D-1623N	D-1627	D-1649N (wide-temp)
Core	8	6	4	4	8
Freq.	2.3 GHz	2.5 GHz	2.4 GHz	2.9 GHz	2.3 GHz
Turbo	3.0 GHz	3.2 GHz	3.2 GHz	3.2 GHz	3.0 GHz
Cache	12 MB	9 MB	6 MB	6 MB	12 MB
Processor Graphics	N/A				
Graphics Base Freq.	N/A				
Ethernet	4x 10G KR 1x GbE LAN (I210AT)				4x 10G KR 1x GbE LAN (I210IT)
Intel® QAT (Gbps)	20 Gbps	10 Gbps	10 Gbps	N/A	20 Gbps
Processor TDP	45 W	45 W	35 W	45 W	45 W
BIOS	AMI BIOS				
Memory	3x DDR4 SO-DIMM				
Temperature Range	0°C to 60 °C	0°C to 60 °C	0°C to 60 °C	0°C to 60 °C	-40°C to 85 °C

I/O Interface

SATA	2 x SATA III	
USB	8 x USB 2.0 4 x USB 3.2 Gen1	
Ethernet	4x 10G KR 1x GbE LAN (I210AT/IT)	
Serial I/O	GPIO	8 GPIO
	I²C	Baud Rate: 400KHz
	SMBus	Baud Rate: 100KHz
	UART	2 Serial Port (Tx/Rx)
PCI Express	24x PCIe 3.0 8x PCIe 2.0	
Display	N/A	
Security	TPM 2.0, Intel®AES	

PCOM-B700G-NS

MECHANICAL & ENVIRONMENT

Dimension	125 x 95mm
Power DC IN	12v ±5%
Storage Temperature	-40°C to 85°C
Operation Temperature	0°C to 60°C (selected SKU -40°C to 85 °C)
Certification	Contact us
MTBF	TBD
Vibration	TBD
OS	Windows 10 Linux Wind River7/Ubuntu/Yocto RTOS Windriver

ORDERING GUIDE

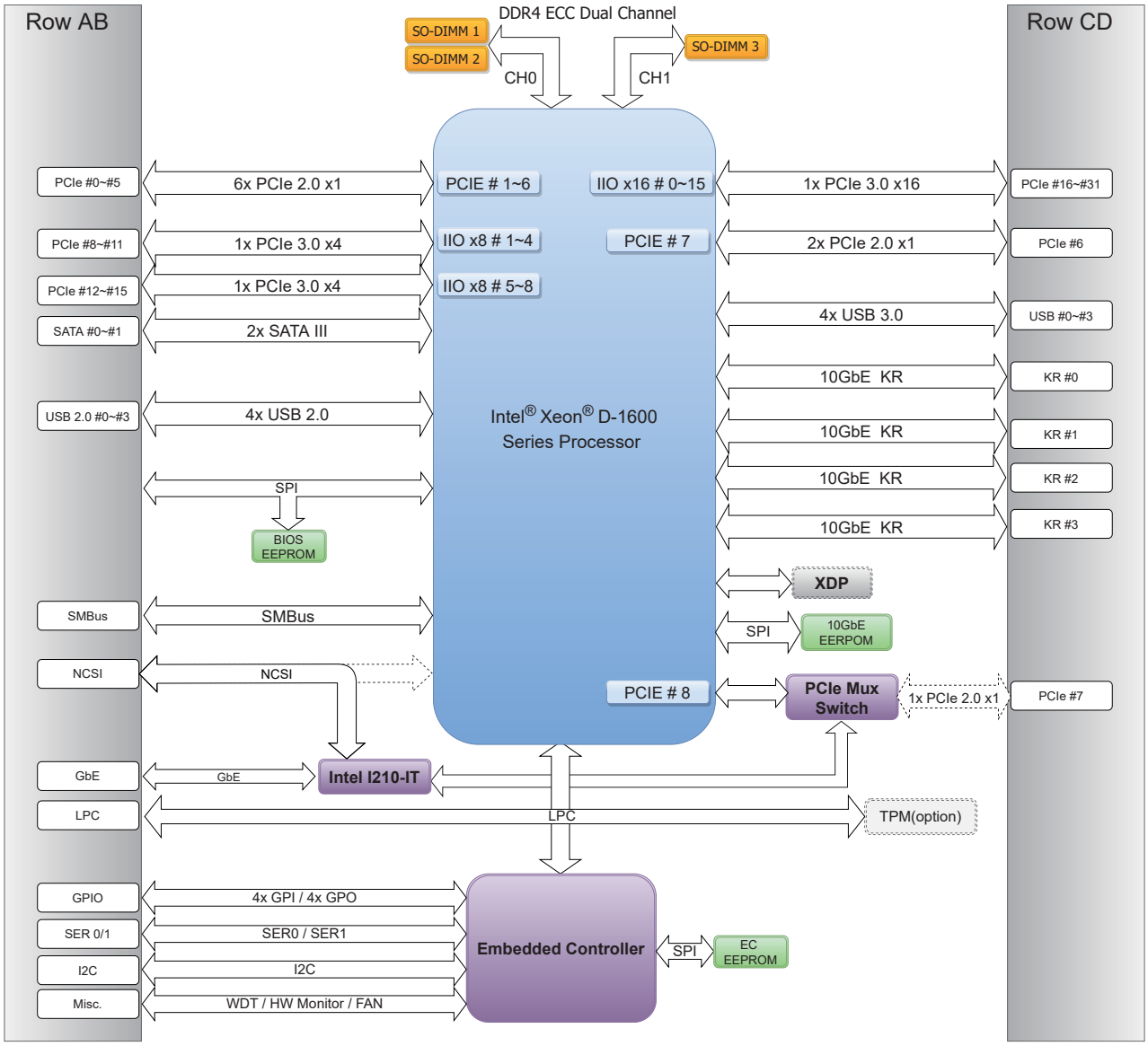
Product	Ordering P/N	Status
PCOM-B700G-NS-D1649N	AB1-3K99	Contact us
PCOM-B700G-NS-D1633N	AB1-3L02	Contact us
PCOM-B700G-NS-D1623N	AB1-3L00	Contact us
PCOM-B700G-NS-D1627	AB1-3L01	Contact us
PCOM-B700G-NS-D1649N-WT	AB1-3L89	Contact us

Accessory	Ordering P/N	Status
Cooler	B9972000	Available
Heat Sink	B830B350	Available
Heat Spreader	B830B360	Contact us

BLOCK DIAGRAM

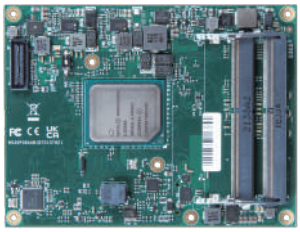
PCOM-B700G-NS

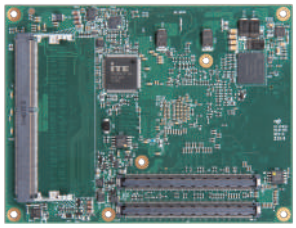
COM Express® Type 7 Basic Size 125x95mm | AT / ATX Mode | -40˚C ~ +85˚C (Selected SKUs)



PCOM-B701GT

Intel® Atom® C3000/C3000-Refresh series SoC based on Type 7 Basic COM-Express® module with 3x DDR4 ECC SO-DIMM Socket





FEATURES

- Intel® Atom® C3000 Refresh series processors
- DDR4 ECC SDRAM up to maxium capacity 96GB and maxium data rate 2400 MT/s
- 4x 10GBASE-KR port (Selected SKUs) and NC-SI Support
- Capable of Industrial temperture -40°C to 85°C(only for eTemp SKUs)
- Support Intel® QAT Technology

RoHS

PCOM-B701GT, a COM Express® COM.0 R3.0 basic size type 7 module, is developed by Portwell Taiwan aiming at Networking and IOTG appliaction. The module implements Atom® C3000 Refresh series processors. It offers connectivity interface such as 4x 10GbE KR, 1xPCIe Gen 3.0 x8, 2x USB 3.0, 4x USB 2.0, and 2x SATA III I/O expansion, it also supports Intel® QuickAssist Technology (Intel® QAT), NC-SI, and extended temperature (-40°C to 80°C) by selected SKUs.

General

Product	PCOM-B701GT					
Form Factor	Type 7, Basic Form Factor COM-Express® (125 x 95 mm)					
Processor	Network and Enterprise (0°C to 60°C)		Extended Temperature (-40°C to 85°C)			
	C3758R	C3558R	C3808	C3708	C3508	C3308
Core	8	4	12	8	4	2
Freq.	2.4 GHz	2.4 GHz	2.0 GHz	1.7 GHz	1.6 GHz	1.6 GHz
Turbo	N/A					2.1 GHz
Cache	16MB	8MB	16MB	12MB	8MB	4MB
Intel® QuickAssist Technology (Intel® QAT)	Yes					
ntel® QAT Speed	High	Medium	High	Medium	Low	Low
Intel® QAT Cryptographic Functions	Yes					
Intel® QAT Compression/ Decompression	Yes					
Ethernet 10G KR	4	2	4	4	N/A	N/A
Processor TDP	26W	17W	25W	17W	11.5W	9W
BIOS	AMI BIOS					
ECC	Yes					
Storage	eMMC 5.0 onboard, default capacity 16GB (up to 64GB)					
Memory	3x SO-DIMM DDR4 up to 96GB 2400 MT/s		3x SO-DIMM DDR4 up to 96GB 2133MT/s		3x SO-DIMM DDR4 up to 64GB 1866MT/s	

I/O Interface

SATA	2x SATA III		1x SATA III	1x SATA III
USB	2x USB 3.0		1x USB 3.0	N/A
Ethernet	Intel® I210AT	Intel® I210IT		
Serial I/O	GPIO: 8 GPIO			
	I²C: Baud Rate: 400KHz			
	SMBus: Baud Rate: 100KHz			
	UART: 2 Serial Port (Tx/Rx)			
PCI Express	1x PCIe Gen 3.0 x4 or 2 PCIe Gen 3.0 x2 and 1x PCIe Gen 3.0 x2 1x PCIe Gen3.0 x8 or 2x PCIe Gen3 x4 or 4x PCIe Gen3 x2			
Security	TPM 2.0			

PCOM-B701GT

MECHANICAL & ENVIRONMENT

Dimension	125 x 95mm
Power DC IN	Normal : +12V AT Mode
Storage Temperature	-40°C to 85°C
Operating Temperature	-40°C to 85°C (C3808 & C3708 & C3508 & C3308) 0°C to 60°C (C3758R & C3558R)
Certification	Contact us
MTBF	Contact us
Vibration	Contact us
OS	Windows Server Ubuntu, Fedora, Yocto, CentOS, FreeBSD Red Hat Enterprise, SUSE SuSE, Wind River

ORDERING GUIDE

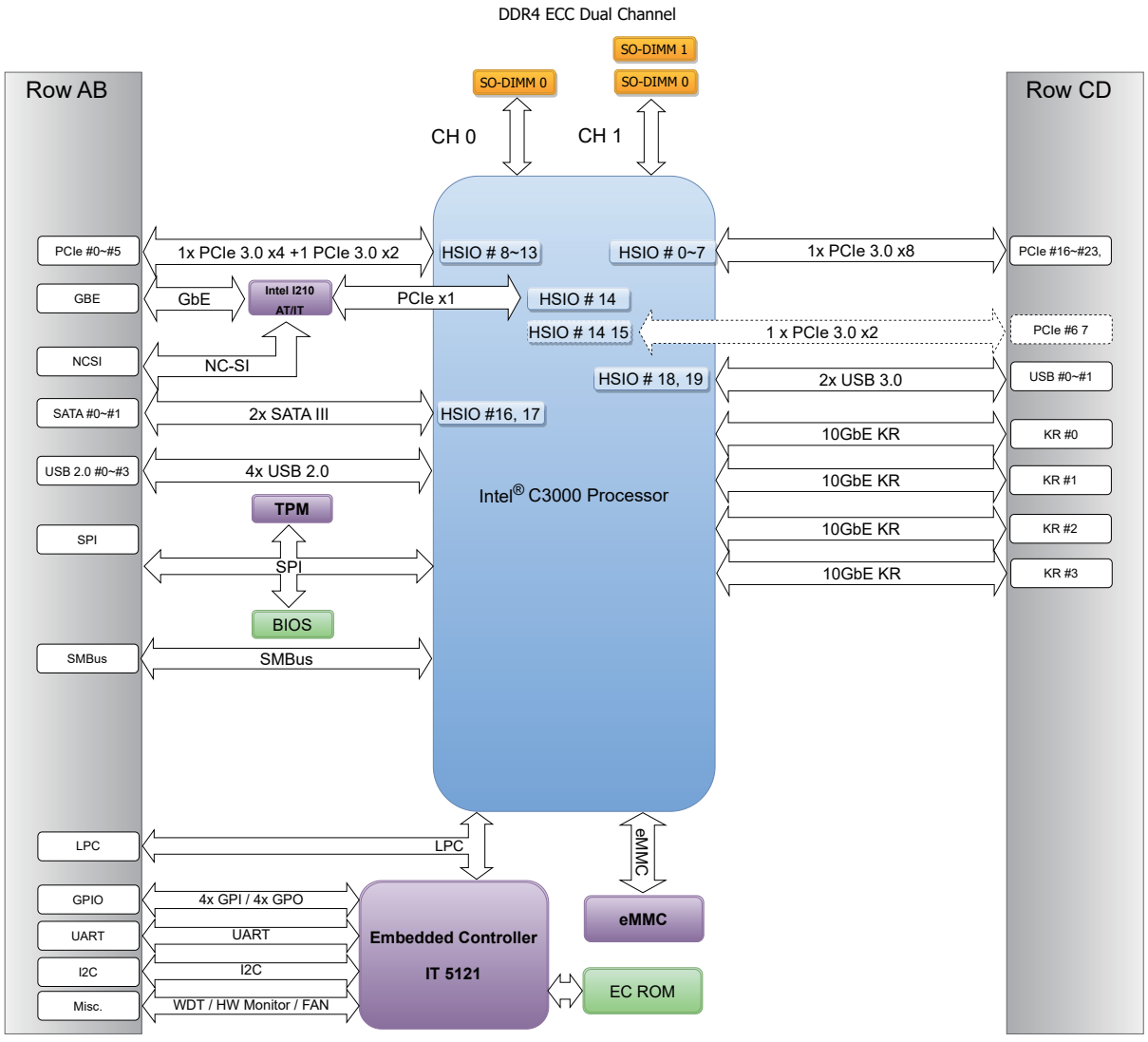
Product	Ordering P/N	Status
PCOM-B701GT-C3808	AB1-3H90	Contact us
PCOM-B701GT-C3708	AB1-3H89	Contact us
PCOM-B701GT-C3508	AB1-3H86	Contact us
PCOM-B701GT-C3308	AB1-3J01	Contact us
PCOM-B701GT-C3758R	AB1-3P54	Contact us
PCOM-B701GT-C3558R	AB1-3P55	Contact us

Accessory	Ordering P/N	Status
Cooler	B9972070	Available
Heat Sink	B830B710	Available
Heat Spreader	B830B720	Available
PCOM-C701 (ATX Carrier board)	AB1-3J61Z	Available
PCOM-C701-BMC (ATX Carrier board)	AB1-3K14Z	Available

BLOCK DIAGRAM

PCOM-B701GT R1

COM Express® Type 7 Compact Module 125x95mm | AT Mode | 12VDC+/-20% | -40˚ C ~ +85˚ C (Selected SKUs)



PCOM-B702G

Intel Atom® processor C3000 Series with DDR4 ECC up to 64GB 2133 MT/s on Two SO-DIMM Sockets with up to 12 HSIO Lanes, 4x KR to support 10G, NC-SI Interface, SATA III, USB 2.0 and 3.0

FEATURES

- Intel Atom® Processors C3000 Series (Denverton)
- DDR4 1866/2133 MT/s ECC up to 64GB
- Up to 12 HSIO Lanes (based on CPU sku)
- High-speed Ethernet, 4x 10GbE (based on CPU sku) and 1x GbE interfaces
- Wide-Temp (-40°C to 85°C by selected sku) Support

PCOM-B702G, a Type 7 COM Express module, is designed with Intel Atom® processor. Based on the COM Express 3.0 Type 7 pinout definition, when compared to the Type 6 pinout, trades all the graphic interfaces for 10 GbE ports and more PCIe lanes, makes PCOM-B702G ideal for applications in networking , micro server and the like, requiring low power consumption while supporting high computing performance and communication throughput.

PCOM-B702G features four 10GbE LAN interfaces (based on CPU sku) and DDR4 ECC SO-DIMM up to 64GB. It is compatible with Type 7 carrier board.

General

Product	PCOM-B702G			
Form Factor	Type 7, Compact Size Form Factor COM Ecpress® (95 X 95mm)			
Processor	Intel® Atom®			
	C3308	C3338	C3508	C3558
Core	2	2	4	4
Freq.	1.60 GHz	1.50 GHZ	1.60 GHz	2.20 GHz
Turbo	2.10 GHz	2.20 GHz	1.60 GHz	2.20 GHz
Cache	4MB	4MB	8MB	8MB
Processor Graphics	N/A			
Graphics Base Frequency				
Graphics Max Dynamic Frequency				
HW Encoding				
HW Decoding				
HW Acceleration				
Processor TDP	9.5W	8.5W	11.5W	16W
BIOS	AMI BIOS			
ECC Memory Supported	YES			
Memory	1x SO-DIMM DDR4 up to 32GB 1866 MT/s		2x SO-DIMM DDR4 up to 64GB 1866 MT/s	2x SO-DIMM DDR4 up to 64GB 2133 MT/s

I/O Interface

SATA	1x SATA III (2x SATA III for C3558)	
USB	1x USB 3.0 (2x USB 3.0 for C3338 and C3558) 4x USB 2.0	
Ethernet	Intel® I210IT	
Serial I/O	GPIO	8 bit GPIO (4 in, 4 out)
	I²C	Frequency:100kHz (Default) / 400kHz (available)
	SMBus	Frequency:100kHz (Default) / 400kHz (available)
	UART	2x UART
PCI Express	C3308: 4x PCIe Gen3 x1 C3338: 1x PCIe Gen3 x4 & 3x PCIe Gen3 x1 C3508: 1x PCIe Gen3 x4 & 2x PCIe Gen3 x1 C3558: 1x PCIe Gen3 x4 & 3x PCIe Gen3 x1	
Security	N/A	

PCOM-B702G

MECHANICAL & ENVIRONMENT

Dimension	95 x 95mm
Power DC IN	12V DC IN AT mode
Storage Temperature	-40°C ~ 85°C
Operating Temperature	-40°C ~ 85°C
Certification	Contact us
MTBF	Contact us
Vibration	Contact us
OS	Windows 10 Pro, CentOS 7.6

ORDERING GUIDE

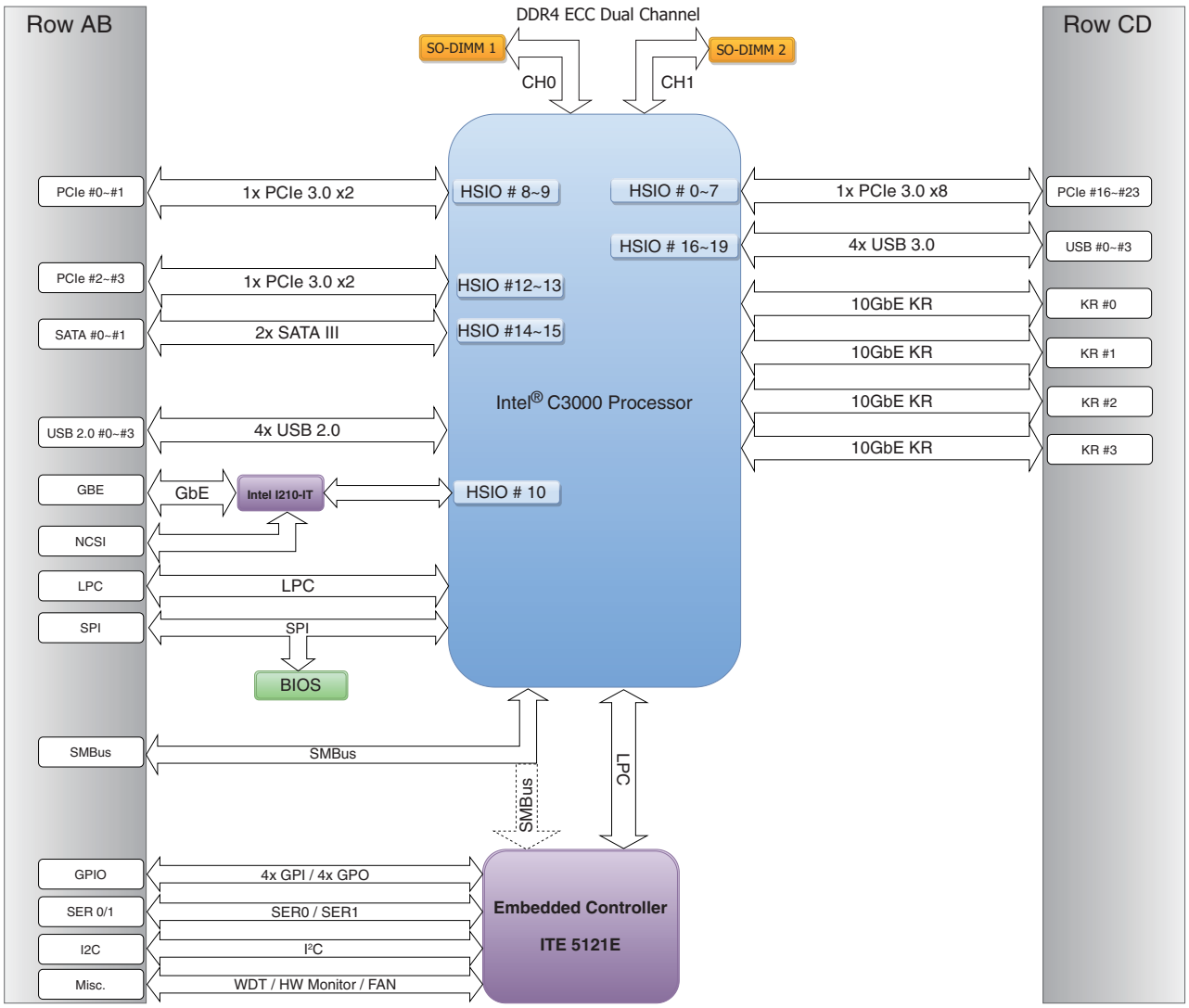
Product	Ordering P/N	Status
PCOM-B702G-C3558	AB1-3H49	Available
PCOM-B702G-C3508	AB1-3J40	Available
PCOM-B702G-C3338	AB1-3H46	Available
PCOM-B702G-C3308	AB1-3H45	Available

Accessory	Ordering P/N	Status
Cooler	TBD	Contact us
Heat Sink	B830A920	Available
Heat Spreader	TBD	Contact us
PCOM-C701(ATX Carrier board)	AB1-3J61Z	Available
PCOM-C701-BMC (ATX Carrier board)	AB1-3K14Z	Contact us

BLOCK DIAGRAM

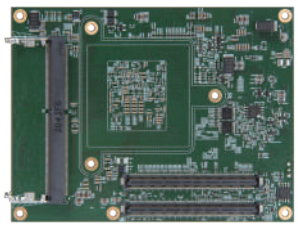
PCOM-B702G

COM Express® Type 7 Compact Module 95x95mm | AT Mode | 12VDC+/-20% | -40° C ~ +85° C (Selected SKUs)



PCOM-B704-GT

COM Express Type 7 Basic module with Intel® Xeon® D-1700 series Processor (Ice-Lake-D LCC)



FEATURES

- Intel® Xeon® D-1700 Series Processor (Ice-Lake-D LCC)
- AI/Deep Learning Accelerate Data Analytics with Intel® AVX-512 and VNNI
- 4x USB2.0/3.2 Gen 2x1, 2x SATAIII, 4x 10G KR, 2x UART
- TDP 40w to 67w consumption
- Selected SKU support -40°C to 85°C wide temperature

PCOM-B704GT, a Type 7 COM Express® basic size(125 x 95 mm) module which based on Intel® Xeon® Ice-Lake-D LCC D-1700 series processors. It is compatible with COMe 3.0 standard. In this architecture, it could provide up to 10 cores processors within the TDP from 40w to 67w. A selected SKU support wide-temperature range.PCOM-B704GT features four 10GbE KR LAN interfaces,16 PCIe 4.0 lanes and 16 PCIe 3.0 lanes,TPM 2.0 and two DDR4 SO-DIMM up to 64GB in total. Portwell wants to promote PCOM-B704GT as a vertical solution to aim in the different versatile applications, such as edge computing, automation, military, transportation and so on.

General

Product	PCOM-B704GT				
Form Factor	Type 7, Basic Form Factor COM-Express® (125 x 95 mm)				
Processor	Intel® Xeon® D-1700 series				
	D-1712TR	D-1715TER	D-1735TR	D-1732TE	D-1746TER
Core	4	4	8	8	10
Freq.	2.0 GHz	2.4 GHz	2.2 GHz	1.9 GHz	2.0 GHz
Turbo	2.5 GHz	2.9 GHz	2.7 GHz	2.4 GHz	2.5 GHz
Cache	10MB	10MB	15MB	15MB	15MB
Processor Graphics	N/A				
Graphics Base Frequency	N/A				
Ethernet	Intel® I210IT				
Processor TDP	40W	50W	59W	52W	67W
BIOS	AMI BIOS				
ECC Memory Supported	Yes				
Memory	2x DDR4 SO-DIMM up to 64GB 2933MT/s				
Temperature Range	0 ~ 60 °C	-40 ~ 85 °C	0 ~ 60 °C	-40 ~ 85 °C	-40 ~ 85 °C

I/O Interface

SATA	2 x SATA III	
USB	4 x USB 3.2 Gen1/USB 2.0	
Ethernet	4x 10G KR 1x GbE LAN	
Serial I/O	GPIO	8 bit GPIO (Default 4 input/4 output)
	I²C	Frequency:50kHz (Default) / 400kHz (available)
	SMBus	Frequency:100kHz (Default) / 1MHz (available)
	UART	2 Serial Port (TX/RX signal only)
PCI Express	16x PCIe 3.0 16x PCIe 4.0	
Display	N/A	
Security	TPM 2.0, Intel®AES	

PCOM-B704-GT

MECHANICAL & ENVIRONMENT

Dimension	125 x 95 mm
Power DC IN	Normal: +12V DC AT/ATX mode
Storage Temperature	-40 ~ 85 °C
Operating Temperature	-40 ~ 85 °C (Selected SKU 0 ~ 60 °C)
Certification	Contact us
MTBF	Contact us
Vibration	Contact us
OS	Windows 10 IoT Enterprise Windows Server Linux

ORDERING GUIDE

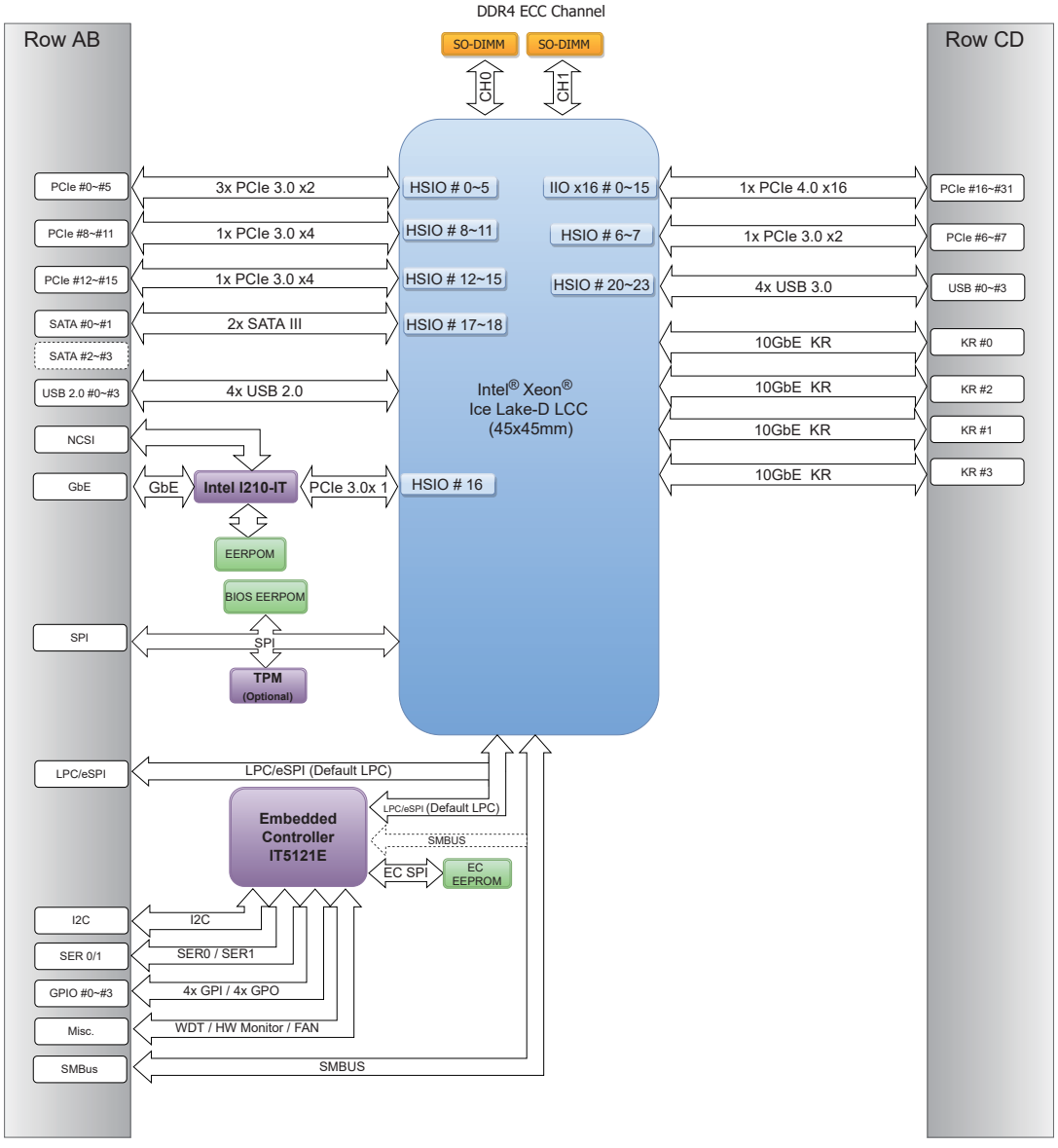
Product	Ordering P/N	Status
PCOM-B704GT-D1746TER	TBD	In Development
PCOM-B704GT-D1735TR	TBD	In Development
PCOM-B704GT-D1732TE	TBD	In Development
PCOM-B704GT-D1715TER	TBD	In Development
PCOM-B704GT-D1712TR	TBD	In Development

Accessory	Ordering P/N	Status
Cooler	TBD	In Development
Heat Sink	TBD	In Development
Heat Spreader	TBD	In Development

BLOCK DIAGRAM

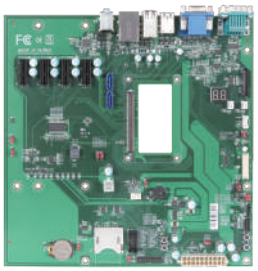
PCOM-B704-GT

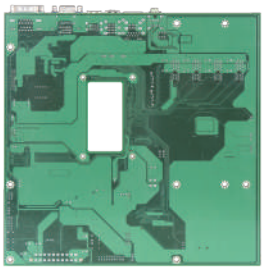
COM Express® Type 7 Basic Module 125x95mm | AT / ATX Mode | -40˚C ~ +85˚C (Selected SKUs)



PCOM-CA00

Micro-ATX Form Factor Evaluation Carrier Board for Type 10 Com-Express® Rev 3.0 Module





FEATURES

- COM Express® carrier board is compatible with the Portwell Type 10 COM Express® modules
- Micro-ATX form factor provides extra expansions slot, and follows the standard space mounting
- Supports 2x USB 3.0, 8x USB 2.0, 2x SATAIII, 4x PCIe x1

Portwell PCOM-CA00 provides the COM-Express type 10 connector with Micro-ATX form factor. This carrier board passed all of Portwell evaluation testing. And it supports VGA(via eDP), LVDS and DP display, and multiple I/O interfaces, including 4x PCIe x1, 1x 2.5Gb RJ45, 2x USB 3.0, 8x USB 2.0, 2x serial ports, and 2x SATA III. For more product features, please refer to the user manual or contact your distributor.

General

Product	PCOM-CA00
Form Factor	Type 10, Micro-ATX (244 x 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	2x USB 3.0, 8x USB2.0		
Ethernet	1x 2.5Gb RJ45		
Serial I/O	GPIO	8 GPIO	
	I²C	Baud Rate：400KHz	
	SMBus	Baud Rate：100KHz	
	UART	2 Serial Port (Tx/Rx)	
PEG	N/A		
PCI Express	4 x PCIe x 1		
Display	Default	Options	Resolution
	LVDS / eDP	LVDS (24bit, dual channel)	Up to 1920x1200 @60Hz
		eDP to VGA	Up to 1920x1200 @60Hz
	DDI	DP	Up to 1920x1600 @60Hz
Security	N/A		

PCOM-CA00

MECHANICAL & ENVIRONMENT

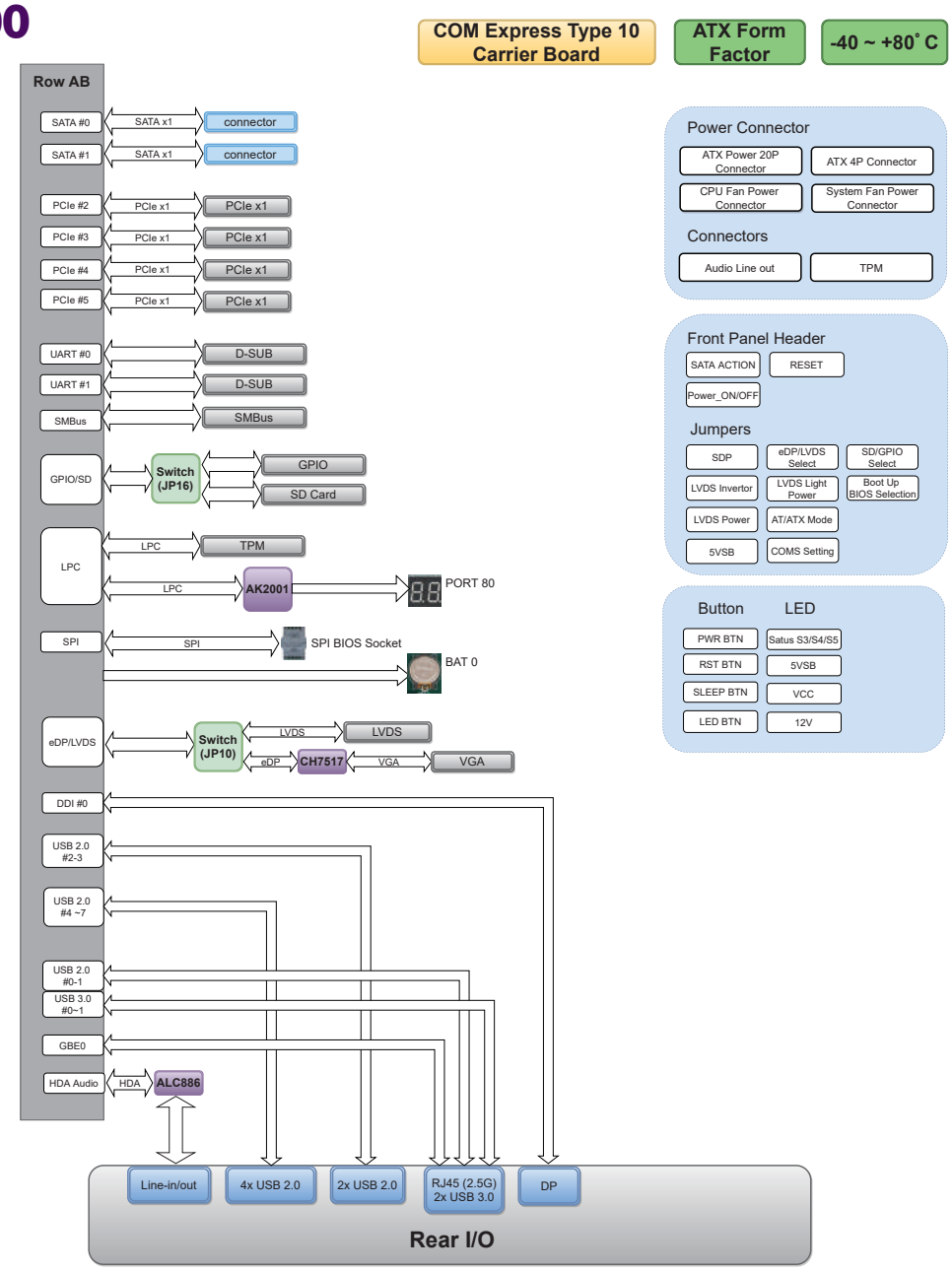
Dimension	244 x 244 mm
Power DC IN	Micro-ATX
Storage Temperature	-40°C to 80°C
Operation Temperature	-40°C to 80°C
Certification	Contact us
MTBF	Over 100,000 hours at 40°C
Vibration	N/A
OS	Depends on module

ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-CA00	AB1-3917	Available

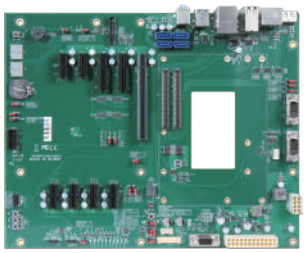
BLOCK DIAGRAM

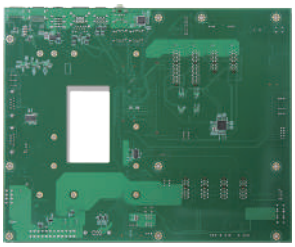
PCOM-CA00



PCOM-C60B

ATX Form Factor Evaluation Carrier Board for Type 6 Com-Express® Rev 3.0 Module





FEATURES

- COM Express® carrier board is compatible with the Portwell Type 6 COM Express® modules
- Support 4x USB 3.2, 8x USB 2.0, 4x SATA III Ports
- Support multiple displays(eDP, DP, VGA, LVDS)
- Support 1x PEG(Gen4), 2x PCIex 4, 6x PCIe x1, 2.5G Ethernet

RoHS

Portwell PCOM-C60B is designed to as a validation board for most of the Portwell COM-Express 3.0 type 6 modules, this carrier will support VGA, eDP/LVDS, DP displays, and included multiple I/O expansions, for example PEG, PCIe, USB3.2, SATAIII and 2.5G ethernet.

General

Product	PCOM-C60B
Form Factor	Type6, ATX (305 X 244mm)
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	4x SATA III		
USB	4x USB 3.2 Gen2 8x USB 2.0 / 1 OTG		
Ethernet	1x GbE (1G/2.5G)		
Serial I/O	GPIO	8 bit GPIO	
	I²C	base on module design	
	SMBus	base on module design	
	UART	2 x Serial Port (Tx/Rx)	
PEG	1x PCIe x16 (Gen4)		
PCI Express	2 x PCIe x 4 6 x PCIe x 1		
Display	Default	Options	Resolution
	VGA	VGA	Depends on module
	LVDS	24bit dual channel LVDS	
		eDP	
	DDI0	DP	
	DDI1	DP	
	DDI2	DP	
Security	Depends on module		

PCOM-C60B

MECHANICAL & ENVIRONMENT

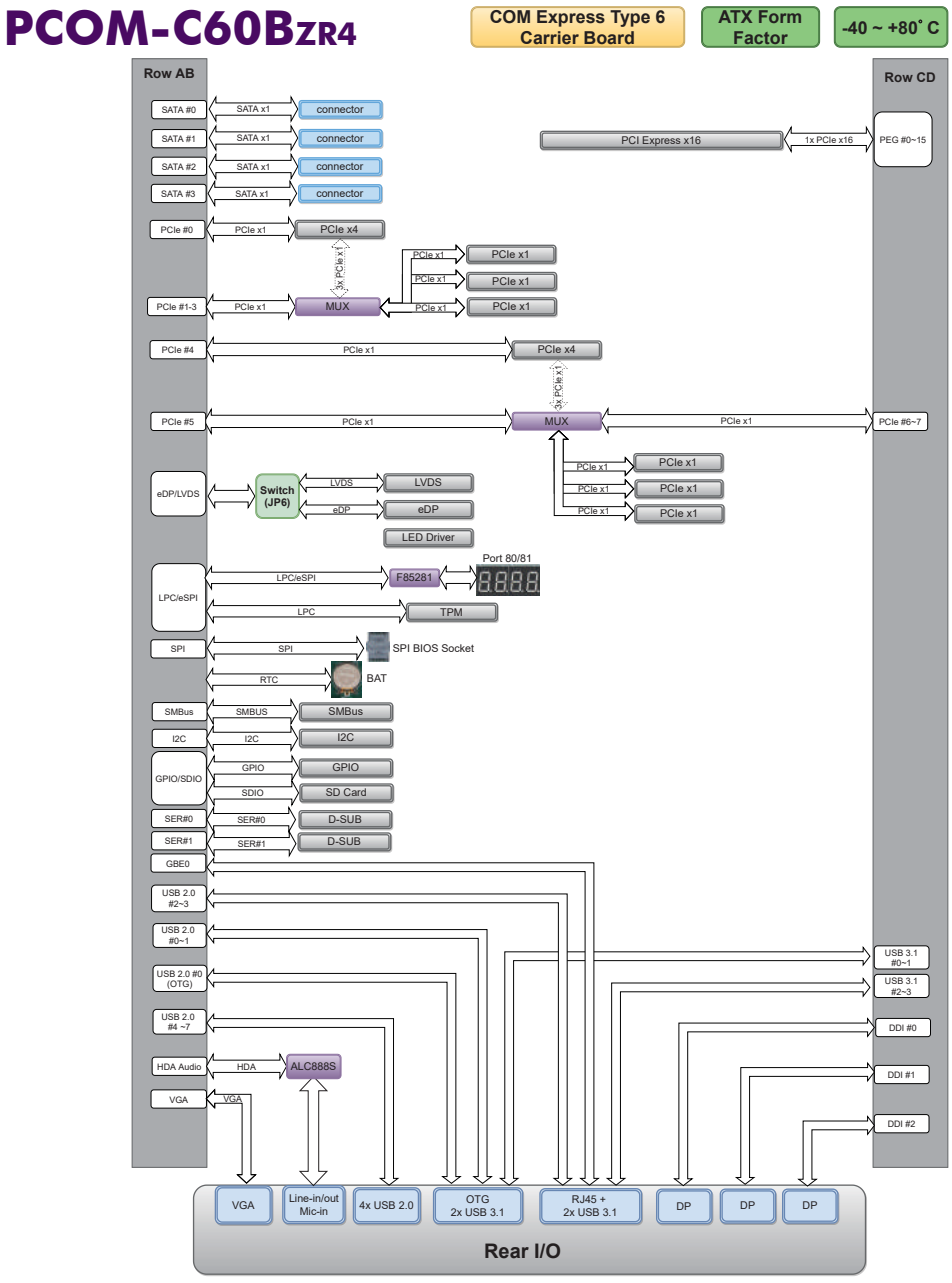
Dimension	305 X 244mm
Power DC IN	Support ATX power supply
Storage Temperature	-40°C to 80°C
Operation Temperature	-40°C to 80°C
Certification	Contact us
MTBF	Over 100,000 hours ar 40°C
Vibration	Contact us
OS	Depends on Module

ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-C60B	AB1-3G22Z	In Development

Accessory	Ordering P/N	Status
LVDS Cable	TBD	In Development
eDP Cable	TBD	In Development

BLOCK DIAGRAM



PCOM-C605

Mini-ITX Form Factor Evaluation Carrier Board for Type 6 Com-Express® Rev 2.1 Module

FEATURES

- COM Express® carrier board is compatible with the Portwell Type 6 COM Express® modules
- Support 4x USB 3.0, 2x USB 2.0, 3x SATA Ports, 1x CFEX
- Support multiple displays(DP, HDMI, VGA, LVDS)
- Support 1 x PEG 2 x PCIe Golden Figer

Portwell PCOM-C605 is designed to as a validation board for most of the Portwell COM-Express 2.1 type 6 modules, this carrier will support VGA, LVDS, DP, HDMI displays, and included multiple I/O expansions, for example PEG, PCIe, USB3.0. SATA III and CFEX.

General

Product	PCOM-C605
Form Factor	Type 6, Mini-ITX (170 x 170 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	1 x CFEX 1 x SATA III, 2 x SATA II		
USB	4 x USB 3.0, 4 x USB2.0		
Ethernet	2 x GbE		
Serial I/O	GPIO	8 bit GPIO	
	I^2C	Based on module desing	
	SMBus	Based on module desing	
	UART	2 x Serial Port (SuperI/O, RS232) 1 x Serial Port (Tx/Rx)	
PEG	1 x PCIe x 16 (Gen3)		
PCI Express	2 x PCIe x 1 Golden Finger		
Display	Default	Options	Resolution
	VGA	VGA	Depends on module
	LVDS	24bit dual channel LVDS	
	DDI0	DP	
	DDI1	HDMI	
Security	Depends on module		

PCOM-C605

MECHANICAL & ENVIRONMENT

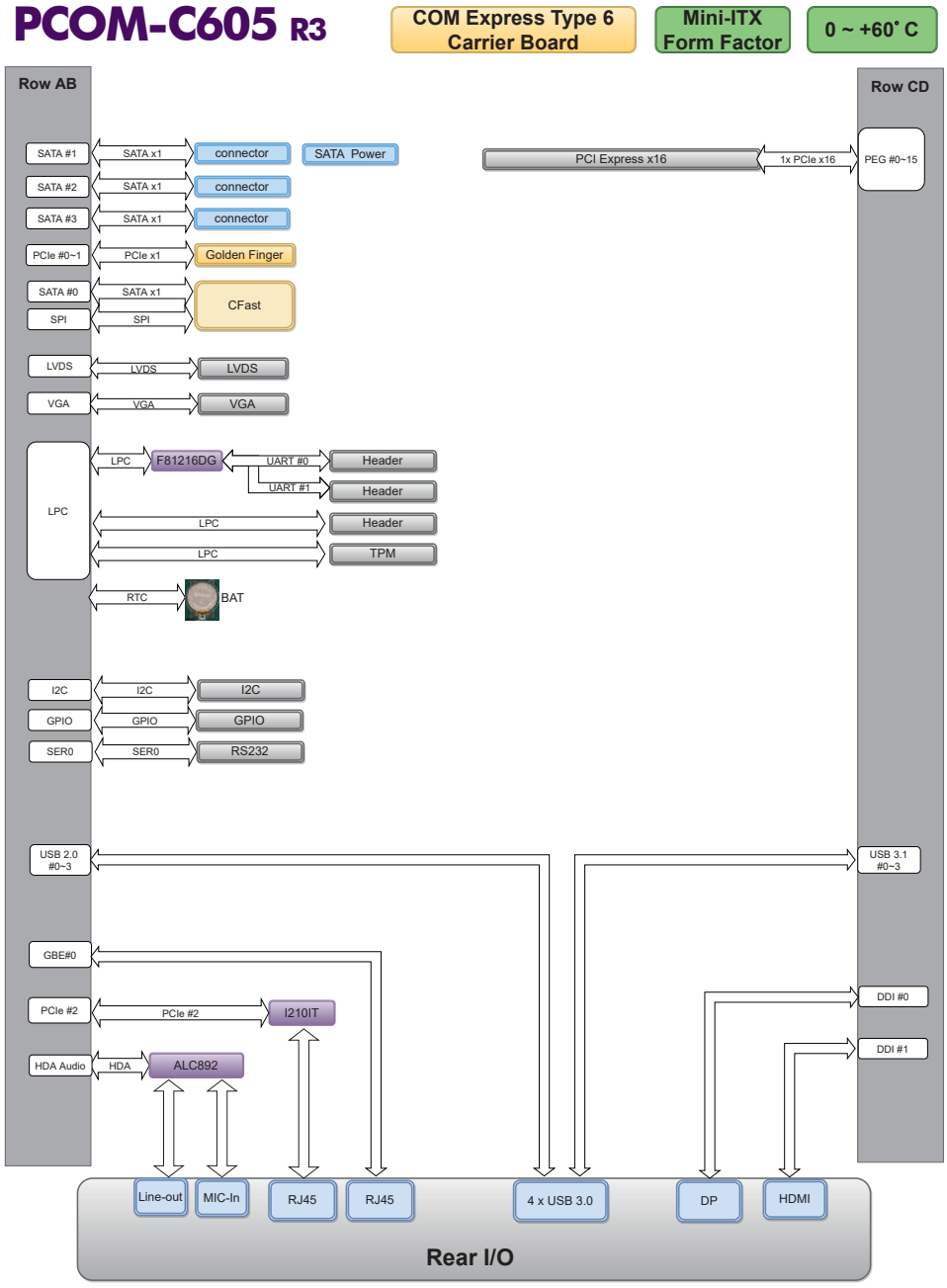
Dimension	170 x 170 mm
Power DC IN	Support ATX power supply
Storage Temperature	-40°C to 80°C
Operation Temperature	-40°C to 80°C
Certification	Contact us
MTBF	Over 100,000 hours at 40°C
Vibration	N/A
OS	Depends on module

ORDERING GUIDE

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

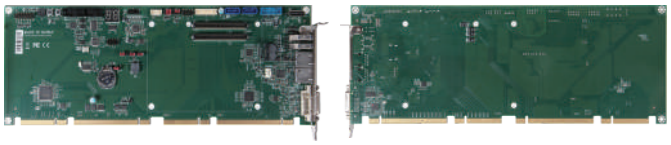
Accessory	Ordering P/N	Status
VGA Cable	B7864720	Available
LVDS Cable	TBD	In Development

BLOCK DIAGRAM



PCOM-C615

PCOM-C615 is PICMG 1.3 Full Size Form Factor Evaluation Carrier Board for COM Express® Revision 2.0 Type VI Module. PCOM-C615 follows standard PICMG 1.3 golden finger pin definition and let customer save system total cost for easily upgrading modules



FEATURES

- Supports four SATA III ports
- Supports multiple display by LVDS, HDMI, DP on board and DVI-I(DVI-D+VGA) on bracket(Choose either HDMI or VGA by BIOS)
- Rich I/O interfaces such as serial ports, USB, PCI

Portwell PCOM-C615 is designed with PICMG 1.3 form factor with COM Express Type VI row connectors, suitable for evaluation testing of Portwell's Type VI COM Express modules on PCIe, PEG, VGA/HDMI, DVI, USB and SATA interface.

General

Product	PCOM-C615
Form Factor	PICMG 1.3 (338.5 x 126.39mm)
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	4 x SATA III (2 ports through backplane)	
USB	2 x USB3.1 Gen2 ports on bracket 2 x USB3.1 Gen1 ports on board 4 x USB2.0 ports through backplane	
Ethernet	2 x GbE	
Serial I/O	GPIO	8 bit GPIO
	I²C	base on module design
	SMBus	base on module design
	UART	1x RS232 1x RS232/422/485
PEG	1x PCIe x16 (PCIe Gen3)	
PCI Express	4x PCIe x1 or 1x PCIe x4 by different bios support (PCIe Gen3)	
Display	HDMI	base on module design
	DP	
	DVI-I (DVI-D/VGA)	
	24bit dual channel LVDS	
Security	N/A	

PCOM-C615

MECHANICAL & ENVIRONMENT

Dimension	338.5 x 126.39mm
Power DC IN	Support ATX power supply
Storage Temperature	-20°C to 80°C
Operation Temperature	0°C to 60°C
Certification	CE, FCC
MTBF	Over 100,000 hours ar 40°C
Vibration	N/A
OS	Depends on Module

ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-C615	ABI-3J53	Available

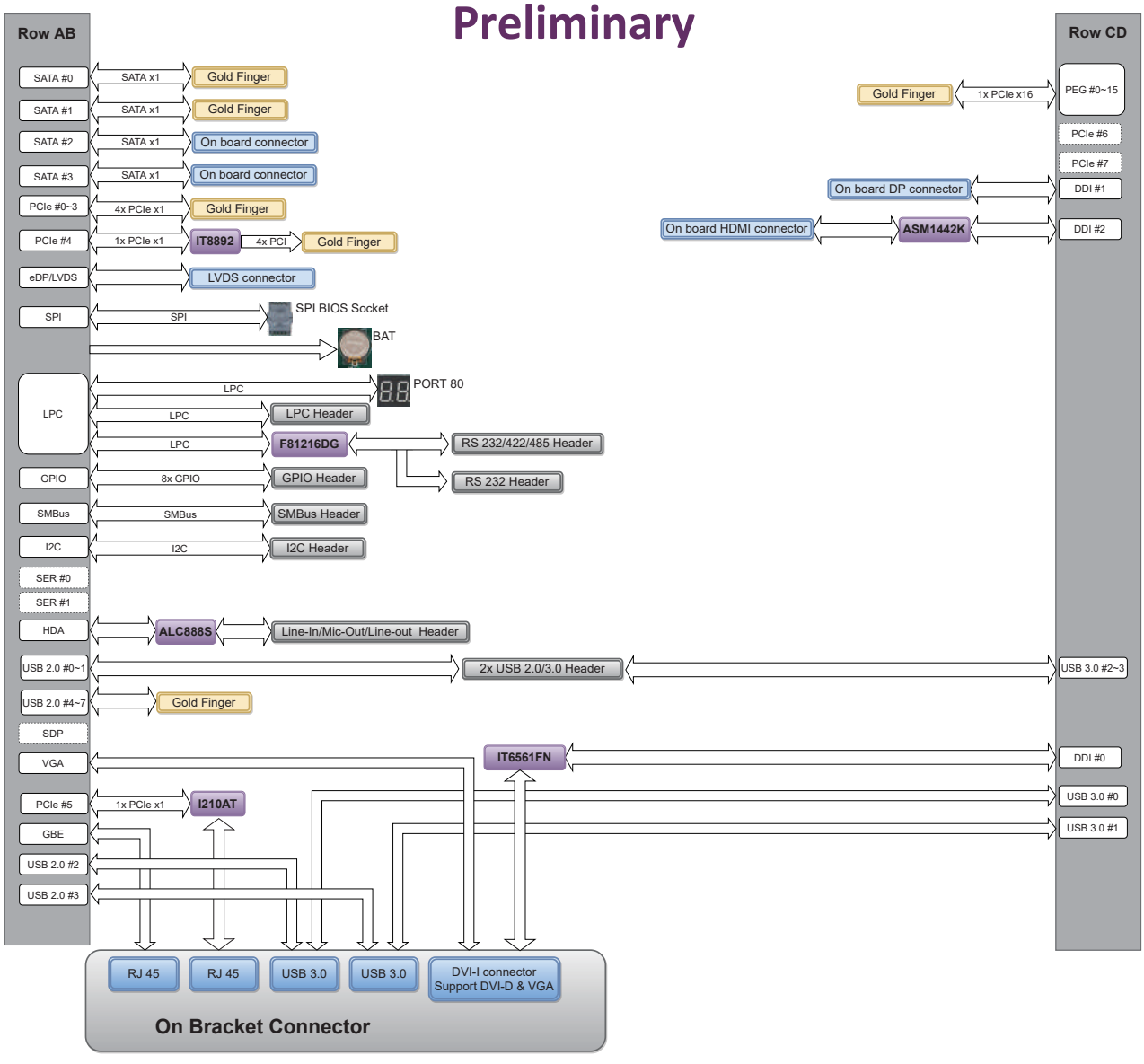
BLOCK DIAGRAM

PCOM-C615 ZR0

COM Express Type 6 Carrier Board

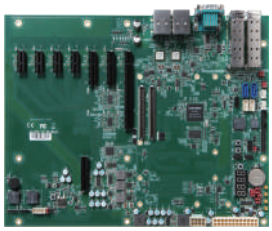
-20 ~ +80° C

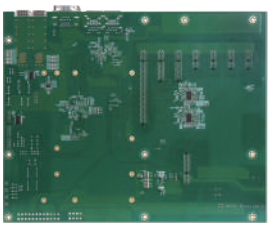
Preliminary



PCOM-C701

ATX Form Factor Evaluation Carrier Board for COM Express Revision 3.0 Type VII Module with 4x 10GbE Support with Inphi CS4227 PHY





FEATURES

- Support both AT and ATX mode
- 10G PHY: Inphi CS4227
- 1x GbE, 4x 10GbE SFP+
- 32 PCIe Lanes, 2 SATA III, 4 USB 3.0, 4 USB 2.0

Portwell PCOM-C701 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, 32x 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 quick and easy. The PCOM-C701 provides COM Express Type VII support in addition to fulfill wide range of device connectivity for prototype and flexibility .

General

Product	PCOM-C701
Form Factor	ATX Form Factor (305 X 244mm)
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 (Port 0/1)	
USB	4x USB 3.0 (Port 0~3) 4x USB 2.0 (Port 0~3)	
Ethernet	1x GbE, 4x 10GbE SFP+	
Serial I/O	GPIO	8 bit GPIO (4 in, 4 out)
	I²C	1
	SMBus	1
	UART	2
PCI Express	1x PCIe Gen3 x16 3x PCIe Gen3 x4 4x PCIe Gen3 x1	
Display	Unavailable in Type7	
Security	N/A	

PCOM-C701

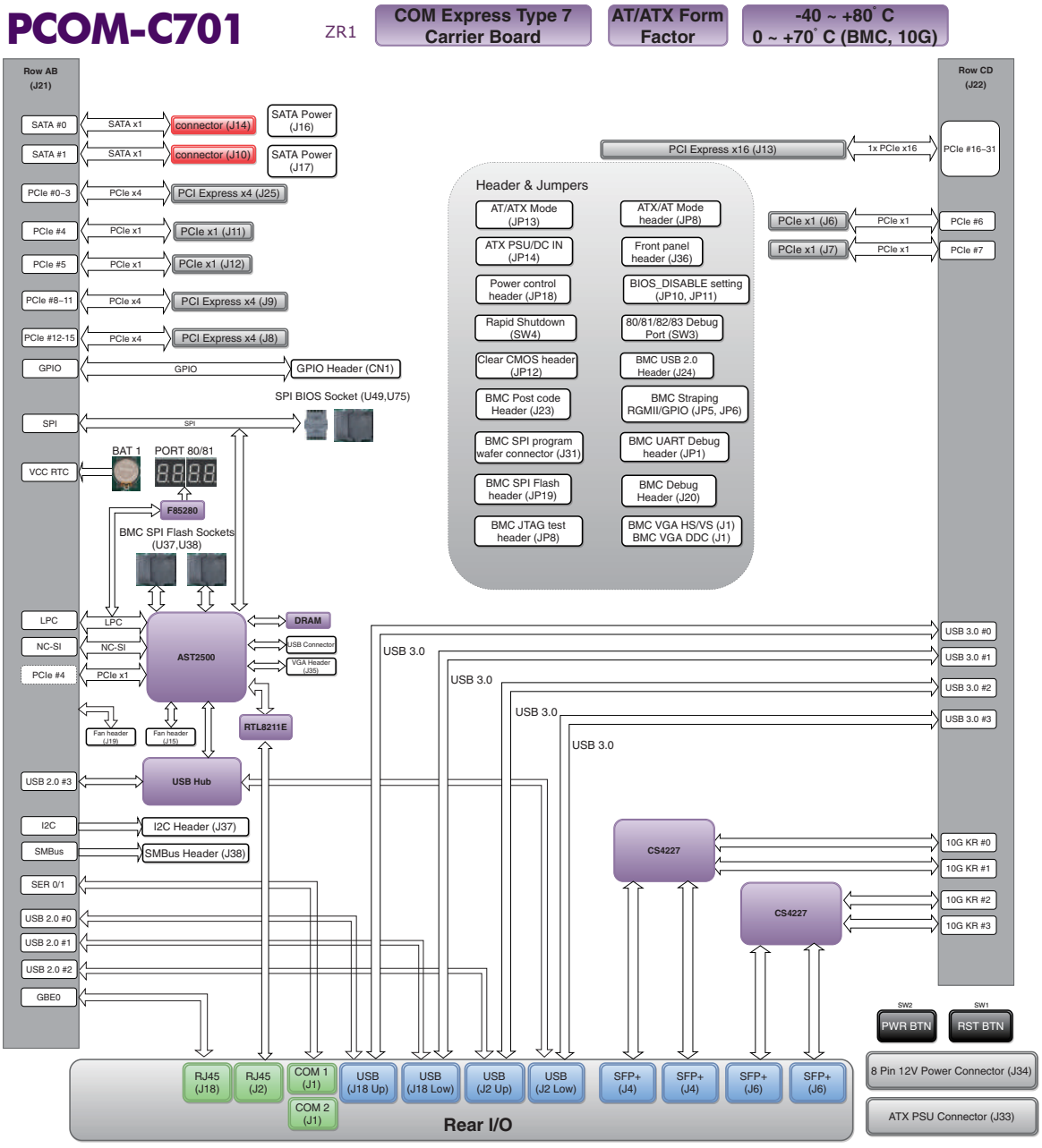
MECHANICAL & ENVIRONMENT

Dimension	305 X 244mm
Power DC IN	Single Power: +12V DC PSU connector available AT/ATX mode
Storage Temperature	-40°C to 85°C
Operation Temperature	-40°C to 85°C 0°C to 70°C for BMC and 10G
Certification	Contact us
MTBF	Contact us
Vibration	Contact us
OS	Depends on Module

ORDERING GUIDE

Product	Ordering P/N	Status
PCOM-C701	AB1-3J61Z	Available

BLOCK DIAGRAM



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-tomarket.

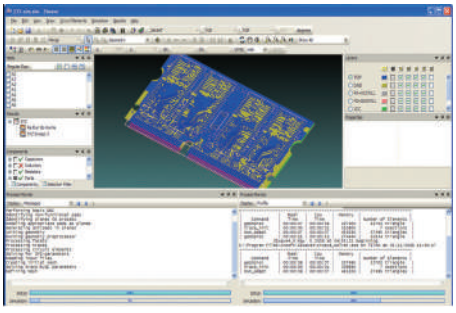
The Mission of SIL is as follows.

- 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

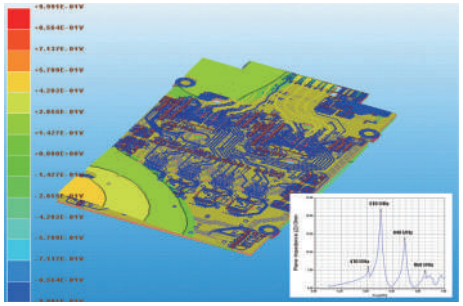
Ansys (Ansoft) Siwave 5.0

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



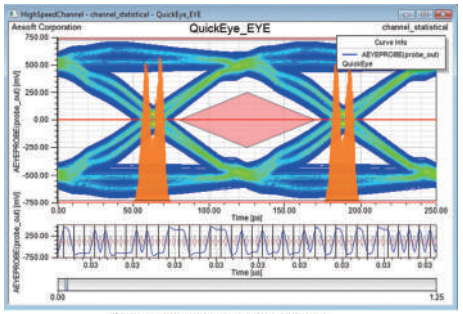
Ansys (Ansoft) PI Advisor

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



Ansys (Ansoft) Designer SI 6.0

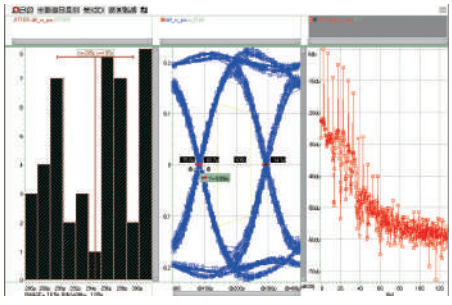
1. Leverages multiple signal integrity simulation methods.
2. Utilizes optimization algorithms, Design of Experiments, tuning and post-processing forkey comp.
3. Utilizes electromagnetic simulation and circuit tools.



Signal Integrity Analysis

Synopsys HSPICE

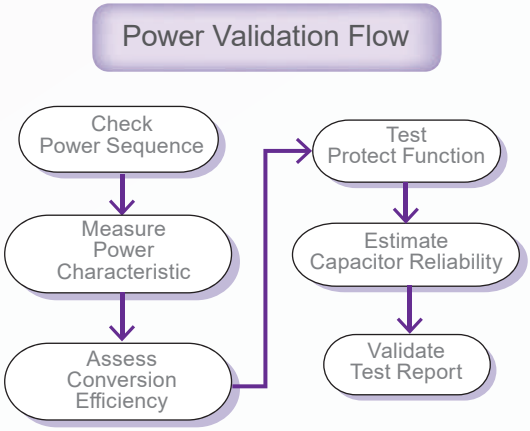
1. Uses the Gold Standard for accurate circuit simulation.
2. Provides Yield-Process variability and device reliability simulation.
3. Applies high speed simulation with harmonic balance and shooting algorithms.

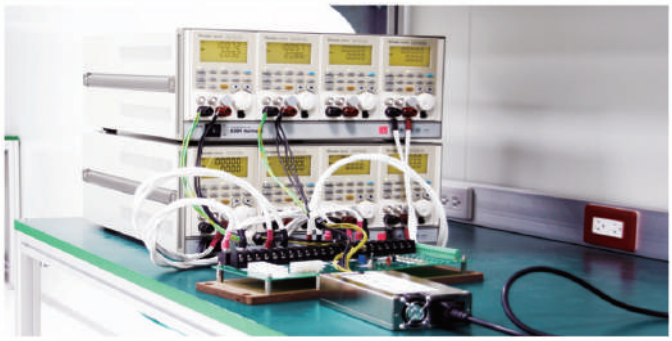


Power & energy,stable & efficient

Power Lab

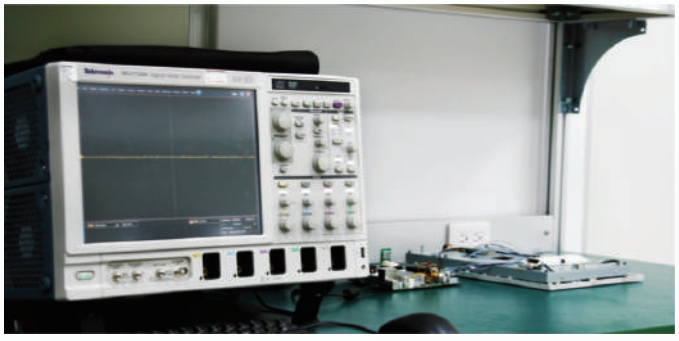
Since the development of the Industrial PC it has been widely used in communications, medical, aerospace, automation & control applications and more. The power design quality and reliability is very important during product development which may affect the system operation stability and power efficiency 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.

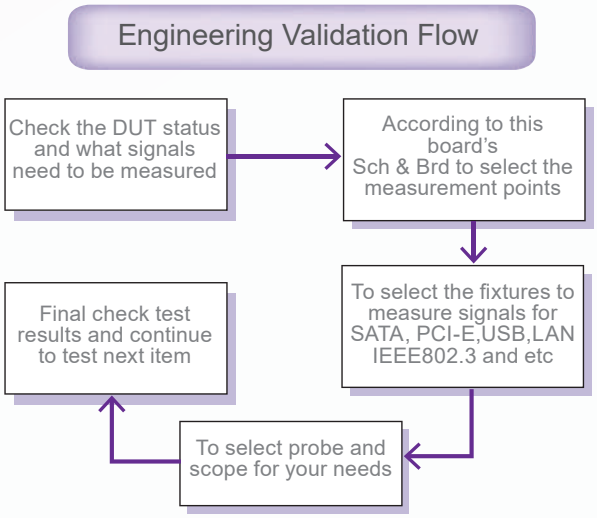




Electronic R&D Lab

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.

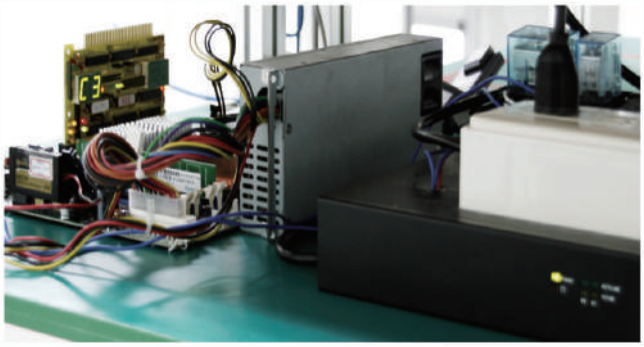




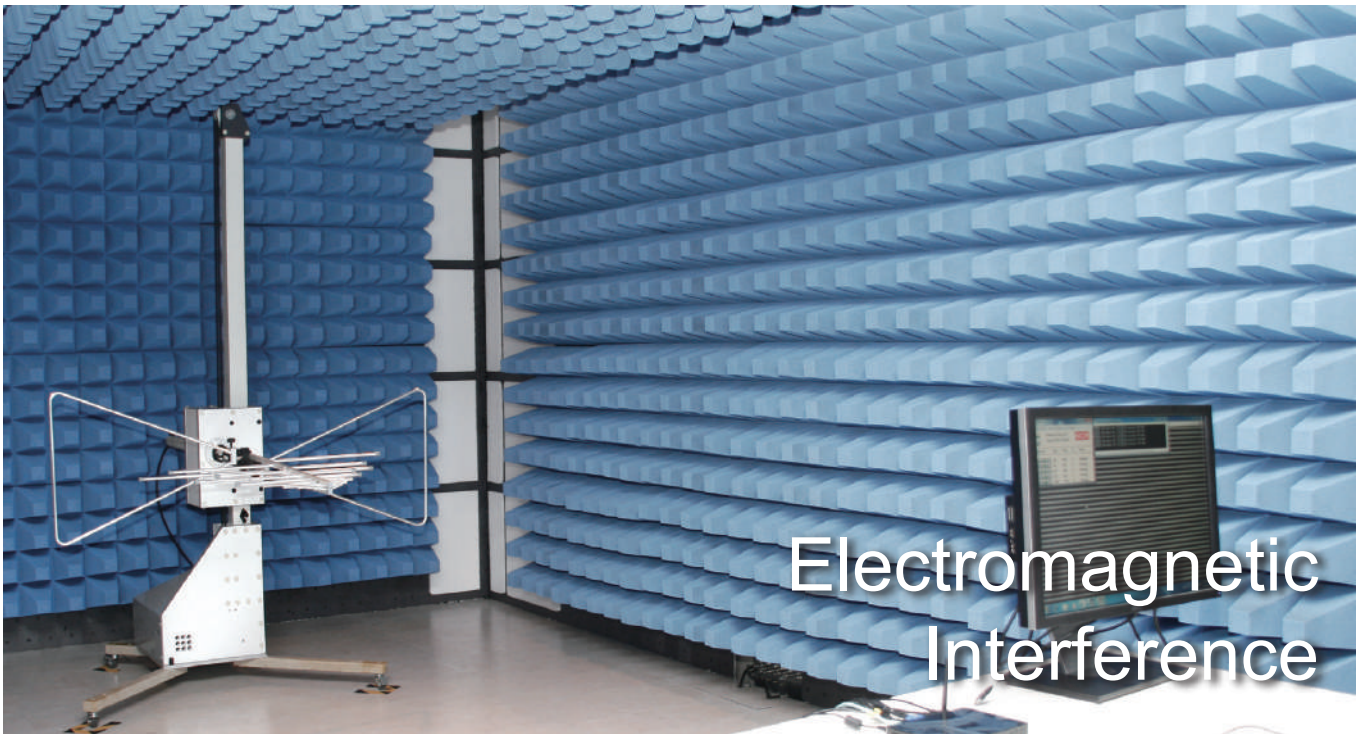
On / Off Lab

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 (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

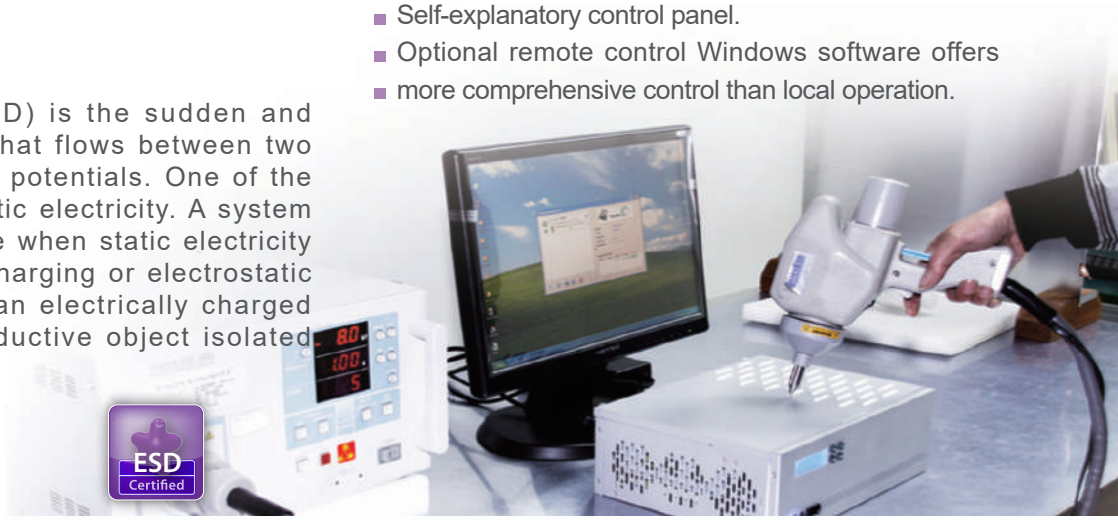
EMS tests including CS & RS are the reliability tests against electric fields, magnetic fields, power cords, control cables, signal cables, ground interference and static electricity discharges, electricity discharge and electromagnetic wave.

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.



EMS Certified

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

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

IP68-2 Certified

Bringing thermal validation expertise to module development

Programmable Temperature & Humidity Chamber

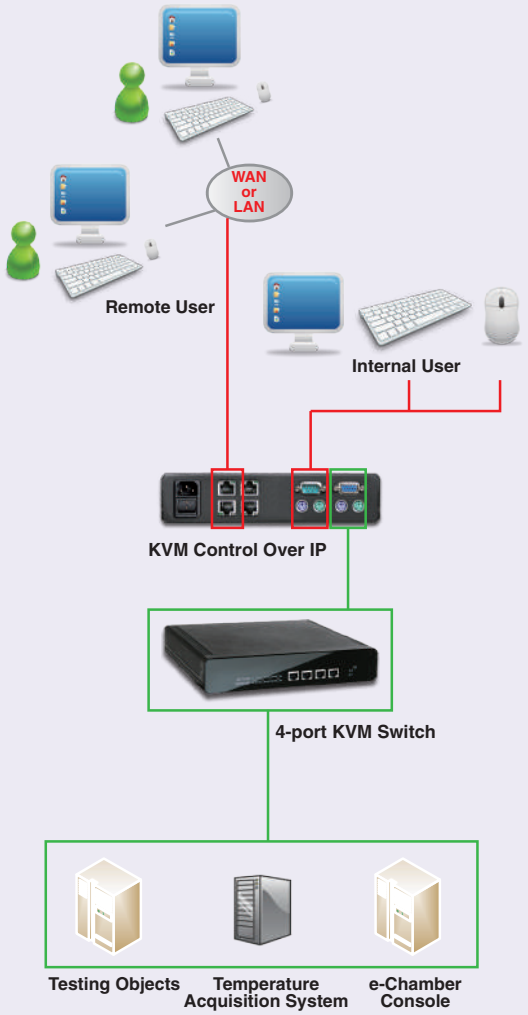
Portwell's Programmable Temperature and Humidity Chamber Farm houses 12 programmable constant temperature and humidity testing machines, with the abilities to run from -60°C up to 150°C. Moreover, the air flow control is compliant with IEC 68-2 standard. Portwell vigorously applies these extreme conditions 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:

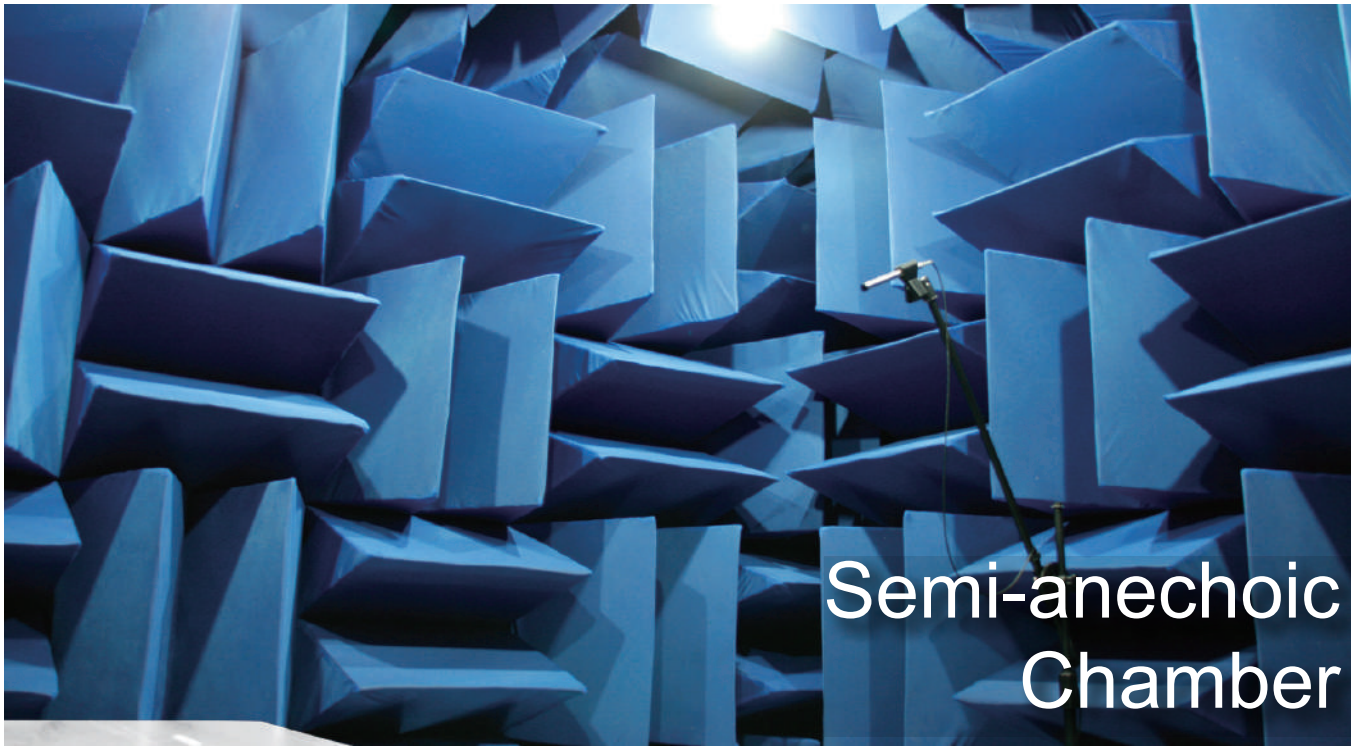
- **Air Flow Control**
  Comply with IEC 68-2 standard, lower wind is under 0.5m/s.
- **With/without Due**
  Available upon request.
- **Humidity Control**
  Can be controlled under 40°C / 10% RH.
- **Web Monitoring**
  Can be arranged by the dedicated program.

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" condi- tions. 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.

Semi-Anechoic Certified

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 Micophone, IEA, analyer and system.

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

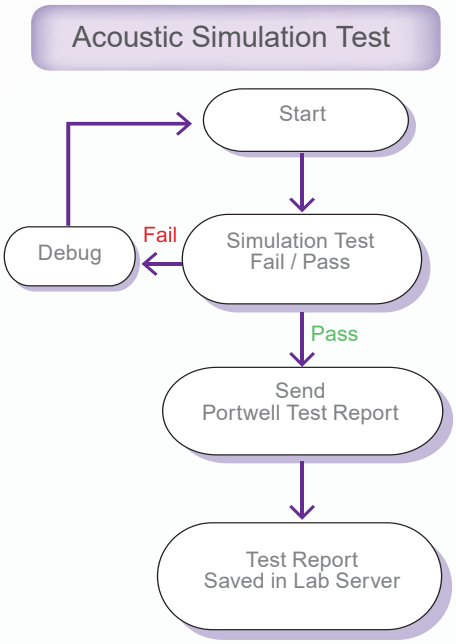
The noise emission meet ISO Standards

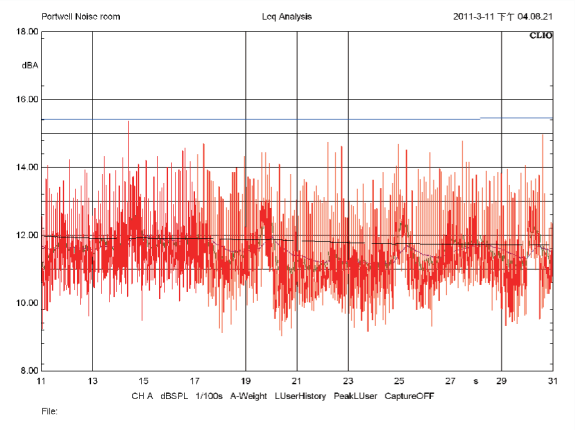
Goals of Semi-Acoustic Chamber

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.

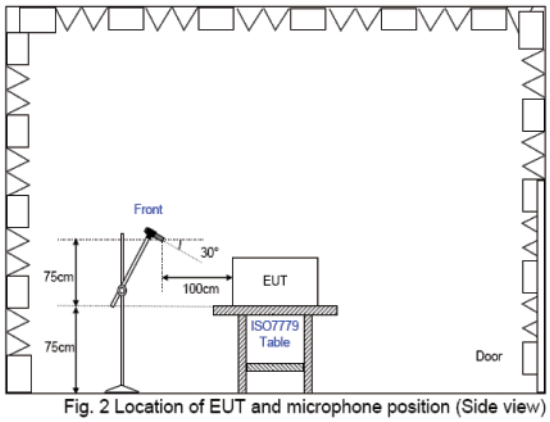


Fig. 2 Location of EUT and microphone position (Side view)

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-A coustic 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 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.

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
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

Super-aging our modules to unveil weaknesses

Stresses are delivered in an ordered sequence:

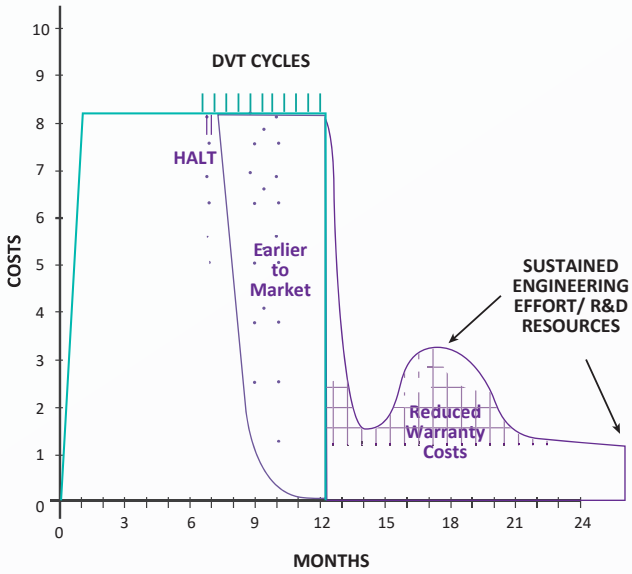
- Temperature Step Stress
  1. Cold Step Stress
  2. Hot Step Stress
- Rapid Temperature Transition Cycling
- Vibration Step Stress
- Combined Environment
  1. Rapid Temperature Transition Cycling and
  2. Vibration Step Stress

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 InfernoTM which can deliver temperatures up to 200°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.

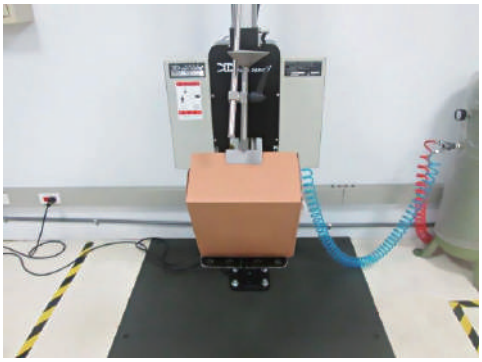
Vibration tester conducts either Sine or Random vibration.

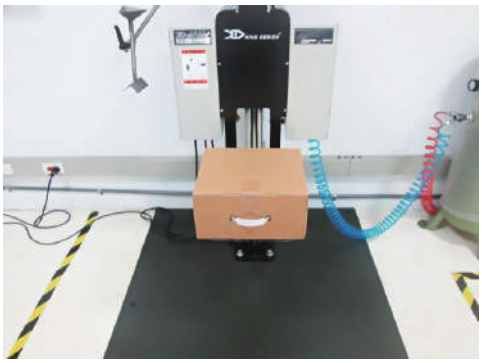
Sine Vibration complies with IEC-68-2-6 and simulates the product on a ship to verify Reso- nance Search and Resonance Dwell. Random Vibration complies with IEC-68-2-36 and simu- lates the product in transportation situations in order to test the packaged product's vibration endurance.

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

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.

Portwell superior service

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

Logistics Service

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

Consulting Service

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

Product Service

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

Manufacturing Service

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

Design Service

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

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

Web Service

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

Extended Visits to PE

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

Direct Contact

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

Global Service (Telephone)

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

Technical Request

For technical support, you could reach our technical request website as follows
https://www.portwell.com.tw/support-center/technical-request/

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