



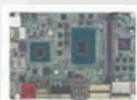
Embedded Computing



ARM-Based Computing



Computer-on-module



Single Board Computer



Industrial Motherboard

Trusted Embedded Computing Platform

ARBOR offers advanced embedded technology and a dedicated service team to help you get the best ROI



Full-service OEM/ODM Solutions

Our dedicated RD/BIOS service team provides customization assistance from initial prototype design all the way through development, manufacturing, assembly, logistics, and after sales services.



Wide Temperature Design & Validation

ARBOR COM Express modules can be operated in an extended temperature range of -40°C to 85°C and have passed stringent vibration tests. The exclusive use of high quality components and highly effective thermal solutions ensure that the modules are rugged enough for use in harsh environments.



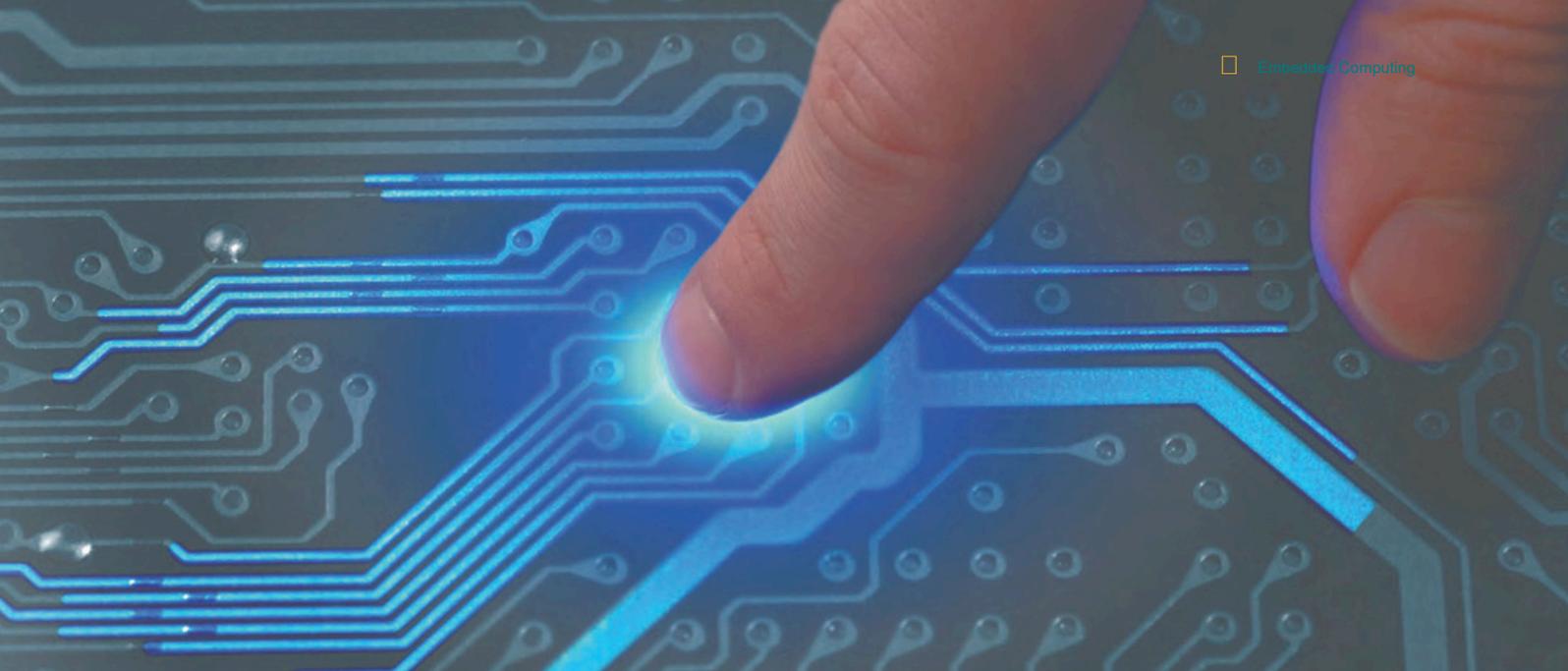
In-house Technologies and Expertise

ARBOR has extensive expertise in power MCU design for automation control. Its BIOS Anti-Crash Technology (ACT) enables embedded system to recover BIOS code from a secondary on-board flash memory and restart in case of a system BIOS failure.



Conformal Coating Service

To provide maximum PCB operational lifespan and functionality, ARBOR offers automated conformal coating services to protect components and circuitry from dust, fungus, moisture and salt spray.



15 Years Longevity Commitment

Most of ARBOR board products carry a life cycle commitment of 15 years from first production. ARBOR will notify customers in advance of component revisions or End-of-Life scheduling, and provide options in qualifying updated components and modules.



Strategic Partner Ecosystem

ARBOR extends our technology and business capability through a powerful alliance ecosystem of industry-leading companies including Intel®, AMD®, Microsoft, as well as the leading standards development organizations, such as PICMG & SGeT.



Quality Assurance

ARBOR's products are certified to comply with applicable regulatory bodies for their application to determine the quality of products, as well as ensure operational safety in embedded applications.



Medical Regulation Compliance

ARBOR is ISO 13485 and ISO 14971 certified, filling the requirements for implementing a comprehensive quality management system (QMS) for the design and manufacture of medical devices.

Embedded Hardware & Software Design Competency

Accelerating your embedded development with lower risk



Hardware Services

ARBOR offers a full lineup of embedded boards in different form factors to fulfill different industrial chassis. In addition to supporting the strong mechanical & thermal solution, our reliable components feature industrial-grade chipsets, and have passed stringent validation testing to an operating temperature range of up to -40°C to 85°C. ARBOR also has extensive expertise in power MCU design.



Software Services

- Embedded BIOS/bootloaders
- Embedded OS/licenses
- Embedded tools
- Trusted Platform Module (TPM)
- SHA1
- BIOS Anti-Crash Technology (ACT)



Validation & Testing

ARBOR provides rigorous product verification to ensure its ruggedness and performance to meet customers' requirements.

- EMI/EMC validation
- Vibration, shock and drop tests
- Humidity and temperature tests
- Thermal analysis
- Performance & compatibility tests



Automated Conformal Coating Services

ARBOR provides the automated conformal coating service, with an acrylic coating being applied to the whole surface of the board except contact pins, to protect the components & circuitry against dust, fungus, moisture and salt spray. The conformal coating also prevents short circuits and corrosion of metal between conductors.



Coating Flow Chart



Supported Form Factors

CPU on Module		Single Board Computer	
Qseven	70 x 70 mm	PC/104	96 x 90 mm
COM Express Mini	84 x 55 mm	3.5"	146 x 102 mm
COM Express Compact	95 x 95 mm	EPIC	165 x 115 mm
COM HPC Client/Server	95 x 120 mm	Slot Computing	338 x 122 / 185 x 122mm
COM Express Basic	125 x 95 mm	Industrial Motherboard	
COM HPC	120 x 95 mm	Mini-ITX	170 x 170 mm
ETX	114 x 95 mm	Micro-ATX	244 x 244 mm

Building a Trustworthy, Long-term Service

Increasing the value of applications at every level of evolution

Extended Product Lifecycle

Unlike commercial motherboards with a typical lifespan of 12 to 18 months, motherboards in embedded computing applications, where design processes can last as long as two years, 3-5 year life cycles are a must. To deliver long-life products, ARBOR selects key components that offer long-life availability, and have adopted Product Lifecycle Management (PLM) systems to manage product design, collaboration, and manufacturing processes effectively.

Parts do go End-of-Life, but ARBOR manages that process by making sure component revision and EOL notifications are made at least 180-days before occurring, helping customers facilitate smooth transitions. Most of ARBOR board products carry a life cycle commitment of 15 years from first production. ARBOR will notify customers in advance of component revisions or End-of-Life scheduling, and provide options in qualifying updated components and modules.



From Edge to Action

33 years of embedded experience



Up to 15 years longevity commitment from first production



EOL notifications are made within 180 days before occurring



Ecosystem Partners

To deliver up-to-date technologies and solutions to our clients, ARBOR extends our technology and business capability through a powerful alliance ecosystem of industry-leading companies and organizations. Together, we provide our customers the top notch services to streamline their projects.



Full Experience of Industry Standards

ARBOR holds the most required ISO certification and industry standards to ensure our products and manufacturing capabilities meet the worldwide regulations and standards compliance. Our customers have no need to worry about getting documents for their product development. With our internal and external test laboratories, this allows manufacturers to circulate industrial products freely within the internal market of the USA, Europe and China.

Certified Quality Assurance

- ISO 9001:2008
- ISO 14001
- CE
- FCC

Medical Compliance

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Regulation

- IEC60601-1, EN60601-1, EN60601-1-2
- UL60601-1
- ISO 13485
- ISO 14971



Customization Competency

Satisfy all your needs to speed up your embedded development

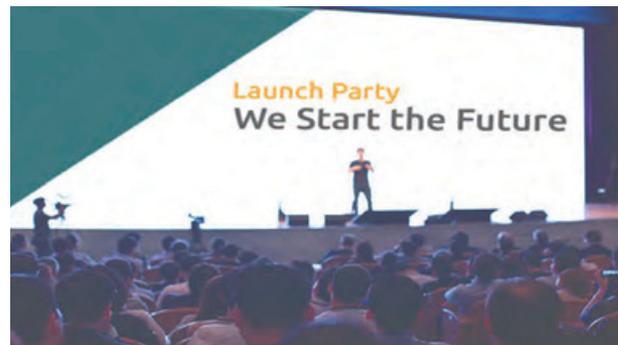
ARBOR's design team has the expertise to develop a solution to meet your environmental needs. Whether it is a completely new design or a minor modification to an existing product, ARBOR's skilled design teams' experience and expertise ensures a solution will be suited to your requirements.

Live Video Equipment

Location: USA

Product & Design-In Service:

- Intel® Core i7 Processor COM Express Type 6 CPU Module w/ customized carrier board
- Full integration of system, chassis design and EMS service of capture, audio and LCD board
- UL-60950 certification service



Train Control & Monitor System

Location: France

Product & Design-In Service:

- Wide-Temperature COM Express Type 10 CPU Module
- Conformal coating to enhance the resistance to environmental conditions
- Assembly integration and testing service



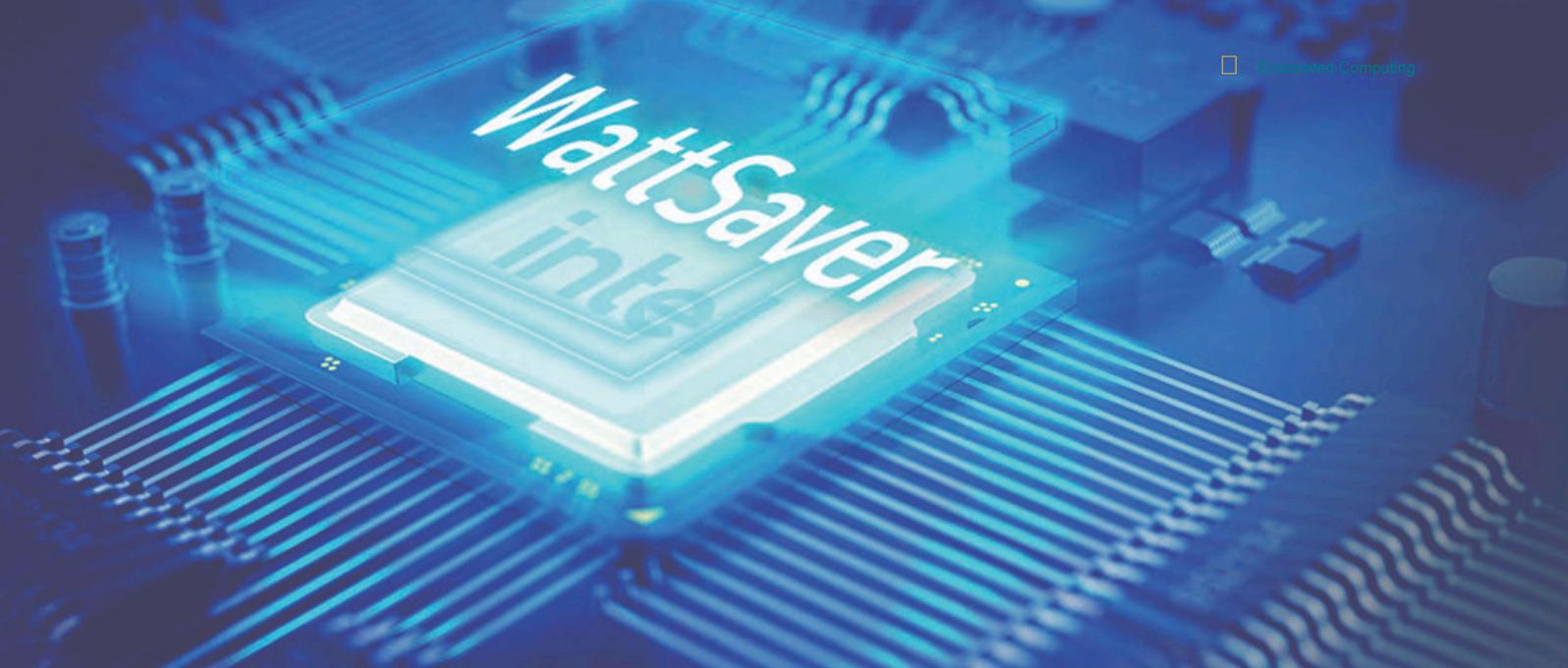
ANPR Camera Engine

Location: South East Asia

Product & Design-In Service:

- Intel® Core™ Processor 3.5" Compact Board
- Custom power and thermal design to fit space constraints of the camera enclosure
- Conformal coating to avoid short circuits in highly humid environments





Innovative WattSaver™ Technology to Optimize CPU Power

WattSaver™ is one of ARBOR's latest technology, showcasing our customization expertise to meet customers' specific embedded application needs. Designed for the latest Intel Hybrid Architecture CPUs with P-Core and E-Core, WattSaver™ optimizes CPU power by reducing wattage output while preserving most of the CPU's performance. By offering application-optimized power configurations, it enables developers to achieve the best balance between power efficiency and performance demands.



Limiting CPU Power

With WattSaver™ technology, the thermal design power (TDP) of a CPU is specifically configured to limit CPU power consumption, achieving up to a 56% reduction while maintaining stable performance.



Increasing Performance-per-Watt

Despite limiting CPU power, it's still possible to achieve a higher performance-per-watt ratio. WattSaver™ can increase performance per watt by 1.71 times, indicating greater efficiency.



Better Performance

With WattSaver™ and DuraPlus™ technology, performance is optimized according to each project's actual applications to ensure that workload can be met.

WattSaver™ Technology Advantages



Cost-Effective Migration to New Generation CPU



More Flexible CPU Selection



Project-Specific Configuration



Reducing Total Cost of Ownership (TCO)

Computer on Modules

Building your embedded projects easier and faster!

Computer on Module perfectly meets your custom application requirements while helping you reach your goals for time-to-market, saving money, design flexibility and risk minimization. With a versatile portfolio of low-power CPU available from Intel®, AMD® and VIA supporting fanless operation, your embedded system will enjoy the benefits of high CPU performance per watt. ARBOR's Computer on Module supports different form factors, including COM Express, Qseven and ETX System on Module to meet every type of demand in your applications.



PICMG Standard Compliant

As an active member of PICMG, ARBOR's COM Express comes with the latest module specifications and pinout definitions.



High Efficient Thermal Solution

ARBOR uses specially CNC-machined aluminum heat-spreaders to contact hot spots in order to efficiently distribute the heat to the outside heat sink.



Conformal Coating Services

Upon customer request, this optional service that protects the components & circuitry against dust, fungus, moisture and salt spray.

Supported Form Factors



COM Express



ETX



Qseven



Carrier Board



COM Express CPU Modules

COM Express Builds Highly-Reliable Embedded Systems, Rugged and wide-temperature designed for the harshest environments.

Ready for Harsh Environment Applications

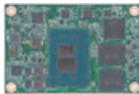
ARBOR COM Express modules provide a wide operating temperature range and a conformal coating that protects components and circuitry from harmful environmental conditions. Size and cost- efficient COM Express modules also address space and budget constraints while delivering the utmost reliability and long life cycle support. Changing customer project scale and/or parameters can easily be addressed with minimal system downtime via ARBOR’s broad range of ready-made COM Express modules.



Greener environment and Sustainable Development

We face various challenges, such as climate change, food shortages, water scarcity, etc. ARBOR presents a smart recycling kiosk, "Reverse Vending Machine". With our COM Express module, it is able to recognize different types of garbage and recycle them automatically.

COM Express CPU Modules

			
Intel® Core™ Ultra / Core™ Ultra Series 2	Intel® Atom	Intel® Core 13th Gen.	AMD Ryzen V1000
EmCOMe-i96U0 / EmCOMe-195U0	EmNANO-iX701	EmCOMe-i94M0	EmETXe-a10M3

COM HPC

Suitable for high-end IoT and edge server applications



ARBOR's COM-HPC solutions will focus on delivering ultimate computing power, server-grade scalability, and high reliability. Leveraging the COM-HPC module's support for large-capacity DDR5 memory and high-power consumption processors, we provide robust backing for demanding applications like rigorous AI inference, complex image processing, and real-time data analysis. Furthermore, the high-pin-count design ensures abundant PCIe Gen 5 lanes and high-speed I/O connectivity, allowing customers to easily integrate multiple accelerators, GPUs, and high-speed storage devices.



Unleash Computational Potential

Supports DDR5 memory, with a maximum capacity of up to 1TB. Suitable for high-performance computing (HPC), AI inference, large-scale data analysis, and other applications..



High Power Delivery Support

Supports up to 251W of input power at the 8V end of the power range. This allows CPUs with about 150W dissipation to be deployed on Server modules. Higher power operation is possible if the fixed 12V supply operation is used.



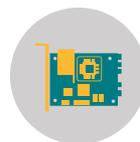
Ultimate Hardware Scalability

Offers up to 49 PCIe Gen 5 lanes, supporting a variety of accelerators and I/O devices. Integrated USB4, 25GbE, and DisplayPort 2.0. The module's size and pin count provide greater design flexibility.

Features



Targets high-end embedded client products that need more displays, a full set of low-, medium-, and very-high-bandwidth I/O, powerful CPUs, and a modest form factor.



I/O includes multiple 10 Gbps or 25 Gbps Ethernet, and up to 49 PCIe lanes at up to PCIe Gen 5 speeds.



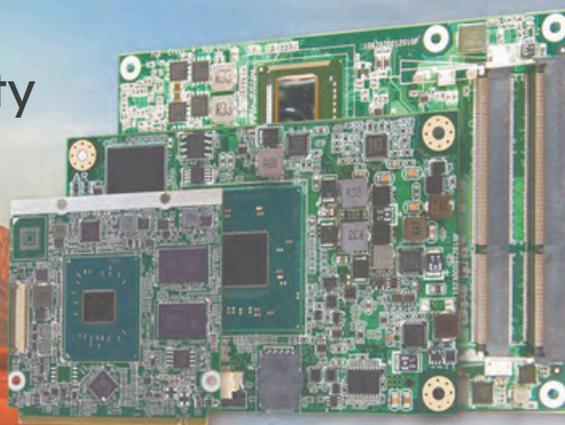
Contain soldered-down or SO-DIMM memory, with a capacity for up to four SO-DIMM slots.



Supports high-bandwidth interfaces such as USB4 / Thunderbolt and DisplayPort 2.0.

Single Board Computers

Meet industrial grade design and quality



ARBOR Single Board Computer (SBC) series ranging from 3.5", PC/104, PC/104-Plus and EPIC, to a wide range of full-size and half-size Slot Computing boards. ARBOR's SBCs are designed around the powerful core logic embodied within the chipsets from Intel® and AMD®. Highly integrated designs allow them to fit the minimal / critical space requirements of most embedded applications.

Moreover, ARBOR's slot based SBCs are all based on open PICMG standards. All of these slot-based SBCs are ideally suited for applications in compact and rugged enclosures suited for mission-critical applications.



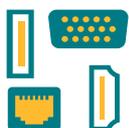
Reliable and Rugged Designs

- Wide temperature design option
- Industrial-grade components
- Conformal coating services



Ready-to-use Platforms

- X86 architecture, Intel® & AMD®
- PICMG, SGeT standards compliance



Extensive I/O Interfaces

- Expandable by PCI Express, Mini PCI Express and M.2 slots
- I/O extension options



Conformal Coating Services

To protect the components & circuitry against dust, fungus, moisture and salt spray.

SBC Product Highlights



Intel® Atom x7000 Series

EmCORE-iX700



Intel® Atom x6000 Series

EmCORE-i2802

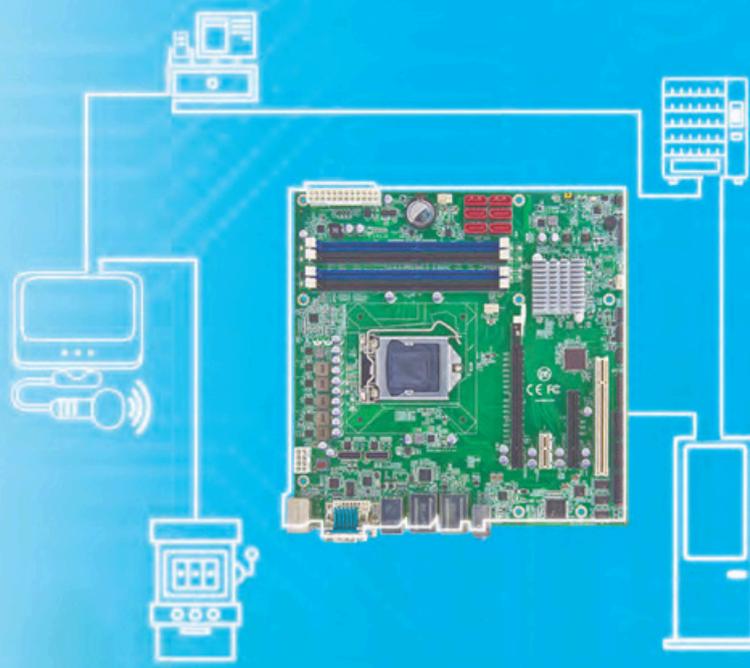


Intel® Core™ i

EmCORE-i90M2-WT

Industrial Motherboards

Minimal configuration and maintenance required



ARBOR offers plenty of industrial motherboard series in different form factors including Micro ATX and Mini-ITX. All industrial motherboards are designed with Intel® chipsets based on demand from system integrators, and ideal alternatives to platforms needing industrial features such as longevity, reliability and manageability, including many controller, server and gaming machine applications.



Customization & Configuration

- One-stop SW/HW integration
- Extensive I/O expansion



Reliability & Longevity

- Fanless Thermal Solution System
- Long term availability 10+ years
- Extended temp. of -20~70°C option
- Wide-Range DC Input



Ready for Vertical Markets

- Standards form factors for easy integration
- Industrial design for the complete product life cycle

Supported Form Factors



Mini-ITX



Micro-ATX



ATX

Semi-Industrial Motherboards

Minimal configuration and maintenance



ARBOR's Semi-Industrial Motherboards are a new series of off-the-shelf motherboards ready for clients to commission their projects faster, smarter and more efficiently. This series is designed to meet the growing demand of light industrial embedded computing applications, such as commercial, retail, gaming and residential systems. Coming in versatile form factors including mini-ITX, micro-ATX and ATX, these motherboards can satisfy various vertical market needs. Plus, the series features the latest platforms such as 8th Gen. Intel® Core™ processors, so that customers can take advantage of the cutting-edge features, making it a perfect fit for price sensitive but performance-demanding applications.



Faster Time to Market

Standard form factors from mini-ITX to full size ATX for easy integration



Greater Affordability

Our cost effective solutions save turnaround costs and time for your projects.



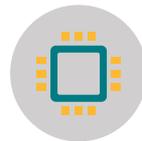
Vertical Markets Ready

Our expertise in a variety of vertical markets can help provide quick execution and rapid project delivery.

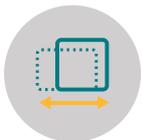
Features



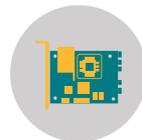
Off-the-shelf motherboards with expansion ability and industrial reliability



Intel® latest platforms from 6th to 8th Gen. Intel® Core Processors



Standard form factors from mini-ITX to full size ATX for easy integration



High bandwidth I/Os like USB 3.1 Gen. 2 (10 Gbit/s), PCIe Gen. 3.0 lanes and M.2

ARM-Based Embedded Solutions

Smart design for sophisticated demands



ARBOR provides ARM-based computer-on-module and system solutions for general, communication and mobility purposes to fulfill the diverse market demands. We offer a series of flexible, highly customizable and cost effective small form factor solutions that can meet the requirements for power-efficient IoT devices and performance-oriented professional applications.

ARBOR ARM-Based IIoT Solutions



Vehicle Panel PC

- 4G/LTE Communication
- OBDII
- CANBUS
- Low Power Consumption
- LCM

Retail Price Checker

- Touch Display
- NFC/RFID Support
- PoE Powered
- Barcode Scanner
- Wireless Communication

Frame-less Panel PC

- Frame-Less Design
- Efficient Thermal Solution
- Wireless Communication

SOM Embedded Boards

- Embedded CPU Board
- Customized Carrier Board

Bedside Infotainment

- Medical Certificate High Performance
- Rich I/O
- Various Size
- Android OS
- Wireless Communication

ARM-Based Embedded Systems

<p>SoM</p>	<p>IOT-800N Slim Panel PC</p>



Custom Your ARM-Based Solutions with ARBOR



ARM-Based Embedded Systems



RP-101K
Open Frame Touch Panel Kit



M1016
Medical Thin Client

Computer On Module

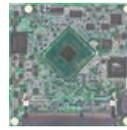
COM-HPC/COMExpress - Type 6



Model	COMX-A300	Model	EmCOMe-i96U0	EmCOMe-i95U0	EmCOMe-i94U0
Form Factor	COM-HPC® Client Size A	Form Factor	COM Express® Compact Type 6	COM Express® Compact Type 6	COM Express® Compact Type 6
Dimension	95 x 120 mm	Dimension	95 x 95 mm	95 x 95 mm	95 x 95 mm
Processor	Soldered onboard Intel® Core™ Ultra Series 2 Processor - Core Ultra 7 155H / 155U / 255H / 255U - Core Ultra 5 125H / 125U / 225H / 225U Integrated Intel® Arc™ Xe LPG+ Graphics	Processor	Soldered onboard Intel® Core™ Ultra Series 2 Processor - Core Ultra 7 265U / 255U / 255H - Core Ultra 5 235U / 225U / 225H Integrated Intel® Arc™ or Iris Xe Graphics (depends on CPU SKU)	Soldered onboard Intel® Core™ Ultra Processor - Core Ultra 7 165U / 155U / 155H - Core Ultra 5 135U / 125U / 125H	Soldered onboard Intel® 13th Generation Intel® Core™ - i7-1365UE 3.7GHz / 4.9GHz - i5-1335UE 3.4GHz / 4.6GHz - i3-1315UE 3.3GHz / 4.5GHz - Intel® Processor U300E 3.2GHz / 4.3GHz
Chipset	(depends on CPU SKU) 2 x DDR5	Chipset	Integrated Intel® Arc™ or Iris Xe Graphics (depends on CPU SKU)	Integrated Intel® Arc™ or Iris Xe Graphics (depends on CPU SKU)	Integrated Intel® Iris Xe or UHD Graphics (depends on CPU SKU)
Memory	SO-DIMM Sockets	Memory	2 x DDR5 SO-DIMM Sockets 1 x Analog RGB port	2 x DDR5 SO-DIMM Sockets 1 x Analog RGB port	2 x DDR5 SO-DIMM Sockets 1 x Analog RGB port
Video Output	3 x DDI ports and 1 eDP	Video Output	3 x DDI ports	3 x DDI ports	3 x DDI ports
Audio	2 x Soundwire Supports HD link or I2S or 2 x Soundwire	Audio	HD audio link	HD audio link	HD audio link
Ethernet	2 x Ethernet with TSN & WOL support	Ethernet	1 x 2.5GbE	1 x 2.5GbE	1 x 2.5GbE
Mass Storage	2 (share with PCIe)	Mass Storage	2 x SATA3.0,	2 x SATA3.0,	2 x SATA3.0,
RS-232/422/485	N/A	RS-232	2 x RX/TX	2 x RX/TX	2 x UART ports (RX/TX only)
USB 2.0	8	RS-232/422/485	N/A	N/A	N/A
USB 3.0 / 4	2 / 2	USB 2.0	8	8	8
Serial Port	GPIO: 12 bit GPIO (default 6 input / 6 output) I2C Baud Rate: 400KHz SMBus Baud Rate: 100KHz UART TX/RX signal only	USB 3.0	4	4	4
Expansion & Serial Bus	4 x PCIe1 Gen4 (Lane 0-3), configurable to x1, x2, x4 2 x PCIe4 Gen4 (Lane 4-7, 8-11) 1 x PCIe4 Gen4 (Lane 12-15) shared with optional onboard NVMe 4 x PCIe1 Gen4 (Lane 16-19), *BOM optional and configurable to x1, x2, x4 1 x PCIe8 Gen5 (Lane 32-39), Processor H only	Digital I/O	8-bit programmable	8-bit programmable	8-bit programmable
TPM	Onboard TPM 2.0	Expansion & Serial Bus	2xPCIex8, 1xPCIex4, 4xPCIex1, I2C SMBUS, SPI, LPC	2xPCIex8, 1xPCIex4, 4xPCIex1, I2C SMBUS, SPI, LPC	1 x PCIe8 (or 2 x PCIe4) 1 x PCIe4 (or 4 x PCIe1) 4 x PCIe x1 lanes, I2C Interface, GPIO, SMBus, LPC
Power Input	DC 8 ~ 20V, 5VSB	TPM	Support TPM 2.0	Support TPM 2.0	Support TPM 2.0
Operating Temperature	🔥 -40 ~ 85°C (-40 ~ 185°F)	Power Input	DC 8.5~20V, 5VSB	DC 8.5~20V, 5VSB	DC 8.5~20V, 5VSB
		Operating Temperature	🔥 -40 ~ 85°C (-40 ~ 185°F)	🔥 -40 ~ 85°C (-40 ~ 185°F)	🔥 -40 ~ 85°C (-40 ~ 185°F)

🔥 Wide Temperature Range

*Note: One PCIe4 lane is from CPU, and it can not be configured as four x1 lanes.



Model	EmCOMe-i93U0	EmETXe-i92U0	EmETXe-i2309-WT	EmETXe-a10R0
Form Factor	COM Express Compact Type 6	COM Express Compact Type 6	COM Express Compact Type 6	COM Express Compact Type 6
Dimension	95 x 95 mm	95 x 95 mm	95 x 95 mm	95 x 95 mm
Processor	12th Generation Intel® Core™ - i7-1265UE 3.5GHz / 4.7GHz - i5-1245UE 3.3GHz / 4.4GHz - i3-1215UE 3.3GHz / 4.4GHz - Celeron® 7305E 1.0GHz	11th Gen. Intel® Core™ - i7-1185G7E 1.8GHz / 4.4GHz - i5-1145G7E 1.5GHz / 4.1GHz - i3-1115G4E 2.2GHz / 3.9GHz Celeron® 6305E 1.8GHz	AMD® Ryzen™ R1000 R1606G 3.5GHz R1505G 3.3GHz	AMD® Ryzen™ V1000 V1807B 3.8GHz V1605B 3.6GHz V1756B 3.6GHz
Chipset	Integrated Intel® Iris Xe or UHD Graphics (depends on CPU SKU)	Integrated Intel® Iris Xe or UHD Graphics (depends on CPU SKU)	N/A	N/A
Memory	2 x DDR5 SO-DIMM Sockets 1 x Analog RGB port	2 x DDR4 SO-DIMM Sockets 1 x Analog RGB port	2 x DDR4 ECC SO-DIMM Sockets	2 x DDR4 ECC SO-DIMM Sockets
Video Output	3 x DDI ports	3 x DDI ports	2 x DDI ports	3 x DDI ports
LVDS	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit
Audio	HD audio link	HD audio link	HD audio link	HD audio link
Ethernet	1 x 2.5GbE	1 x GbE	1 x GbE	1 x GbE
Mass Storage	2 x SATA3.0,	2 x SATA3.0,	2 x SATA3.0	2 x SATA3.0
RS-232	2 x UART ports (RX/TX only)	2 x UART ports (RX/TX only)	2 x RX/TX	2 x RX/TX
RS-232/422/485	N/A	N/A	N/A	N/A
USB 2.0	8	8	8	8
USB 3.0	4	4	2	4
Digital I/O	8-bit programmable	8-bit programmable	8-bit Programmable	8-bit Programmable
Expansion & Serial Bus	1 x PCIe8 (or 2 x PCIe4), 1 x PCIe4 (or 4 x PCIe1), 4 x PCIe1, I2C Interface, GPIO, SMBUS, LPC	1 x PCIe4*, 4 x PCIe1, I2C Interface, GPIO	6 x PCIe x1, 1 x PCIe x4 I2C, SMBus, SPI, LPC	8 x PCIe x1, 1 x PCIe x8, I2C, SMBus, SPI, LPC
TPM	Support TPM 2.0	Support TPM 2.0	Supports TPM 2.0	Supports TPM 2.0
Power Input	DC 8.5~20V, 5VSB	DC 8.5~20V, 5VSB	DC 8.5V~20V, 5VSB	DC 8.5V~20V, 5VSB
Operating Temperature	 -40 ~ 85°C (-40 ~ 185°F)	 -40 ~ 85°C (-40 ~ 185°F)	-20~70°C (-4 ~ 158°F)	-20 ~ 70°C (-4 ~ 158°F)



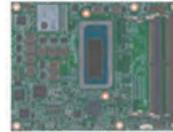
Wide Temperature Range

Computer On Module

COMExpress - Type6

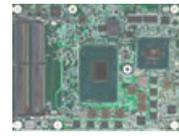
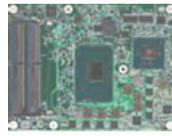
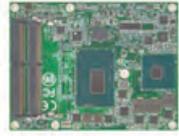


NEW



Model	EmETXe-a10M0	EmCOMe-i94M0	EmCOMe-i93M0	EmETXe-a10M3
Form Factor	COM Express® Compact Type 6	COM Express® Basic Type 6	COM Express® Basic Type 6	COM Express® Basic Type 6
Dimension	95 x 95 mm	125 x 95 mm	125 x 95 mm	125 x 95 mm
Processor	AMD® Ryzen™ V1000 V1807B 3.8GHz V1605B 3.6GHz V1756B 3.6GHz	13 th Gen. Intel Core™ i7-13800HE 4.0GHz / 5.0GHz i5-13600HE 3.6GHz / 4.8GHz i3-13300HE 3.4GHz / 4.6GHz i7-1370PE 3.7GHz / 4.8GHz i5-1350PE 3.4GHz / 4.6GHz i3-1320PE 3.3GHz / 4.5GHz	12 th Gen. Intel Core™ i7-12800HE 3.5GHz / 4.6GHz i5-12600HE 3.3GHz / 4.5GHz i3-12300HE 3.3GHz / 4.3GHz i7-1270PE 3.3GHz / 4.5GHz i5-1250PE 3.2GHz / 4.4GHz i3-1220PE 3.1GHz / 4.2GHz	AMD® Ryzen V1000 V1807B 3.8 GHz V1605B 3.6 GHz V1756B 3.6 GHz V1404I 3.6 GHz
Chipset	N/A	N/A	N/A	N/A
Memory	2 x DDR4 ECC SO-DIMM Sockets	2 x DDR5 SO-DIMM Sockets	2 x DDR5 SO-DIMM Sockets	2 x DDR4 ECC SO-DIMM Sockets
Video Output	3 x DDI ports	3 x DDI ports, 1 x Analog RGB port	3 x DDI ports, 1 x Analog RGB port	3 x DDI ports
LVDS	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit
Audio	HD audio link	HD audio link	HD audio link	HD audio link
Ethernet	1 x GbE	1 x 2.5GbE	1 x 2.5GbE	1 x GbE
Mass Storage	2 x SATA3.0	2 x SATA3.0 1 x BGA NVMe SSD (Optional)	2 x SATA3.0 1 x BGA NVMe SSD (Optional)	4 x SATA3.0
RS-232	2 x RX/TX	2 x RX/TX	2 x RX/TX	2 x RX/TX
RS-232/422/485	N/A	N/A	N/A	N/A
USB 2.0	8	8	8	8
USB 3.0	4	4	4	4
Digital I/O	8-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit programmable
Expansion & Serial Bus	8 x PCIe x1, 1 x PCIe x8, I2C, SMBus, SPI, LPC	2 x PCIe x8, 1 x PCIe x4, 4 x PCIe x1, I2C, SMBUS, SPI, LPC	2 x PCIe x8, 1 x PCIe x4, 4 x PCIe x1, I2C, SMBUS, SPI, LPC	8 x PCIe x1, 1 x PCIe x8, I2C, SMBus, SPI, LPC
TPM	Supports TPM 2.0	N/A	N/A	Supports TPM 2.0
Power Input	DC 8.5V~20V, 5VSB	DC 8.5V~20V, 5VSB	DC 8.5V~20V, 5VSB	DC 8.5V~28V, 5VSB
Operating Temperature	-20 ~ 70°C (-4 ~ 158°F)	-40 ~ 85°C (-40 ~ 185°F)	-40 ~ 85°C (-40 ~ 185°F)	-20 ~ 70°C (-4 ~ 158°F)

Wide Temperature Range



Model	EmETXe-i91M0-WT	EmETXe-i90M3-WT	EmETXe-i89M3-WT
Form Factor	COM Express [®] Basic Type 6	COM Express [®] Basic Type 6	COM Express [®] Basic Type 6
Dimension	125 x 95 mm	125 x 95 mm	125 x 95 mm
Processor	8th /9 Gen. Intel Core™ i7-9850HE 4.4GHz i7-8850H 4.3GHz i5-8400H 4.2GHz i3-8100H 3.0GHz	7th® Gen. Intel Core™ i7-7820EQ 3.7GHz i5-7442EQ 2.9GHz Xeon E3-1505L v6 3.0GHz	6th Gen. Intel Core™ i7-6822EQ 2.8GHz i5-6442EQ 2.7GHz Xeon E3-1505L v5 2.8GHz Xeon E3-1505M v5 3.7GHz
Chipset	QM370	QM175 / CM238	QM170 / CM236
Memory	2 x DDR4 SO-DIMM Sockets	2 x DDR4 SO-DIMM Sockets	2 x DDR4 SO-DIMM Sockets
Video Output	3 x DDI ports or 2 x DDI ports, Analog RGB (Optional)	2 x DDI ports, 1 x Analog RGB	2 x DDI ports, 1 x Analog RGB
LVDS	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit
Audio	HD audio link	HD audio link	HD audio link
Ethernet	1 x GbE	1 x GbE	1 x GbE
Mass Storage	4 x SATA3.0	4 x SATA3.0	4 x SATA3.0
RS-232	2 x RX/TX	2 x RX/TX	2 x RX/TX
RS-232/422/485	N/A	N/A	N/A
USB 2.0	8	8	8
USB 3.0	4	4	4
Digital I/O	8-bit Programmable	8-bit Programmable	8-bit Programmable
Expansion & Serial Bus	8 x PCIe x1, 1 x PCIe x16, I2C, SMBus, SPI, LPC	8 x PCIe x1, 1 x PCIe x16, I2C, SMBus, SPI, LPC	8 x PCIe x1, 1 x PCIe x16, I2C, SMBus, SPI, LPC
Power Input	DC 8.5V~20V, 5VSB	DC 8.5V~20V, 5VSB	DC 8.5~20V, 5VSB
Operating Temperature	ⓘ -40 ~ 85°C (-40 ~ 185°F)	ⓘ -40 ~ 85°C (-40 ~ 185°F)	ⓘ -40 ~ 85°C (-40 ~ 185°F)

ⓘ Wide Temperature Range

Computer On Module

COMExpress - Type10



Model	EmNANO-iX701	EmNANO-i2800	EmNANO-i2402-WT	EmNANO-i2408
Form Factor	COM Express Mini Type 10	COM Express Mini Type 10	COM Express Mini Type 10	COM Express Mini Type 10
Dimension	84 x 55 mm	84 x 55 mm	84 x 55 mm	84 x 55 mm
Processor	Soldered onboard Intel® Atom® x7211RE 1.0GHz/3.2GHz(Turbo) Dual cores TDP 6W Atom® x7433RE 1.5GHz/3.5GHz(Turbo) Quad cores TDP 9W	Intel® Atom® x6211E 1.3GHz Dual cores TDP 6W Atom® x6413E 1.5GHz Quad cores TDP 9W	Intel Atom E3900 Series Intel Celeron N3350 2.40 GHz Intel Pentium N4200 2.50 GHz	Intel Atom Processor E3940 1.6GHZ
Chipset	N/A	N/A	N/A	N/A
Memory	Soldered onboard LPDDR5 4800MT/s 4GB / 8GB / 16GB	Soldered onboard LPDDR4 3200MT/s 4GB / 8GB SDRAM	Soldered onboard 4GB DDR3L SDRAM	Soldered Onboard 4GB DDR3L SDRAM
Video Output	1 x DDI port	1 x DDI port	1 x DDI port	1 x DDI port
LVDS	Single Channel 24-bit	Single Channel 24-bit	Single Channel 24-bit	Single Channel 24-bit
Audio	HD audio link	HD audio link	HD audio link	HD audio link
Ethernet	1 x GbE	1 x GbE	1 x GbE	1 x GbE
Mass Storage	2 x SATA3.0 eMMC 5.0 (OEM Request)	2 x SATA3.0 eMMC 5.0 (OEM Request)	2 x SATA3.0 eMMC 5.0 (OEM Request)	2 x SATA3.0 eMMC 5.0 (OEM Request)
RS-232	2 x RX/TX	2 x RX/TX	2 x RX/TX	2 x RX/TX
RS-232/422/485	N/A	N/A	N/A	N/A
USB 2.0	8	8	8	8
USB 3.0	2	2 x USB 3.2	2	2
Digital I/O	N/A	N/A	N/A	N/A
Expansion & Serial Bus	4 x PCIe x1, LPC, I2C, SMBus, SDIO	4 x PCIe x1, LPC, I2C, SMBus, SDIO	4 x PCIe x1, SDIO, I2C, SMBus, SPI, LPC	4x PCIe x1, SDIO, I2C, SMBbus, PI, LPC
Power Input	DC 12V / 5V Auto Detect	DC 12V / 5V Auto Detect	DC 12V / 5V Auto Detect	DC 12V / 5V Auto Detect
Operating Temperature	-40 ~ 85°C (-40 ~ 185°F)	-40 ~ 85°C (-40 ~ 185°F)	-40 ~ 85°C (-40 ~ 185°F) (ForAtomE3900Series)	-40 ~ 85°C (-40 ~ 185°F)

Wide Temperature Range

Computer On Module

Qseven



Model	EmQ-iX702	EmQ-i2801	EmQ-i2401	EmQ-i240A
Form Factor	Qseven R2.1	Qseven R2.1	Qseven R2.0	Qseven R2.1
Dimension	70 x 70 mm	70 x 70 mm	70 x 70 mm	70 x 70 mm
Processor	Soldered onboard Intel® Atom® x7211RE 1.0GHz/3.2GHz(Turbo) Dual cores TDP 6W Atom® x7433RE 1.5GHz/3.5GHz(Turbo) Quad cores TDP 9W	Intel® Atom® x6211E 1.3GHz Dual cores TDP 6W Intel® Atom® x6413E 1.5GHz Quad cores TDP 9W	Intel Atom® E3900 Series Intel Pentium N4200 2.5GHZ Intel Celeron N3350 2.4GHZ	Intel Atom® E3900 Series Intel Pentium N4200 2.5GHZ Intel Celeron N3350 2.4GHZ
Memory	Soldered onboard LPDDR5 4800MT/s 4GB / 8GB / 16GB	Soldered LPDDR4 8GB	Soldered onboard 4GB DDR3L SDRAM	Soldered onboard 8GB LPDDR4 SDRAM
Video Output	1 x DDI port	1 x DDI port	1 x DDI port	1 x DDI port
LVDS	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit
Audio	HD audio link	HD audio link	HD audio link	HD audio link
Ethernet	1 x GbE	1 x GbE	1 x GbE	1 x GbE
Mass Storage	2 x SATA3.0 eMMC 5.1(OEM Request)	2 x SATA3.0 eMMC 5.1(OEM Request)	2 x SATA3.0 eMMC 5.0(OEM Request)	2 x SATA3.0 eMMC 5.0 (OEM Request)
RS-232	1	N/A	1	1
RS-232/422/485	N/A	N/A	N/A	N/A
USB 2.0	6	6	4	6
USB 3.0	2	2 x USB 3.1	2	2
Digital I/O	N/A	N/A	N/A	N/A
Expansion & Serial Bus	4 x PCIe1 lanes, I2C, SMBus	4 x PCIe1 lanes, I2C, SMBus	4 x PCIe x1, SDIO, I2C, SMBus, SPI, LPC	4 x PCIe x1, SDIO, I2C, SMBus, SPI, LPC
Power Input	DC 5V, 5VSB	DC 5V, 5VSB	DC 5V, 5VSB	DC 5V, 5VSB
Operating Temperature	 -40~85° C (-40~185° F)	 -40~85° C (-40~185° F)	 -20~85° C (-4~185° F)	 -20~ 85°C (-4~185°F)

 Wide Temperature Range
*Note: Via FPC connector

Computer On Module

PC/104 & PC/104+ / SMARC



Model	Em104P-i2313	Em104-i230F	EmSMK-iX703	EmSMK-i2403
Form Factor	ETXP	PC/104	SMARC 2.1	SMARC 2.0
Dimension	114 x 95 mm	96 x 90 mm	82 x 50 mm	82 x 50 mm
Processor	Intel Atom E3825 1.33GHz / E3845 1.91GHz	Intel Atom E3825 1.33GHz / E3845 1.91GHz	Soldered onboard Intel Atom x7211RE 1.0GHz/3.2GHz(Turbo) Dual cores TDP 6W Atom x7433RE 1.5GHz/3.5GHz(Turbo) Quad cores TDP 9W	Intel Atom Processor x7-E3950 1.6GHz x5-E3940 1.6GHz x5-E3930 1.3GHz
Chipset	N/A	N/A	N/A	N/A
Memory	1 x DDR3L SO-DIMM Socket	1 x DDR3L SO-DIMM Socket	Soldered onboard LPDDR5 4800MT/s 4GB / 8GB / 16GB	Soldered Onboard 8GB LPDDR4 SDRAM
Video Output	Analog RGB	Analog RGB	1 x eDP port, 1 x DP++ port, 1 x HDMI port	1 x eDP port, 1 x DP++ port, 1 x HDMI port
LVDS	Dual Channel 24-bit	Dual Channel 24-bit	N/A	N/A
Audio	Realtek ALC886	Realtek ALC888S	HD audio link	HD audio link
Ethernet	1 x 10/100Mbps 1 x GbE	2 x GbE	2x 2.5GbE	1 x GbE
Mass Storage	1 x Ultra ATAx SATA2.0, 1 x CF II Socket	1 x SATA2.0, 1 x mSATA Socket	1 x SATA3.0, eMMC (OEM Request)	SATA3.0, eMMC (OEM Request)
RS-232	3 x RS-232	2 x RS-232	4 x RX/TX (2xHSUART, 2xUART)	4 x RX/TX (2xHSUART, 2xUART)
RS-232/422/485	1 x RS-232/422/485 selectable	2 x RS-232/422/485 selectable	N/A	N/A
USB 2.0	4	2	6	6
USB 3.0	N/A	1	2	2
Digital I/O	16-bit DIO (8-in/8-out)	8-bit Programmable	8-bit Programmable	8-bit Programmable
Expansion & Serial Bus	PC/104-Plus	PC/104	4 x PCIe x1, SDIO, I2C, SMBus, SPI, LPC	4 x PCIe x1, SDIO, I2C, SMBus, SPI, LPC
Power Input	DC 12V, 5V	DC 12V, 5V	DC 3 ~ 5.25V	DC 3 ~ 5.25V
Operating Temperature	Wide Temperature Range -40 ~ 85°C (-40 ~ 185°F)	Wide Temperature Range -40 ~ 85°C (-40 ~ 185°F)	Wide Temperature Range -20 ~ 85°C (-4 ~ 185°F)	Wide Temperature Range -20 ~ 85°C (-4 ~ 185°F)

Wide Temperature Range

ARM-Based System on Module



Model	SOM-RK391	SOM-RP301
Form Factor	SOM-1-L	SOM-1-S
Dimension	69.6 x 70 mm	69.6 x 50 mm
Processor	Rockchip RK3399 Dual-core Cortex-A72 + Quad-core Cortex-A53	PX30 Quad-Core ARM Cortex-A35, 1.5GHz
Memory	LPDDR4 2GB, optional to 4GB	LPDDR3 2GB
Storage	16GB eMMC with SDIO 5.1	16GB, support SD card boot up
Graphics	Mali-T860MP4 GPU	Mali-G31 GPU
Display	1 x HDMI, 1 x MIPI DSI, 1 x eDP	LVDS or MIPI DSI
Camera	2 x MIPI CSI RX (up to 13MP)	1x MIPI-CSI RX interface with 8MP ISP
Audio	2 x 1W Speaker; 2 x Analog MIC; 1 x Digital MIC; 1 x Headphone	1 x 1W Speaker; 1 x Analog MIC; 1 x Digital MIC; 1 x Headphone out
LAN	1 x GbE	1x 10/100 Ethernet port
Wifi+BT	1 x 802.11 a/b/g/n/ac + BT 5.0	1 x 802.11 a/b/g/n/ac and BT 4.2
USB 2.0	4	4
USB 3.0	2 (Type C)	-
Serial Ports	2 UART ports, 2-wire; 2 UART ports, 4-wire	2 UART ports, 2-wire; 2 UART ports, 4-wire
RTC	Supported	Supported
SDIO	Supported	Supported
GPIO	8	Supported
SPI	1	1
I2C	2	2
Power Input	5V/3A	5V/1.5A
Operating Temperature	-10 ~ 60°C	-10 ~ 70°C
OS Support	Android	Linux: Ubuntu, Buildroot, Android

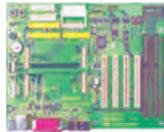
Model	PBA-9000-A
Form Factor	Carrier Board for SOM series
Dimension	165 x 115 mm
Display	1 x HDMI; 1x MIPI DSI; 1 x eDP; 1 x LVDS
Camera	2 x MIPI CSI RX (up to 13MP)
Audio	2 x 1W Speaker; 2 x Analog MIC; 1 x Digital MIC; 1 x Headphone
Ethernet	1 x GbE RJ-45
USB 2.0	4
USB 3.0	2 (Type C)
Serial Port	2 x RS-232 ports, 2-wire; 2 x RS-232 ports, 4-wire
RTC	Supported
SD Card	Supported
SPI	2
I2C	2
Power Input	12V/3A
Operating Temperature	-10 ~ 60°C

Carrier Board



Model	PBC-900J	PBN-9007	PBQ-3000	PBQ-900L
Form Factor	COM Express Basic Type 6 Carrier Board	COM Express Mini Type 10 Carrier Board	EPIC™ form factor Qseven Carrier Board	EPIC™ form factor Qseven Carrier Board
Dimension	125 x 95 mm	125 x 95 mm	165 x 115 mm	165 x 115 mm
Graphics interface	1 x VGA BHs, 1 x LVDS connector	1 x LVDS connector, 1 x DisplayPort connector	1 x VGA connector, 1 x LVDS connector, 1 x DVI-D connector	1 x LVDS connector, 1 x DVI-I connector
Audio	Realtek ALC662	Realtek ALC662	Realtek ALC662	Realtek ALC662
Ethernet	2 x lockable BHs	2 x RJ-45 connectors	2 x RJ-45 connectors	2 x RJ-45 connectors
Storage	1 x SATA connector, 1 x mSATA Socket	1 x SATA connector, 1 x CFast Socket	2 x SATA connectors	1 x SATA connector, 1 x M.2 Socket
Serial Port	3 x RS-232, 1 x RS-232/422/485	1 x RS-232, 1 x RS-232/422/485	3 x RS-232, 1 x RS-232/422/485	3 x RS-232, 1 x RS-232/422/485, 1 x UART
LPT Port	1	N/A	N/A	N/A
USB 2.0	2	4	6	1
USB 3.0/2.0	2	2	N/A	2
Digital I/O	16-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable
Expansion & Serial Bus	1 x Mini-Card Socket, PCI/104	1 x Mini-Card Socket, SIM Socket	1 x Mini-Card Socket, LPC	SMBus, I2C, SDIO, 1 x M.2 Socket E-key
Power Input	DC 12V	DC 12V	10V ~ 30V	10V ~ 30V
Operating Temperature	 -40 ~ 85°C (-40 ~ 185°F)	 -40 ~ 85°C (-40 ~ 185°F)	-20~70° C (-4 ~ 158°F)	 -40 ~ 85°C (-40 ~ 185°F)

 Wide Temperature Range

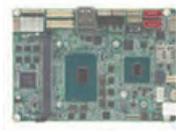
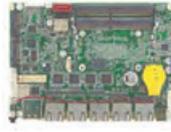


Model	PBQ-900R	PBE-1000	PBE-1101	PBE-1705
Form Factor	ATX form factor Qseven Carrier Board	ATX form factor ETX Evaluation Board	ETX carrier Board	ATX form factor COM Exp. Type 6 Evaluation Board
Dimension	305 x 244 mm	305 x 210 mm	114 x 95mm	305 x 244 mm
Graphics interface	Depends on CPU module	1 x VGA connector, 1 x LVDS connector	1 x VGA connector 1 x 24-bit LVDS connector	1 x VGA connector, 1 x DVI-I connector, 1 x LVDS connector, 2 x DisplayPort connectors
Audio	Realtek® ALC886	Mic-in/ Line-in/ Line-out	Mic-in/Line-in/Line-out	Realtek® ALC886
Ethernet	1 x RJ-45 connector	1 x RJ-45 connector	2 x LAN PHs	1 x RJ-45 connector
Storage	2 x SATA connectors	2 x Ultra ATA connectors 1 x FDD connector, 1 x CF II socket	1 x Ultra ATA connector 1 x CFII Socket	4 x SATA connectors
Serial Port	12 x RS-232/422/485 (depends on Super IO module)	3 x RS-232, 1 x RS-232/422/485	3 x RS-232 1 x RS-232/422/485	6 x RS-232
LPT Port	1 (depends on Super IO module)	1	1	1
USB 2.0	5 (depends on Super IO module)	4	4	2
USB 3.0/2.0	3 (depends on Super IO module)	N/A	N/A	4
Digital I/O	12-bit Programmable	16-bit DIO 8-in/ 8-out	16-bit DIO, 8-in/ 8-out	8-bit Programmable
Expansion & Serial Bus	1 x PCIe x 16 slot, 4 x PCIe x1 slots, 1 x M.2 Socket E-key SDIO, I2C, LPT	4 x PCI slots, 3 x ISA slots	PC/104-Plus, 1 x I2C	2 x PCIe x1 slots, 1 x PCIe x 4 slot, 1 x PCIe x16 slot, 2 x Mini-Card Sockets
Power Input	9~36V	AT/ ATX	12V DC	DC 5~20V / ATX
Operating Temperature	 -40 ~ 85°C (-40 ~ 185°F)	0 ~ 60°C (32 ~ 140°F)	 -40 ~ 85°C (-40 ~ 185°F)	 -40 ~ 85°C (-40 ~ 185°F)

 Wide Temperature Range

Single Board Computer

3.5” Miniboard



Model	SeCORE-i92UZ	EmCORE-i90U2-WT	EmCORE-i90M2-W T	EmCORE-i89M2-WT
Form Factor	3.5"	3.5"	3.5"	3.5"
Dimension	146 x 106 mm	146 x 102 mm	146 x 102 mm	146 x 102 mm
Processor	11th Gen. Intel® Core™ i7-1165G7 4.4GHz i5-1135G7 4.2GHz i3-1115G7 4.1Hz, Intel® Celeron® 6305E 1.8GHz	7th Gen. Intel® Core™ i7-7600U 3.4GHz i5-7300U 2.8GHz i3-7100U 2.4GHz, Intel® Celeron® 3965U 2.2GHz	7th Gen. Intel® Core™ i5-7442EQ 2.9Ghz	6th Gen. Intel® Core™ i5-6442EQ 2.7GHz i7-6822EQ 2.8GHz
Chipsets	N/A	N/A	QM175	QM170
Memory	2 x DDR4 SO-DIMM	2 x DDR4 SO-DIMM Sockets	1 x DDR4 SO-DIMM Socket	1 x DDR4 SO-DIMM Socket
Graphic interface	2 x HDMI 1 x LVDS/eDP	1 x HDMI 1 x DisplayPort	1 x HDMI 1 x DisplayPort	1 x HDMI 1 x DisplayPort
LVDS	2 x Dual Channels 24-bit	Dual Channels 24-bit	2 x Dual Channels 24-bit (1 x LVDS is optional)	2 x Dual Channels 24-bit
Audio	Realtek ALC662	Realtek® ALC269	Realtek® ALC662	Realtek® ALC886
Ethernet port	2 x GbE	5 x GbE	2 x GbE	2 x GbE
Storage	1 x SATA2.0 1 x M.2 M-key	1 x SATA3.0 1 x M.2 B-key	2 x SATA3.0 1 x M.2 M-key	2 x SATA3.0 1 x M.2 M-key
Serial port	3 x RS-232 2 x RS232/TTL 1 x RS232/RS485/TTL	4 x RS-232/422/485 selectable	4 x RS-232 2 x RS-232/422/485 selectable	4 x RS-232 2 x RS-232/422/485 selectable
USB 2.0	4	4	4	4
USB 3.0/2.0	6	4	2	2
Digital I/O	8-bit programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable
Expansion & Serial Bus	1 x M.2 M Key, 1 x M.2 E Key, 1 x M.2 B Key	4 x PCIe x 1 / 1 x PCIe x 4 FCC connector, 1 x M.2 E-key, 1 x Nano SIM Socket (OEM request)	1 x Mini-Card Socket 1 x Micro SIM socket	1 x Mini-Card Socket 1 x Micro SIM Socket (OEM request)
Power Input	DC 12V	DC 9V ~ 15V / 15V ~ 36V	DC 12V	DC 12V
Operating Temperature	0°C ~ 60°C (32°F ~ 140°F)	 -40 ~ 85°C (-40 ~ 185°F)	 -40 ~ 85°C (-40 ~ 185°F)	 -40 ~ 85°C (-40 ~ 185°F)

 Wide Temperature Range



Model	EmCORE-iX700	EmCORE-i2802	EmCORE-a10R2	EmCORE-i2305-W T
Form Factor	3.5"	3.5"	3.5"	3.5"
Dimension	146 x 102 mm	146 x 102 mm	146 x 102 mm	146 x 102 mm
Processor	Soldered onboard Intel® Atom® x7211RE 1.0GHz/3.2GHz(Turbo) Dual cores TDP 6W Atom® x7433RE 1.5GHz/3.5GHz(Turbo) Quad cores TDP 9W	Intel Elkhartlake Celeron N6210 1.2GHz/ Atom® x6413E 1.5GHz Processor	Soldered onboard AMD Ryzen™ R1102G 2.6GHz	Intel® Atom® E3825 1.33GHz / E3845 1.91GHz Celeron® N2807 2.16GHz / N2930 2.16GHz
Chipsets	N/A	N/A	N/A	N/A
Memory	1 x DDR5 SO-DIMM socket, up to 16GB 4800 MT/s SDRAM	1 x DDR4 SO-DIMM socket	1 x DDR4 SO-DIMM Socket	1 x DDR3L SO-DIMM Socket
Graphic interface	1 x Analog RGB 1 x HDMI 1 x Display Port	1 x Display Port	1 x DisplayPort*	Analog RGB, 1 x HDMI
LVDS	Dual Channels 24-bit	2 x Dual channel 24-bit	2 x Dual Channels 24-bit	Dual Channels 24-bit
Audio	HD audio link	Realtek® RTL8111	Realtek ALC269	HD audio link
Ethernet port	2x 2.5GbE	2 x GbE	2 x GbE	2 x GbE
Storage	1 x SATA 3.0 port 1 x M.2 M-key 2280 (PCIe x1 / SATA 3.0)	2 x SATA3.0	2 x SATA3.0	1 x SATA2.0, 1 x mSATA , eMMC 4.5 (OEM request, E3800 family only)
Serial port	2 x RS-232/422/485 selectable	6 x Serial Ports	6 x RS-232	1 x RS-232 1 x RS-232/485 selectable
USB 2.0	4	4	6	4
USB 3.0/2.0	2	2	2	1
Digital I/O	8-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable
Expansion & Serial Bus	1 x M.2 E-key 2030 (PCIe x1 / USB 2.0) 1 x M.2 B-key 3042/3052 (PCIe x1 / USB 3.2)	2 x Mini-card socket 1 x Micro SIM socket (for full size Minicard)	2 x Mini-Card Sockets (1 x Full size, 1 x Half size) 1 x Micro SIM Socket	1 x Mini-Card Socket, 1 x micro-SDXC socket, 2 x I2C ports (OEM request, E3800 family only)
Power Input	DC 12V	DC 8V ~ 13.2V	DC 8V - 13.2V	DC 12V
Operating Temperature	🔧 -40 ~ 85°C (-40 ~ 158°F, WT-series) -20 ~ 50°C (-4 ~ 122°F)	-20 ~ 70°C (-4 ~ 158°F)	-20 ~ 70°C (-4 ~ 158°F)	🔧 -40 ~ 85°C (-40 ~ 185°F)

🔧 Wide Temperature Range *Choose two from three

Industrial Motherboard / Slot Computing



Model	ITX-I93QI-H610	ITX-i92QA
Form Factor	Mini-ITX	Wide Mini-ITX mother board
Dimension	170 x 170 mm	170 x 210 mm
Processor	Intel® 14th / 13th / 12th Generation Core™ i9 / i7 / i5 / i3 processors, TDP 35W/65W CPU	10th Generation Xeon W/ Core™ i9 / i7 / i5 / i3 processors in LGA1200 socket
Chipsets	Intel® H610 Chipset	Intel PCH W480E
Memory	1 x DDR5 4800MHz SODIMM, Max Memory Size up to 32 GB	2 x DDR4 DIMM sockets support ECC
Graphic interface	1 x DP 1.4 1 x HDMI 2.0b	2 x HDMI 2.0 port
Audio	HD audio link Mic-in / Line-out	-
Ethernet port	2 x 2.5GbE Ethernet controller (up to 4 LAN optional)	5 x Intel i210AT GbE controllers, 1 x Intel i219LM PHY with iAMT
Storage	1 x SATA 3.0 1 x M.2 2242 M key(SATA3.0) for SATA SSD	4 x SATA 3.0 2 x M.2 2280 M-key (Gen3x4, supports NVMe SSD)
Serial port	2 x RS232/422/485, 4 x RS232	3 x RS-232 ports; 2 x RS-232/422/485 ports
USB 2.0	4	2 x USB 2.0 ports
USB 3.0/2.0	4	4 x USB 3.0/2.0 ports
Digital I/O	8 bit GPIO	N/A
Expansion & Serial Bus	1 x M.2 2230 E key(SATA3.0) for WIFI, 1 x Mini-PCIe slot (PCIe / USB2.0 signal supported), 1 x SIM socket	1 x PCIe16 slot, support SCDB-3297; 1 x PCIe8 + 2x PCIe4 lanes Riser Card
Power Input	DC 19-24V	2.98A@12V (w/ i5-10500TE)
TPM	On board (Optional)	-
Operating Temperature	0 ~ 60°C (32 ~ 140°F)	0 ~ 60°C (32 ~ 140°F)

Model	EmCORE-i230R
Form Factor	Half Size ISA SBC
Dimension	185 x 122 mm
Processor	Intel® Celeron® Processor N2930 1.83Ghz
Chipsets	-
Memory	1 x DDR3L SO-DIMM Socket
Graphic interface	1 x Analog RGB
LVDS	Dual Channel 24-bit
Audio	HD audio link
Ethernet port	1 x GbE
Storage	1 x SATA 1 x NGFF M.2 M-key
Serial port	3 x RS-232 1 x RS-232/422/485 selectable
USB 2.0	4
USB 3.0/2.0	1
Digital I/O	8-bit Programmable
Expansion & Serial Bus	1 x NGFF M.2 E-key, 1 x PC-104 slot, ISA interface
Power Input	DC 5CV, DC 12V
Operating Temperature	-20 ~ 70°C (-4 ~ 158°F)

Semi-Industrial Motherboard



Model	ITX-i91Q2	MB-i93Q0	MB-i91Q0	MB-i91Q1
Form Factor	Mini-ITX	micro-ATX	ATX	micro-ATX
Dimension	170 x 170 mm	244 x 244 mm	305 x 244 mm	244 x 244 mm
Processor	8 th Gen. Intel® Core™ i7/i5/i3 / Pentium	14th/13th/12th Gen. Intel® Core™ i9/i7/i5/i3 Pentium® / Celeron®	8 th Gen. Intel® Core™ i7/i5/i3 Xeon®E / Pentium / Celeron	8 th Gen. Intel® Core™ i7/i5/i3 Pentium
Socket	LGA1151	LGA1700	LGA1151	LGA1151
Chipset	Intel® PCH Q370	Intel® PCH Q670E/ PCH H610E	Intel® PCH Q370 / C246	Intel® PCH H310
Super I/O	NUVOTON NCT6116D	Fintek F81966D-I	Fintek F81966	Fintek F81966
RAM Socket	2 x DDR4 2400MHz SO-DIMM	2 x DDR3L 1866MHz SO-DIMM	4 x DDR4 2666MHz Long-DIMM	2 x DDR4 2666MHz Long-DIMM
Max. Capacity	32GB	Up to 128GB	64GB	32GB
Serial Port	4 x RS-232 2 x RS-232/422/485	5 x RS-232 1 x RS-232/422/485	8 x RS-232 2 x RS-232/422/485	8 x RS-232 2 x RS-232/422/485
USB Port	4 x USB 3.1 (Gen. 2) 6 x USB 3.0/2.0 2 x USB 2.0	Up to 6 x USB 3.2 Gen 2 ports 9 x internal USB 2.0 ports	4 x USB 3.1 (Gen. 2) 4 x USB 3.0/2.0 4 x USB 2.0	4 x USB 3.0/2.0 ports 4 x USB 2.0 ports
Digital I/O	8-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable
Expansion & Serial Bus	1 x PCIe x16, 1 x Mini-card(half), 1 x SIM	Up to 1 x PCIe x16 slot 3 x PCIe x4 slots, M.2 E key, 2230 (PCIex1/ USB 2.0)	2 x PCIe x16, 1 x PCIe x4, 1 x PCIe x1, 2 x PCI, 1 x M.2 E-key	1 x PCIe x16, 1 x PCIe x1, 2 x PCI, 1 x Mini-card (full) 1 x SIM
Storage	5 x SATA 600MB/s 1 x mSATA (full)	1 x SATA 600MB/s 1 x M.2 M-key	5 x SATA 600MB/s 1 x M.2 M-key	3 x SATA 600MB/s 1 x M.2 M-key
Ethernet	2 x GbE	Up to 1 x 2.5GbE, 2 x GbE	2 x GbE	2 x GbE
Audio	Mic-in, Line-in, Line-out	Mic-in, Line-in, Line-out	Mic-in, Line-in, Line-out	Mic-in, Line-in, Line-out
LVDS	Dual Channels 24-bit	N/A	N/A	N/A
Video Output	1 x HDMI, 1 x DP 1 x VGA	1 x HDMI 1 x DP 1 x VGA	1 x VGA, 1 x DVI-D, 1 x HDMI, 1 x DP	1 x VGA, 1 x DVI-D, 1 x HDMI, 1 x DP
Power Input	24-pin + 4-pin ATX power connector		24-pin + 8-pin ATX power connector	
		24-pin ATX power connector		24-pin + 8-pin ATX power connector
Operating Temperature	0 ~ 60°C (32 ~ 140°F)	0 ~ 60°C (32 ~ 140°F)	0 ~ 60°C (32 ~ 140°F)	0 ~ 60°C (32 ~ 140°F)

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