



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 $+85^{\circ}\text{C}$ 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)



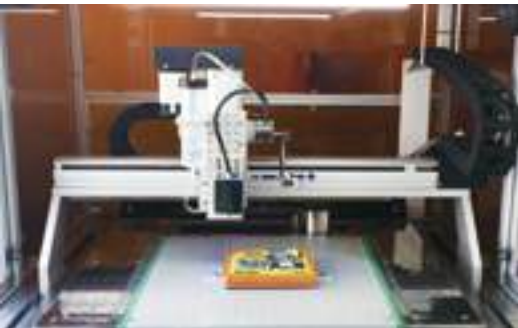
Validation & Testing

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

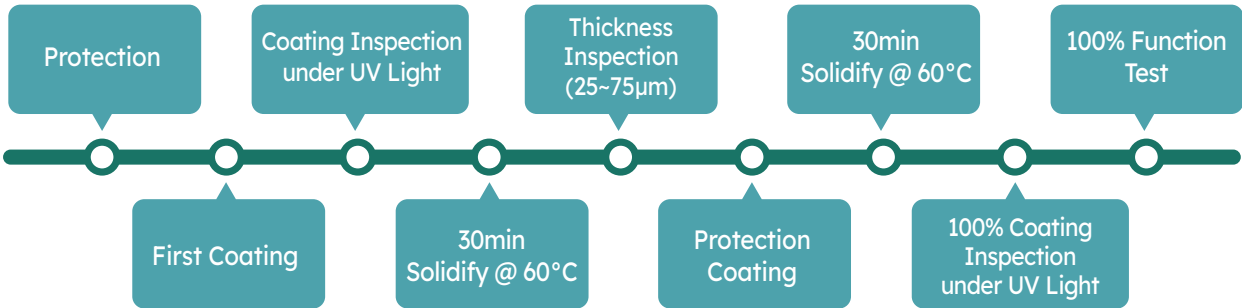
- EMI/EMC validation
- Vibration, shock and drop tests
- Humidity and temperature tests
- Thermal analysis
- Performance & compatibility tests

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 Express Basic	125 x 95 mm	Slot Computing	338 x 122 / 185 x 122mm
ETX	114 x 95 mm	Industrial Motherboard	
		Mini-ITX	170 x 170 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.



31 years of embedded experience



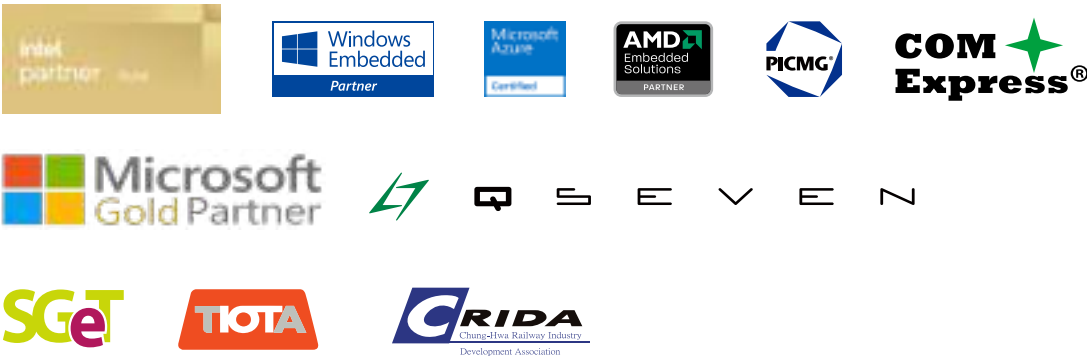
Up to 15 years longevity commitment from first production



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 Regulation Compliance

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



Customization Competency

Satisfy all your needs to speed 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:

- 6th Gen. 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 CWR Technology to Optimize CPU Power

CPU Watt Reduction (CWR) is one of ARBOR's latest technology illustrating our customization competency to satisfy customers' individual embedded applications. It limits CPU power consumption while at the same time optimizing its performance. By offering application-optimized CPU power configuration, it enables developers to achieve the best tradeoff between power and performance demands.



Limiting CPU Power

With CWR technology, the thermal design power (TDP) of a CPU is specifically configured to limit CPU power consumption.



Increasing Performance-per-Watt

Limiting CPU power inevitably impacts the performance, yet a higher performance-watt ratio can be delivered, indicating higher power efficiency can be attained.



Better Performance

CWR optimizes performance at acceptable levels according to each project's actual applications to ensure workload can be met.

CWR Technology Advantages



Cost-Effective Migration to New Generation CPU



More Flexible CPU Selection



Project-Specific Configuration



Reducing Total Cost of Ownership (TCO)

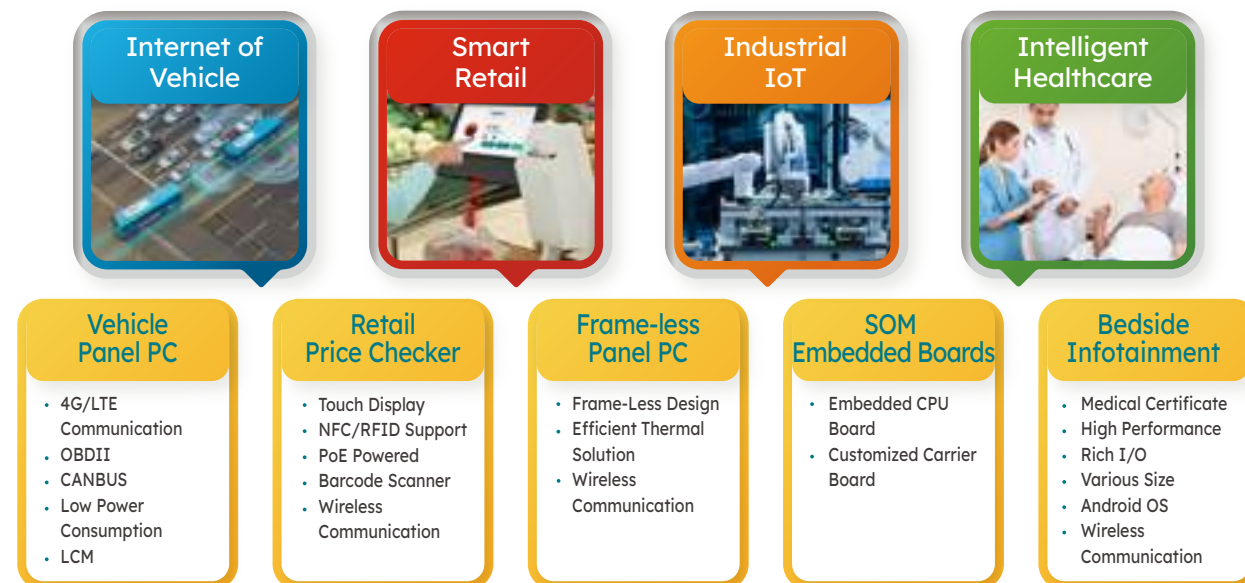
ARM-Based Embedded Solutions

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.

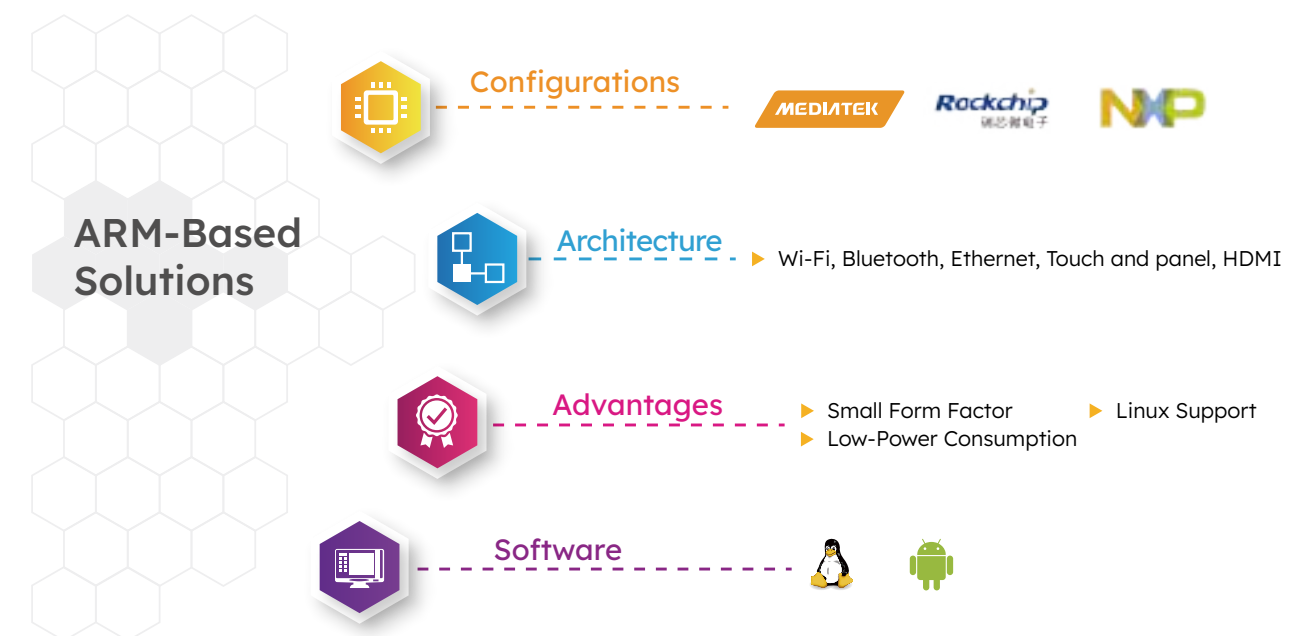
ARBOR ARM-Based IIoT Solutions



ARM-Based Embedded Systems

SoM	IOT-800N Slim Panel PC	PC1017 Price Checking Terminal	IEC-3390 Compact Signage System

Custom Your ARM-Based Solutions with ARBOR



ARM-Based Embedded Systems

RP-101K Open Frame Touch Panel Kit	M1016 Medical Thin Client

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® 13 th Gen.	Intel® Elkhart Lake	Intel® 13 th Gen.	AMD Ryzen V1000
EmETXe-i94U0	EmNANO-i2800	EmETXe-i94M0	EmETXe-a10M3

Single Board Computers

Meet industrial grade design and quality



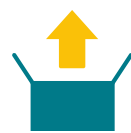
ARBOR Single Board Computer (SBC) series ranging from 3.5", PC/104, PC/104-Plus and EPIC, to a wide range of full-size and half-size Slot Computing boards. ARBOR's SBCs are designed around the powerful core logic embodied within the chipsets from Intel® and AMD®. Highly integrated designs allow them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



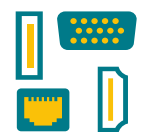
Reliable and Rugged Designs

- 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

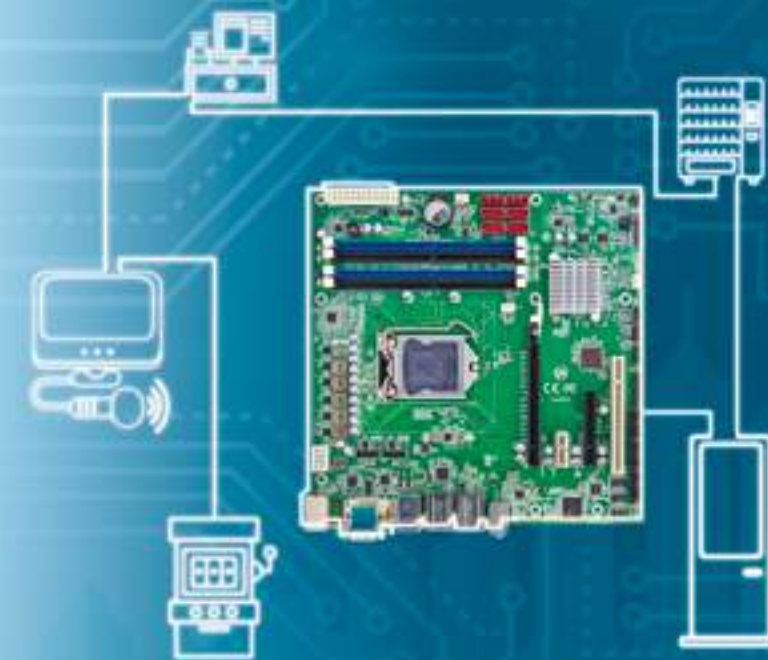
To protect the components & circuitry against dust, fungus, moisture and salt spray.

SBC Product Highlights

		
Intel Elkhartlake	Intel® 7th Gen.	Intel® 7th Gen.
EmCORE-i2802	EmCORE-i90U2-WT	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

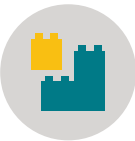
Our cost effective solutions save turnaround costs and time for your projects.



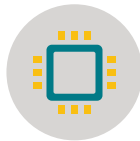
Vertical Markets Ready

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

Features



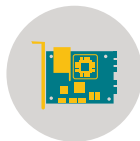
Off-the-shelf motherboards with expansion ability and industrial reliability



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

Selection Guide

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

Computer On Module
COM Express - Type 6



Model	EmETXe-i94U0	EmETXe-i93U0	EmETXe-i92U0	EmETXe-i92U1	EmETXe-i91U0
Form Factor	COM Express® Compact Type 6	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	95 x 95 mm
Processor	13 th 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	12 th 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	11 th 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	11 th 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	8 th Gen. Intel® Core™ - i7-8665UE 1.7GHz / 4.4GHz - i5-8365UE 1.6GHz / 4.1GHz - i3-8145UE 2.2GHz / 3.9GHz - Celeron® 4305UE 2.2GHz
Chipset	Integrated Intel® Iris Xe or UHD Graphics (depends on CPU SKU)	Integrated Intel® Iris Xe or UHD Graphics (depends on CPU SKU)	Integrated Intel® Iris Xe or UHD Graphics (depends on CPU SKU)	Integrated Intel® Iris Xe or UHD Graphics (depends on CPU SKU)	Integrated Intel® Iris Xe or UHD Graphics (depends on CPU SKU)
Memory	2 x DDR5 SO-DIMM Sockets	2 x DDR5 SO-DIMM Sockets	2 x DDR4 SO-DIMM Sockets	2 x DDR4 SO-DIMM Sockets	2 x DDR4 SO-DIMM Sockets
Video Output	1 x Analog RGB port 3 x DDI ports	1 x Analog RGB port 3 x DDI ports	1 x Analog RGB port 3 x DDI ports	1 x Analog RGB port 3 x DDI ports	2 x DDI ports or 1 x DDI port, 1 x Analog RGB port
LVDS	Dual Channels 24-bit	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	HD audio link
Ethernet	1 x 2.5GbE	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,	2 x SATA3.0,
RS-232	2 x UART ports (RX/TX only)	2 x UART ports (RX/TX only)	2 x UART ports (RX/TX only)	2 x UART ports (RX/TX only)	2 x UART ports (RX/TX only)
RS-232/422/485	N/A	N/A	N/A	N/A	N/A
USB 2.0	8	8	8	8	8
USB 3.0	4	4	4	4	4
Digital I/O	8-bit programmable	8-bit programmable	8-bit programmable	8-bit programmable	8-bit programmable
Expansion & Serial Bus	1 x PCIe x8 (or 2 x PCIe x4) 1 x PCIe x4 (or 4 x PCIe x1) 4 x PCIe x1 lanes, I²C Interface, GPIO, SMBus, LPC	1 x PCIe x8 (or 2 x PCIe x4), 1 x PCIe x4 (or 4 x PCIe x1), 4 x PCIe x1, I²C Interface, GPIO, SMBus, LPC	1 x PCIe x4*, 4 x PCIe x1, I²C Interface, GPIO	1 x PCIe x4, 8 x PCIe x1, GPIO, SPI, SMBus, LPC	8 x PCIe x1, I²C Interface
TPM	Support TPM 2.0	Support TPM 2.0	Support TPM 2.0	Support TPM 2.0	Support TPM 2.0
Power Input	DC 8.5~20V, 5VSB	DC 8.5~20V, 5VSB	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)	-40 ~ 85° C (-40 ~ 185° F)	-40 ~ 85° C (-40 ~ 185° F)

Wide Temperature Range

*Note: One PCIe x4 lane is from CPU, and it can not be configured as four x1 lanes.

Computer On Module
COM Express - Type 6



Model	EmETXe-i2309-WT	EmETXe-a10R0	EmETXe-a10M0	EmETXe-a10M3
Form Factor	COM Express® Compact Type 6	COM Express® Compact Type 6	COM Express® Compact Type 6	COM Express® Basic Type 6
Dimension	95 x 95 mm	95 x 95 mm	95 x 95 mm	125 x 95 mm
Processor	Intel® Atom® E3845 1.91GHz	AMD® Ryzen™ R1000 R1606G 3.5GHz R1505G 3.3GHz	AMD® Ryzen™ V1000 V1807B 3.8GHz V1605B 3.6GHz V1756B 3.6GHz	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	1 x DDR3L SO-DIMM Socket	2 x DDR4 ECC SO-DIMM Sockets	2 x DDR4 ECC SO-DIMM Sockets	2 x DDR4 ECC SO-DIMM Sockets
Video Output	1 x DDI port Analog RGB (Optional),	2 x DDI ports	3 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 GbE	1 x GbE	1 x GbE	1 x GbE
Mass Storage	2 x SATA2.0 eMMC 4.5 (OEM request)	2 x SATA3.0	2 x SATA3.0	4 x SATA3.0
RS-232	1 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	1	2	4	4
Digital I/O	8-bit Programmable (Optional)	8-bit Programmable	8-bit Programmable	8-bit programmable
Expansion & Serial Bus	8 x PCIe x1, I²C, SMBus, SPI, LPC	6 x PCIe x1, 1 x PCIe x4 I²C, SMBus, SPI, LPC	8 x PCIe x1, 1 x PCIe x8, I²C, SMBus, SPI, LPC	8 x PCIe x1, 1 x PCIe x8, I²C, SMBus, SPI, LPC
TPM	-	Supports TPM 2.0	Supports TPM 2.0	Supports TPM 2.0
Power Input	DC 12V, 5VSB	DC 8.5V~20V, 5VSB	DC 8.5V~20V, 5VSB	DC 8.5V~28V, 5VSB
Operating Temperature	-40 ~ 85° C (-40 ~ 185° F)	-20~70° C (-4 ~ 158° F)	-20 ~ 70° C (-4 ~ 158° F)	-20 ~ 70° C (-4 ~ 158° F)

Wide Temperature Range

Computer On Module
COM Express - Type 6



Model	EmETXe-i94M0	EmETXe-i93M0	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	COM Express® Basic Type 6	COM Express® Basic Type 6
Dimension	125 x 95 mm	125 x 95 mm	125 x 95 mm	125 x 95 mm	125 x 95 mm
Processor	13 th Gen. Intel® Core™ i7-13800HE 4.0GHz / 5.0GHz i5-13600HE 3.6GHz / 4.8GHz i3-13300HE 3.4GHz / 4.6GHz	12 th Gen. Intel® Core™ i7-12800HE 3.5GHz / 4.6GHz i5-12600HE 3.3GHz / 4.5GHz i3-12300HE 3.3GHz / 4.3GHz	8 th /9 th Gen. Intel® Core™ i7-9850HE 4.4GHz i7-8850H 4.3GHz i5-8400H 4.2GHz i3-8100H 3.0GHz	7 th Gen. Intel® Core™ i7-7820EQ 3.7GHz i5-7442EQ 2.9GHz Xeon E3-1505L v6 3.0GHz	6 th 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 DDR5 SO-DIMM Sockets	2 x DDR5 SO-DIMM Sockets	2 x DDR4 SO-DIMM Sockets	2 x DDR4 SO-DIMM Sockets	2 x DDR4 SO-DIMM Sockets
Video Output	3 x DDI ports, 1 x Analog RGB port	3 x DDI ports, 1 x Analog RGB port	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	Dual Channels 24-bit	Dual Channels 24-bit
Audio	HD audio link	HD audio link	HD audio link	HD audio link	HD audio link
Ethernet	1 x 2.5GbE	1 x 2.5GbE	1 x GbE	1 x GbE	1 x GbE
Mass Storage	2 x SATA3.0 1 x BGA NVMe SSD (Optional)	2 x SATA3.0 1 x BGA NVMe SSD (Optional)	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	2 x RX/TX	2 x RX/TX
RS-232/422/485	N/A	N/A	N/A	N/A	N/A
USB 2.0	8	8	8	8	8
USB 3.0	4	4	4	4	4
Digital I/O	8-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable
Expansion & Serial Bus	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 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 8.5V~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)	-40 ~ 85° C (-40 ~ 185° F)	-40 ~ 85° C (-40 ~ 185° F)

Wide Temperature Range

Computer On Module
COM Express - Type 10

NEW



Model	EmNANO-i2800	EmNANO-i2402-WT	EmNANO-i2408	EmNANO-i230V-WT
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	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	Intel® Atom® Processor E3825 1.33GHz E3845 1.91GHz
Chipset		N/A	N/A	N/A
Memory	Soldered onboard LPDDR4 3200MT/s 4GB / 8GB SDRAM	Soldered onboard 4GB DDR3L SDRAM	Soldered Onboard 4GB DDR3L SDRAM	Soldered Onboard 2GB/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 SATA2.0
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	2 x USB 3.2	2	2	1
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, SDIO, I²C, SMBus, SPI, LPC	4x PCIe x1, SDIO, I²C, SMBbus, PI, LPC	3x 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) (For Atom E3900 Series)	-40 ~ 85° C (-40 ~ 185° F)	-40 ~ 85° C (-40 ~ 185° F)

Wide Temperature Range

Computer On Module

PC/104 & PC/104+

SMARC



Model	Em104P-i2313	Em104-i230F	EmSMK-i2403
Form Factor	ETXP	PC/104	SMARC 2.0
Dimension	114 x 95 mm	96 x 90 mm	82 x 50 mm
Processor	Intel® Atom® E3825 1.33GHz / E3845 1.91GHz	Intel® Atom® E3825 1.33GHz / E3845 1.91GHz	Intel® Atom® Processor x7-E3950 1.6GHz x5-E3940 1.6GHz x5-E3930 1.3GHz
Chipset	N/A	N/A	N/A
Memory	1 x DDR3L SO-DIMM Socket	1 x DDR3L SO-DIMM Socket	Soldered Onboard 8GB LPDDR4 SDRAM
Video Output	Analog RGB	Analog RGB	1 x eDP port, 1 x DP++ port, 1 x HDMI port
LVDS	Dual Channel 24-bit	Dual Channel 24-bit	N/A
Audio	Realtek® ALC886	Realtek® ALC888S	HD audio link
Ethernet	1 x 10/100Mbps 1 x GbE	2 x GbE	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)
RS-232	3 x RS-232	2 x RS-232	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
USB 2.0	4	2	6
USB 3.0	N/A	1	2
Digital I/O	16-bit DIO (8-in/8-out)	8-bit Programmable	8-bit Programmable
Expansion & Serial Bus	PC/104-Plus	PC/104	4 x PCIe x1, SDIO, I ² C, SMBus, SPI, LPC
Power Input	DC 12V, 5V	DC 12V, 5V	DC 3~5.25V
Operating Temperature	-40 ~ 85° C (-40 ~ 185° F)	-40 ~ 85° C (-40 ~ 185° F)	-20 ~ 85° C (-4 ~ 185° F)

Wide Temperature Range

Computer On Module
Qseven

NEW



Model	EmQ-i2801	EmQ-i2401	EmQ-i240A
Form Factor	Qseven® R2.1	Qseven® R2.0	Qseven® R2.1
Dimension	70 x 70 mm	70 x 70 mm	70 x 70 mm
Processor	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 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
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	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	N/A	1	1
RS-232/422/485	N/A	N/A	N/A
USB 2.0	6	4	6
USB 3.0	2 x USB 3.1	2	2
Digital I/O	N/A	N/A	N/A
Expansion & Serial Bus	4 x PClex1 lanes, I ² C, SMBus	4 x PCIe x1, SDIO, I ² C, SMBus, SPI, LPC	4 x PCIe x1, SDIO I ² C, SMBus, SPI, LPC
Power Input	DC 5V, 5VSB	DC 5V, 5VSB	DC 5V, 5VSB
Operating Temperature	-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

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, I ² C, 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

Carrier Board



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, I ² C, LPT	4 x PCI slots, 3 x ISA slots	PC/104-Plus, 1 x I ² C	2 x PCIe x1 slots, 1 x PCIe x 4 slot, 1 x PClex16 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



NEW

Model	SeCORE-i92UZ	EmCORE-i90U2-WT	EmCORE-i90M2-WT	EmCORE-i89M2-WT	EmCORE-i2802
Form Factor	3.5”	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	146 x 102 mm
Processor	11 th Gen. Intel [®] Core™ i7-1165G7 4.4GHz i5-1135G7 4.2GHz i3-1115G7 4.1Hz, Intel [®] Celeron [®] 6305E 1.8GHz	7 th Gen. Intel [®] Core™ i7-7600U 3.4GHz i5-7300U 2.8GHz i3-7100U 2.4GHz, Intel [®] Celeron [®] 3965U 2.2GHz	7 th Gen. Intel [®] Core™ i5-7442EQ 2.9Ghz	6 th Gen. Intel [®] Core™ i5-6442EQ 2.7GHz i7-6822EQ 2.8GHz	Intel Elkhartlake Celeron N6210 1.2GHz/ Atom [®] x6413E 1.5GHz Processor
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	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	1 x Display Port
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	2 x Dual channel 24-bit
Audio	Realtek [®] ALC662	Realtek [®] ALC269	Realtek [®] ALC662	Realtek [®] ALC886	Realtek [®] RTL8111
Ethernet port	2 x GbE	5 x GbE	2 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	2 x SATA3.0
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	6 x Serial Ports
USB 2.0	4	4	4	4	4
USB 3.0/2.0	6	4	2	2	2
Digital I/O	8-bit programmable	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)	2 x Mini-card socket 1 x Micro SIM socket (for full size Minicard)
Power Input	DC 12V	DC 9V ~ 15V / 15V ~ 36V	DC 12V	DC 12V	DC 8V ~ 13.2V
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) 	-20 ~ 70°C (-4 ~ 158°F)

 Wide Temperature Range

Single Board Computer
3.5” Miniboard



Slot Computing



Model	EmCORE-a10R2	EmCORE-i2305-WT	EmCORE-i230G-WT	HiCORE-i89Q1	HiCORE-i89Q2
Form Factor	3.5”	3.5”	3.5"	PICMG 1.3 full size SBC	PICMG 1.3 full size SBC
Dimension	146 x 102 mm	146 x 102 mm	146 x 102 mm	338 x 126 mm	338 x 126 mm
Processor	Soldered onboard AMD [®] Ryzen™ R1102G 2.6GHz	Intel [®] Atom [®] E3825 1.33GHz / E3845 1.91GHz Celeron [®] N2807 2.16GHz / N2930 2.16GHz	Intel [®] Atom [®] E3825 1.33GHz / E3845 1.91GHz	6 th /7 th Gen. Intel [®] Core™ i7/i5/i3 (Socket LGA1151)	6 th /7 th Gen. Intel [®] Core™ i7/i5/i3 (Socket LGA1151)
Chipsets	N/A	N/A	N/A	Q170	Q170
Memory	1 x DDR4 SO-DIMM Socket	1 x DDR3L SO-DIMM Socket	1 x DDR3L SO-DIMM Socket	4 x DDR4 Long-DIMM Sockets	4 x DDR4 Long-DIMM Sockets
Graphic interface	1 x DisplayPort*	Analog RGB, 1 x HDMI	1 x Analog RGB, 1 x HDMI	1 x DVI-I 1 x DisplayPort	1 x Analog RGB 1 x DisplayPort
LVDS	2 x Dual Channels 24-bit	Dual Channels 24-bit	Dual Channel 24-bit	N/A	N/A
Audio	Realtek [®] ALC269	HD audio link	Realtek [®] ALC662	HD Audio Link	HD Audio Link
Ethernet port	2 x GbE	2 x GbE	2 x GbE	2 x GbE	2 x GbE
Storage	2 x SATA3.0	1 x SATA2.0, 1 x mSATA , eMMC 4.5 (OEM request, E3800 family only)	1 x SATA2.0, 1 x CFast Socket, eMMC 4.5 (OEM request)	6 x SATA3.0	6 x SATA3.0
Serial port	6 x RS-232	1 x RS-232 1 x RS-232/485 selectable	2 x RS-232/485 selectable	1 x RS-232 1 x RS-232/422/485	1 x RS-232 1 x RS-232/422/485
USB 2.0	6	4	6	8	8
USB 3.0/2.0	2	1	1	2	2
Digital I/O	8-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable
Expansion & Serial Bus	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 I ² C ports (OEM request, E3800 family only)	1 x Mini-Card Socket, 1 x micro SDXC Socket, 1 x micro SIM Socket	PCI / PCIe golden finger	PCI / PCIe golden finger
Power Input	DC 8V - 13.2V	DC 12V	DC 12V	DC 12V, 5VSB	DC 12V, 5VSB
Operating Temperature	-20 ~ 70° C (-4 ~ 158° F)	-40 ~ 85° C (-40 ~ 185° F) 	-40 ~ 85° C (-40 ~ 185° F) 	0 ~ 60° C (32 ~ 122° F)	0 ~ 60° C (32 ~ 122° F)

 Wide Temperature Range

*Choose two from three

Slot
Computing



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)

Industrial Motherboard



Model	ITX-i92QA	MB-i89Q0
Form Factor	Wide Mini-ITX mother board	Micro-ATX Motherboard
Dimension	170 x 210 mm	244 x 244 mm
Processor	10 th Generation Xeon W/ Core i3/ i5/ i7/ i9 processors in LGA1200 socket	6 th Gen. Intel® Core™ i7/i5/i3 i7-6700 3.4GHZ i5-6500 3.6GHZ i3-6100 3.7GHZ
Chipsets	Intel PCH W480E	Q170
Memory	2 x DDR4 DIMM sockets support ECC	4 x DDR4 Long-DIMM Sockets
Graphic interface	2 x HDMI 2.0 port	1 x DVI-I 2 x DisplayPort
Audio	-	Realtek® ALC269
Ethernet port	5 x Intel i210AT GbE controllers, 1 x Intel i219LM PHY with iAMT	2 x GbE
Storage	4 x SATA 3.0 2 x M.2 2280 M-key (Gen3x4, supports NVMe SSD)	6 x SATA3.0
Serial port	3 x RS-232 ports; 2 x RS-232/422/485 ports	2 x RS-232 up to 4 x RS-232 (OEM request)
USB 2.0	2 x USB 2.0 ports	10
USB 3.0/2.0	4 x USB 3.0/2.0 ports	4
Digital I/O	N/A	N/A
Expansion & Serial Bus	1 x PCIe16 slot, support SCDB-3297; 1 x PCIe8 + 2x PCIe4 lanes Riser Card	1 x PCI Slot 1 x PCIe x16 Slot 1 x PCIe x4 in x8 Slot 1 x PCIe x1 Slot
Power Input	2.98A@12V (w/ i5-10500TE)	24-pin + 4-pin ATX power connector
Operating Temperature	0 ~ 60° C (32 ~ 140° F)	0 ~ 60° C (32 ~ 140° F)

Semi-Industrial Motherboard



Model	ITX-i91Q2	ITX-i89QA	ITX-i89QB	ITX-i89QC
Form Factor	Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX
Dimension	170 x 170 mm	170 x 170 mm	170 x 170 mm	170 x 170 mm
Processor	8 th Gen. Intel® Core™ i7/ i5/i3 / Pentium®	7 th /6 th Gen. Intel® Core™ i7/i5/i3 / Pentium®	7 th /6 th Gen. Intel® Core™ i7/i5/i3 / Pentium®	7 th /6 th Gen. Intel® Core™ i7/i5/i3 / Pentium®
Socket	LGA1151	LGA1151	LGA1151	LGA1151
Chipset	Intel® PCH Q370	Intel® PCH Q170	Intel® PCH Q170	Intel® PCH Q170
Super I/O	NUVOTON® NCT6116D	Fintek® F81768	Fintek® F81866	Fintek® F81866
RAM Socket	2 x DDR4 2400MHz SO-DIMM	2 x DDR4 2133MHz SO-DIMM	2 x DDR4 2133MHz SO-DIMM	2 x DDR4 2133MHz SO-DIMM
Max. Capacity	32GB	32GB	32GB	32GB
Serial Port	4 x RS-232 2 x RS-232/422/485	1 x RS-232 (RJ-45 type)	2 x RS-232 2 x RS-232/422/485	4 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	6 x USB 3.0/2.0 2 x USB 2.0	6 x USB 3.0/2.0 2 x USB 2.0	4 x USB 3.0/2.0 2 x USB 2.0
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	1 x PCIe x16, 1 x Mini-card (half), 1 x M.2 E-key, 1 x SIM	1 x PCIe x16, 1 x Mini-card (half)	1 x PCIe x4, 1 x Mini-card (half), 1 x SIM
Storage	5 x SATA 600MB/s 1 x mSATA (full)	4 x SATA 600MB/s 1 x mSATA (full)	4 x SATA 600MB/s 1 x mSATA (full)	4 x SATA 600MB/s 1 x mSATA (full)
Ethernet	2 x GbE	4 x GbE	2 x GbE	2 x GbE
Audio	Mic-in, Line-in, Line-out	N/A	Mic-in, Line-in, Line-out	Mic-in, Line-in, Line-out
LVDS	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit	N/A
Video Output	1 x HDMI, 1 x DP 1 x VGA	1 x HDMI	1 x HDMI, 1 x DP 1 x DVI-D	3 x HDMI
Power Input	24-pin + 4-pin ATX power connector	24-pin + 4-pin ATX power connector	24-pin + 4-pin ATX power connector	9V~ 24V DC-in jack or 2-pin internal ATX 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)

Semi-Industrial Motherboard



Model	MB-i93Q0	MB-i89Q8	MB-i89Q9	MB-i91Q0	MB-i91Q1
Form Factor	micro-ATX	ATX	micro-ATX	ATX	micro-ATX
Dimension	244 x 244 mm	305 x 244 mm	244 x 244 mm	305 x 244 mm	244 x 244 mm
Processor	12 th /13 th Gen. Intel® Core™ i9/i7/i5/i3 Pentium® / Celeron®	7 th /6 th Gen. Intel® Core™ i7/i5/i3 Pentium® / Celeron®	7 th /6 th Gen. Intel® Core™ 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	LGA1700	LGA1151	LGA1151	LGA1151	LGA1151
Chipset	Intel® PCH Q670E/ PCH H610E	Intel® PCH H110	Intel® PCH H110	Intel® PCH Q370 / C246	Intel® PCH H310
Super I/O	Fintek® F81966D-I	Fintek® F71808E	Fintek® F81866A	Fintek® F81966	Fintek® F81966
RAM Socket	2 x DDR3L 1866MHz SO-DIMM	2 x DDR4 2133 / 1866MHz Long-DIMM	2 x DDR4 2133MHz Long-DIMM	4 x DDR4 2666MHz Long-DIMM	2 x DDR4 2666MHz Long-DIMM
Max. Capacity	Up to 128GB	32GB	32GB	64GB	32GB
Serial Port	5 x RS-232 1 x RS-232/422/485	4 x RS-232 2 x RS-232/422/485	9 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	Up to 6 x USB 3.2 Gen 2 ports 9 x internal USB 2.0 ports	8 x USB 3.0/2.0 5 x USB 2.0	4 x USB 3.0/2.0 ports 5 x 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	8-bit Programmable
Expansion & Serial Bus	Up to 1 x PCIe16 slot 3 x PCIe4 slots, M.2 E key, 2230 (PCIex1/ USB 2.0)	1 x PCIe x16, 1 x PCIe x 4, 5 x PCI, 1 x Mini-card (full) 1 x SIM	1 x PCIe x16, 1 x PCIe x1, 2 x PCI, 1 x Mini-card (full), 1 x SIM	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	1 x SATA 600MB/s 1 x M.2 M-key	3 x SATA 600MB/s 1 x M.2 M-key	3 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	Up to 1 x 2.5GbE, 2 x GbE	2 x GbE	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	Mic-in, Line-in, Line-out
LVDS	N/A	N/A	N/A	N/A	N/A
Video Output	1 x HDMI 1 x DP 1 x VGA	1 x VGA 1 x HDMI	1 x VGA, 1 x DVI-D, 1 x HDMI	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 ATX power connector	24-pin + 8-pin ATX power connector	24-pin + 8-pin ATX power connector	24-pin + 8-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)	0 ~ 60°C (32 ~ 140°F)

Multi-Display Terminals



Model	IEC-3702	IEC-3367	IEC-3900/02/04	IEC-3390	IEC-3300
Dimension (W x D x H)	115.4 x 107.6 x 37 mm	198.5 x 124 x 68.7 mm	130 x 124 x 35 mm	163 x 109 x 35 mm	163 x 109 x 39 mm
CPU	Soldered onboard Intel® 11th Gen. Core i5-1135G7 processor (Tiger Lake-UP3)	Soldered onboard Intel® 11 th Gen. Core i7/i5/i3 or Celeron® processor	IEC-3900 / 7 th Gen. Intel® Core™ i7/ i5 IEC-3902 / 8 th Gen. Intel® i7/ i5, Celeron® IEC-3904 / 11 th Gen. Intel® i7/ i5/ i3, Celeron®	ARMv8, Dual Cortex-A72 + Quad Cortex-A53	Intel® Celeron® N2807 2.16GHz / J1900 2.42GHz Intel® Atom E3800(OEM)
Memory	2 x DDR4 SO-DIMM Socket	2 x DDR4 SO-DIMM Socket	2 x DDR4 SO-DIMM Sockets	LPDDR4 4GB soldered onboard	1 x DDR3L SO-DIMM Socket
Video	2 x HDMI, 1 x DP	2 x HDMI	2 x HDMI	2 x HDMI	1 x VGA, 1 x HDMI
Audio	1 x Line-out & Mic	1 x Line-out & Mic	N/A	1 x Line-out	1 x Line-out
Ethernet	1 x GbE, 1 x 2.5GbE	2 x GbE	1 x GbE	2 x GbE	2 x GbE
Mass Storage	1 x M.2 M-Key	1 x M.2 M-key	1 x M.2 M-Key	64G eMMC Flash soldered onboard	1 x mSATA eMMC (OEM request for ATOM only)
USB 2.0	-	-	-	4	3
USB 3.0/2.0	4	6	4	1	1
RS-232	1 (DB-9)	3	1(RJ-45)	2	1 (DB-9)
Expansion & Serial Bus	N/A	1 x M.2 2230 E-Key slot 1 x M.2 3052 B-Key slot	N/A	1 x Micro SD	1 x mPCIe (for Wi-Fi option)
Power Input	DC 12-24V	DC 12V	DC 24V	DC 12V	DC 12V
Operating Temperature	0 ~ 50° C (32 ~ 122°F)	0 ~ 40° C (32 ~ 104°F)	-20 ~ 70° C (-4 ~ 158°F)	0 ~ 50° C (32 ~ 122°F)	-20 ~ 55° C (-4 ~ 131°F)

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