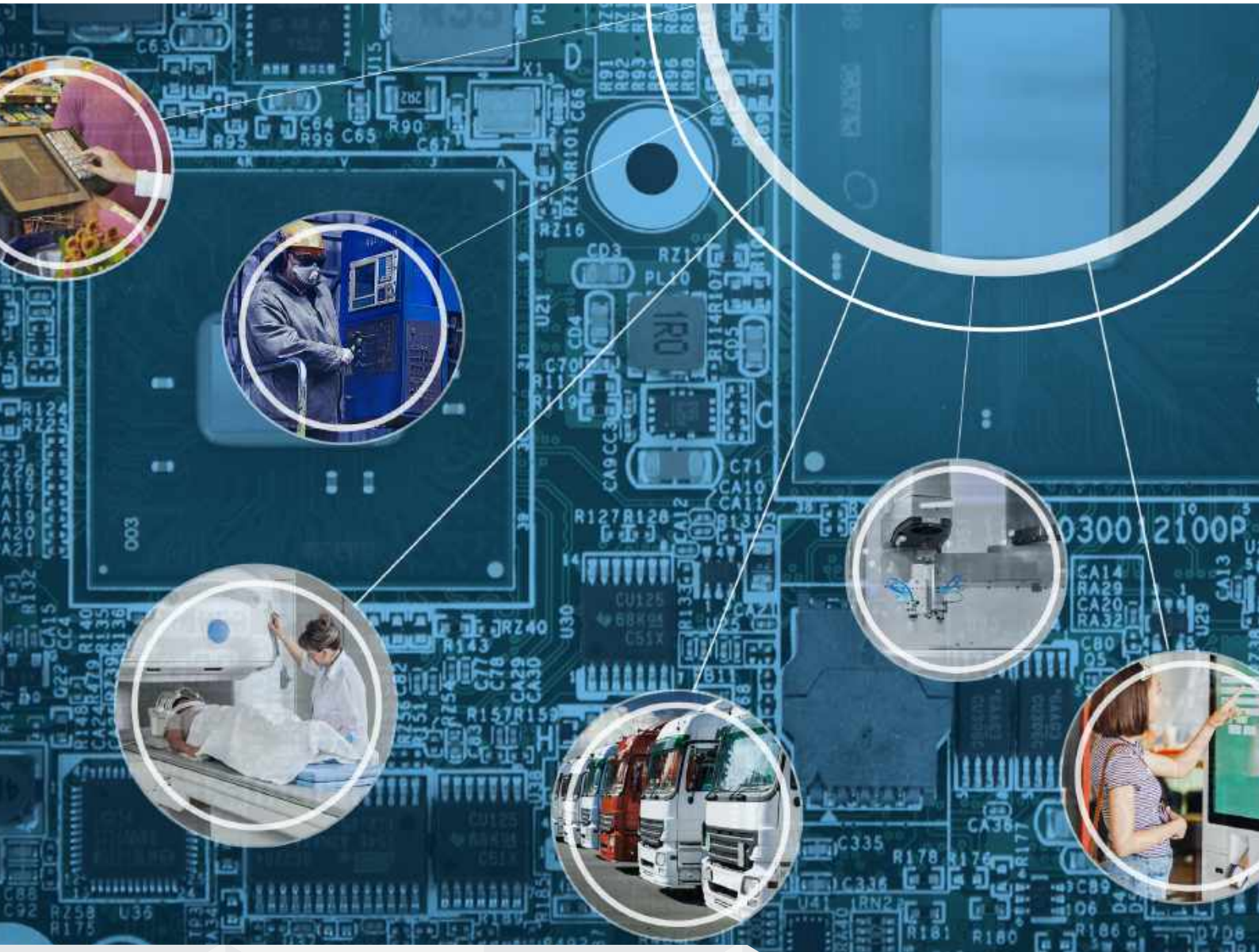
ARBOR



Embedded Computing

ARM-Based Computing

Computer-on-modules

Single Board Computers

Industrial Motherboards

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 support from initial prototype design all the way through development, manufacturing, assembly, logistics, and after sales services.

Wide Temperature Design & Validation

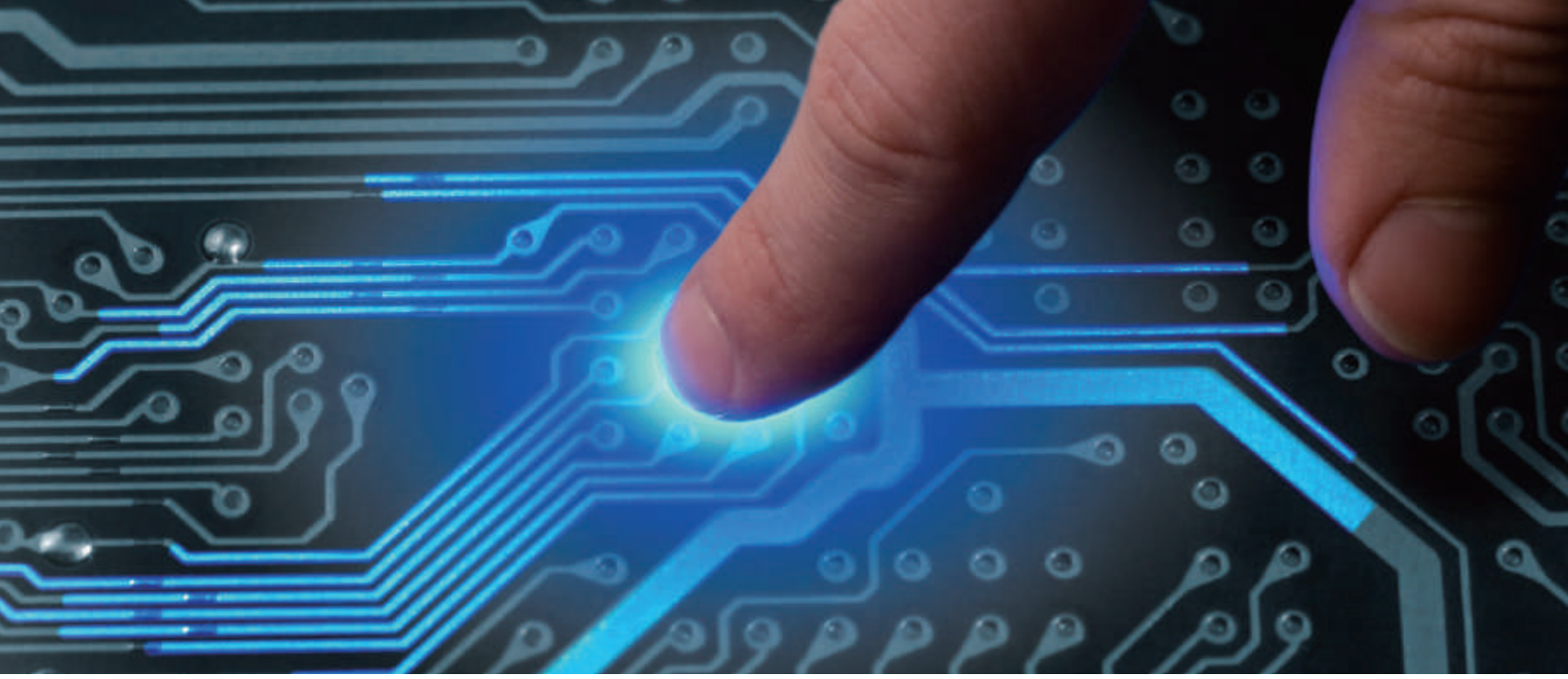
ARBOR COM Express modules can be operated in an extended temperature range of –40°C to +85°C, and have passed stringent vibration tests. The exclusive use of high quality components and highly effective thermal solutions ensure that the modules are rugged enough for use in harsh environments.

In-house Technologies and Expertise

ARBOR has extensive expertise in power MCU design for automation control. Its BIOS Anti-Crash Technology (ACT) enables embedded systems 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)

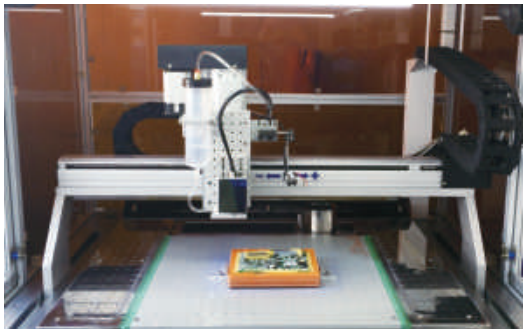
Validation & Testing

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

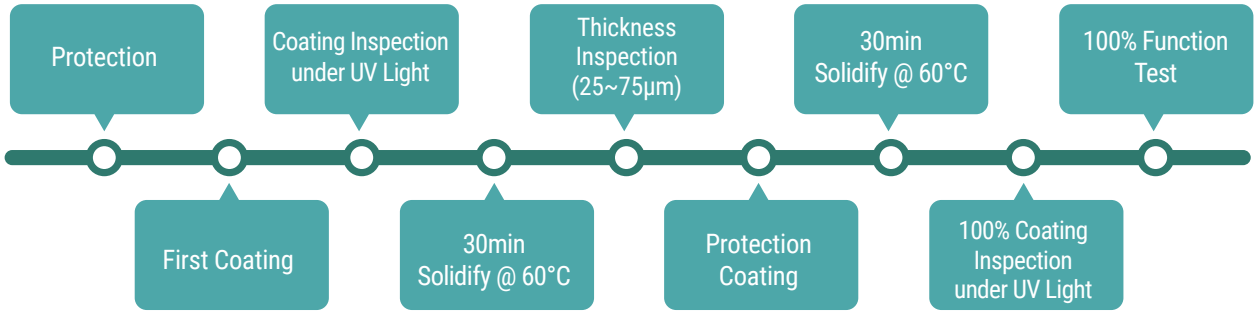
- EMI/EMC validation
- Vibration, shock and drop tests
- Humidity and temperature tests
- Thermal analysis
- Performance & compatibility tests

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. Conformal coating also prevents short circuits and corrosion of metal between conductors.



Coating Flow Chart



Supported Form Factors

CPU on Module	
Qseven	70 x 70 mm
COM Express Mini	84 x 55 mm
COM Express Compact	95 x 95 mm
COM Express Basic	125 x 95 mm
ETX	114 x 95 mm

Single Board Computer	
PC/104	96 x 90 mm
3.5"	146 x 102 mm
EPIC	165 x 115 mm
Slot Computing	338 x 122 / 185 x 122mm
Industrial Motherboard	
Mini-ITX	170 x 170 mm
Micro-ATX	244 x 244 mm

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 complete 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)

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.

ARBOR 27 Years of Excellence

27 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

ARM-Based Computing Platform

Linux customization tailored for you

ARBOR provides ARM-based computer-on-module 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 and Qseven ARM-based computer-on-module that can meet the requirements for power-efficient IoT devices and performance-oriented professional applications.

Board-to-System Service

ARBOR provides full-board customization service with our ARM-based computer-on-module to meet customer's requirements. We also offer customization from board-to-system, including early planning, design and development. With our responsive workflow, experienced R&D technologies and integrated services, ARBOR delivers high-quality OEM/ODM services to maximize your business success.

OS Customization

ARBOR offers full Linux operating system, drivers and software customization service for our ARM-based computing solutions. Our expert software team can tailor the OS to meet your requirements. This includes Android customization, Yocto, Ubuntu and Debian. We also offer BSP (Board Support Package) to support customers who are developing their own project.

ARM-Based Computer-On-Module	
	
SoM	QSeven

Custom Your ARM-Based Solutions with ARBOR

ARM-Based Solutions

- Form Factor
  - Qseven R2.1
  - Stamp 1 Small Form Factor
- Configurations
  - Texas Instruments
  - Rockchip 瑞芯微电子
  - NXP
- Architecture
  - Wi-Fi, Bluetooth, Ethernet, Touch and panel, HDMI
- Advantages
  - Small Form Factor
  - Low-Power Consumption
  - Linux Support
- Software
  - yocto PROJECT

Contact us for your custom design.

ARM-Based Embedded Systems

				
IOT-800N Slim Panel PC	PC1017 Price Checking Terminal	RP-101K Open Frame Touch Panel Kit	M1166 Medical Thin Client	M1861 Medical Infotainment Terminal

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 factor includes COM Express, Qseven and ETX System on Module to meet every type of demands 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

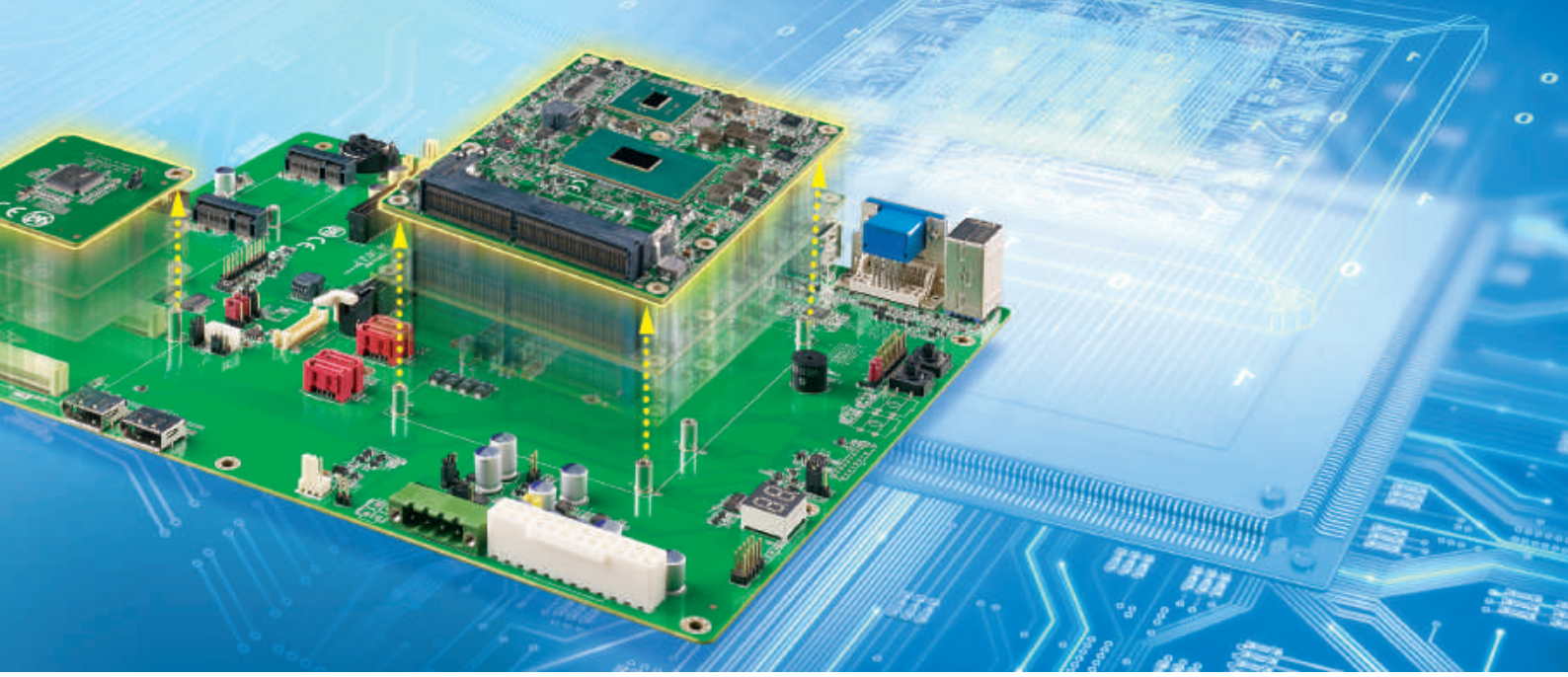
ARBOR uses specially CNC-machined aluminum heat-spreaders to contact hot spots in order to efficiently distribute the heat to the outside heat sink.

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



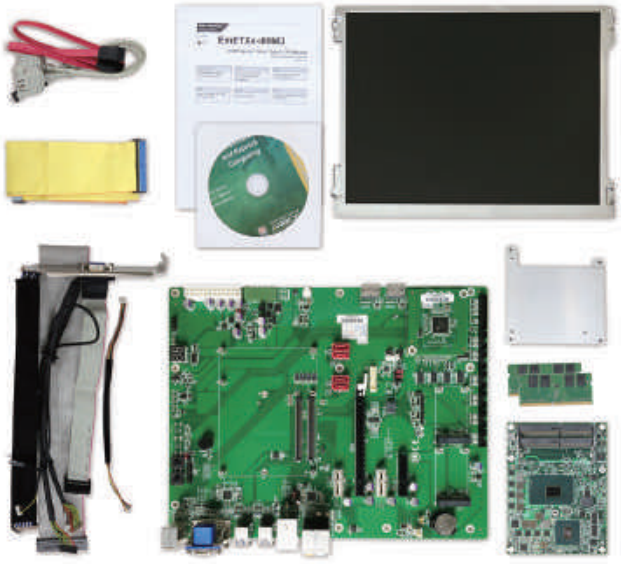
Quick, Easy Way to Start Your Own Embedded Projects

COM Express Type 6 Starter Kit

Kit Contents

- COM Express Type 6 CPU module of your choice
- RAM module
- ATX size reference carrier board
- Selected hardware and software components.
- All required accessories
- Quick installation guide

Get starter kit here



Target Applications

Medical Equipment

- Ultrasounds
- X-rays

Industrial Automation

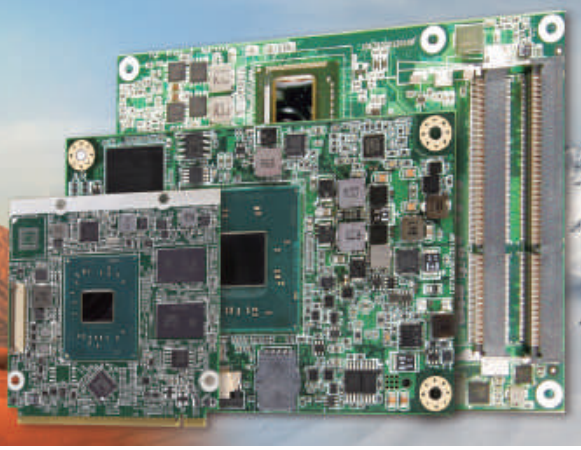
- Industrial imaging
- HMI

Harsh Environment Applications

- Heavy duty industry
- Field works, military

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 complinace

Extensive I/O Interfaces

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

Conformal Coating Services

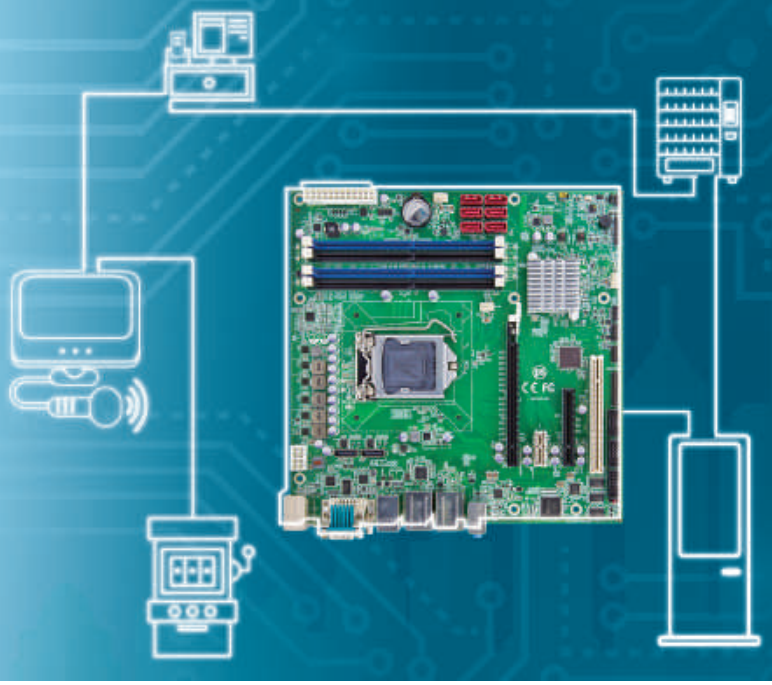
To protect the components & circuitry against dust, fungus, moisture and salt spray.

Supported Form Factors

			
PC/104	3.5” Compact	EPIC	Slot Computing

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

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	SOM-1
Dimension	69.6 x 70 mm	69.6 x 50 mm
Processor	Rockchip RK3399 Dual-core Cortex-A72 + Quad-core Cortex-A53	RockChip PX30 Quad-Core ARM Cortex-A35, 1.5GHz
Memory	LPDDR4 2GB, optional to 4GB	LPDDR3 1GB, optional to 2GB
Storage	16GB eMMC with SDIO 5.1	Option internal eMMC with SDIO 5.1
Graphics	Mali-T860MP4 GPU	Mali-G31GPU
Display	1 x HDMI, 1 x MIPI DSI, 1 x eDP	LVDS or MIPI DSI
Camera	2 x MIPI CSI RX (up to 13MP)	1 x MIPI CSI RX (up to 8MP)
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
LAN	1 x GbE	1 x 10/100 Ethernet port
Wifi+BT	1 x 802.11 a/b/g/n/ac + BT 4.2	1 x 802.11 a/b/g/n/ac + BT 4.2
USB 2.0	4	4 with USB Hub
USB 3.0	2 (Type C)	1 (Type C)
Serial Ports	2 x UART ports, 2-wire; 2 x UART ports, 4-wire	2 x UART ports, 2-wire; 2 x UART ports, 4-wire
RTC	Supported	Supported
SDIO	Supported	Supported
DIO	8-bit DI, 8-bit DO	N/A
GPIO	Supported	Supported
SPI	1	2
I2C	2	2
Power Input	5V/3A	5V/1.5A
Operating Temperature	-10 ~ 60°C	-10°C ~ 70°C
OS Support	Android*	Android*

*BTO service for Buildroot/Debian/Ubuntu

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
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 UART ports, 2-wire; 2 x UART ports, 4-wire
RTC	Supported
SDIO	Supported
DIO	8-bit DI, 8-bit DO
GPIO	Supported
Power Input	5V/3A
Operating Temperature	-20 ~ 70°C

Computer On Module
COM Express - Type 6

NEW





Model	EmETXe-i91U0-WT	EmETXe-i90U0-WT	EmETXe-i89U0-WT	EmETXe-i88U4	EmETXe-i88U0-WT
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	8th Gen. Intel® Core™ Processor i7-8665UE 4.4GHz i5-8365UE 4.1GHz i3-8145UE 3.9GHz Celeron® 4305UE 2.0GHz	7th Gen. Intel® Core™ Processor i7-7600U 3.9GHz i5-7300U 3.5GHz	6th Gen. Intel® Core™ Processor i7-6600U 3.4GHz i5-6300U 3.0GHz i3-6100U 2.3GHz Celeron® 3955U 2.0GHz	5th Gen. Intel® Xeon processor D-1539 2.2GHz D-1508 2.6GHz D-1527 2.76GHz	5th Gen. Intel® Core™ Processor i7-5650U 3.1GHz
Chipset	N/A	N/A	N/A	N/A	N/A
Memory	2 x DDR4 SO-DIMM sockets	2 x DDR4 SO-DIMM sockets	2 x DDR4 SO-DIMM Sockets	2 x DDR4 ECC SO-DIMM Sockets	1 x DDR3L SO-DIMM Sockets
Video Output	2 x DDI ports or 1 x DDI port, 1 x Analog RGB	2 x DDI ports	2 x DDI ports	N/A	2 x DDI ports
LVDS	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit	N/A	Dual Channels 24-bit
Audio	HD link	HD link	HD link	HD audio link	HD link
Ethernet	1 x GbE	1 x GbE	1 x GbE	1 x GbE	1 x GbE
Mass Storage	2 x SATA600 eMMC 5.0 (OEM Request)	2 x SATA600 eMMC 5.0 (OEM Request)	2 x SATA600, eMMC 5.0 (OEM Request)	4 x SATA600	3 x SATA600
RS-232	2 x RX/TX	2 x RX/TX	2 x RX/TX	N/A	N/A
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	2
Digital I/O	8-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable
Expansion Bus	8 x PCIe x1, I2C	8 x PCIe x1, I2C	8 x PCIe x1, I2C	1 x PCIe x16 lane, 8 x PCIe x1 lanes, I2C Interface	8 x PCIe x1, LPC
Power Input	DC 5V~20V, 5VSB	DC 5V~20V, 5VSB	DC 5~20V, 5VSB	DC 12V, +5VSB	DC 12V, 5VSB
Operating Temperature	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W	0 ~ 60°C (52 ~ 140°F) W	-40 ~ 85°C (-40 ~ 185°F) W

W Wide Temperature Model

Computer On Module
COM Express - Type 6

NEW





Model	EmETXe-i87U2-WT	EmETXe-i2309-WT	EmETXe-a10R0	EmETXe-a58M0	EmETXe-a10M0-WT
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	4th Gen. Intel® Core™ Processor i7-4650U 1.7GHz	Intel® Atom™ Processor E3845 1.91GHz	AMD Ryzen R1000 Processor V1606G 2.6GHz V1505G 2.4GHz	AMD G-series Processor GX-412HC 1.6Ghz	AMD Ryzen V1000 Processor V1605B 2.0 GHz V1756B 3.25GHz V1807B 3.35GHz
Chipset	N/A	N/A	N/A	N/A	N/A
Memory	1 x DDR3L SO-DIMM Socket	1 x DDR3L SO-DIMM Socket	2 x DDR4 ECC SO-DIMM Sockets	1 x DDR3L SO-DIMM Socket	2 x DDR4 ECC SO-DIMM Sockets
Video Output	2 x DDI ports	Analog RGB, 1 x DDI port	2 x DDI ports	Analog RGB, 2 x DDI port	3 x DDI ports
LVDS	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit	N/A	Dual Channels 24-bit
Audio	HD link	HD link	HD link	HD link	HD audio link
Ethernet	1 x GbE	1 x GbE	1 x GbE	1 x GbE	1 x GbE
Mass Storage	3 x SATA600	2 x SATA300, eMMC 4.5 (OEM request)	3 x SATA600	2 x SATA600	2 x SATA600
RS-232	N/A	1 x RX/TX	2 x RX/TX	N/A	2 x RX/TX
RS-232/422/485	N/A	N/A	N/A	N/A	N/A
USB 2.0	8	8	7	7	8
USB 3.0	2	1	2	2	4
Digital I/O	8-bit Programmable	N/A	8-bit Programmable	N/A	8-bit Programmable
Expansion Bus	8 x PCIe x1, LPC	7 x PCIe x1, LPC, SDIO	6 x PCIe x1, 1 x PCIe x4 SPI, LPC	7 x PCIe x1, SDIO	8 x PCIe x1, 1 x PCIe x8, SPI, LPC
Power Input	DC 12V, 5VSB	DC 12V	DC 5V~20V, +5VSB	DC 12V, 5VSB	DC 5V~20V, +5VSB
Operating Temperature	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W	-20~70°C (-4 ~ 158°F)	0 ~ 60°C (32 ~ 140°F)	-40 ~ 85°C (-40 ~ 185°F) W

W Wide Temperature Model

Computer On Module
COM Express - Type 6




Model	EmETXe-i91M0-WT	EmETXe-i90M3-WT	EmETXe-i90M0-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
Dimension	125 x 95 mm	125 x 95 mm	125 x 95 mm	125 x 95 mm
Processor	8th Gen. Intel® Core™ Processor i7-8850H 4.3GHz i5-8400H 4.2GHz i3-8100H 3.0GHz	7th Gen. Intel® Core™ i7-7820EQ 3.7GHz i5-7442EQ 2.9GHz	7th Gen. Intel® Core™ Processor i7-7820EQ 3.7GHz i5-7442EQ 2.9GHz	6th Gen. Intel® Core™ Processor i7-6822EQ 2.8GHz i5-6442EQ 2.7GHz
Chipset	QM370	QM175	QM175	QM170
Memory	2 x DDR4 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 or Analog RGB, 2 x DDI ports	Analog RGB, 2 x DDI ports	3 x DDI ports	Analog RGB, 2 x DDI ports
LVDS	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit
Audio	HD link	HD link	HD link	HD link
Ethernet	1 x GbE	1 x GbE	1 x GbE	1 x GbE
Mass Storage	4 x SATA600	4 x SATA600	4 x SATA600	4 x SATA600
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 Bus	8 x PCIe x1, 1 x PEG x16, I2C	8 x PCIe x1, 1 x PCIe x16, I2C, LPC	8 x PCIe x1, 1 x PCIe x16, I2C, LPC	8 x PCIe x1, I2C, 1 x PCIe x16, LPC
Power Input	DC 8.5V~20V, +5VSB	DC 8.5V~20V, +5VSB	DC 8.5V~20V, +5VSB	DC 5~20V, 5VSB
Operating Temperature	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W

W Wide Temperature Model

Computer On Module
COM Express - Type 6

NEW




Model	EmETXe-i89M0-WT	EmETXe-i87M2-WT	EmETXe-i87M0-WT	EmETXe-a10M3
Form Factor	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
Processor	6th Gen. Intel® Core™ Processor i7-6822EQ 2.8GHz Xeon E3-1505M 4.0GHz	5th Gen. Intel® Core™ Processor i7-5700EQ 3.4GHz	4th Gen. Intel® Core™ Processor i7-4700EQ 2.4GHz i5-4402E 1.6GHz i3-4102E 1.6GHz i3-4112E 1.8GHz	AMD Ryzen V1000 Processor V1605B 2.0 GHz V1756B 3.25GHz V1807B 3.35GHz
Chipset	QM170	QM87	QM87	N/A
Memory	2 x DDR4 SO-DIMM Sockets	2 x DDR3L ECC SO-DIMM Sockets	2 x DDR3L SO-DIMM Sockets	2 x DDR4 ECC SO-DIMM Sockets
Video Output	3 x DDI ports	Analog RGB, 3 x DDI ports	Analog RGB, 3 x DDI ports	3 x DDI ports
LVDS	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit (OEM request)	Dual Channels 24-bit
Audio	HD link	HD link	HD link	HD audio link
Ethernet	1 x GbE	1 x GbE	1 x GbE	1 x GbE
Mass Storage	4 x SATA600	2 x SATA300, 2 x SATA600	2 x SATA300, 2 x SATA600	2 x SATA600
RS-232	2 x RX/TX	N/A	N/A	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 Bus	8 x PCIe x1, I2C, 1 x PCIe x16, LPC	6 x PCIe x1, 1 x PCIe x16	8 x PCIe x1, 1 x PCIe x16, LPC	8 x PCIe x1, 1 x PCIe x8, SPI, LPC
Power Input	DC 5~20V, 5VSB	DC 12V, 5VSB	DC 12V, 5VSB	DC 5V~20V, +5VSB
Operating Temperature	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W

W Wide Temperature Model

Computer On Module
COM Express - Type 10

Computer On Module
Qseven





Model	EmNANO-i2402	EmNANO-a56M0	EmNANO-i230V-WT	EmQ-i240A	EmQ-i2401
Form Factor	COM Express® Mini Type 10	COM Express® Mini Type 10	COM Express® Mini Type 10	Qseven® R2.1	Qseven® R2.0
Dimension	84 x 55 mm	84 x 55 mm	84 x 55 mm	70 x 70 mm	70 x 70 mm
Processor	Intel® Celeron® Processor N3350 2.4GHz / Intel® Pentium® Processor N4200 2.5GHz	AMD G-Series Processor GX-210HA 1.0GHz	Intel® Atom Processor E3825 1.33GHz E3845 1.91GHz	Intel® Celeron® Processor N3350 2.4GHz / Intel® Pentium® Processor N4200 2.5GHz	Intel® Celeron® Processor N3350 2.4GHz / Intel® Pentium® Processor N4200 2.5GHz
Chipset	N/A	N/A	N/A	N/A	N/A
Memory	Soldered onboard 4GB DDR3L SDRAM	Soldered onboard 2GB DDR3L SDRAM	Soldered Onboard 4GB DDR3L SDRAM	Soldered onboard 8GB LPDDR4 SDRAM	Soldered onboard 4GB DDR3L SDRAM
Video Output	1 x DDI port	Analog RGB (via RSV pin), 1 x DDI port	1 x DDI port	1 x DisplayPort	1 x DDI port
LVDS	Single Channel 24-bit	Single Channel 18-bit	Single Channel 24-bit	Dual Channels 24-bit	Dual Channels 24-bit
Audio	HD link	HD link	HD Link	HD link	HD link
Ethernet	1 x GbE	1 x GbE	1 x GbE	1 x GbE	1 x GbE
Mass Storage	2 x SATA600 EMMC 5.0 (OEM Request)	2 x SATA600	2 x SATA300	2 x SATA eMMC 5.0 (OEM Request)	2 x SATA600, eMMC (OEM Request)
RS-232	1 x RX/TX	N/A	2 x RX/TX	N/A	N/A
RS-232/422/485	N/A	N/A	N/A	N/A	N/A
USB 2.0	8	8	8	6	4
USB 3.0	2	2	1	2	2
Digital I/O	N/A	8-bit Programmable	N/A	N/A	N/A
Expansion Bus	4 x PCIe x1, SDIO, I2C	3 x PCIe x1, LPC	3x PCIe x1, SDIO, SMBbus, SPI, LPC, I2C	4 x PCIe x1, I2C, SDIO	4 x PCIe x1, SDIO, I2C
Power Input	DC 12V / 5V Auto Detect	DC 12V, 5VSB	DC 12V / 5V Auto Detect	DC 5V, 5VSB	DC 5V, 5VSB
Operating Temperature	-20~ 85°C (-4~185°F)	-20~70°C (-4 ~ 158°F)	-40 ~ 85°C (-40 ~ 185°F) W	-20~ 85°C (-4~185°F)	-40~85°C (-40 ~ 185°F) W

W Wide Temperature Model

Computer On Module
Qseven

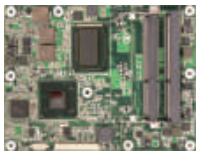



Model	EmQ-i2205	EmQ-i2200	EmQ-i230J-WT	EmQ-a50M1
Form Factor	Qseven® R2.0	Qseven® R2.0	Qseven® R1.2	Qseven® R1.2
Dimension	70 x 70 mm	70 x 70 mm	70 x 70 mm	70 x 70mm
Processor	Intel® Celeron processor N3060 2.48GHz N3160 2.24GHz	Intel® Celeron Processor N3160 2.24GHz	Intel® Atom™ Processor E3825 1.33GHz E3845 1.91GHz	AMD G-Series Processor G-T40E 1.0GHz
Chipset	N/A	N/A	N/A	A50M
Memory	Soldered onboard 2GB DDR3L SDRAM, upgradable to 4GB	Soldered onboard 4GB DDR3L SDRAM	Soldered onboard 4GB DDR3L SDRAM, upgradable to 4GB (OEM request)	Soldered Onboard 2GB DDR3L SDRAM
Video Output	2 x DisplayPorts, 1 x eDP port	1 x DisplayPort / HDMI selectable port	Analog RGB (via RSV Pin), 1 x DDI port	Analog RGB (via RSV pin), 1 x DDI port
LVDS	N/A	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 18/24-bit
Audio	HD Link	HD link	HD link	HD link
Ethernet	1 x GbE	1 x GbE	1 x GbE	1 x GbE
Mass Storage	2 x SATA600	2 x SATA600, eMMC (OEM Request)	2 x SATA300, eMMC 4.5 (OEM request)	2 x SATA600, 8GB NANDrive (OEM request)
RS-232	1 x UART port(TX/RX only)	1 x RX/TX	N/A	N/A
RS-232/422/485	N/A	N/A	N/A	N/A
USB 2.0	4	4	8	8
USB 3.0	2	2	N/A	N/A
Digital I/O	N/A	N/A	N/A	N/A
Expansion Bus	3 x PCIe x1, I2C, SDIO	3 x PCIe x1, SDIO, I2C	3 x PCIe x1, SDIO, I2C	3 x PCIe x1, LPC
Power Input	DC 5V	DC 5V	DC 5V, 5VSB	DC 5V, 5VSB
Operating Temperature	-20 ~ 70°C (-4 ~ 158°F)	-20~70°C (-4 ~ 158°F)	-40 ~ 85°C (-40 ~ 185°F) W	-20~70°C (-4 ~ 158°F)

W Wide Temperature Model

Computer On Module
SMARC

Computer On Module
ETX



Model	EmSMK-i2403-WT	EmETX-i2304-WT	EmETX-a58M1	EmETX-a55E0
Form Factor	SMARC 2.0	ETX 3.02	ETX 3.02	ETX 3.02
Dimension	82 x 50 mm	114 x 95 mm	114 x 95 mm	114 x 95 mm
Processor	Intel® Atom Processor E3940 1.8GHz	Intel® Atom Processor E3825 1.33GHz E3845 1.91GHz	AMD G-Series Processor GX-212JC 1.2GHz GX-218GL 1.8Ghz	AMD G-Series Processor G-T56N 1.65GHz G-T40N 1.0GHz
Chipset	N/A	N/A	N/A	A55E
Memory	Soldered Onboard 8GB LPDDR4 SDRAM	1 x DDR3L SO-DIMM Socket	1 x DDR3 SO-DIMM Socket	1 x DDR3 SO-DIMM Socket
Video Output	1 x eDP port, 1 x DP++ port, 1 x HDMI port	Analog RGB, 1 x DDI port*	Analog RGB / 1x DVI 1 x DDI	Analog RGB 1 x DDI
LVDS	N/A	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit
Audio	HD link	Realtek® ALC662	Realtek® ALC662	Realtek® ALC886
Ethernet	HD link	1 x 10/100Mbps	1 x 10/100Mbps	1 x 10/100Mbps
Mass Storage	1 x SATA600 eMMC (OEM Request)	1 x Ultra ATA 2 x SATA300	2 x SATA600	2 x SATA600
RS-232	N/A	1 x RS-232	1 x RS-232	1 x RS-232
RS-232/422/485	N/A	1 x RS-232/422/485 (by Carrier Board)	1 x RS-232/422/485 (by Carrier Board)	1 x RS-232/422/485 (by Carrier Board)
USB 2.0	6	4	4	4
USB 3.0	2	N/A	N/A	N/A
Digital I/O	9-bit Programmable	N/A	N/A	N/A
Expansion Bus	4 x PCIe x1, SDIO, I2S	4 x PCI & ISA, LPC	4 x PCI (OEM request)	4 x PCI, ISA, LPC
Power Input	DC 3~5.25V	DC 5V, 5VSB	DC 5V, 5VSB	DC 5V, 5VSB
Operating Temperature	-40~ 85°C (-40~185°F) W	-40 ~ 85°C (-40 ~ 185°F) W	0 ~ 60°C (0 ~ 140°F)	-20~70°C (-4 ~ 158°F)

W Wide Temperature Model

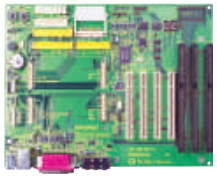
Carrier Board




Model	PBC-900J	PBN-9007	PBQ-900L	PBQ-3000
Form Factor	COM Exp. Basic Type 6 Carrier Board	COM Exp. 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 connector, 1 x LVDS connector	1 x LVDS connector, 1 x DisplayPort connector	1 x LVDS connector, 1 x DVI connector	1 x VGA connector, 1 x LVDS connector, 1 x DisplayPort connector
Audio	Realtek® ALC662	Realtek® ALC662	Realtek® ALC662	Realtek® ALC662
Ethernet	2 x LAN connectors	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	1 x SATA connector, 1 x M.2 socket	2 x SATA connectors
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 1 x UART	3 x RS-232, 1 x RS-232/422/485
LPT Port	1	N/A	N/A	N/A
USB 2.0	2	4	1	6
USB 3.0/2.0	2	2	2	N/A
Digital I/O	16-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable
Expansion Bus	1 x Mini-Card Socket, PCI/104	1 x Mini-Card Socket, SIM socket	SMBus, I2C, SDIO, 1 x M.2 socket	1 x Mini-Card Socket, LPC
Power Input	DC 12V	DC 12V	10V ~ 30V	10V ~ 30V
Operating Temperature	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W

W Wide Temperature Model

Carrier Board



NEW

Model	PBE-1705-F1	PBE-1000	PBQ-900R	PBE-1100
Form Factor	ATX form factor COM Exp. Type 6 Evaluation Board	ATX form factor ETX Evaluation Board	ATX form factor Qseven Carrier Board	ETX form factor Carrier Board
Dimension	305 x 244 mm	305 x 210 mm	305 x 243 mm	114 x 95 mm
Graphics interface	1 x VGA/DVI connector, 1 x LVDS connector, 2 x DisplayPort connectors	1 x VGA connector, 1 x LVDS connector	Depends on CPU module	1 x VGA connector, 1 x LVDS connector
Audio	Realtek® ALC888	Mic-in/ Line-in/ Line-out	Realtek® ALC886	Mic-in/ Line-in/ Line-out
Ethernet	1 x RJ-45 connector	1 x RJ-45 connector	1 x GbE by CPU Module	2 x LAN connectors
Storage	4 x SATA connectors	2 x Ultra ATA connectors, 1 x FDD connector, 1 x CF II socket	2 x SATA connectors	1 x Ultra ATA connector, 1 x FDD connector, 1 x CF II socket
Serial Port	6 x RS-232	3 x RS-232, 1 x RS-232/422/485	12 x RS-232/422/485 (depends on Super IO module)	3 x RS-232, 1 x RS-232/422/485
LPT Port			1 (depends on Super IO module)	
USB 2.0	2	5	5 (depends on Super IO module)	4
USB 3.0/2.0	4	N/A	3 (depends on Super IO module)	N/A
Digital I/O	8-bit Programmable	16-bit DIO 8-in/ 8-out	12-bit Programmable	16-bit DIO 8-in/ 8-out
Expansion Bus	2 x PCIe x1 slots, 1 x PCIe x 4 slot, 1 x PCIex16 slot, 2 x Mini-Card sockets	4 x PCI slots, 3 x ISA slots	4 x PCIe x1, SDIO, I2C	PC-104-Plus
Power Input	DC 5~20V / ATX	AT/ ATX	9~36V	DC 12V, 5V
Operating Temperature	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W

W Wide Temperature Model

Single Board Computer
3.5" Miniboard




Model	EmCORE-i90U2-WT	EmCORE-i90M2-WT	EmCORE-i89M2-WT	EmCORE-i2305-WT
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	6th/7th Gen. Intel® Core™ Processor i7-7600U 3.9GHz i5-7300U 3.5GHz i3-7100U 2.4GHz	7th Gen. Intel® Core™ Processor i5-7442EQ 2.9Ghz i7-7820EQ 3.7Ghz	6th Gen. Intel® Core™ Processor i5-6442EQ 2.7GHz i7-6822EQ 2.8GHz	Intel® Atom™ Processor E3825 1.33GHz / E3845 1.91GHz Celeron® Processor N2807 1.58GHz / N2930 1.83GHz
Chipsets	N/A	QM175	QM170	N/A
Memory	2 x DDR4 SO-DIMM sockets	1 x DDR4 SO-DIMM Socket	1 x DDR4 SO-DIMM Socket	1 x DDR3L SO-DIMM Socket
Graphic interface	1 x HDMI 1 x DisplayPort	1 x HDMI 1 x DisplayPort	1 x HDMI 1 x DisplayPort	Analog RGB, 1 x HDMI
LVDS	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit
Audio	Realtek® ALC269	Realtek® ALC662	Realtek® ALC662	Realtek® ALC662
Ethernet port	5 x GbE	2 x GbE	2 x GbE	2 x GbE
Storage	1 x SATA600 1 x M.2 B-key	2 x SATA600 1 x M.2 M-key	2 x SATA600 1 x M.2 M-key	1 x SATA300, 1 x mSATA , eMMC 4.5 (OEM request, E3800 family only)
Serial port	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	1 x RS-232 1 x RS-232/485 selectable
USB 2.0	4	2	2	4
USB 3.0/2.0	4	4	4	1
Digital I/O	8-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable
Expansion Bus	1 x M.2 E-key, 1 x Micro SIM socket	1 x Mini-Card Socket 1 x SIM socket	1 x Mini-Card Socket 1 x SIM socket	1 x Mini-Card Socket, 1 x micro-SDXC socket, 2 x I2C ports (OEM request, E3800 family only)
Power Input	DC 9V / 36V	DC 12V	DC 12V	DC 12V
Operating Temperature	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W	-40 ~ 85°C (-40 ~ 185°F) W

W Wide Temperature Model

Single Board Computer
3.5" Miniboard




Model	EmCORE-i230G-WT	EmCORE-a55E1	Em104P-i2313	Em104-i230F
Form Factor	3.5"	3.5"	ETXP	PC/104
Dimension	146 x 102 mm	146 x 102 mm	114 x 95 mm	96 x 90 mm
Processor	Intel® Atom™ Processor E3825 1.33GHz E3845 1.91GHz	AMD G-Series Processor G-T56N 1.65GHz G-T40N 1.0GHz	Intel® Atom™ Processor E3825 1.33GHz E3845 1.91GHz	Intel® Atom™ Processor E3825 1.33GHz E3845 1.91GHz
Chipsets	N/A	A55E	N/A	N/A
Memory	1 x DDR3L SO-DIMM Socket	1 x DDR3 SO-DIMM Socket	1 x DDR3L SO-DIMM Socket	1 x DDR3L SO-DIMM Socket
Graphic interface	Analog RGB, HDMI	Analog RGB, HDMI	Analog RGB	Analog RGB
LVDS	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit	Dual Channels 24-bit
Audio	Realtek® ALC662	Realtek® ALC662	Realtek® ALC662	Realtek® ALC662
Ethernet port	2 x GbE	2 x GbE	1 x 10/100Mbps 1 x GbE	2 x GbE
Storage	1 x SATA300, 1 x CFast socket, eMMC 4.5 (OEM request)	2 x SATA600, 1 x CFast socket	1 x Ultra ATA 2 x SATA300, 1 x CF II socket	1 x SATA300, 1 x mSATA socket
Serial port	2 x RS-232/485 selectable	5 x RS-232 1 x RS-232/422/485 selectable	3 x RS-232 1 x RS-232/422/485 selectable	2 x RS-232 2 x RS-232/422/485 selectable
USB 2.0	6	6	4	2
USB 3.0/2.0	1	N/A	N/A	1
Digital I/O	8-bit Programmable	8-bit Programmable	16-bit DIO 8-in/8-out	8-bit Programmable
Expansion Bus	1 x Mini-Card Socket, 1 x micro SDXC socket, 1 x micro SIM socket	1 x Mini-Card Socket, 1 x SIM socket	PC/104-Plus	PC/104
Power Input	DC 12V	DC 12V	DC 12V, 5V	DC 12V, 5V
Operating Temperature	-40 ~ 85°C (W) (-40 ~ 185°F)	0 ~ 70°C (32 ~ 158°F)	-40 ~ 85°C (W) (-40 ~ 185°F)	-40 ~ 85°C (W) (-40 ~ 185°F)

(W) Wide Temperature Model

Slot Computing

Industrial Motherboard





Model	HiCORE-i89Q1	HiCORE-i89Q2	ITX-i89H0	ITX-a55E3	MB-i89Q0
Form Factor	PICMG 1.3 full size SBC	PICMG 1.3 full size SBC	Mini-ITX	Mini-ITX	Micro-ATX Motherboard
Dimension	338 x 126 mm	338 x 126 mm	170 x 170 mm	170 x 170 mm	244 x 244 mm
Processor	6nd Gen. Intel® Core™ i7/i5/i3 Processor (Socket LGA1151)	6nd Gen. Intel® Core™ i7/i5/i3 Processor (Socket LGA1151)	6nd Gen. Intel® Core™ i3-6100E 2.7GHz / Intel® Xeon® E3-1505L V5 2.8GHz E3-1515M V5 3.7GHz	AMD G-Series Processor G-T40N 1.0GHz	6th Gen. Intel® Core™ i7/i5/i3 Processor (Socket LGA1151)
Chipsets	Q170	Q170	CM236	A55E	Q170
Memory	4 x DDR4 Long-DIMM Sockets	4 x DDR4 Long-DIMM Sockets	2 x DDR4 ECC SO-DIMM Sockets	Soldered Onboard 2GB DDR3 SDRAM	4 x DDR4 Long-DIMM Sockets
Graphic interface	1 x DVI-I 1 x DisplayPort	1 x Analog RGB 1 x DisplayPort	1 x HDMI 2 x DisplayPort	1 x DVI-I	1 x DVI-I 2 x DisplayPort
LVDS	N/A	N/A	N/A	Dual Channels 24-bit	N/A
Audio	HD Audio Link	HD Audio Link	Realtek® ALC662	Realtek® HD ALC662	Realtek® ALC269
Ethernet port	2 x GbE	2 x GbE	1 x GbE	2 x GbE	2 x GbE
Storage	6 x SATA600	6 x SATA600	2 x SATA600 1 x M.2 M-key	2 x SATA600, 1 x mSATA socket	6 x SATA600 RAID 0, 1, 5, 10 supported
Serial port	1 x RS-232 1 x RS-232/422/485	1 x RS-232 1 x RS-232/422/485	1 x UART interface (TX, RX, CTS, RTS)	4 x RS-232 2 x RS-232/422/485 selectable	2 x RS-232 4 x RS-232 (OEM request)
USB 2.0	8	8	4	8	10
USB 3.0/2.0	2	2	6	N/A	4
Digital I/O	8-bit Programmable	8-bit Programmable	N/A	8-bit Programmable	N/A
Expansion Bus	PCI/ PCIe golden finger	PCI/ PCIe golden finger	1 x PCIe Gen 3.0 x16 1 x M.2 E-key, 1 x LPC	1 x PCI, 1 x Mini-card socket, 1 x PCIe x1 slot, 1 x SIM socket	1 x PCI 1 x PCIe x16 1 x PCIe x4 in x8 1 x PCIe x1
Power Input	DC 12V, 5VSB	DC 12V, 5VSB	DC12V	DC 9 ~ 36V	24-pin + 4-pin ATX power connector
Operating Temperature	0 ~ 60°C (32 ~ 122°F)	0 ~ 60°C (32 ~ 122°F)	-20 ~ 70°C (-4 ~ 158°F)	-20 ~ 70°C (-4 ~ 158°F)	0 ~ 60°C (32 ~ 140°F)

Semi-Industrial Motherboard





Model	ITX-i91Q2	ITX-i89Q3	ITX-i89QA	ITX-i89QB	ITX-i89QC
Form Factor	Mini-ITX	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	170 x 170 mm
Processor	8th Gen. Intel® Core™ i7/i5/i3 / Pentium®	7th/6th Gen. Intel® Core™ i7/i5/i3 / Pentium®	7th/6th Gen. Intel® Core™ i7/i5/i3 / Pentium®	7th/6th Gen. Intel® Core™ i7/i5/i3 / Pentium®	7th/6th Gen. Intel® Core™ i7/i5/i3 / Pentium®
Socket	LGA1151	LGA1151	LGA1151	LGA1151	LGA1151
Chipset	Intel® PCH Q370	Intel® PCH H110	Intel® PCH Q170	Intel® PCH Q170	Intel® PCH Q170
Super I/O	NUVOTON NCT6116D	Fintek F81803U	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	2 x DDR4 2133MHz SO-DIMM
Max. Capacity	32GB	32GB	32GB	32GB	32GB
Serial Port	4 x RS-232 2 x RS-232/422/485	4 x RS-232 2 x RS-232/422/485	1 x Serial Port (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	4 x USB 3.0/2.0 4 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	2 x USB 3.0/2.0 4 x USB 2.0
Digital I/O	8-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable
Expansion	1 x PCIe x16, 1 x Mini-card (half) 1 x SIM	1 x PCIe x16 Gen2 1 x Mini-card (ful) 1 x SIM	1 x PCIe x16 Gen 3, 1 x Mini-card (half) 1 x M.2 E-key 1 x SIM	1 x PCIe x16 Gen 3, 1 x Mini-card (half)	4 x PCIe x4 Gen 3, 1 x Mini-card (half) 1 x SIM
Storage	5 x SATA 600MB/s 1 x mSATA (full)	2 x SATA 600MB/s, 1 x M.2 M-key	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	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	N/A	Mic-in, Line-in, Line-out	Mic-in, Line-in, Line-out
LVDS	Dual Channels 24-bit	N/A	Dual Channel 24-bit	Dual Channels 24-bit	N/A
Video Output	1 x VGA 1 x HDMI 1 x DP	1 x eDP 1 x HDMI 1 x DP	1 x HDMI	1 x DVI-D 1 x HDMI 1 x DP	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	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)	0 ~ 60˚C (32 ~ 140˚F)

Semi-Industrial Motherboard





Model	ITX-i240B	MB-i91Q1	MB-i91Q0	MB-i89Q9	MB-i89Q8
Form Factor	Mini-ITX	micro-ATX	ATX	micro-ATX	ATX
Dimension	170 x 170 mm	244 x 244 mm	305 x 244 mm	244 x 244 mm	305 x 244 mm
Processor	Intel® Pentium® N4200/ Celeron® N3350 Atom™ x7-E3950 / x5-E3930	8th Gen. Intel® Core™ i7/i5/i3 Pentium®	8th Gen. Intel® Core™ i7/i5/i3 Pentium®	7th/6th Gen. Intel® Core™ i7/i5/i3 Pentium® / Celeron®	7th/6th Gen. Intel® Core™ i7/i5/i3 Pentium® / Celeron®
Socket	-	LGA1151	LGA1151	LGA1151	LGA1151
Chipset	N/A	Intel® PCH H310	Intel® PCH Q370	Intel® PCH H110	Intel® PCH H110
Super I/O	NUVOTON NCT6116D	Fintek F81966	Fintek F81966	Fintek F81866A	Fintek F71808E
RAM Socket	2 x DDR3L 1866MHz SO-DIMM	2 x DDR4 2666MHz Long-DIMM	4 x DDR4 2666MHz Long-DIMM	2 x DDR4 2133MHz SO-DIMM	2 x DDR4 2133/1866MHz SO-DIMM
Max. Capacity	8GB	32GB	64GB	32GB	32GB
Serial Port	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	9 x RS-232 1 x RS-232/422/485	4 x RS-232 2 x RS-232/422/485
USB Port	4 x USB 3.0/2.0 3 x USB 2.0	4 x USB 3.0/2.0 ports 4 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 5 x USB 2.0 ports	8 x USB 3.0/2.0 5 x USB 2.0
Digital I/O	8-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable	8-bit Programmable
Expansion	1 x PCIe x1, 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 SIM, 1 x M.2 E-key	1 x PCIe x16 Gen 2, 1 x PCIe x1 Gen 2, 2 x PCI 1 x Mini-card (full) 1 x SIM	1 x PCIe x16, 1 x PCIe x 4, 5 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	5 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
Ethernet	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	Dual Channels 24-bit	N/A	N/A	N/A	N/A
Video Output	1 x HDMI 1 x DP	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	1 x VGA 1 x DVI-D 1 x HDMI	1 x VGA 1 x HDMI
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)

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