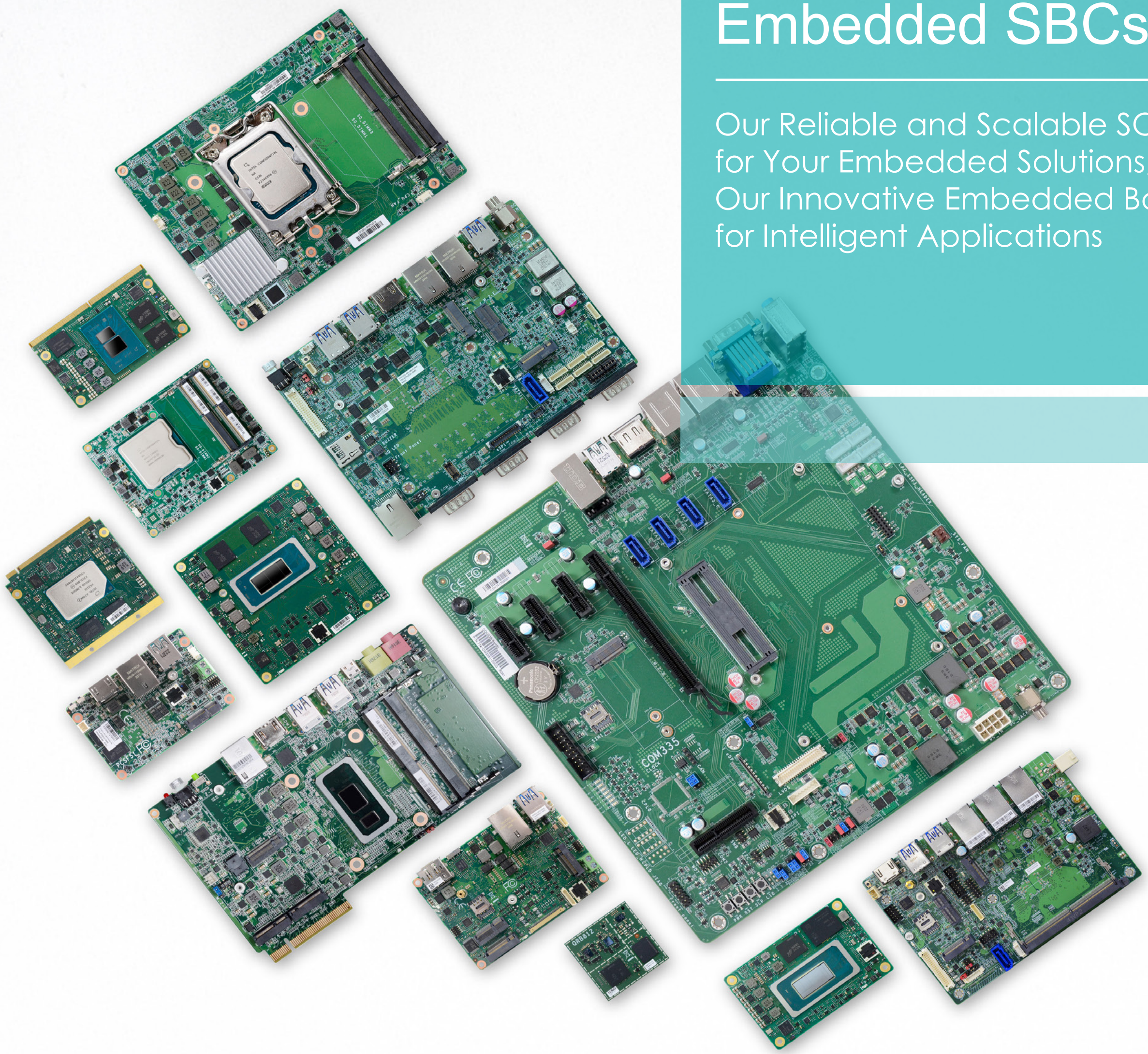
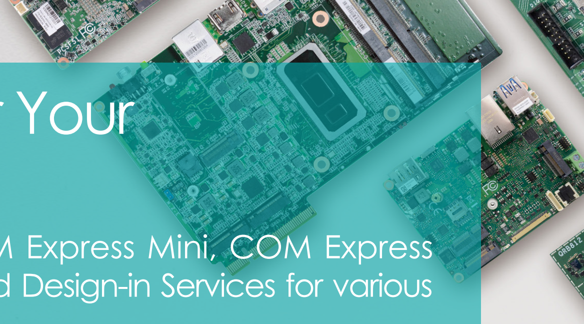
DFI

Desire
For
Innovation

System-On-Modules & Embedded SBCs

Our Reliable and Scalable SOMs
for Your Embedded Solutions,
Our Innovative Embedded Boards
for Intelligent Applications





Our Reliable and Scalable SOMs for Your Embedded Solutions

We provide off-the-shelf System-On-Modules including COM Express Mini, COM Express Compact, COM Express Basic, Qseven, SMARC and Customized Design-in Services for various embedded computing solutions.

System-On-Modules Product Overview

COM HPC

RPS9HC

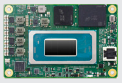
Processor	Platform	Chipset	Model	Index
Intel® Core™ Ultra Series 3 Processors	-	-	PTH9HM	P9
14th/13th Gen Intel® Core Processors	Desktop	R680E/ Q670E/ H610E	RPS9HC	

COM Express Compact

MTH966

Processor	Platform	Chipset	Model	Index
Intel® Core™ Ultra Processor	U/H	-	MTH966	P10
Intel® Core™ Ultra Processor	U/H	-	MTH968	
13th Gen Intel® Core™ Processor	ULT	-	RPP968	
12th Gen Intel® Core™ Processor	ULT	-	ADP968	
11th Gen Intel® Core™ Processor	ULT	-	TGU968	P11
8th Gen Intel® Core™ Processor	ULT	-	WL968	
7th Gen Intel® Core™ Processor	ULT	-	KU968	
6th Gen Intel® Core™ Processor	ULT	-	SU968	
Intel® Atom® Amston / Twin Lake Series	Atom	-	ASL968	
Intel® Atom® Processor E3900/ Intel® Pentium® N4200"	Atom	-	AL968	

COM Express Mini



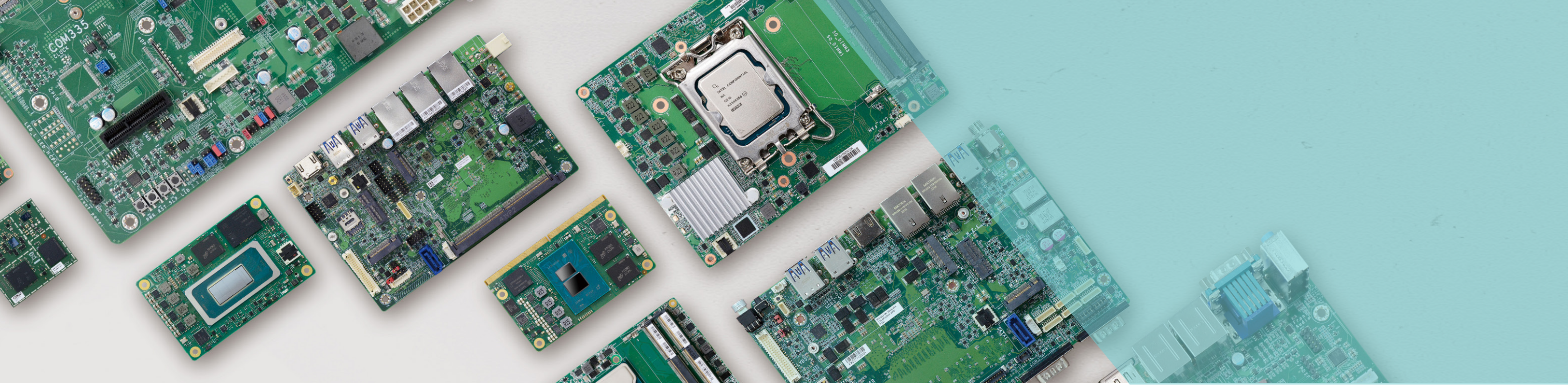
MTU9A2

Processor	Platform	Chipset	Model	Index
Intel® Core™ Ultra Processor	ULT	-	MTU9A2	P12
11th Gen Intel® Core™ Processor	ULT	-	TGU9A2	
8th Gen Intel® Core™ Processor	ULT	-	WL9A3	
Intel® Atom® Processor Alder Lake-N Series	Atom	-	ADN9A2	
Intel® Atom® Processor Amston Lake Series	Atom	-	ASL9A2	P13
Intel® Atom® Processor Elkhart Lake Series	Atom	-	EHL9A2	
Intel® Atom® Processor E3900/ Intel® Pentium® N4200	Atom	-	AL9A2	
		-	AL9A3	
		-	AL9A8	
AMD® Ryzen™ R1000 Series Processor	AMD	-	GH9A3	

COM Express Basic

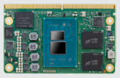
ICD970

Type	Processor	Platform	Chipset	Model	Index
Type 7	3rd Gen Intel® Xeon® Scalable Processors D-1700 Family	Server	-	ICD970	P14
	Intel® Atom® Processor C3000	Atom	-	DV970	
Type 6	11th Gen Intel® Core™ Processor	Mobile	RM590E/ QM580E/ HM570E	TGH960	P15
	9th/8th Gen Intel® Core™ Processor	Mobile	CM246/ QM370/ HM370	CH960	
				CH961	
	6th Gen Intel® Core™ Processor	Mobile	CM236/ QM170	SH960MD	
	AMD® Ryzen™ V1000/R1000 Embedded Processors	AMD	-	GH960	



SMARC

ASL600



Processor	Compliance	Model	Index
Intel® Atom® Processor Amston Lake Series	SMARC specification V2.2	ASL600	P16
NXP i.MX8M Plus	SMARC module specification V2.2	F8000	

OSM

QRB812

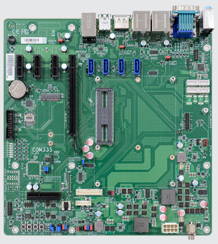
Processor	Form Factor	Model	Index
Qualcomm QRB5165 Processor	Size-L	QRB812	P17

Qseven

EHL701

Processor	Platform	Chipset	Model	Index
Intel® Atom® Processor x6000	Atom	-	EHL701	P18
			EHL700	
Intel® Atom® Processor E3900	Atom	-	AL701	
			AL700	P19
Rockchip RK3568 / RK3568J Cortex A55	ARM	-	RK701	
Freescale™ i.MX6 Series	ARM	-	FS700	

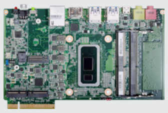
Carrier Board



COM335

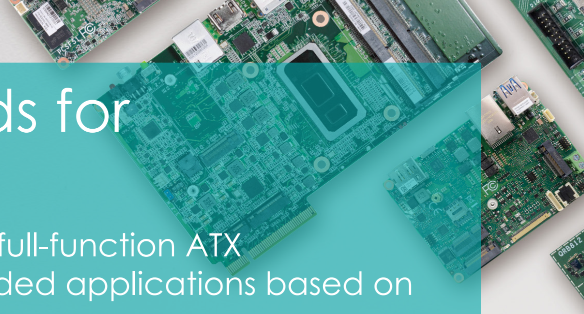
Type	Form Factor	Compliance	Model	Index
COM HPC Client	Extend ATX	COM HPC R2.0	COM836	P20
Type10,6	microATX	COM Express R3.1	COM335	
		COM Express R3.1	COM335-C	
Type7		COM Express R3.1	COM336	
		COM Express R3.0	COM333-I	P21
Type6		COM Express R2.1	COM332-B(R.B1)	
SMARC		SMARC (ASL600)	SMX331	
Type 10	Mini-ITX	COM Express R2.1	COM100-B	
QSeven		Qseven (BT700)	Q7X-151(R.A)	
		Qseven (AL700, AL701, BT701)	Q7X-151(R.D1)	
	Proprietary	Qseven (FS700)	Q7A-551	

SDM



SDML-WL

Form Factor	Processor	Compliance	Model	Index
SDM Large	8th Gen Intel® Core™ Processor	Intel® Smart Display Module	SDML-WL	P22



Our Innovative Embedded Boards for Intelligent Applications

Our embedded boards (ranging from ultra-small Pico-ITX to full-function ATX motherboards) provide service to a broad range of embedded applications based on cutting-edge platforms and technologies.

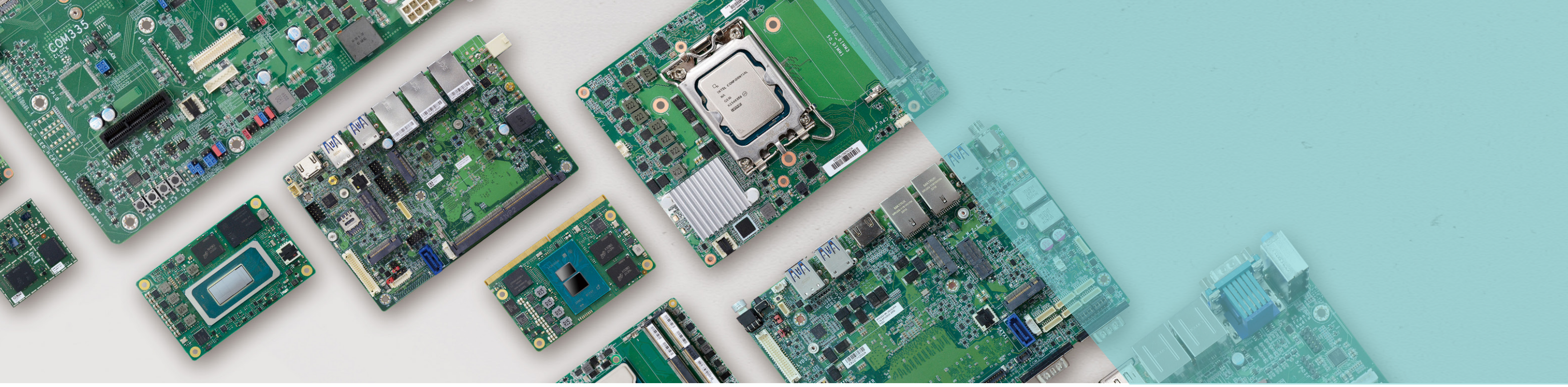
Embedded SBCs & Industrial Motherboards Product Index

Embedded SBCs

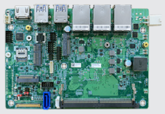
PCSF51

RPP051

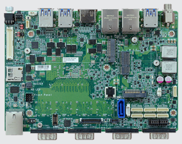
Form Factor	Processor	Platform	Model	Index
1.8"	Intel® Atom® Amston/Twin lake	Atom	TWLF51	P23
	Intel Atom® E3900	Atom	ALF51	
	AMD® Embedded R2000 Series - Picasso	AMD	PCSF51	
	AMD® Embedded R1000 Series	AMD	GHF51	
2.5"	13th Gen Intel® Core™	ULT	RPP051	P24
	8th Gen Intel® Core™	ULT	WL051	
			WL053	
	Intel® Atom® Amston Lake/Twin Lake	Atom	ASL051	
	Intel® Atom® Elkhart Lake	Atom	EHL051	
	Intel Atom® E3900	Atom	AL05P	
			AL051	P25
			AL053	
	NXP i.MX 93	NXP	M93053	
	NXP i.MX 8M Series	NXP	M8M051	
	NXP i.MX 8M Mini	NXP	8MM053	
	Freescale i.MX6 Series	NXP	FS053	P26
	Qualcomm QCS6490	Qualcomm	QCS051	



Embedded SBCs



ASL553



MTH253

Form Factor	Processor	Platform	Model	Index
3.5"	9th/8th Gen Intel® Core™	Desktop	CS551	P26
	Intel® Core™ Ultra Processor	U/H	MTH556	
	8th Gen Intel® Core™	ULT	WL551	P27
	7th Gen Intel® Core™	ULT	KU551	
			KU553	
	7th/6th Gen Intel® Core™	ULT	SU551	
	Intel® Atom® Amston/Twin lake	Atom	IRN556	P28
	Intel® Atom® Amston Lake	Atom	ASL553	
	Intel® Atom® Alder Lake-N	Atom	ADN553	
	Intel® Atom® Elkhart Lake	Atom	EHL556	
	Intel® Atom® E3900	Atom	AL551	P29
			AL553	
	AMD® Embedded V1000 / R2000 / R1000	AMD	GH551	
	NXP i.MX 8M Plus	NXP	M8MP553	
4"	Intel® Core™ Ultra Processor	U/H	MTH253	P30
	12th Gen Intel® Core™	ULT	ADP253	
	6th Gen Intel® Core™	ULT	SU256-SCM	
	Intel® Atom® Amston Lake	Atom	ASL253	
	Intel® Atom® Alder Lake-N	Atom	ADN253	P31
	Intel® Atom® Elkhart Lake	Atom	EHL253	
	Intel® Atom® E3900	Atom	AL253	
	AMD® Ryzen 8000	AMD	HPT253	

Customer-Oriented SOM Design-In Services

Design Assistance

- Comprehensive evaluation of carrier board design during planning phase
  Hardware/Software Recommendations, Technical Specifications, Developing Schedule, and Database
  Schematic Review, Placement/Layout Review, Debugging Assistance Services, and General/Special Reference Design
- Comprehensive design documentation for designing carrier board
  Carrier Board Design Guide, User's Manual, Schematic & Layout Checklist, and 2D/3D Mechanical Drawing

Strict Validation

- Strict validation and testing process ensures reliable deployments
  Dedicated Design Review Team, Thermal Simulation, and COMe Debug Module Card

Thermal Solution

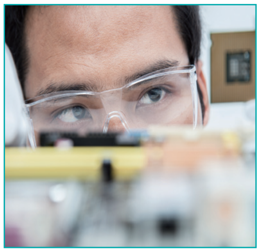
- Customized thermal solution design & Optional heatspreader
  For special requirements like high-temperature environments or ultra-slim chassis

Software Integration

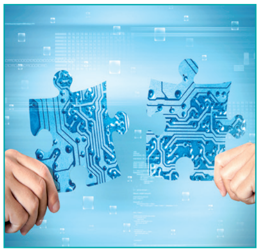
- Embedded OS and BIOS customization
  Windows 10, Windows 7, WES 7, Windows XP, Linux (CentOS/Debian), etc.
- Windows licensing offerings
- Application Programming Interface (API) library
  Watchdog, Hardware Control/Monitor, GPIO, Backlight Control, SMBus, etc.
- Remote management utility

Planning

Design



Validation



Integration

Production

Innovative Design & Services

Rugged Design

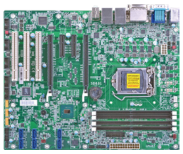
- Industrial-rated components with high MTBF over 100,000 hrs
- Extended operating temperatures
- High ESD protection for I/O ports
- Signal integrity measurement
- Wide range power design
- 100% Japanese-made solid capacitor
- Power hot plug protection for DC-in type SBC and Industrial Motherboards

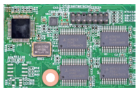
Software Integration

- Embedded BIOS and OS customization services
- Windows licensing offerings
- Android, Linux distribution (Yocto/Ubuntu/CentOS/Debian)
- Embedded API
  (Hardware Monitor, SMBus, I^{2}C, Brightness Control, GPIO,Watchdog)
- Remote management utility

Embedded Total Solution

- Express customization service: 30 days (NRE cost: project based)
- Strict revision control
- Long product life cycle support
- High volume OEM/ODM production capabilities

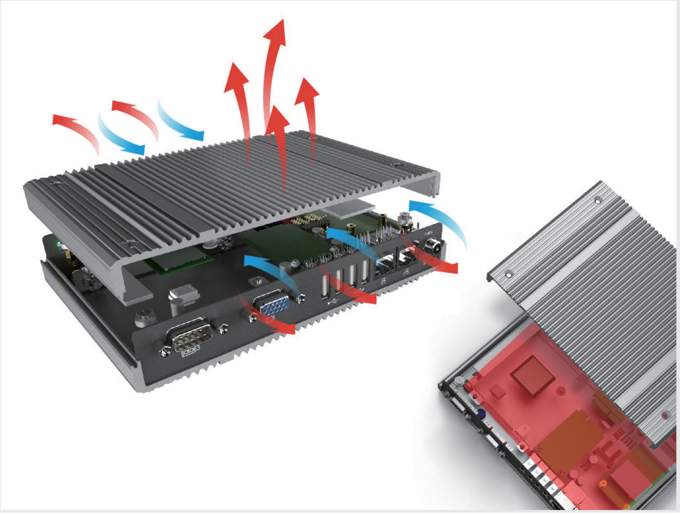

Embedded Boards


Peripherals


Systems

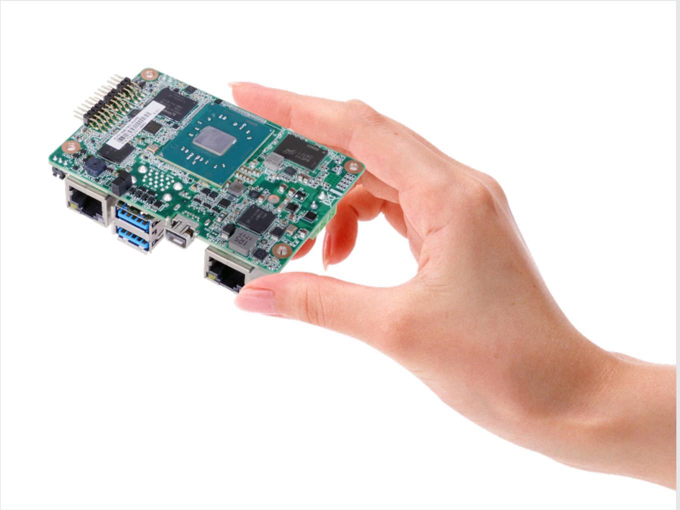

Embedded Software & BIOS

Vertical Solutions



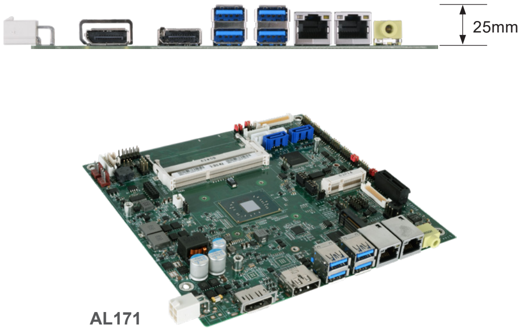
Easy System Integration

- Optional peripheral: DC power module, Wi-Fi, Cellular, GPS module
- Optimized low profile thermal solution: fanless for ULT and Atom based platform
- Optional heatspreader for 4", 3.5", Pico-ITX SBC with efficient thermal dissipation
- Unified mechanical design for rear I/O location, screw hole, and connector type



The Smallest Our 1.8" SBC

- 1.8” small form factor fits space-limited applications
- All-in-one 100% readiness standalone SBC
- Ultra low power Fanless embedded SBC
- Perfectly fits gateway application with a few I/O requirements



Thin Mini-ITX

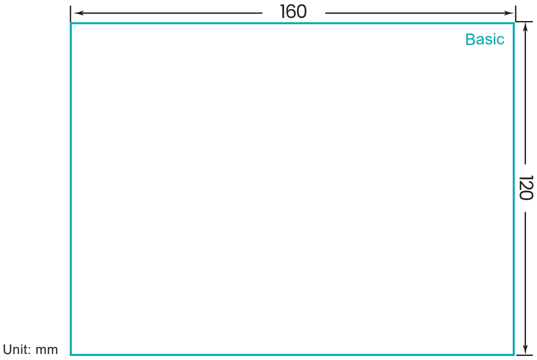
- Thinner than general Mini-ITX, and only 25mm in height
- Equipped with a variety of I/O connectivity
- Features mSATA, Mini PCIe, LVDS and built-in DC power connector
- Designed for slim panel PCs, POS systems, portable medical devices, and All-in-One systems

COM HPC

Computer on Module High Performance Computing

Features

Supports high-performance multi-core processors, possesses high-performance edge computing capabilities, and offers flexible expandability, meeting the requirements of various industrial applications. It also supports multiple high-speed interfaces suitable for data-intensive and compute-intensive applications.



Wide Temp | Wide Temp | R680E/Q670E/H610E

Model Name		**PTH9HM**	**RPS9HC**
Compliance		COM HPC® R1.20, Client Size Mini	COM HPC® R1.15, Client Size C
System	Processor	Intel® Core™ Ultra series 3 processors	14th/13th Gen Intel® Core™
	Socket	BGA 2540	LGA 1700
	Max. Speed	5.1GHz	3.3~5.8GHz
	TDP	15W/28W	35W/60W/65W
	Cache	18M	12M/20M/24M/30M/33M/36M
	Chipset	-	Intel® R680E/Q670E/H610E
	BIOS	AMI SPI 256Mbit	AMI SPI 256Mbit
Memory	Technology	Dual Channel LPDDR5 (IBECC support)	Dual Channel DDR5 (ECC support by R680E with i7/i5)
	Max. Capacity	64GB	192GB
	Socket	-	4 SODIMM
Graphics	Interface	1 eDP, 2 DDI	1 eDP, 3 DDI
Expansion	PCIe	2 PCIe x4 Gen4 + 1 PCIe x4 Gen5 or 2 PCIex4 Gen4 + 1 PCIex4 Gen5 + 1 PCIex8 Gen5	1 PCIe x16, 4 PCIe x4, 2 PCIe x4, 2 PCIe x1
	PCI	-	-
	LPC	-	-
	I^2C	2	1
	SMBus	1	1
	CAN Bus	-	-
Audio	Interface	HD Audio	HD Audio
Ethernet	Controller	2 Intel® I226IT	2 Intel® I226
I/O	USB	1 USB4.0 Gen2, 2 USB3.2 Gen2, 8 USB2.0	4 USB 3.2 Gen2, 8 USB 2.0
	SATA	-	2 SATA 3.0
	DIO	12 bit in/out	12 bit in/out
TPM		TPM 2.0 (Opt.)	TPM 2.0 (Opt.)
Power		8V-20V, 5VSB (ATX mode), 8V-20V (AT mode)	12V, 5VSB, VCC-RTC (ATX mode), 12V, VCC-RTC (AT mode)
Operating Temperature		-40°C~85°C	0°C~60°C

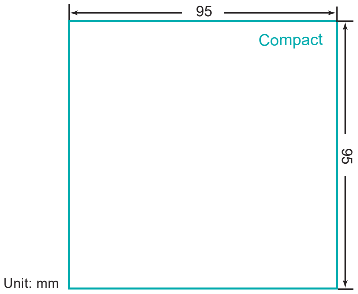
*Populated by default

COM Express Compact

Reliable & Compact Solutions

Features

COM Express® Compact module is designed with computing capability and cost efficiency in a compact form factor with a footprint of 95 x 95 mm, making it the best Option for transportation and defense applications. DFI's Compact modules are available with COM Express® pin-out Type 2 and Type 6.



Model Name		**MTH966**	**MTH968**	**RPP968**	**ADP968**
Compliance		COM Express® R3.1 Compact, Type 6	COM Express® R3.1 Compact, Type 6	COM Express® R3.1 Compact, Type 6	COM Express® R3.1 Compact, Type 6
System	Processor	Intel® Core™ Ultra Processor	Intel® Core™ Ultra Processor	13th Gen Intel® Core™	12th Gen Intel® Core™
	Socket	FCBGA1744	FCBGA1744	FCBGA1744	FCBGA1744
	Max. Speed	1.3~1.7GHz	1.2~1.7GHz	1.1~2.7GHz	1.0~1.8GHz
	TDP	15W/28W	15W/28W/45W	15W/28W/45W	15W/28W
	Cache	12M/18M/24M	12M/24M	8M/10M/12M/18M/24M	8M/10M/12M/18M
	Chipset	-	-	-	-
	BIOS	AMI BIOS	AMI BIOS	AMI BIOS	AMI BIOS
Memory	Technology	Dual Channel LPDDR5 7467MHz	Dual Channel DDR5 5600MHz	Dual Channel DDR5 5200MHz	Dual Channel DDR4 3200MHz
	Max. Capacity	32GB	96GB	64GB	64GB
	Socket	Memory down	2 SODIMM	2 SODIMM	2 SODIMM
Graphics	Interface	1 LVDS/eDP, 3 DDI	1 VGA, 1 LVDS/eDP, 3 DDI	1 VGA, 1 LVDS/eDP, 3 DDI	1 VGA, 1 LVDS/eDP, 3 DDI
Expansion	PCIe	8 PCIe x1, 1 PCIe x8, 2 PCIe x4	1 PCIe x8, 2 PCIe x4, 8 PCIe x1	1 PCIe x8, 2 PCIe x4, 5/8 PCIe x1	1 PCIe x8, 2 PCIe x4, 5/8 PCIex1
	PCI	-	-	-	-
	LPC	1 LPC/eSPI	1 LPC/eSPI	-	-
	I^{2}C	1	-	1	1
	SMBus	1	1	1	1
	CAN Bus	-	-	-	-
Audio	Interface	HD Audio	HD Audio	HD Audio	HD Audio
Ethernet	Controller	1 Intel® I226IT/LM	1 Intel® I226IT/LM, co-lay PCIe x1 (Opt.)	1 Intel® I226IT/LM, co-lay PCIe x1 (Opt.)	1 Intel® I225IT/LM, co-lay PCIe x1 (Opt.)
I/O	USB	2 USB 4.0, 4 USB 3.2 Gen2, 8 USB 2.0	2 USB4.0, 3 USB 3.2 Gen2, 8 USB 2.0	2 USB4.0, 4 USB 3.2, 8 USB 2.0	4 USB 3.2, 8 USB 2.0
	SATA	2 SATA 3.0, co-lay PCIe x1 (Opt.)	2 SATA 3.0, co-lay 2 PCIe x1 (Opt.)	2 SATA 3.0, co-lay PCIe x1 (Opt.)	2 SATA 3.0, co-lay PCIe x1 (Opt.)
	SSD	1 on board SSD up to 1024GB (Opt.)	1 on board SSD up to 1024GB (Opt.)	1 on board SSD up to 1024GB (Opt.)	1 on board SSD up to 1024GB (Opt.)
	eMMC	-	-	-	-
	DIO	8-bit DIO	8-bit DIO	8-bit DIO	8-bit DIO
TPM		Optional	Optional	Optional	Optional
iAMT		-	-	-	-
Power		8.5~20V, 5VSB, VCC-RTC (ATX mode) 8.5~12V, VCC-RTC (AT mode)	8.5~20V, 5VSB, VCC-RTC (ATX mode) 8.5~20V, VCC-RTC (AT mode)	8.5~20V, 5VSB, VCC-RTC (ATX mode) 8.5~12V, VCC-RTC (AT mode)	8.5~20V, 5VSB, VCC-RTC (ATX mode) 8.5~20V, VCC-RTC (AT mode)
Operating Temperature		-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C

*Populated by default




Wide Temp ULT | Wide Temp ULT | Wide Temp ULT | Wide Temp ULT

Model Name		**TGU968**	**WL968**	**KU968**	**SU968**
Compliance		COM Express® R3.0 Compact, Type 6	COM Express® R3.0 Compact, Type 6	COM Express® R2.1 Compact, Type 6	COM Express® R2.1 Compact, Type 6
System	Processor	11th Gen Intel® Core™	8th Gen Intel® Core™	7th Gen Intel® Core™	6th Gen Intel® Core™
	Socket	FCBGA 1449	FCBGA 1528	BGA 1356	BGA 1356
	Max. Speed	1.8~3.0GHz	2.0~4.4GHz	2.2~3.9GHz	2~3.4GHz
	TDP	15-28W	15W	15W	15W
	Cache	4M~12M	2M/4M/6M/8M	2M/3M/4M	2M/3M/4M
	Chipset	-	-	-	-
	BIOS	AMI BIOS	AMI SPI 128Mbit	Insyde SPI 128Mbit	Insyde SPI 128Mbit
Memory	Technology	Dual Channel DDR4 3200MHz	Dual Channel DDR4 2400/2133MHz	Dual Channel DDR4 2133MHz	Dual Channel DDR3L 1600MHz
	Max. Capacity	64GB	64GB	4GB / 8GB / 16GB	16GB
	Socket	2 SODIMM	2 SODIMM	Memory down	2 SODIMM
Graphics	Interface	1 VGA/DDI, 1 LVDS/eDP, 3 DDI	1 VGA/DDI, 1 LVDS/eDP, 1 DDI	1 VGA/DDI, 1 LVDS/eDP, 1 DDI	1 VGA/DDI, 1 LVDS/eDP, 1 DDI
Expansion	PCIe	1 PCIe x4, 5/8 PCIex1	6 PCIe x1 / 2 PCIe x1 + 1 PCIe x4 / 3 PCIe x1 + 2 PCIe x2	5 PCIe x1 / 4 PCIe x1 + 1 PCIe x4 / 3 PCIe x1 + 2 PCIe x2	5 PCIe x1 / 4 PCIe x1 + 1 PCIe x4 / 3 PCIe x1 + 2 PCIe x2
	PCI	-	-	-	-
	LPC	-	1	1	1
	I^{2}C	1	1	1	1
	SMBus	1	1	1	1
	CAN Bus	-	-	-	-
Audio	Interface	HD Audio	HD Audio	HD Audio	HD Audio
Ethernet	Controller	1 Intel® I225LM	1 Intel® I219LM	1 Intel® I219LM	1 Intel® I219LM
I/O	USB	4 USB 3.2, 8 USB 2.0	4 USB 3.2, 8 USB 2.0	4 USB 3.2, 8 USB 2.0	4 USB 3.2, 8 USB 2.0
	SATA	2 SATA 3.0	2/3 SATA 3.0 (RAID 0/1/5)	3 SATA 3.0 (RAID 0/1/5)	3 SATA 3.0 (RAID 0/1/5/10)
	SSD	1 on board SSD up to 1024GB (Opt.)	-	-	-
	eMMC	-	1 eMMC 5.1 up to 128GB (Opt.)	-	-
	DIO	8-bit DIO	8-bit DIO	8-bit DIO	8-bit DIO
TPM		Optional	Optional	Optional	Optional
iAMT		-	iAMT 12.0 (Core i7/i5)	iAMT 11.0 (Core i7/i5)	iAMT 11.0 (Core i7/i5)
Power		8.5~20V, 5VSB, VCC-RTC (ATX mode) 8.5~20V, VCC-RTC (AT mode)	12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)	12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)	12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)
Operating Temperature		-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C

*Populated by default


Wide Temp Atom | Wide Temp Atom

Model Name		**ASL968**	**AL968**
Compliance		COM Express® R3.1 Compact, Type 6	COM Express® R2.1 Compact, Type 6
System	Processor	Intel® Atom® Amston / Twin Lake Series	Intel® Atom® E3900 / Intel® Pentium® N4200
	Socket	BGA 1264	BGA 1296
	Max. Speed	3.2~3.6GHz	1.8~2.5GHz
	TDP	6W/9W/12W	6W/6.5W/9.5W/12W
	Cache	6M	2M
	Chipset	-	-
	BIOS	AMI SPI 256MHz	AMI SPI 128Mbit (supports UEFI boot only)
Memory	Technology	Single Channel DDR5 4800MHz (IBECC Supported)	Dual Channel DDR3L 1600MHz
	Max. Capacity	16GB	8GB
	Socket	1 SODIMM	2 SODIMM
Graphics	Interface	1 LVDS/eDP, 2 DDI	1 VGA/DDI, 1 LVDS/eDP, 1 DDI
Expansion	PCIe	Up to 8 PCIe x1	4 PCIe x1
	PCI	-	-
	LPC	1 LPC/eSPI	1
	I^{2}C	1	1
	SMBus	1	1
	CAN Bus	1	-
Audio	Interface	HD Audio	HD Audio
Ethernet	Controller	1 Intel® I226IT/LM, co-lay PCIe x1 (Opt.)	1 Intel® I211AT/I210IT
I/O	USB	2 USB 3.2, 8 USB 2.0	4 USB 3.2, 8 USB 2.0
	SATA	2 SATA 3.0, co-lay 2 PCIe x1 (Opt.)	2 SATA 3.0
	SSD	-	-
	eMMC	1 64GB eMMC 5.1	1 eMMC up to 32GB (Opt.)
	DIO	8-bit DIO	8-bit DIO
TPM		Optional	Optional
iAMT		-	-
Power		8.5~20V, 5VSB, VCC-RTC (ATX mode) 8.5~12V, VCC-RTC (AT mode)	12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)
Operating Temperature		-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C

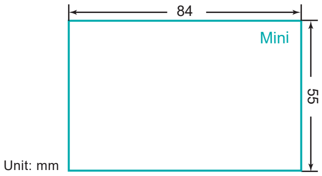
*Populated by default

COM Express Mini

Power-Saving & Small-Size Solutions

Features

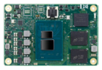
COM Express® Mini module delivers high performance on a small footprint which features 55 x 84 mm in size. It is ideal for space-limited, power-saving and mobile applications. DFI's ultra-small modules are available with COM Express® pin-out Type 10.




Wide Temp ULT

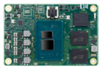

Wide Temp ULT


Wide Temp ULT

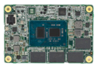

Atom

Model Name		MTU9A2	TGU9A2	WL9A3	ADN9A2
Compliance		COM Express® R3.1 Mini, Type 10	COM Express® R3.0 Mini, Type 10	COM Express® R3.0 Mini, Type 10	COM Express® R3.1 Mini, Type 10
System	Processor	Intel® Core™ Ultra Processor	11th Gen Intel® Core™	8th Gen Intel® Core™	Intel® Atom® Processor Alder Lake-N Series
	Socket	FCBGA1744	BGA1526	FCBGA 1528	BGA 1264
	Max. Speed	1.3~1.7GHz	up to 3.0GHz(Turbo)	3.9~4.4GHz	3.4~3.8GHz
	TDP	15W	15-28W	15W	6W/9W/12W/15W
	Cache	12M	4M/6M/8M/12M	4M/6M/8M	6M
	BIOS	AMI SPI 256Mbit	AMI SPI 256Mbit	AMI SPI 128Mbit	AMI SPI 256Mbit
Memory	Technology	Single Channel LPDDR5 7467MHz (IBECC Supported by Ubuntu)	Single Channel LPDDR4X 4266MHz	Dual Channel LPDDR3 2133MHz	Dual Channel LPDDR5 4800MHz (IBECC Supported)
	Max. Capacity	32GB	8GB/16GB	8GB/16GB	8GB/16GB
	Socket	Memory down	Memory down	Memory down	Memory down
Graphics	Interface	1 DDI, 1 eDP	1 eDP, 1 DDI	1 LVDS/eDP, 1 DDI	1 LVDS/eDP, 1 DDI
Expansion	PCIe	4 PCIe x1	1 PCIe x4	4 PCIe x1	4 PCIe x1
	SDIO	-	-	1	-
	LPC	1 eSPI	-	1	1
	I^{2}C	1	1	2	1
	SMBus	1	1	1	1
	CAN Bus	1 (Opt.)	-	-	1 (Opt.)
Audio	Interface	HD Audio	HD Audio	HD Audio	HD Audio
Ethernet	Controller	1 Intel® I226IT	1 Intel® I225IT	1 Intel® I219	1 Intel® I226IT/LM
I/O	USB	2 USB 3.2 Gen2, 8 USB 2.0	2 USB 3.2 Gen2, 8 USB 2.0	2 USB 3.2, 8 USB 2.0	2 USB 3.2 Gen2, 8 USB 2.0
	SATA	2 SATA 3.0	2 SATA 3.0	2 SATA 3.0	2 SATA 3.0
	SSD	1 on board SSD up to 1024GB (Opt.)	1 on board SSD up to 1024GB (Opt.)	-	-
	eMMC	-	-	1 eMMC up to 64GB (Opt.)	1 eMMC 5.1 up to 128GB (Opt.)
	DIO	8-bit DIO	8-bit DIO	8-bit GPIO	8-bit DIO
TPM		dTPM or fTPM (Opt.)	dTPM or fTPM (Opt.)	fTPM	dTPM or fTPM (Opt.)
Power		8.5V~20V, 5VSB, VCC-RTC (ATX mode), 8.5V~20V, VCC-RTC (AT mode)	4.75V~20V, 5VSB, VCC-RTC (ATX mode), 4.75V~20V, VCC-RTC (AT mode)	12V~20V, 5VSB, VCC-RTC (ATX mode) 12V~20V, VCC-RTC (AT mode)	4.75V~20V, 5VSB, VCC-RTC (ATX mode), 4.75V~20V, VCC-RTC (AT mode)
Operating Temperature		-40°C~85°C	-40°C~85°C, -5°C~65°C	-40°C~85°C, -5°C~65°C	-5°C~65°C

*Populated by default



Wide Temp Atom



Wide Temp Atom

Wide Temp Atom

Model Name		**ASL9A2**	**EHL9A2**	**AL9A2**
Compliance		COM Express® R3.1 Mini, Type 10	COM Express® R3.0 Mini, Type 10	COM Express® R2.1 Mini, Type 10
System	Processor	Intel® Atom® Processor Amston Lake Series	Intel® Atom® Processor Elkhart Lake Series	Intel® Atom® E3900 / Intel® Pentium® N4200
	Socket	BGA 1264	FCBGA 1528	BGA 1296
	Max. Speed	3.2~3.6GHz	1.7~4.4GHz	1.8~2.5GHz
	TDP	6W/9W/12W	6W/9W/10W/12W	6W/6.5W/9.5W/12W
	Cache	6M	4M/6M/8M	2M
	BIOS	AMI SPI 256Mbit	AMI SPI 256Mbit	AMI SPI 128Mbit (supports UEFI boot only)
Memory	Technology	Dual Channel LPDDR5 4800MHz (IBECC Supported)	Dual Channel LPDDR4X 3733/4267MHz (IBECC Supported)	Single Channel DDR3L 1600MHz
	Max. Capacity	8GB/16GB	8GB/16GB	4GB non-ECC / 8GB ECC
	Socket	Memory down	-	Memory down
Graphics	Interface	1 LVDS/eDP, 1 DDI	1 LVDS/eDP, 1 DDI	1 LVDS/eDP, 1 DDI
Expansion	PCIe	4 PCIe x1	4 PCIe x1	4 PCIe x1
	SDIO	-	1 (Opt.)	1 (Opt.)
	LPC	1	1	1
	I^{2}C	1	1	2
	SMBus	1	1	1
	CAN Bus	1 (Opt.)	-	-
Audio	Interface	HD Audio	HD Audio	HD Audio
Ethernet	Controller	1 Intel® I226IT/LM	1 Intel® I225IT/LM	1 Intel® I210AT/IT
I/O	USB	2 USB 3.2 Gen2, 8 USB 2.0	2 USB 3.2, 8 USB 2.0	2 USB 3.2, 8 USB 2.0
	SATA	2 SATA 3.0	2 SATA 3.0	2 SATA 3.0
	SSD	-	-	-
	eMMC	1 eMMC 5.1 up to 128GB (Opt.)	1 eMMC 5.1 up to 128GB (Opt.)	1 eMMC up to 64GB (Opt.)
	DIO	8-bit DIO	8-bit DIO	8-bit GPIO
TPM		dTPM or fTPM (Opt.)	dTPM or fTPM (Opt.)	-
Power		4.75V~20V, 5VSB, VCC-RTC (ATX mode) 4.75V~20V, VCC-RTC (AT mode)	4.75V~20V, 5VSB, VCC-RTC (ATX mode) 4.75V~20V, VCC-RTC (AT mode)	4.75V~20V, 5VSB, VCC-RTC (ATX mode) 4.75V~20V, VCC-RTC (AT mode)
Operating Temperature		-40°C~85°C	-40°C~85°C, -5°C~65°C	-40°C~85°C, 0°C~60°C

*Populated by default

Wide Temp Atom

Wide Temp Atom

Wide Temp AMD R1000

Model Name		**AL9A3**	**AL9A8**	**GH9A3**
Compliance		COM Express® R2.1 Mini, Type 10	COM Express® R2.1 Mini, Type 10	COM Express® R3.0 Mini, Type 10
System	Processor	Intel® Atom® E3900 / Intel® Pentium® N4200	Intel® Atom® E3900 / Intel® Pentium® N4200	AMD® Ryzen™ Embedded R1000 Series
	Socket	BGA 1296	BGA 1296	FP5
	Max. Speed	1.8~2.5GHz	1.8~2.5GHz	up to 3.5GHz (Turbo)
	TDP	6W/6.5W/9.5W/12W	6W/6.5W/9.5W/12W	12W
	Cache	2M	2M	1M
	BIOS	AMI SPI 128Mbit (supports UEFI boot only)	AMI SPI 128Mbit (supports UEFI boot only)	SPI 64Mbit
Memory	Technology	Dual Channel DDR3L 1600MHz	Dual Channel LPDDR4 2400MHz	Single Channel LPDDR4 2400MHz
	Max. Capacity	4GB / 8GB	4GB / 8GB	4GB / 8GB
	Socket	Memory down	Memory down	Memory down
Graphics	Interface	1 LVDS/eDP, 1 DDI	1 LVDS/eDP, 1 DDI	1 LVDS/eDP, 1 DDI
Expansion	PCIe	4 PCIe x1	4 PCIe x1	3 PCIe x1
	SDIO	1 (Opt.)	1 (Opt.)	1
	LPC	1	1	1
	I^{2}C	1	1	2
	SMBus	1	1	1
	CAN Bus	-	-	-
Audio	Interface	HD Audio	HD Audio	HD Audio
Ethernet	Controller	1 Intel® I210AT/IT	1 Intel® I210AT/IT	1 Intel® I210
I/O	USB	2 USB 3.2, 8 USB 2.0	2 USB 3.2, 8 USB 2.0	2 USB 3.2, 8 USB 2.0
	SATA	2 SATA 3.0	2 SATA 3.0	2 SATA 3.0
	SSD	1 SSD up to 64GB (Opt.)	-	-
	eMMC	-	1 eMMC up to 128GB	Optional
	DIO	8-bit GPIO	6-bit GPIO	8-bit GPIO
TPM		-	dTPM or fTPM (Opt.)	dTPM or fTPM (Opt.)
Power		4.75V~20V, 5VSB, VCC-RTC (ATX mode) 4.75V~20V, VCC-RTC (AT mode)	4.75V~20V, 5VSB, VCC-RTC (ATX mode) 4.75V~20V, VCC-RTC (AT mode)	12V~20V, 5VSB, VCC-RTC (ATX mode) 12V~20V, VCC-RTC (AT mode)
Operating Temperature		-40°C~85°C, 0°C~60°C	-40°C~85°C, -5°C~65°C	-40°C~85°C, 0°C~60°C

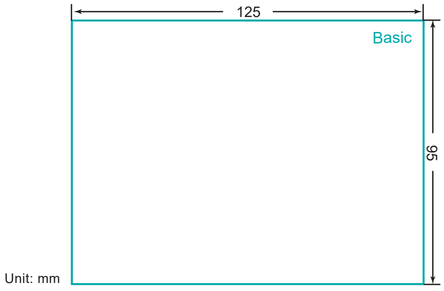
*Populated by default

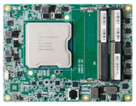
COM Express Basic

High-Performance & Cost-Effective Solutions

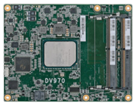
Features

COM Express® Basic module provides high-level processing performance and high-speed interfaces for a wide range of computing-demand applications such as medical, transportation, and industrial automation. DFI's Basic modules are compatible with COM Express® pin-out Type 2, Type 6 and Type 7.





Wide Temp Server

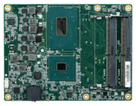


Wide Temp Server

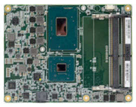
Model Name		**ICD970**	**DV970**
Compliance		COM Express® R3.0 Basic Type 7	COM Express® R3.0 Basic Type 7
System	Processor	3rd Gen Intel® Xeon® Processor D-1700 Family	Intel® Atom® C3000
	Socket	FCLGA4189	BGA 1310
	Max. Speed	1.9~2.4GHz	1.7~2.0GHz
	TDP	40W/50W/52W/59W/67W	17W/25W/31W
	Cache	10M/15M	12M/16M
	Chipset	-	-
	BIOS	Insyde SPI 512Mbit	Insyde SPI 128Mbit
Memory	Technology	Dual Channel DDR4 2666/2933MHz	Dual Channel DDR4 2400MHz
	Max. Capacity	64GB	64GB
	Socket	2 SODIMM	2 SODIMM
Graphics	Interface	-	-
Expansion	PCIe	2 PCIe x8, 1 PCIe x16	2 PCIe x8
	LPC	1	1
	I^{2}C	1	1
	SMBus	1	1
	CAN Bus	-	-
Audio	Interface	-	-
Ethernet	Controller	1 Intel® I210AT/IT, 4 10Gbase-KR	1 Intel® I210AT/IT, 4 10Gbase-KR
I/O	USB	4 USB 3.2, 4 USB 2.0	2 USB 3.2, 4 USB 2.0
	SATA	2 SATA 3.0	2 SATA 3.0 (RAID 0/1/10)
	SSD	-	-
	eMMC	eMMC 5.1 16GB (Opt.)	-
	DIO	8-bit DIO (4 in, 4 out)	8-bit DIO (4 in, 4 out)
TPM		Optional	Optional
iAMT		-	-
Power		12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)	12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)
Operating Temperature		-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C

*Populated by default

Wide Temp RM590E/QM580E/HM570E



Wide Temp CM246/QM370/HM370



Wide Temp CM246/QM370/HM370

Model Name		**TGH960**	**CH960**	**CH961**
Compliance		COM Express® R3.0 Basic Type 6	COM Express® R2.1 Basic Type 6	COM Express® R2.1 Basic Type 6
System	Processor	11th Gen Intel® Core™	9th/8th Gen Intel® Core™	9th/8th Gen Intel® Core™
	Socket	BGA 1787	BGA 1440	BGA 1440
	Max. Speed	3.1~4.7GHz	2.5~4.4GHz	2.5~4.5GHz
	TDP	25W/35W/45W	45W	45W
	Cache	8M/12M/24M	2M/4M/6M/8M/9M/12M	2M/4M/6M/8M/9M/12M
	Chipset	Intel® RM590E/QM580E/HM570E	Intel® CM246/QM370/HM370	Intel® CM246/QM370/HM370
	BIOS	AMI SPI 256Mbit	AMI SPI 128Mbit	AMI SPI 128Mbit
Memory	Technology	Dual Channel DDR4 3200MHz, ECC support (Opt.)	Dual Channel DDR4 2666MHz	Dual Channel DDR4 2666MHz, ECC support in CM246
	Max. Capacity	96/128GB	64GB	96GB
	Socket	3/4 SODIMM	2 SODIMM	4 SODIMM
Graphics	Interface	1 VGA, 1 LVDS/eDP, 3 DDI	1 VGA/DDI, 1 LVDS/eDP, 2 DDI	1 VGA/DDI, 1 LVDS/eDP, 2 DDI
Expansion	PCIe	1 PCIe x16, 8 PCIe x1	1 PCIe x16, 8 PCIe x1	1 PCIe x16, 8 PCIe x1
	LPC	1	1	1
	I^2C	1	1	1
	SMBus	1	1	1
	CAN Bus	-	-	-
Audio	Interface	HD Audio	HD Audio	HD Audio
Ethernet	Controller	1 Intel® I225LM	1 Intel® I219LM	1 Intel® I219LM/V
I/O	USB	4 USB 3.2 Gen2, 8 USB 2.0	4 USB 3.2, 8 USB 2.0	4 USB 3.2, 8 USB 2.0
	SATA	4 SATA 3.0 (RAID 0/1/5/10)	4 SATA 3.0 (RAID 0/1/5/10 in CM246 & QM370)	4 SATA 3.0 (RAID 0/1/5/10)
	SSD	NVMe SSD: PCIe x4, 64GB~1TB (Opt.)	-	NVMe SSD: PCIe x4, 64GB~1TB (Opt.)
	eMMC	-	-	-
	DIO	8-bit DIO (4 in, 4 out)	8-bit DIO (4 in, 4 out)	8-bit DIO (4 in, 4 out)
TPM		Optional	Optional in CM246 & QM370	Optional
iAMT		iAMT 12.0 (Core i7/i5 in RM590E & QM580E)	iAMT 12.0 (Core i7/i5 in CM246 & QM370)	iAMT 12.0 (Core i7/i5 in CM246 & QM370)
Power		8.5V~20V, 5VSB, VCC-RTC (ATX mode) 8.5V~20V, VCC-RTC (AT mode)	12V, 5VSB, VCC-RTC (ATX mode), 12V, VCC-RTC (AT mode)	8.5V~20V, 5VSB, VCC-RTC (ATX mode) 8.5V~20V, VCC-RTC (AT mode)
Operating Temperature		-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C

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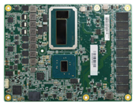
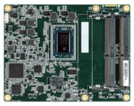


Wide Temp CM236/QM170



Wide Temp AMD

Model Name		**SH960MD**	**GH960**
Compliance		COM Express® R2.1 Basic, Type 6	COM Express® R3.0 Basic, Type 6
System	Processor	6th Gen Intel® Core™	AMD® Ryzen™ V1000/R1000 Embedded Processors
	Socket	BGA 1440	FP5 BGA
	Max. Speed	1.6~3.7GHz	3.2~3.8GHz
	TDP	25W/35W/45W	12-25W/35-54W
	Cache	2M/3M/6M/8M	1M/2M
	Chipset	Intel® CM236/QM170	-
	BIOS	Insyde SPI 128Mbit	Insyde SPI 64Mbit
Memory	Technology	Dual Channel DDR4 2400MHz, ECC support in CM236	Dual Channel DDR4 up to 2400/3200MHz
	Max. Capacity	8GB / 16GB	32GB
	Socket	Memory down	2 SODIMM
Graphics	Interface	1 VGA/DDI, 1 LVDS/eDP, 2 DDI	1 VGA/DDI, 1 LVDS/eDP, 2 DDI
Expansion	PCIe	1 PCIe x16 / 2 PCIe x8, 8 PCIe x1	1 PCIe x8, 6 PCIe x1 / 2 PCIe x2 / 1 PCIe x4
	LPC	1	1
	I^2C	1	1
	SMBus	1	1
	CAN Bus	-	-
Audio	Interface	HD Audio	HD Audio
Ethernet	Controller	1 Intel® I210IT	1 Intel® I210AT/IT
I/O	USB	4 USB 3.2, 8 USB 2.0	4 USB 3.2, 8 USB 2.0
	SATA	4 SATA 3.0 (RAID 0/1/5/10)	4 SATA 3.0 (RAID 0/1)
	SSD	-	-
	eMMC	-	-
	DIO	8-bit DIO	8-bit DIO (4 in, 4 out)
TPM		Optional	Optional
iAMT		iAMT 11.0	-
Power		12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)	12V, 5VSB, VCC-RTC (ATX mode), 12V, VCC-RTC (AT mode)
Operating Temperature		-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C

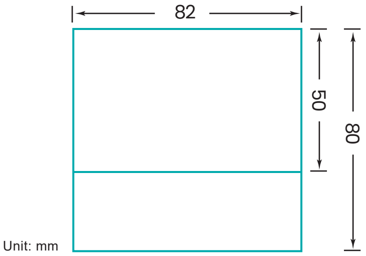
*Populated by default

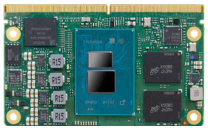
SMARC

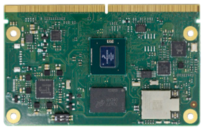
Smart Mobility ARChitecture

Features

SMARC ("Smart Mobility ARChitecture") is mainly designed for applications that require extremely energy-saving, constrained space, and high performance with a full-size module measuring 82 x 80 mm and short size measuring 82 x 50 mm. It's the ideal solution for digital signage, human-machine interface, automation, and portable devices.







Model Name		**ASL600**	**F8000**
Compliance		SMARC specifications V2.2	SMARC specifications V2.2
System	Processor	Intel® Atom® Processor Amston Lake Series	NXP i.MX 8M Plus Quad/Dual Cortex-A53
	Socket	BGA 1264	-
	Max. Speed	3.2~3.6GHz	Up to 1.8GHz
	TDP	6W/9W/12W	-
	Cache	6M	512 KB L2 cache
	Chipset	-	-
	BIOS	AMI SPI 256MHz	-
Memory	Technology	LPDDR5 4800MHz	LPDDR4 4000MHz
	Max. Capacity	16GB	8GB
	Socket	Memory down	Memory down
Graphics	Interface	1 LVDS/eDP, 1 HDMI/DDI, 1 DDI	1 single-channel LVDS, 1 HDMI
Expansion	PCIe	Up to 4 PCIex1	1 PCIe x1
	PCI	-	-
	LPC	-	-
	I^{2}C	2	5
	SMBus	1	-
	CAN Bus	2	2
Audio	Interface	HD Audio	2x I2S
Ethernet	Controller	2 Intel® I226	2 GbE
I/O	USB	2 USB 3.2, 4 USB 2.0	1 USB OTG, 2 USB 3.0, 2/4 USB 2.0 (Opt.)
	SATA	1 SATA 3.0	-
	eMMC	1 eMMC 5.1 up to 128GB (Opt.)	1 eMMC 5.1 up to 128GB (Opt.)
	DIO	14-pin GPIO	14-bit GPIO
TPM		TPM 2.0	TPM 2.0 (Opt.)
Power		5V DC-in	5V DC-in
Operating Temperature		-40°C~85°C	-40°C~85°C

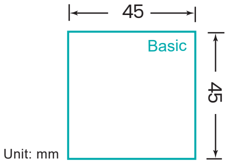
*Populated by default

OSM

Open Standard Module

Features

The Open Standard Module is a solderable system-on-module, optimized for rugged applications requiring vibration resistance and a compact form factor. Its modular design enhances cost efficiency, minimizes footprint, and allows for future interface expansion.The Open Standard Module is a solderable system-on-module, optimized for rugged applications requiring vibration resistance and a compact form factor. Its modular design enhances cost efficiency, minimizes footprint, and allows for future interface expansion.



Qualcomm

Model Name		**QRB812**
Compliance		OSM 1.1
System	Processor	Qualcomm® QRB5165 Processor
	Socket	MPSP1099
	Max. Speed	1.80~2.84GHz
	TDP	8W
	Cache	128KB/256KB/512KB
	Chipset	-
	BIOS	-
Memory	Technology	LPDDR5
	Max. Capacity	8GB
	Socket	Memory down
Graphics	Interface	1 4-lane MIPI-DSI, 1 USB-C DP
Storage	UFS	128GB UFS 3.1
Expansion	PCIe	2 PCIe x2, 1 PCIe x1
	I2C	1
	SPI	2 SPI
	PWM	4 PWM
	UART	2 UART(TX/RX/RTS/CTS), 2 UART(TX/RX), 1 UART(console)
	SDIO	1 4-bit SDIO
	MIPI-CSI	6 4-lane MIPI-CSI
	USB	2 USB 3.2 Gen 2
	GPIO	16 GPIO
Security	TEE	Qualcomm® Trusted Execution Environment v5
Power		5V DC-in
Operating Temperature		-5°C~65°C

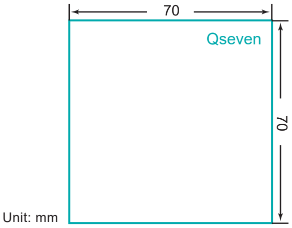
*Populated by default

Qseven

Extremely Small & Mobile Solutions

Features

Qseven is equipped with fast serial interfaces in an ultra-small form factor with a measurement of just 70 x 70 mm. It is much smaller than other system-on-module standards such as COM Express, which makes it an ideal solution for space-limited and low power applications such as industrial automation, retail, and power & energy.




Wide Temp Atom


Wide Temp Atom


Wide Temp Atom

Model Name		**EHL701**	**EHL700**	**AL701**
Compliance		Qseven R2.1	Qseven R2.1	Qseven R2.1
System	Processor	Intel Atom® x6000	Intel Atom® x6000	Intel® Atom® E3900
	Socket	BGA 1493	BGA 1493	BGA 1296
	Max. Speed	1.2~3.0GHz	1.2~3.0GHz	1.8~2.5GHz
	TDP	6W/6.5W/9W/10W/12W	6W/6.5W/9W/10W/12W	6W/6.5W/9.5W/12W
	Cache	1M~2M	1M~2M	2M
	BIOS	AMI SPI 256Mbit (supports UEFI boot only)	AMI SPI 256Mbit (supports UEFI boot only)	AMI SPI 128Mbit (supports UEFI boot only)
Memory	Technology	Dual Channel LPDDR4 3200MHz	Dual Channel LPDDR4 3200MHz	Dual Channel LPDDR4 3200MHz
	Max. Capacity	4GB / 8GB / 16GB	4GB / 8GB	4GB/8GB
	Socket	Memory down	Memory down	Memory down
Graphics	Interface	1 LVDS/eDP, 1 DDI	1 eDP, 1 DDI	1 LVDS/eDP, 1/2 DDI
Expansion	PCIe	4 PCIe x1	4 PCIe x1	4 PCIe x1
	LPC	1	1	1
	I^2C	1	1	1
	SMBus	1	1	1
	CAN Bus	-	-	1 (Opt.)
Audio	Interface	HD Audio	HD Audio	HD Audio
Ethernet	Controller	1 Intel® I211	1 Intel® I211/I210	1 Intel® I211AT / 1 Intel® I210IT
I/O	USB	1 USB 3.2 + 8 USB 2.0 / 2 USB 3.2 + 6 USB 2.0	1 USB 3.2 + 8 USB 2.0 / 2 USB 3.2 + 6 USB 2.0	1 USB 3.2 + 8 USB 2.0 / 3 USB 3.2 + 4 USB 2.0 (Opt.)
	SATA	2 SATA 3.0	2 SATA 3.0	2 SATA 3.0
	eMMC	1 eMMC 5.1 up to 128GB (Opt.)	1 eMMC 5.1 up to 128GB (Opt.)	1 eMMC 5.0 up to 32GB (Opt.)
	DIO	4-bit GPIO	4-bit GPIO	4-bit GPIO
	SD	-	-	-
TPM		dTPM or fTPM (Opt.)	fTPM	fTPM
Power		5V, 5VSB, VCC-RTC	5V, 5VSB, VCC-RTC	5V, 5VSB, VCC_RTC
Operating Temperature		-40°C~85°C, 0°C~60°C, -5°C~65°C (Opt.)	-40°C~85°C, 0°C~60°C, -5°C~65°C (Opt.)	-40°C~85°C, 0°C~60°C

*Populated by default

Wide Temp

Atom

Model Name		AL700
Compliance		Qseven R2.1
System	Processor	Intel® Atom® E3900
	Socket	BGA 1296
	Max. Speed	1.8~2.5GHz
	TDP	6W/6.5W/9.5W/12W
	Cache	2M
	BIOS	AMI SPI 128Mbit (supports UEFI boot only)
Memory	Technology	Dual Channel DDR3L 1600MHz
	Max. Capacity	4GB/8GB
	Socket	Memory down
Graphics	Interface	1 LVDS/eDP, 1/2 DDI
Expansion	PCIe	4 PCIe x1
	LPC	1
	I^{2}C	1
	SMBus	1
	CAN Bus	-
Audio	Interface	HD Audio
Ethernet	Controller	1 Intel® I211AT / 1 Intel® I210IT
I/O	USB	1 USB 3.2 + 8 USB 2.0 / 3 USB 3.2 + 4 USB 2.0 (Opt.)
	SATA	2 SATA 3.0
	eMMC	1 eMMC 5.0 up to 32GB (Opt.)
	DIO	4-bit GPIO
	SD	-
TPM		fTPM
Power		5V, 5VSB, VCC_RTC
Operating Temperature		-40°C~85°C, 0°C~60°C

*Populated by default

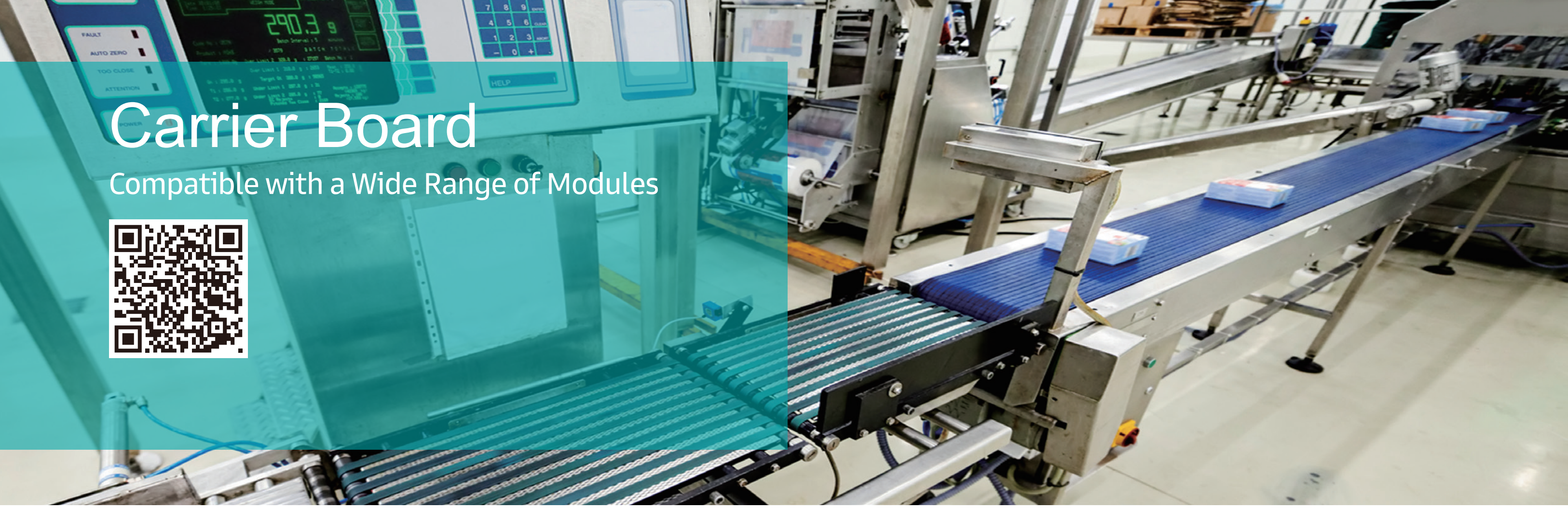
Wide Temp

ARM

ARM

Model Name		RK701	FS700
Compliance		Qseven R2.1	Qseven R1.2
System	Processor	Rockchip RK3568 / RK3568J Cortex A55	Freescale™ i.MX6 Series
	Socket	FCBGA	FCPBGA
	Max. Speed	1.8~2GHz	1.0GHz
	TDP	5W	-
	Cache	32KB	32KB
	BIOS	-	-
Memory	Technology	DDR4 3200MHz	Single Channel DDR3 1000/1200MHz
	Max. Capacity	2GB / 4GB / 8GB	1GB/2GB
	Socket	Memory Down	Memory down
Graphics	Interface	1 eDP/LVDS, 1 DP/TMDS	1 HDMI, 2 LVDS
Expansion	PCIe	2 PCIe x1, 1 PCIe x1	1 PCIe x1
	LPC	-	-
	I^{2}C	1	2
	SMBus	-	1
	CAN Bus	1	1
Audio	Interface	HD Audio	I2S
Ethernet	Controller	1 RTL8211F-CG	1 Atheros AR8033
I/O	USB	1 USB 3.2, 4 USB 2.0	4 USB 2.0, 1 USB OTG
	SATA	2 SATA 3.0	1 SATA 2.0
	eMMC	1 eMMC 5.1 up to 128GB (Opt.)	1 eMMC up to 16GB
	DIO	4-bit GPIO	1 SDIO
	SD	-	1 microSD onboard
TPM		TPM 2.0	-
Power		5V, 5VSB, VCC-RTC	5V
Operating Temperature		-40°C~85°C, 0°C~60°C	-20°C~70°C

*Populated by default

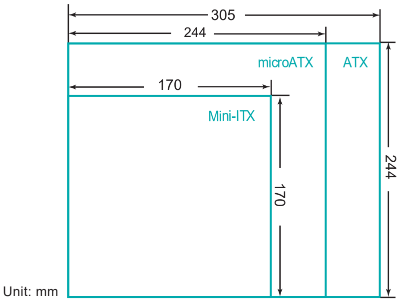


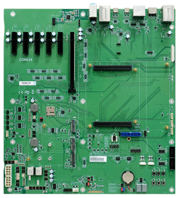
Carrier Board

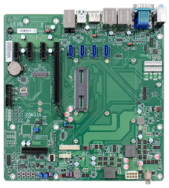
Compatible with a Wide Range of Modules

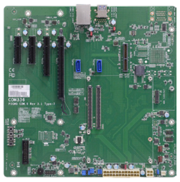
Features

Our carrier board (also known as base board or evaluation board) offers a flexible engineering development environment for COM Express Type 10, Type 7, Type 6, Type 2, Qseven and SMARC to help our customers minimize installation requirements while reducing design time and cost.



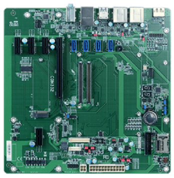


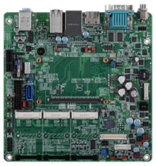




Model Name		**COM836**	**COM335**	**COM335-C**	**COM336**
Compliance		COM HPC® R2.0, Client size A, B, C	COM Express® R3.1, Type 6, Type 10	COM Express® R3.1, Type 6, Type 10	COM Express® R3.1, Type 7
Form Factor		Extend ATX (325 x 340mm)	microATX (244 x 244 mm)	microATX (244 x 244 mm)	microATX (244 x 244 mm)
Graphics	Connector	2 DP++, 1 eDP, 1 HDMI	1 VGA, 3 DP, 1 LVDS/eDP, 1 eDP/LVDS	1 VGA, 1 DP++, 1 LVDS, 1 eDP, 2 USB4	1 VGA from BMC
Expansion	PCIe, PCI	1 PCIe x16, 5 PCIe x4	1 PCIe x16, 1 PCIe x4, 3 PCIe x1	1 PCIe x16, 1 PCIe x4, 3 PCIe x1	1 PCIe x8, 2 PCIe x4, 1 PCIe x16
	Mini PCIe, M.2	1 M.2 B Key 3052, 1 M.2 E Key 2242, 1 M.2 M key 2242/2260/2280	1 M.2 B Key 3042/3052	1 M.2 B Key 3042/3052	-
	SIM	1	1	1	-
Audio	Audio Codec	Realtek ALC888	Realtek ALC888S-VD2-GR	Realtek ALC888S-VD2-GR	-
Rear I/O	Ethernet	2 2.5GbE	1 GbE	1 GbE	1 CEI 10GbE LAN Mini MEZZ, 2 1GbE LAN (RJ-45)
	Serial	-	-	-	-
	USB	2 USB 3.2, 2 USB 3.2 type-C	3 USB 3.2, 4 USB 2.0	2 USB4, 3 USB 3.2, 4 USB 2.0	4 USB 3.2
	Display	-	3 DP	1 DP++	-
	Audio	Mic-in, Line-in, Line-out	Mic-in, Line-in,Line-out	Mic-in, Line-in,Line-out	-
Internal I/O	Serial	2 (TX/RX/CTS/RTS)	1 (TX/RX)	1 (TX/RX)	1 (TX/RX)
	USB	-	-	-	-
	Display	1 eDP	1 VGA, 1 LVDS, 1 LCD/Inverter Power, 1 eDP	1 VGA, 1 LVDS, 1 eDP, 1 LCD/Inverter Power	1 VGA from BMC
	Audio	1 Audio (Line-out/Line-in/Mic-in), 1 S/PDIF	1 Audio (Line-out/Mic-in), 1 S/PDIF	1 Audio (Line-out/Mic-in), 1 S/PDIF	-
	SATA	2 SATA 3.0	4 SATA 3.0	4 SATA 3.0	2 SATA 3.0
	DIO	8-bit GPIO, 4-bit GPIO	8-bit DIO	8-bit DIO	8-bit DIO
	LPC	-	1	1	1
	SMBus	1	1	1	1
	I^2C	-	1	1	1
	CANBus	-	-	-	1 (Opt.)
Power		8-20V, 5VSB, VCC-RTC (ATX mode) 8-20V, VCC-RTC (AT mode)	1 DC jack 8.5V~20V 12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)	1 DC jack 8.5V~20V 12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)	12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)
Operating Temperature		0°C~60°C	0°C~60°C	0°C~60°C	-20°C~70°C

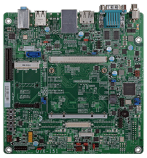
*Populated by default

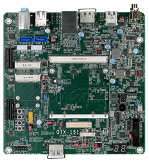


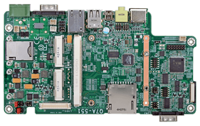


Model Name		**COM333-I**	**COM332-B(R.B1)**	**SMX331**	**COM100-B**
Compliance		COM Express® R3.0, Type 7	COM Express® R2.1, Type 6	SMARC (ASL600)	COM Express® R2.1, Type 10
Form Factor		microATX (244 x 244 mm)	microATX (244 x 244 mm)	microATX (244 x 244 mm)	Mini-ITX (170 x 170 mm)
Graphics	Connector	1 VGA via BMC	1 VGA, 3 DP, 1 LVDS/eDP, 1 eDP/LVDS	1 LVDS/eDP, 1 DP, 1DP++	1 LVDS, 1 DP
Expansion	PCIe, PCI	8 PCIe x4 / 4 PCIe x8	1 PCIe x16, 4 PCIe x1	1 PCIex1, 1 PCIex4	1 PCIe x1
	Mini PCIe, M.2	-	1 M.2 M Key 2280	1 M.2 B Key 2242/3052, 1 M.2 E Key 2230	3 Mini PCIe
	SIM	-	-	1	1
Audio	Audio Codec	-	Realtek ALC888S-VD2-GR	Realtek ALC888S	Realtek ALC886
Rear I/O	Ethernet	2 GbE, 4 10Gbase-KR (2 RJ45, 2 SFP+)	1 GbE	2 2.5GbE	1 GbE
	Serial	1 RS-232	-	2 RS232/422/485	2 (TX/RX)
	USB	4 USB 3.2/2.0	4 USB 3.2, 4 USB 2.0	2 USB 3.2, 2 USB 2.0	2 USB 3.2, 4 USB 2.0
	Display	-	3 DP	1 DP, 1 DP++	1 DP
	Audio	-	Mic-in, Line-in, Line-out	Mic-in, Line-in, Lone-out	Mic-in, Line-in, Line-out
Internal I/O	Serial	2 (TX/RX)	2 (TX/RX)	2 (TR/RX)	1 (TX/RX)
	USB	-	-	-	-
	Display	-	1 VGA, 1 LVDS, 1 LCD/Inverter Power, 1 eDP	1 LVDS	1 LVDS, 1 LCD/Inverter Power
	Audio	-	Audio (Line-out/Mic-in), S/PDIF	Audio (Line-out/Mic-in), S/PDIF	Audio (Line-out/Mic-in), S/PDIF
	SATA	2 SATA 3.0	4 SATA 3.0	1 SATA 3.0	1 SATA 3.0
	DIO	8-bit DIO, SDIO	8-bit DIO	14-bit DIO	8-bit DIO
	LPC	1	1	-	1
	SMBus	1	1	1	1
	I^{2}C	1	-	1	1
	CANBus	-	-	2	-
Power		4-pin ATX 12V, 24-pin ATX	12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)	9-36VDC in	12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)
Operating Temperature		0°C~60°C	0°C~60°C	0°C~60°C	0°C~60°C

*Populated by default







Model Name		**Q7X-151(R.A)**	**Q7X-151(R.D1)**	**Q7A-551**
Compliance		Qseven (BT700)	Qseven (AL700 / AL701 / BT701)	Qseven (FS700)
Form Factor		Mini-ITX (170 x 170 mm)	Mini-ITX (170 x 170 mm)	Proprietary (190 x 102 mm)
Graphics	Connector	1 LVDS, 1 DP	1 LVDS, 2 DP, 1 eDP	1 HDMI, 1 LVDS
Expansion	PCIe, PCI	1 PCIe x4	2 PCIe x1	-
	Mini PCIe, M.2	-	2 Mini PCIe	1 Mini PCIe
	SIM	-	-	1
Audio	Audio Codec	Realtek ALC886	Realtek ALC886	I2S
Rear I/O	Ethernet	1 GbE	1 GbE	1 GbE
	Serial	2 RS-232	2 RS-232	2 RS-232
	USB	1 USB 3.2, 2 USB 2.0	3 USB 3.2, 6 USB 2.0	2 USB 2.0, 1 USB Client
	Display	1 DP	1 DP	1 HDMI
	Audio	Mic-in, Line-in, Line-out	Mic-in, Line-in, Line-out	Mic-in, Line-out
Internal I/O	Serial	1 (TX/RX)	1 (TX/RX)	1 MXM Connector, 1 RS232/422/485, 1 FlexCAN
	USB	2 USB 2.0 (Opt.)	2 USB 2.0 (Opt.)	-
	Display	1 LVDS, 1 LCD/Inverter Power	1 LVDS,1 LCD/Inverter Power	1 LVDS
	Audio	-	-	2 1W audio amplifier connectors (left and right sides)
	SATA	1 SATA 3.0, 1 mSATA	2 SATA 3.0	-
	DIO	-	-	12-bit DIO
	LPC	1	1	-
	SMBus	1	1	-
	I^{2}C	1	1	-
	CANBus	1	1	1
Power		12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)	12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)	12V, 5VSB, VCC-RTC (ATX mode) 12V, VCC-RTC (AT mode)
Operating Temperature		0°C~60°C	0°C~60°C	0°C~60°C

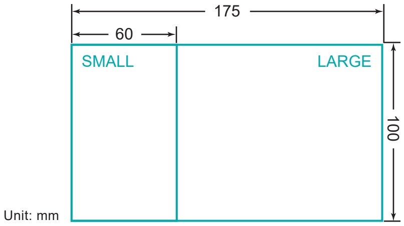
*Populated by default

SDM

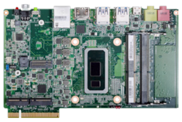
Compact & Smart Retail Signage Solutions

Features

Intel® Smart Display Module is for next generation commercial AIO displays and visual IoT devices. Intel® SDM provides the primary compute building block and requires an interface board on the displays or host system to complete platform implementation and provide standard end user physical interfaces.



Large Size: 175mm x 100mm
Small Size: 60mm x 100mm



Model Name		SDML-WL
Compliance		SDM Large
System	Processor	8th Gen Intel® Core™
	Socket	FCBGA 1528
	Max. Speed	2.0~4.4GHz
	TDP	15W
	Cache	2M/4M/6M/8M
	Chipset	-
	BIOS	AMI Winbond SPI 128Mbit
Memory	Technology	Dual Channel DDR4 2400MHz
	Max. Capacity	32GB
	Socket	2 SODIMM
Graphics	Interface	1 DP, 2 HDMI
Expansion	M.2	1 2230 E Key (PCIe x1 interface), 1 2242 B Key (PCIe x1 interface), 1 2280 M Key
Audio	Interface	Realtek ALC262
Ethernet	Controller	1 Intel® I219LM/V
Rear I/O	USB	4 USB 3.2, 1 USB 3.2 Type-C
	Ethernet	1 GbE
	Display	1 HDMI
	Audio	1 Line-out, 1 Mic-in
SDM Golden Finger	Serial	1 UART
	USB	1 USB 3.2, 1 USB 2.0
	Display	1 DP, 1 HDMI
	I^2C	2
TPM		-
iAMT		iAMT 12.0 (Core i7/i5)
Power		12V DC-in
Operating Temperature		0°C~60°C

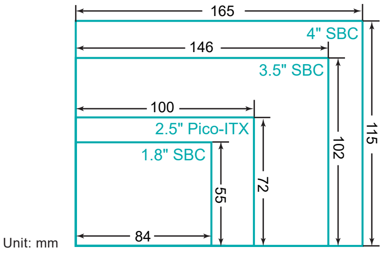
*Populated by default

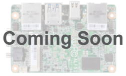
Embedded SBCs

Ultra-Small & Low-Power Solutions

Features

Our single board computers (SBC) support low power consumption and fanless design with rich I/O connectivity in a small size. In addition, we provide a wide range of form factors covering from: 1.8" SBC (84mm x 55mm), 2.5" Pico-ITX (100 x 72 mm), 3.5" SBC (146 x 102 mm), to 4" SBC (165 x 115 mm) in order to target space-limited embedded applications like POS, KIOSK, digital signage, and surveillance.

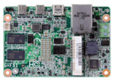




1.8" Atom


1.8" Atom


1.8" AMD


1.8" AMD

Model Name		**TWLF51**	**ALF51**	**PCSF51**	**GHF51**
Platform		Atom	Atom	AMD R-Series	AMD R-Series
System	Processor	Intel® Atom® Amston/Twin lake	Intel Atom® E3900	AMD Ryzen™ Embedded R2000 Series - Picasso	AMD® Ryzen™ Embedded R1000 Series
	Socket	BGA 1264	BGA 1296	FP5	FP5
	Max. Speed	3.2~3.9GHz	1.8~2.5GHz	2.1~2.7GHz	1.2~2.6GHz
	TDP	up to 15W	6/6.5/9.5W	12W	up to 12W
	Cache	6M	2MB	1/2MB	2MB
	Chipset	-	Memory Down	Memory Down	Memory Down
	BIOS	AMI SPI 256Mbit	Insyde SPI 128Mbit (supports UEFI boot only)	AMI SPI 128Mbit	AMI SPI 64Mbit
Memory	Technology	Single Channel LPDDR5 4800MHz	Single Channel LPDDR4 2400MHz	Single Channel DDR4 2400/2667 MHz	Single Channel DDR4 2400MHz
	Max. Capacity	8GB	8GB	8GB	8GB
	Socket	-	-	-	-
Graphics	Connector	1 Micro HDMI	1 Mini DP++	1 HDMI	2 Micro HDMI
Expansion	PCIe, PCI	-	-	-	-
	Mini PCIe / M.2	1 M.2 E key	1 Full-size Mini PCIe	1 M.2 E key	1 Full-size Mini PCIe
	SIM	-	-	-	-
Audio	Audio Codec	-	-	-	-
Ethernet	Controller	1 Intel® I210AT / I210IT	2 Intel® I210AT / I210IT	1 Intel® I210AT	1 Intel® I211AT / I210IT
Rear I/O	Ethernet	1 GbE	2 GbE	1 GbE	1 GbE
	Serial	-	-	-	-
	USB	2 USB 3.2 Gen2	2 USB 3.2 Gen1	2 USB 3.2 Gen2 (Type A)	1 USB 3.2 Gen2 (Type C)
	Display	1 Micro HDMI	1 Mini DP++	1 HDMI	2 Micro HDMI
	Audio	-	-	-	-
	PS/2	-	-	-	-
Internal I/O	Serial	1 RS-232/422/485	1 RS-232/422/485	-	-
	USB	2 USB 2.0	1 USB 2.0	-	-
	Display	-	-	-	-
	Audio	-	-	-	-
	Storage	1 eMMC up to 128GB	1 eMMC up to 64GB	1 eMMC up to 128GB	1 eMMC up to 64GB
	DIO	8-bit DIO	8-bit DIO	8-bit DIO	8-bit DIO
	CANBus	-	-	-	-
	SMBus/I^2C	1 I^2C/SMBus (Opt.)	1 SMBus	-	1 SMBus
TPM / iAMT		dTPM2.0	fTPM 2.0	fTPM 2.0	fTPM 2.0
Power		12V DC-in	12V DC	12 VDC	12 VDC
Operating Temperature		-5°C ~ 65°C / -20°C ~ 70°C	0°C ~ 60°C / -20°C ~ 70°C / -40°C ~ 85°C	0°C ~ 60°C / -20°C ~ 70°C	0°C ~ 60°C / -20°C ~ 70°C

2.5"

ULT

2.5"

ULT

2.5"

ULT

Model Name		**RPP051**	**WL051**	**WL053**
Platform		ULT	ULT	ULT
System	Processor	13th Gen Intel® Core™	8th Gen Intel® Core™	8th Gen Intel® Core™
	Socket	BGA 1744	BGA 1528	BGA 1528
	Max. Speed	4.3~4.9GHz	2.0~4.4GHz	2.0~4.4GHz
	TDP	15W	15W	15W
	Cache	8M~12M	2M~8M	2M~8M
	Chipset	-	-	-
	BIOS	AMI SPI 256Mbit	AMI SPI 128Mbit	AMI SPI 128Mbit
Memory	Technology	Single Channel DDR5 up to 4800MHz	Single Channel DDR4 up to 2400MHz	Single Channel DDR4 up to 2400MHz
	Max. Capacity	32GB	32GB	32GB
	Socket	1 SODIMM	1 SODIMM	1 SODIMM
Graphics	Connector	1 DP++, 1 eDP	1 DP++, 1 eDP	1 DP++
Expansion	PCIe, PCI	-	-	-
	Mini PCIe / M.2	1 M.2 E key 2230, 2 M.2 B key 3042/2242	1 M.2 E key 2230, 2 M.2 B key 3042/2242	1 M.2 E key 2230, 2 M.2 B key 3042/2242
	SIM	1 Nano SIM	-	-
Audio	Audio Codec	ALC888S	ALC888S	-
Ethernet	Controller	1 Intel® I226IT	1 Intel® I219V/LM, 1 Intel® I211AT/I210IT	1 Intel® I219V/LM
Rear I/O	Ethernet	1x 2.5GbE	2 GbE	1 GbE
	Serial	-	-	-
	USB	2 USB 3.2 Gen2	2 USB 3.2 Gen2	2 USB 3.2 Gen2
	Display	1 DP++	1 DP++	1 DP++
	Audio	-	-	-
	PS/2	-	-	-
Internal I/O	Serial	1 RS-232/422/485	1 RS-232/422/485	1 RS-232/422/485
	USB	2 USB 2.0	2 USB 2.0	2 USB 2.0
	Display	1 eDP	1 eDP	-
	Audio	1 Audio (Line-out, Mic-in)	1 Audio (Line-out, Mic-in)	-
	Storage	-	-	-
	DIO	8-bit DIO	8-bit DIO	8-bit DIO
	CANBus	-	-	-
	SMBus/I^{2}C	1 SMBus	1 SMBus	1 SMBus/I^{2}C (Opt.)
	Camera	-	-	-
TPM / iAMT		fTPM 2.0, iAMT (Core i7/i5 only)	fTPM 2.0, iAMT (Core i7/i5 only)	fTPM 2.0, iAMT (Core i7/i5 only)
Power		12V DC-in	12V DC-in	9-36V DC-in
Operating Temperature		-5°C ~ 65°C / -30°C ~ 80°C / -40°C ~ 85°C	-5°C ~ 65°C / -30°C ~ 80°C	-5°C ~ 65°C / -30°C ~ 80°C

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Atom

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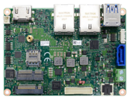
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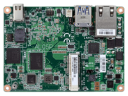
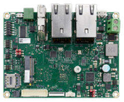

Atom

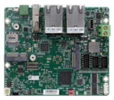
Model Name		**ASL051**	**EHL051**	**AL05P**
Platform		Atom	Atom	Atom
System	Processor	Intel® Atom® Amston/Twin lake	Intel Atom® Elkhart Lake	Intel Atom® E3900
	Socket	BGA 1264	BGA 1493	BGA 1296
	Max. Speed	3.2~3.9GHz	2.6~3.0GHz	1.8~2.5GHz
	TDP	up to 15W	6~12W	6~9.5W
	Cache	6M	2M/4M	2M
	Chipset	-	-	-
	BIOS	AMI SPI 256Mbit	AMI SPI 256Mbit	Insyde SPI 128Mbit (supports UEFI boot only)
Memory	Technology	Single Channel DDR5 4800MHz	Single Channel DDR4 up to 3200MHz	Single Channel LPDDR4 2400MHz
	Max. Capacity	16GB	32GB	4GB
	Socket	1 SODIMM	1 SODIMM	-
Graphics	Connector	1 HDMI, 1 LVDS/eDP (Opt.)	1 HDMI, 1 LVDS	1 Mini DP++
Expansion	PCIe, PCI	-	-	-
	Mini PCIe / M.2	1 M.2 E Key 2230, 1 M.2 B Key 3042/2242, 1 M.2 B key 2242	1 M.2 E Key 2230, 1 M.2 B Key 3042/2242	1 Full-size Mini PCIe
	SIM	1 Nano SIM	1 Nano SIM	-
Audio	Audio Codec	CMEDIA CM9825	ALC888S	-
Ethernet	Controller	2 Intel® I226V/IT	2 Intel® I226V/IT	1 Intel® I211AT, 1 Intel® I210IT
Rear I/O	Ethernet	2x 2.5GbE	2 GbE	1 GbE
	Serial	-	-	-
	USB	2 USB 3.2 Gen2	2 USB 3.2 Gen 2	2 USB 3.2 Gen 1
	Display	1 HDMI	1 HDMI	1 Mini DP++
	Audio	-	-	-
	PS/2	-	-	-
Internal I/O	Serial	2 RS-232/422/485	2 RS-232/422/485	1 RS-232/422/485
	USB	2 USB 2.0	2 USB 2.0	2 USB 2.0
	Display	1 LVDS/eDP (Opt.)	1 LVDS, 1 LCD Power	-
	Audio	1 Audio (Line-out/Mic-in)	1 Audio (Line-out/Mic-in)	-
	Storage	-	1 SATA 3.0, 1 5V SATA Power	1 eMMC up to 64GB
	DIO	8-bit DIO	8-bit DIO	8-bit DIO
	CANBus	-	-	-
	SMBus/I^{2}C	1 SMBus/I^{2}C (Opt.)	1 SMBus/I^{2}C (Opt.)	1 SMBus
	Camera	-	-	-
TPM / iAMT		dTPM2.0	dTPM2.0	fTPM 2.0
Power		12V DC-in	12V DC-in	48V DC PoE
Operating Temperature		-5°C ~ 65°C / -40°C ~ 85°C	-5°C ~ 65°C / -40°C ~ 85°C	0°C ~ 60°C / -20°C ~ 70°C

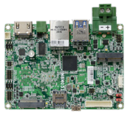
2.5"  Atom

2.5"  Atom

2.5"  NXP

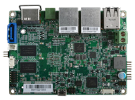
Model Name		**AL051**	**AL053**	**M93053**
Platform		Atom	Atom	NXP
System	Processor	Intel Atom® E3900	Intel Atom® E3900	NXP i.MX 93 Dual Cortex-A55
	Socket	BGA 1296	BGA 1296	-
	Max. Speed	1.8~2.5GHz	1.8~2.5GHz	Up to 1.7GHz
	TDP	6~12W	6~12W	-
	Cache	2M	2M	-
	Chipset	-	-	-
	BIOS	Insyde SPI 64Mbit (supports UEFI boot only)	Insyde SPI 128Mbit (supports UEFI boot only)	-
Memory	Technology	Single Channel DDR3L 1866MHz	Single Channel DDR3L 1866MHz	Single Channel LPDDR4
	Max. Capacity	8GB	8GB	2GB
	Socket	1 SODIMM	1 SODIMM	Memory Down
Graphics	Connector	1 Mini DP++, 1 VGA	1 Mini DP++, 1 LVDS	1 HDMI or 1 LVDS
Expansion	PCIe, PCI	-	-	-
	Mini PCIe / M.2	1 Full-size Mini PCIe, 1 M.2 B key 2242	1 Full-size Mini PCIe, 1 M.2 B key 2242	1 M.2 B Key 3042
	SIM	-	-	1 Nano SIM
Audio	Audio Codec	ALC888S	ALC888S	-
Ethernet	Controller	2 Intel® I210AT, 2 Intel® I210IT(Opt.)	1 Intel® I210AT, 1 Intel® I210IT(Opt.)	RTL8211
Rear I/O	Ethernet	2 GbE	1 GbE	2 GbE
	Serial	-	-	1 RS485
	USB	2 USB 3.2 Gen1	2 USB 3.2 Gen1	2 USB 2.0, 1 Micro USB 2.0 (OTG)
	Display	1 Mini DP++, 1 VGA	1 Mini DP++	1 HDMI
	Audio	-	-	-
	PS/2	-	-	-
Internal I/O	Serial	1 RS-232/422/485	1 RS-232/422/485	1 RS-232/422/485, 1 RS-232
	USB	2 USB 2.0	2 USB 2.0	2 USB 2.0
	Display	1 LVDS, 1 LCD Power	1 LVDS, 1 LCD Power	1 LVDS, 1 LCD Power
	Audio	1 Audio (Line-out, Mic-in)	1 Audio (Line-out, Mic-in)	-
	Storage	1 SATA 3.0	-	1 eMMC up to 64GB, 1 uSD card
	DIO	8-bit DIO	8-bit DIO	8-bit DIO
	CANBus	-	-	1 CANBus 2.0b
	SMBus/I^{2}C	1 SMBus	1 SMBus	-
	Camera	-	-	1 MIPI-CSI (2-Lanes)
TPM / iAMT		fTPM 2.0	fTPM 2.0	-
Power		12V DC-in	9-36V DC-in	9-36V DC-in
Operating Temperature		0°C ~ 60°C / -20°C ~ 70°C / -40°C ~ 85°C	0°C ~ 60°C / -20°C ~ 70°C / -40°C ~ 85°C	-5°C ~ 65°C / -40°C ~ 85°C

2.5"  NXP

2.5"  NXP

Model Name		**M8M051**	**8MM053**
Platform		NXP	NXP
System	Processor	NXP i.MX 8M Quad / Dual Cortex-A53	NXP i.MX 8M Mini Quad Cortex-A53
	Socket	-	-
	Max. Speed	Up to 1.5GHz	1.6~1.8GHz
	TDP	-	-
	Cache	-	-
	Chipset	-	-
	BIOS	-	-
Memory	Technology	Single Channel LPDDR4 up to 3200 MHz	Single Channel LPDDR4
	Max. Capacity	2GB/4GB	4GB
	Socket	Memory Down	Memory Down
Graphics	Connector	1 HDMI or 1 LVDS	1 HDMI
Expansion	PCIe, PCI	-	-
	Mini PCIe / M.2	1 M.2 B key 3042/2242, 1 M.2 E key 2230	1 M.2 B key 3042/2242, 1 M.2 E key 2230
	SIM	1 Nano SIM	1 Nano SIM
Audio	Audio Codec	SGTL5000	-
Ethernet	Controller	1 ATHEROS AR8035	1 RTL8211
Rear I/O	Ethernet	1 GbE	2 GbE
	Serial	1 RS485	1 RS485
	USB	2 USB 3.2 Gen1, 1 Micro USB 2.0 (Download mode)	2 USB 2.0
	Display	1 HDMI	1 HDMI
	Audio	-	-
	PS/2	-	-
Internal I/O	Serial	1 RS-232/422/485, 1 RS232	2 RS232
	USB	2 USB 2.0	1 USB 2.0
	Display	1 LVDS, 1 Backlight Power	-
	Audio	1 Audio (Line-out / Mic-in)	-
	Storage	1 eMMC up to 64GB, 1 uSD card	1 eMMC up to 64GB
	DIO	8-bit DIO	4 DIO, 1 PWR, 1 GND
	CANBus	1 CANBus 2.0	-
	SMBus/I^{2}C	1 I^{2}C	-
	Camera		-
TPM / iAMT		-	-
Power		12V DC-in	9-36V DC-in
Operating Temperature		-5°C ~ 65°C / -30°C ~ 80°C	-5°C ~ 65°C / -40°C ~ 80°C

2.5"



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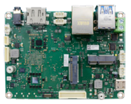
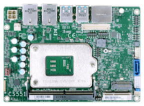


Qualcomm

Model Name		**FS053**	**QCS051**
Platform		NXP	Qualcomm
System	Processor	Freescale i.MX6 Series	Qualcomm QCS6490
	Socket	-	-
	Max. Speed	1.0GHz	2.7GHz
	TDP	-	-
	Cache	-	-
	Chipset	-	-
	BIOS	4MB NOR Flash	-
Memory	Technology	Single Channel DDR3L 1600/1866MHz	Single Channel LPDDR5
	Max. Capacity	1GB/2GB, 4GB (Opt.)	4GB/8GB
	Socket	SDRAM Memory down	SDRAM Memory down
Graphics	Connector	1 HDMI, 1 LVDS	1 HDMI
Expansion	PCIe, PCI	-	-
	Mini PCIe / M.2	1 Full-size Mini PCIe	1 M.2 B key 3052, 1 M.2 E key 2230
	SIM	-	1 Nano SIM
Audio	Audio Codec	-	WCD9385
Ethernet	Controller	1 ATHEROS AR8033, 1 LAN7500	1 LAN AX88179
Rear I/O	Ethernet	2 GbE	1 GbE
	Serial	1 RS-485	-
	USB	2 USB 2.0, 1 USB 2.0 OTG Port	2 USB 3.2 Gen1 Type A
	Display	1 HDMI	1 HDMI
	Audio	-	1 Audio Jack (Line out/Mic in)
	PS/2	-	-
Internal I/O	Serial	1 RS-232/422/485	1 RS-232
	USB	1 USB 2.0	3 USB 2.0, 1 USB Type C (Download only)
	Display	1 LVDS	-
	Audio	-	-
	Storage	1 SATA 2.0 (Quad processor only), 1 eMMC up to 32GB	1 UFS 3.1, default 128GB
	DIO	8-bit DIO	8-bit DIO
	CANBus	-	1 CAN FD
	SMBus/I²C	1 I²C	-
	Camera		2 MIPI-CSI2 (4-Lanes)
TPM / iAMT		-	-
Power		9~36V DC-in	5V DC-in
Operating Temperature		0°C ~ 60°C / -20°C ~ 70°C	0°C ~ 60°C / -25°C ~ 75°C

3.5"



C246/Q370/H310

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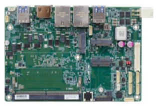

U/H

Model Name		**CS551**	**MTH556**
Platform		Desktop	U/H
System	Processor	9th/8th Gen Intel® Core™	Intel® Core™ Ultra Processor
	Socket	LGA 1151	BGA2049
	Max. Speed	2.9~4.0GHz	4.3~5.0GHz
	TDP	35W	up to 28W
	Cache	2M/4M/6M/9M/12M	12~24M
	Chipset	Intel® C246/Q370/H310	-
	BIOS	AMI SPI 128Mbit	AMI SPI 256Mbit
Memory	Technology	Single Channel DDR4 2666MHz (C246 with ECC Support)	DDR5 5600MHz
	Max. Capacity	32GB	96GB
	Socket	1 SODIMM	2 SODIMM
Graphics	Connector	2 DP++, 1 LVDS	1 HDMI, 1 LVDS/eDP, 1 USB-C DP Alt. mode
Expansion	PCIe, PCI	-	-
	Mini PCIe / M.2	1 Full size Mini PCIe, 1 M.2 M key 2280	1 M.2 M key 2280, 1 M.2 B key 3052, 1 M.2 E key 2230
	SIM	1 Nano SIM (Opt.)	1 Nano SIM
Audio	Audio Codec	ALC262	CM9825
Ethernet	Controller	2 Intel® I211AT/I210IT	2 Intel® I226V/LM
Rear I/O	Ethernet	2 GbE	2x 2.5GbE
	Serial	-	-
	USB	4 USB 3.2 Gen1/Gen2	3 USB 3.2, 1 USB Type C
	Display	2 DP++	1 HDMI, 1 USB-C DP Alt. Mode
	Audio	-	-
	PS/2	-	-
Internal I/O	Serial	1 RS-232/422/485	2 RS-232/422/485, 2 RS-232
	USB	2 USB 2.0	2 USB 2.0
	Display	1 LVDS	1 LVDS/eDP
	Audio	1 Audio (Line-out, Mic-in)	1 Audio (Line-out, Mic-in)
	Storage	1 SATA 3.0, 1 SATA Power	-
	DIO	8-bit DIO	8-bit DIO
	CANBus	-	-
	SMBus	1	-
TPM / iAMT		fTPM 2.0	dTPM 2.0.
Power		12V DC-in	9~36V DC-in
Operating Temperature		-5°C ~ 65°C / -30°C ~ 80°C	-5°C ~ 65°C / -20°C ~ 70°C

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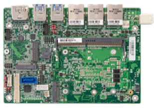

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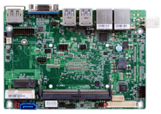

ULT

Model Name		**WL551**	**KU551**
Platform		ULT	ULT
System	Processor	8th Gen Intel® Core™	7th Gen Intel® Core™
	Socket	BGA1528	BGA 1356
	Max. Speed	2.0~4.4GHz	2.2~3.9GHz
	TDP	15W	15W
	Cache	2M~8M	2M/3M/4M
	Chipset	-	-
	BIOS	AMI SPI 128Mbit	Insyde SPI 128Mbit
Memory	Technology	Single Channel DDR4 up to 2400MHz	Single Channel DDR4 1866/2133MHz
	Max. Capacity	32GB	16GB
	Socket	1 SODIMM	1 SODIMM
Graphics	Connector	1 DP++, 1 LVDS/eDP (Opt.)	1 VGA/DDI, 1 LVDS/eDP, 1 DP++/DDI
Expansion	PCIe, PCI	-	-
	Mini PCIe / M.2	1 M.2 M key 2280/2242, 1 M.2 B key 3042/2242, 1 M.2 E key 2230	1 Full-size Mini PCIe, 1 M.2 B key 2242, 1 E I/O(Opt.)
	SIM	1 Nano SIM (Opt.)	-
Audio	Audio Codec	ALC888S	ALC888S
Ethernet	Controller	3 Intel® I211AT/I210IT	1 Intel® I210AT, 1 Intel® I219LM
Rear I/O	Ethernet	3 GbE	2 GbE
	Serial	-	-
	USB	4 USB 3.2 Gen2	4 USB 3.2
	Display	1 DP++	1 VGA, 1 DP++
	Audio	-	-
	PS/2	-	-
Internal I/O	Serial	1 RS-232/422/485	2 RS-232/422/485
	USB	2 USB 2.0	2 USB 2.0
	Display	1 LVDS, 1 LCD/Inverter Power or 1 eDP (Opt.)	1 LVDS, 1 LCD/Inverter Power
	Audio	1 Audio (Line-out, Mic-in)	1 Audio (Line-out, Mic-in)
	Storage	1 SATA 3.0, 1 SATA Power	1 SATA 3.0, 1 SATA Power
	DIO	8-bit DIO	8-bit DIO
	CANBus	-	-
	SMBus	1	1
TPM / iAMT		fTPM 2.0 (default) / dTPM 2.0. (Opt.)	fTPM 2.0, iAMT 11.6
Power		12V DC-in	12V DC-in
Operating Temperature		-5°C ~ 65°C / -20°C ~ 80°C	0°C ~ 60°C / -20°C ~ 70°C (Opt.)

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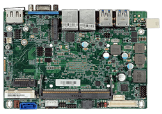

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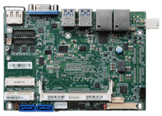
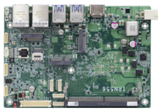
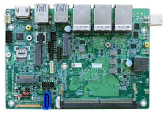


ULT

Model Name		**KU553**	**SU551**
Platform		ULT	ULT
System	Processor	7th Gen Intel® Core™	7th/6th Gen Intel® Core™
	Socket	BGA 1356	BGA 1356
	Max. Speed	2.2~3.9GHz	2.0~3.9GHz
	TDP	15W	15W
	Cache	2M/3M/4M	2M/3M/4M
	Chipset	-	-
	BIOS	Insyde SPI 128Mbit	Insyde SPI 128Mbit
Memory	Technology	Single Channel DDR4 1866/2133MHz	Single Channel DDR3L 1600MHz
	Max. Capacity	16GB	8GB
	Socket	1 SODIMM	1 SODIMM
Graphics	Connector	1 VGA, 1 LVDS/eDP, 1 DP++	1 VGA, 1 LVDS, 1 DP++
Expansion	PCIe, PCI	-	-
	Mini PCIe / M.2	1 Full-size Mini PCIe, 1 M.2 B key 2242, 1 M.2 E key 2230	1 Full-size Mini PCIe, 1 Half-size Mini PCIe
	SIM	1 SIM (Opt.)	1 SIM (Opt.)
Audio	Audio Codec	ALC888S	ALC888S
Ethernet	Controller	1 Intel® I210AT/I210IT, 1 Intel® I219LM/I219V	1 Intel® I210AT, 1 Intel® I219LM
Rear I/O	Ethernet	2 GbE	2 GbE
	Serial	-	-
	USB	4 USB 3.2	4 USB 3.2 Gen1
	Display	1 VGA, 1 DP++	1 VGA, 1 DP++
	Audio	-	-
	PS/2	-	-
Internal I/O	Serial	1 RS-232/422/485	2 RS-232/422/485, 2 RS-232
	USB	2 USB 2.0	2 USB 2.0
	Display	1 LVDS, 1 LCD/Inverter Power	1 LVDS, 1 LCD/Inverter Power
	Audio	1 Audio (Line-out, Mic-in)	1 Audio (Line-out, Mic-in)
	Storage	1 SATA 3.0, 1 SATA Power	2 SATA 3.0, 1 SATA Power
	DIO	8-bit DIO	8-bit DIO
	CANBus	-	-
	SMBus	1	1
TPM / iAMT		fTPM 2.0, iAMT 11.6	iAMT 11.0 (Core i7/i5 only)
Power		9~36V DC-in	12V DC-in
Operating Temperature		0°C ~ 60°C / -20°C ~ 70°C (Opt.)	0°C ~ 60°C / -20°C ~ 70°C (Opt.)

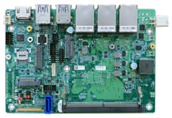


3.5" Atom

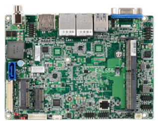


3.5" Atom

Model Name		IRN556	ASL553
Platform		Atom	Atom
System	Processor	Intel® Atom® Amston/Twin lake	Intel® Atom® Amston Lake
	Socket	BGA 1264	BGA 1264
	Max. Speed	3.2~3.9GHz	3.2~3.6GHz
	TDP	up to 15W	6W~12W
	Cache	6M	6M
	Chipset	-	-
	BIOS	AMI SPI 256Mbit	AMI SPI 256Mbit
Memory	Technology	Single Channel DDR5 4800MHz	Single Channel DDR5 4800MHz
	Max. Capacity	16GB	16GB
	Socket	1 SODIMM	1 SODIMM
Graphics	Connector	1 HDMI, 1 LVDS	1 HDMI, 1 Type-C DP Alt. Mode, 1 LVDS/eDP(Opt.)
Expansion	PCIe, PCI	-	-
	Mini PCIe / M.2	1 M.2 M key 2242, 1 M.2 B key 3052, 1 M.2 E key 2230	1 M.2 M key 2280/2242, 1 M.2 B key 3052/3042, 1 M.2 E key 2230
	SIM	1 Nano SIM	1 Nano SIM
Audio	Audio Codec	ALC888S	ALC888S
Ethernet	Controller	2 Intel® i210IT	3 Intel® I226IT
Rear I/O	Ethernet	2 GbE	3x 2.5GbE
	Serial	-	-
	USB	4 USB 3.2	4 USB 3.2
	Display	1 HDMI	1 HDMI, 1 Type-C DP Alt. Mode
	Audio	-	-
	PS/2	-	-
Internal I/O	Serial	2 RS-232/422/485, 2 RS-232	1 RS-232/422/485
	USB	2 USB 2.0	2 USB 2.0
	Display	1 LVDS	1 LVDS, 1 LCD/Inverter Power or eDP (Opt.)
	Audio	1 Audio (Line-out/Mic-in), 1 Speaker out	1 Audio (Line-out/Mic-in)
	Storage	-	1 SATA 3.0, 1 SATA Power
	DIO	8-bit DIO	8-bit DIO
	CANBus	-	-
	SMBus	I2C/SMBus (Opt.)	-
TPM / iAMT		dTPM 2.0	dTPM 2.0.
Power		9~36V DC-in	9~36V DC-in
Operating Temperature		-5°C ~ 65°C / -40°C ~ 85°C	-40°C ~ 85°C

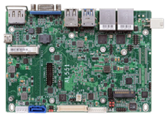


3.5" Atom

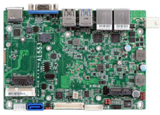


3.5" Atom

Model Name		ADN553	EHL556
Platform		Atom	Atom
System	Processor	Intel Atom® Alder Lake-N	Intel Atom® Elkhart Lake
	Socket	BGA 1264	BGA 1493
	Max. Speed	3.2~3.8GHz	1.5~3.0GHz
	TDP	up to 15W	6.5~12W
	Cache	6M	2M/4M
	Chipset	-	-
	BIOS	AMI SPI 256Mbit	AMI SPI 256Mbit
Memory	Technology	Single Channel DDR5 4800MHz	Single Channel DDR4 3200MHz (in-band ECC support in embedded/industrial SKU)
	Max. Capacity	16GB	32GB
	Socket	1 SODIMM	1 SODIMM
Graphics	Connector	1 HDMI, 1 Type-C DP Alt. Mode, 1 LVDS/eDP	1 HDMI or VGA , 1 DP++, 1 LVDS or eDP + Backlight
Expansion	PCIe, PCI	-	-
	Mini PCIe / M.2	1 M.2 M key 2280/2242, 1 M.2 B key 3052/3042, 1 M.2 E key 2230	1 Mini PCIe, 1 M.2 E key 2230
	SIM	1 Nano SIM	-
Audio	Audio Codec	ALC888S	ALC888S
Ethernet	Controller	3 Intel® I226V/IT	2 Intel® I225IT
Rear I/O	Ethernet	3x 2.5GbE	2 GbE
	Serial	-	-
	USB	4 USB 3.2	2 USB 3.2 Gen2
	Display	1 HDMI, 1 Type-C DP Alt. Mode	1 DP++, 1 HDMI or VGA
	Audio	-	-
	PS/2	-	-
Internal I/O	Serial	1 RS-232/422/485	1 RS-232/422/485 + 1 RS-232, or 1 RS-232/422/485
	USB	2 USB 2.0	4 USB 2.0
	Display	1 LVDS, 1 LCD/Inverter Power or eDP (Opt.)	1 LVDS or eDP + Backlight
	Audio	1 Audio (Line-out, Mic-in)	1 Audio (Line-out, Mic-in)
	Storage	1 SATA 3.0, 1 SATA Power	1 SATA 3.0, 1 SATA Power
	DIO	8-bit DIO	8-bit DIO (BIOS select)
	CANBus	-	-
	SMBus	-	-
TPM / iAMT		dTPM 2.0.	dTPM 2.0
Power		9~36V DC-in	9~36V DC-in
Operating Temperature		-5°C ~ 65°C	-40°C ~ 85°C



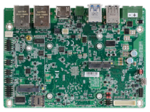
3.5" Atom



3.5" Atom

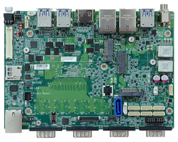
Model Name		AL551	AL553
Platform		Atom	Atom
System	Processor	Intel Atom® E3900	Intel Atom® E3900
	Socket	BGA 1296	BGA 1296
	Max. Speed	1.8~2.5GHz	1.8~2.5GHz
	TDP	6W~12W	6W~12W
	Cache	2M	2M
	Chipset	-	-
	BIOS	Insyde SPI 128Mbit (supports UEFI boot only)	Insyde SPI 128Mbit (supports UEFI boot only)
Memory	Technology	Single Channel DDR3L 1866MHz	Single Channel DDR3L 1866MHz
	Max. Capacity	8GB	8GB
	Socket	1 SODIMM	1 SODIMM
Graphics	Connector	1 VGA, 1 LVDS, 1 DP++	1 VGA, 1 LVDS, 1 HDMI
Expansion	PCIe, PCI	-	-
	Mini PCIe / M.2	1 Full-size Mini PCIe, 1 M.2 B key 2242, 1 E I/O (Opt.)	1 Full-size Mini PCIe, 1 M.2 B key 2242, 1 M.2 E key 2230
	SIM	-	-
Audio	Audio Codec	ALC888S	ALC888S
Ethernet	Controller	2 Intel® I210AT, 2 Intel® I210IT (Opt.)	2 Intel® I210AT, 2 Intel® I210IT (Opt.)
Rear I/O	Ethernet	2 GbE	2 GbE
	Serial	-	-
	USB	2 USB 3.2 Gen1, 2 USB 2.0, 1 USB 3.2 Gen1 Type C OTG (Opt.)	2 USB 3.2 Gen1, 2 USB 2.0
	Display	1 VGA, 1 DP++	1 VGA, 1 HDMI
	Audio	-	-
	PS/2	-	-
Internal I/O	Serial	2 RS-232/422/485	1 RS-232/422/485
	USB	2 USB 2.0	2 USB 2.0
	Display	1 LVDS, 1 LCD/Inverter Power	1 LVDS, 1 LCD/Inverter Power
	Audio	1 Audio (Line-out, Mic-in), Speaker Out (Opt.)	1 Audio (Line-out, Mic-in)
	Storage	1 SATA 3.0, 1 SATA Power	1 SATA 3.0, 1 SATA Power
	DIO	8-bit DIO	8-bit DIO
	CANBus	-	-
	SMBus	1	1
TPM / iAMT		fTPM 2.0 (default) / dTPM 2.0. (Opt.)	fTPM 2.0
Power		12V DC-in	9~36V DC-in
Operating Temperature		0°C ~ 60°C / -20°C ~ 70°C / -40°C ~ 85°C (Opt.)	0°C ~ 60°C / -20°C ~ 70°C / -40°C ~ 85°C

3.5" AMD



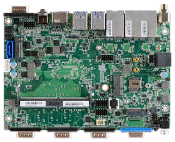
3.5" NXP

Model Name		GH551	M8MP553
Platform		AMD V Series, R-Series	NXP
System	Processor	AMD® Ryzen™ Embedded V1000/R2000/R1000 Series	NXP i.MX 8M Plus Quad/Dual Cortex-A53
	Socket	FP5	-
	Max. Speed	up to 3.6GHz (Turbo)	Up to 1.8GHz
	TDP	up to 15W	-
	Cache	4MB	512 KB L2 cache
	Chipset	-	-
	BIOS	AMI SPI 64Mbit	-
Memory	Technology	Single Channel DDR4 up to 2400MHz (ECC/non-ECC)	Single Channel LPDDR4 up to 4000MHz
	Max. Capacity	16GB	2GB/4GB/8GB
	Socket	1 SODIMM	Memory Down
Graphics	Connector	up to 4 DP++, 1 LVDS (Opt.)	1 HDMI, 1 LVDS
Expansion	PCIe, PCI	-	-
	Mini PCIe / M.2	1 Full-size Mini PCIe, 1 M.2 M key 2280/2242	1 M.2 B key 3052/2242, 1 M.2 E key 2230
	SIM	1 Nano SIM (Opt.)	1 Nano SIM
Audio	Audio Codec	ALC888S	SGTL5000
Ethernet	Controller	3 Realtek® RTL8111HN/ RTL8119I	2 ATHEROS AR8035
Rear I/O	Ethernet	3 GbE	2 GbE
	Serial	-	1 RS-485
	USB	2 USB 3.2 Gen2, 1 USB 2.0	2 USB 3.2 Gen1, 2 USB 2.0
	Display	up to 4 DP++	1 HDMI
	Audio	-	-
	PS/2	-	-
Internal I/O	Serial	1 RS-232/422/485	1 RS-232/422/485, 1 RS-232
	USB	1 USB 2.0	2 USB 2.0, 1 micro USB 2.0
	Display	1 LVDS + Backlight	1 LVDS, 1 LCD / Intverter Power
	Audio	Line-out, Mic-in, Speaker out	1 Audio (Line-out, Mic-in)
	Storage	1 SATA 3.0, 1 SATA Power	1 eMMC 5.1 up to 64GB, 1 uSD card
	DIO	8-bit DIO	8-bit DIO
	CANBus	-	2 CANBus 2.0b
	SMBus	1	-
TPM / iAMT		fTPM 2.0 (default) / dTPM 2.0. (Opt.)	-
Power		12V DC-in	9~36V DC-in
Operating Temperature		-5°C ~ 65°C / -30°C ~ 80°C	-30°C ~ 80°C



4"

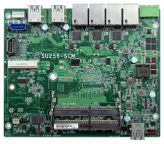
U/H



4"

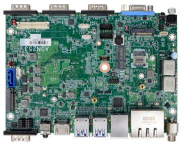
ULT

Model Name		MTH253	ADP253
Platform		U/H	ULT
System	Processor	Intel® Core™ Ultra Processor	12th Gen Intel® Core™
	Socket	BGA2049	BGA 1744
	Max. Speed	4.3~5.0GHz	4.4~4.7GHz
	TDP	up to 28W	15W
	Cache	12M/18M/24M	up to 12M
	BIOS	AMI SPI 256Mbit	AMI SPI 256Mbit (Supports UEFI boot only)
Memory	Technology	Dual Channel LPDDR5/x 6400MHz	Dual Channel DDR4 3200MHz
	Max. Capacity	up to 32GB	up to 32GB
	Socket	Memory down	Memory down, 1 SODIMM
Graphics	Connector	1 HDMI, 1 LVDS, 1 USB-C DP Alt. mode	1 HDMI, 1 VGA/DP(Opt.), 2 Type-C Alt. Mode
	Mini PCIe / M.2	1 M.2 M key 2280, 1 M.2 B key 3052, 1 M.2 E key 2230	1 M.2 E key 2230, 1 M.2 B key 3052/3042, 1 M.2 M key 2280
	SIM	1	1
Audio	Audio Codec	-	ALC888S
Ethernet	Controller	2 Intel® I226V, 1 Intel® i210AT (support OOB)	3 Intel® I225LM/I225IT
Rear + Front I/O	Ethernet	2x 2.5GbE , 1x GbE	1x 2.5GbE, 2 GbE
	Serial	1 RS-232/422/485, 1 RS-232, 1 RS-232/422/485 or 8-bit DIO	2 RS-232/422/485, 2 RS-232
	USB	5 USB 3.2 or 4 USB 3.2 + 1 USB 2.0, 1 USB Type C	4 USB 3.2 (2 Type C + 2 Type A) / 4 USB 3.2 (Type A)
	Display	1 HDMI, 1 USB-C DP Alt. Mode	1 HDMI, 1 VGA/DP (Opt.), 2 Type-C Alt. Mode
	Audio	-	1 Audio (Line-out, Mic-in)
Internal I/O	Serial	2 RS-232	2 RS-232
	USB	1 USB 2.0	2 USB 2.0
	Display	1 LVDS	-
	Audio	-	1 Front Audio (Line-out, Mic-in)
	Storage	1 SATA 3.0	1 SATA 3.0, 1 SATA Power
	DIO	8-bit DIO (Opt.)	8-bit DIO (Opt.)
	LPC	-	-
	SMBus	-	-
TPM / iAMT		TPM 2.0.	dTPM 2.0., iAMT (Core i7/i5 only)
Power		9~36V DC-in	9~36V DC-in
Operating Temperature		-5°C ~ 65°C	-5°C ~ 65°C / -30°C ~ 80°C



4"

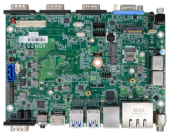
ULT



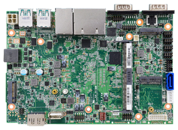
4"

Atom

Model Name		SU256-SCM	ASL253
Platform		ULT	Atom
System	Processor	6th Gen Intel® Core™	Intel® Atom® Amston Lake
	Socket	BGA 1356	BGA 1264
	Max. Speed	2.3~3.9GHz	3.2~3.6GHz
	TDP	15W	6W/9W/12W
	Cache	3M/4M	6M
	BIOS	Insyde SPI 128Mbit	AMI SPI 256Mbit (supports UEFI boot only)
Memory	Technology	Dual Channel DDR4 2400MHz	LPDDR5 4800MHz
	Max. Capacity	4GB/8GB	8GB/16GB
	Socket	2 SODIMM	Memory down
Graphics	Connector	1 HDMI	1 eDP/LVDS, 1 HDMI, 1 USB-C Alt. Mode
	Mini PCIe / M.2	1 Full-size Mini PCIe	1 M.2 M key 2242/2280, 1 B key 3042/3052, 1 M.2 E key 2230
	SIM	-	1 Nano SIM
Audio	Audio Codec	-	ALC888S
Ethernet	Controller	3 Intel® I210IT, 1 Intel® I219LM	2 Intel® I226V/LM, 1 Intel® i210
Rear + Front I/O	Ethernet	4 GbE	2x 2.5GbE, 1x GbE
	Serial	-	1 RS-232/DIO, 3 RS-232/422/485
	USB	6 USB 3.2	3 USB 3.2 type-A, 1 USB-C 3.2
	Display	-	1 HDMI, 1 Type-C Alt. Mode
	Audio	-	1 Audio (Line-out, Mic-in)
Internal I/O	Serial	-	2 RS-232
	USB	-	1 USB 2.0
	Display	1 HDMI	1 eDP/LVDS
	Audio	-	-
	Storage	1 mSATA, 1 SATA 3.0	1 SATA 3.0, 1 SATA Power
	DIO	-	8-bit DIO (Opt.)
	LPC	1	-
	SMBus	1	1
TPM / iAMT		TPM 2.0. (Opt.), iAMT 9.5 (Core i7/i5 only)	TPM 2.0.
Power		15~36V	9~36V DC-in
Operating Temperature		-20°C ~ 70°C	-40°C ~ 80°C

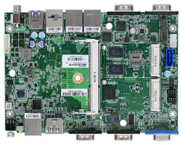


4" Atom

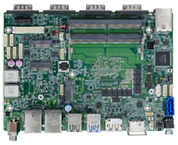


4" Atom

Model Name		ADN253	EHL253
Platform		Atom	Atom
System	Processor	Intel Atom® Alder Lake-N	Intel Atom® Elkhart Lake
	Socket	BGA 1264	BGA 1493
	Max. Speed	2.7~3.4GHz	1.9~3.0GHz
	TDP	6W/10W/12W/15W	6.5W/9W/10W/12W
	Cache	6M	2M/4M
	BIOS	AMI SPI 256Mbit (supports UEFI boot only)	AMI SPI 256Mbit (supports UEFI boot only)
Memory	Technology	LPDDR5 4800MHz	On board DDR4 + 1 DDR4 up to 3200MHz (in-band ECC support in embedded/industrial SKU)
	Max. Capacity	8GB/16GB	up to 32GB
	Socket	Memory down	Memory down, 1 SODIMM
Graphics	Connector	1 eDP/LVDS, 1 HDMI, 1 USB-C Alt. Mode	1 VGA, 1 DP++
	Mini PCIe / M.2	1 M.2 M key 2242/2280, 1 B key 3042/3052, 1 M.2 E key 2230	1 M.2 E Key 2230, 1 M.2 B Key 3042/3052, 1 M.2 M Key 2280
	SIM	1 Nano SIM	2 Nano SIM
Audio	Audio Codec	ALC888S	ALC888
Ethernet	Controller	2 Intel® I226V/LM, 1 Intel® i210	1 Intel® I225 (2.5GbE), 2/3 Intel® I210/I211
Rear + Front I/O	Ethernet	2x 2.5GbE, 1x GbE	1x 2.5GbE, 2/3x GbE
	Serial	1 RS-232/DIO, 3 RS-232/422/485	2 RS-232/422/485
	USB	3 USB 3.2 type-A, 1 USB-C 3.2	2/4 USB 3.1
	Display	1 HDMI, 1 Type-C Alt. Mode	1 DP++
	Audio	1 Audio (Line-out, Mic-in)	-
Internal I/O	Serial	2 RS-232	2 RS-232
	USB	1 USB 2.0	2 USB 2.0, 1 USB 2.0 (Vertical)
	Display	1 eDP/LVDS	1 VGA
	Audio	-	1 Audio (Line-out, Mic-in)
	Storage	1 SATA 3.0, 1 SATA Power	1 SATA 3.0, 1 SATA Power, 1 16GB/32GB eMMC (Opt.)
	DIO	8-bit DIO (Opt.)	8-bit DIO (Opt.)
	LPC	-	-
	SMBus	1	1
TPM / iAMT		dTPM 2.0.	TPM 2.0. (Opt.)
Power		9~36V DC-in	9~36V DC-in
Operating Temperature		-5°C ~ 80°C	0°C ~ 80°C / -40°C ~ 80°C



4" Atom



4" AMD

Model Name		AL253	HPT253
Platform		Atom	AMD
System	Processor	Intel Atom® E3900	AMD® Ryzen 8000
	Socket	BGA 1296	BGA 1140
	Max. Speed	1.8~2.5GHz	3.3~4.3GHz
	TDP	6W/9.5W/12W	28/45W
	Cache	2M	6/8M
	BIOS	AMI SPI 128Mbit (support UEFI/legacy mode)	AMI SPI 256Mbit
Memory	Technology	Dual Channel DDR3L 1866MHz	Dual Channel DDR5 5600MHz
	Max. Capacity	up to 8GB	up to 96GB
	Socket	Memory down, 1 SODIMM	2 SODIMM
Graphics	Connector	1 DP++, 1 VGA/DP(Opt.)	1 LVDS/eDP, 1 HDMI, 1 DP, 1 Type C Alt. mode
	Mini PCIe / M.2	1 Full-size Mini PCIe, 1 M.2 E key 2230	1 M.2 M key 2280, 1 B key 3052, 1 M.2 E key 2230
	SIM	1 (Opt.)	1 Nano SIM
Audio	Audio Codec	-	-
Ethernet	Controller	4 Intel® I211AT/I210IT	2 Intel® I226V, 1 Intel® i210IT
Rear + Front I/O	Ethernet	Up to 4 GbE	2x 2.5GbE, 1x GbE
	Serial	4 RS-232/422/485	1 RS-232/DIO, 3 RS-232/422/485
	USB	Up to 4 USB 3.2 Gen1	2 USB 3.2 type-A, 1 USB-C 3.2, 1 USB 2.0 Type A
	Display	1 DP++, 1 VGA/DP (Opt.)	1 HDMI, 1 DP, 1 Type C Alt. mode
	Audio	-	-
Internal I/O	Serial	-	-
	USB	2 USB 2.0	2 USB 2.0
	Display	-	1 eDP/LVDS
	Audio	-	-
	Storage	1 SATA 3.0, 1 SATA Power,1 Full mSATA, 1 eMMC up to 64GB (Opt.)	1 SATA 3.0, 1 SATA Power
	DIO	8-bit DIO	8-bit DIO (Opt.)
	LPC	-	-
	SMBus	-	-
TPM / iAMT		fTPM 2.0	dTPM 2.0
Power		9~36V DC-in	9~36V DC-in
Operating Temperature		0°C ~ 60°C / -40°C ~ 85°C	0°C ~ 60°C

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