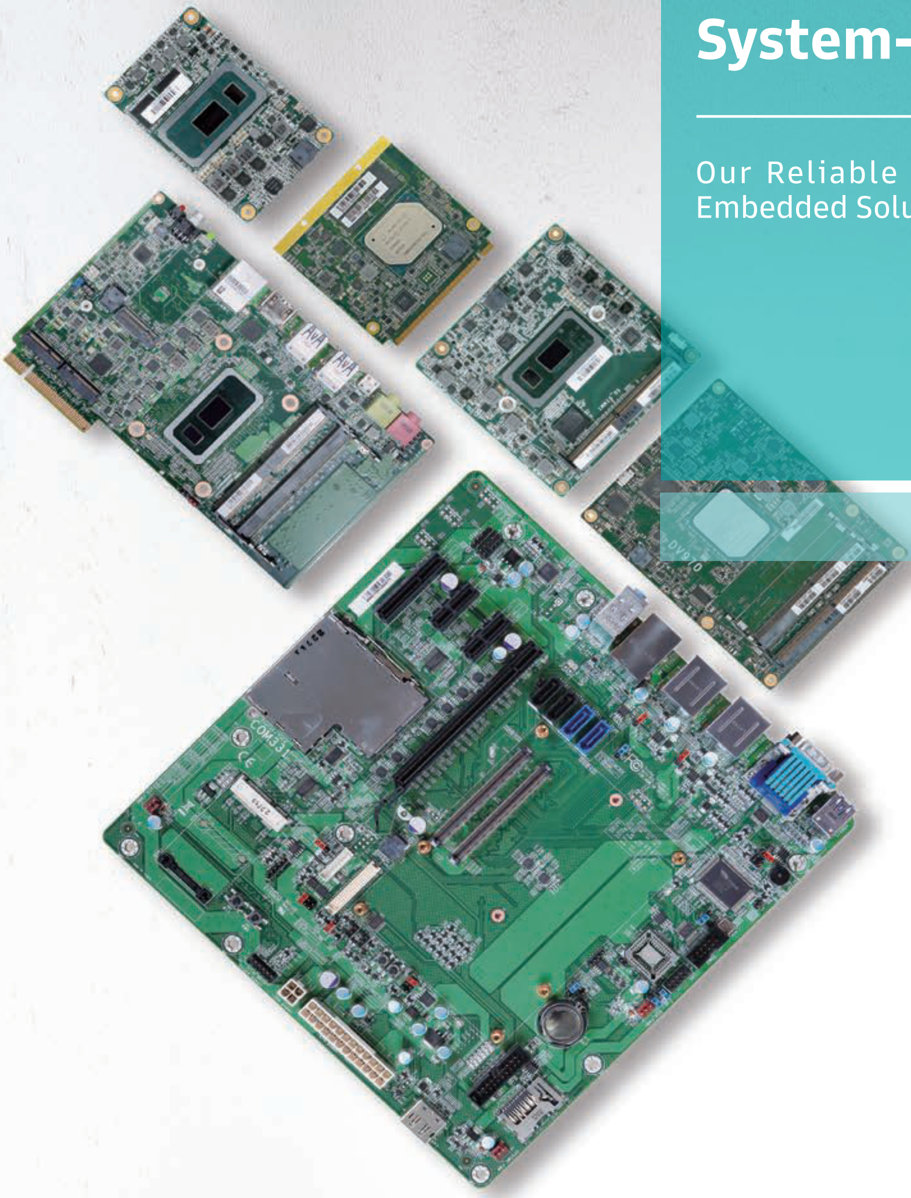
DFI Desire For Innovation

2021



System-On-Modules

Our Reliable and Scalable SOMs for Your Embedded Solutions

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

Qseven

AL701

Processor	Platform	Chipset	Model	Index
Intel Atom® Processor J6413 / x6000	Atom	-	EHL700	P6
Intel Atom® Processor E3900	Atom	-	AL701	P6~P7
			AL700	
Intel Atom® Processor E3800	Atom	-	BT700	
Freescale™ i.MX6 Series	ARM	-	FS700	

COM Express Mini

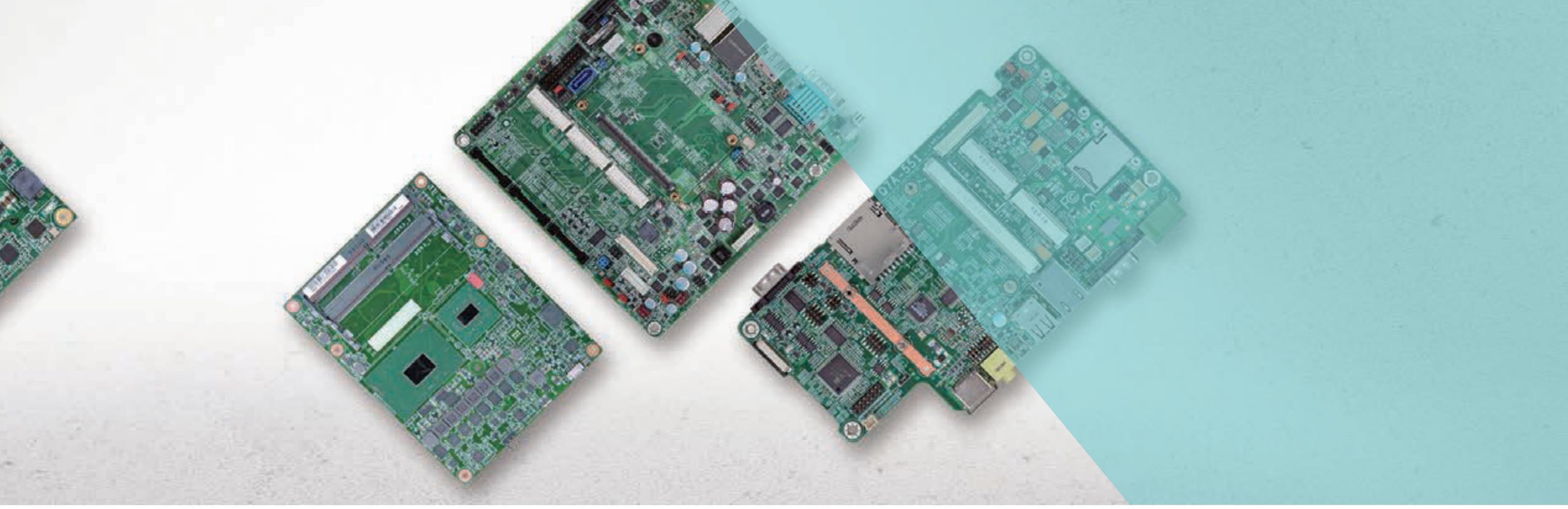
WL9A3

Type	Processor	Platform	Chipset	Model	Index
Type 10	11th Gen Intel® Core™ Processor	ULT	-	TGU9A2	P8
	8th Gen Intel® Core™ Processor	ULT	-	WL9A3	P9
	Intel Atom® Processor J6413 / x6000, Intel® Pentium® N/J Series	Atom	-	EHL9A2	
	Intel Atom® Processor E3900/ Intel® Pentium® N4200	Atom	-	AL9A2	
				AL9A3	
				AL9A8	
	Intel Atom® Processor E3800	Atom	-	BT9A3	
	AMD® Ryzen™ R1000 Series Processor	AMD	-	GH9A3	

COM Express Compact

WL968

Type	Processor	Platform	Chipset	Model	Index
Type 6	11th Gen Intel® Core™ Processor	ULT	-	TGU968	P10
	8th Gen Intel® Core™ Processor	ULT	-	WL968	P11
	7th Gen Intel® Core™ Processor	ULT	-	KU968	
	6th Gen Intel® Core™ Processor	ULT	-	SU968	
	Intel Atom® Processor E3900/ Intel® Pentium® N4200	Atom	-	AL968	
	Intel Atom® Processor E3800	Atom	-	BT968	



COM Express Basic

DV970

Type	Processor	Platform	Chipset	Model	Index
Type 7	Intel Atom® Processor C3000	Atom	-	DV970	P12
Type 6	8th Gen Intel® Core™ Processor	Mobile	CM246/ QM370	CH960-CM246/QM370, CH961-CM246/QM370,	
			HM370	CH960-HM370, CH961-HM370	
	7th Gen Intel® Core™ Processor	Mobile	CM238/ QM175	KH960-CM238/QM175	P13
			HM175	KH960-HM175	
	6th Gen Intel® Core™ Processor	Mobile	CM236/ QM170	SH960MD-CM236/QM170	P14~P15
				SH960-CM236/QM170	
			HM170	SH960-HM170	
	AMD® Ryzen™ V1000/R1000 Embedded Processors	AMD	-	GH960	

Carrier Board

COM333-I

Form Factor	Compliance	Model	Index
Mini-ITX	COM Express R2.1, Type 10	COM100-B	P16~P17
microATX	COM Express R3.0, Type 7	COM333-I	
	COM Express R2.1, Type 6	COM332-B(R.A)	
	COM Express R2.1, Type 6	COM332-B(R.B1)	
Mini-ITX	Qseven (BT700)	Q7X-151(R.A)	P18
	Qseven (AL700, AL701)	Q7X-151(R.D1)	
Proprietary	Qseven (FS700)	Q7A-551	

SDM

SDML-WL

Form Factor	Compliance	Model	Index
SMD Large	8th Gen Intel® Core™ Processor	SDML-WL	P19

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

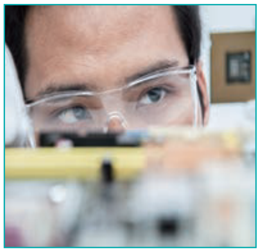
- Customized thermal solution design & Optional heatspreader
  For special requirements like high-temperature environments or ultra-slim chassis

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

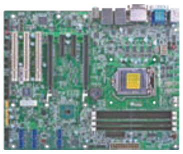
- Industrial-rated components with high MTBF over 100,000 hrs
- Extended operating temperatures
- High ESD protection for I/O ports
- Signal integrity measurement
- Wide range power design
- 100% Japanese-made solid capacitor
- Power hot plug protection for DC-in type SBC and Industrial Motherboards

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

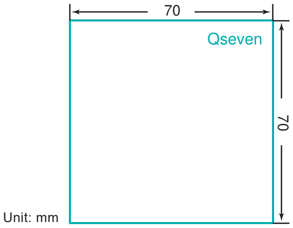
Vertical Solutions

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

Model Name		EHL700
Compliance		Qseven R2.1
System	Processor	Intel Atom® x6000 / Intel Pentium® N and J Series Processors / Intel Celeron® N and J Series Processors
	Socket	BGA 1493
	Max. Speed	1.2~3.0GHz
	TDP	6W/6.5W/9W/10W/12W
	Cache	1M~2M
	Chipset	-
	BIOS	AMI SPI 256Mbit
Memory	Technology	Dual Channel LPDDR4 3200MHz
	Max. Capacity	4GB/8GB/16GB
	Socket	Memory down
Graphics	Interface	1 LVDS, 1 DDI
Expansion	PCIe	4 PCIe x1
	PCI	-
	LPC	1
	I²C	1
	SMBus	1
	CAN Bus	-
Audio	Interface	HD Audio
Ethernet	Controller	1 Intel® I211AT / 1 Intel® I210IT
I/O	USB	1 USB 3.1 + 8 USB 2.0 / 3 USB 3.1 + 4 USB 2.0
	SATA	2 SATA 3.0
	IDE	-
	SSD	-
	eMMC	optional
	DIO	4-bit DIO
	SD	-
TPM		FTPM
iAMT		-
Power		5V, 5VSB, VCC_RTC
Operating Temperature		-40°C~85°C, -5 to 65°C

*Populated by default

Wide Temp

Atom

Wide Temp

Atom

Wide Temp

Atom

Model Name		**AL701**	**AL700**	**BT700**
Compliance		Qseven R2.1	Qseven R2.1	Qseven R2.0
System	Processor	Intel Atom® E3900	Intel Atom® E3900	Intel Atom® E3800
	Socket	BGA 1296	BGA 1296	BGA 1170
	Max. Speed	1.1~2.5GHz	1.1~2.5GHz	1.46~2.41GHz
	TDP	6W/6.5W/9.5W/12W	6W/6.5W/9.5W/12W	5W/7.5W/8W/10W
	Cache	2M	2M	0.5M/1M/2M
	BIOS	AMI SPI 128Mbit	AMI SPI 128Mbit	AMI SPI 64Mbit
Memory	Technology	Dual Channel LPDDR4 3200MHz	Dual Channel DDR3L 1600MHz	Single Channel DDR3L 1066/1333MHz
	Max. Capacity	4GB/8GB	4GB/8GB	2GB/4GB
	Socket	Memory down	Memory down	Memory down
Graphics	Interface	1 LVDS*/eDP, 1 DDI	1 LVDS*/eDP, 1 DDI	1 LVDS, 1 DDI
Expansion	PCIe	4 PCIe x1	4 PCIe x1	3 PCIe x1
	LPC	1	1	1
	I^{2}C	1	1	1
	SMBus	1	1	1
	CAN Bus	1 (only Linux support)	-	-
Audio	Interface	HD Audio	HD Audio	HD Audio
Ethernet	Controller	1 Intel® I211 / 1 Intel® I210	1 Intel® I211 / 1 Intel® I210	1 Intel® I210
I/O	USB	1 USB 3.0, 8 USB 2.0	1 USB 3.0, 8 USB 2.0	1 USB 3.0, 6 USB 2.0
	SATA	2 SATA 3.0	2 SATA 3.0	2 SATA 2.0
	eMMC	optional	optional	optional
	DIO	4-bit DIO	4-bit DIO	-
	SD	optional	optional	optional
TPM		optional	FTPM	optional
Power		VCC_RTC, 5V standby, 5V	VCC_RTC, 5V standby, 5V	VCC_RTC, 5V standby, 5V
Operating Temperature		-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C	-40°C~85°C, -20°C~70°C, 0°C~60°C

ARM

Model Name		**FS700**
Compliance		Qseven R1.2
System	Processor	Freescale™ i.MX6 Series
	Socket	FCPBGA
	Max. Speed	1.0GHz
	TDP	-
	Cache	32KB
	Chipset	-
	BIOS	-
Memory	Technology	Single Channel DDR3 1000/1200MHz
	Max. Capacity	1GB/2GB
	Socket	Memory down
Graphics	Interface	1 HDMI, 2 LVDS
Expansion	PCIe	1 PCIe x1
	LPC	-
	I^{2}C	2
	SMBus	-
	CAN Bus	1
Audio	Interface	I^{2}S
Ethernet	Controller	1 Atheros AR8033
I/O	USB	4 USB 2.0, 1 USB OTG
	SATA	1 SATA 2.0
	IDE	-
	SSD	-
	eMMC	onboard
	DIO	-
	SD	1 SDIO, 1 microSD onboard
TPM		-
iAMT		-
Power		VCC_RTC, 5V standby, 5V
Operating Temperature		0°C~60°C

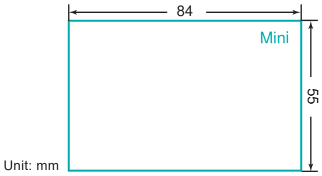
*Populated by default

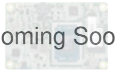
COM Express Mini

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.





Coming Soon

COMe Type 10

Wide Temp

ULT

Model Name		**TGU9A2**
Compliance		COM Express® R3.0 Mini, Type 10
System	Processor	11th Gen Intel® Core™
	Socket	BGA1526
	Max. Speed	up to 3.0GHz(Turbo)
	TDP	up to 28W
	Cache	4M/6M/8M/12M
	Chipset	-
	BIOS	AMI BIOS
Memory	Technology	Dual Channel LPDDR4X 4266MHz
	Max. Capacity	8GB/16GB
	Socket	Memory down
Graphics	Interface	1 eDP, 1 DDI
Expansion	PCIe	1 PCIe x4
	SDIO	-
	PCI	-
	LPC	1
	I^2C	2
	SMBus	1
	CAN Bus	-
Audio	Interface	HD Audio
Ethernet	Controller	1 Intel® I219
I/O	USB	2 USB 3.2, 8 USB 2.0
	SATA	2 SATA 3.0
	IDE	-
	SSD	optional
	eMMC	-
	DIO	8-bit DIO
	SD	-
TPM		optional
iAMT		-
Power		4.75V~20V, 5VSB, VCC_RTC (ATX mode), 4.75V~20V, VCC_RTC (AT mode)
Operating Temperature		-40°C~85°C, -5°C~65°C

*Populated by default

COMe Type 10

		 Wide Temp ULT	 Wide Temp Atom	 Wide Temp Atom	 Wide Temp Atom
Model Name		**WL9A3**	**AL9A2**	**AL9A3**	**BT9A3**
Compliance		COM Express® R3.0 Mini, Type 10	COM Express® R2.1 Mini, Type 10	COM Express® R2.1 Mini, Type 10	COM Express® R2.1 Mini, Type 10
System	Processor	8th Gen Intel® Core™	Intel Atom® E3900/Intel® Pentium® N4200	Intel Atom® E3900/Intel® Pentium® N4200	Intel Atom® E3800
	Socket	FCBGA 1528	BGA 1296	BGA 1296	BGA 1170
	Max. Speed	1.7~4.4GHz	1.1~2.5GHz	1.1~2.5GHz	1.46~2.41GHz
	TDP	15W	6W/6.5W/9.5W/12W	6W/6.5W/9.5W/12W	5W/7.5W/8W/10W
	Cache	4M/6M/8M	2M	2M	0.5M/1M/2M
	BIOS	AMI SPI 128Mbit	AMI SPI 128Mbit	AMI SPI 128Mbit	AMI SPI 64Mbit
Memory	Technology	Dual Channel LPDDR3 2133MHz	Single Channel DDR3L 1866MHz	Dual Channel DDR3L 1866MHz	Single Channel DDR3L 1066/1333MHz
	Max. Capacity	8GB/16GB	4GB non-ECC/8GB ECC	4GB/8GB	2GB/4GB
	Socket	Memory down	Memory down	Memory down	ECC memory down
Graphics	Interface	1 LVDS*/eDP, 1 DDI	1 LVDS*/eDP, 1 DDI	1 LVDS*/eDP, 1 DDI	1 LVDS, 1 DDI
Expansion	PCIe	4 PCIe x1	4 PCIe x1	4 PCIe x1	3 PCIe x1
	LPC	1	1	1	1
	I^{2}C	2	2	1	1
	SMBus	1	1	1	1
Audio	Interface	HD Audio	HD Audio	HD Audio	HD Audio
Ethernet	Controller	1 Intel® I219	1 Intel® I210AT/IT	1 Intel® I210AT/IT	1 Intel® I210AT/IT
I/O	USB	2 USB 3.0, 8 USB 2.0	2 USB 3.0, 8 USB 2.0	2 USB 3.0, 8 USB 2.0	1 USB 3.0, 8 USB 2.0
	SATA	2 SATA 3.0	2 SATA 3.0	2 SATA 3.0	2 SATA 2.0
	SSD	-	-	optional	-
	eMMC	optional	optional	-	optional
	DIO	8-bit DIO	8-bit DIO	8-bit DIO	8-bit DIO
	SD	optional	optional	optional	-
TPM		FTPM	FTPM	FTPM	FTPM
iAMT		-	-	-	-
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)	4.75V~20V, 5VSB, VCC_RTC (ATX mode) 4.75V~20V, VCC_RTC (AT mode)
Operating Temperature		-30°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

COMe Type 10

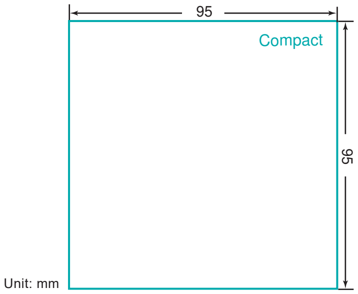
		Coming Soon Wide Temp Atom	 Wide Temp AMD R1000	Coming Soon Wide Temp Atom
Model Name		**EHL9A2**	**GH9A3**	**AL9A8**
Compliance		COM Express® R3.0 Mini, Type 10	COM Express® R3.0 Mini, Type 10	COM Express® R3.0 Mini, Type 10
System	Processor	Intel Atom® X6000 Processors	AMD® Ryzen™ Embedded R1000 series	Intel Atom® E3900/Intel® Pentium® N4200
	Socket	FCBGA 1528	FP5	BGA 1296
	Max. Speed	1.7~4.4GHz	up to 2.8GHz(Turbo)	1.1~2.5GHz
	TDP	6W/9W/10W/12W	up to 10W	6W/6.5W/9.5W/12W
	Cache	4M/6M/8M	4M	2M
	Chipset	-	-	-
	BIOS	AMI SPI 128Mbit	SPI 64Mbit	AMI SPI 128Mbit
Memory	Technology	Dual Channel LPDDR4X 4266MHz	Single Channel DDR4 2400MHz	Dual Channel LPDDR4-2400MHz
	Max. Capacity	8GB/16GB	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	3 PCIe x1	4 PCIe x1
	SDIO	1	1	1
	LPC	1	1	1
	I^{2}C	2	2	1
	SMBus	1	1	1
	CAN Bus	1	-	-
Audio	Interface	HD Audio	HD Audio	HD Audio
Ethernet	Controller	1 x GbE (1 x 2.5G by optional)	1 Intel® I210	1 Intel® I210AT/IT
I/O	USB	2 USB 3.1, 8 USB 2.0	2 USB 3.1, 8 USB 2.0	2 USB 3.0, 8 USB 2.0
	SATA	2 SATA 3.0	2 SATA 3.0	2 SATA 3.0
	SSD	-	-	-
	eMMC	optional	optional	optional
	DIO	8-bit DIO	8-bit DIO	8-bit GPIO
	SD	1	-	optional
TPM		dTPM (TPM 2.0)	optional	optional
Power		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, -5°C~65°C	-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C

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.



Coming Soon

COMe Type 6

Wide Temp

ULT

Model Name		TGU968
Compliance		COM Express® R3.0 Compact, Type 6
System	Processor	11th Gen Intel® Core™
	Socket	FCBGA 1449
	Max. Speed	1.5~4.4GHz
	TDP	15W
	Cache	4M~12M
	Chipset	-
	BIOS	AMI BIOS
Memory	Technology	Dual Channel DDR4 3200MHz
	Max. Capacity	64GB
	Socket	2 SODIMM
Graphics	Interface	1 VGA*/DDI, 1 LVDS*/eDP, 1 DDI
Expansion	PCIe	8 PCIe x1 + 1 PCIe x4
	PCI	-
	LPC	-
	I^2C	1
	SMBus	1
	CAN Bus	-
Audio	Interface	HD Audio
Ethernet	Controller	1 Intel® I225
I/O	USB	4 USB 3.1, 8 USB 2.0
	SATA	2 SATA 3.0
	IDE	-
	SSD	optional
	eMMC	-
	DIO	8-bit DIO
	SD	-
TPM		optional
iAMT		-
Power		12V, 5VSB, VCC_RTC (ATX mode) 12V, VCC_RTC (AT mode)
Operating Temperature		-40°C~85°C, 0°C~60°C

*Populated by default

COMe Type 6

Wide Temp

ULT

Wide Temp

ULT

Wide Temp

ULT

Model Name		WL968	KU968	SU968
Compliance		COM Express® R3.0 Compact, Type 6	COM Express® R2.1 Compact, Type 6	COM Express® R2.1 Compact, Type 6
System	Processor	8th Gen Intel® Core™	7th Gen Intel® Core™	6th Gen Intel® Core™
	Socket	FCBGA 1528	BGA 1356	BGA 1356
	Max. Speed	1.7~4.4GHz	2.2~3.9GHz	2~3.4GHz
	TDP	15W	15W	15W
	Cache	4M/6M/8M	2M/3M/4M	2M/3M/4M
	Chipset	-	-	-
	BIOS	AMI SPI 128Mbit	Insyde SPI 128Mbit	Insyde SPI 128Mbit
Memory	Technology	Dual Channel DDR4 2400MHz	Dual Channel DDR4 2133MHz	Dual Channel DDR3L 1600MHz
	Max. Capacity	64GB	4GB/8GB/16GB	32GB
	Socket	2 SODIMM	Memory down	2 SODIMM
Graphics	Interface	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	4 PCIe x1 + 1 PCIe x4	4 PCIe x1 + 1 PCIe x4	4 PCIe x1 + 1 PCIe x4
	PCI	-	-	-
	LPC	1	1	1
	I^{2}C	1	1	1
	SMBus	1	1	1
	CAN Bus	-	-	-
Audio	Interface	HD Audio	HD Audio	HD Audio
Ethernet	Controller	1 Intel® I219	1 Intel® I219	1 Intel® I219
I/O	USB	4 USB 3.0, 8 USB 2.0	4 USB 3.0, 8 USB 2.0	4 USB 3.0, 8 USB 2.0
	SATA	3 SATA 3.0 (RAID)	3 SATA 3.0 (RAID)	3 SATA 3.0 (RAID)
	IDE	-	-	-
	SSD	-	-	-
	eMMC	optional	-	-
	DIO	8-bit DIO	8-bit DIO	8-bit DIO
	SD	-	-	-
TPM		optional	optional	optional
iAMT		iAMT 12.0 (Core i7/i5)	iAMT 11.0 (Core i7/i5)	iAMT 11.0 (Core i7/i5)
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		-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C	-40°C~85°C, 0°C~60°C

COMe Type 6

Wide Temp

Atom

Wide Temp

Atom

Model Name		BT968	AL968
Compliance		COM Express® R2.1 Compact, Type 6	COM Express® R2.1 Compact, Type 6
System	Processor	Intel Atom® E3800	Intel Atom® E3900/Intel® Pentium® N4200
	Socket	BGA 1170	BGA 1296
	Max. Speed	1.46~2.41GHz	1.1~2.5GHz
	TDP	5W/7.5W/8W/10W	6W/6.5W/9.5W/12W
	Cache	0.5M/1M/2M	2M
	Chipset	-	-
	BIOS	AMI SPI 64Mbit	Insyde SPI 128Mbit
Memory	Technology	Dual/Single Channel DDR3L 1066/1333MHz	Dual Channel DDR3L 1600MHz
	Max. Capacity	4GB/8GB	8GB
	Socket	1 or 2 SODIMM	2 SODIMM
Graphics	Interface	1 VGA, 1 LVDS*/DDI, 1 DDI	1 VGA*/DDI, 1 LVDS*/eDP, 1 DDI
Expansion	PCIe	3 PCIe x1	4 PCIe x1
	PCI	-	-
	LPC	1	1
	I^{2}C	1	1
	SMBus	1	1
	CAN Bus	-	-
Audio	Interface	HD Audio	HD Audio
Ethernet	Controller	1 Intel® I210	1 Intel® I211 / 1 Intel® I210
I/O	USB	1 USB 3.0, 8 USB 2.0	4 USB 3.0, 8 USB 2.0
	SATA	2 SATA 2.0	2 SATA 3.0
	IDE	-	-
	SSD	-	-
	eMMC	optional	optional
	DIO	8-bit DIO	8-bit DIO
	SD	-	optional
TPM		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, -20°C~70°C, 0°C~60°C	-40°C~85°C, 0°C~60°C

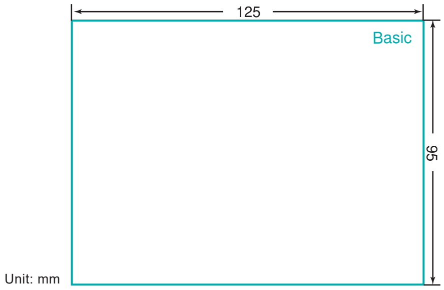
*Populated by default

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.



COMe Type 6/7

Wide Temp

Atom

Wide Temp

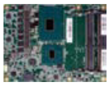
HM370
QM370
CM246

Wide Temp

HM370
QM370
CM246

Model Name		**DV970**	**CH960-CM246/QM370/HM370**	**CH961-CM246/QM370/HM370**
Compliance		COM Express® R3.0 Basic, Type 7	COM Express® R2.1 Basic, Type 6	COM Express® R2.1 Basic, Type 6
System	Processor	Intel Atom® C3000	8th Gen Intel® Core™	8/9th Gen Intel® Core™
	Socket	BGA 1310	BGA 1440	BGA 1440
	Max. Speed	1.7~2.0GHz	2.5~4.4GHz	2.5~4.5GHz
	TDP	17W/25W/31W	45W	45W
	Cache	12M/16M	8M/12M	8M/12M
	Chipset	-	Intel® CM246/QM370/HM370	Intel® CM246/QM370/HM370
	BIOS	Insyde SPI 128Mbit	AMI SPI 128Mbit	AMI SPI 128Mbit
Memory	Technology	Dual Channel DDR4 2400MHz	Dual Channel DDR4 2666MHz	Dual Channel DDR4 2666MHz
	Max. Capacity	64GB	64GB	128GB
	Socket	2 SODIMM	2 SODIMM	4 SODIMM
Graphics	Interface	-	1 VGA*/DDI, 1 LVDS*/eDP, 2 DDI	1 VGA*/DDI, 1 LVDS*/eDP, 2 DDI
Expansion	PCIe	2 PCIe x8	1 PCIe x16 / 2 PCIe x8, 8 PCIe x1	1 PCIe x16 / 2 PCIe x8, 8 PCIe x1
	PCI	-	-	-
	LPC	1	1	1
	I²C	1	1	1
	SMBus	1	1	1
	CAN Bus	-	-	-
Audio	Interface	-	HD Audio	HD Audio
Ethernet	Controller	1 Intel® I210, 4 10Gbase-KR	1 Intel® I219	1 Intel® I219
I/O	USB	2 USB 3.0, 4 USB 2.0	4 USB 3.1, 8 USB 2.0	4 USB 3.1, 8 USB 2.0
	SATA	2 SATA 3.0 (RAID)	4 SATA 3.0 (RAID in CM246&QM370)	4 SATA 3.0 (RAID in CM246&QM370)
	IDE	-	-	-
	SSD	-	-	-
	eMMC	-	-	-
	DIO	8-bit DIO	8-bit DIO	8-bit DIO
TPM		optional	optional	optional
iAMT		-	iAMT 12.0 (Core i7/i5 in CM246&QM370)	iAMT 12.0 (Core i7/i5 in CM246&QM370)
Power		12V, 5VSB, VCC_RTC (ATX mode) 12V, 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

*Populated by default



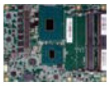
COMe Type 6

Wide Temp

QM175

CM238

Model Name		**KH960-CM238/QM175**
Compliance		COM Express® R2.1 Basic, Type 6
System	Processor	7th Gen Intel® Core™
	Socket	BGA 1440
	Max. Speed	2.1~4.0GHz
	TDP	25W/35W/45W
	Cache	3M/6M/8M
	Chipset	Intel® CM238/QM175
	BIOS	Insyde SPI 128Mbit
Memory	Technology	Dual Channel DDR4 2400MHz
	Max. Capacity	32GB
	Socket	2 SODIMM
Graphics	Interface	1 VGA*/DDI, 1 LVDS*/eDP, 2 DDI
Expansion	PCIe	1 PCIe x16 / 2 PCIe x8, 8 PCIe x1
	PCI	-
	LPC	1
	I^{2}C	1
	SMBus	1
	CAN Bus	-
Audio	Interface	HD Audio
Ethernet	Controller	1 Intel® I219
I/O	USB	4 USB 3.0, 8 USB 2.0
	SATA	4 SATA 3.0 (RAID)
	IDE	-
	SSD	-
	eMMC	-
	DIO	8-bit DIO
TPM		optional
iAMT		iAMT 11.0 (Core i7/i5)
Power		12V, 5VSB, VCC_RTC (ATX mode) 12V, VCC_RTC (AT mode)
Operating Temperature		-40°C~85°C, 0°C~60°C



COMe Type 6

Wide Temp

HM175

Model Name		**KH960-HM175**
Compliance		COM Express® R2.1 Basic, Type 6
System	Processor	7th Gen Intel® Core™
	Socket	BGA 1440
	Max. Speed	2.1~3.7GHz
	TDP	25W/35W/45W
	Cache	3M/6M/8M
	Chipset	Intel® HM175
	BIOS	Insyde SPI 128Mbit
Memory	Technology	Dual Channel DDR4 2400MHz
	Max. Capacity	32GB
	Socket	2 SODIMM
Graphics	Interface	1 VGA*/DDI, 1 LVDS*/eDP, 2 DDI
Expansion	PCIe	1 PCIe x16 / 2 PCIe x8, 8 PCIe x1
	PCI	-
	LPC	1
	I^{2}C	1
	SMBus	1
	CAN Bus	-
Audio	Interface	HD Audio
Ethernet	Controller	1 Intel® I219
I/O	USB	4 USB 3.0, 8 USB 2.0
	SATA	4 SATA 3.0
	IDE	-
	SSD	-
	eMMC	-
	DIO	8-bit DIO
TPM		optional
iAMT		-
Power		12V, 5VSB, VCC_RTC (ATX mode) 12V, VCC_RTC (AT mode)
Operating Temperature		-40°C~85°C, 0°C~60°C

*Populated by default

QM170
CM236

COMe Type 6

Wide Temp

Model Name		**SH960-CM236/QM170**
Compliance		COM Express® R2.1 Basic, Type 6
System	Processor	6th Gen Intel® Core™
	Socket	BGA 1440
	Max. Speed	1.6~3.7GHz
	TDP	25W/35W/45W
	Cache	2M/3M/6M/8M
	Chipset	Intel® CM236/QM170
	BIOS	Insyde SPI 128Mbit
Memory	Technology	Dual Channel DDR4 2133MHz
	Max. Capacity	32GB
	Socket	2 SODIMM
Graphics	Interface	1 VGA*/DDI, 1 LVDS*/eDP, 2 DDI
Expansion	PCIe	1 PCIe x16 / 2 PCIe x8, 8 PCIe x1
	PCI	-
	LPC	1
	I^{2}C	1
	SMBus	1
	CAN Bus	-
Audio	Interface	HD Audio
Ethernet	Controller	1 Intel® I219
I/O	USB	4 USB 3.0, 8 USB 2.0
	SATA	4 SATA 3.0 (RAID)
	IDE	-
	SSD	-
	eMMC	-
	DIO	8-bit DIO
TPM		optional
iAMT		iAMT 11.0
Power		12V, 5VSB, VCC_RTC (ATX mode) 12V, VCC_RTC (AT mode)
Operating Temperature		-40°C~85°C, 0°C~60°C

QM170
CM236

COMe Type 6

Wide Temp

Model Name		**SH960MD-CM236/QM170**
Compliance		COM Express® R2.1 Basic, Type 6
System	Processor	6th Gen Intel® Core™
	Socket	BGA 1440
	Max. Speed	1.9~3.5GHz
	TDP	25W/35W/45W
	Cache	2M/3M/6M/8M
	Chipset	Intel® CM236/QM170
	BIOS	Insyde SPI 128Mbit
Memory	Technology	Dual Channel DDR4 2400MHz
	Max. Capacity	16GB
	Socket	Memory down
Graphics	Interface	1 VGA*/DDI, 1 LVDS*/eDP, 2 DDI
Expansion	PCIe	1 PCIe x16 / 2 PCIe x8, 8 PCIe x1
	PCI	-
	LPC	1
	I^{2}C	1
	SMBus	1
	CAN Bus	-
Audio	Interface	HD Audio
Ethernet	Controller	1 Intel® I210
I/O	USB	4 USB 3.1, 8 USB 2.0
	SATA	4 SATA 3.0 (RAID)
	IDE	-
	SSD	-
	eMMC	-
	DIO	8-bit DIO
TPM		optional
iAMT		-
Power		12V, 5VSB, VCC_RTC (ATX mode) 12V, VCC_RTC (AT mode)
Operating Temperature		-40°C~85°C

*Populated by default

COMe Type 6

Wide Temp

HM170

Model Name		SH960-HM170
Compliance		COM Express® R2.1 Basic, Type 6
System	Processor	6th Gen Intel® Core™
	Socket	BGA 1440
	Max. Speed	1.6~3.5GHz
	TDP	25W/35W/45W
	Cache	2M/3M/6M/8M
	Chipset	Intel® HM170
	BIOS	Insyde SPI 128Mbit
Memory	Technology	Dual Channel DDR4 2133MHz
	Max. Capacity	32GB
	Socket	2 SODIMM
Graphics	Interface	1 VGA*/DDI, 1 LVDS*/eDP, 2 DDI
Expansion	PCIe	1 PCIe x16 / 2 PCIe x8, 8 PCIe x1
	PCI	-
	LPC	1
	I^{2}C	1
	SMBus	1
	CAN Bus	-
Audio	Interface	HD Audio
Ethernet	Controller	1 Intel® I219
I/O	USB	4 USB 3.0, 8 USB 2.0
	SATA	4 SATA 3.0
	IDE	-
	SSD	-
	eMMC	-
	DIO	8-bit DIO
TPM		optional
iAMT		iAMT 11.0
Power		12V, 5VSB, VCC_RTC (ATX mode) 12V, VCC_RTC (AT mode)
Operating Temperature		-40°C~85°C, 0°C~60°C

COMe Type 6

Wide Temp

AMD

Model Name		GH960
Compliance		COM Express® R3.0 Basic, Type 6
System	Processor	AMD® Ryzen™ V1000 Embedded Processors
	Socket	FP5 BGA
	Max. Speed	2~3.8GHz
	TDP	12/54W
	Cache	4/8M
	Chipset	-
	BIOS	Insyde SPI 64Mbit
Memory	Technology	Dual Channel DDR4 up to 2400/3200MHz
	Max. Capacity	32GB
	Socket	2 SODIMM
Graphics	Interface	1 VGA*/DDI, 1 LVDS*/eDP, 2 DDI
Expansion	PCIe	1 PCIe x16 / 2 PCIe x8, 8 PCIe x1
	PCI	-
	LPC	1
	I^{2}C	1
	SMBus	1
	CAN Bus	-
Audio	Interface	HD Audio
Ethernet	Controller	1 Intel® I210
I/O	USB	4 USB 3.1, 8 USB 2.0
	SATA	4 SATA 3.0 (RAID)
	IDE	-
	SSD	-
	eMMC	-
	DIO	8-bit DIO
TPM		optional
iAMT		-
Power		12V, 5VSB, VCC_RTC (ATX mode), 12V, VCC_RTC (AT mode)
Operating Temperature		-40~85°C, 0~60°C

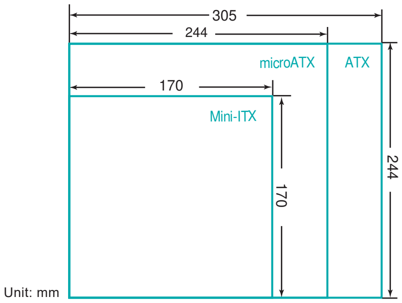
*Populated by default

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		COM333-I
Compliance		COM Express® R3.0, Type 7
Form Factor		microATX (244 x 244 mm)
Graphics	Connector	1 VGA via BMC
Expansion	PCIe, PCI	2 x PCIe x4/ 1 x PCIe x8
	Mini PCIe, M.2	-
	SIM	-
Audio	Audio Codec	-
Rear I/O	Ethernet (GbE)	2 GbE, 4 10Gbase-KR(2 RJ45, 2 SFP+)
	Serial	-
	USB	4 USB 3.0/2.0
	Display	-
	Audio	-
	PS/2	-
Internal I/O	Serial	1 (TX/RX)
	USB	-
	Display	-
	Audio	-
	SATA	2 SATA 3.0
	DIO	8-bit DIO
	LPC	1
	SMBus	1
	I^{2}C	1
Power		4-pin ATX 12V, 24-pin ATX
Operating Temperature		0°C~60°C

*Populated by default

Model Name		COM100-B
Compliance		COM Express® R2.1, Type 10
Form Factor		Mini-ITX (170 x 170 mm)
Graphics	Connector	1 LVDS, 1 DP
Expansion	PCIe, PCI	1 PCIe x1
	Mini PCIe, M.2	3 Mini PCIe
	SIM	1
Audio	Audio Codec	Realtek ALC886
Rear I/O	Ethernet (GbE)	1
	Serial	2 RS-232
	USB	2 USB 3.0, 4 USB 2.0
	Display	1 DP
	Audio	Mic-in, Line-in, Line-out
	PS/2	-
Internal I/O	Serial	2 (TX/RX)
	USB	-
	Display	1 LVDS
	Audio	Front Audio, S/PDIF
	SATA	1 SATA 3.0
	DIO	8-bit DIO
	LPC	1
	SMBus	1
	I^2C	1
Power		5~19V DC-in
Operating Temperature		0°C~60°C

Model Name		COM332-B(R.A)	COM332-B(R.B1)
Compliance		COM Express® R2.1, Type 6	COM Express® R2.1, Type 6
Form Factor		microATX (244 x 244 mm)	microATX (244 x 244 mm)
Graphics	Connector	1 VGA 1 LVDS*/eDP,, 3 DP, 1 eDP*/LVDS	1 VGA 1 LVDS*/eDP,, 3 DP, 1 eDP*/LVDS
Expansion	PCIe, PCI	1 PCIe x16, 6 PCIe x1	1 PCIe x16, 4 PCIe x1
	Mini PCIe, M.2	2 Mini PCIe	1 M.2
	SIM	-	-
Audio	Audio Codec	Realtek ALC888	Realtek ALC888
Rear I/O	Ethernet (GbE)	1	1
	Serial	-	-
	USB	4 USB 3.0, 4 USB 2.0	4 USB 3.1, 4 USB 2.0
	Display	3 DP	3 DP
	Audio	Mic-in, Line-in, Line-out	Mic-in, Line-in, Line-out
	PS/2	-	-
Internal I/O	Serial	2 (TX/RX)	2 (TX/RX)
	USB	-	-
	Display	1 VGA, 1 LVDS, 1 eDP	1 VGA, 1 LVDS, 1 eDP
	Audio	Front Audio, S/PDIF	Front Audio, S/PDIF
	SATA	4 SATA 3.0	4 SATA 3.0
	DIO	8-bit DIO	8-bit DIO
	LPC	1	1
	SMBus	1	1
	I^2C	-	-
Power		4-pin ATX 12V, 24-pin ATX	4-pin ATX 12V, 24-pin ATX
Operating Temperature		0°C~60°C	0°C~60°C

*Populated by default

Model Name		Q7X-151(R.A)	Q7X-151(R.D1)
Compliance		BT700	AL700 / AL701 / BT701
Form Factor		Mini-ITX (170 x 170 mm)	Mini-ITX (170 x 170 mm)
Graphics	Connector	1 LVDS, 1 DP	1 LVDS, 2 DP, 1 eDP
Expansion	PCIe, PCI	1 PCIe x4	2 PCIe
	Mini PCIe	-	2 Mini PCIe
	SIM	-	-
Audio	Audio Codec	Realtek ALC886	Realtek ALC886
Rear I/O	Ethernet (GbE)	1	1
	Serial	2 RS-232	2 RS-232
	USB	1 USB 3.0, 2 USB 2.0	3 USB 3.0, 6 USB 2.0
	Display	1 DP	1 DP
	Audio	Mic-in, Line-in, Line-out	Mic-in, Line-in, Line-out
	PS/2	-	-
Internal I/O	Serial	1 (TX/RX)	1 (TX/RX)
	USB	4 USB 2.0 (optional)	2 USB 2.0 (optional)
	Display	1 LVDS	1 LVDS
	Audio	-	-
	SATA	2 SATA 3.0	2 SATA 3.0
	DIO	-	-
	LPC	1	1
	SMBus	1	1
	I^{2}C	1	1
	CAN Bus	1	1
Power		12V DC-in	12V DC-in
Operating Temperature		0°C~60°C	0°C~60°C

Model Name		Q7A-551
Compliance		FS700
Form Factor		Proprietary (190 x 102 mm)
Graphics	Connector	1 HDMI, 1 LVDS
Expansion	PCIe, PCI	-
	Mini PCIe	1 Mini PCIe
	SIM	1
Audio	Audio Codec	I^{2}S
Rear I/O	Ethernet (GbE)	1
	Serial	1 RS-232/422/485, 1 RS232/UART
	USB	2 USB 2.0, 1 USB Client
	Display	1 HDMI
	Audio	Line-out / Mic-in
	PS/2	-
Internal I/O	Serial	1 RS-232/422/485
	USB	-
	Display	1 LVDS
	Audio	-
	SATA	-
	DIO	12-bit DIO
	LPC	-
	SMBus	-
	I^{2}C	-
	CAN Bus	1
Power		12~36V DC-in
Operating Temperature		0°C~60°C

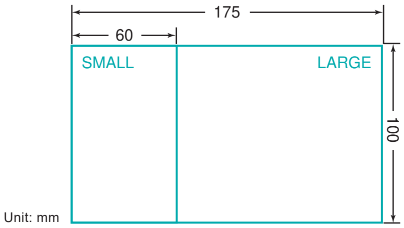
*Populated by default

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	1.7~4.4GHz
	TDP	15W
	Cache	2M/4M/6M/8M
	Chipset	-
	BIOS	AMI SPI 128Mbit
Memory	Technology	Dual Channel DDR4 2400MHz
	Max. Capacity	32GB
	Socket	2 SODIMM
Graphics	Interface	1 DP, 2 HDMI
Expansion	PCIe	1 PCIe x1 for docking, 1 PCIe x4 for M.2 M Key, 1 PCIe x1 for M.2 B Key, 1 PCIe x1 for M.2 E Key
	PCI	-
	LPC	-
	I^{2}C	1 I^{2}C master, 1 I^{2}C slaver (for docking)
	SMBus	-
	CAN Bus	-
Audio	Interface	HD Audio
Ethernet	Controller	1 Intel® I219
I/O	USB	4 USB 3.1 (Type A), 1 USB 3.1 (Type C)
	SATA	-
	IDE	-
	SSD	-
	eMMC	-
	DIO	-
	SD	-
TPM		Option
iAMT		iAMT 12.0 (Core i7/i5)
Power		12V DC-in
Operating Temperature		0°C~60°C

*Populated by default

Headquarters
DFI Inc.
10F, No.97, Sec.1, Xintai 5th Rd.
Xizhi Dist., New Taipei City 22175
Taiwan (R.O.C.)
Tel: +886 (2) 2697-2986
Fax: +886 (2) 2697-2168
www.dfi.com
estore.dfi.com

DFI AMERICA, LLC.
197 Route 18 South, STE 108, East
Brunswick, NJ 08816, U.S.A.
Tel: +1 (732) 390-2815
Fax: +1 (732) 562-0693
us.dfi.com
www.dfi-itox.com/estore

Diamond Flower Information (NL) B.V.
Klompenmakerstraat 89, 3194 DD
Rotterdam Hoogvliet, The Netherlands
Tel: +31 (10) 313-4100
Fax: +31 (10) 313-4101
www.dfi.com

DFI Co., Ltd.
5F Dai2 Denpa Bldg. 2-14-10 Sotokanda
Chiyoda-ku, Tokyo, 101-0021, Japan
Tel: +81 (3) 5209-1081
Fax: +81 (3) 5209-1082
www.dfi.com

Yan Ying Hao Trading Co., Ltd. (Shenzhen)
Room 1501, Building C, Yuking Centre, No.
7, Qingquan Rd, Longhua Dist., Shenzhen,
China
Tel: +86 (0755) 2372-9390/2372-9391
www.dfi.com

Value-Added Services

eStore

Easy / Fast / Convenient

Provides you around-the-clock services worldwide

Online Technical Service

Real-Time / Professional / 24/7

Resolves your technical questions on the spot