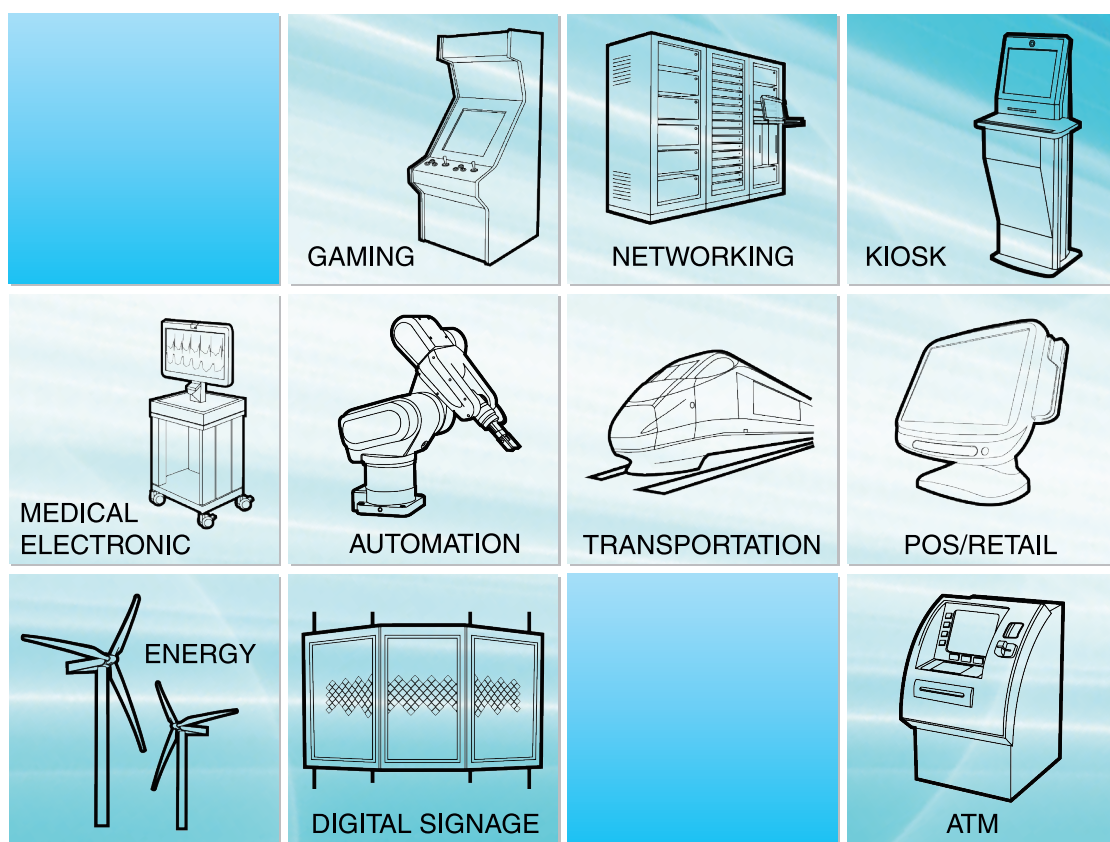


Industrial Platform Solution

We Customize Your Business



Ready platforms for time to market integration in industrial applications

Table of Contents

Overview	About MSI IPC	3
	Our Strengths	4
	Software Services Provided	5
	Product Solution Guide	6
	Industrial Platform Solution	10
	Semi-rugged Terminal, POS System	11
Product Selection Guide	HMI Panel PC	12
	Embedded System	15
	Embedded Board	18
Semi-Rugged Terminal	Semi-rugged Terminal ▶ MS-9A80	35
POS System	POS System ▶ MS-9A82	36
HMI Panel PC	HMI Panel PC ▶ MS-HMIR121A	37
	MS-HMIR150A	38
	MS-HMIR170A	39
	MS-HMIR185A	40
	MS-HMIR190A	41
	MS-HMIR215A	42
	MS-HMIC070A	43
	MS-HMIC101A	44
	MS-HMIC104A	45
	MS-HMIC121A	46
	MS-HMIC150A	47
	MS-HMIC170A	48
	MS-HMIC190A	49
	MS-HMIC215A	50
	MS-9A91	51
Embedded Systems	X86-based Systems ▶ MS-9A76	52
	MS-9A66	53
	MS-9A89	54
	MS-9A79	55
	MS-9A59	56
	MS-9A69	57
	MS-9A78	58
	MS-9A68	59
	MS-9A95	60
	MS-9A75	61
	MS-9A65	62
Embedded Mainboards	COM Express Board ▶ MS-98H7	63
	MS-98F7	64
	MS-98D7	65
	MS-9988	66
	Qseven Board ▶ MS-98H2	67
	MS-99A1	68
	Pico-ITX Board ▶ MS-98I6	69
	MS-98H6	70



3.5" Board ▶	MS-98J8	71
	MS-98H3	72
	MS-98E6	73
	MS-98I8	74
	MS-98G6	75
	MS-98F6	76
	MS-98F3	77
EPIC Board ▶	MS-98H5	78
PICMG 1.0 Board ▶	MS-98G7	79
Mini-ITX Board ▶	MS-98K1	80
	MS-98E1	81
	MS-98H1	82
	MS-98C7	83
	MS-98B3	84
	MS-98J4	85
	MS-98H4	86
	MS-98G5	87
	MS-98B1	88
	MS-98J0	89
	MS-9892	90
	MS-98F1	91
	MS-98I0	92
	MS-98F5	93
	MS-98E3	94
	MS-98C8	95
	MS-9899	96
	MS-9887	97
	Micro-ATX Board ▶	MS-98E2
MS-98G3		99
MS-98D6		100
ATX Board ▶	MS-98K9	101
	MS-98L9	102
	MS-98H9 V2.0	103
	MS-98H9	104
	MS-98B5	105
	MS-98A9	106
Mini PCIe Module ▶	MS-99C5	107
Full-Size Mini-PCIe		

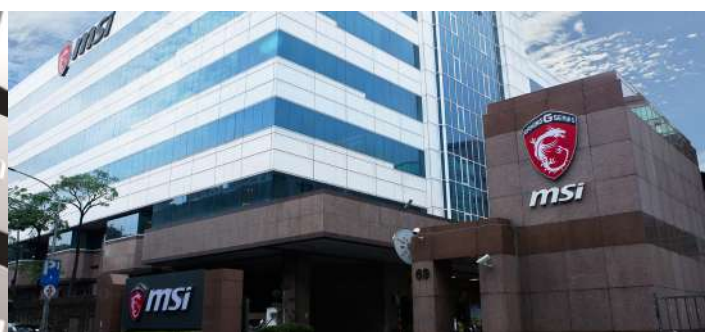
About MSI Industrial Platform Solution (IPC Business Unit in MSI group)

MSI has more than 30 years' of experience in motherboard design & manufacturing, ranked among the world's top 3 largest motherboard manufacturers, recognized internationally for high quality and stability by clients and individual users.

In Y2006, MSI entered Embedded and Industrial market development, and started providing reliable and expandable product with longevity support (5 to 7 Years).

We design & manufacture high-quality embedded boards and systems for various applications, such as **digital signage, medical electronics, ATM, POS, Kiosk, industrial automation, gaming, utility, and transportation.**

With solid R&D and manufacturing capability, we serves client with efficient DMS (Design, Manufacturing & Service) solution, and is poised to become the best partner for worldwide partner in Embedded and Industrial market.



Our Strengths



1. Various Solutions:

Providing various systems based on x86 and RISC platforms.

2. Energy Saving:

Through experienced system design to reduce heat generation and increase operation reliability.

3. Strict Quality Control:

Through a 7-stage of QC system from design to mass production is able to assure the quality.

4. Multi Compliance*:

FCC, CE, RCM, BSMI, VCC, WEEE, GOST, CCC and RoHS compliant.

5. High R&D Capability:

In IPS team, 55% with 5-10 years of experience and 35% with over 10 years of experience

6. Longevity support:

We manage to offer a comprehensive longevity services and work closely with you to help new and existing products.

*Actual compliance is followed as shown on product specifications.

MSI DMS



DMS (Design Manufacture Service)

- Intel® member and commitment.
- Over 150 choices of board solutions for time-to-market.
- Speedy ODM process in 3 months.
- Experienced firmware, software, and hardware engineering.

Design for System Integration SBC

- 2D/3D mechanical design team.
- Embedded OS porting.
- OS pre-installed test, function validation, system burn-in and testing.
- Private branding services.

Manufacturing Capability

- PCBA production line, lead-free ready!
- System assembly line and dynamic burn-in rooms.
- Complete quality assurance systems.
- Certified by ISO 9001, ISO 14001, OHSAS 18001, ISO 13485, QC 080000, and ISO/TS 16949.

Service

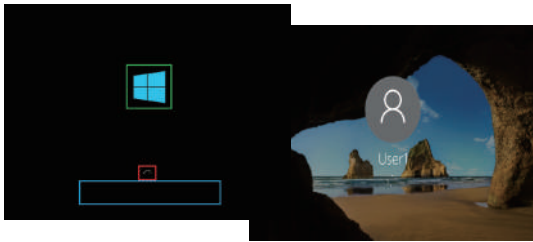
- Rich application know-how and act as your consultant.
- Always be customer-oriented and flexible to fulfill your needs globally.
- Long-term partnership and customer satisfaction.
- Act as your virtual design house and manufacturing site.

SOFTWARE SERVICES PORVIDED

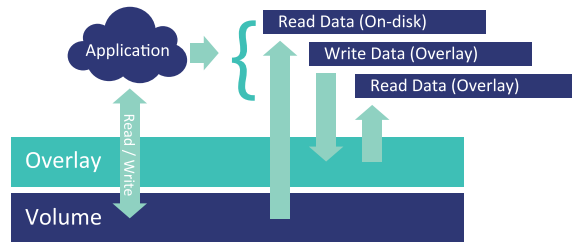
1. Embedded OS Customization

- POSReady 7
- Industry 8.1
- Windows 10 IoT LTSP*/CBB#
- WES7 E/P
- WES 8
- *: Long Term Service Branch
- #: Current Branch for Business

UnBranded Boot / Custom Logon



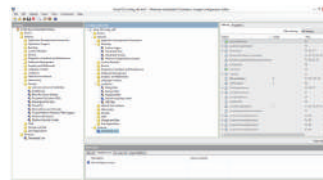
Write Filter



Keyboard Filter



OS Configuration Tool for Advanced build



And other embedded Features:

- Toast Notification Blocking
- USB Filter
- Assigned Access
- Shell Launcher

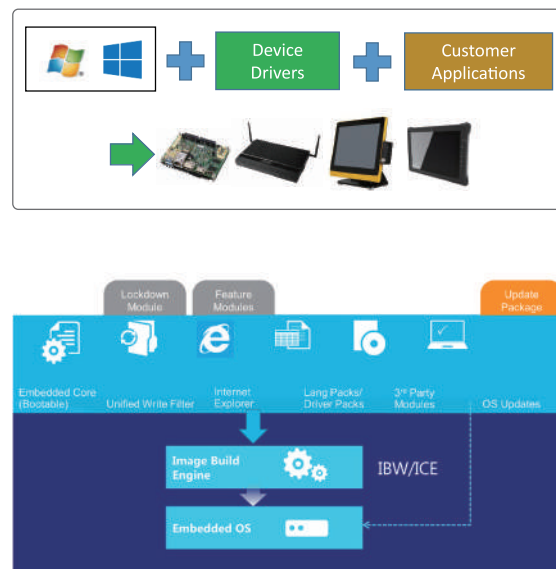
2. HIDAC Utility & API/Drivers

Hardware Information & Device Access Control

Hardware Management	Device Access Control
<p>Information of</p> <ul style="list-style-type: none"> • System • Utility • Memory • Disk Drive Usager 	<p>LVDS/eDP Panel Brightness Level from 1 to 5 (100%)</p>
<p>Hardware Monitor</p> <ul style="list-style-type: none"> • Temperature • Voltage • FAN Speed 	<p>Cash Drawer Open & Status Supported on models with RJ11 Cash Drawer port</p>
<p>Alarm Logs</p> <ul style="list-style-type: none"> • Real-time display of Hardware Monitor alarm logs 	<p>On Board GPIO Pin header</p> <ul style="list-style-type: none"> • Real-time display of GPIO status • Selectable GPO status
	<p>Watchdog Timer Operation Real-time display and control of Watchdog Timer</p>

3. Embedded OS Integration

Integrated Microsoft Embedded OS with device driver and customer's application by customer request



Product Solution Guide

		Automation	Digital Signage	Gaming	Industrial
Semi-Rugged Terminal ▶	MS-9A80	*	*		*
POS System ▶	MS-9A82	*			*
HMI Panel PC ▶	MS-HMIR121A	*			*
	MS-HMIR150A	*			*
	MS-HMIR170A	*			*
	MS-HMIR185A	*			*
	MS-HMIR190A	*			*
	MS-HMIR215A	*			*
	MS-HMIC070A	*			*
	MS-HMIC101A	*			*
	MS-HMIC104A	*			*
	MS-HMIC121A	*			*
	MS-HMIC150A	*			*
	MS-HMIC170A	*			*
	MS-HMIC190A	*			*
	MS-HMIC215A	*			*
	MS-9A91	*			*
X86-based Systems ▶	MS-9A76	*	*	*	*
	MS-9A66	*	*	*	*
	MS-9A89	*	*		*
	MS-9A79	*	*		*
	MS-9A59	*	*		*
	MS-9A69	*	*		
	MS-9A78	*	*		
	MS-9A68	*	*		
	MS-9A95		*		*
	MS-9A75		*		
	MS-9A65		*		
COM Express Board ▶	MS-98H7	*		*	*
	MS-98F7	*		*	*
	MS-98D7	*		*	*
	MS-9988	*		*	*
Qseven Board ▶	MS-98H2	*			*
	MS-99A1	*			*
Pico-ITX Board ▶	MS-98I6	*	*		*
	MS-98H6	*	*		*
3.5" Board ▶	MS-98J8	*	*		*

	IoT	Medical	Transportation	POS/Retail	Energy	Kiosk
MS-9A80	*	*	*	*	*	
MS-9A82			*	*		*
MS-HMIR121A	*		*			*
MS-HMIR150A			*			*
MS-HMIR170A			*			*
MS-HMIR185A			*			*
MS-HMIR190A			*			*
MS-HMIR215A			*			*
MS-HMIC070A	*		*			
MS-HMIC101A	*		*			
MS-HMIC104A	*		*			
MS-HMIC121A	*		*			*
MS-HMIC150A			*			*
MS-HMIC170A			*			*
MS-HMIC190A			*			*
MS-HMIC215A			*			*
MS-9A91			*			*
MS-9A76	*	*	*	*	*	
MS-9A66	*	*	*	*		
MS-9A89	*		*			*
MS-9A79	*		*			*
MS-9A59	*		*			*
MS-9A69	*	*	*			*
MS-9A78	*				*	*
MS-9A68	*				*	*
MS-9A95	*		*	*	*	*
MS-9A75	*		*		*	*
MS-9A65	*		*		*	*
MS-98H7		*	*	*	*	*
MS-98F7		*	*	*		*
MS-98D7		*	*	*		*
MS-9988		*	*	*		*
MS-98H2			*			
MS-99A1			*			
MS-98I6	*	*	*			*
MS-98H6	*		*			*
MS-98J8	*	*	*			*

Product Solution Guide

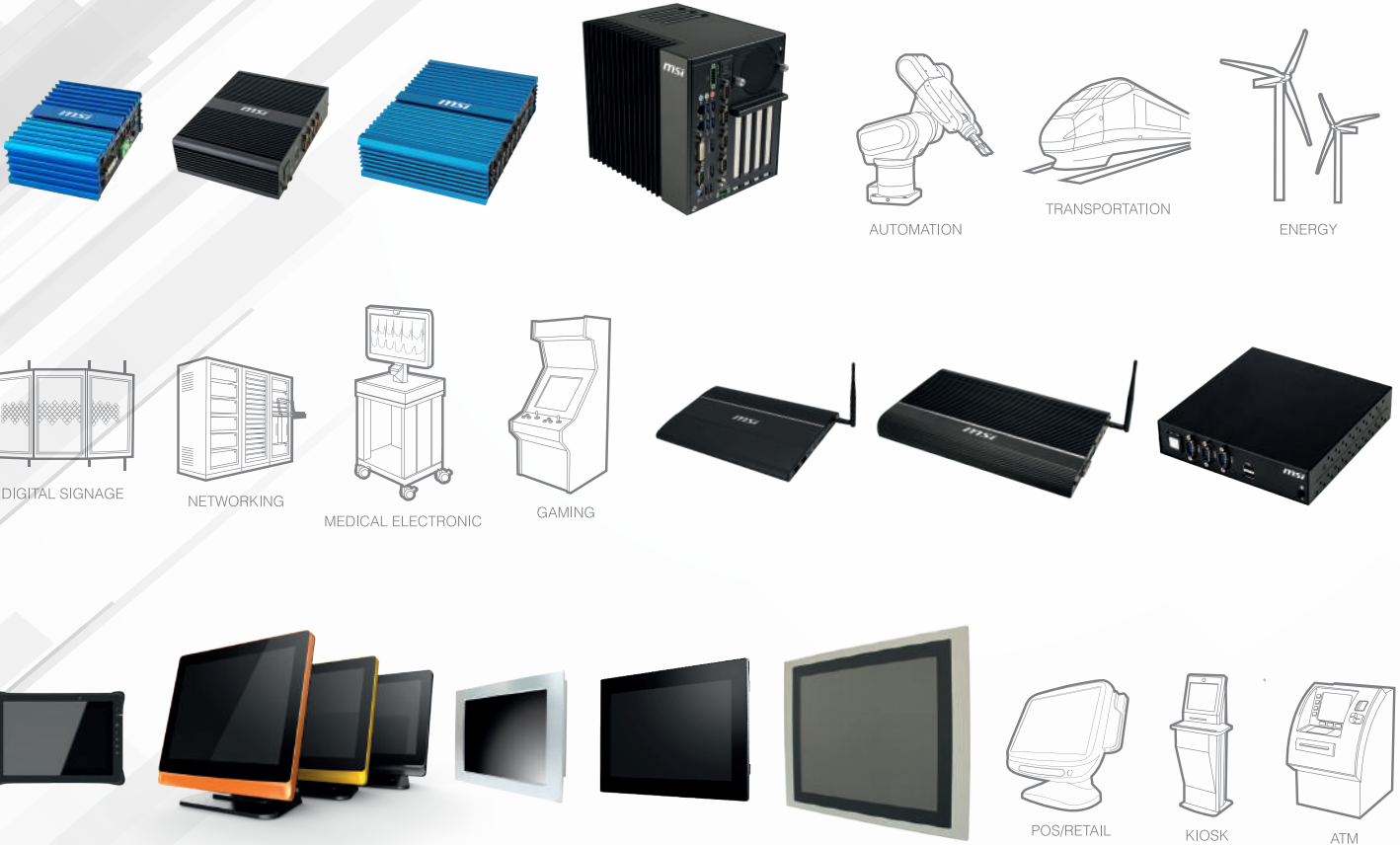
		Automation	Digital Signage	Gaming	Industrial	
3.5" Board ▶	MS-98H3	*	*		*	
	MS-98E6	*	*		*	
	MS-98I8	*	*		*	
	MS-98G6	*	*		*	
	MS-98F6	*	*		*	
	MS-98F3	*	*		*	
EPIC Board ▶	MS-98H5	*			*	
PICMG 1.0 Board ▶	MS-98G7	*			*	
Mini-ITX Board ▶	MS-98K1	*		*	*	
	MS-98E1	*		*		
	MS-98H1	*				
	MS-98C7		*	*		
	MS-98B3		*	*		
	MS-98J4		*	*		
	MS-98H4		*		*	
	MS-98G5		*	*		
	MS-98B1	*	*		*	
	MS-98J0	*	*		*	
	MS-9892	*			*	
	MS-98F1	*	*	*	*	
	MS-98I0	*	*		*	
	MS-98F5	*	*		*	
	MS-98E3	*	*	*	*	
	MS-98C8	*	*			
	MS-9899	*	*	*	*	
	MS-9887	*	*		*	
	Micro-ATX Board ▶	MS-98E2	*		*	
		MS-98G3				
MS-98D6		*		*		
ATX Board ▶	MS-98K9	*			*	
	MS-98L9	*			*	
	MS-98H9 V2.0	*			*	
	MS-98H9	*			*	
	MS-98B5	*			*	
	MS-98A9	*			*	
	MS-98H6	*				
Full-Size Mini-PCIe ▶	MS-99C5					

	IoT	Medical	Transportation	POS/Retail	Energy	Kiosk
MS-98H3	*	*	*			*
MS-98E6	*	*	*			*
MS-98I8	*	*	*			*
MS-98G6	*	*	*			*
MS-98F6	*	*	*			*
MS-98F3	*	*	*			*
MS-98H5			*	*		
MS-98G7						
MS-98K1						
MS-98E1						
MS-98H1						
MS-98C7		*				*
MS-98B3	*	*				*
MS-98J4	*	*		*		*
MS-98H4	*			*		*
MS-98G5	*	*	*			*
MS-98B1		*		*		*
MS-98J0		*		*		
MS-9892					*	*
MS-98F1	*	*	*	*	*	*
MS-98I0	*	*	*	*		*
MS-98F5	*	*	*	*		*
MS-98E3	*	*	*	*		*
MS-98C8	*					*
MS-9899			*			*
MS-9887				*		*
MS-98E2						
MS-98G3						*
MS-98D6						*
MS-98K9						
MS-98L9		*				
MS-98H9 V2.0						
MS-98H9						
MS-98B5						
MS-98A9						
MS-98H6						
MS-99C5				*		

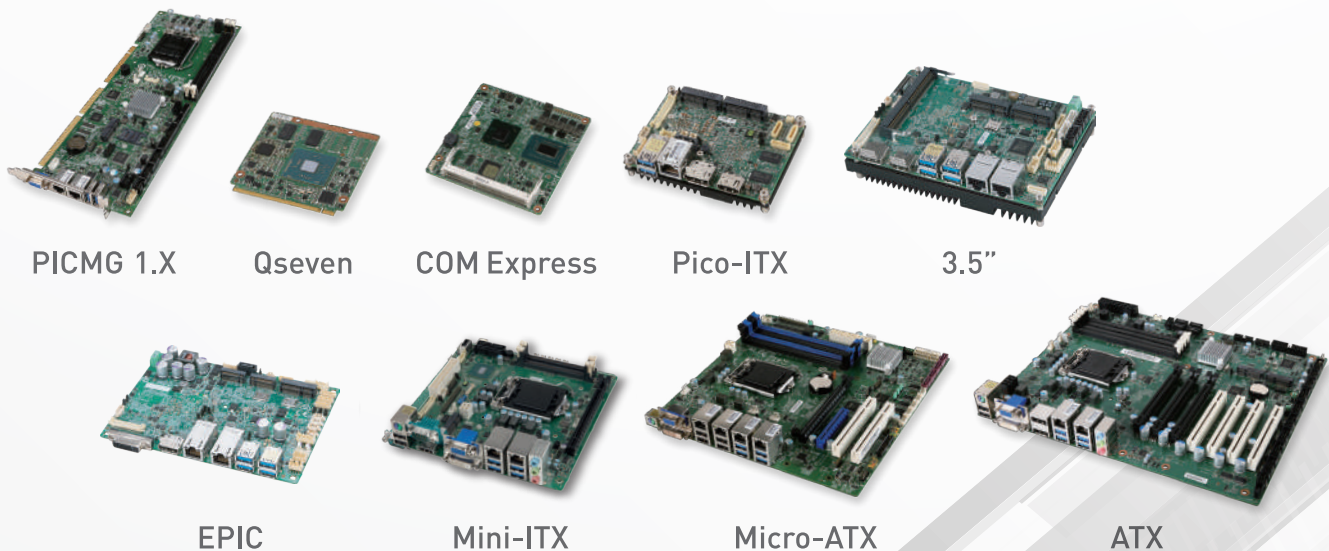
Industrial Platform Solution

We Customize Your Business

Embedded Systems Compact, Fanless, Reliable



Embedded Boards Rich in Variety





Model		MS-9A80
		Semi-rugged Terminal
Display	LCD Size	10.1"
	Resolution	1280x800
	Brightness (cd/m ²)	300
	Contrast Ratio	1300:1
	Support Colors	16.2M
	Pixel Pitch (H/Vmm)	0.264x0.264
	Viewing Angle	H: 170 degree, V: 170 degree
Touch Panel		PCAP, 10-points Multi-touch screen, w/AR
System Processor	CPU	Intel® Celeron® Processor N3010, DC, 4W
	Frequency	1.04 GHz, up to 2.24GHz
	L2 Cache	2 MB
	CPU Type	BGA
	Chipset	N/A
Memory	BIOS	AMI
	Technology	Single-channel DDR3L SO-DIMM 1600MHz
	Max. Capacity	4GB (up to 8GB)
Storage	Socket	1 x 204-pin SO-DIMM
	mSATA	32G (up to 128G)
Communication	WLAN	WiFi 802.11 a/b/g/n/ac
	Bluetooth	Bluetooth v4.0
	3G/4G LTE	Optional 3G/4G LTE
	GPS	Optional GPS
Button	5 buttons (Power; Barcode reader trigger; 3 Programming Button)	
LED indicator	Power LED	
Sensor	G-Sensor, Geomagnetic sensor, Gyro sensor, Light sensor	
Camera	Front Camera	2MP camera
	Rear Camera	5MP autofocus camera
I/O Interface	DC	1
	USB	1 x USB 3.0
	Audio	1 (Earphone/Mic-in)
	HDMI	1 (HDMI 1.4b)
	Docking	1 (docking connector)
	Speaker	1
Power Supply	DC Input	DC-in 12V/19V/24V
	LAN	10/100Base-T Ethernet (RJ45)
Optional I/O Module (select 1 out of 5)	USB	1 x USB 2.0
	Barcode Reader	1D/2D barcode scanner
	Serial Port	D-sub 9-pin RS-232 port
	MicroSD	MicroSD slot
	RFID	Optional 13.56MHz RFID
Expansion Slot	SIM Card Slot	Nano type
	M.2	1 x E Key (PCIe x1, USB 2.0), 2230
	Mini-PCIe	2 x Full-size (one for mSATA; one for 3G/4G LTE module)
Battery	Type	Li-polymer battery (11.1V, 4000mAh), up to 8 hours(a)
Power Supply	DC	DC-in 19V
	AC	Optional 65W external AC-DC adapter for AC input
Environment	Operating Temperature	-10°C ~ 50°C
	Operating Humidity	95% RH, non-condensing
	Storage Temperature	-20°C ~ 60°C
	Storage Humidity	95% RH, non-condensing
	Storage Humidity	10% ~ 90% non-condensing
Physical Characteristics	IP Rating	Full IP65
	Drop Resistant	1.2m drop design
	Vibration Resistant	Meet MIL-STD-810G method 514.6, procedure I (operating)
Certification	Dimensions (W x H x D)	300 x 212 x 25 mm(b)
	Weight	Under 1.4kg(c)
Certification	EMC	FCC, CE, RCM, VCCI
	Safety	CB
Software Platform	OS Support	Windows 7 (64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit)

(a) The battery life will vary by system setting and configuration.
 (b) The weight & dimensions are subject to change before mass production stage.
 (c) Product specifications are subject to change without notice

Model		MS-9A82	
		POS System	
Display	LCD Size	15"	
	Resolution	1024 x 768	
	Brightness (cd/m ²)	350	
	Contrast Ratio	700:1	
	Support Colors	16.2M/262K	
	Pixel Pitch (H/Vmm)	0.297x0.297	
	Viewing Angle	H: 150~170 degree V: 140~160 degree	
Touch Panel		5-wire resistive touch panel PCAP touch panel(Optional)	
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W	
	Frequency	2.0 GHz	
	L2 Cache	2MB	
	CPU Type	FCBGA1170	
	Chipset	SoC	
	BIOS	AMI	
Memory	Technology	Dual-channel DDR3L SO-DIMM 1333MHz	
	Max. Capacity	Up to 8GB	
	Socket	2 x 204-pin SO-DIMM	
Graphic	Graphic Controller	Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 224 MB SDRAM	
	Multiple Display	2 independent displays	
	Display Interface	VGA up to 2560 x 1600 @60Hz	
Ethernet	Controller	1 x Realtek® 8111E VL-CG GbE LAN	
Audio	Controller	Realtek® ALC887 HD Audio Codec	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	
Expansion Slot	M.2	N/A	
	Mini-PCIe	1 x Full-size (for mSATA only) 1 x Half-size	
Storage	SATA	1 x 2.5" HDD/SSD	
	mSATA	1 (Optional)	
	RJ-45	1 x Line-out	
I/O Interface	Audio	1 x USB 3.0 5 x USB 2.0	
	USB	2 x RS-232/422/485(D-Sub) 2 x RS-232(RJ45 Type) (all w/+5V/+12V selectivity by BIOS)	
	Serial	1	
	PS/2	1	
	VGA	1	
	Power Supply	DC Input	DC-In 12V
		IP Rating	IP65 Front
Environment	Operating Temperature	0~40°C (HDD) 0~50°C (SSD or mSATA)	
	Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-20°C ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing	
	Vibration	Operating, 0.25 Grms, 5-300 Hz, 3 aes	
	Shock	Operating, 3 G, half sine 11 ms	
	Physical Characteristics	Housing	SGCC, PC+ABS
MSR		3-Track MSR (USB)	
iButton		iButton (USB)	
2nd Display		8" without touch (USB)	
Customer Display		VFD, 2 x 20 characters (COM)	
Dimensions (W x H x D)		365 x 340 x 208mm	
Certification	Weight	7 kg	
	Mounting	VESA mount(100)	
	EMC	FCC, CE, RCM, VCCI, BSMI	
Software Platform	Safety	CB	
	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Linux Kernel 3.11+	

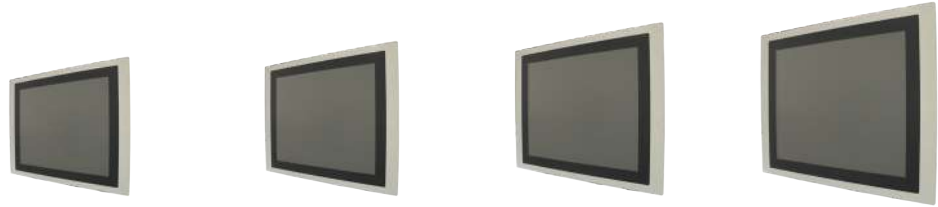
Semi-rugged Terminal
 POS System
 HMI Panel PC
 Embedded System
 Embedded Board
 COM Express Board
 0seven Board
 Pico-ITX Board
 3.5" Board
 EPIC Board
 PICMG 1.0 Board
 Mini-ITX Board
 Micro-ATX Board
 ATX Board
 Mini-PCIe Module

NEW



Model		MS-HMIR121A	MS-HMIR150A	MS-HMIR170A	MS-HMIR185A	MS-HMIR190A	MS-HMIR215A
HMI Panel PC							
Display	LCD Size	12.1"	15"	17"	18.5"	19"	21.5"
	Resolution	1024x768	1024x768	1280x1024	1366x768	1280x1024	1920x1080
	Brightness (cd/m ²)	500	400	350	300	250	300
	Contrast Ratio	700:1	700:1	1000:1	1000:1	1000:1	3000:1
	Support Colors	16.2 M	16.2 M	16.7 M	16.7 M	16.7 M	16.7 M
	Pixel Pitch (H/Vmm)	0.24 x 0.24	0.297 x 0.297	0.264 x 0.264	0.3 x 0.3	0.294 x 0.294	0.248 x 0.248
	Viewing Angle	H: 160 degree V: 160 degree	H: 160 degree V: 140 degree	H: 170 degree V: 160 degree	H: 170 degree V: 160 degree	H: 170 degree V: 160 degree	H: 178 degree V: 178 degree
Touch Panel	5-wire resistive touch panel						
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W					
	Frequency	2.0 GHz, up to 2.42 GHz					
	L2 Cache	2MB					
	Chipset	SoC					
Memory	Technology	Dual-channel DDR3L 1333 MHz					
	Max. Capacity	Up to 8GB					
	Socket	1 x 204-pin SO-DIMMs (Optional 1)					
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz					
Ethernet	Controller	1 x Realtek® RTL8111G-CG GbE LAN Optional : 1					
Expansion Slot	Mini-PCIe	1 x Full-size (w/ mSATA)					
Storage	SATA	1 x 2.5" HDD/SSD					
	mSATA	1					
I/O Interface	RJ-45	2 (Optional 1)					
	Audio	1 x Mic-in, 1 x Line-out					
	USB	4 x USB 2.0					
	Serial	2 x COM ports COM1: RS-232, 0V/5V/12V COM2: RS-232, w/o power					
	PS/2	N/A					
	HDMI	N/A					
	DVI	N/A					
	DisplayPort	N/A					
	VGA	1					
	Antenna	1 opening reserved for antenna					
Power Supply	DC Input	DC-in 12V					
	IP Rating	IP65 Front					
Environment	Operating Temperature	0°C ~ 45°C					
	Operating Humidity	10% ~ 90% non-condensing					
	Storage Temperature	-20°C ~ 80°C	-10°C ~ 70°C				
	Storage Humidity	10% ~ 90% non-condensing					
	Housing	Aluminum					
Physical Characteristics	Dimensions (W x H x D)	354.9 x 264.7 x 99mm	400.9 x 303.7 x 93mm	453.5 x 352 x 89.7mm	521.7 x 317.6 x 95mm	487 x 376.8 x 93.9mm	581.3 x 337.2 x 93.6mm
	Weight	7.5 kg	9 kg	13 kg	13.5 kg	13.5 kg	13.5 kg
	Mounting	VESA 75, Panel Mount, Clip mount	VESA 100, Panel Mount, Clip mount				
Certification	EMC	CE (Class A)					
	Safety	N/A					
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)					

NEW



Model		MS-HMIC070A	MS-HMIC101A	MS-HMIC104A	MS-HMIC121A
HMI Panel PC					
Display	LCD Size	7"	10.1"	10.4"	12.1"
	Resolution	1024x600	1280x800	1024x768	1024x768
	Brightness (cd/m ²)	320	300	400	500
	Contrast Ratio	500:1	1300:1	1200:1	700:1
	Support Colors	16.7M	16.7M	16.2 M	16.2 M
	Pixel Pitch (H/Vmm)	0.15 x 0.15	0.1695 x 0.1695	0.2055 x 0.2055	0.24 x 0.24
	Viewing Angle	H: 150 degree V: 150 degree	H: 160 degree V: 160 degree	H: 180 degree V: 180 degree	H: 160 degree V: 160 degree
Touch Panel	Projective Capacitive touch panel				
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W			
	Frequency	2.0 GHz, up to 2.42 GHz			
	L2 Cache	2MB			
	Chipset	SoC			
Memory	Technology	Single-channel DDR3L 1333 MHz			
	Max. Capacity	Up to 8GB			
	Socket	1 x 204-pin SO-DIMM			
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz HDMI up to 1920 x 1080 @60Hz			
Ethernet	Controller	2 x Intel® I210-AT GbE LAN			
Expansion Slot	M.2	N/A			
	Mini-PCIe	2 x Full-size (one w/ mSATA)			
Storage	SATA	1 x 2.5" HDD/SSD			
	mSATA	1			
I/O Interface	RJ-45	2			
	Audio	N/A			
	USB	1 x USB 3.0 3 x USB 2.0			
	Serial	2 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232, 0V/5V/12V			
	PS/2	N/A			
	HDMI	1			
	DVI	N/A			
	DisplayPort	N/A			
	VGA	1			
	Antenna	1 opening reserved for antenna			
Power Supply	DC Input	DC-in 12V/19V/24V			
Environment	IP Rating	IP65 Front			
	Operating Temperature	0°C ~ 45°C			
	Operating Humidity	20%~90% RH			
	Storage Temperature	-20°C ~ 80°C			
	Storage Humidity	10% ~ 90% non-condensing			
Physical Characteristics	Housing	Aluminum			
	Dimensions (W x H x D)	232.3 x 166 x 62mm	301.7 x 207.8 x 57.5mm	297 x 240.1 x 59.8mm	332.2 x 262.7 x 61mm
	Weight	3 kg	4 kg	3 kg	4 kg
	Mounting	VESA 75, Panel Mount, Clip mount			
Certification	EMC	CE (Class A)			
	Safety	N/A			
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)			

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

NEW



Model		MS-HMIC150A	MS-HMIC170A	MS-HMIC190A	MS-HMIC215A	MS-9A91
HMI Panel PC						
Display	LCD Size	15"	17"	19"	21.5"	15.6"
	Resolution	1024x768	1280x1024	1280x1024	1920x1080	1366x768
	Brightness (cd/m ²)	400	350	250	300	300
	Contrast Ratio	700:1	1000:1	1000:1	3000:1	500:1
	Support Colors	16.2 M	16.7 M	16.7 M	16.7 M	16.7M
	Pixel Pitch (H/Vmm)	0.297 x 0.297	0.264 x 0.264	0.294 x 0.294	0.248 x 0.248	0.252 x 0.252
	Viewing Angle	H: 160 degree V: 140 degree	H: 170 degree V: 160 degree	H: 170 degree V: 160 degree	H: 178 degree V: 178 degree	H: 140~160 degree V: 140~160 degree
Touch Panel	Projective Capacitive touch panel					
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W				Intel® Atom™ Processor E3845, QC, 10W
	Frequency	2.0 GHz, up to 2.42 GHz				1.91 GHz
	L2 Cache	2MB				
	Chipset	SoC				
Memory	Technology	Dual-channel DDR3L 1333 MHz				Dual-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB				
	Socket	1 x 204-pin SO-DIMMs (Optional 1)				2 x 204-pin SO-DIMM
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz				
Ethernet	Controller	1 x Realtek® RTL8111G-CG GbE LAN, Optional : 1				2 x Realtek 8111E VL-CG GbE LAN
Expansion Slot	M.2	N/A				
	Mini-PCIe	1 x Full-size (w/ mSATA)				1 x Full-size (mSATA only) 1 x Half-size
Storage	SATA	1 x 2.5" HDD/SSD				
	mSATA	1				
I/O Interface	RJ-45	2 (Optional 1)				2
	Audio	1 x Mic-in, 1 x Line-out				1 x Line-out
	USB	4 x USB 2.0				5 x USB2.0, 1 x USB3.0
	Serial	2 x COM ports COM1: RS-232, 0V/5V/12V COM2: RS-232, w/o power				4 x COM ports COM1/4: RS-232/422/485 (0V/5V/12V) (D-Sub Type) COM2/3: RS-232 (0V/5V/12V) (RJ-45 Type)
	PS/2	N/A				
	HDMI	N/A				
	DVI	N/A				
	DisplayPort	N/A				
	VGA	1				
	Antenna	1 opening reserved for antenna				3 openings reserved for antennas
Power Supply	DC Input	DC-in 12V				DC-in 12V or 12V/19V/24V (by BOM option)
Environment	IP Rating	IP65 Front				IP65 Front / IP31 Rear
	Operating Temperature	0°C ~ 45°C				-10 ~ 45°C (HDD), -10 ~ 50°C (SSD)
	Operating Humidity	10% ~ 90% non-condensing				
	Storage Temperature	-10°C ~ 70°C				-20°C ~ 60°C
	Storage Humidity	10% ~ 90% non-condensing				
Physical Characteristics	Housing	Aluminum				SGCC, aluminum
	Dimensions (W x H x D)	441 x 322 x 81.1mm	483 x 376 x 70.8mm	528 x 414.4 x 71.8mm	607 x 395 x 72.8mm	418 x 271 x 60mm
	Weight	10 kg	14 kg	14.5 kg	14.5 kg	5.04 Kg
	Mounting	VESA 100, Panel Mount, Clip mount				VESA 75/100, Panel Mount
Certification	EMC	CE (Class A)				FCC, CE, RCM, VCCI, BSMI
	Safety	N/A				BSMI, CB
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)				Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Linux Fedora 20 Linux Ubuntu 13.10 (Kernel 3.11)



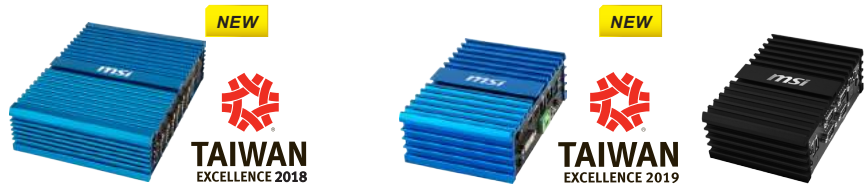
NEW



Model		MS-9A76			MS-9A66		
		Embedded System					
System Processor	CPU	7th/6th Gen Intel® Desktop Kaby Lake/Skylake Core™ i7/i5/i3/Celeron®/Pentium® Processor, Max. 65W			4th Gen Intel® Desktop Haswell Core™ i7/i5/i3/Celeron®/Pentium® Processor, Max. 35W		
	Frequency	2.3GHz~3.9 GHz (Depends on CPU)			2M~4M (Depends on CPU)		
	L2 Cache	2M~8M (Depends on CPU)			Socket (LGA1150)		
	CPU Type	Socket (LGA1151)			Intel® Q87 Express		
	Chipset	Intel® Q170 Express / Intel® C236 Express			Intel® Q87 Express	Intel® C226 Express	Intel® Q87 Express
	BIOS	AMI			AMI		
Memory	Technology	Dual-channel DDR4(non-ECC) 2133/2400MHz for Q170 Dual-channel DDR4(ECC) 2133/2400MHz for C236			Dual-channel DDR3 1600/1333MHz		
	Max. Capacity	Up to 32GB			Up to 16GB		
	Socket	2 x 260-pin SO-DIMMs			2 x 204-pin SO-DIMMs		
Graphic	Controller	Intel® HD Graphics			Intel® HD Graphics		
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM			Shared system memory up to 1.7 GB SDRAM		
	Multiple Display	3 Independent Displays			3 independent displays		
	Display Interface	DP up to 3840 x 2160 @60Hz DVI-I up to 1920 x 1200 @60Hz			DP up to 3840 x 2160 @60Hz DVI-I up to 1920 x 1200 @60Hz		
Ethernet	Controller	1 x Intel® I219GbE-PHY LAN (Support Intel AMT) 1 x Intel® I210-AT GbE LAN			1 x Intel® I217GbE-PHY LAN 1 x Intel® I210-AT GbE LAN		
Audio	Controller	Realtek® ALC887 HD Audio Codec			Realtek® ALC887 HD Audio Codec		
H/W Monitor	Watchdog Timer	256-level Watchdog Timer			256-level Watchdog Timer		
	Smart Fan	N/A			N/A		
TPM	Controller	Infineon SLB9665TT2.0			Infineon SLB9635TT1.2		
Expansion Slot	PCIe x16	1	N/A	1	N/A	N/A	1
	PCIe x8	N/A	2	N/A	N/A	2	N/A
	PCI	3	2	1	3	2	1
	M.2	N/A			N/A		
	Mini-PCIe	N/A		1 x Full-size (w/ mSATA)	N/A		1 x Full-size (w/ mSATA)
Storage	SATA	2 x 2.5" HDD/SSD			2 x 2.5" HDD/SSD		
	mSATA	N/A		1	N/A		1
	CFast	1			1		
I/O Interface	RJ-45	2			2		
	PoE	N/A			N/A		
	Audio	1 x Mic-in 1 x Line-out 1 x Line-in			1 x Mic-in / 1 x Line-out / 1 x Line-in		
	USB	6 x USB 3.0 5 x USB 2.0 (one port w/ security key)			4 x USB 3.0 / 3 x USB 2.0 (one port w/ security key)		
	Serial	5 x COM ports COM1~2: RS232/422/485, 0V/5V/12V COM3~5: RS-232, 0V			5 x COM ports COM1: RS232/422/485, 0V/5V/12V COM2: RS232/422/485, 0V COM3~5: RS-232, 0V		
	PS/2	1			1		
	GPIO	8-bits (4 x GPI; 4 x GPO), 5~35V, Isolation 1.5KV			8-bits (4 x GPI; 4 x GPO), 5~24V, Isolation 1.5KV		
	CANbus	N/A			N/A		
	HDMI	N/A			N/A		
	LVDS	N/A			N/A		
	DVI	1 (DVI-I)			1 (DVI-I)		
	DisplayPort	2			2		
	Antenna	N/A			N/A		
	Power Supply	DC Input	DC-In 9-36V Wide-Range pluggable connectors with latch (GND, V-, V+)			DC-In 9-36V Wide-Range pluggable connectors with latch (GND, V-, V+)	
Environment	IP Rating	Full IP20			Full IP20		
	Operating Temperature	-10 ~ 50°C w/ industrial DC power Up to 35W CPU -10 ~ 40°C w/ Fan module Up to 65W CPU			-10 ~ 50°C w/ industrial DC power		
	Operating Humidity	10 ~ 90%, non-condensing			10 ~ 90%, non-condensing		
	Storage Temperature	-20 ~ 80°C			-20 ~ 80°C		
	Storage Humidity	10 ~ 90%, non-condensing			10 ~ 90%, non-condensing		
	Vibration	Operating, IEC 60068-2-64: 1.5 Grms, random, 5 ~ 500 Hz, 1hr/axis (w/ HDD/SSD)			Operating, IEC 60068-2-27: 50G, half sine, 11ms (w/ HDD)		
	Shock	Operating, IEC 60068-2-27: 50G, half sine, 11ms (w/ HDD/SSD)			Operating, IEC 60068-2-64: 2 Grms, random, 5 ~ 500 Hz, 1hr/axis (w/ HDD)		
Physical characteristics	Dimensions (W x D x H)	217 x 226 x 176mm		217 x 226 x 143mm	176 x 226 x 217mm		143 x 226 x 217mm
	Weight	4.8 Kg		4.4 Kg	4.86 kg		4.4 kg
	Mounting	Wall mount			Wall mount		
Certification	EMC	FCC Class A, CE, RCM, VCCI, BSMI			FCC, CE, RCM, VCCI, BSMI		
	Safety	UL			N/A		
Software Platform	OS Support	Windows 7 (32/64-bit) (Skylake-S Series CPU Only) Windows 8.1 (64-bit) (Skylake-S Series CPU Only) Windows 10 (64-bit)			Windows XP (32/64-bit) Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)		

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCle Module



Model		MS-9A89				MS-9A79		MS-9A59		
		Embedded System								
System Processor	CPU	MS-9A89-U1 Intel® Kaby Lake-U Core™ i3-7100U Processor, DC, 15W	MS-9A89-U2 Intel® Skylake-U Core™ i5-6300U Processor, DC, 15W	MS-9A89-U3 Intel® Skylake-U Core™ i3-6100U Processor, DC, 15W	MS-9A89-A1 Intel® Atom™ x7 Processor E3950, QC, 12W	MS-9A89-A2 Intel® Atom™ x5 Processor E3940, QC, 9.5W	MS-9A79-A1 Intel® Atom™ x5 Processor E3940, QC, 9.5W	MS-9A79-A2 Intel® Celeron® Processor N3350, DC, 6W	Intel® Celeron® Processor N3160, QC, 6W	
	Frequency	2.4GHz			1.6GHz, up to 2.0GHz	1.6GHz, up to 1.8GHz	1.6 GHz up to 1.8 GHz	1.1 GHz up to 2.4 GHz	1.6GHz~2.24GHz	
	L2 Cache	3MB			2MB		2MB		2MB	
	CPU Type	BGA						BGA		
	Chipset	Integrated in Process			Integrated in SoC Process		Integrated in SoC		Integrated in SoC Process	
BIOS	AMI						AMI		AMI	
Memory	Technology	Single channel for DDR3L 1866/1600 MHz			Single channel for DDR4 2133 MHz		Dual-channel LPDDR4-2133MHz	Dual-channel LPDDR4-2400MHz	Single-Channel DDR3L 1600MHz	
	Max. Capacity	Up to 16GB			Up to 8GB		Onboard 4 GB		Onboard 2GB	
	Socket	1 x 204-pin SO-DIMMs			1 x 260-pin SO-DIMMs		N/A		N/A	
Graphic	Controller	Intel® HD Graphics			Intel® HD Graphics		Intel® HD Graphics		Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM						Shared system memory up to 1.7 GB SDRAM		Shared system memory up to 1.7 GB SDRAM
	Multiple Display	2 or 3 independent displays			2 or 3 independent displays		2 or 3 independent displays		2 or 3 independent displays	
	Display Interface	HDMI1.4 up to 4096 x 2160 @24Hz DP up to 3840 x 2160 @60Hz LVDS up to 1920 x 1200 @60Hz (optional by cable) DVI-I up to 1920 x 1200 @60Hz (optional by MS-99C0)			HDMI up to 3840 x 2160 @30Hz DP up to 4096 x 2160 @60Hz LVDS up to 1920 x 1200 @60Hz (optional by cable) DVI-I up to 1920 x 1200 @60Hz (optional by MS-99C0)		HDMI up to 3840 x 2160 @30Hz Mini-DP up to 4096 x 2160 @60Hz LVDS up to 1920 x 1200 @60Hz (optional by cable) DVI-I up to 1920 x 1200 @60Hz (optional by MS-99C0)		HDMI up to 3840 x 2160 @30Hz DP1.1a up to 3840 x 2160 @30Hz LVDS up to 1920 x 1200 @60Hz (optional) DVI-I up to 1920 x 1200 @60Hz (optional)	
Ethernet	Controller	1x Intel® I210-AT GbE LAN 1x Intel® I219LM GbE LAN PHY			2 x Intel® I210-T 2 x Intel® I210-AT GbE LAN		2 x Intel® I210-T GbE LAN 2 x Intel® I211-AT GbE LAN		1 x Intel® I211-AT GbE LAN	
Audio	Controller	Realtek® ALC887-V D2-CG HD Audio Codec						Realtek® ALC887-V D2-CG HD Audio Codec		
H/W Monitor	Watchdog Timer	256-level Watchdog Timer						256-level Watchdog Timer		
TPM	Smart Fan	N/A						N/A		
	Controller	N/A						Pin Header		
Expansion Slot	PCIe x16	N/A						N/A		
	PCIe x8	N/A						N/A		
	PCI	2 x Full-size (Mini-PCIe1 Slot w/ NANO SIM-Holder) (Mini-PCIe2 Slot w/ mSATA)			N/A		N/A		N/A	
Storage	M.2	N/A						N/A		
	Mini-PCIe	2 x Full-size (Mini-PCIe1 Slot w/ NANO SIM-Holder) (Mini-PCIe2 Slot w/ mSATA)			N/A		1 x Full-size (w/ NANO SIM-Holder) 1 x Half-size (Shared w/ mSATA)		1 x Half-size	
	SATA	1 x 2.5" HDD/SSD Bay			N/A		1 x 2.5" HDD/SSD Bay		1 x 2.5" HDD/SSD Bay	
I/O Interface	mSATA	N/A						1 x Full-size		
	CFast	4 (Two by optional) LAN1/2: Standard LAN3/4: Optional (Supported standard LAN or PoE 802.3af)						N/A		
	RJ-45	4 (LAN1/2 Standard, LAN3/4 by Option)						2		
	PoE	2 x 802.11af (by request)						N/A		
Power Supply	Audio	1 x Line-out / 1 x Mic-in						1 x Line-out / 1 x Mic-in		
	USB	4x USB 3.0 4x USB 2.0			4 x USB 3.0 2 x USB 2.0		2 x USB 3.0 2 x USB 2.0		2 x USB 3.0 2 x USB 2.0	
	Serial	6 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2-6: RS-232, 0V/5V/12V						2 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232/422/485, 0V/5V/12V		2 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232/422/485, 0V/5V/12V
	PS/2	N/A						N/A		1
	GPIO	16-bit (8*GPI; 8*GPO), 5V						16-bit (8*GPI; 8*GPO), 5V		16-bit (8*GPI; 8*GPO), 5V
	CANbus	2 x CAN 2.0B (optional)						CAN 2.0B (by BOM option)		N/A
	HDMI	1 (by BOM option)						1		1
	LVDS	1 (optional)						1 (by BOM option)		1 (optional)
	DVI	1 (DVI-I by option)						1 (DVI-I by BOM option)		1 (DVI-I by option)
	DisplayPort	1						1 (Mini-DP)		1
	Antenna	4 openings reserved for antennas						4 openings reserved for antennas		3 openings reserved for antennas
Environment	DC Input	DC-in 12V~24V						DC-in 12V Jack (5.5mm/2.5mm) / Phoenix pluggable with latch (Support OCP/OVP Protection)		DC-in 12V Jack (5.5mm/2.5mm) / Phoenix pluggable with latch (Support OCP/OVP Protection)
	IP Rating	N/A						N/A		N/A
	Operating Temperature	-10~45°C (HDD) -10~60°C (w/WT SSD/mSATA)			-10~45°C (HDD) -20~70°C (w/WT SSD/mSATA)		-10~45°C (HDD) -10~55°C (SSD/mSATA)		-10~45°C (HDD) -10~55°C (SSD or mSATA)	
	Operating Humidity	10 ~ 90%, non-condensing						10 ~ 90%, non-condensing		10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C						-40 ~ 80°C		-20 ~ 80°C
Physical characteristics	Storage Humidity	10 ~ 90%, non-condensing						10 ~ 90%, non-condensing		10 ~ 90%, non-condensing
	Vibration	IEC61373 Category 1, Class B						IEC61373 Category 1, Class A		IEC61373 Category 1, Class A
	Shock	IEC61373 Category 1, Class B						IEC61373 Category 1, Class A		IEC61373 Category 1, Class A
Certification	Dimensions(W x D x H)	215 x 155 x 55mm						155 x 110 x 55 mm		155 x 105 x 55mm
	Weight	1.50 kg						1.1 kg		0.90 kg
	Mounting	Wall mount(STD)/DIN-rail mount(STD)/ VESA mount(by BOM option)						Wall mount (STD)/DIN-rail mount(STD)/VESA mount(by BOM option)		Wall mount (STD)/VESA mount(by BOM option)/DIN-rail mount(by BOM option)
Software Platform	EMC	CE, FCC, VCCI, RCM, BSMI, EN50155						FCC, CE, RCM, VCCI, BSMI		FCC, CE, RCM, VCCI, BSMI
	Safety	BSMI						BSMI		BSMI
OS Support	OS Support	Windows 7(For Skylake-U SKUs) Windows 8.1(For Skylake-U SKUs) Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)			Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)		Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)		Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit) Linux Fedora 21 (by request) Linux Ubuntu 14.04 (by request)	



Model		MS-9A69		MS-9A78		MS-9A68						
		Embedded System										
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W		Intel® BDW ULT Core™ i3-5010U Processor, DC, 15W		4th Gen Intel® Desktop Haswell/ Haswell Refresh Core™ i7/i5/i3/Celeron®/ Pentium® Processor, Max. 45W		3rd Gen Intel® Mobile Ivy bridge/ Sandy bridge Core™ i7/i5/i3/Celeron®/ Pentium® Processors, Max. 45W				
	Frequency	2 GHz		2.1 GHz		2GHz~2.42GHz (J1900) 1.83GHz~2.16GHz (N2930)		1.5GHz~2.3GHz (Depends on CPU)		1.0 GHz~3.8GHz (Depends on CPU)		
	L2 Cache	2MB		3MB		2MB		2M~8M (Depends on CPU)		2M~8M (Depends on CPU)		
	CPU Type	BGA		BGA		BGA		Socket (LGA 1150)		Socket G2 (rPGA 989)		
	Chipset	Integrated in SoC Process		Integrated in Process		N/A		Intel® Q87 Express		Intel® QM77/HM76 Express		
	BIOS	AMI		AMI		AMI		AMI		AMI		
Memory	Technology	Single-channel DDR3L 1333 MHz		Single-channel DDR3L 1600 MHz		Dual-channel DDR3L 1333MHz		Dual-channel DDR3/DDR3L 1333/1600MHz		Dual-channel DDR3 1066/1333/1600 MHz		
	Max. Capacity	Up to 8GB		Up to 8GB		Up to 8GB		Up to 16GB		Up to 16GB		
	Socket	1 x 204-pin SO-DIMM		2 x 204-pin SO-DIMMs		2 x 204-pin SO-DIMMs		2 x 204-pin SO-DIMMs		2 x 204-pin SO-DIMMs		
Graphic	Controller	Intel® HD Graphics		Intel® HD Graphics		Intel® HD Graphics		Intel® HD Graphics		Intel® HD Graphics		
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM		Shared system memory up to 1.7 GB SDRAM		Shared system memory up to 1.7 GB SDRAM		Shared system memory up to 1.7 GB SDRAM		Shared system memory up to 1.7 GB SDRAM		
	Multiple Display	2 independent displays		3 independent displays		2 independent displays		3 independent displays		2 independent displays (SNB CPU only) 3 independent displays (IVB CPU only)		
	Display Interface	VGA up to 2560 x 1600 @60Hz HDMI up to 1920 x 1080 @60Hz LVDS up to 1920 x 1200 @60Hz (optional)		VGA up to 1920 x 1200 @60Hz HDMI up to 1920 x 1080 @60Hz LVDS up to 1920 x 1200 @60Hz (optional)		VGA up to 2560 x 1600 @60Hz HDMI up to 1920 x 1080 @60Hz		VGA up to 1920 x 1200 @60Hz DP up to 3840 x 2160 @60Hz		DP up to 2560 x 1600 @60Hz DVI-I up to 1920 x 1200 @60Hz		
Ethernet	Controller	2 x Intel® I210-AT GbE LAN		1 x Intel® I210-AT GbE LAN 1 x Intel® I218-LM GbE LAN PHY		2 x Intel® I210-AT GbE LAN		1 x Intel® I217-LM GbE PHY (iAMT 9.0 supported) 1 x Intel® I210-AT PCIe GbE LAN		2 x Intel® I210-AT GbE LAN		
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec		Realtek® ALC887 HD Audio Codec		Realtek® ALC887 HD Audio Codec		Realtek® ALC887 HD Audio Codec		Realtek® ALC887 HD Audio Codec		
H/W Monitor	Watchdog Timer	256-level Watchdog Timer		256-level Watchdog Timer		256-level Watchdog Timer		256-level Watchdog Timer		256-level Watchdog Timer		
TPM	Controller	N/A		Pin header		N/A		N/A		N/A		
Expansion Slot	PCIe x16	N/A		N/A		N/A		N/A		N/A		
	PCI	N/A		N/A		N/A		N/A		N/A		
	M.2	N/A		N/A		N/A		N/A		N/A		
Storage	Mini-PCIe	2 x Full-size (one w/ mSATA)		1 x Full-size (w/ mSATA) 1 x Half-size		1 x Full-size (w/ mSATA)		1 x Full-size (w/ mSATA) 1 x Half-size		2 x Full-size (1 w/ SIM Holder)		
	SATA	1 x 2.5" HDD/SSD Bay		1 x 2.5" HDD/SSD		1 x 2.5" HDD/SSD		1 x 2.5" HDD/SSD		1 x 2.5" HDD/SSD		
	mSATA	1 x Full-size (Shared with Mini-PCIe)		1		1		2 (shared with Mini-PCIe slots)		2 (shared with Mini-PCIe slots)		
	CFast	N/A		N/A		N/A		N/A		N/A		
I/O Interface	RJ-45	4 (optional 2 x RJ-45 version available)		2		2		2		2		
	PoE	N/A		N/A		N/A		N/A		N/A		
	Audio	1 x Line-out / 1 x Mic-in		1 x Mic-in; 1 x Line-out; 1 x Line-in		1 x Mic-in; 1 x Line-out; 1 x Line-in		1 x Mic-in; 1 x Line-out; 1 x Line-in		1 x Mic-in; 1 x Line-out; 1 x Line-in		
	USB	1 x USB 3.0 5 x USB 2.0		2 x USB 3.0 4 x USB 2.0		6 x USB 2.0 1 x USB 3.0		4 x USB 2.0 4 x USB 3.0		2 x USB 3.0 6 x USB 2.0		
	Serial	6 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2-6: RS-232, 0V/5V/12V		4 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2-4: RS-232, 0V/5V/12V		5 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2-5: RS-232, 0V/5V/12V		4 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2-4: RS-232		4 x COM ports COM 1: RS-232/422/485, 0V/5V/12V COM 2-4: RS-232, 0V/5V/12V		
	PS/2	N/A		N/A		N/A		1		1		
	GPIO	8-bit (4*GPI; 4*GPO), 5V		N/A		N/A		N/A		N/A		
	CANbus	2 x CAN 2.0B (by BOM option)		N/A		N/A		N/A		N/A		
	HDMI	1		1		1		N/A		N/A		
	LVDS	1 (optional)		N/A		N/A		N/A		N/A		
	DVI	N/A		N/A		N/A		N/A		1 (DVI-I)		
	DisplayPort	N/A		N/A		N/A		2		2		
	VGA	1		N/A		1		N/A		N/A		
	Antenna	2 openings reserved for antennas		2 openings reserved for antennas		2 openings reserved for antennas		2 openings reserved for antennas		1 opening reserved for antenna		
	Power Supply	DC Input	DC-in 12V/19V/24V		DC-in 12V		DC-in 12V		DC-in 12V		DC-in 12V/19V	
		AC Input	N/A		N/A		N/A		N/A		N/A	
	Environment	IP Rating	N/A		N/A		N/A		N/A		Full IP30	
Operating Temperature		-10 ~ 45°C (HDD) -10 ~ 50°C (SSD or mSATA)		-10 ~ 50°C (HDD) -10 ~ 60°C (SSD)		-10 ~ 50°C (HDD) -10 ~ 60°C (SSD)		-10 ~ 50°C (TDP: 35W) -10 ~ 40°C (TDP: 45W)		0 ~ 50°C		
Operating Humidity		10 ~ 90%, non-condensing		10 ~ 90%, non-condensing		10 ~ 90%, non-condensing		10 ~ 90%, non-condensing		10 ~ 90%, non-condensing		
Storage Temperature		-20 ~ 80°C		-20 ~ 80°C		-20 ~ 80°C		-20 ~ 80°C		-20 ~ 80°C		
Storage Humidity		10 ~ 90%, non-condensing		10 ~ 90%, non-condensing		10 ~ 90%, non-condensing		10 ~ 90%, non-condensing		10 ~ 90%, non-condensing		
Vibration		Operating: 0.25 Grms, 5-300Hz, 3axes (w/ HDD)		Operating: 0.25 Grms, 5-300Hz, 3axes (w/ HDD)		Operating: 0.25 Grms, 5-300Hz, 3axes (w/ HDD)		Operating: 0.25 Grms, 5-300Hz, 3axes (w/ HDD)		Operating: 0.25 Grms, 5-300Hz, 3axes (w/ HDD)		
Shock		Operating: 3 G, half sine 11 ms duration (w/ HDD)		Operating: 3 G, half sine 11 ms duration (w/ HDD)		Operating: 3 G, half sine 11 ms duration (w/ HDD)		Operating: 3 G, half sine 11 ms duration (w/ HDD)		Operating: 3 G, half sine 11 ms duration (w/ HDD)		
Physical characteristics	Dimensions (WxDxH)	200 x 150 x 55mm		180 x 183 x 49mm		180 x 183 x 49mm		180 x 180 x 44mm		180 x 180 x 44mm		
	Weight	1.38 kg		1.80 kg		1.80 kg		1.80 kg		1.80 kg		
	Mounting	Wall mount (STD)/VESA mount(by BOM option)/ DIN-rail mount(by BOM option)		Wall mount		Wall mount		Wall mount		Wall mount		
Certification	EMC	FCC, CE, RCM, VCCI, BSMI		FCC, CE, RCM, VCCI, BSMI		FCC, CE, RCM, VCCI, BSMI		FCC, CE, RCM, VCCI, BSMI		FCC, CE, RCM, VCCI, BSMI		
	Safety	BSMI		BSMI, CB, UL		BSMI, CB, UL		BSMI, CB, UL		BSMI, CB, UL		
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Linux Fedora 20 (by request) Linux Ubuntu 13.10 (by request)		Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit) Linux Fedora 19 (by request) Linux Ubuntu 13.04 (by request)		Windows 7 (32/64-bit) Windows 8 (32/64-bit) Windows 10 (64-bit)		Windows 7 (32/64-bit) Windows 8 (32/64-bit) Windows 10 (64-bit) Linux Fedora V19 (Kernel 3.8.2)		Windows 8 (32-bit) Windows 7 (32/64-bit) Windows XP (32/64-bit)		

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module



Model		MS-9A95	MS-9A75	MS-9A65
		Embedded System		
System Processor	CPU	7th/6th Gen Intel® Mobile Kaby Lake-U/ Skylake-U Core™ i7/i5/i3/ Celeron® Processor, DC, 15W	Intel® BDW ULT Core™ i5-5200U Processor, DC, 15W	Intel® Celeron® Processor J1900, QC, 10 W
	Frequency	2.0GHz~3.9GHz (Depends on CPU)	2.2GHz~2.7GHz	2GHz~2.42GHz
	L2 Cache	2MB~4MB (Depends on CPU)	3MB	2MB
	CPU Type	BGA	BGA	BGA
	Chipset	Integrated	N/A	N/A
	BIOS	AMI	AMI	AMI
Memory	Technology	Dual-channel for DDR4 2133 MHz	Dual-channel for DDR3L 1333/1600 MHz	Dual-channel DDR3L 1333MHz
	Max. Capacity	Up to 32GB	Up to 16GB	Up to 8GB
	Socket	2 x 260-pin SO-DIMMs	2 x 204-pin SO-DIMMs	2 x 204-pin SO-DIMMs
Graphic	Controller	Intel® HD Graphics 5500	Intel® HD Graphics 5500	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM
	Multiple Display	3 independent displays	3 independent displays	2 independent displays
	Display Interface	HDMI 2.0 up to 4096 x 2160 @60Hz DP up to 4096 x 2304 @60Hz DVI-I up to 1920 x 1200 @60Hz	DP up to 3840 x 2160 @60Hz DVI-D up to 1920 x 1200 @60Hz VGA up to 1920 x 1200 @60Hz	HDMI up to 1920 x 1080 @60Hz DVI-I up to 1920 x 1200 @60Hz
Ethernet	Controller	1 x Intel® I219-LM GbE LAN PHY 1 x Intel® I210-AT GbE LAN	1 x Intel® I218LM GbE LAN PHY 1 x Intel® I210-AT GbE LAN	2 x Intel® I210-AT GbE
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec	Realtek® ALC887/888S HD Audio Codec	Realtek® ALC887 HD Audio Codec
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer
	Smart Fan	N/A	Yes	Yes
TPM	Controller	Infineon SLB9665TT2.0	Infineon SLB9635TT 1.2	N/A
Expansion Slot	Mini-PCIe	1 x E Key (PCIe x2, USB 2.0), 2230	N/A	N/A
	Mini-PCIe	1 x Full-size (one w/ SIM holder or mSATA) 1 x Half-size	2 x Full-size (one w/ SIM holder or mSATA)	1 x Full-size, mSATA (with SIM holder) 1 x Half-size
Storage	SATA	1 x 2.5" HDD/SSD (7mm)	1 x 2.5" HDD/SSD	1 x 2.5" HDD/SSD
	mSATA	1 (shared with mini-PCIe)	1 (shared with mini-PCIe)	1
I/O Interface	RJ-45	2	2	2
	PoE	N/A	N/A	N/A
	Audio	1 x SPDIF-out 1 x Line-out (Mic-in by AP driver)	1 x Mic-in 1 x Line-out	1 x Mic-in 1 x Line-out
	USB	4 x USB 3.0 2 x USB 2.0	SKU1: 4 x USB 3.0; 2 x USB 2.0 SKU2: 4 x USB 3.0	2 x USB 2.0 1 x USB 3.0
	Serial	2 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232, 0V	SKU1: 1 x COM port, RS-232/422/485 SKU2: 2 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232, 0V	1 x COM port COM1: RS-232/422/485, 0V/5V/12V
	GPIO	N/A	N/A	N/A
	CANbus	N/A	N/A	N/A
	HDMI	2 (Co-lay with DP)	N/A	1
	DVI	1 (DVI-I)	1 (DVI-I)	1 (DVI-I)
	DisplayPort	2 (Co-lay with HDMI)	2	N/A
	VGA	1 (DVI-I to VGA dongle)	1 (from DVI-I)	N/A
	Antenna	2 openings reserved for antennas	2 openings reserved for antennas	1 (opening reserved for 2nd antenna)
	Power Supply	DC Input	DC-in 19V with Lockable DC Jack	DC-in 12V/19V/24V
AC Input		N/A	N/A	N/A
Environment	IP Rating	Full IP40	Full IP40	N/A
	Operating Temperature	-10 ~ 50°C (SSD) -10 ~40°C (HDD)	-10 ~ 50°C (SSD), -10 ~40°C (HDD)	0 ~ 40°C (HDD) -10 ~ 60°C (SSD)
	Operating Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C	-20 ~ 80°C	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing
	Vibration	Operating: IEC 60068-2-64: 2 Grms, 5 ~ 500 Hz, 1hr/axis (w/ SSD)	Operating: 0.25 Grms, 5-300Hz, 3axes (w/ HDD)	Operating: 0.25 Grms, 5-300Hz, 3axes (w/ HDD)
	Shock	Operating: IEC 60068-2-27: 50G, half sine, 11ms (w/ SSD)	Operating: 3 G, half sine 11 ms duration (w/ HDD)	Operating: 3 G, half sine 11 ms duration (w/ HDD)
Physical characteristics	Dimensions (W x D x H)	196 x 285 x 29mm	196 x 285 x 33mm	180 x 255 x 19mm
	Weight	2.25 kg	2.60 kg	1.30 kg
	Mounting	VESA/Wall mount, DIN Rail	VESA mount	VESA mount
Certification	EMC	FCC, CE, RCM, VCCI, BSMI	FCC, CE, RCM, VCCI, BSMI	FCC, CE, RCM, VCCI, BSMI
	Safety	BSMI, CB, Energy Star	BSMI, CB	BSMI, CB, Energy Star
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Fedora 25 Linux Ubuntu 17.04	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Linux Fedora Core 21 Linux Ubuntu 15.04	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)



Model		MS-98H7		MS-98F7		MS-98D7	
		COM Express Board					
Processor	CPU	8th Gen Intel® Embedded Coffee Lake-H Xeon™ E-2176M Mobile Processor, HC, 45W		8th Gen Intel® Embedded Coffee Lake-H Core™ i7-8850H/i5-8400H/i3-8100H Mobile Processor, HC/QC, 45W		7th/6th Gen Intel® Embedded Mobile Kaby Lake-ULT/Skylake-ULT Core™ i7/i5/i3/Celeron Processor, DC, 15W	
	Frequency	2.5GHz~4.4GHz (Depends on CPU)		2.0GHz~3.4GHz (Depends on CPU)		i7-3517UE, 2.8 GHz i3-3217UE, 1.6 GHz	
	L2 Cache	8MB~12MB (Depends on CPU)		2MB~4MB (Depends on CPU)		3MB~4MB (Depends on CPU)	
	CPU Type	BGA		BGA		BGA	
	Chipset	Intel® CM246 Express	Intel® QM370 Express	N/A		Intel® QM77 Express	
	BIOS	AMI		AMI		AMI	
Memory	Technology	Dual-channel DDR4 (ECC) 2666MHz	Dual-channel DDR4 (Non-ECC) 2666MHz	Dual-channel DDR4 2133MHz		Single-channel DDR3/DDR3L 1600/1333MHz	
	Max. Capacity	Up to 32GB		Up to 32GB		Up to 8GB	
	Socket	2 x 260-pin SO-DIMMs		2 x 260-pin SO-DIMMs		1 x 204-pin SO-DIMM	
Display	Controller	Intel® HD Graphics		Intel® HD Graphics		Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM		Shared system memory up to 1.7 GB SDRAM		Shared system memory up to 1.7 GB SDRAM	
	LVDS	Dual channel 18/24-bit		Dual channel 24-bit		Dual channel 24-bit	
	eDP	N/A		N/A		N/A	
	VGA	1		1 (Share with DDI1 Signal, by BOM option)		1	
	DVI						
	HDMI	3 DDI ports support HDMI/DP/DVI (DDI3 AUX shared with VGA)		2 DDI ports support HDMI/DP (DDI1 by BOM option, default is for VGA)		3 DDI ports support DVI/HDMI/DP (DDI1 supports video out also)	
	DisplayPort						
	Multiple Display	3 independent displays		3 independent displays		3 independent displays	
	Display Interface	LVDS Resolution up to 1920 x 1200 @60Hz VGA Resolution up to 1920 x 1080 @60Hz 3 x DDI: DVI up to 1920 x 1200 @60Hz HDMI1.4 up to 4096 x 2160 @24Hz DP up to 4096 x 2304 @60Hz		LVDS Resolution up to 1920 x 1200 @60Hz VGA Resolution up to 1920 x 1080 @60Hz 2 x DDI: HDMI1.4 up to 4096 x 2160 @24Hz DP up to 4096 x 2304 @60Hz		VGA up to 2048 x 1536 @60Hz LVDS up to 1920 x 1200 @60Hz 3 x DDI: HDMI/DVI up to 1920 x 1200 @60Hz DP up to 2560 x 1600 @60Hz	
Ethernet	Controller	1 x Intel® I219LM GbE-PHY LAN (AMT 12.x supported)		1 x Intel® I219LM GbE-PHY LAN (AMT 11.x supported)		1 x Intel® 82579LM GbE-PHY LAN (AMT 8.0 supported)	
Audio	Controller	Support HD audio interface to carrier board		Support HD audio interface to carrier board		Support HD audio interface to carrier board	
Super I/O	Controller	N/A		N/A		N/A	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer		256-level Watchdog Timer		256-level Watchdog Timer	
	Smart Fan	Yes		Yes		Yes	
TPM	Controller	Infineon SLB9665TT 2.0		Yes (TPM2.0, by BOM option)		N/A	
I/O Interface	USB	8 x USB 2.0 (to carrier board) 4 x USB 3.1 (to carrier board)		8 x USB 2.0 (to carrier board) 4 x USB 3.0 (to carrier board)		8 x USB 2.0 (to carrier board) 4 x USB 3.0 (to carrier board)	
	Serial	2 x COM ports (to carrier board)		2 x COM ports (to carrier board)		2 x COM ports (to carrier board)	
	Parallel	N/A		N/A		N/A	
	PS/2	1 x PCI Express x16 GEN. 3.0 lanes (Configurable to 1 x16 or 2 x8 or 1 x8 + 2 x4)		N/A		N/A	
	GPIO	N/A		8-bits (4 x GPI; 4 x GPO), 5V		8-bits (4 x GPI; 4 x GPO), 5V	
Expansion Slot	PCIe x16	8 x PCI Express GEN. 3.0 lanes (Configurable to 5 x PCIe x1 or 4 x PCIe x1 & 1 x PCIe x4)		N/A		1	
	PCIe x4	N/A		N/A		N/A	
	PCIe x1	N/A		8 x PCI Express GEN. 3.0 lanes (Configurable to 5 x PCIe x1 or 4 x PCIe x1 & 1 x PCIe x4)		7 x PCI Express GEN. 2.0 lanes	
	PCI	N/A		N/A		N/A	
	Mini-PCIe	N/A		N/A		N/A	
Storage	SATA	4 x SATA 3.0		3 x SATA 3.0		2 x SATA 3.0; 2 x SATA 2.0	
	mSATA	N/A		32GB eMMC 5.0 (by BOM option)		N/A	
Power Supply	DC	N/A		N/A		N/A	
	ATX	ATX +12 V and +5 VSB (standby power) AT: +12 V		ATX +12 V and +5 VSB (standby power) AT: +12 V		ATX +12 V and +5 VSB (standby power) AT: +12 V	
Environment	Operating Temperature	-10 ~ 60°C		-20 ~ 70°C		0 ~ 60°C	
	Operating Humidity	10 ~ 90%, non-condensing		10 ~ 90%, non-condensing		10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C		-20 ~ 80°C		-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing		10 ~ 90%, non-condensing		10 ~ 90%, non-condensing	
Form Factor	Dimensions	125 x 95mm (COM Express Type 6 Basic module)		95 x 95mm (COM Express Type 6 compact module)		95 x 95mm (COM Express Type 6 compact module)	
	Weight	0.113 kg		0.105 kg		0.095 kg	
Certification	EMC	FCC, CE, RCM, VCCI, BSMI		FCC, CE, RCM, VCCI, BSMI		FCC, CE, RCM, VCCI, BSMI	
Software Platform	OS Support	Windows 10 (64-bit) Linux Kernel 4.x (by request)		Windows 7 (32/64-bit) (Skylake-ULT Only) Windows 8.1 (64-bit) (Skylake-ULT Only) Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)		Windows 7 (32/64-bit) Windows 8 (32/64-bit)	

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCle Module

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Qseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module



Model	MS-9988		MS-98H2	MS-99A1
	COM Express Board		Qseven Board	
Processor	CPU	N/A	Intel® Pentium® processor N3710, QC, 6W Intel® Celeron® processor N3160, QC, 6W	N/A
	Frequency	N/A	N3710, 1.6 GHz up to 2.56 GHz N3160, 1.6 GHz up to 2.24GHz	N/A
	L2 Cache	N/A	N/A	N/A
	CPU Type	N/A	BGA	N/A
	Chipset	N/A	Integrated in SoC	N/A
Memory	BIOS	AMI	AMI	AMI
	Technology	N/A	Dual-channel DDR3L 1600MHz	N/A
	Max. Capacity	N/A	Up to 8GB	N/A
Display	Socket	N/A	Onboard	N/A
	Controller	N/A	Intel® HD Graphics	N/A
	Graphic Memory	N/A	Shared system memory up to 1.7 GB SDRAM	N/A
	LVDS	Dual channel 24-bit (depends on module board)	N/A	Dual channel 18/24-bit (depends on module board)
	eDP	N/A	1	N/A
	VGA	1	N/A	N/A
	DVI	N/A	N/A	N/A
	HDMI	N/A	N/A	1
	DisplayPort	3	3	1
	Multiple Display	3 independent displays	3 independent displays	3 independent displays
Display Interface	Depends on module board	eDP1.4 up to 2560 x 1600 @60Hz 2 x DDI: HDMI up to 2560 x 1600 @60Hz; up to 3840 x 2160 @30Hz DP1.1a up to 2560 x 1600 @60Hz; up to 3840 x 2160 @30Hz	Depends on module board	
Ethernet	Controller	1 x RJ45 for COM Express module board	1 x Intel® I211-AT GbE LAN	5 x Intel® I211-AT GbE LAN (6 GLAN SKU) 1 x Intel® I211-AT GbE LAN (2 GLAN SKU)
Audio	Controller	Realtek® ALC887 HD Audio Codec	Support HD audio interface to carrier board	Realtek® ALC887-VD2-CG HD Audio Codec
Super I/O	Controller	Fintek F81866	N/A	Fintek F81866AD-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes	Yes	Yes
TPM	Controller	Pin header	N/A	Pin header
I/O Interface	USB	4 x USB 3.0 (4 x rear) 4 x USB 2.0 (2 x rear; 2 x internal)	4 x USB 2.0 (to carrier board) 2 x USB 3.0 (to carrier board)	3 x USB 2.0 (2 x rear; 1 x internal) 2 x USB 3.0 (2 x rear)
	Serial	2 x COM ports COM1 RS-232/422/485, 0V/5V/12V COM2 RS-232, 0V/5V/12V 2 x UART ports (From COM Express module board)	1 x UART port (to carrier board)	6 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232/422/485, 0V/5V/12V COM3-6: RS-232, 0V/5V/12V 1 x UART Port (from Qseven module board)
	Parallel	1	N/A	N/A
	PS/2	1 (wafer connector)	N/A	1 (box header)
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V	N/A	8-bits (4 x GPI; 4 x GPO), 5V
Expansion Slot	PCIe x16	1	N/A	N/A
	PCIe x4	N/A	N/A	N/A
	PCIe x1	6	3 x PCI Express GEN. 2.0 lanes	1
	PCI	N/A	N/A	N/A
	M.2	N/A	N/A	N/A
	Mini-PCIe	2 x Full-size	N/A	2 x Full-size (one w/ mSATA)
Storage	SATA	N/A	2 x SATA 3.0	1 x SATA 3.0
	mSATA	ATX-24P, 12V-4P	N/A	1
Power Supply	DC	0 ~ 60°C	+5 V and +5 VSB (standby power)	DC-in 12V
	ATX	10 ~ 90%, non-condensing	N/A	N/A
Environment	Operating Temperature	-20 ~ 80°C	-10 ~ 60°C	-10 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing
	Storage Temperature	305 x 244mm (ATX)	-20 ~ 80°C	-20 ~ 80°C
	Storage Humidity	0.60 kg	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing
Form Factor	Dimensions	305 x 244mm (ATX)	70 x 70mm (Qseven CPU module)	170 x 170mm (Mini-ITX)
	Weight	Depends on CPU Module Board	0.23 kg	0.242 Kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI	FCC, CE, RCM, VCCI, BSMI	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 10 (64-bit) Linux Kernel 4.x (by request)	Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Fedora 22 (by request) Linux Ubuntu 15.04 (by request)	Depends on CPU Module Board



Model		MS-9816		MS-98H6
		Pico-ITX Board		
Processor	CPU	Apollo Lake SKUs		Apollo Lake-I SKU
	Frequency	Intel® Pentium® Processor N4200, QC, 6W Intel® Celeron® Processor N3350, DC, 6W	Intel® Atom™ x5 Processor E3940, QC, 9.5W Intel® Atom™ x5 Processor E3930, DC, 6.5W	Intel® Pentium® processor N3710, QC, 6W Intel® Celeron® processor N3160, QC, 6W Intel® Celeron® processor N3010, DC, 4W
	L2 Cache	2MB		2MB
	CPU Type	BGA		BGA
	Chipset	Integrated in SoC		Integrated in SoC
	BIOS	AMI		AMI
Memory	Technology	Single-channel LPDDR4 2400MHz/2400MHz	Single-channel LPDDR4 2133MHz	Single-channel LPDDR4 2133MHz
	Max. Capacity	Up to 4GB		Up to 2GB
	Socket	Onboard		Onboard
Display	Controller	Intel® HD Graphics		Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM		Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual Channel 18/24-bit		Dual Channel 18/24-bit
	eDP	N/A		N/A
	VGA	N/A		N/A
	DVI	N/A		N/A
	HDMI	1		1
	DisplayPort	1 (Mini-DP)		1
Ethernet	Controller	2 x Intel® 211-AT GbE LAN	2 x Intel® I210-IT GbE LAN	1 x Intel® I211-AT GbE LAN
	Audio	Realtek® ALC887-VD2-CG HD Audio Codec		Realtek® ALC887-VD2-CG HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I		Fintek F81866AD-I
	Watchdog Timer	256-level Watchdog Timer		256-level Watchdog Timer
H/W Monitor	Smart Fan	N/A		Yes
	TPM	Controller Pin header		N/A
I/O Interface	USB	2x USB 2.0 (2 x internal) 2 x USB 3.0 (2 x rear)		2 x USB 2.0 (2 x internal) 2 x USB 3.0 (2 x rear)
	Serial	2 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232/422/485, 0V/5V/12V		2 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232/422/485, 0V/5V/12V
	Parallel	N/A		N/A
	PS/2	N/A		N/A
	GPIO	16-bits (8 x GPI; 8 x GPO), 5V		16-bits (8 x GPI; 8 x GPO), 5V
Expansion Slot	PCIe x16	N/A		N/A
	PCIe x4	N/A		N/A
	PCIe x1	3		N/A
	PCI	N/A		N/A
	M.2	N/A		N/A
Storage	Mini-PCIe	1 x Full-size (Mini-PCIe Full-size Slot w/ NANO SIM-Holder) 1 x Half-size (Mini-PCIe Half-size Slot w/ mSATA)		1 x Half-size
	SATA	1 x SATA 3.0		1 x SATA 3.0
Power Supply	mSATA	1 (Shared with Mini-PCIe Half-size)		1
	DC	DC-in 12V		DC-in 12V
Environment	ATX	N/A		N/A
	Operating Temperature	-10 ~ 60°C	-40 ~ 85°C	Heat-Spreader: 100(L) x 72.2(W) x 8(H) mm (standard packing) Heat-Sink: -10~60°C , 100(L) x 72.2(W) x 33(H) mm (by option)
	Operating Humidity	10 ~ 90%, non-condensing		10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C	-40 ~ 85°C	-20 ~ 80°C
Form Factor	Storage Humidity	10 ~ 90%, non-condensing		10 ~ 90%, non-condensing
	Dimensions	101 x 73mm (Pico-ITX)		100 x 72mm (Pico-ITX)
Certification	Weight	0.27 kg		0.27 kg
	EMC	FCC, CE, RCM, VCCI, BSMI		FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)		Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit) Linux Fedora 21 (by request) Linux Ubuntu 14.04 (by request)

*1 x MIPI-CSI 2.0 (by request)

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
P1CM1G 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module



Model		MS-98J8	MS-98H3	MS-98E6		
		3.5" Board				
Processor	CPU	Intel® Pentium™ N4200 Processor, QC, 6W Intel® Celeron™ N3350 Processor, DC, 6W Intel® Atom™ X5-E3940 Processor, QC, 9.5W Intel® Atom™ X5-E3930 Processor, DC, 6.5W	7th/6th Gen Intel® Embedded Mobile Kaby Lake-U/Skylake-U Core™ i7/i5/i3/ Celeron® Processor, DC, 15W	Apollo Lake SKUs		Apollo Lake-I SKUs
	Frequency	N4200, 1.1 GHz, up to 2.5 GHz N3350, 1.1 GHz, up to 2.4 GHz E3940, 1.6 GHz, up to 1.8 GHz E3930, 1.3 GHz, up to 1.8 GHz	2.0GHz~3.4GHz (Depends on CPU)	N4200, 1.1 GHz, up to 2.5 GHz N3350, 1.1 GHz, up to 2.4 GHz		E3950, 1.6 GHz, up to 2.0 GHz E3940, 1.6 GHz, up to 1.8 GHz E3930, 1.3 GHz, up to 1.8 GHz
	L2 Cache	2M	2MB~4MB (Depends on CPU)	1M~2M (Depends on CPU)		
	CPU Type	BGA	BGA	BGA		
	Chipset	Integrated in SoC	N/A	Integrated in SoC		
	BIOS	AMI	AMI	AMI		
Memory	Technology	Single Channel for DDR3L 1866/1600 MHz	Single-channel DDR4 2133MHz	Single-channel DDR3L 1866/1600 MHz		
	Max. Capacity	Up to 8GB	Up to 16GB	Up to 8GB		
	Socket	1 x 204pin SO-DIMM	1 x 260-pin SO-DIMM	1 x 204-pin SO-DIMM		
Display	Controller	Intel® HD Graphics	Intel® HD Graphics	Intel® HD Graphics		
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM		
	LVDS	Dual Channel 18/24-bit	Dual Channel 18/24-bit	2 x Dual Channel 18/24-bit (LVDS1 Share with eDP Signal, LVDS2 Share with DP1 Signal)		
	eDP	N/A	1 (Share with LVDS Signal)	1 (Share with LVDS1 Signal)		
	VGA	N/A	N/A	N/A		
	DVI	N/A	N/A	N/A		
	HDMI	1	1 (HDMI1 Co-lay DP1 & HDMI2 Co-lay DP2 by option)	1 (HDMI1 Co-lay DP1/LVDS2 & HDMI2 Co-lay DP2 by option)		
	DisplayPort	1	1 (DP1 Co-lay HDMI1 & DP2 Co-lay HDMI2 by option)	1 (DP1 Co-lay HDMI1/LVDS2 & DP2 Co-lay HDMI2 by option)		
	Multiple Display	3 independent displays	3 independent displays	3 independent displays		
	Display Interface	LVDS up to 1920 x 1200 @60Hz HDMI up to 3840 x 2160 @30Hz DP up to 4096 x 2160 @60Hz	LVDS up to 1920 x 1200 @60Hz eDP up to 4096 x 2304 @60Hz HDMI1/HDMI2 HDMI1.4 up to 4096 x 2160 @24Hz DP1/DP2 up to 4096 x 2304 @60Hz	LVDS1/LVDS2 up to 1920 x 1200 @60Hz eDP up to 4096 x 2160 @60Hz HDMI1/HDMI2 up to 3840 x 2160 @30Hz DP1/DP2 up to 4096 x 2160 @60Hz		
Ethernet	Controller	2 x Realtek® RTL8111H GbE LAN	1 x Intel® I210-AT GbE LAN 1 x Intel® I219LM GbE-PHY LAN (AMT 11.x supported)	2 x Intel® I211-AT GbE LAN	2 x Intel® I210-IT GbE LAN	
Audio	Controller	Realtek® ALC887 HD Audio Codec	Realtek® ALC887-VD2-CG HD Audio Codec	Realtek® ALC887-VD2-CG HD Audio Codec		
Super I/O	Controller	Fintek F81866AD-I	Fintek F81866AD-I	Fintek F81867AD-I		
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer		
	Smart Fan	Yes	Yes	Yes		
TPM	Controller	Pin header (Default) Infineon SLB9665TT 2.0 (by BOM option)	Pin header	Pin header		
I/O Interface	USB	4 x USB 3.0 (4 x rear) 2 x USB 2.0 (2 x internal)	4 x USB 3.0 (4 x Rear) 4 x USB 2.0 (4 x Internal)	4 x USB 3.0 (4 x Rear) 2 x USB 2.0 (2 x Internal)		
	Serial	4 x COM ports (Internal) COM1: RS-232/422/485, 0V/5V/12V COM2~4: RS-232	6 x COM ports (Internal) COM1: RS-232/422/485, 0V/5V/12V, support auto flow control COM2~6: RS-232, 0V/5V/12V (RS-422/485 Optional)	6 x COM ports (Internal) COM1: RS-232/422/485, 0V/5V/12V, support auto flow control COM2~6: RS-232, 0V/5V/12V (RS-422/485 by Optional)		
	PS/2	1 (wafer connector)	N/A	N/A		
	GPIO	8-Bit (4 x GPI, 4 x GPO), 5V	16-bits (8 x GPI; 8 x GPO), 5V	16-bits (8 x GPI; 8 x GPO), 5V		
Expansion Slot	M.2	1 x E Key (PCIe x1, USB2.0), 2230	N/A	N/A		
	Mini-PCIe	1 x Full-size (w/ mSATA)	2 x Full-size (Mini-PCIe1 Slot w/ NANO SIM-Holder) (Mini-PCIe2 Slot w/ mSATA)	2 x Full-size (Mini-PCIe1 Slot w/ NANO SIM-Holder) (Mini-PCIe2 Slot w/ mSATA)		
Storage	SATA	1 x SATA 3.0	2 x SATA 3.0	1 x SATA 3.0		
	mSATA	1 (Shared with Mini-PCIe)	1 (Shared with Mini-PCIe2)	1 (Shared with Mini-PCIe1)		
Power Supply	DC	DC-in 9~36V	DC-in 12~24V	DC-in 12~24V (Box header with 4pin)	DC-in 12~24V (Phoenix connector with 2pin)	
	ATX	N/A	N/A	N/A		
Environment	Operating Temperature	-10 ~ 60°C	-10 ~ 60°C Note: Thermal Test w/ Airflow:0.7m/s	-10 ~ 60°C		
	Operating Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing		
	Storage Temperature	-20 ~ 80°C	-20 ~ 80°C	-20 ~ 80°C		
	Storage Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing		
Form Factor	Dimensions	146 x 102mm (3.5")	146 x 102mm (3.5")	146 x 102mm (3.5")		
	Weight	0.33 kg	0.59 kg	0.34 kg	0.59 kg	
Certification	EMC	CE, FCC Class B, BSMI, VCCI, RCM	FCC, CE, RCM, VCCI, BSMI	FCC, CE, RCM, VCCI, BSMI		
Software Platform	OS Support	Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)	Windows 7 (32/64-bit) (Skylake-ULT Only) Windows 8.1 (64-bit) (Skylake-ULT Only) Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)	Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)		

*1 x microSD slot

*1 x MIPI-CSI 2.0 (by request); *1 x microSD slot



Model		MS-9818	MS-98G6	MS-98F6
		3.5" Board		
Processor	CPU	Intel® Celeron® Processor N3160, QC, 6W Intel® Celeron® Processor N3010, DC, 4W	Intel® Celeron® Processor J1900, QC, 10W Intel® Celeron® Processor N2930, QC, 7.5W	Intel® Celeron® Processor J1900, QC, 10W Intel® Celeron® Processor N2930, QC, 7.5W
	Frequency	N3160, 1.6 GHz up to 2.24 GHz N3010, 1.04 GHz up to 2.24 GHz ²	J1900, 2 GHz N2930, 1.83 GHz	J1900, 2 GHz N2930, 1.83 GHz
	L2 Cache	2MB	2MB	2MB
	CPU Type	BGA	BGA	BGA
	Chipset	Integrated in SoC	N/A	N/A
	BIOS	AMI	AMI	AMI
Memory	Technology	Single-channel DDR3L 1600MHz	Single-channel DDR3L 1333 MHz	Single-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB	Up to 8GB	Up to 8GB
	Socket	1 x 204-pin SO-DIMM	1 x 204-pin SO-DIMM	1 x 204-pin SO-DIMM
Display	Controller	Intel® HD Graphics	Intel® HD Graphics	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual channel 18/24-bit	Dual channel 18/24-bit	Dual channel 18/24-bit
	VGA	N/A	N/A	1
	DVI	N/A	1 (DVI-I)	N/A
	HDMI	1	N/A	1
	DisplayPort	1	N/A	N/A
	Multiple Display	3 independent displays	2 independent displays	2 independent displays
Display Interface	LVDS up to 1920 x 1200 @60Hz HDMI up to 2560 x 1600 @60Hz; up to 3840 x 2160 @30Hz DP1.1a up to 2560 x 1600 @60Hz; up to 3840 x 2160 @30Hz	LVDS up to 1920 x 1200 @60Hz DVI-I up to 1920 x 1200 @60Hz	VGA up to 2560 x 1600 @60Hz HDMI up to 1920 x 1080 @60Hz LVDS up to 1920 x 1200 @60Hz	
Ethernet	Controller	2 x Realtek RTL8111G GbE LA	2 x Intel® I210-AT GbE LAN	2 x Intel® I210-AT GbE LAN
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec	Realtek® ALC887-VD2-CG HD Audio Codec	Realtek® ALC887-VD2-CG HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I	Fintek F81866AD-I	Fintek F81866AD-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes	Yes	N/A
TPM	Controller	Pin header	N/A	N/A
I/O Interface	USB	2 x USB 2.0 (2 x internal) 4 x USB 3.0 (4 x rear)	7 x USB 2.0 (4 x internal; 3 x rear) 1 x USB 3.0 (1 x rear)	7 x USB 2.0 (4 x internal; 3 x rear) 1 x USB 3.0 (1 x rear)
	Serial	4 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2~4: RS-232	6 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2~6: RS-232, 0V/5V/12V	6 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2~6: RS-232, 0V/5V/12V
	PS/2	N/A	1 (wafer connector)	1 (wafer connector)
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V	8-bits (4 x GPI; 4 x GPO), 5V	8-bits (4 x GPI; 4 x GPO), 5V
Expansion Slot	M.2	N/A	N/A	N/A
	Mini-PCIe	2 x Full-size (Mini-PCIe1 Slot w/ mSATA)	2 x Full-size (one w/ mSATA)	2 x Full-size (one w/ mSATA)
Storage	SATA	1 x SATA 3.0	1 x SATA 2.0	1 x SATA 2.0
	mSATA	1 (Shared with Mini-PCIe1)	1	1
Power Supply	DC	DC-in 9~36V	DC-in 12V/19V/24V	DC-in 12V/19V/24V
	ATX	N/A	N/A	N/A
Environment	Operating Temperature	-10 ~ 60°C	-10 ~ 60°C	-10 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C	-20 ~ 80°C	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing
Form Factor	Dimensions	146 x 102mm (3.5")	146 x 102mm (3.5")	146 x 102mm (3.5")
	Weight	0.33 kg	0.31 kg	0.31 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI	FCC, CE, RCM, VCCI, BSMI	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Fedora 21 (by request) Linux Ubuntu 14.04.03 (by request)	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Linux Fedora 20 (by request) Linux Ubuntu 13.10 (by request)	Windows 7 (64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit) Linux Fedora 19 (by request) Linux Ubuntu 13.04 (by request)

Semi-rugged Terminal
 POS System
 HMI Panel PC
 Embedded System
 Embedded Board
 COM Express Board
 Oseven Board
 Pico-ITX Board
 3.5" Board
 EPIC Board
 PICMG 1.0 Board
 Mini-ITX Board
 Micro-ATX Board
 ATX Board
 Mini-PCIe Module

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module



NEW



Model		MS-98F3	MS-98H5		MS-98G7
		3.5" Board	EPIC Board		PICMG 1.0 Board
Processor	CPU	Intel® Core™ i5-4300U/i3-4010U Processors, DC, 15W Intel® Core™ i7-5650U/i5-5350U/i3-5010U/3765U Processors, DC, 15W	Intel® Pentium® Processor N4200, QC, 6W Intel® Celeron® Processor N3350, DC, 6W	Intel® Atom™ x7 Processor E3950, QC, 12W Intel® Atom™ x5 Processor E3940, QC, 9.5W Intel® Atom™ x5 Processor E3930, DC, 6.5W	4th Gen Intel® Desktop Haswell/Haswell refresh Core™ i7/i5/i3/Pentium/Celeron Processor, Max. 95W
	Frequency	i5-4300U, 1.9GHz, up to 2.9GHz i3-4010U, 1.7GHz i7-5650U, 2.2GHz, up to 3.1GHz i5-5350U, 1.8GHz, up to 2.9GHz i3-5010U, 2.1GHz 3765U, 1.9GHz	N4200, 1.1 GHz, up to 2.5 GHz N3350, 1.1 GHz, up to 2.4 GHz	E3950, 1.6 GHz, up to 2.0 GHz E3940, 1.6 GHz, up to 1.8 GHz E3930, 1.3 GHz, up to 1.8 GHz	2.4GHz~4.0GHz (Depends on CPU)
	L2 Cache	2MB~4MB (Depends on CPU)	2M		2M~8M (Depends on CPU)
	CPU Type	BGA	BGA		Socket (LGA 1150)
	Chipset	N/A	Integrated in SoC		Intel® H81
Memory	BIOS	AMI	AMI	AMI	AMI
	Technology	Single-channel for DDR3L 1600 MHz	Single-channel LPDDR4 2400MHz	Single-channel LPDDR4 2133/2400MHz	Dual-channel DDR3/DDR3L 1333/1600MHz
	Max. Capacity	Up to 8GB	Up to 4GB		Up to 16GB
Display	Socket	1 x 204-pin SO-DIMM	Onboard		2 x 240-pin UDIMMs
	Controller	Intel® HD Graphics	Intel® HD Graphics		Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM		Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual channel 18/24-bit	Dual Channel 18/24-bit		N/A
	VGA	1 (optional)	N/A		1
	DVI	N/A	1 (DVI-D)		1 (DVI-D, pin-header)
	HDMI	1	1 (by BOM option)		N/A
	DisplayPort	1 (optional)	1 (Co-lay HDMI)		N/A
Ethernet	Multiple Display	3 independent displays	3 independent displays		2 independent displays
	Display Interface	VGA up to 1920 x 1200 @60Hz HDMI up to 2560 x 1600 @60Hz LVDS up to 1920 x 1200 @60Hz DP up to 3840 x 2160 @60Hz	LVDS up to 1920 x 1200 @60 Hz DVI-D up to 1920 x 1200 @60 Hz HDMI up to 3840 x 2160 @30Hz DP up to 4096 x 2160 @60Hz		VGA up to 1920 x 1200 @60Hz DVI-D up to 1920 x 1200 @60Hz
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec	Realtek® ALC887 HD Audio Codec		Realtek® ALC887 HD Audio Codec
H/W Monitor	Super I/O	Controller	Fintek F81866AD-I	Fintek F81867D-I	Fintek F81866
	Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer		256-level Watchdog Timer
	Smart Fan	N/A	Yes		Yes
TPM	USB	4 x USB 2.0 (2 x internal; 2 x rear) 2 x USB 3.0 (2 x rear with USB 2.0 signal)	N/A		N/A
	Controller	N/A	Pin header (Default) Infineon SLB9665TT 2.0 (by BOM option)	Infineon SLB9665XT 2.0 (Default)	Pin header
I/O Interface	Serial	N/A	4 x USB 3.0 (rear) , 4 x USB 2.0 (internal)		2 x USB 3.0 (rear), 4 x USB 2.0 (internal)
	Parallel	4 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2~4: RS-232, 0V/5V/12V	6 x COM ports (internal) COM1~2: RS-232/422/485, 0V/5V/12V COM3~6: RS-232, 0V/5V/12V		2 x COM (internal) COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232, 0V/5V/12V
	PS/2	N/A	N/A		1
	GPIIO	1 (pin header)	N/A		1 (wafer connector)
Expansion Slot	GPIIO	8-bits (4 x GPI; 4 x GPO), 5V	16-bits (8 x GPI; 8 x GPO), 5V		8-bits (4 x GPI; 4 x GPO), 5V
	PCI	N/A	N/A		N/A
	M.2	N/A	1 x M Key (SATA 3.0), 2242 1 x B Key (PCIe x1, USB2.0), 3042		N/A
Storage	Mini-PCIe	1 x Full-size (w/ mSATA) 1 x Half-size	1 x Full-size (w/ SIM holder)		1 x Full-size (w/ mSATA)
	SATA	2 x SATA 3.0	1 x SATA 3.0		2 x SATA 3.0 1 x SATA 2.0
Power Supply	mSATA	1	1		1
	DC	DC-in 12V/19V/24V	DC-in 12V		N/A
Environment	ATX	N/A	N/A		ATX/AT-Power 12V-4P, power from PICMG1.0 backplane
	Operating Temperature	-10 ~ 60°C	0 ~ 60°C		0 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing		10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C	-20 ~ 80°C		-20 ~ 80°C
Form Factor	Storage Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing		10 ~ 90%, non-condensing
	Dimensions	146 x 102mm (3.5")	146 x 102mm (3.5")		338 x 122mm (PICMG 1.0)
Certification	Weight	0.56 kg	0.28 kg		0.40 kg
	EMC	FCC, CE, RCM, VCCI, BSMI	FCC, CE, RCM, VCCI, BSMI		FCC, CE
Software Platform	OS Support	Windows 7 (64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit) Linux Fedora 19 (by request) Linux Ubuntu 13.04 (by request)	Windows XP (32-bit) Windows 7 (32-bit) Linux Fedora 14 (by request) Linux Ubuntu 12.04 (by request)		Windows XP (32-bit) Windows 7 (32/64-bit) Windows 8 (32/64-bit) Linux Fedora 19 (by request) Linux Ubuntu 10.04 (by request)



Model		MS-98K1			MS-98E1		MS-98H1	
		Mini-ITX Board						
Processor	CPU	7th Gen Intel® Desktop Kaby Lake-S i7-7700/i7-7700T/i5-7500/i5-7500T/i3-7101E/i3-7101TE, Max 65W 6th Gen Intel® Desktop Skylake-S i7-6700/i7-6700TE/i5-6500/i5-6500TE/i3-6100/i3-6100TE/G4400/G4400TE/G3900/G3900TE, Max 65W			7th/6th Gen Intel® Desktop Kaby Lake/Skylake Xeon/i7/i5/i3/Pentium®/Celeron® Series Processor, Max. 95W		7th/6th Gen Intel® Desktop Kaby Lake/Skylake Core™ i7/i5/i3/Pentium®/Celeron® Series Processor, Max. 95W	
	Frequency	2.3GHz~4.0GHz (Depends on CPU)			2.3GHz~4.0GHz (Depends on CPU)		2.4GHz~4.0 GHz (Depends on CPU)	
	L2 Cache	2M ~ 8M (Depends on CPU)			2M ~ 8M (Depends on CPU)		2M~8M (Depends on CPU)	
	CPU Type	Socket (LGA 1151)			Socket (LGA 1151)		Socket (LGA 1150)	
	Chipset	Intel® Q170 Express	Intel® H110 Express		Intel® C236 Express	Intel® H110 Express	Intel® Q87/H81 Express	
	BIOS	AMI			AMI		AMI	
	Memory	Technology	Dual-channel DDR4 (non-ECC) 2133MHz/2400MHz			Dual-channel DDR4 (ECC) 2133MHz/2400MHz (7th Gen)		Dual-channel DDR3/DDR3L 1066/1333/1600MHz
Max. Capacity		Up to 32 GB			Up to 32GB		Up to 16GB	
Socket		2 x 260-pin SO-DIMMs			2 x 260-pin SO-DIMMs		2 x 204-pin SO-DIMMs	
Display	Controller	Intel® HD Graphics			Intel® HD Graphics		Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM			Shared system memory up to 1.7 GB SDRAM		Shared system memory up to 1.7 GB SDRAM	
	LVDS	1 x Dual channel 18/24-bit			1		N/A	
	eDP	N/A			N/A		N/A	
	VGA	N/A			1		2	
	DVI	2 (DVI-D)			1 (DVI-D)		1 (DVI-D)	
	HDMI	1 (Co-lay with DP by Optional)			1		1	
	DisplayPort	1			N/A		N/A	
	Multiple Display	3 independent displays	2 independent displays		3 independent displays	2 independent displays	3 independent displays (Q87 SKU) 2 independent displays (H81 SKU)	
	Display Interface	LVDS up to 1920 x 1200 @60Hz DVI-D up to 1920 x 1200 @60Hz HDMI up to 4096 x 2160 @24Hz DP up to 4096 x 2160 @60Hz			LVDS up to 1920 x 1200 @60Hz HDMI up to 4096 x 2160 @24Hz DVI-D up to 1920 x 1200 @60Hz VGA up to 1920 x 1200 @60Hz		VGA1 up to 1920 x 1080 @60Hz VGA2 up to 1920 x 1080 @60Hz DVI-D up to 1920 x 1200 @60Hz HDMI up to 1920 x 1200 @60Hz	
Ethernet	Controller	4 x Intel® I210-AT GbE LAN (Front LAN LED Supported)	4 x Intel® I211-AT GbE LAN (Front LAN LED Supported)	2 x Intel® I211-AT GbE LAN (Front LAN LED Supported)	1 x Intel® I219-LM GbE-PHY 1 x Intel® I211-AT PCIe GbE LAN(Co-lay I210-AT)		4 x Intel® I210-AT GbE LAN 2 x Intel® I211-AT GbE LAN (depends on SKU)	
	Audio	Realtek® ALC887 HD Audio Codec			Realtek® ALC887 HD Audio Codec		Realtek® ALC887 HD Audio Codec	
Super I/O	Controller	Fintek F81866AD-I			Fintek F81866AD-I		Fintek F81866D	
	Watchdog Timer	256-level Watchdog Timer			256-level Watchdog Timer		256-level Watchdog Timer	
H/W Monitor	Smart Fan	Yes			Yes		Yes	
	TPM	Controller	Infineon SLB9665TT 2.0	Pin header (Default) Infineon SLB965TT 2.0 (by BOM option)	Pin header		Pin header	
I/O Interface	USB	8 x USB3.0 (rear) 3 x USB2.0 (internal)	4 x USB3.0 (rear) 5 x USB2.0 (4 x rear; 1 x internal)		4 x USB 3.0 (4 x rear) 4 x USB 2.0 (2 x rear; 2 x internal) 1 x USB 2.0 (Vertical, internal)		2 x USB 3.0 (rear) 4 x USB 2.0 (2 x rear; 2 x internal)	
	Serial	4 x COM ports (Internal) COM1: RS-232/422/485, RI/5V/12V COM2-4: RS-232/422/485, 0V/5V/12V	4 x COM ports (Internal) COM1: RS-232/422/485, RI/5V/12V COM2-4: RS-232, 0V/5V/12V		5 x COM ports (COM1: rear, COM2-4: internal) COM1: RS-232/422/485, 0V/5V/12V COM2-5: RS-232, 0V/5V/12V		10 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232/422/485, 0V/5V/12V COM3-6: RS-232, 0V/5V/12V COM7-10: RS-232, 0V/5V/12V (depends on SKU)	
	PS/2	N/A			1		1	
	GPIO	16-bits (8 x GPI; 8 x GPO), 5V			8-bits (4 x GPI, 4 x GPO), 5V		8-bits (4 x GPI; 4 x GPO), 5V	
	Expansion Slot	PCIe x16 1 (Maximum 75W Supported)			1		1	
Storage	PCIe x1	N/A			N/A		N/A	
	M.2	1 x M Key (PCIe x4 NVMe, SATA3.0), 1 x M Key (SATA3.0), 2242/2280			1 x M Key (PCIe x4, SATA3.0), 2242	N/A	N/A	
	Mini-PCIe	1 x Full-size (w/ SIM holder)			1 x Full-size, mSATA		1 x Full-size(W/ mSATA) 1 x Half-size	
	SATA	2 x SATA 3.0			4 x SATA 3.0	3 x SATA 3.0	2 x SATA 3.0	
Power Supply	mSATA	N/A			1 (shared w/ Mini-PCIe)		1 (shared w/ Mini-PCIe)	
	DC	DC-in 12 ~24V			N/A		N/A	
Environment	ATX	N/A			ATX-Power 24P, 12V-4P		ATX-Power 24P, 12V-4P	
	Operating Temperature	-10 ~ 60°C			0 ~ 60°C		-10 ~ 60°C	
	Operating Humidity	10 ~ 90%, non-condensing			10 ~ 90%, non-condensing		10~90%, non-condensing	
	Storage Temperature	-20 ~ 80°C			-20 ~ 80°C		-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing			10 ~ 90%, non-condensing		10~90%, non-condensing	
Form Factor	Dimensions	170 x 170mm (Mini-ITX)			170 x 170mm (Mini-ITX)		170 x 170mm (Mini-ITX)	
	Weight	0.42 kg	0.42 kg	0.39 kg	0.37 kg	0.37 kg		
Certification	EMC	FCC, CE , RCM, VCCI, BSMI (Class A)			FCC, CE, RCM, VCCI, BSMI		FCC Class A, CE, RCM, VCCI, BSMI	
	OS Support	Windows 7 (32/64-bit) (Skylake-S Series CPU Only) Windows 8.1 (64-bit) (Skylake-S Series CPU Only) Windows 10 (64-bit) Linux Fedora 23 (by request) Linux Ubuntu 16.04 (by request)			Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Fedora 23 (by request) Linux Ubuntu 16.04 (by request)		Windows XP (32-bit) Windows 7 (32/64-bit) Windows 8/8.1 (32/64-bit) Windows 10 (64-bit) Linux Fedora 19 (by request) Linux Ubuntu 13.04 (by request)	

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCle Module

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module



Model		MS-98C7	MS-98B3	
		Mini-ITX Board		
Processor	CPU	4th Gen Intel® Desktop Haswell/ Haswell Refresh Core™ i7/i5/i3/ Celeron®/Pentium® Processor, Max. 65W	6th/7th Gen Intel® Mobile-H Kaby Lake/Skylake Core™ Xeon® / Core™ i7/i5/i3/Celeron® Processor, Max. 45W	
	Frequency	2.2GHz~4.4GHz (Depends on CPU)	2.3GHz~3.9 GHz (Depends on CPU)	
	L2 Cache	2M ~ 8M (Depends on CPU)	3M~8M (Depends on CPU)	
	CPU Type	Socket (LGA 1150)	BGA	
	Chipset	Intel® H81/Q87 Express	Intel® HM170/QM170/CM236 Express	
	BIOS	AMI	AMI	
Memory	Technology	Dual-channel DDR3/DDR3L 1066/1333/1600MHz	Dual-channel DDR4 1866/2133 MHz	
	Max. Capacity	Up to 16GB	Up to 32GB	
	Socket	2 x 204-pin SO-DIMMs	2 x 260-pin SO-DIMMs	
Display	Controller	Intel® HD Graphics	Intel® Iris™ Graphics/HD Graphics (depends on CPU)	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM	
	LVDS	Dual channel 24-bit (add chrontel 7511B chipset)	2 x Dual channel 24-bit (LVDS1 co-design with eDP, LVDS2 co-design with DVI-D)	
	VGA	1	N/A	
	DVI	N/A	1 (DVI-I)	N/A
	HDMI	N/A	2(1 x HDMI2.0, 1 x HDMI1.4 colay with DP)	
	DisplayPort	2	1(Colay with HDMI1.4)	
	Multiple Display	2 independent displays (H81 SKU) 3 independent displays (Q87 SKU)	3 independent displays	
Display Interface	LVDS up to 1920 x 1200 @60Hz VGA up to 1920 x 1200 @60Hz DP up to 3840 x 2160 @60Hz	LVDS up to 1920 x 1200 @60Hz eDP up to 4096 x 2160 @60Hz DP up to 4096 x 2160 @60Hz HDMI up to 4096 x 2160 @60Hz DVI up to 1920 x 1200 @60Hz	LVDS up to 1920 x 1200 @60Hz eDP up to 4096 x 2160 @60Hz DP up to 4096 x 2160 @60Hz HDMI up to 4096 x 2160 @60Hz	
Ethernet	Controller	1 x Intel® I217-LM GbE PHY (iAMT 9.0 supported) 1 x Intel® I210-AT PCIe GbE LAN	Intel® I219-LM LAN PHY Intel® I210 co-lay I211 LAN	Intel® I219-LM LAN PHY
Audio	Controller	Realtek® ALC887 HD Audio Codec		
Super I/O	Controller	Fintek F81866D		
H/W Monitor	Watchdog Timer	256-level Watchdog Timer		
	Smart Fan	Yes		
TPM	Controller	Pin header		
I/O Interface	USB	Q87: 6 x USB 2.0 (4 x internal; 2 x rear); 4 x USB 3.0 (rear) H81: 6 x USB 2.0 (2 x internal; 4 x rear); 2 x USB 3.0 (rear)	4 x USB3.0 (rear) 6 x USB2.0 (internal)	2 x USB3.0 (rear) 6 x USB2.0 (internal)
	Serial	5 x COM ports (COM1: rear, COM2~5: internal) COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232, w/ WOR function COM3~5: RS-232, 0V/5V/12V	2 x COM ports (rear) RS-232/422/485,0V/5V/12V	1 x COM port (rear) RS-232/422/485,0V/5V/12V
	Parallel	1 (Pin header)		
	PS/2	1		
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V		
Expansion Slot	PCIe x16	1 (up to 75W)		
	PCIe x4	N/A		
	PCI	N/A		
	M.2	N/A		
	Mini-PCIe	1 x Full-size(W/ mSATA) 1 x Half-size	1 x Full-size co-lay mSATA 1 x Half-size	
Storage	SATA	Q87: 4 x SATA 3.0 H81: 2 x SATA 3.0; 1 x SATA 2.0	QM87: 2 x SATA 3.0 HM86: 1 x SATA 3.0; 1 x SATA 2.0	
	mSATA	1 (shared w/ Mini-PCIe)		
Power Supply	DC	DC-in 12V		
	ATX	N/A		
Environment	Operating Temperature	0 ~ 60°C		
	Operating Humidity	10 ~ 90%, non-condensing		
	Storage Temperature	-20 ~ 80°C		
	Storage Humidity	10 ~ 90%, non-condensing		
Form Factor	Dimensions	170 x 170mm (Mini-ITX)		
	Weight	0.37 kg		
Certification	EMC	FCC, CE, RCM, VCCI, BSMI		
Software Platform	OS Support	Windows XP (32/64-bit) Windows 7 (32/64-bit) Windows 8 (32/64-bit) Linux Fedora 19 (by request)		
		Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Kernel 4.4		



Model		MS-98J4	MS-98H4	MS-98G5	
		Mini-ITX Board			
Processor	CPU	7th/6th Gen Intel® Mobile Kaby Lake/Skylake-ULT Core™ i7/i5/i3/Celeron™ Processor, DC/QC, Max. 15W	5th Gen Intel® Mobile Broadwell ULT Core™ i3/i5/i7 Processor, Max. 15W	4th Gen Intel® Mobile Haswell-H Core™ i7/i5/i3/Celeron™ Mobile Processor, Max. 47W	
	Frequency	Depends on CPU	Depends on CPU	2.2GHz~3.6 GHz (Depends on CPU)	
	L2 Cache	Depends on CPU	Depends on CPU	3M~6M (Depends on CPU)	
	CPU Type	BGA	BGA	BGA	
	Chipset	Integrated	Integrated	Intel® HM86/QM87 Express	
	BIOS	AMI	AMI	AMI	
Memory	Technology	Dual-channel DDR4 2133 MHz SDRAM	Dual-channel DDR3L 1333 /1600 MHz SDRAM	Dual-channel DDR3L 1333 /1600 MHz SDRAM	
	Max. Capacity	Up to 32GB	Up to 16 GB	Up to 16 GB	
	Socket	2 x 260-pin SO-DIMMs	2 x 204-pin SO-DIMMs	2 x 204-pin SO-DIMMs	
Display	Controller	Intel® HD Graphics	Intel® HD Graphics	Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM	
	LVDS	2 x Dual channel 24-bit (LVDS1 co-design with eDP, LVDS2 co-design with DP2/HDMI2.0)	1 x Dual channel 18/24-bit (Colay with DP)	Dual channel 24-bit	
	eDP	1 (Co-design with LVDS1)	N/A	N/A	
	VGA	N/A	1 (shared w/ DVI-D)	N/A	
	DVI	N/A	1 (DVI-D, shared w/ VGA)	1 (DVI-I)	
	HDMI	2 (1 x HDMI1.4 colay with DP1, 1 x HDMI2.0 colay with DP2)	1 (shared w/ DP)	1	
	DisplayPort	2 (DP1 colay with HDMI1.4, DP2 colay with HDMI2.0)	2 (1 shared w/ HDMI, 1 shared w/ LVDS)	1	
	Multiple Display	3 independent displays	3 independent displays	3 independent displays	
Display Interface	LVDS up to 1920 x 1200 @60Hz eDP up to 4096 x 2304 @60Hz DP up to 4096 x 2304 @60Hz HDMI up to 4096 x 2160 @60Hz	LVDS up to 1920 x 1200 @60Hz HDMI up to 4096 x 2304 @30Hz DP up to 3840x 2160 @60Hz DVI-I up to 1920x 1200 @60Hz	LVDS up to 1920 x 1200 @60Hz DVI up to 1920 x 1200 @60Hz DP up to 3840 x 2160 @60Hz HDMI up to 3840 x 2160 @24Hz		
Ethernet	Controller	1 x Intel® I219LM GbE LAN PHY 1 x Intel® I211-AT/I210-AT GbE LAN*	1 x Intel® I218LM GbE LAN PHY 1 x Intel® I210-AT GbE LAN	1 x Intel® I217-LM LAN PHY 1 x Intel® I210-AT GbE LAN	
	Audio	Realtek® ALC887/888S HD Audio Codec	Realtek® ALC887/888S HD Audio Codec	Realtek® ALC887 HD Audio Codec	
Super I/O	Controller	Fintek F81866AD-I	Fintek F81866AD-I	Fintek F81866AD-I	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer	
	Smart Fan	Yes	Yes	Yes	
TPM	Controller	Infineon SLB9665TT2.0(default) Pin header (By BOM option)	Infineon SLB9635TT1.2	Pin header	
I/O Interface	USB	4 x USB 3.0 (rear) 5 x USB 2.0 (4 x internal, 1 x vertical connector)	4 x USB 3.0 (rear) 4 x USB 2.0 (4 x internal)	4 x USB3.0 (rear) 8 x USB2.0 (6 x internal; 2 x rear)	
	Serial	6 x COM Ports (Internal) COM1~2: RS-232/422/485, 0V/5V/12V, RI support (RS-232/422/485 by Optional, RS485 support 1000M+) COM3~6: RS-232, 0V/5V/12V (depends on SKU)	2 x COM Ports (Internal) COM3~4: RS-232, 0V/5V/12V	4 x COM ports (by SKU) COM1: RS-232/422/485, 0V/5V/12V COM2~4: RS-232, 0V/5V/12V	5 x COM ports (COM1: rear, COM2~5: internal) COM1: RS-232/422/485, 0V/5V/12V COM2~5: RS-232
	Parallel	N/A	N/A	N/A	
	PS/2	1 (pin header)	1 (pin header)	1	
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V	8-bits (4 x GPI; 4 x GPO), 5V	8-bits (4 x GPI; 4 x GPO), 5V	
Expansion Slot	PCIe x16	N/A	N/A	1 (up to 75W, w/ riser card to extend to x8+x8 or x8+x4+x4)	
	M.2	1 x E Key 2230 for Wi-Fi/BT module 1 x M Key (PCIe x4 NVMe, SATA3.0)2280 for SSD	1 x E Key 2230 for Wi-Fi/BT module	1 x M Key (SATA 3.0), 2242 1 x E Key (PCIe x1, USB2.0), 2230	
	Mini-PCIe	1 x Full-size(w/mSATA) 1 x Full/Half-size(w/ SIM Holder)	N/A	N/A	
Storage	SATA	2 x SATA 3.0	2 x Full-size (one w/ SIM holder or mSATA)	QM87: 1 x Full-size, mSATA (w/ SIM Holder) 1 x Half-size HM86: 1 x Half-size	
	mSATA	1 (shared w/ Mini-PCIe)	1 (shared w/ Mini-PCIe)	1	
Power Supply	DC	DC-in 12V~24V	DC-in 12V/19V/24V	DC-in 12V/19V	
	ATX	N/A	N/A	N/A	
Environment	Operating Temperature	-10 ~ 60°C	-10 ~ 60°C	0 ~ 60°C	
	Operating Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C	-20 ~ 80°C	-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	
Form Factor	Dimensions	170 x 170mm (Mini-ITX)	170 x 170mm (Mini-ITX)	170 x 170mm (Mini-ITX)	
	Weight	0.34 kg	0.37 kg	0.35 kg	
Certification	EMC	FCC, CE, RCM, VCCI, BSMI	FCC, CE, RCM, VCCI	FCC, CE, RCM, VCCI, BSMI	
Software Platform	OS Support	Windows 7 (32/64-bit) (Skylake-U Only) Windows 8.1 (64-bit) (Skylake-U Only) Windows 10/ Windows 10 IoT Enterprise (64-bit) Linux Kernel 4.x (Fedora 25 & Ubuntu 16.04)	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Linux Fedora Core 21 Linux Ubuntu 15.04	Windows 7 (32/64-bit) Windows 8 (32 bit)	

Semi-Tugged Terminal
 POS System
 HMI Panel PC
 Embedded System
 Embedded Board
 COM Express Board
 Oseven Board
 Pico-ITX Board
 3.5" Board
 EPIC Board
 PICMG 1.0 Board
 Mini-ITX Board
 Micro-ATX Board
 ATX Board
 Mini-PCIe Module

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCle Module



Model		MS-98B1	MS-98J0	MS-9892					
		Mini-ITX Board							
Processor	CPU	Intel® Celeron® Processor N3350, DC, 6W Intel® Atom™ x5 Processor E3940, QC, 9.5W	Intel® Celeron® Processor N3350, DC, 6W Intel® Atom™ x5 Processor E3940, QC, 9.5W	<table border="1"> <thead> <tr> <th>Apollo Lake SKUs</th> <th>Apollo Lake-I SKUs</th> </tr> </thead> <tbody> <tr> <td>Intel® Pentium® Processor N4200, QC, 6W Intel® Celeron® Processor N3350, DC, 6W</td> <td>Intel® Atom™ x5 Processor E3940, QC, 9W Intel® Atom™ x5 Processor E3930, DC, 6W</td> </tr> </tbody> </table>		Apollo Lake SKUs	Apollo Lake-I SKUs	Intel® Pentium® Processor N4200, QC, 6W Intel® Celeron® Processor N3350, DC, 6W	Intel® Atom™ x5 Processor E3940, QC, 9W Intel® Atom™ x5 Processor E3930, DC, 6W
	Apollo Lake SKUs	Apollo Lake-I SKUs							
	Intel® Pentium® Processor N4200, QC, 6W Intel® Celeron® Processor N3350, DC, 6W	Intel® Atom™ x5 Processor E3940, QC, 9W Intel® Atom™ x5 Processor E3930, DC, 6W							
	Frequency	N3350, 1.1 GHz, up to 2.4 GHz E3940, 1.6 GHz, up to 1.8 GHz	N3350, 1.1 GHz, up to 2.4 GHz E3940, 1.6 GHz, up to 1.8 GHz	N4200, 1.1 GHz, up to 2.5 GHz N3350, 1.1 GHz, up to 2.4 GHz					
	L2 Cache	2MB	2MB	1M~2M (Depends on CPU)					
	CPU Type	BGA	BGA	BGA					
Chipset	Integrated in SoC	Integrated in SoC	Integrated in SoC						
BIOS	AMI	AMI	AMI						
Memory	Technology	Dual-channel DDR3L 1866 MHz	Dual-channel DDR3L 1866 MHz	Dual-channel DDR3L 1866 MHz					
	Max. Capacity	Up to 8 GB	Up to 8 GB	Up to 8GB					
	Socket	2 x 204-pin SO-DIMMs	2 x 204-pin SO-DIMMs	2 x 204-pin SO-DIMMs					
Display	Controller	Intel® HD Graphics	Intel® HD Graphics	Intel® HD Graphics					
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM					
	LVDS	1 x Dual channel 18/24-bit (Signal shared w/ eDP)	1 x Dual channel 18/24-bit	1 x Dual channel 18/24-bit					
	eDP	1 (by BOM option)	1 (by BOM option)	1 (colay with LVDS)					
	VGA	N/A	1 (by BOM option)	N/A					
	DVI	N/A	N/A	N/A					
	HDMI	1 (co-lay DP)	1 (co-lay DP)	1 (co-lay with DP)					
	DisplayPort	2 (One Signal shared w/ eDP)	1 (co-lay VGA)	1 (co-lay with HDMI)					
	Multiple Display	3 independent displays	3 independent displays	3 independent displays					
	Display Interface	LVDS up to 1920 x 1200 @60 Hz eDP up to 4096 x 2160 @60Hz HDMI up to 3840 x 2160 @30Hz DP up to 4096 x 2160 @60Hz	LVDS up to 1920 x 1200 @60 Hz eDP up to 4096 x 2160 @60Hz HDMI up to 3840 x 2160 @30Hz DP up to 4096 x 2160 @60Hz VGA up to 1920 x 1080 @60Hz	LVDS up to 1920 x 1200 @60Hz eDP up to 4096 x 2160 @60Hz HDMI up to 3840 x 2160 @30Hz DP up to 4096 x 2160 @60Hz					
Ethernet	Controller	2 x Intel® I211-AT co-lay I210-AT GbE LAN	2 x Realtek® RTL8111H-CG	2 x Intel® I211-AT GbE LAN	2 x Intel® I210-IT GbE LAN				
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec	Realtek® ALC887-VD2-CG HD Audio Codec	Realtek® ALC887-VD2-CG HD Audio Codec					
Super I/O	Controller	Fintek F81867D-I	Fintek F81867D-I	Fintek F81867D-I					
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer					
	Smart Fan	Yes	Yes	Yes					
TPM	Controller	Pin header (default) Infineon SLB9665TT 2.0 (by BOM option)	Pin header (default) Infineon SLB9665TT 2.0 (by BOM option)	Pin header (default) Infineon SLB9665TT 2.0 (by BOM option)	Pin header (default) Infineon SLB9665XT 2.0 (by BOM option)				
	USB	4 x USB3.0 (rear) 5 x USB2.0 (internal)	4 x USB3.0 (rear) 3 x USB2.0 (internal)	4 x USB3.0 (rear) 6 x USB2.0 (internal)					
I/O Interface	Serial	6 x COM ports (internal) COM1~2: RS-232/422/485, 0V/5V/12V COM3~6: RS-232, w/o Power	6 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2~6: RS-232, w/o Power	6 x COM ports (internal) COM1/2: RS-232/422/485, 0V/5V/12V COM3~6: RS-232, W/O Power					
	PS/2	1 (pin header)	1 (pin header)	1 (pin header)					
	GPIO	16-bits (8 x GPI; 8 x GPO), 5V	8-bits (4 x GPI; 4 x GPO), 5V	16-bits (8 x GPI; 8 x GPO), 5V					
	PCIe x16	N/A	N/A	N/A					
Expansion Slot	PCIe x1	1	1	1					
	M.2	1 x M Key (SATA 3.0), 2242 1 x E Key (PCIe x1, USB2.0), 2230	1 x M Key (SATA 3.0), 2242 1 x E Key (PCIe x1, USB2.0), 2230	N/A					
	Mini-PCIe	N/A	N/A	1 x Full-size (w/ SIM holder) 1 x Full-size (W/ mSATA)					
Storage	SATA	2 x SATA 3.0 (SATA2 share with M.2 M Key)	1 x SATA 3.0	2 x SATA3.0 (SATA2 share with M.2)					
	mSATA	N/A	N/A	1 (shared w/SATA2)					
Power Supply	DC	DC-in 12/19/24V	DC-in 12V	DC-in 12V~24V					
	ATX	N/A	N/A	N/A					
Environment	Operating Temperature	-10 ~ 60°C	-10 ~ 60°C	-10 ~ 60°C	-40 ~ 85°C				
	Operating Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing					
	Storage Temperature	-20 ~ 80°C	-20 ~ 80°C	-20 ~ 80°C	-40 ~ 85°C				
	Storage Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing					
Form Factor	Dimensions	170 x 170mm (Mini-ITX)	170 x 170mm (Mini-ITX)	170 x 170mm (Mini-ITX)					
	Weight	0.37 kg	0.37 kg	0.37 kg					
Certification	EMC	FCC, CE, RCM, VCCI, BSMI	FCC, CE, RCM, VCCI, BSMI	FCC, CE, RCM, VCCI, BSMI					
Software Platform	OS Support	Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by Rrequest)	Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)	Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)					



Model		MS-98F1		MS-9810	MS-98F5
				Mini-ITX Board	
Processor	CPU	Intel® Pentium processor N3710, QC, 6W Intel® Celeron processor N3160, QC, 6W Intel® Celeron processor N3060, DC, 6W Intel® Celeron processor N3010, DC, 4W		Intel® Pentium processor N3710, QC, 6W Intel® Celeron processor N3160, QC, 6W Intel® Celeron processor N3060, DC, 6W Intel® Celeron processor N3010, DC, 4W	Intel® Celeron® Processor J1900, QC, 10W Intel® Celeron® Processor N2930, QC, 7.5W
	Frequency	N3710, 1.6 GHz, up to 2.56 GHz N3160, 1.6 GHz, up to 2.24 GHz N3060, 1.6 GHz, up to 2.48 GHz N3010, 1.04 GHz, up to 2.24 GHz		N3710, 1.6 GHz, up to 2.56 GHz N3160, 1.6 GHz, up to 2.24 GHz N3060, 1.6 GHz, up to 2.48 GHz N3010, 1.04 GHz, up to 2.24 GHz	J1900, 2.0 GHz, up to 2.42 GHz N2930, 1.83 GHz, up to 2.16 GHz
	L2 Cache	2MB		2MB	2 MB
	CPU Type	BGA		BGA	BGA
	Chipset	Integrated		Integrated	Integrated
	BIOS	AMI		AMI	AMI
Memory	Technology	Dual-channel DDR3L 1333/1600 MHz		Dual-channel DDR3L 1333/1600 MHz	Dual-channel DDR3L 1333/1066 MHz
	Max. Capacity	Up to 8 GB		Up to 8 GB	Up to 8 GB
	Socket	2 x 204-pin SO-DIMMs		2 x 204-pin SO-DIMMs (1 slot for opt SKU)	2 or 1 x 204-pin SO-DIMMs (depends on SKU)
Display	Controller	Intel® HD Graphics		Intel® HD Graphics	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM		Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM
	LVDS	2 x Dual channel 18/24-bit		Dual channel 24-bit	Dual Channel 24-bit (add chrontel 7511B chipset)
	VGA	NA		N/A	1
	DVI	N/A		1 (DVI-D)	N/A
	HDMI	N/A		1 (co-lay with DP)	N/A
	Multiple Display	3 independent displays		3 independent displays	2 independent displays
	Display Interface	LVDS up to 1920 x 1200 @60Hz DP up to 3840 x 2160 @30Hz eDP up to 2560 x 1600 @60Hz		LVDS up to 1920 x 1200 @60Hz DP up to 3840 x 2160 @30Hz HDMI up to 1920 x 1200 @60Hz DVI up to 1920 x 1200 @60Hz	VGA up to 2560 x 1600 @60Hz LVDS up to 1920 x 1200 @60Hz
Ethernet	Controller	2 x Intel® i210-AT GbE LAN	1 x Intel® i210-AT GbE LAN	2 or 1 x Realtek® RTL8111G-CG GbE LAN (depends on SKU)	2 or 1 x Realtek® RTL8111G-CG GbE LAN (depends on SKU)
Audio	Controller	Realtek® ALC887 co-lay ALC888S		Realtek® ALC887 co-lay ALC888S	Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I		Fintek F81866AD-I	Fintek F81866AD-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer		256-level Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes		Yes	Yes
TPM	Controller	Pin header (default) Infineon SLB9635TT 1.2 (by BOM option)		Pin header (default) Infineon SLB9635TT 1.2 (by BOM option)	Pin header
I/O Interface	USB	4 x USB3.0 (rear) 4 x USB2.0 (internal)	4 x USB3.0 (rear) 4 x USB2.0 (internal)	2 x USB 3.0 (rear) 5 x USB 2.0 (internal)	8 x USB 2.0 (4 x internal; 4 x rear)
	Serial	6 x COM ports (COM1~2: rear, COM3~6: internal) COM1&5: RS-232/422/485, 0V/5V/12V COM2~4: RS-232, 0V/5V/12V COM6: RS-232 w/o power	4 x COM ports (COM1: rear, COM3: internal) COM1: RS-232/422/485, 0V/5V/12V COM5: RS-232, 0V/5V/12V COM6: RS-232 w/o power	6 x COM ports (COM1: rear, COM2~5: internal) COM1: RS-232/422/485, 0V/5V/12V COM2~6: RS-232, w/o power	6 x COM ports (COM1: rear, COM2~6: internal) COM1: RS-232, 0V/5V/12V COM2~6: RS-232, w/o power
	Parallel	1		1 (by BOM option)	1 (pin header)
	PS/2	1 (pin header)		1 (pin header)	1 (pin header)
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V		8-bits (4 x GPI; 4 x GPO), 5V	8-bits (4 x GPI, 4 x GPO), 3.3V
Expansion Slot	PCIe x16	1		N/A	N/A
	PCI	N/A		1	N/A
	M.2	N/A		N/A	N/A
	Mini-PCIe	2 x Full/Half-size (one w/ SIM holder)		1 x Full-size co-lay mSATA, support Half-size card	1 x Full-size, mSATA
Storage	SATA	1 x SATA 3.0		1 x SATA 3.0	1 x SATA 2.0
	CFast	N/A		N/A	N/A
	mSATA	1 (support by mini PCIe slot)		1 (support by mini PCIe slot)	1
Power Supply	DC	DC-in 12/19/24V		DC-in 12V	DC-in 12V
	ATX	ATX Power 20P		N/A	N/A
Environment	Operating Temperature	0 ~ 60°C		0 ~ 60°C	0 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing		10 ~ 90%, non-condensing	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C		-20 ~ 80°C	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing		10 ~ 90%, non-condensing	10 ~ 90%, non-condensing
Form Factor	Dimensions	170 x 170mm (Mini-ITX)		170 x 170mm (Mini-ITX)	170 x 170mm (Mini-ITX)
	Weight	0.37 kg		0.37 kg	0.37 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI		FCC, CE, RCM, VCCI	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Fedora 23 Linux Ubuntu 15.10		Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Ubuntu 14.04.3 & Fedora 20	Windows 8 (32/64-bit) Windows 10 (64-bit)

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module



Model	MS-98E3	MS-98C8	MS-9899	
	Mini-ITX Board			
Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W Intel® Celeron® Processor N2930, QC, 7.5W	3rd Gen Intel® Mobile Ivy bridge/Sandy bridge Core™ i7/i5/i3/Celeron®/Pentium® Processors, Max. 45W	3rd Intel® Core™ i7/i5/i3 Mobile Processor
	Frequency	J1900, 2.0 GHz, up to 2.42 GHz N2930, 1.83 GHz, up to 2.16 GHz	1.0 GHz~3.8 GHz (Depends on CPU)	Depends on CPU
	L2 Cache	2 MB	2M~8M (Depends on CPU)	Depends on CPU
	CPU Type	BGA	Socket G2 (rPGA 989)	Socket G2 (rPGA 989)
	Chipset	Integrated	Intel® HM76/QM77 Express	Intel® HM76/QM77 Express
	BIOS	AMI	AMI	AMI
Memory	Technology	Dual-channel DDR3L 1333/1066 MHz	Dual-channel DDR3 1066/1333/1600 MHz	Dual-channel DDR3/DDR3L 1066/1333/1600MHz
	Max. Capacity	Up to 8 GB	Up to 16 GB	Up to 16 GB
	Socket	2 x 204-pin SO-DIMMs	2 x 204-pin SO-DIMMs	2 x 204-pin SO-DIMMs
Display	Controller	Intel® HD Graphics	Intel® HD Graphics	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual Channel 24-bit (add chrontel 7511B chipset)	Dual channel 18/24-bit	Dual channel 24-bit
	eDP	N/A	N/A	1 (Pin header; only for QM77)
	VGA	1	N/A	1
	DVI	N/A	1 (DVI-I)	1 (DVI-D; only for QM77)
	HDMI	1	N/A	1 (only for QM77)
	DisplayPort	N/A	2	N/A
	Multiple Display	2 independent displays	2 independent displays (SNB CPU only) 3 independent displays (IVB CPU only)*	2 Independent displays
Display Interface	VGA up to 2560 x 1600 @60Hz HDMI up to 1920 x 1080 @60Hz LVDS up to 1920 x 1200 @60Hz	LVDS up to 1920 x 1200 @60Hz DP up to 2560 x 1600 @60Hz DVI-I up to 1920 x 1200 @60Hz	LVDS up to 1920 x 1200 @60Hz DVI-D up to 2560 x 1600 @60Hz VGA up to 2560 x 1600 @60Hz HDMI up to 2560 x 1600 @60Hz	
Ethernet	Controller	2 x Intel® I210-AT GbE LAN	1 x Intel® 82579 PHY GbE LAN 1 x Intel® I210-AT PCIe GbE LAN	1 x Intel® 82579LM GbE LAN PHY iAMT 8.0 (QM77 only) 1 x Intel® 82583V GbE LAN
Audio	Controller	Realtek® ALC887 HD Audio Codec	Realtek® ALC887 HD Audio Codec	Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I	Fintek F81866D	Fintek F81866D
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes	Yes	Yes
TPM	Controller	Pin header	Pin header	Pin header
I/O Interface	USB	8 x USB 2.0 (4 x internal; 4 x rear) 1 x USB 3.0 (internal)	4 x USB 3.0 (2 x internal; 2 x rear) 6 x USB 2.0 (2 x internal; 4 x rear)	4 x USB 3.0 (2 x rear; 2 x internal) 6 x USB 2.0 (4 x rear; 2 x internal)
	Serial	6 x COM ports (COM1~2: rear, COM3~6: internal) COM1: RS-232/422/485, 0V/5V/12V COM2~6: RS-232, 0V/5V/12V	4 x COM ports (COM1: rear, COM2~4: internal) COM1: RS-232/422/485, 0V/5V/12V COM2~4: RS-232, 0V/5V/12V	4 x COM ports (COM1: rear, COM2~4: internal) COM1: RS-232/422/485, 0V/5V/12V COM2~4: RS-232, 0V/5V/12V (no power selection jumper for HM76)
	Parallel	N/A	N/A	N/A
	PS/2	1 (Pin header)	1	1
	GPIO	8-bits (4 x GPI, 4 x GPO), 5V	8-bits (4 x GPI; 4 x GPO), 5V	8-bits (4 x GPI; 4 x GPO), 5V
Expansion Slot	PCIe x16	1 x SATA 2.0	N/A	1
	PCI	N/A	N/A	N/A
	M.2	N/A	N/A	N/A
	Mini-PCIe	1 x Full-size, mSATA	1 x Full-size 1 x Half-size, mSATA	1 x Full-size
Storage	SATA	1 x SATA 2.0	2 x SATA 3.0; 2 x SATA 2.0	2 x SATA 3.0 2 x SATA 2.0
	CFast	N/A	N/A	1 (QM77 only)
	mSATA	1	1	1
Power Supply	DC	DC-in 12V/19V/24V	DC-in 12V/19V	N/A
	ATX	ATX-Power 20P	N/A	ATX-Power 24P, 12V-4P
Environment	Operating Temperature	0 ~ 60°C	0 ~ 70°C	0 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C	-20 ~ 80°C	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing
Form Factor	Dimensions	170 x 170mm (Mini-ITX)	170 x 170mm (Mini-ITX)	170 x 170mm (Mini-ITX)
	Weight	0.37 kg	0.35 kg	0.37 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI	FCC, CE, RCM, VCCI, BSMI	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 8 (64-bit)	Windows 7 (32/64-bit) Windows 8 (32 bit)	Windows XP (32/64-bit) Windows 7 (32/64-bit) Windows 8 (32/64-bit)



Model		MS-9887	MS-98E2		MS-98G3
		Mini-ITX Board	Micro-ATX Board		
Processor	CPU	2nd Gen Intel® Mobile Sandy Bridge Core™ i7/i5/i3/Pentium®/Celeron® Processor, Max. 55W	C236 SKU		4th Gen Intel® Desktop Haswell/Haswell Refresh Core™ i7/i5/i3/Celeron®/Pentium® Processors, Max. 95W
	Frequency	1.5M~8M (Depends on CPU)	1.1GHz~3.7 GHz (Depends on CPU)		2.2GHz~4.4GHz (Depends on CPU)
	L2 Cache	Socket G2 (rPGA-989)	2M ~ 8M (Depends on CPU)		2M ~ 8M (Depends on CPU)
	CPU Type	Intel® HM65 Express (without iAMT function) Intel® QM67 Express (with iAMT 7.0)	Socket (LGA 1151)		Socket (LGA 1150)
	Chipset	AMI	Intel® C236 Express	Intel® H110 Express	Intel® Q87 Express
	BIOS	AMI	AMI		AMI
Memory	Technology	Dual-channel DDR3 1066/1333/1600MHz	Dual-channel DDR4 (ECC) 2133MHz/2400MHz (7th Gen)	Dual-channel DDR4 (non-ECC) 2133MHz/2400MHz (7th Gen)	Dual-channel DDR3 1066/1333/1600MHz
	Max. Capacity	Up to 16 GB	Up to 64 GB	Up to 32 GB	Up to 32GB
	Socket	2 x 204-pin SO-DIMMs	4 x 288-pin Long-DIMMs	2 x 288-pin Long-DIMMs	4 x 240-pin Long-DIMMs
	Controller	Intel® HD Graphics	Intel® HD Graphics		Intel® HD Graphics
Display	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM		Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual channel 18/24-bit	1	N/A	N/A
	eDP	N/A	N/A		N/A
	VGA	1	1		1
	DVI	2 (DVI-D)	1 (DVI-D)		1 (DVI-D)
	DisplayPort	N/A	1		N/A
	Multiple Display	2 independent displays	3 independent displays	2 independent displays	2 independent displays
	Display Interface	LVDS up to 1920 x 1080 @60 Hz VGA up to 1920 x 1080 @60 Hz DVI-D up to 2560 x 1600 @60 Hz HDMI up to 1920 x 1200 @60 Hz	LVDS up to 1920 x 1200 @60Hz DP up to 4096 x 2304 @60Hz DVI-D up to 1920 x 1200 @60Hz VGA up to 1920 x 1200 @60Hz	DP up to 4096 x 2304 @60Hz DVI-D up to 1920 x 1200 @60Hz VGA up to 1920 x 1200 @60Hz	VGA up to 1920 x 1080 @60Hz DVI up to 2560 x 1600 @60Hz
Ethernet	Controller	1 x Intel® 82579LM GbE LAN PHY 1 x Intel® 82574L GbE LAN	1 x Intel® I219-LM GbE-PHY 1 x Intel® I210-AT PCIe GbE LAN	1 x Intel® I219-LM GbE-PHY 1 x Intel® I211-AT PCIe GbE LAN	1 x Intel® I217-LM GbE-PHY 3 x Intel® I210-AT PCIe GbE LAN
	Audio	Controller	Realtek® ALC887 HD Audio Codec		Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F71889AD	Fintek F81866AD-I + F81216H	Fintek F81866AD-I	Fintek F81866AD-I + F81216AD
H/W Monitor	Watchdog Timer	256-level Watchdog Timer		256-level Watchdog Timer	
	Smart Fan	Yes		Yes	
TPM	Controller	Infineon SLB9635TT1.2	Pin header		Pin header
I/O Interface	USB	8 x USB 2.0 (4 x rear; 4 x internal)	6 x USB 3.0 (4 x rear; 2 x internal) 6 x USB 2.0 (2 x rear; 4 x internal)	4 x USB 3.0 (4 x rear) 6 x USB 2.0 (2 x rear; 4 x internal)	8 x USB 2.0 (4 x rear; 4 x internal) 4 x USB 3.0 (4 x rear)
	Serial	4 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2~4: RS-232, 0V/5V/12Vz	10 x COM ports (COM1: rear, COM2~9: internal) COM1: RS-232/422/485, 0V/5V/12V COM2~6: RS-232, 0V/5V/12V COM7~10: RS-232, without power	6 x COM ports (COM1: rear, COM2~5: internal) COM1: RS-232/422/485, 0V/5V/12V COM2~6: RS-232, 0V/5V/12V	10 x COM ports (internal) COM1~4: RS-232, 0V/5V/12V COM5: RS-232/422/485, 0V/5V/12V COM6: RS-232/422/485, without power COM7~10: RS-232, 0V/5V/12V
	Parallel	N/A	N/A		1
	PS/2	1		1	
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V		8-bits (4 x GPI, 4 x GPO), 5V	
	Expansion Slot	PCIe x16	N/A		1
PCIe x8	N/A	1*PCIe x8 (x4 signal)	1*PCIe x8 (x1 signal)	N/A	
PCIe x4	1	N/A		1*PCIe x8 (x4 signal)	
PCIe x1	N/A	1		N/A	
PCI	1 x Full-size	1		2	
M.2	N/A	1 x M Key (PCIe x4, SATA3.0), 2242/2260/2280	N/A		N/A
Mini-PCIe	1 x Full-size, mSATA	1 x Full-size, mSATA		1 x Full-size, mSATA	
Storage	SATA	2 x SATA 3.0; 2 x SATA 2.0 (support RAID 0, 1, 5, 10)	6 x SATA 3.0	3 x SATA 3.0	4 x SATA 3.0
	mSATA	N/A	N/A		1
Power Supply	DC	DC-in 12V		N/A	
	ATX	N/A		ATX-Power 24P, 12V-8P	ATX-Power 24P, 12V-4P
Environment	Operating Temperature	0 ~ 60°C		0 ~ 60°C	
	Operating Humidity	10 ~ 90%, non-condensing		10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C		-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing		10 ~ 90%, non-condensing	
Form Factor	Dimensions	170 x 170mm (Mini-ITX)		244 x 244 mm (uATX)	
	Weight	0.32 kg		0.73 kg	
Certification	EMC	FCC Class A, CE, RCM, VCCI, BSMI		FCC, CE, RCM, VCCI, BSMI	
Software Platform	OS Support	Windows XP (32/64-bit) Windows 7 (32/64-bit)	Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Fedora 23 (by request) Linux Ubuntu 16.04 (by request)	Windows XP (32-bit) Windows 7 (32/64-bit)	

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System Board
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module



Model	MS-98D6		MS-98K9			MS-98L9
	Micro-ATX Board		ATX Board			
Processor	CPU	4th Gen Intel® Desktop Haswell/ Haswell Refresh Core™ i7/i5/i3/Celeron®/ Pentium® Processor, Max. 95W	8th Gen Intel® Desktop Coffee Lake-S Xeon®/i7/i5/i3/Pentium®/Celeron® Series Processor, Max 95W			7th/6th Gen Intel® Desktop Kaby Lake/ Skylake i7/i5/i3/Pentium®/Celeron® Series Processor, Max 65W
	Frequency	2M ~ 8M (Depends on CPU)	2.1GHz~4.7GHz (Depends on CPU)			2.3GHz~4.2GHz (Depends on CPU)
	L2 Cache	Socket (LGA 1150)	2MB~12MB (Depends on CPU)			2MB~8MB (Depends on CPU)
	CPU Type	Intel® Q87 Express	Socket (LGA 1151)			
	Chipset	AMI	Intel® C246 Express	Intel® Q370 Express	Intel® Q370 Express	Intel® H110 Express
Memory	BIOS	AMI	AMI UEFI			AMI UEFI
	Technology	Dual-channel DDR3 1066/1333/1600MHz	Dual-channel DDR4 (ECC) 2666MHz	Dual-channel DDR4 (non-ECC) 2666MHz	Dual-channel DDR4 (non-ECC) 2666MHz	Dual-channel DDR4 2133/2400MHz
	Max. Capacity	Up to 32 GB	Up to 64GB			Up to 32GB
	Socket	4 x 240-pin Long-DIMMs	4 x 288-pin UDIMMs			2 x 288-pin UDIMMs
Display	Controller	Intel® HD Graphics	Intel® HD Graphics			Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM			Shared system memory up to 1.7 GB SDRAM
	LVDS	N/A	N/A			N/A
	eDP	N/A	N/A			N/A
	VGA	N/A	1			1
	DVI	1 (DVI-I)	1		N/A	N/A
	HDMI	N/A	1			1
	DisplayPort	2	2			1
	Multiple Display	3 independent displays	3 independent displays			2 independent displays
	Display Interface	DP up to 3840 x 2160 @ 60Hz DVI up to 1920 x 1200 @ 60Hz	VGA up to 1920 x 1200 @60Hz HDMI up to 4096 x 2160 @24Hz DP up to 4096 x 2304 @60Hz		HDMI up to 4096 x 2160 @24Hz DP up to 4096 x 2304 @60Hz	VGA up to 1920 x 1200 @60Hz HDMI up to 4096 x 2160 @24Hz
Ethernet	Controller	1 x Intel® I217-LM GbE-PHY 1 x Intel® I210-AT PCIe GbE LAN	1 x Intel® I219-LM GbE LAN PHY 2 x Intel® I210-AT GbE LAN		1 x Intel® I219-LM GbE LAN PHY 1 x Intel® I210-AT GbE LAN	
Audio	Controller	Realtek® ALC887-VD2-CG Audio Codec			Realtek® ALC887-VD2-CG Audio Codec	
Super I/O	Controller	Fintek F81866AD-I			Fintek F81866AD-I	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer			256-level Watchdog Timer	
	Smart Fan	Yes			Yes	
TPM	Controller	Pin header	Infineon SLB 9665TT2.0 TPM 2.0		Pin header (Default) Infineon SLB9665TT 2.0 (by BOM option) Box header	
I/O Interface	USB	8 x USB 2.0 (6 x rear, 2 x internal) 4 x USB 3.0 (4 x rear)	6 x USB 3.1 Gen2 Type-A (6 x rear) 7 x USB 2.0 (2 x rear, 5 x internal with one Vertical Type-A)		4 x USB 3.1 Gen2 Type-A (4 x rear) 7 x USB 2.0 (2 x rear, 5 x internal with one Vertical Type-A)	
	Serial	10 x COM ports (internal) COM1~4: RS-232, 0V/5V/12V COM5: RS-232/422/485, 0V/5V/12V COM6: RS-232/422/485, without power COM7~10: RS-232, 0V/5V/12V (COM1 & COM2 support WOR)	10 x COM ports (internal) COM1~2: RS-232/422/485, Ring/0V/5V/12V, Auto-flow Control COM3~10: RS-232, 0V/5V/12V		6 x COM ports (Internal) COM1~2: RS-232/422/485, Ring/0V/5V/12V, Auto-flow Control COM3~6: RS-232, 0V/5V/12V	
	Parallel	1	Yes		N/A	
	PS/2	1	1 x PS/2 port by Y-cable for keyboard and mouse		1 x PS/2 port by Y-cable for keyboard and mouse	
	GPIO	8-bits (4 x GPI, 4 x GPO), 5V	16-bits (8 x GPI; 8 x GPO), 5V		8-bits (4 x GPI; 4 x GPO by default), 5V 8-bits (8 x GPI or 8 x GPO by request), 5V	
Expansion Slot	PCIe x16	1	3 (Signal configured as 1 PCIe x16 or 2 PCIe x8 or 1 PCIe x8 + 2 PCIe x4)		1	
	PCIe x4	1*PCIe x8 (x4 signal)	2 (PCIe x16 Slot Type; 1*PCIe x4 NVMe)		1	
	PCIe x1	N/A	2		N/A	
	PCI	2	N/A		5	
	M.2	N/A	1 x M Key (PCIe x4 NVMe, SATA 3.0), 2242/2260/2280 1 x E Key (PCIe x1, USB 2.0), 2230 N/A		N/A	
	Mini-PCIe	1 x Full-size, mSATA	N/A		N/A	
Storage	SATA	4 x SATA 3.0	6 x SATA 3.0 (Support RAID 0/1/5/10, SATA Port 6 share with M.2 M Key)		4 x SATA 3.0	
	mSATA	1	N/A		N/A	
Power Supply	DC	N/A	N/A		N/A	
	ATX	ATX-Power 24P, 12V-4P	ATX-Power 24P, 12V-8P		ATX-Power 24P, 12V-8P	
Environment	Operating Temperature	0 ~ 60°C	-10 ~ 60°C		-10 ~ 60°C	
	Operating Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing		10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C	-20 ~ 80°C		-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing		10 ~ 90%, non-condensing	
Form Factor	Dimensions	244 x 244mm (uATX)	305 x 244mm (ATX)		305 x 244mm (ATX)	
	Weight	0.73 kg	0.70 kg		0.70 kg	
Certification	EMC	FCC, CE, RCM, VCCI, BSMI	CE, FCC Class B, BSMI, RCM, VCCI		CE, FCC Class B, BSMI, RCM, VCCI	
Software Platform	OS Support	Windows XP (32-bit) Windows 7 (32/64-bit) Windows 8 (32/64-bit)	Windows 10 (64-bit) Linux Kernel 4.x (by request)		Windows 7 (32/64-bit) (Skylake-S Series CPU Only) Windows 8.1 (64-bit) (Skylake-S Series CPU Only) Windows 10 (64-bit) Linux Fedora 23 (by request) Linux Ubuntu 16.04 (by request)	



Model		MS-98H9 V2.0	MS-98H9				
		ATX Board					
Processor	CPU	7th/6th Gen Intel® Desktop Kaby Lake/Skylake i7/i5/i3/Pentium®/ Celeron® Series Processor, Max 95W	C236 SKU		H110 SKU		
			Frequency	2.6 GHz~4.5 GHz (Depends on CPU)			
			L2 Cache	2MB~8MB (Depends on CPU)			
			CPU Type	Socket (LGA 1151)			
			Chipset	Intel® Q170 Express	Intel® C236 Express	Intel® Q170 Express	Intel® H110 Express
			BIOS	AMI UEFI			
Memory	Technology	Dual-channel DDR4 (non-ECC) 2133MHz					
	Max. Capacity	Up to 64GB	Up to 64GB		Up to 32GB		
	Socket	4 x 288-pin UDIMMs	4 x 288-pin UDIMMs		2 x 288-pin UDIMMs		
Display	Controller	Intel® HD Graphics					
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM					
	VGA	1 (Non Hot Plug)					
	DVI	1 (DVI-D)					
	DisplayPort	2					
	Multiple Display	3 independent displays					
	Display Interface	VGA up to 1920 x 1080 @60Hz DVI-D up to 1920 x 1200 @60Hz DP up to 4096 x 2304 @60Hz					
Ethernet	Controller	1 x Intel® I219-LM GbE LAN PHY 1 x Intel® I210-AT GbE LAN					
Audio	Controller	Realtek® ALC887 HD Audio Codec					
Super I/O	Controller	Fintek F81866AD-I					
H/W Monitor	Watchdog Timer	256-level Watchdog Timer					
	Smart Fan	Yes					
TPM	Controller	Box header					
I/O Interface	USB	6 x USB 2.0 (2 x rear; 4 x internal) 6 x USB 3.0 (4 x rear; 2 x internal)	6 x USB3.0 (4 x rear, 2 x internal) 6 x USB2.0 (2 x rear, 4 x internal)		4 x USB3.0 (4 x rear) 4 x USB2.0 (2 x rear, 2 x internal)		
	Serial	6 x COM ports (internal) COM1~2: RS-232/422/485, 0V/5V/12V COM3~6: RS-232, 0V/5V/12V					
	Parallel	Yes					
	PS/2	1 x PS/2 port by Y-cable for keyboard and mouse					
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V					
Expansion Slot	PCIe x16	1					
	PCIe x4	N/A		2			
	PCIe x1	N/A		N/A			
	PCI	6					
	M.2	N/A					
	Mini-PCIe	2 x Full-size (one w/ mSATA)	2 x Full-size (one w/ mSATA)		N/A		
Storage	SATA	5 x SATA 3.0 (Support RAID 0/1/5/10)		5 x SATA 3.0 (Support RAID 0/1/5/10)			
	mSATA	1		1			
Power Supply	DC	N/A					
	ATX	ATX-Power 24P, 12V-8P					
Environment	Operating Temperature	-10 ~ 60°C					
	Operating Humidity	10 ~ 90%, non-condensing					
	Storage Temperature	-20 ~ 80°C					
	Storage Humidity	10 ~ 90%, non-condensing					
Form Factor	Dimensions	305 x 244mm (ATX)					
	Weight	0.70 kg					
Certification	EMC	FCC, CE, RCM, VCCI, BSMI (Class B)					
Software Platform	OS Support	Windows 7 (32/64-bit) (Skylake-S Series CPU Only) Windows 8.1 (64-bit) (Skylake-S Series CPU Only) \ Windows 10 (64-bit) Linux Fedora 23 (by request) Linux Ubuntu 16.04 (by request)					

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module



Model		MS-98B5	MS-98A9	MS-99C5
		ATX Board		Full-Size Mini-PCIe
Processor	CPU	4th Gen Intel® Core™ i7/i5/i3/Pentium®/Celeron® Processor, Max. 95W	3rd Gen Intel® Core™ i7/i5/i3/Pentium®/Celeron® Processor, Max.95W	N/A
	Frequency	2.4GHz~4.0 GHz (Depends on CPU)	2.8GHz~3.9 GHz (Depends on CPU)	N/A
	L2 Cache	2M~8M (Depends on CPU)	3M~8M (Depends on CPU)	N/A
	CPU Type	Socket (LGA 1150)	Socket (LGA 1155)	N/A
	Chipset	Intel® H81/Q87 Express	Intel® Q77 Express	N/A
	BIOS	AMI	AMI	N/A
Memory	Technology	Dual-channel DDR3/DDR3L 1333/1600MHz	Dual-channel DDR3 1333/1600MHz	N/A
	Max. Capacity	Up to 32GB	Up to 32GB	N/A
	Socket	4 x 240-pin DIMMs	4 x 240-pin DIMMs	N/A
	Controller	Intel® HD Graphics	Intel® HD Graphics	N/A
Display	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	Shared system memory up to 1.7 GB SDRAM	N/A
	VGA	N/A	1	N/A
	DVI	1 (DVI-I)	1 (DVI-D)	N/A
	DisplayPort	1	1	N/A
	Multiple Display	2 independent displays (H81 SKU) 3 independent displays (Q87 SKU)	2 independent displays (SNB CPU only) 3 independent displays (IVB CPU only)	N/A
	Display Interface	VGA up to 1920 x 1080 @60Hz DVI-D up to 2560 x 1600 @60Hz DP up to 2560 x 1600 @60Hz	VGA up to 1920 x 1080 @60Hz DVI-D up to 1920 x 1200 @60Hz DP up to 2560 x 1600 @60Hz HDMI up to 1920 x 1200 @60Hz	N/A
Ethernet	Controller	1 x Intel® I217-LM GbE LAN PHY 1 x Intel® I210-AT GbE LAN	1 x Intel® 82579LM GbE LAN PHY 1 x Intel® 82583V GbE LAN	N/A
Audio	Controller	Realtek® ALC887 HD Audio Codec	Realtek® ALC887 HD Audio Codec	N/A
Super I/O	Controller	Fintek F81866AD-I	Fintek F81866	N/A
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	256-level Watchdog Timer	N/A
	Smart Fan	Yes	Yes	N/A
TPM	Controller	Pin header	Pin header	N/A
I/O Interface	USB	8 x USB 2.0(Q87: 2 x rear; 6 x internal; H81: 4 x rear; 4 x internal) 4 x USB 3.0(Q87: 4 x rear; H81: 2 x rear)	4 x USB 3.0 (rear) 8 x USB 2.0 (2 x rear; 6 x internal)	1 x 24V Power USB (by cable) 2 x 12V Power USB (by cable)
	Serial	6 x COM ports (COM1~2: rear, COM3~6: internal) COM1~2: RS-232/422/485, 0V/5V/12V COM3~6: RS-232, 0V/5V/12V	6 x COM ports (COM1: rear, COM2~6: internal) COM1~2: RS-232/422/485, 0V/5V/12V COM3~6: RS-232, 0V/5V/12V	N/A
	Parallel	1	1	N/A
	PS/2	1 x PS/2 port by Y-cable for keyboard and mouse	1	N/A
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V	8-bits (4 x GPI; 4 x GPO), 5V	N/A
Expansion Slot	PCIe x16	1	1	N/A
	PCIe x4	N/A	1	N/A
	PCIe x1	3	N/A	N/A
	PCI	3	5	N/A
	M.2	N/A	N/A	N/A
	Mini-PCIe	2 x Full-size (Q87 only)	1 x Full-size	N/A
Storage	SATA	6 x SATA 3.0 (H81 SKU: 2 x SATA 2.0, 2 x SATA 3.0) (Q87 SKU: RAID 0/1/5/10)	2 x SATA 3.0; 3 x SATA 2.0 (support RAID 0, 1, 5, 10)	N/A
	mSATA	N/A	1	N/A
Power Supply	DC	N/A	N/A	DC-in 12V
	ATX	ATX-Power 24P, 12V-4P	ATX-Power 24P, 12V-4P	N/A
Environment	Operating Temperature	0 ~ 60°C	0 ~ 60°C	0 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C	-20 ~ 80°C	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing	10 ~ 90%, non-condensing
Form Factor	Dimensions	305 x 244mm (ATX)	305 x 244mm (ATX)	47.75 x 30mm (Full-Size Mini-PCIe)
	Weight	0.70 kg	0.75 kg	0.01 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI (Class A)	FCC Class A, CE, RCM, VCCI, BSMI	CE, FCC Class A, BSMI, VCCI, RCM
Software Platform	OS Support	Windows XP (32/64-bit) Windows 7 (32/64-bit) Windows 8 (32/64-bit) Windows 10 (64-bit)	Windows XP (32/64-bit) Windows 7 (32/64-bit) Windows 8 (32/64-bit)	Windows XP (32/64-bit) Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Fedora 25 Ubuntu 16.04

* 1 x ISA Slot (optional)

MS-9A80

10.1" Industrial Tablet PC with Intel® Atom™ Braswell N3010 Processor for Semi-Rugged, Fanless & Low-Power Solution



Specifications

Coming Soon

Display	LCD Size	10.1"
	Resolution	1280x800
	Brightness (cd/m2)	300
	Contrast Ratio	1300:1
	Support Colors	16.2M/262K
	Pixel Pitch (H/Vmm)	0.264x0.264
	Viewing Angle	H: 170 degree V: 170 degree
Touch Panel	PCAP, 10-points Multi-touch screen, w/AR	
System Processor	CPU	Intel® Celeron® Processor N3010, DC, 4W
	Frequency	1.04 GHz, up to 2.24GHz
	L2 Cache	2 MB
	CPU Type	BGA
	BIOS	AMI
Memory	Technology	Single-channel DDR3L SO-DIMM 1600MHz
	Max. Capacity	4GB (up to 8GB)
	Socket	1 x 204-pin SO-DIMM
Storage	mSATA	32G (up to 128G)
Communication	WLAN	WiFi 802.11 a/b/g/n/ac
	Bluetooth	Bluetooth (v4.0)
	3G/4G LTE	Optional 3G/4G LTE
	GPS	Optional GPS
Button	5 buttons (Power, Barcode reader trigger, 3 programming button)	
LED indicator	Power LED	
Sensor	G-Sensor, Geomagnetic sensor, Gyro sensor, Light sensor	
Camera	Front Camera	2MP camera
	Rear Camera	5MP autofocus camera
IO interface	DC Jack	1
	USB 3.0	1
	Audio Jack	1 (Earphone/Mic-in)
	HDMI	1 (HDMI1.4b)
	Docking	1 (docking connector)
	Speaker	1

Features

- 10.1" 1280 x 800 IPS LED Panel with capacitive multi-touch
- Built-in Wi-Fi and Bluetooth, optional 3G/4G LTE
- Dual camera design; optional 1D/2D barcode scanner and NFC RFID for data collection
- Full IP65 dust/water-proof design
- 1.2m drop resistance and vibration resistance
- Li-polymer and hot-swappable battery design
- Rich peripherals capability with docking station and extension module supported

Optional I/O Module (select 1 out of 5)	LAN	10/100Base-T Ethernet (RJ45)
	USB 2.0	USB 2.0 port
	Barcode Reader	1D/2D barcode scanner
	Serial Port	D-sub 9-pin RS-232 port
	MicroSD	MicroSD slot
Expansion Slot	RFID	Optional 13.56MHz RFID
	SIM Card Slot	Nano type
	M.2	1 x E Key (PCIe x1, USB 2.0), 2230
	Mini-PCIe	2 x Full-size (one for mSATA; one for 3G/4G LTE module)
Battery	Battery Type	Li-polymer battery (11.1V, 4000mAh), up to 8 hours ^(a)
	Operating Temperature	-10°C ~ 50°C
Environment	Operating Humidity	95% RH, non-condensing
	Storage Temperature	-20°C ~ 60°C
	Storage Humidity	95% RH, non-condensing
	IP Rating	Full IP65
Rugged Features	Drop Resistant	1.2m drop design
	Vibration Resistant	Meet MIL-STD-810G method 514.6, procedure I (operating)
Physical Characteristics	Dimensions (W x H x D)	300 x 212 x 25 mm ^(b)
	Weight	Under 1.4kg ^(b)
Certification	EMC	FCC, CE, RCM, VCCI
	Safety	CB
Software Platform	OS Support	Windows 7 (64-bit), Windows 8.1 (64-bit), Windows 10 (64-bit)

(a) The battery life will vary by system setting and configuration.

(b) The weight & dimensions are subject to change before mass production stage.

(c) Product specifications are subject to change without notice.

Semi-rugged Terminal

POS System

HMI Panel PC

Embedded System

Embedded Board

COM Express Board

Oseven Board

Pico-ITX Board

3.5" Board

EPIC Board

PICMG 1.0 Board

Mini-ITX Board

Micro-ATX Board

ATX Board

Mini-PCIe Module

MS-9A82

MSI 2nd Gen Stylish 15" Ultra-Slim POS System with Intel® Celeron® Processor

NEW

Specifications

Display	LCD Size	15"
	Resolution	1024x768
	Brightness (cd/m ²)	350
	Contrast Ratio	700:1
	Support Colors	16.2M/262K
	Pixel Pitch (H/Vmm)	0.297x0.297
	Viewing Angle	H: 150~170 degree V: 140~160 degree
Touch Panel		5-wire resistive touch panel PCAP touch panel (optional)
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W
	Frequency	2.0 GHz
	L2 Cache	2MB
	CPU Type	FCBGA1170
	Chipset	SoC
	BIOS	AMI
Memory	Technology	Dual-channel DDR3L SO-DIMM 1333MHz
	Max. Capacity	Up to 8GB
	Socket	2 x 204-pin SO-DIMM
Graphic	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 224 MB SDRAM
	Multiple Display	2 independent displays
	Display Interface	VGA up to 2560 x 1600 @60Hz
Ethernet	Controller	1 x Realtek® 8111E VL-CG GbE LAN
Audio	Controller	Realtek® ALC887 HD Audio Codec
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Full-size (for mSATA only) 1 x Half-size
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1 (Optional)
I/O Interface	RJ-45	1
	Audio	1 x Line-out
	USB	1 x USB 3.0 5 x USB 2.0
	Serial	2 x RS-232/422/485 (D-Sub) 2 x RS-232 (RJ45 type) (all w/+5V/+12V selectable via BIOS)
	PS/2	1
	VGA	1
	Power Supply	DC Input
Environment	IP Rating	IP65 Front
	Operating Temperature	0 ~ 40°C (HDD) 0 ~ 50°C (SSD or mSATA)
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20°C ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
	Vibration	Operating, 0.25 Grms, 5-300 Hz, 3 aes
	Shock	Operating, 3 G, half sine 11 ms
	Housing	SGCC, PC+ABS
Physical Characteristics	MSR	3-Track MSR (USB)
	iButton	iButton (USB)
	2nd Display	8" without touch (USB)
	Customer Display	VFD, 2 x 20 characters (COM)
	Dimensions (W x H x D)	365 x 340 x 208mm
	Weight	7 kg
	Mounting	VESA mount(100)
Certification	EMC	FCC, CE, RCM, VCCI, BSMI
	Safety	CB
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Linux Kernel 3.11+



Features

- Intel® Celeron® Processor J1900, 2GHz
- True flat and IP65 waterproof front panel
- Easy maintenance design
- ESD protection up to 8KV contact and 10KV air
- Stylish / Slim ID Design
- All COM Ports with 5V/12V power selection in BIOS
- Plenty USB ports for more peripherals (USB 2.0*5, USB 3.0*1)

Ordering Information

Part Number	Description
939-9A82-001	POS BAREBONE, FANLESS, MEMORY 4GB, BLACK, ADAPTER 12V/84W, USA POWER CORD.
939-9A82-002	POS BAREBONE, FANLESS, MEMORY 4GB, BLACK, ADAPTER 12V/84W, EU POWER CORD.

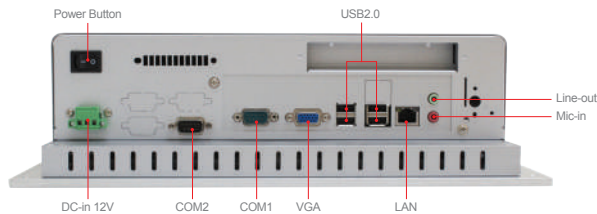
Packing List

Part Number	Description
K33-3001002-I45 / K33-3001005-I45	USA Power Cord / EU Power Cord
S93-0401650-S14	12V/7A, 84W AC-DC Adapter

MS-HMIR121A

12.1" Fanless HMI Resistive Panel PC with Intel® Atom™ Processor

NEW



Features

- Low-power and fanless design perfectly fit industrial applications
- 12.1" 1024x768 XGA resolution LCD display
- 5 wires resistive single-touch solution
- Surface Hardness:3H
- IP65 dust/water-proof design for front panel
- Support DC-in 12V
- Intel® Celeron® Processor J1900, 2.00 GHz, Quad Core

Ordering Information

Part Number	Description
S98-0100010-K99	12.1", 5-wire resistive Panel PC, Barebone, Baytrail J1900, EU power cord

Packing List

Part Number	Description
Coming soon	Adaptor 12V/60W
Coming soon	Power cable, EU
Coming soon	SATA Cable with Power
Coming soon	HDD Screw x 4
Coming soon	Clip Mount x 8
Coming soon	System Driver CD
Coming soon	Touch Panel Driver CD

Specifications

Display	LCD Size	12.1"
	Resolution	1024x768
	Brightness (cd/m2)	500
	Contrast Ratio	700:1
	Support Colors	16.2 M
	Pixel Pitch (H/Vmm)	0.24 x 0.24
	Viewing Angle	H: 160 degree V: 160 degree
Touch Panel	5-wire resistive touch panel	
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W
	Frequency	2.0 GHz, up to 2.42 GHz
	L2 Cache	2MB
	Chipset	SoC
Memory	Technology	Dual-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB
	Socket	1 x 204-pin SO-DIMMs (Optional 1)
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz
Ethernet	Controller	1 x Realtek® RTL8111G-CG GbE LAN Optional : 1
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Full-size (w/ mSATA)
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1
	CFast	N/A
	CompactFlash	N/A
I/O Interface	RJ-45	2 (Optional 1)
	Audio	1 x Mic-in, 1 x Line-out
	USB	4 x USB 2.0
	Serial	2 x COM ports COM1: RS-232, 0V/5V/12V COM2: RS-232, w/o power
	PS/2	N/A
	HDMI	N/A
	DVI	N/A
	DisplayPort	N/A
	VGA	1
	Antenna	1 opening reserved for antenna
Power Supply	DC Input	DC-in 12V
	IP Rating	IP65 Front
Environment	Operating Temperature	0°C ~ 45°C
	Operating Humidity	10% ~ 90% non-condensing
	Storage Temperature	-20°C ~ 80°C
	Storage Humidity	10% ~ 90% non-condensing
	Housing	Aluminum
Physical Characteristics	Dimensions (W x H x D)	354.9 x 264.7 x 99mm
	Weight	7.5 kg
	Mounting	VESA 75, Panel Mount, Clip mount
Certification	EMC	CE (Class A)
	Safety	N/A
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)

Semi-rugged Terminal

POS System

HMI Panel PC

Embedded System

Embedded Board

COM Express Board

Oseven Board

Pico-ITX Board

3.5" Board

EPIC Board

PICMG 1.0 Board

Mini-ITX Board

Micro-ATX Board

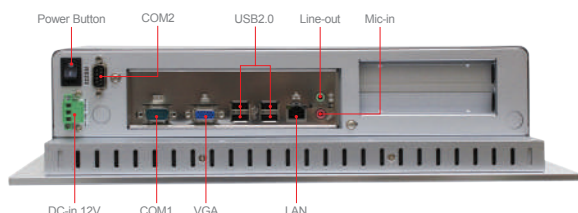
ATX Board

Mini-PCIe Module

MS-HMIR150A

15" Fanless HMI Resistive Panel PC with Intel® Atom™ Processor

NEW



Features

- Low-power and fanless design perfectly fit industrial applications
- 15" 1024x768 XGA resolution LCD display
- 5 wires resistive single-touch solution
- Surface Hardness:3H
- IP65 dust/water-proof design for front panel
- Support DC-in 12V
- Intel® Celeron® Processor J1900, 2.00 GHz, Quad Core

Ordering Information

Part Number	Description
S98-0100020-K99	15", 5-wire resistive Panel PC, Barebone, Baytrail J1900, EU power cord

Packing List

Part Number	Description
Coming soon	Adaptor 12V/60W
Coming soon	Power cable, EU
Coming soon	SATA Cable with Power
Coming soon	HDD Screw x 4
Coming soon	Clip Mount x 10
Coming soon	System Driver CD
Coming soon	Touch Panel Driver CD

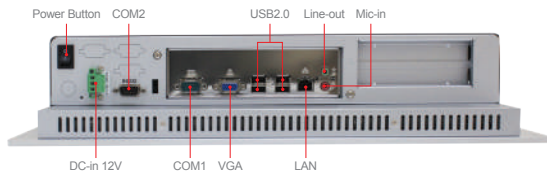
Specifications

Display	LCD Size	15"
	Resolution	1024x768
	Brightness (cd/m2)	400
	Contrast Ratio	700:1
	Support Colors	16.2 M
	Pixel Pitch (H/Vmm)	0.297 x 0.297
Touch Panel	Viewing Angle	H: 160 degree V: 140 degree
		5-wire resistive touch panel
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W
	Frequency	2.0 GHz, up to 2.42 GHz
	L2 Cache	2MB
	Chipset	SoC
Memory	Technology	Dual-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB
Graphic	Socket	1 x 204-pin SO-DIMMs (Optional 1)
	Display Interface	VGA up to 2560 x 1600 @60Hz
Ethernet	Controller	1 x Realtek® RTL8111G-CG GbE LAN Optional : 1
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Full-size (w/ mSATA)
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1
	CFast	N/A
	CompactFlash	N/A
I/O Interface	RJ-45	2 (Optional 1)
	Audio	1 x Mic-in, 1 x Line-out
	USB	4 x USB 2.0
	Serial	2 x COM ports COM1: RS-232, 0V/5V/12V COM2: RS-232, w/o power
	PS/2	N/A
	HDMI	N/A
	DVI	N/A
	DisplayPort	N/A
	VGA	1
	Antenna	1 opening reserved for antenna
Power Supply	DC Input	DC-in 12V
	IP Rating	IP65 Front
Environment	Operating Temperature	0°C ~ 45°C
	Operating Humidity	10% ~ 90% non-condensing
	Storage Temperature	-10°C ~ 70°C
	Storage Humidity	10% ~ 90% non-condensing
Physical Characteristics	Housing	Aluminum
	Dimensions (W x H x D)	400.9 x 303.7 x 93mm
	Weight	9 kg
	Mounting	VESA 100, Panel Mount, Clip mount
Certification	EMC	CE (Class A)
	Safety	N/A
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)

MS-HMIR170A

17" Fanless HMI Resistive Panel PC with Intel® Atom™ Processor

NEW



Features

- Low-power and fanless design perfectly fit industrial applications
- 17" 1280x1024 SXGA resolution LCD display
- 5 wires resistive single-touch solution
- Surface Hardness:3H
- IP65 dust/water-proof design for front panel
- Support DC-in 12V
- Intel® Celeron® Processor J1900, 2.00 GHz, Quad Core

Ordering Information

Part Number	Description
S98-0100030-K99	17", 5-wire resistive Panel PC, Barebone, Baytrail J1900, EU power cord

Packing List

Part Number	Description
Coming soon	Adaptor 12V/60W
Coming soon	Power cable, EU
Coming soon	SATA Cable with Power
Coming soon	HDD Screw x 4
Coming soon	Clip Mount x 10
Coming soon	System Driver CD
Coming soon	Touch Panel Driver CD

Specifications

Display	LCD Size	17"
	Resolution	1280x1024
	Brightness (cd/m2)	350
	Contrast Ratio	1000:1
	Support Colors	16.7 M
	Pixel Pitch (H/Vmm)	0.264 x 0.264
	Viewing Angle	H: 170 degree V: 160 degree
Touch Panel	5-wire resistive touch panel	
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W
	Frequency	2.0 GHz, up to 2.42 GHz
	L2 Cache	2MB
	Chipset	SoC
Memory	Technology	Dual-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB
	Socket	1 x 204-pin SO-DIMMs (Optional 1)
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz
Ethernet	Controller	1 x Realtek® RTL8111G-CG GbE LAN Optional : 1
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Full-size (w/ mSATA)
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1
	CFast	N/A
	CompactFlash	N/A
I/O Interface	RJ-45	2 (Optional 1)
	Audio	1 x Mic-in, 1 x Line-out
	USB	4 x USB 2.0
	Serial	2 x COM ports COM1: RS-232, 0V/5V/12V COM2: RS-232, w/o power
	PS/2	N/A
	HDMI	N/A
	DVI	N/A
	DisplayPort	N/A
	VGA	1
	Antenna	1 opening reserved for antenna
	Power Supply	DC Input
IP Rating		IP65 Front
Environment	Operating Temperature	0°C ~ 45°C
	Operating Humidity	10% ~ 90% non-condensing
	Storage Temperature	-10°C ~ 70°C
	Storage Humidity	10% ~ 90% non-condensing
Physical Characteristics	Housing	Aluminum
	Dimensions (W x H x D)	453.5 x 352 x 89.7mm
	Weight	13 kg
	Mounting	VESA 100, Panel Mount, Clip mount
Certification	EMC	CE (Class A)
	Safety	N/A
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)

Semi-rugged Terminal

POS System

HMI Panel PC

Embedded System

Embedded Board

COM Express Board

Oseven Board

Pico-ITX Board

3.5" Board

EPIC Board

PICMG 1.0 Board

Mini-ITX Board

Micro-ATX Board

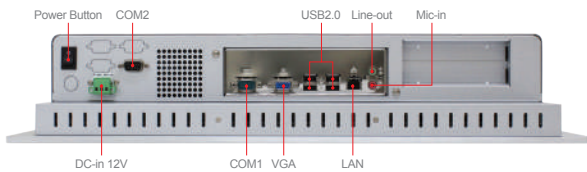
ATX Board

Mini-PCIe Module

MS-HMIR185A

18.5" Fanless HMI Resistive Panel PC with Intel® Atom™ Processor

NEW



Features

- Low-power and fanless design perfectly fit industrial applications
- 18.5" 1366x768 WXGA resolution LCD display
- 5 wires resistive single-touch solution
- Surface Hardness:3H
- IP65 dust/water-proof design for front panel
- Support DC-in 12V
- Intel® Celeron® Processor J1900, 2.00 GHz, Quad Core

Ordering Information

Part Number	Description
S98-0100080-K99	18.5", 5-wire resistive Panel PC, Barebone, Baytrail J1900, EU power cord

Packing List

Part Number	Description
Coming soon	Adaptor 12V/60W
Coming soon	Power cable, EU
Coming soon	SATA Cable with Power
Coming soon	HDD Screw x 4
Coming soon	Clip Mount x 10
Coming soon	System Driver CD
Coming soon	Touch Panel Driver CD

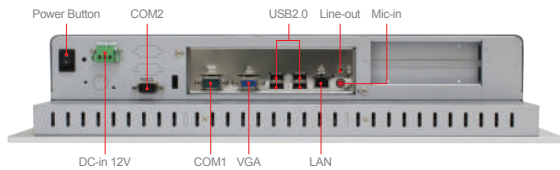
Specifications

Display	LCD Size	18.5"
	Resolution	1366x768
	Brightness (cd/m2)	300
	Contrast Ratio	1000:1
	Support Colors	16.7 M
	Pixel Pitch (H/Vmm)	0.3 x 0.3
Touch Panel	Viewing Angle	H: 170 degree V: 160 degree
	5-wire resistive touch panel	
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W
	Frequency	2.0 GHz, up to 2.42 GHz
	L2 Cache	2MB
	Chipset	SoC
Memory	Technology	Dual-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB
	Socket	1 x 204-pin SO-DIMMs (Optional 1)
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz
Ethernet	Controller	1 x Realtek® RTL8111G-CG GbE LAN Optional : 1
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Full-size (w/ mSATA)
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1
	CFast	N/A
	CompactFlash	N/A
I/O Interface	RJ-45	2 (Optional 1)
	Audio	1 x Mic-in, 1 x Line-out
	USB	4 x USB 2.0
	Serial	2 x COM ports COM1: RS-232, 0V/5V/12V COM2: RS-232, w/o power
	PS/2	N/A
	HDMI	N/A
	DVI	N/A
	DisplayPort	N/A
	VGA	1
	Antenna	1 opening reserved for antenna
Power Supply	DC Input	DC-in 12V
	IP Rating	IP65 Front
Environment	Operating Temperature	0°C ~ 45°C
	Operating Humidity	10% ~ 90% non-condensing
	Storage Temperature	-10°C ~ 70°C
	Storage Humidity	10% ~ 90% non-condensing
Physical Characteristics	Housing	Aluminum
	Dimensions (W x H x D)	521.7 x 317.6 x 95mm
	Weight	13.5 kg
Certification	Mounting	VESA 100, Panel Mount, Clip mount
	EMC	CE (Class A)
Software Platform	Safety	N/A
	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)

MS-HMIR190A

19" Fanless HMI Resistive Panel PC with Intel® Atom™ Processor

NEW



Features

- Low-power and fanless design perfectly fit industrial applications
- 19" 1280x1024 SXGA resolution LCD display
- 5 wires resistive single-touch solution
- Surface Hardness:3H
- IP65 dust/water-proof design for front panel
- Support DC-in 12V
- Intel® Celeron® Processor J1900, 2.00 GHz, Quad Core

Ordering Information

Part Number	Description
S98-0100090-K99	19", 5-wire resistive Panel PC, Barebone, Baytrail J1900, EU power cord

Packing List

Part Number	Description
Coming soon	Adaptor 12V/60W
Coming soon	Power cable, EU
Coming soon	SATA Cable with Power
Coming soon	HDD Screw x 4
Coming soon	Clip Mount x 10
Coming soon	System Driver CD
Coming soon	Touch Panel Driver CD

Specifications

Display	LCD Size	19"
	Resolution	1280x1024
	Brightness (cd/m2)	250
	Contrast Ratio	1000:1
	Support Colors	16.7 M
	Pixel Pitch (H/Vmm)	0.294 x 0.294
	Viewing Angle	H: 170 degree V: 160 degree
Touch Panel	5-wire resistive touch panel	
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W
	Frequency	2.0 GHz, up to 2.42 GHz
	L2 Cache	2MB
	Chipset	SoC
Memory	Technology	Dual-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB
	Socket	1 x 204-pin SO-DIMMs (Optional 1)
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz
Ethernet	Controller	1 x Realtek® RTL8111G-CG GbE LAN Optional : 1
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Full-size (w/ mSATA)
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1
	CFast	N/A
	CompactFlash	N/A
I/O Interface	RJ-45	2 (Optional 1)
	Audio	1 x Mic-in, 1 x Line-out
	USB	4 x USB 2.0
	Serial	2 x COM ports COM1: RS-232, 0V/5V/12V COM2: RS-232, w/o power
	PS/2	N/A
	HDMI	N/A
	DVI	N/A
	DisplayPort	N/A
	VGA	1
	Antenna	1 opening reserved for antenna
	Power Supply	DC Input
IP Rating		IP65 Front
Environment	Operating Temperature	0°C ~ 45°C
	Operating Humidity	10% ~ 90% non-condensing
	Storage Temperature	-10°C ~ 70°C
	Storage Humidity	10% ~ 90% non-condensing
	Housing	Aluminum
Physical Characteristics	Dimensions (W x H x D)	487 x 376.8 x 93.9mm
	Weight	13.5 kg
	Mounting	VESA 100, Panel Mount, Clip mount
Certification	EMC	CE (Class A)
	Safety	N/A
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)

Semi-rugged Terminal

POS System

HMI Panel PC

Embedded System

Embedded Board

COM Express Board

Oseven Board

Pico-ITX Board

3.5" Board

EPIC Board

PICMG 1.0 Board

Mini-ITX Board

Micro-ATX Board

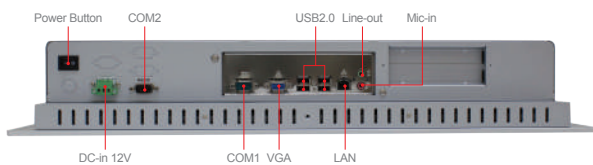
ATX Board

Mini-PCIe Module

MS-HMIR215A

21.5" Fanless HMI Resistive Panel PC with Intel® Atom™ Processor

NEW



Features

- Low-power and fanless design perfectly fit industrial applications
- 21.5" 1920x1080 Full HD resolution LCD display
- 5 wires resistive single-touch solution
- Surface Hardness:3H
- IP65 dust/water-proof design for front panel
- Support DC-in 12V
- Intel® Celeron® Processor J1900, 2.00 GHz, Quad Core

Ordering Information

Part Number	Description
S98-0100070-K99	21.5", 5-wire resistive Panel PC, Barebone, Baytrail J1900, EU power cord

Packing List

Part Number	Description
Coming soon	Adaptor 12V/80W
Coming soon	Power cable, EU
Coming soon	SATA Cable with Power
Coming soon	HDD Screw x 4
Coming soon	Clip Mount x 10
Coming soon	System Driver CD
Coming soon	Touch Panel Driver CD

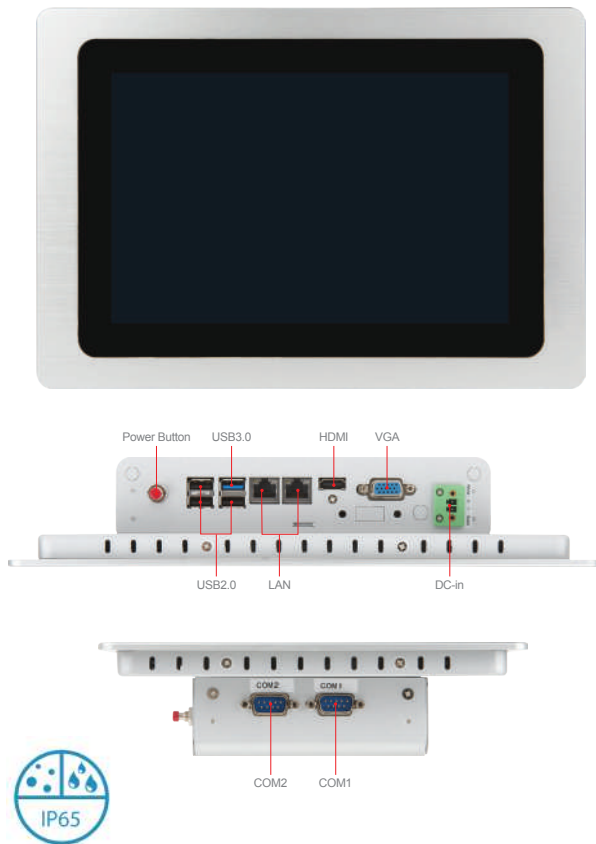
Specifications

Display	LCD Size	21.5"
	Resolution	1920x1080
	Brightness (cd/m2)	300
	Contrast Ratio	3000:1
	Support Colors	16.7 M
	Pixel Pitch (H/Vmm)	0.248 x 0.248
Viewing Angle	H: 178 degree	
	V: 178 degree	
Touch Panel	5-wire resistive touch panel	
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W
	Frequency	2.0 GHz, up to 2.42 GHz
	L2 Cache	2MB
	Chipset	SoC
Memory	Technology	Dual-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB
	Socket	1 x 204-pin SO-DIMMs (Optional 1)
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz
Ethernet	Controller	1 x Realtek® RTL8111G-CG GbE LAN Optional : 1
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Full-size (w/ mSATA)
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1
	CFast	N/A
	CompactFlash	N/A
I/O Interface	RJ-45	2 (Optional 1)
	Audio	1 x Mic-in, 1 x Line-out
	USB	4 x USB 2.0
	Serial	2 x COM ports COM1: RS-232, 0V/5V/12V COM2: RS-232, w/o power
	PS/2	N/A
	HDMI	N/A
	DVI	N/A
	DisplayPort	N/A
	VGA	1
	Antenna	1 opening reserved for antenna
Power Supply	DC Input	DC-in 12V
	IP Rating	IP65 Front
Environment	Operating Temperature	0°C ~ 45°C
	Operating Humidity	10% ~ 90% non-condensing
	Storage Temperature	-10°C ~ 70°C
	Storage Humidity	10% ~ 90% non-condensing
Physical Characteristics	Housing	Aluminum
	Dimensions (W x H x D)	581.3 x 337.2 x 93.6mm
	Weight	13.5 kg
	Mounting	VESA 100, Panel Mount, Clip mount
Certification	EMC	CE (Class A)
	Safety	N/A
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)

MS-HMICO70A

7" Fanless HMI Projective Capacitive Panel PC with Intel® Atom™ Processor

NEW



Features

- Low-power and fanless design perfectly fit industrial applications
- 7" 1024x600 WSVGA resolution LCD display
- Projective Capacitive multi-touch solution
- Surface Hardness:7H
- IP65 dust/water-proof design for front panel
- Support DC-in 12V/19V/24V
- Intel® Celeron® Processor J1900, 2.00 GHz, Quad Core

Ordering Information

Part Number	Description
S98-0100130-K99	7", Projected Capacitive Touch Panel PC, Barebone, Baytrail J1900, USA power cord
S98-0100160-K99	7", Projected Capacitive Touch Panel PC, Barebone, Baytrail J1900, EU power cord

Packing List

Part Number	Description
Coming soon	Adaptor 12V/60W
Coming soon	Power cable, USA
Coming soon	SATA Cable with Power
Coming soon	HDD Screw x 4
Coming soon	Clip Mount x 8
Coming soon	System Driver CD
Coming soon	Touch Panel Driver CD

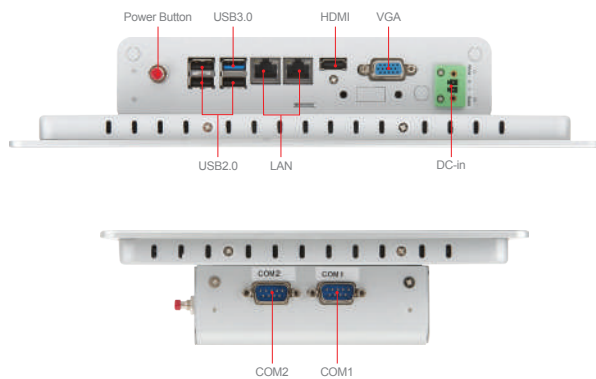
Specifications

Display	LCD Size	7"	
	Resolution	1024x600	
	Brightness (cd/m2)	320	
	Contrast Ratio	500:1	
	Support Colors	16.7M	
	Pixel Pitch (H/Vmm)	0.15X0.15	
	Viewing Angle	H: 150 degree V: 150 degree	
Touch Panel	Projective Capacitive touch panel		
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W	
	Frequency	2.0 GHz, up to 2.42 GHz	
	L2 Cache	2MB	
	Chipset	SoC	
Memory	Technology	Single-channel DDR3L 1333 MHz	
	Max. Capacity	Up to 8GB	
	Socket	1 x 204-pin SO-DIMM	
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz HDMI up to 1920 x 1080 @60Hz	
Ethernet	Controller	2 x Intel® I210-AT GbE LAN	
Expansion Slot	M.2	N/A	
	Mini-PCIe	2 x Full-size (one w/ mSATA)	
Storage	SATA	1 x 2.5" HDD/SSD	
	mSATA	1	
	CFast	N/A	
	CompactFlash	N/A	
	Serial	2 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232, 0V/5V/12V	
I/O Interface	RJ-45	2	
	Audio	N/A	
	USB	1 x USB 3.0 3 x USB 2.0	
	PS/2	N/A	
	HDMI	1	
	DVI	N/A	
	DisplayPort	N/A	
	VGA	1	
	Antenna	1 opening reserved for antenna	
	Power Supply	DC Input	DC-in 12V/19V/24V
		IP Rating	IP65 Front
Environment	Operating Temperature	0°C ~ 45°C	
	Operating Humidity	20%~90% RH	
	Storage Temperature	-20°C ~ 80°C	
	Storage Humidity	10% ~ 90% non-condensing	
	Housing	Aluminum	
Physical Characteristics	Dimensions (W x H x D)	232.3 x 166 x 62mm	
	Weight	3 kg	
	Mounting	VESA 75, Panel Mount, Clip mount	
Certification	EMC	CE (Class A)	
	Safety	N/A	
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)	

MS-HMIC101A

10.1" Fanless HMI Projective Capacitive Panel PC with Intel® Atom™ Processor

NEW



Features

- Low-power and fanless design perfectly fit industrial applications
- 10.1" 1280x800 WXGA resolution LCD display
- Projective Capacitive multi-touch solution
- Surface Hardness:7H
- IP65 dust/water-proof design for front panel
- Support DC-in 12V/19V/24V
- Intel® Celeron® Processor J1900, 2.00 GHz, Quad Core

Ordering Information

Part Number	Description
S98-0100100-K99	10.1", Projected Capacitive Touch Panel PC, Bare-bone, Baytrail J1900, USA power cord
S98-0100170-K99	10.1", Projected Capacitive Touch Panel PC, Bare-bone, Baytrail J1900, EU power cord

Packing List

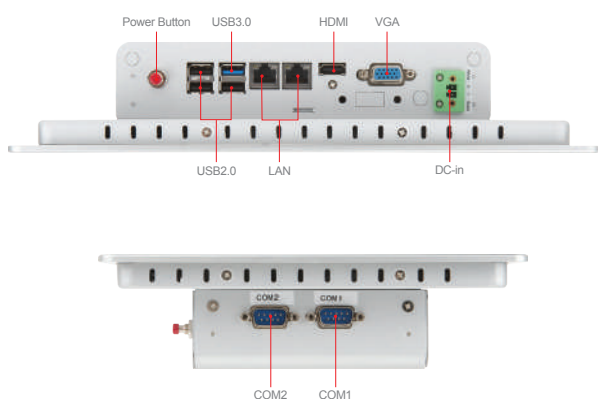
Part Number	Description
Coming soon	Adaptor 12V/60W
Coming soon	Power cable, USA
Coming soon	SATA Cable with Power
Coming soon	HDD Screw x 4
Coming soon	Clip Mount x 8
Coming soon	System Driver CD
Coming soon	Touch Panel Driver CD

Specifications

Display	LCD Size	10.1"
	Resolution	1280x800
	Brightness (cd/m2)	300
	Contrast Ratio	1300:1
	Support Colors	16.7M
	Pixel Pitch (H/Vmm)	0.1695X0.1695
Viewing Angle	H: 160 degree	
	V: 160 degree	
Touch Panel	Projective Capacitive touch panel	
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W
	Frequency	2.0 GHz, up to 2.42 GHz
	L2 Cache	2MB
	Chipset	SoC
Memory	Technology	Single-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB
	Socket	1 x 204-pin SO-DIMM
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz HDMI up to 1920 x 1080 @60Hz
Ethernet	Controller	2 x Intel® I210-AT GbE LAN
Expansion Slot	M.2	N/A
	Mini-PCIe	2 x Full-size (one w/ mSATA)
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1
	CFast	N/A
	CompactFlash	N/A
	RJ-45	2
I/O Interface	Audio	N/A
	USB	1 x USB 3.0 3 x USB 2.0
	Serial	2 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232, 0V/5V/12V
	PS/2	N/A
	HDMI	1
	DVI	N/A
	DisplayPort	N/A
	VGA	1
	Antenna	1 opening reserved for antenna
	Power Supply	DC Input
IP Rating		IP65 Front
Environment	Operating Temperature	0°C ~ 45°C
	Operating Humidity	20%~90% RH
	Storage Temperature	-20°C ~ 80°C
	Storage Humidity	10% ~ 90% non-condensing
Physical Characteristics	Housing	Aluminum
	Dimensions (W x H x D)	301.7 x 207.8 x57.5mm
	Weight	4 kg
	Mounting	VESA 75, Panel Mount, Clip mount
Certification	EMC	CE (Class A)
	Safety	N/A
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)

MS-HMIC104A

10.4" Fanless HMI Projective Capacitive Panel PC with Intel® Atom™ Processor



Features

- Low-power and fanless design perfectly fit industrial applications
- 10.4" 1024x768 XGA resolution LCD display
- Projective Capacitive multi-touch solution
- Surface Hardness:7H
- IP65 dust/water-proof design for front panel
- Support DC-in 12V/19V/24V
- Intel® Celeron® Processor J1900, 2.00 GHz, Quad Core

Ordering Information

Part Number	Description
S98-0100120-K99	10.4", Projected Capacitive Touch Panel PC, Bare-bone, Baytrail J1900, USA power cord

Packing List

Part Number	Description
Coming soon	Adaptor 12V/60W
Coming soon	Power cable, USA
Coming soon	SATA Cable with Power
Coming soon	HDD Screw x 4
Coming soon	Clip Mount x 8
Coming soon	System Driver CD
Coming soon	Touch Panel Driver CD

Display	LCD Size	10.4"	
	Resolution	1024x768	
	Brightness (cd/m2)	400	
	Contrast Ratio	1200:1	
	Support Colors	16.2 M	
	Pixel Pitch (H/Vmm)	0.2055X0.2055	
	Viewing Angle	H: 180 degree V: 180 degree	
Touch Panel	Projective Capacitive touch panel		
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W	
	Frequency	2.0 GHz, up to 2.42 GHz	
	L2 Cache	2MB	
	Chipset	SoC	
Memory	Technology	Single-channel DDR3L 1333 MHz	
	Max. Capacity	Up to 8GB	
	Socket	1 x 204-pin SO-DIMM	
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz HDMI up to 1920 x 1080 @60Hz	
Ethernet	Controller	2 x Intel® I210-AT GbE LAN	
Expansion Slot	M.2	N/A	
	Mini-PCIe	2 x Full-size (one w/ mSATA)	
Storage	SATA	1 x 2.5" HDD/SSD	
	mSATA	1	
	CFast	N/A	
	CompactFlash	N/A	
	RJ-45	2	
I/O Interface	Audio	N/A	
	USB	1 x USB 3.0 3 x USB 2.0	
	Serial	2 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232, 0V/5V/12V	
	PS/2	N/A	
	HDMI	1	
	DVI	N/A	
	DisplayPort	N/A	
	VGA	1	
	Antenna	1 opening reserved for antenna	
	Power Supply	DC Input	DC-in 12V/19V/24V
		IP Rating	IP65 Front
Environment	Operating Temperature	0°C ~ 45°C	
	Operating Humidity	20%~90% RH	
	Storage Temperature	-20°C ~ 80°C	
	Storage Humidity	10% ~ 90% non-condensing	
Physical Characteristics	Housing	Aluminum	
	Dimensions (W x H x D)	297 x 240.1 x 59.8mm	
	Weight	3 kg	
	Mounting	VESA 75, Panel Mount, Clip mount	
Certification	EMC	CE (Class A)	
	Safety	N/A	
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)	

Semi-rugged Terminal

POS System

HMI Panel PC

Embedded System

Embedded Board

COM Express Board

Qseven Board

Pico-ITX Board

3.5" Board

EPIC Board

PICMG 1.0 Board

Mini-ITX Board

Micro-ATX Board

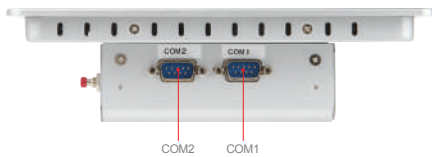
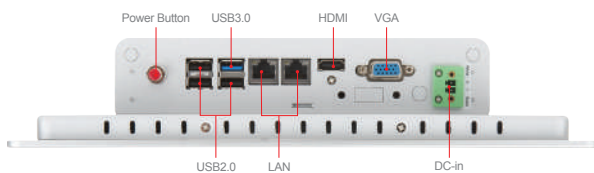
ATX Board

Mini-PCIe Module

MS-HMIC121A

12.1" Fanless HMI Projective Capacitive Panel PC with Intel® Atom™ Processor

NEW



Features

- Low-power and fanless design perfectly fit industrial applications
- 12.1" 1024x768 XGA resolution LCD display
- Projective Capacitive multi-touch solution
- Surface Hardness:7H
- IP65 dust/water-proof design for front panel
- Support DC-in 12V/19V/24V
- Intel® Celeron® Processor J1900, 2.00 GHz, Quad Core

Ordering Information

Part Number	Description
S98-0100110-K99	12.1", Projected Capacitive Touch Panel PC, Bare-bone, Baytrail J1900, USA power cord
S98-0100150-K99	12.1", Projected Capacitive Touch Panel PC, Bare-bone, Baytrail J1900, EU power cord

Packing List

Part Number	Description
Coming soon	Adaptor 12V/60W
Coming soon	Power cable, USA
Coming soon	SATA Cable with Power
Coming soon	HDD Screw x 4
Coming soon	Clip Mount x 8
Coming soon	System Driver CD
Coming soon	Touch Panel Driver CD

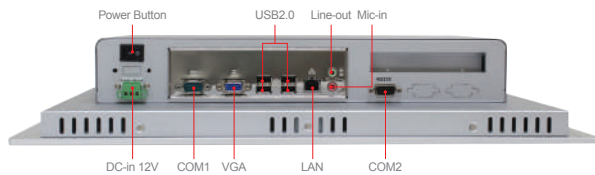
Specifications

Display	LCD Size	12.1"
	Resolution	1024x768
	Brightness (cd/m2)	500
	Contrast Ratio	700:1
	Support Colors	16.2 M
	Pixel Pitch (H/Vmm)	0.24X0.24
Viewing Angle	H: 160 degree	
	V: 160 degree	
Touch Panel	Projective Capacitive touch panel	
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W
	Frequency	2.0 GHz, up to 2.42 GHz
	L2 Cache	2MB
	Chipset	SoC
Memory	Technology	Single-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB
	Socket	1 x 204-pin SO-DIMM
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz HDMI up to 1920 x 1080 @60Hz
Ethernet	Controller	2 x Intel® I210-AT GbE LAN
Expansion Slot	M.2	N/A
	Mini-PCIe	2 x Full-size (one w/ mSATA)
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1
	CFast	N/A
	CompactFlash	N/A
	RJ-45	2
I/O Interface	Audio	N/A
	USB	1 x USB 3.0 3 x USB 2.0
	Serial	2 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232, 0V/5V/12V
	PS/2	N/A
	HDMI	1
	DVI	N/A
	DisplayPort	N/A
	VGA	1
	Antenna	1 opening reserved for antenna
	Power Supply	DC Input
IP Rating		IP65 Front
Environment	Operating Temperature	0°C ~ 45°C
	Operating Humidity	20%~90% RH
	Storage Temperature	-20°C ~ 80°C
	Storage Humidity	10% ~ 90% non-condensing
Physical Characteristics	Housing	Aluminum
	Dimensions (W x H x D)	332.2 x 262.7 x 61mm
	Weight	4 kg
	Mounting	VESA 75, Panel Mount, Clip mount
Certification	EMC	CE (Class A)
	Safety	N/A
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)

MS-HMIC150A

15" Fanless HMI Projective Capacitive Panel PC with Intel® Atom™ Processor

NEW



Features

- Low-power and fanless design perfectly fit industrial applications
- 15" 1024x768 XGA resolution LCD display
- Projective Capacitive multi-touch solution
- Surface Hardness:7H
- IP65 dust/water-proof design for front panel
- Support DC-in 12V
- Intel® Celeron® Processor J1900, 2.00 GHz, Quad Core

Ordering Information

Part Number	Description
S98-0100140-K99	15", Projected Capacitive Touch Panel PC, Barebone, Baytrail J1900, EU power cord

Packing List

Part Number	Description
Coming soon	Adaptor 12V/60W
Coming soon	Power cable, EU
Coming soon	SATA Cable with Power
Coming soon	HDD Screw x 4
Coming soon	Clip Mount x 10
Coming soon	System Driver CD
Coming soon	Touch Panel Driver CD

Specifications

Display	LCD Size	15"
	Resolution	1024x768
	Brightness (cd/m2)	400
	Contrast Ratio	700:1
	Support Colors	16.2 M
	Pixel Pitch (H/Vmm)	0.297 x 0.297
	Viewing Angle	H: 160 degree V: 140 degree
Touch Panel	Projective Capacitive touch panel	
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W
	Frequency	2.0 GHz, up to 2.42 GHz
	L2 Cache	2MB
	Chipset	SoC
Memory	Technology	Dual-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB
	Socket	1 x 204-pin SO-DIMMs (Optional 1)
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz
Ethernet	Controller	1 x Realtek® RTL8111G-CG GbE LAN Optional : 1
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Full-size (w/ mSATA)
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1
	CFast	N/A
	CompactFlash	N/A
I/O Interface	RJ-45	2 (Optional 1)
	Audio	1 x Mic-in, 1 x Line-out
	USB	4 x USB 2.0
	Serial	2 x COM ports COM1: RS-232, 0V/5V/12V COM2: RS-232, w/o power
	PS/2	N/A
	HDMI	N/A
	DVI	N/A
	DisplayPort	N/A
	VGA	1
	Antenna	1 opening reserved for antenna
Power Supply	DC Input	DC-in 12V
	IP Rating	IP65 Front
Environment	Operating Temperature	0°C ~ 45°C
	Operating Humidity	10% ~ 90% non-condensing
	Storage Temperature	-10°C ~ 70°C
	Storage Humidity	10% ~ 90% non-condensing
Physical Characteristics	Housing	Aluminum
	Dimensions (W x H x D)	441 x 322 x 81.1mm
	Weight	10 kg
	Mounting	VESA 100, Panel Mount, Clip mount
Certification	EMC	CE (Class A)
	Safety	N/A
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)

Semi-rugged Terminal

POS System

HMI Panel PC

Embedded System

Embedded Board

COM Express Board

Oseven Board

Pico-ITX Board

3.5" Board

EPIC Board

PICMG 1.0 Board

Mini-ITX Board

Micro-ATX Board

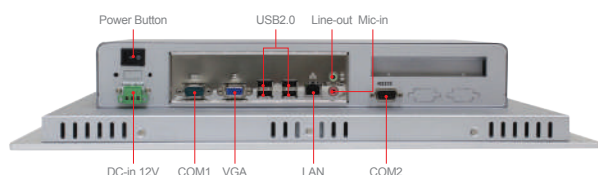
ATX Board

Mini-PCIe Module

MS-HMIC170A

17" Fanless HMI Projective Capacitive Panel PC with Intel® Atom™ Processor

NEW



Features

- Low-power and fanless design perfectly fit industrial applications
- 17" 1280x1024 SXGA resolution LCD display
- Projective Capacitive multi-touch solution
- Surface Hardness:7H
- IP65 dust/water-proof design for front panel
- Support DC-in 12V
- Intel® Celeron® Processor J1900, 2.00 GHz, Quad Core

Ordering Information

Part Number	Description
S98-0100050-K99	17", Projected Capacitive Touch Panel PC, Barebone, Baytrail J1900, EU power cord

Packing List

Part Number	Description
Coming soon	Adaptor 12V/60W
Coming soon	Power cable, EU
Coming soon	SATA Cable with Power
Coming soon	HDD Screw x 4
Coming soon	Clip Mount x 10
Coming soon	System Driver CD
Coming soon	Touch Panel Driver CD

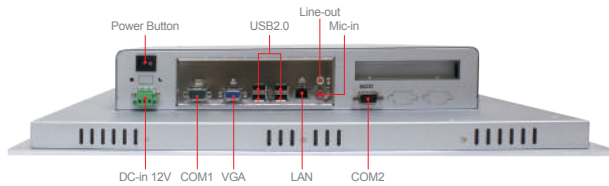
Specifications

Display	LCD Size	17"
	Resolution	1280x1024
	Brightness (cd/m2)	350
	Contrast Ratio	1000:1
	Support Colors	16.7 M
	Pixel Pitch (H/Vmm)	0.264 x 0.264
Viewing Angle	H: 170 degree	
	V: 160 degree	
Touch Panel	Projective Capacitive touch panel	
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W
	Frequency	2.0 GHz, up to 2.42 GHz
	L2 Cache	2MB
	Chipset	SoC
Memory	Technology	Dual-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB
Socket	1 x 204-pin SO-DIMMs (Optional 1)	
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz
Ethernet	Controller	1 x Realtek® RTL8111G-CG GbE LAN Optional : 1
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Full-size (w/ mSATA)
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1
	CFast	N/A
	CompactFlash	N/A
I/O Interface	RJ-45	2 (Optional 1)
	Audio	1 x Mic-in, 1 x Line-out
	USB	4 x USB 2.0
	Serial	2 x COM ports COM1: RS-232, 0V/5V/12V COM2: RS-232, w/o power
	PS/2	N/A
	HDMI	N/A
	DVI	N/A
	DisplayPort	N/A
	VGA	1
	Antenna	1 opening reserved for antenna
Power Supply	DC Input	DC-in 12V
	IP Rating	IP65 Front
Environment	Operating Temperature	0°C ~ 45°C
	Operating Humidity	10% ~ 90% non-condensing
	Storage Temperature	-10°C ~ 70°C
	Storage Humidity	10% ~ 90% non-condensing
Physical Characteristics	Housing	Aluminum
	Dimensions (W x H x D)	483 x 376 x 70.8mm
	Weight	14 kg
	Mounting	VESA 100, Panel Mount, Clip mount
Certification	EMC	CE (Class A)
	Safety	N/A
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)

MS-HMIC190A

19" Fanless HMI Projective Capacitive Panel PC with Intel® Atom™ Processor

NEW



Features

- Low-power and fanless design perfectly fit industrial applications
- 19" 1280x1024 SXGA resolution LCD display
- Projective Capacitive multi-touch solution
- Surface Hardness:7H
- IP65 dust/water-proof design for front panel
- Support DC-in 12V
- Intel® Celeron® Processor J1900, 2.00 GHz, Quad Core

Ordering Information

Part Number	Description
S98-0100060-K99	19", Projected Capacitive Touch Panel PC, Barebone, Baytrail J1900, EU power cord

Packing List

Part Number	Description
Coming soon	Adaptor 12V/60W
Coming soon	Power cable, EU
Coming soon	SATA Cable with Power
Coming soon	HDD Screw x 4
Coming soon	Clip Mount x 10
Coming soon	System Driver CD
Coming soon	Touch Panel Driver CD

Specifications

Display	LCD Size	19"
	Resolution	1280x1024
	Brightness (cd/m2)	250
	Contrast Ratio	1000:1
	Support Colors	16.7 M
	Pixel Pitch (H/Vmm)	0.294 x 0.294
	Viewing Angle	H: 170 degree V: 160 degree
Touch Panel	Projective Capacitive touch panel	
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W
	Frequency	2.0 GHz, up to 2.42 GHz
	L2 Cache	2MB
	Chipset	SoC
Memory	Technology	Dual-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB
	Socket	1 x 204-pin SO-DIMMs (Optional 1)
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz
Ethernet	Controller	1 x Realtek® RTL8111G-CG GbE LAN Optional : 1
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Full-size (w/ mSATA)
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1
	CFast	N/A
	CompactFlash	N/A
I/O Interface	RJ-45	2 (Optional 1)
	Audio	1 x Mic-in, 1 x Line-out
	USB	4 x USB 2.0
	Serial	2 x COM ports COM1: RS-232, 0V/5V/12V COM2: RS-232, w/o power
	PS/2	N/A
	HDMI	N/A
	DVI	N/A
	DisplayPort	N/A
	VGA	1
	Antenna	1 opening reserved for antenna
Power Supply	DC Input	DC-in 12V
	IP Rating	IP65 Front
Environment	Operating Temperature	0°C ~ 45°C
	Operating Humidity	10% ~ 90% non-condensing
	Storage Temperature	-10°C ~ 70°C
	Storage Humidity	10% ~ 90% non-condensing
Physical Characteristics	Housing	Aluminum
	Dimensions (W x H x D)	528 x 414.4 x 71.8mm
	Weight	14.5 kg
	Mounting	VESA 100, Panel Mount, Clip mount
Certification	EMC	CE (Class A)
	Safety	N/A
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)

Semi-rugged Terminal

POS System

HMI Panel PC

Embedded System

Embedded Board

COM Express Board

Oseven Board

Pico-ITX Board

3.5" Board

EPIC Board

PICMG 1.0 Board

Mini-ITX Board

Micro-ATX Board

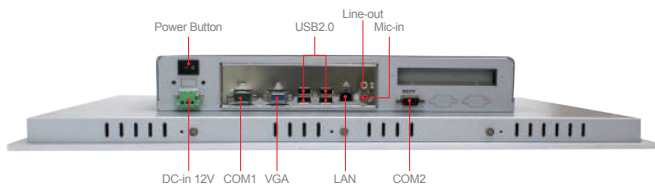
ATX Board

Mini-PCIe Module

MS-HMIC215A

21.5" Fanless HMI Projective Capacitive Panel PC with Intel® Atom™ Processor

NEW



Features

- Low-power and fanless design perfectly fit industrial applications
- 21.5" 1920x1080 Full HD resolution LCD display
- Projective Capacitive multi-touch solution
- Surface Hardness:7H
- IP65 dust/water-proof design for front panel
- Support DC-in 12V
- Intel® Celeron® Processor J1900, 2.00 GHz, Quad Core

Ordering Information

Part Number	Description
S98-0100040-K99	21.5", Projected Capacitive Touch Panel PC, Bare-bone, Baytrail J1900, EU power cord

Packing List

Part Number	Description
Coming soon	Adaptor 12V/80W
Coming soon	Power cable, EU
Coming soon	SATA Cable with Power
Coming soon	HDD Screw x 4
Coming soon	Clip Mount x 10
Coming soon	System Driver CD
Coming soon	Touch Panel Driver CD

Specifications

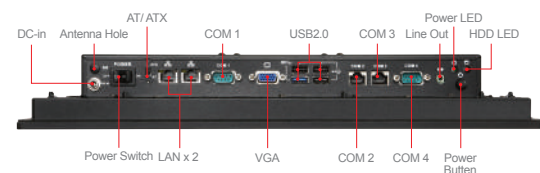
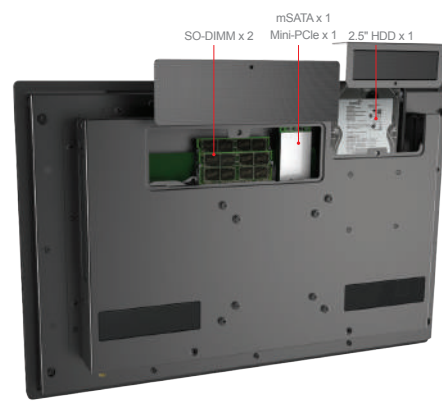
Display	LCD Size	21.5"
	Resolution	1920x1080
	Brightness (cd/m2)	300
	Contrast Ratio	3000:1
	Support Colors	16.7 M
	Pixel Pitch (H/Vmm)	0.248 x 0.248
Viewing Angle	H: 178 degree	
	V: 178 degree	
Touch Panel	Projective Capacitive touch panel	
System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W
	Frequency	2.0 GHz, up to 2.42 GHz
	L2 Cache	2MB
	Chipset	SoC
Memory	Technology	Dual-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB
Socket	1 x 204-pin SO-DIMMs (Optional 1)	
Graphic	Display Interface	VGA up to 2560 x 1600 @60Hz
Ethernet	Controller	1 x Realtek® RTL8111G-CG GbE LAN Optional : 1
	Expansion Slot	M.2 Mini-PCIe
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1
	CFast	N/A
	CompactFlash	N/A
I/O Interface	RJ-45	2 (Optional 1)
	Audio	1 x Mic-in, 1 x Line-out
	USB	4 x USB 2.0
	Serial	2 x COM ports COM1: RS-232, 0V/5V/12V COM2: RS-232, w/o power
	PS/2	N/A
	HDMI	N/A
	DVI	N/A
	DisplayPort	N/A
	VGA	1
	Antenna	1 opening reserved for antenna
Power Supply	DC Input	DC-in 12V
	IP Rating	IP65 Front
Environment	Operating Temperature	0°C ~ 45°C
	Operating Humidity	10% ~ 90% non-condensing
	Storage Temperature	-10°C ~ 70°C
	Storage Humidity	10% ~ 90% non-condensing
Physical Characteristics	Housing	Aluminum
	Dimensions (W x H x D)	607 x 395 x 72.8mm
	Weight	14.5 kg
Certification	Mounting	VESA 100, Panel Mount, Clip mount
	EMC	CE (Class A)
Software Platform	Safety	N/A
	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)

MS-9A91

MSI 2nd Gen Stylish 15.6" Ultra-Slim HMI Panel PC with Intel® Atom™ Processor

Specifications

Display	LCD Size	15.6"	
	Resolution	1366x768	
	Brightness (cd/m ²)	300	
	Contrast Ratio	500:1	
	Support Colors	262K/16.7M	
	Pixel Pitch (H/Vmm)	0.252x0.252	
Touch Panel	Projective Capacitive touch panel or optional 5-wire resistive touch panel		
	Viewing Angle	H: 140~160 degree V: 140~160 degree	
System Processor	CPU	Intel® Atom™ Processor E3845, QC, 10W	
	Frequency	1.91 GHz	
	L2 Cache	2MB	
	CPU Type	BGA	
	Chipset	SoC	
	BIOS	AMI	
Memory	Technology	Dual-channel DDR3L 1333 MHz	
	Max. Capacity	Up to 8GB	
	Socket	2 x 204-pin SO-DIMM	
Graphic	Controller	VGA up to 2560 x 1600 @60Hz	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	Multiple Display	2 independent displays	
Ethernet	Controller	2 x Realtek 8111E VL-CG GbE LAN	
	Controller	Realtek® ALC887 HD Audio Codec	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	
Expansion Slot	M.2	N/A	
	Mini-PCIe	1 x Full-size (mSATA only) 1 x Half-size	
Storage	SATA	1 x 2.5" HDD/SSD	
	mSATA	1	
I/O Interface	RJ-45	2	
	Audio	1 x Line-out	
	USB	5 x USB 2.0 1 x USB 3.0	
	Serial	4 x COM ports COM1/4: RS-232/422/485 (0V/5V/12V) (D-Sub Type) COM2/3: RS-232 (0V/5V/12V) (RJ-45 Type)	
		PS/2	N/A
		VGA	1
	Antenna	3 openings reserved for antennas	
	Power Supply	DC Input	DC-in 12V or 12V/19V/24V (by BOM option)
		AC Input	N/A
	Environment	IP Rating	IP65 Front / IP31 Rear
Operating Temperature		-10 ~ 45°C (HDD) -10 ~ 50°C (SSD)	
Operating Humidity		10 ~ 90%, non-condensing	
Storage Temperature		-20°C ~ 60°C	
Storage Humidity		10 ~ 90%, non-condensing	
Vibration		Operating, 0.25 Grms, 5-300 Hz, 3 axes (w/ HDD)	
Shock		Operating, 3 G, half sine 11 ms	
Physical Characteristics	Housing	SGCC, aluminum	
	Dimensions (W x H x D)	418 x 271 x 60mm	
	Weight	5.04 Kg	
Certification	EMC	FCC, CE, RCM, VCCI, BSMI	
	Safety	CB, BSMI	
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Linux Fedora 20 Linux Ubuntu 13.10 (Kernel 3.11)	



Features

- Low-power and fanless design perfectly fit industrial applications
- Industrial design in slim and stylish housing
- Easy maintenance design for HDD/SSD/Mini-PCIe/memory
- IP65 dust/water-proof design for front panel
- Flat 15.6" TFT LCD with PCAP and 10-point touch panel
- Anti-scratch coating: 7H hardness
- Intel® Atom™ Processor E3845, 1.91 GHz, Quad Core

Ordering Information

Part Number	Description
939-9A91-001	Bare Bone, Baytrail-I E3845, BLACK w/o LOGO, 12V/84W DC-in Adaptor, USA Power Cord
939-9A91-002	Bare Bone, Baytrail-I E3845, BLACK w/o LOGO, 12V/84W DC-in Adaptor, EU Power Cord

Packing List

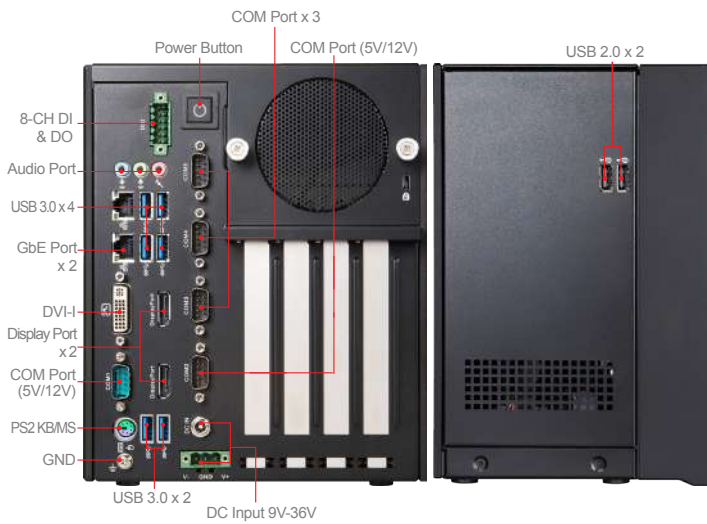
Part Number	Description
S93-0401650-S14	12V/84W DC-in Adaptor
K33-3001002-I45/ K33-3001005-I45	USA Power Cord, 1800mm/ EU Power Cord, 1830mm
K3B-3001008-V03	RJ45 to D-Sub9 COM Cable, 200mm
E22-9A91040-F62	Panel Mount Bracket
E2B-9A61020-P65	Panel Mount Nut
E49-1304006-P65	Panel Mount Screw
E41-140P001-P65	Panel Mount Screw
G71-SEDC155-N56	Driver CD

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

MS-9A76

Outperform Fanless Box PC with 7th/6th Gen Intel® Core™ i Processor for Rugged, Scalable & Versatile Solution

NEW



Specifications

Processor	CPU	7th/6th Gen Intel® Desktop Kaby Lake/Skylake Core™ i7/ i5/i3/Celeron™/Pentium™ Processor, Max. 65W		
	Frequency	2.3GHz~3.9 GHz (Depends on CPU)		
	L2 Cache	2M~8M (Depends on CPU)		
	CPU Type	Socket (LGA1151)		
	Chipset	Intel® Q170 Express / Intel® C236 Express		
Memory	BIOS	AMI		
	Technology	Dual-channel DDR4(non-ECC) 2133/2400MHz for Q170 Dual-channel DDR4(ECC) 2133/2400MHz for C236		
	Max. Capacity	Up to 32GB		
	Socket	2 x 260-pin SO-DIMMs		
Display	Controller	Intel® HD Graphics		
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM		
	Multiple Display	3 Independent Displays		
Ethernet	Display Interface	DP up to 3840 x 2160 @60Hz DVI-I up to 1920 x 1200 @60Hz		
	Controller	1 x Intel® I219GbE-PHY LAN (Support Intel AMT) 1 x Intel® I210-AT GbE LAN		
Audio	Controller	Realtek® ALC887 HD Audio Codec		
H/W Monitor	Watchdog Timer	256-level Watchdog Timer		
	Smart Fan	N/A		
TPM	Controller	Infineon SLB9665TT.0		
TPM	PCIe x16	1	N/A	1
	PCIe x8	N/A	2	N/A
	PCIe x4	N/A		
	PCIe x1	N/A		
	PCI	3	2	1
	M.2	N/A		
Storage	Mini-PCIe	N/A		
	SATA	2 x 2.5" HDD/SSD		
	mSATA	N/A		
	CFast	1		
I/O Interface	CompactFlash	N/A		
	RJ-45	2		
	PoE	N/A		
	Audio	1 x Mic-in 1 x Line-out 1 x Line-in		
	USB	6 x USB 3.0 5 x USB 2.0 (one port w/ security key)		
	Serial	5 x COM ports COM1~2: RS232/422/485, 0V/5V/12V COM3~5: RS-232, 0V		
	PS/2	1		
	GPIO	8-bits (4 x GPI; 4 x GPO), 5~35V, Isolation 1.5KV		
	CANbus	N/A		
	HDMI	N/A		
	LVDS	N/A		
	DVI	1 (DVI-I)		
DisplayPort	2			
Antenna	N/A			
Power Supply	DC Input	DC-In 9-36V Wide-Range pluggable connectors with latch (GND, V-, V+)		
	IP Rating	Full IP20		
Environment	Operating Temperature	-10 ~ 50°C w/ industrial DC power Up to 35W CPU -10 ~ 40°C w/ Fan module Up to 65W CPU		
	Operating Humidity	10 ~ 90%, non-condensing		
	Storage Temperature	-20 ~ 80°C		
	Storage Humidity	10 ~ 90%, non-condensing		
	Vibration	Operating, IEC 60068-2-64: 1.5 Grms, random, 5 ~ 500 Hz, 1hr/axis (w/ HDD/SSD)		
Form Factor	Shock	Operating, IEC 60068-2-27: 50G, half sine, 11ms (w/ HDD/SSD)		
	Dimensions (Wx DxH)	217 x 226 x 176mm	217 x 226 x 143mm	
Certification	Weight	4.8 Kg	4.4 Kg	
	Mounting	Wall mount		
Software Platform	EMC	FCC Class A, CE, RCM, VCCI, BSMI		
	Safety	UL		
OS Support	OS Support	Windows 7 (32/64-bit) (Skylake-S Series CPU Only) Windows 8.1 (64-bit) (Skylake-S Series CPU Only) Windows 10 (64-bit)		

Features

- 7th/6th Gen Intel® Core i7/i5/i3/Pentium®/Celeron® processor
- Fanless design to support Intel® 7th/6th Gen CPU (up to 35W)
- 3 independent displays: DP and DVI-I
- Wide range 9~36V DC power input
- Supports AT power mode
- Optional system fan module (Up to 65W)
- Supports 2 expansion slots: 1*PCIe x16; 1*PCI and 4 expansion slots: 1*PCIe x16; 3*PCI, 2*PCIe x8; 2*PCI
- GPIO supports 5~35V for automation
- Removable cover for easy maintenance (CPU, HDD, memory, CFast, expansion slots)
- Supports DAQ, video capture and Embedded VGA card for PCI express slot
- Anti-Vibration & Shockproof Design to Compliance IEC 60068-2

Ordering Information

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Packing List

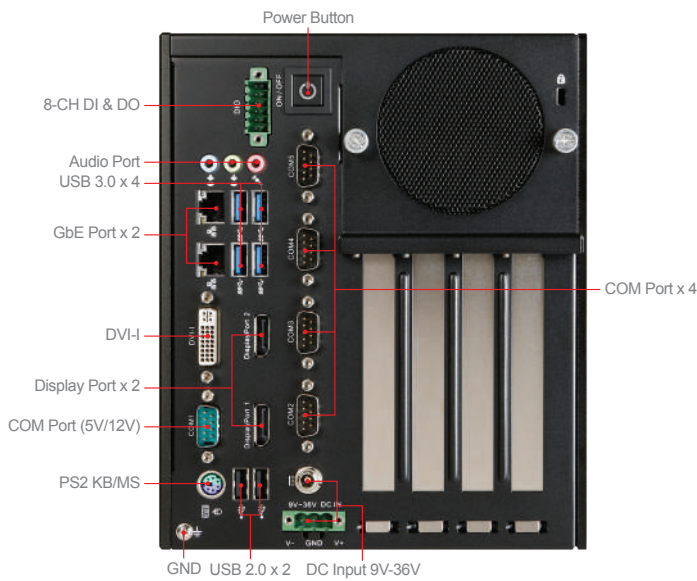
Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Optional Item

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

MS-9A66

Outperform Fanless Box PC with 4th Gen Intel® Core™ i Processor for Rugged, Scalable & Versatile Solution



Features

- 4th Gen Intel® Core i7/i5/i3/Pentium®/Celeron® processor
- Fanless design to support Intel® 4th Gen CPU (up to 35W)
- 3 independent display: DP and DVI-I
- Wide range 9~36V DC power input
- Supports AT power mode
- Optional system fan module
- Supports 2 expansion slots: 1*PCIe x16, 1*PCI for Q87 & 4 expansion slots: 1*PCIe x16, 3*PCI for Q87; 2*PCIe x8, 2*PCI for C226
- GPIO supports 5~24V for automation
- Removable cover for easy maintenance (HDD, memory, CFast, expansion slots)
- Supports DAQ, video capture and embedded VGA card for PCI express slot
- Anti-Vibration & Shockproof Design to Compliance IEC 60068-2

Ordering Information

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Packing List

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Specifications

System Processor	CPU	4th Gen Intel® Desktop Haswell Core™ i7/i5/i3/ Celeron®/Pentium® Processor, Max. 35W			
	Frequency	2.2GHz~2.7 GHz (Depends on CPU)			
	L2 Cache	2M~4M (Depends on CPU)			
	CPU Type	Socket (LGA1150)			
Memory	Chipset	Intel® Q87 Express	Intel® C226 Express	Intel® Q87 Express	
	BIOS	AMI			
	Technology	Dual-channel DDR3 1600/1333MHz			
	Max. Capacity	Up to 16GB			
Graphic	Socket	2 x 204-pin SO-DIMMs			
	Controller	Intel® HD Graphics			
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM			
	Multiple Display	3 independent displays			
Ethernet	Display Interface	DP up to 3840 x 2160 @60Hz DVI-I up to 1920 x 1200 @60Hz			
	Controller	1 x Intel® I217GbE-PHY LAN 1 x Intel® I210-AT GbE LAN			
Audio	Controller	Realtek® ALC887 HD Audio Codec			
H/W Monitor	Watchdog Timer	256-level Watchdog Timer			
TPM	Smart Fan	N/A			
	Controller	Infineon SLB9635TT1.2			
	Expansion Slot	PCIe x16	1	N/A	1
		PCIe x8	N/A	2	N/A
PCI		3	2	1	
Storage	M.2	N/A			
	Mini-PCIe	N/A		1 x Full-size (w/ mSATA)	
	SATA	2 x 2.5" HDD/SSD			
	mSATA	N/A		1	
I/O Interface	CFast	1			
	RJ-45	2			
	PoE	N/A			
	Audio	1 x Mic-in, 1 x Line-out, 1 x Line-in			
	USB	4 x USB 3.0 3 x USB 2.0 (one port w/ security key)			
	Serial	5 x COM ports COM1: RS232/422/485, 0V/5V/12V COM2: RS232/422/485, 0V COM3-5: RS-232, 0V			
	Parallel	N/A			
	PS/2	1			
	GPIO	8-bits (4 x GPI; 4 x GPO), 5~24V, Isolation 1.5KV			
	CANbus	N/A			
Power Supply	DVI	1 (DVI-I)			
	DisplayPort	2			
	DC Input	DC-In 9-36V Wide-Range pluggable connectors with latch (GND, V-, V+)			
	AC Input	N/A			
Environment	IP Rating	Full IP20			
	Operating Temperature	-10 ~ 50°C w/ industrial DC power			
	Operating Humidity	10 ~ 90%, non-condensing			
	Storage Temperature	-20 ~ 80°C			
	Storage Humidity	10 ~ 90%, non-condensing			
	Vibration	Operating, IEC 60068-2-27: 50G, half sine, 11ms (w/ HDD)			
Physical characteristics	Shock	Operating, IEC 60068-2-64: 2 Grms, random, 5 ~ 500 Hz, 1hr/axis (w/ HDD)			
	Dimensions (W x D x H)	176 x 226 x 217mm	143 x 226 x 217mm		
	Weight	4.86 kg	4.4 kg		
	Mounting	Wall mount			
Certification	EMC	FCC, CE, RCM, VCCI, BSMI			
	Safety	N/A			
Software Platform	OS Support	Windows XP (32/64-bit) Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)			

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

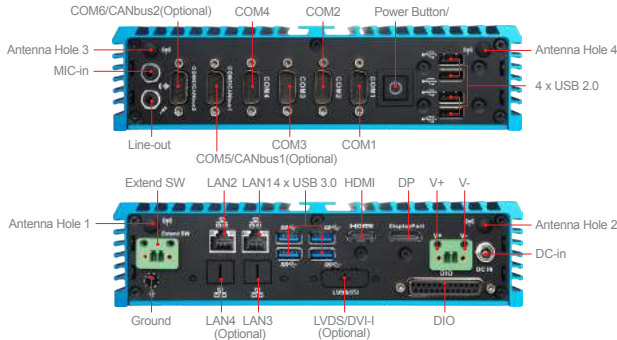
MS-9A89

Compact-Size Box PC with Intel® Kaby Lake-U/Skylake-U or Apollo Lake-I Series Processor for Ultra Low-Power Fanless Solution

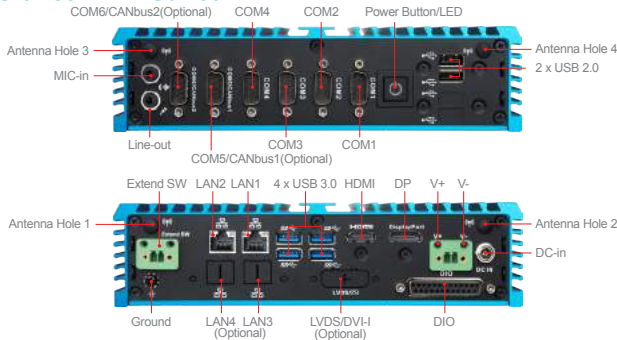
NEW



MS-9A89-U1/ MS-9A89-U2/ MS-9A89-U3



MS-9A89-A1/ MS9A89-A2



Specifications

		MS-9A89-U1	MS-9A89-U2	MS-9A89-U3	MS-9A89-A1	MS-9A89-A2
Processor	CPU	Intel® KBL-U Core™ i3-7100U Processor, DC, 15W	Intel® SKL-U Core™ i5-6300U Processor, DC, 15W	Intel® SKL-U Core™ i3-6100U Processor, DC, 15W	Intel® Atom™ x7 Processor E3950, QC, 12W	Intel® Atom™ x5 Processor E3940, QC, 9.5W
	Frequency	2.4GHz			1.6GHz, up to 2.0GHz	
	L2 Cache	3MB			2MB	
	CPU Type	BGA				
	Chipset	Integrated in Process			Integrated in SoC Process	
Memory	BIOS	AMI				
	Technology	Single channel for DDR4 2133 MHz			Single channel for DDR3L 1866/1600 MHz	
	Max. Capacity	Up to 16GB			Up to 8GB	
Display	Socket	1 x 260-pin SO-DIMMs			1 x 204-pin SO-DIMMs	
	Controller	Intel® HD Graphics				
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM				
	Multiple Display	2 or 3 independent displays			2 or 3 independent displays	
Ethernet	Display Interface	HDMI1.4 up to 4096 x 2160 @24Hz DP up to 3840 x 2160 @60Hz LVDS up to 1920 x 1200 @60Hz (optional by cable) DVI-I up to 1920 x 1200 @60Hz (optional by MS-99C0)			HDMI up to 3840 x 2160 @30Hz DP up to 4096 x 2160 @60Hz LVDS up to 1920 x 1200 @60Hz (optional by cable) DVI-I up to 1920 x 1200 @60Hz (optional by MS-99C0)	
	Controller	1 x Intel® I210-AT GbE LAN 1 x Intel® I219-LM GbE LAN PHY			2 x Intel® I210-IT GbE LAN	2 x Intel® I210-AT GbE LAN
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec				
H/W Monitor	Watchdog Timer	256-level Watchdog Timer				
TPM	Controller	N/A				
Expansion Slot	Controller	N/A				
	Mini-PCIe	2 x Full-size (Mini-PCIe1 Slot w/ NANO SIM-Holder) (Mini-PCIe2 Slot w/ mSATA)				
Storage	SATA	1 x 2.5" HDD/SSD Bay				
	mSATA	1				
I/O Interface	RJ-45	4 (LAN1/2 Standard, LAN3/4 by Option)				
	PoE	2 x 802.11af (by request)				
	Audio	1 x Line-out / 1 x Mic-in				
	USB	4 x USB 3.0, 4 x USB 2.0			4 x USB 3.0, 2 x USB 2.0	
	Serial	6 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2-6: RS-232, 0V/5V/12V				
	GPIO	16-bit (8*GPI; 8*GPO), 5V				
	CANbus	2 x CAN 2.0B (optional)				
	HDMI	1				
	LVDS	1 (optional)				
	DVI	1 (DVI-I by option)				
Power Supply	DisplayPort	1				
	Antenna	4 openings reserved for antennas				
Environment	DC Input	DC-in 12V~24V				
	Operating Temperature	-10~45°C (HDD) -10~60°C (w/ WT SSD/mSATA)			-10~45°C (HDD) -20~70°C (w/ WT SSD/mSATA)	-10~45°C (HDD) -10~60°C (w/ WT SSD/mSATA)
	Operating Humidity	10 ~ 90%, non-condensing				
	Storage Temperature	-20 ~ 80°C				
	Storage Humidity	10 ~ 90%, non-condensing				
Form Factor	Vibration	IEC61373 Category 1, Class B:				
	Shock	IEC61373 Category 1, Class B				
	Dimensions (Wx DxH)	215 x 155 x 55mm				
Certification	Weight	1.55 kg				
	Mounting	Wall mount(STD)/DIN-rail mount(STD)/ VESA mount(by BOM option)				
Software Platform	EMC	CE, FCC, VCCI, RCM, BSMI, EN50155				
	Safety	BSMI				
OS Support	OS Support	Windows 7(For Skylake-U SKUs) Windows 8.1(For Skylake-U SKUs) Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)				

Features

- Ultra low power with fanless design
- Support DDR4 2133MHz SO-DIMM Memory up to 16GB(For KBL-U Series)
- Support DDR3L 1866/1600MHz SO-DIMM Memory up to 8GB(For APL-I Series)
- Support operating temperature: -20~70°C (w/ WT SSD or mSATA For MS-9A89A1 SKU)
- 3 independent displays: HDMI, DP and LVDS/DVI-I(Optional)
- Supports 16-bit GPIO (8*GPI; 8*GPO)
- Dual GbE LAN and 4*USB 3.0 and 4*USB2.0(APL-I Series support 2*USB2.0) and 6*COM
- Dual Mini-PCIe for expansion
- Support DC in 12V~24V
- 4 openings reserved for antennas
- Anti-Vibration & Shockproof Design
- EN50155 Compliance

Ordering Information

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Packing List

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

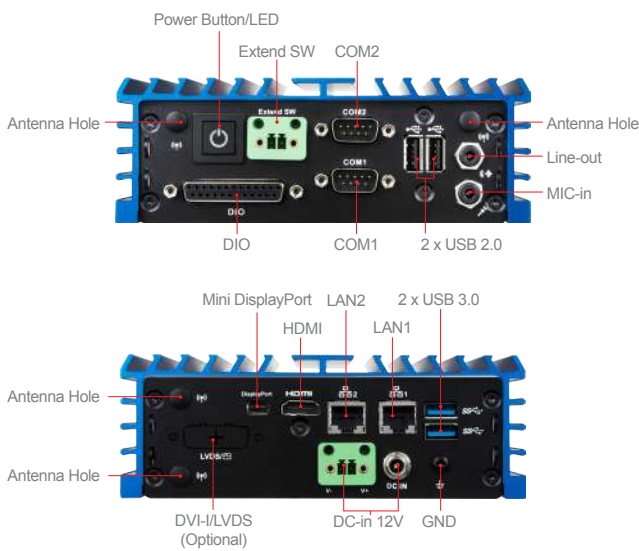
Optional Item

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

MS-9A79

Palm-Size Box PC with Intel® Apollo Lake Series SoC Platform for Ultra Low-Power Fanless Solution

NEW



Features

- Ultra low power with fanless design
- Supports operating temperature: -20~70°C (w/ WT SSD/ mSATA)
- Supports Onboard 4GB LPDDR4-2133/2400MHz memory
- Support 2 or 3 independent displays with HDMI, Mini-DP, and LVDS/DVI-I(Optional)
- Supports 16-bit GPIO (8*GPI; 8*GPO), 5V
- Multi GbE LAN and 2 USB 3.0, 2 USB2.0 and 2 COM Ports
- Supports Flexible DC-in 12V input
- Compliance IEC 61373 body mount class A
- EN60068-2-1, EN60068-2-2, EN60068-2-30 Compliance
- 4 openings reserved for antennas

Ordering Information

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Packing List

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Optional Item

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Specifications

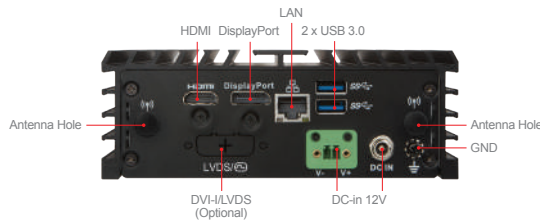
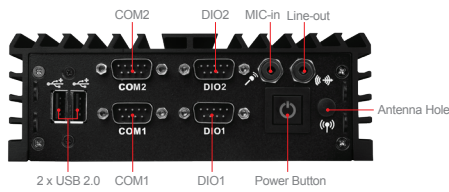
		MS-9A79-A1	MS-9A79-A2
Processor	CPU	Intel® Atom™ x5 Processor E3940, QC, 9.5W	Intel® Celeron® Processor N3350, DC, 6W
	Frequency	1.6 GHz up to 1.8 GHz	1.1 GHz up to 2.4 GHz
	L2 Cache	2MB	
	CPU Type	BGA	
	Chipset	Integrated in SoC	
Memory	BIOS	AMI	
	Technology	Dual-channel LPDDR4-2133MHz	Dual-channel LPDDR4-2400MHz
	Max. Capacity	Onboard 4 GB	
Display	Socket	N/A	
	Controller	Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	Multiple Display	2 or 3 independent displays	
Display Interface	HDMI up to 3840 x 2160 @30Hz		
	Mini-DP up to 4096 x 2160 @60Hz		
	LVDS up to 1920 x 1200 @60Hz (optional by cable)		
	DVI-I up to 1920 x 1200 @60Hz (optional by MS-99C0)		
Ethernet	Controller	2 x Intel® I210-IT GbE LAN	2 x Intel® I211-AT GbE LAN
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	
	Smart Fan	N/A	
TPM	Controller	Pin Header	
Expansion Slot	Mini-PCIe	1 x Full-size (w/ NANO SIM-Holder) 1 x Half-size (Shared w/ mSATA)	
	SATA	1 x 2.5" HDD/SSD Bay	
Storage	mSATA	1 x Half-size (Shared w/ Mini-PCIe)	
	CFast	N/A	
	CompactFlash	N/A	
I/O Interface	RJ-45	2	
	Audio	1 x Line-out 1 x Mic-in	
	USB	2 x USB 3.0 2 x USB 2.0	
	Serial	2 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232/422/485, 0V/5V/12V	
	GPIO	16-bit (8*GPI; 8*GPO), 5V	
	CANbus	N/A	
	HDMI	1	
	LVDS	1 (optional by cable)	
	DVI	1 (DVI-I by BOM option)	
	DisplayPort	1 (Mini-DP)	
	VGA	N/A	
	Antenna	4 openings reserved for antennas	
Power Supply	DC Input	DC-in 12V Jack (5.5mm/2.5mm) / Phoenix pluggable with latch (Support OCP/ OVP Protection)	
	AC Input	N/A	
Environment	Operating Temperature	-10 ~ 45°C (HDD) -20 ~ 70°C (w/ WT SSD/mSATA)	-10 ~ 45°C (HDD) -10 ~ 60°C (SSD/mSATA)
	Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-40 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing	
Form Factor	Vibration	IEC61373 Category 1, Class A	
	Shock	IEC61373 Category 1, Class A	
	Dimensions (WxDxH)	155 x 110 x 55 mm	
Certification	Weight	1.1 kg	
	Mounting	Wall mount (STD)/DIN-rail mount(STD)/VESA mount(by BOM option)	
Software Platform	EMC	FCC, CE, RCM, VCCI, BSMI	
	Safety	BSMI	
OS Support	OS Support	Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)	

Semi-rugged Terminal
POS System
Panel PC
Embedded System Board
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

MS-9A59

Palm-Size Box PC with Intel® Braswell N3160 SoC Platform for Ultra Low-Power Fanless Solution

NEW



Features

- Ultra low power with fanless design
- Supports Onboard 2GB DDR3L memory
- 2 or 3 independent displays:HDMI, VGA and DVI-I/ LVDS(Optional)
- Supports 16-bit GPIO (8*GPI; 8*GPO)
- Supports 1 Intel® GbE LAN, 2 USB 3.0, 2 USB 2.0 and 2 COM ports
- Supports Flexible DC-in 12V input
- Anti-Vibration & Shockproof Design
- Compliance IEC 61373 body mount class A
- 3 openings reserved for antennas

Ordering Information

Part Number	Description
939-9A59-001	MS-9A59/MS-9A59/709-9A59-010\829-9A59-004\STD MS-9A59 VER 1.1 HEATSINK, 1*SATA CABLE, 2*WALL MOUNT, CD, 12V/36W ADAPTER, POWER CORD USA SINGLE
939-9A59-002	MS-9A59/MS-9A59/709-9A59-010\829-9A59-005\STD MS-9A59 VER 1.1 HEATSINK, 1*SATA CABLE, 2*WALL MOUNT, CD, 12V/36W ADAPTER, POWER CORD EU SINGLE

Packing List

Part Number	Description
K33-3001020-I45/ K33-3001021-I45	Power Cord, USA, 1800mm/ Power Cord, EU, 1800mm
K1D-3010018-V03	SATA Cable with power, 120mm
NA1-1020051-PC1	Phoenix Terminal Plugged
S93-0408870-S14	Adapter 12V/36W
G71-SEDC165-N56	Driver DVD
E22-9A59010-LA2	Wall Mounting Bracket
E25-9B01030-K23	Rubber for Wall Mounting
E49-1068001-P65	Screw for Wall Mounting
E24-9B02010-P09	DIN Rail
E41-1356002-P65	Screw for DIN Rail

Specifications

System Processor	CPU	Intel® Celeron® Processor N3160, QC, 6W	
	Frequency	1.6GHz~2.24GHz	
	L2 Cache	2MB	
	CPU Type	BGA	
	Chipset	Integrated in SoC Processor	
Memory	BIOS	AMI	
	Technology	Single-Channel DDR3L 1600MHz	
	Max. Capacity	Onboard 2GB	
Graphic	Socket	N/A	
	Controller	Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	Multiple Display	2 or 3 independent displays	
	Display Interface	HDMI up to 3840 x 2160 @30Hz DP1.1a up to 3840 x 2160 @30Hz LVDS up to 1920 x 1200 @60Hz (optional) DVI-I up to 1920 x 1200@60Hz (optional)	
Ethernet	Controller	1 x Intel® I211-AT GbE LAN	
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	
TPM	Controller	Pin Header	
Expansion Slot	M.2	N/A	
Storage	Mini-PCIe	1 x Half-size	
	SATA	1 x 2.5" HDD/SSD Bay	
I/O Interface	mSATA	1 x Full-size	
	RJ-45	1	
	PoE	N/A	
	Audio	1 x Line-out 1 x Mic-in	
	USB	2 x USB 3.0, 2 x USB 2.0	
	Serial	2 x COM Ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232/422/485, 0V/5V/12V	
	GPIO	16-bit (8*GPI; 8*GPO), 5V	
	CANbus	N/A	
	HDMI	1	
	LVDS	1 (optional)	
Power Supply	DVI	1 (DVI-I by option)	
	DisplayPort	1	
	Antenna	3 openings reserved for antennas	
	DC Input	DC-in 12V Jack (5.5mm/2.5mm) / Phoenix Pluggable with Latch (Support OCP&OVP Protection)	
	AC Input	N/A	
	IP Rating	N/A	
	Environment	Operating Temperature	-10 ~ 45°C (2.5" HDD) -10 ~ 55°C (2.5" SSD or mSATA)
		Operating Humidity	10 ~ 90%, non-condensing
		Storage Temperature	-20 ~ 80°C
		Storage Humidity	10 ~ 90%, non-condensing
Vibration		IEC61373 Category 1, Class A	
Physical characteristics	Shock	IEC61373 Category 1, Class A	
	Dimensions (W x D x H)	155 x 105 x 55mm	
	Weight	0.90 kg	
Certification	Mounting	Wall mount (STD)/VESA mount(by BOM option) / DIN-rail mount(by BOM option)	
	EMC	FCC, CE, RCM, VCCI, BSMI	
Software Platform	Safety	BSMI	
	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit) Linux Fedora 21 (by request) Linux Ubuntu14.04 (by request)	

Optional Item

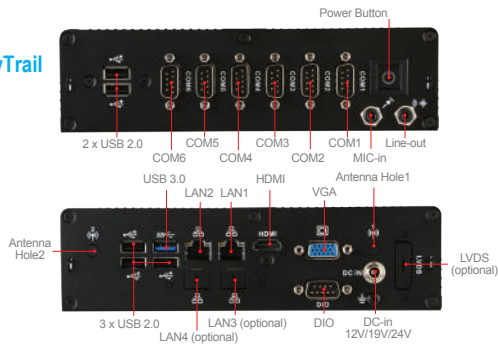
Part Number	Description
E22-9A95080-C22	VESA Mount

MS-9A69

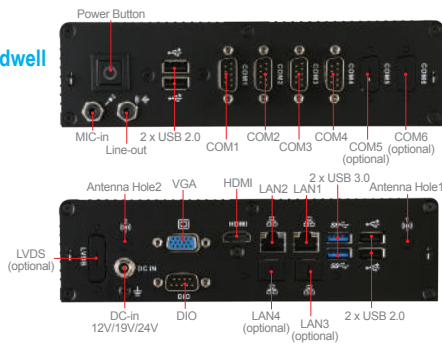
Compact-Size Box PC with Intel® BDW ULT or Bay Trail-D Series Processor for Ultra Low-Power Fanless Solution



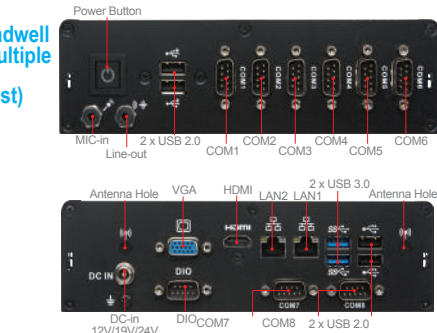
MS-9A69 with BayTrail



MS-9A69 with Broadwell



MS-9A69 with Broadwell 8 COM ports for multiple connection (Support by Request)



Features

- Ultra low power with fanless design
- Supports DDR3L 1333/1600 MHz SO-DIMM memory up to 8GB
- 2 or 3 independent displays: HDMI, VGA and LVDS (BDW only)
- Dual GbE LAN, rich USB and COM ports
- Dual Mini-PCIe for expansion
- Supports DC-in 12V/19V/24V
- 2 openings reserved for antennas

Ordering Information

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Packing List

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Specifications

System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W	Intel® BDW ULT Core™ i3-5010U Processor, DC, 15W
	Frequency	2 GHz	2.1 GHz
	L2 Cache	2MB	3MB
	CPU Type	BGA	BGA
	Chipset	Integrated in SoC Process	Integrated in Process
	BIOS	AMI	
Memory	Technology	Single-channel DDR3L 1333 MHz	Single-channel DDR3L 1600 MHz
	Max. Capacity	Up to 8GB	
	Socket	1 x 204-pin SO-DIMM	
Graphic	Controller	Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	Multiple Display	2 or 3 independent displays	
	Display Interface	VGA up to 2560 x 1600 @60Hz HDMI up to 1920 x 1080 @60Hz LVDS up to 1920 x 1200 @60Hz (optional)	VGA up to 1920 x 1200 @60Hz HDMI up to 1920 x 1080 @60Hz LVDS up to 1920 x 1200 @60Hz (optional)
Ethernet	Controller	2 x Intel® I210-AT GbE LAN	1 x Intel® I210-AT GbE LAN 1 x Intel® I218-LM GbE LAN PHY
	Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	
TPM	Controller	N/A	
Expansion Slot	M.2	N/A	
	Mini-PCIe	2 x Full-size (one w/ mSATA)	1 x Full-size (w/ mSATA) 1 x Half-size
Storage	SATA	1 x 2.5" HDD/SSD Bay	
	mSATA	1 x Full-size (Shared with Mini-PCIe)	
I/O Interface	RJ-45	4 (optional 2 x RJ-45 version available)	
	PoE	N/A	
	Audio	1 x Line-out / 1 x Mic-in	
	USB	1 x USB 3.0 5 x USB 2.0	2 x USB 3.0 4 x USB 2.0
	Serial	6 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2-6: RS-232, 0V/5V/12V	4 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2-4: RS-232, 0V/5V/12V
	GPIO	8-bit (4*GPI; 4*GPO), 5V	
	CANbus	2 x CAN 2.0B (by BOM option)	
	HDMI	1	
	LVDS	1 (optional)	
	VGA	1	
	Antenna	2 openings reserved for antennas	
	Power Supply	DC Input	DC-in 12V/19V/24V
AC Input		N/A	
IP Rating		N/A	
Environment	Operating Temperature	-10 ~ 45°C (HDD) -10 ~ 55°C (SSD or mSATA)	
	Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing	
	Vibration	Operating: 0.25 Grms, 5-300Hz, 3axes (w/ HDD)	
Physical characteristics	Shock	Operating: 3 G, half sine 11 ms duration (w/ HDD)	
	Dimensions (WxDxH)	200 x 150 x 55mm	
Certification	Weight	1.38 kg	
	Mounting	Wall mount (STD)/VESA mount (by BOM option)/ DIN-rail mount (by BOM option)	
Software Platform	EMC	FCC, CE, RCM, VCCI, BSMI	
	Safety	BSMI	
OS Support	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Linux Fedora 20 (by request) Linux Ubuntu 13.10 (by request)	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit) Linux Fedora 19 (by request) Linux Ubuntu 13.04 (by request)

Optional Item

Part Number	Description
E22-9A95080-C22	VESA Mount

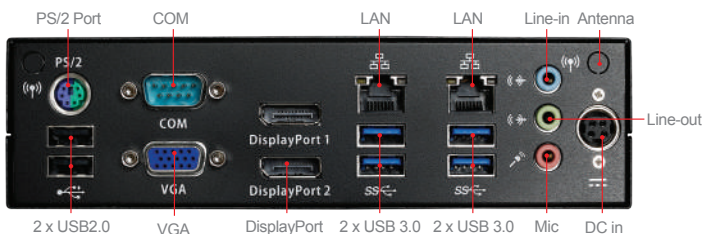
Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

MS-9A78

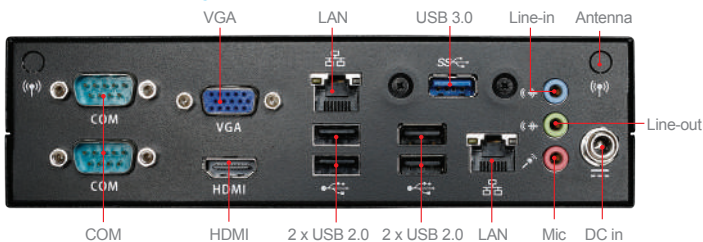
Swappable Box PC with Intel® BayTrail/Haswell Platform for Low-Power & High-Performance Solution



MS-9A78 with Haswell



MS-9A78 with Bay Trail



Features

- Mini-ITX motherboard is swappable for standard BOX
- Supports Intel® 4th Generation Haswell platform and BayTrail platform
- Supports up to TDP 45W high performance
- Haswell (98C7) SKU operation temperature:
 - (1) 35W CPU: -10 ~ 50°C
 - (2) 45W CPU: -10 ~ 40°C
- BayTrail (98E3) SKU operation temperature: -10 ~ 60°C
- 2 openings reserved for antennas

Ordering Information

Part Number	Description
939-9A78-001	J1900, 12V 84W DC-in DOE VI Adaptor, EU Power Cord
939-9A78-002	J1900, 12V 84W DC-in DOE VI Adaptor, USA Power Cord
939-9A78-003	Q87, 12V 130W DC-in DOE V Adaptor, EU Power Cord
939-9A78-004	Q87, 12V 130W DC-in DOE V Adaptor, USA Power Cord
939-9A78-005	Q87, 12V 130W DC-in DOE V Adaptor, USA Power Cord, White Brand
939-9A78-008	Q87, 12V 130W DC-in DOE VI Adaptor, USA Power Cord

Packing List

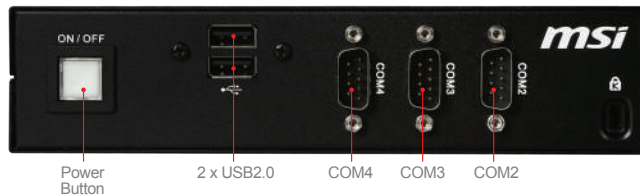
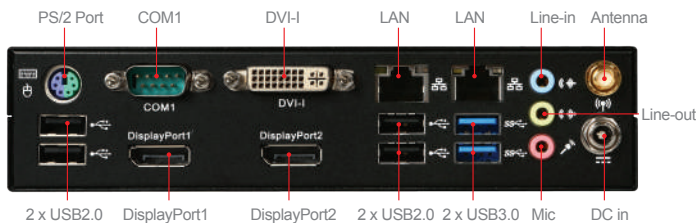
Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Specifications

System Processor	CPU	Intel® Celeron® Processor J1900/ N2930, QC, 10W/7.5W	4th Gen Intel® Desktop Haswell/ Haswell Refresh Core™ i7/i5/ i3/Celeron®/Pentium® Processor, Max. 45W
	Frequency	2GHz~2.42GHz (J1900) 1.83GHz~2.16GHz (N2930)	1.5GHz~2.3GHz (Depends on CPU)
	L2 Cache	2MB	2M~8M (Depends on CPU)
	CPU Type	BGA	Socket (LGA 1150)
	Chipset	N/A	Intel® Q87 Express
	BIOS	AMI	
Memory	Technology	Dual-channel DDR3L 1066/1333MHz	Dual-channel DDR3/DDR3L 1333/1600MHz
	Max. Capacity	Up to 8GB	Up to 16GB
	Socket	2 x 204-pin SO-DIMMs	
Graphic	Controller	Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	Multiple Display	2 independent displays	3 independent displays
	Display Interface	VGA up to 2560 x 1600 @60Hz HDMI up to 1920 x 1080 @60Hz	VGA up to 1920 x 1200 @60Hz DP up to 3840 x 2160 @60Hz
Ethernet	Controller	2 x Intel® I210-AT GbE LAN	1 x Intel® I217-LM GbE PHY (iAMT 9.0 supported) 1 x Intel® I210-AT PCIe GbE LAN
	Audio	Controller	Realtek® ALC887 HD Audio Codec
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	
	Smart Fan	Yes	
TPM	Controller	Pin header	
Expansion Slot	M.2	N/A	
	Mini-PCIe	1 x Full-size (w/ mSATA)	1 x Full-size (w/ mSATA) 1 x Half-size
Storage	SATA	1 x 2.5" HDD/SSD	
	mSATA	1	
I/O Interface	RJ-45	2	2
	PoE	N/A	
	Audio	1 x Mic-in; 1 x Line-in; 1 x Line-out	
	USB	6 x USB 2.0 1 x USB 3.0	4 x USB 2.0 4 x USB 3.0
	Serial	5 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2-5: RS-232, 0V/5V/12V	4 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2-4: RS-232
	PS/2	N/A	
	GPIO	N/A	
	CANbus	N/A	
	HDMI	1	N/A
	DVI	N/A	
Power Supply	DisplayPort	N/A	
	VGA	1	
Environment	Antenna	2 openings reserved for antennas	
	DC Input	12V	
Physical characteristics	AC Input	N/A	
	GPIO	N/A	
	Operating Temperature	-10 ~ 50°C (HDD) -10 ~ 60°C (SSD)	-10 ~ 50°C (TDP: 35W) -10 ~ 40°C (TDP: 45W)
	Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing	
Certification	Vibration	Operating: 0.25 Grms, 5-300Hz, 3axes (w/ HDD)	
	Shock	Operating: 3 G, half sine 11 ms duration (w/ HDD)	
Software Platform	Dimensions (W x D x H)	180 x 183 x 49mm	
	Weight	1.80 kg	
OS Support	Mounting	Wall mount	
	EMC	FCC, CE, RCM, VCCI, BSMI	
OS Support	Safety	BSMI, CB, UL	
	OS Support	Windows 7 (32/64-bit) Windows 8 (32/64-bit) Windows 10 (64-bit)	Windows 7 (32/64-bit) Windows 8 (32/64-bit) Linux Fedora V19 (Kernel 3.8.2)

MS-9A68

Industrial Box PC with Intel® Ivy Bridge Platform for Rich I/O Ports & Fanless Solution



Features

- Support Intel® Ivy Bridge mobile series CPU
- Great 3D graphic performance with high definition up to 1080P
- Support standard and low-voltage DDR3 SO-DIMM up to 16GB
- 3 independent displays: DP, DP and DVI-I
- Support DirectX11 Shader Model 4.0
- Support 2 Intel® GbE LAN (one with iAMT 8.0) and 2 USB 3.0 ports
- Support SATA 3.0 and mSATA storage (optional)
- 4 powered COM ports

Ordering Information

Part Number	Description
939-9A68-003	QM77, 19V 90W ADAPTER, USA POWER CORD
939-9A68-004	HM76, 19V 90W ADAPTER, EU POWER CORD
939-9A68-005	HM76, 19V 90W ADAPTER, USA POWER CORD
939-9A68-006	QM77, 19V 90W ADAPTER, EU POWER CORD

Packing List

Part Number	Description
S93-0406480-S14	ADAPTOR
E43-1064014-P65	HDD Screw
E31-0804100-AM1	HEATSINK
K33-3001020-I45/ K33-3001021-I45	Power Cord, USA, 1800mm/ Power Cord, EU, 1800mm
S79-0000360-V03	ANTENNA
E25-9A58020-K23	HDD RUBBER
E22-9A68050-LA2	Wall mounting bracket
G71-SEDC093-J24	Driver CD

Specifications

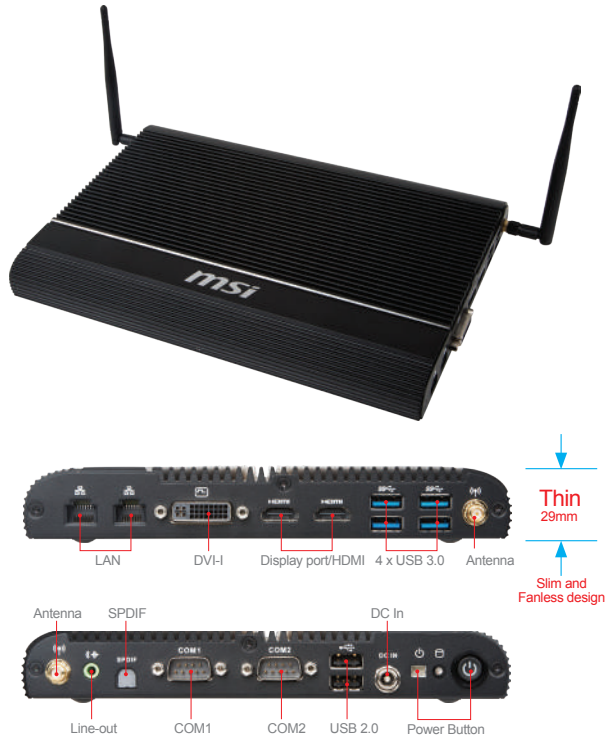
System Processor	CPU	3rd Gen Intel® Mobile Ivy bridge/ Sandy bridge Core™ i7/i5/i3/Celeron®/ Pentium® Processors, Max. 45W
	Frequency	1.0 GHz~3.8GHz (Depends on CPU)
	L2 Cache	2M~8M (Depends on CPU)
	CPU Type	Socket G2 (rPGA 989)
	Chipset	Intel® QM77/HM76 Express
Memory	BIOS	AMI
	Technology	Dual-channel DDR3 1066/1333/1600 MHz
	Max. Capacity	Up to 16GB
Graphic	Socket	2 x 204-pin SO-DIMMs
	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	Multiple Display	2 independent displays (SNB CPU only) 3 independent displays (IVB CPU only)
Ethernet	Display Interface	DP up to 2560 x 1600 @60Hz DVI-I up to 1920 x 1200 @60Hz
	Controller	2 x Intel® I210-AT GbE LAN
Audio	Controller	Realtek® ALC887 HD Audio Codec
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
Expansion Slot	M.2	N/A
	Mini-PCIe	2 x Full-size (1 w/ SIM Holder)
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	2 (shared with Mini-PCIe slots)
I/O Interface	RJ-45	2
	PoE	N/A
	Audio	1 x Mic-in 1 x Line-out 1 x Line-in
	USB	2 x USB 3.0 6 x USB 2.0
	Serial	4 x COM ports COM 1: RS-232/422/485, 0V/5V/12V COM 2~4: RS-232, 0V/5V/12V
	PS/2	1
	GPIO	N/A
	CANbus	N/A
	DVI	1 (DVI-I)
	DisplayPort	2
Power Supply	Antenna	1 opening reserved for antenna
	DC Input	DC-in 12/19V
	AC Input	N/A
Environment	IP Rating	Full IP30
	Operating Temperature	0 ~ 50°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Physical characteristics	Vibration	Operating: 0.25 Grms, 5-300Hz, 3axes (w/ HDD)
	Shock	Operating: 3 G, half sine 11 ms duration (w/ HDD)
Certification	Dimensions (W x D x H)	180 x 180 x 44mm
	Weight	1.80 kg
	Mounting	Wall mount
Software Platform	EMC	FCC, CE, RCM, VCCI, BSMI
	Safety	CB, UL
OS Support	OS Support	Windows 8 (32-bit) Windows 7 (32/64-bit) Windows XP (32/64-bit)

MS-9A95

Slim Fanless Box PC with Intel® Skylake/Kaby Lake ULT, High Performance & Low-Power for 4K2K Digital Signage, KIOSK & Automation

WindBOX IV Advanced

NEW



Features

- Slim and fanless system design with 29mm thickness
- Intel® Skylake/Kaby Lake Mobile U series, low power solution, TDP 15W
- Supports 2 x DDR4 SO-DIMM up to 32GB memory
- 3 independent display: 2 x DP/HDMI, 1 x DVI-I
- TPM 2.0 on board
- Cableless design with proprietary board
- 2 x GbE LAN, 4 x USB 3.0 and 2 x USB 2.0, 2 x COM, audio, and lockable DC jack
- Mini-PCIe slots for mSATA Cards, 3G/4G ; M.2 slot for WiFi
- Storage: 1 x mSATA and 2.5" SDD/HDD(7mm) for flexible use
- Easy maintain for 2x Memory, 2 x Mini-PCIe, SIM Card Slot, 2.5"HDD (all on bottom side)

Ordering Information

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Packing List

Part Number	Description	Quantity
S93-0401690-S14	Adaptor 19V/65W	1
K33-3001020-I45/ K33-3001021-I45	Power Cord, USA, 1800mm/ Power Cord, EA, 1800mm	1
E22-9A95080-C22	VESA Mounting Bracket	1
E41-1406003-P65	VESA Mounting Screw	4
E24-9B02010-P09	DIN Rail	2
E41-1356002-P65	DIN Rail Screw	4

Optional Item

Part Number	Description
S79-0000360-V03	RF Antenna

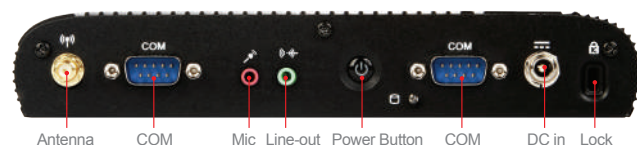
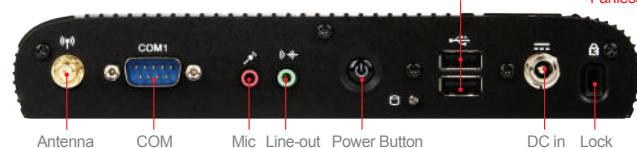
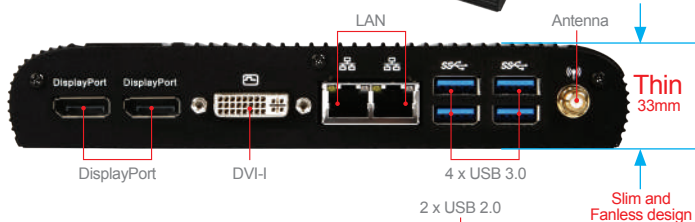
Specifications

System Processor	CPU	7th/6th Gen Intel® Mobile Kaby Lake-U/ Skylake-U Core™ i7/i5/i3/ Celeron® Processor, DC, 15W
	Frequency	2.0GHz~3.9GHz (Depends on CPU)
	L2 Cache	2MB~4MB (Depends on CPU)
	CPU Type	BGA
	Chipset	Integrated
Memory	BIOS	AMI
	Technology	Dual-channel for DDR4 2133 MHz
	Max. Capacity	Up to 32GB
Graphic	Socket	2 x 260-pin SO-DIMMs
	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	Multiple Display	3 independent displays
Display Interface	Display Interface	HDMI 2.0 up to 4096 x 2160 @60Hz DP up to 4096 x 2304 @60Hz DVI-I up to 1920 x 1200 @60Hz
	Ethernet	Controller 1 x Intel® I219-LM GbE LAN PHY 1 x Intel® I210-AT GbE LAN
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
TPM	Smart Fan	N/A
	Controller	Infineon SLB9665TT.2.0
Expansion Slot	M.2	1 x E Key (PCIe x2, USB 2.0), 2230
	Mini-PCIe	1 x Full-size (one w/ SIM holder or mSATA) 1 x Half-size
Storage	SATA	1 x 2.5" HDD/SSD (7mm)
	mSATA	1 (shared with mini-PCIe)
	RJ-45	2
	PoE	N/A
I/O Interface	Audio	1 x SPDIF-out 1 x Line-out (Mic-in by AP driver)
	USB	4 x USB 3.0 2 x USB 2.0
	Serial	2 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232, 0V
	GPIO	N/A
	CANbus	N/A
	HDMI	2 (Co-lay with DP)
	DVI	1 (DVI-I)
	DisplayPort	2 (Co-lay with HDMI)
	VGA	1 (DVI-I to VGA dongle)
	Antenna	2 openings reserved for antennas
Power Supply	DC Input	DC-in 19V with Lockable DC Jack
	AC Input	N/A
Environment	IP Rating	Full IP40
	Operating Temperature	-10 ~ 50°C (SSD), -10 ~ 40°C (HDD)
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
	Vibration	Operating: IEC 60068-2-64: 2 Grms, 5 ~ 500 Hz, 1hr/axis (w/ SSD)
Physical characteristics	Shock	Operating: IEC 60068-2-27: 50G, half sine, 11ms (w/ SSD)
	Dimensions (W x D x H)	196 x 285 x 29mm
	Weight	2.25 kg
Certification	Mounting	VESA/Wall mount, DIN Rail
	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	Safety	BSMI, CB
	OS Support	Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Fedora 25 Linux Ubuntu 17.04

MS-9A75

Slim Industrial Fanless Box PC with Intel® BDW ULT, High Performance & Low-Power for 4K2K Digital Signage

WindBOX III Advanced



Features

- Slim and fanless system design with 33mm thickness
- 5th Gen Intel® Broadwell ULT Core i7/i5/i3, Celeron Processor
- Support DDR3L SO-DIMM up to 16GB memory
- 3 independent displays: 2 DP and 1 DVI-I (support DVI-D and VGA via Y cable)
- 2 x GbE LAN, 4 x USB 3.0 and 2 x USB2.0, 1 x COM, audio, and lockable DC jack
- Mini-PCIe slots for WiFi, 3G, or mSATA cards
- Flexible design for easy maintenance on 2.5" HDD/SSD, memory & 2 full size mini-PCIe
- DC-in 19V/65W adaptor

Ordering Information

Part Number	Description
9S9-9A75-001	I5-5200U, 1*COM, MEMORY 2GB, HDD 500GB, WIRELESS LAN, 19V/65W ADAPTER, POWER CORD EU
9S9-9A75-003	I5-5200U, 1*COM, MEMORY 2GB, HDD 500GB, WIRELESS LAN, 19V/65W ADAPTER, POWER CORD USA
9S9-9A75-004	I5-5200U, 2*COM, MEMORY 4GB, HDD 500GB, WIRELESS LAN, 19V/65W ADAPTER, POWER CORD USA
939-9A75-001	I5-5200U, 1*COM, WIRELESS LAN, 19V/65W ADAPTER, POWER CORD EU
939-9A75-002	I5-5200U, 1*COM, WIRELESS LAN, 19V/65W ADAPTER, POWER CORD USA

Specifications

System Processor	CPU	Intel® BDW ULT Core™ i5-5200U Processor, Dual Core, 15W
	Frequency	2.2GHz~2.7GHz
	L2 Cache	3MB
	CPU Type	BGA
	Chipset	N/A
	BIOS	AMI
Memory	Technology	Dual-channel for DDR3L 1333/1600 MHz
	Max. Capacity	Up to 16GB
	Socket	2 x 204-pin SO-DIMMs
Graphic	Controller	Intel® HD Graphics 5500
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	Multiple Display	3 independent displays
	Display Interface	DP up to 3840 x 2160 @60Hz DVI-D up to 1920 x 1200 @60Hz VGA up to 1920 x 1200 @60Hz
Ethernet	Controller	1 x Intel® I218LM GbE LAN PHY 1 x Intel® I210-AT GbE LAN
Audio	Controller	Realtek® ALC887/888S HD Audio Codec
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Infineon SLB9635TT 1.2
Expansion Slot	M.2	N/A
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1 (shared with mini-PCIe)
I/O Interface	RJ-45	2
	PoE	N/A
	Audio	1 x Mic-in, 1 x Line-out
	USB	SKU1: 4 x USB 3.0; 2 x USB 2.0 SKU2: 4 x USB 3.0
	Serial	SKU1: 1 x COM port, RS-232/422/485 SKU2: 2 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232, 0V
	GPIO	N/A
	CANbus	N/A
	HDMI	N/A
	DVI	1 (DVI-I)
	DisplayPort	2
Power Supply	VGA	1 (from DVI-I)
	Antenna	2 openings reserved for antennas
Environment	DC Input	DC-in 12V/19V/24V
	AC Input	N/A
	IP Rating	Full IP40
	Operating Temperature	-10 ~ 50°C (SSD), -10 ~ 40°C (HDD)
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Physical characteristics	Vibration	Operating: 0.25 Grms, 5-300Hz, 3axes (w/ HDD)
	Shock	Operating: 3 G, half sine 11 ms duration (w/ HDD)
Certification	Dimensions (W x D x H)	196 x 285 x 33mm
	Weight	2.60 kg
	Mounting	VESA mount
Software Platform	EMC	FCC, CE, RCM, VCCI, BSMI
	Safety	BSMI, CB, Energy Star
Packing List	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Linux Fedora Core 21 Linux Ubuntu 15.04
	Part Number	Description
E22-9A95080-C22	VESA Mounting Bracket	
K33-3001020-I45/ K33-3001021-I45	Power Cord, USA, 1800mm/ Power Cord, EA, 1800mm	
S79-0000360-V03	RF Antenna	
S93-0401690-S14	Adaptor	
G71-SEDC141-X03	Driver CD	

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

MS-9A65

Ultra-Slim & Featherweight Fanless Box PC with Intel® BayTrail Platform for Low-Power & Digital Signage

WindBOX II Advanced



Features

- Ultra-slim and low power fanless design with 19mm thinness
- Support Intel® BayTrail platform
- Mini-PCIe slots for WiFi, 3G, or mSATA cards
- Easy maintenance on 2.5" drive & mini-PCIe with removable bottom cover
- Smart power button design to avoid mistaken action
- Cable clip for better cabling and avoid cable loose

Ordering Information

Part Number	Description
9S9-9A65-001	MS-9A65\709-9A65-010\829-9A65-001 STD VER 1.0, WindBOX II, FANLESS, BAYTRAIL J1900, MEMORY 2GB, HDD 500GB, WIRELESS LAN, MSI LOGO, BLACK, 1*ANTENNA, CD, ADAPTER 19V/65W, POWER CORD USA, SINGLE
9S9-9A65-002	MS-9A65\709-9A65-010\829-9A65-002 OPT:A VER 1.0, WindBOX II, FANLESS, BAYTRAIL J1900, MEMORY 2GB, HDD 500GB, WIRELESS LAN, MSI LOGO, BLACK, 1*ANTENNA, CD, ADAPTER 19V/65W, POWER CORD EU, SINGLE

Packing List

Part Number	Description	Quantity
G71-SEDC136-X03	Driver CD	1
K33-3001020-I45/ K33-3001021-I45	Power Cord, USA, 1800mm/ Power Cord, EU, 1800mm	1
S93-0401680-S14	19V/65W DOE VI Adaptor	1
S79-0000360-V03	Antenna	1
E24-9A14090-K23	Cable Tie	2
E22-9A95080-C22	VESA Mounting Bracket	1

Specifications

System Processor	CPU	Intel® Celeron® Processor J1900, QC, 10 W
	Frequency	2GHz~2.42GHz
	L2 Cache	2MB
	CPU Type	BGA
	Chipset	N/A
Memory	BIOS	AMI
	Technology	Dual-channel DDR3L 1333MHz
	Max. Capacity	Up to 8GB
Graphic	Socket	2 x 204-pin SO-DIMMs
	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
Multiple Display	Multiple Display	2 independent displays
	Display Interface	HDMI up to 1920 x 1080 @60Hz DVI-I up to 1920 x 1200 @60Hz
Ethernet	Controller	2 x Intel® I210-AT GbE
Audio	Controller	Realtek® ALC887 HD Audio Codec
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	N/A
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Full-size (w/ mSATA or SIM holder) 1 x Half-size
Storage	SATA	1 x 2.5" HDD/SSD
	mSATA	1
I/O Interface	RJ-45	2
	PoE	N/A
	Audio	1 x Mic-in 1 x Line-out
	USB	2 x USB 2.0 1 x USB 3.0
	Serial	1 x COM port COM1: RS-232/422/485, 0V/5V/12V
	GPIO	N/A
	CANbus	N/A
	HDMI	1
	DVI	1 (DVI-I)
	Antenna	1 (opening reserved for 2nd antenna)
Power Supply	DC Input	DC-in 19V
	AC Input	N/A
Environment	Operating Temperature	0 ~ 40°C (HDD) -10 ~ 60°C (SSD)
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
	Vibration	Operating: 0.25 Grms, 5-300Hz, 3axes (w/ HDD)
Physical characteristics	Shock	Operating: 3 G, half sine 11 ms duration (w/ HDD)
	Dimensions (W x D x H)	180 x 255 x 19mm
	Weight	1.30 kg
Certification	Mounting	VESA mount
	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	Safety	BSMI, CB, Energy Star
	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit)

MS-98H7

COM Express SBC with 8th Gen Intel® Coffee Lake-H Platform for Type 6 Basic Solution

NEW



Features

- Supports 8th Gen Intel® Embedded Coffee Lake-H Xeon™ & Core™ i7/i5/i3 Mobile Processor
- Supports 2 x DDR4 2666MHz SO-DIMMs up to 32GB (ECC supported by CM246)
- Supports 3 independent displays with 4K/2K HD resolution
- Supports Intel® I219LM GbE-PHY LAN w/ iAMT 12.x
- Supports 4 SATA 3.0 with RAID 0/1/5/10, 2 COM, 4 USB 3.1 Gen1, and 8 USB 2.0 ports
- Supports 8 PCIe x1 Gne3 for multiple expansion (Configurable to 5 x PCIe x1 or 4 x PCIe x1 & 1 x PCIe x4)
- Supports PEG Gne3 configurable to 1 x16 or 2 x8 or 1 x8 + 2 x4
- Supports TPM 2.0 Onboard

Ordering Information

Part Number	Description
919-98H7-001	MS-98H7\609-98H7-010\ 809-98H7-002 VER 10 COM Express Basic M/B Intel Coffee Lake-H CM246 +E2176M, 2*DDR4 SO-DIMM, 3*DDI, 1*VGA, 1*LVDS, 1*TPM2.0, 2*COM Express type 6 connector
919-98H7-002	MS-98H7\609-98H7-020\ 809-98H7-002 VER 10 OPT:A COM Express Basic M/B Intel Coffee Lake-H QM370+i7-8850H, 2*DDR4 SO-DIMM, 3*DDI, 1*VGA, 1*LVDS, 1*TPM2.0, 2*COM Express type 6 connector
919-98H7-003	MS-98H7\609-98H7-030\ 809-98H7-002 VER 10 OPT:B COM Express Basic M/B Intel Coffee Lake-H QM370+i5-8400H, 2*DDR4 SO-DIMM, 3*DDI, 1*VGA, 1*LVDS, 1*TPM2.0, 2*COM Express type 6 connector
919-98H7-004	MS-98H7\609-98H7-040\ 809-98H7-002 VER 10 OPT:C COM Express Basic M/B Intel Coffee Lake-H QM370+i3-8100H, 2*DDR4 SO-DIMM, 3*DDI, 1*VGA, 1*LVDS, 1*TPM2.0, 2*COM Express type 6 connector

Packing List

Part Number	Description	Quantity
E31-2100190-K08	Heat spreader	1
G71-SEDC191-N56/ G71-SEDC191-X03	Driver DVD	1

Specifications

Processor	CPU	8th Gen Intel® Embedded Coffee Lake-H Xeon™ E-2176M Mobile Processor, HC, 45W	8th Gen Intel® Embedded Coffee Lake-H Core™ i7-8850H/i5-8400H/i3-8100H Mobile Processor, HC/QC, 45W
	Frequency	2.5GHz~4.4GHz (Depends on CPU)	
	L2 Cache	8MB~12MB (Depends on CPU)	
	CPU Type	BGA	
Memory	Chipset	Intel® CM246 Express	Intel® QM370 Express
	BIOS	AMI	
	Technology	Dual-channel DDR4 (ECC) 2666MHz	Dual-channel DDR4 (Non-ECC) 2666MHz
	Max. Capacity	Up to 32 GB	
Display	Socket	2 x 260-pin SO-DIMMs	
	Controller	Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	LVDS	Dual channel 18/24-bit	
	eDP	N/A	
	VGA	1	
	DVI	3 DDI ports support HDMI/DP/DVI (DDI3 AUX shared with VGA)	
	HDMI	3 DDI ports support HDMI/DP/DVI (DDI3 AUX shared with VGA)	
	DisplayPort	3 independent displays	
	Multiple Display	3 independent displays	
Display Interface	LVDS Resolution	up to 1920x1200 @60Hz	
	VGA Resolution	up to 1920 x 1080 @60Hz	
Ethernet	Controller	1 x Intel® I219LM GbE-PHY LAN (AMT 12.x supported)	
	Controller	Support HD audio interface to carrier board	
Audio	Controller	N/A	
	Watchdog Timer	256-level Watchdog Timer	
Super I/O	Smart Fan	Yes	
	TPM	Controller Infineon SLB9665TT 2.0	
I/O Interfaces	USB	8 x USB 2.0 (to carrier board) 4 x USB 3.1 (to carrier board)	
	Serial	2 x COM ports (to carrier board)	
	Parallel	N/A	
	PS/2	N/A	
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V	
Expansion Slot	PCIe x16	1 x PCI Express x16 GEN. 3.0 lanes (Configurable to 1 x16 or 2 x8 or 1 x8 + 2 x4)	
	PCIe x4	N/A	
	PCIe x1	8 x PCI Express GEN. 3.0 lanes (Configurable to 5 x PCIe x1 or 4 x PCIe x1 & 1 x PCIe x4)	
	PCI	N/A	
Storage	M.2	N/A	
	Mini-PCIe	N/A	
	SATA	4 x SATA 3.0	
	IDE	N/A	
	eSATA	N/A	
	CFast	N/A	
	mSATA	N/A	
CompactFlash	N/A		
Power Supply	DC	N/A	
	ATX	ATX +12 V and +5 VSB (standby power) AT: +12 V	
Environment	Operating Temperature	-10 ~ 60°C	
	Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing	
Form Factor	Dimensions	125 x 95mm (COM Express Type 6 Basic module)	
	Weight	0.113 kg	
Certification	EMC	FCC, CE, RCM, VCCI, BSMI	
Software Platform	OS Support	Windows 10 (64-bit) Linux Kernel 4.x (by request)	

Semi-rugged Terminal

POS System

HMI Panel PC

Embedded System

Embedded Board

COM Express Board

Oseven Board

Pico-ITX Board

3.5" Board

EPIC Board

PI/CMG 1.0 Board

Mini-ITX Board

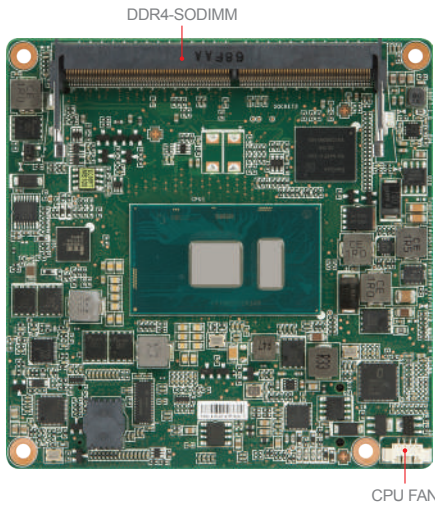
Micro-ATX Board

ATX Board

Mini-PCIe Module

MS-98F7

COM Express SBC with 7th/6th Gen Intel® Kaby Lake-U/ Skylake-U Platform for Type 6 Compact Solution



Features

- Supports 7th/6th Gen Intel® Embedded Mobile Kaby Lake-ULT/ Skylake-ULT Core™ i7/i5/i3/Celeron Processor
- Supports 2 x DDR4 1866/2133 SO-DIMM up to 32GB
- Supports 3 independent displays with 4K/2K HD resolution
- Supports Intel® GbE LAN w/ iAMT 11.x
- Supports 3 SATA 3.0, 2 COM, 4 USB 3.0, and 8 USB 2.0 ports
- Supports 8 PCIe x1 Gne3 for multiple expansion (Configurable to 5 x PCIe x1 or 4 x PCIe x1 & 1 x PCIe x4)
- Supports TPM 2.0 and 32GB eMMC 5.0

Ordering Information

Part Number	Description
919-98F7-001	MS-98F7 10 COM Express Compact M/B Intel Kabylake-U i7-7600U, 2*DDR4 SO-DIMM, DDI /VGA/ LVDS signal, 1*eMMC, 1*TPM2.0, 2*COM Express type 6 connector
919-98F7-002	MS-98F7 10 OPT:A COM Express Compact M/B Intel Kabylake-U i5-7300U, 2*DDR4 SO-DIMM, 2*DDI / LVDS signal, 2*COM Express type 6 connector
919-98F7-003	MS-98F7 10 OPT:B COM Express Compact M/B Intel Kabylake-U i3-7100U, 2*DDR4 SO-DIMM, 2*DDI / LVDS signal, 2*COM Express type 6 connector
919-98F7-004	MS-98F7 10 OPT:C COM Express Compact M/B Intel Skylake-U i7-6600U, 2*DDR4 SO-DIMM, DDI /VGA/ LVDS signal, 1*eMMC, 1*TPM2.0, 2*COM Express type 6 connector

Packing List

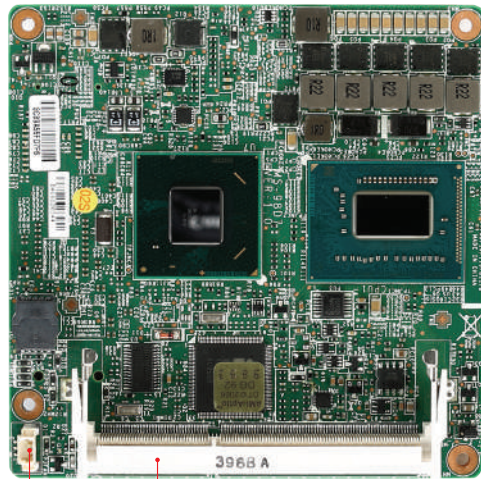
Part Number	Description	Quantity
E31-2100190-K08	Heat spreader	1

Specifications

Processor	CPU	7th/6th Gen Intel® Embedded Mobile Kaby Lake-ULT/Skylake-ULT Core™ i7/i5/i3/Celeron® Processor, DC, 15W
	Frequency	2.0GHz~3.4GHz (Depends on CPU)
	L2 Cache	2MB~4MB (Depends on CPU)
	CPU Type	BGA
	Chipset	N/A
Memory	BIOS	AMI
	Technology	Dual-channel DDR4 2133MHz
Display	Max. Capacity	Up to 32GB
	Socket	2 x 260-pin SO-DIMMs
	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
Display	LVDS	Dual channel 24-bit
	eDP	N/A
	VGA	1 (Share with DDI1 Signal, by BOM option)
	DVI	2 DDI ports support HDMI/DP (DDI1 by BOM option, default is for VGA)
	HDMI	2 DDI ports support HDMI/DP (DDI1 by BOM option, default is for VGA)
	DisplayPort	2 DDI ports support HDMI/DP (DDI1 by BOM option, default is for VGA)
	Multiple Display	3 independent displays
Display Interface	LVDS Resolution	up to 1920x1200 @60Hz
	VGA Resolution	up to 1920 x 1080 @60Hz
Ethernet	2 x DDI:	HDMI1.4 up to 4096 x 2160 @24Hz DP up to 4096 x 2304 @60Hz
	Controller	1 x Intel® I219LM GbE-PHY LAN (AMT 11.x supported)
Audio	Controller	Support HD audio interface to carrier board
Super I/O	Controller	N/A
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Yes (TPM2.0, by BOM option)
I/O Interface	USB	8 x USB 2.0 (to carrier board) 4 x USB 3.0 (to carrier board)
	Serial	2 x COM ports (to carrier board)
	Parallel	N/A
	PS/2	N/A
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
Expansion Slot	PCIe x16	N/A
	PCIe x4	N/A
	PCIe x1	8 x PCI Express GEN. 3.0 lanes (Configurable to 5 x PCIe x1 or 4 x PCIe x1 & 1 x PCIe x4)
	PCI	N/A
	M.2	N/A
	Mini-PCIe	N/A
	SATA	3 x SATA 3.0
Storage	mSATA	32GB eMMC 5.0 (by BOM option)
	DC	N/A
Power Supply	ATX	ATX +12 V and +5 VSB (standby power) AT: +12 V
	Operating Temperature	-20 ~ 70°C
Environment	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	95 x 95mm (COM Express Type 6 compact module)
	Weight	0.105 kg
Certification	EMC	FCC, CE,RCM, VCCI, BSMI
Software Platform	OS Support	Windows 7 (32/64-bit) (Skylake-ULT Only) Windows 8.1 (64-bit) (Skylake-ULT Only) Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)

MSI-98D7

COM Express SBC with 3rd Gen Intel® Ivy Bridge Mobile Platform for Type 6 Compact Solution



CPU Fan SO-DIMM

Features

- 3rd Gen Intel® Embedded Ivy Bridge i7/i3 Mobile Processor
- Supports DDR3 1600 SO-DIMM up to 8GB
- Supports VGA, LVDS and 3 DDI ports
- Supports Intel® GbE LAN w/ iAMT 8.0
- Supports 7 PCIe x1 Gen2 for multiple expansion
- Supports 2 SATA 3.0, 2 SATA 2.0, 2 COM, 4 USB 3.0, and 8 USB 2.0 ports

Ordering Information

Part Number	Description
919-98D7-001	COM EXPRESS COMPACT M/B INTEL EMBEDDED MOBILE i7-3517UE + QM77, 1*DDR3 SO-DIMM, 2*COM EXPRESS TYPE 6 CONNECTOR
919-98D7-002	COM EXPRESS COMPACT M/B INTEL EMBEDDED MOBILE i3-3217UE + QM77, 1*DDR3 SO-DIMM, 2*COM EXPRESS TYPE 6 CONNECTOR

Packing List

Part Number	Description	Quantity
E32-2500010-K08	FANSINK	1

Specifications

Processor	CPU	3rd Gen Intel® Mobile Ivy Bridge ULT Core™ i7-3517UE/i3-3217UE Processor, DC, 17W
	Frequency	i7-3517UE, 2.8 GHz i3-3217UE, 1.6 GHz
	L2 Cache	3MB~4MB (Depends on CPU)
	CPU Type	BGA
	Chipset	Intel® QM77 Express
Memory	BIOS	AMI
	Technology	Single-channel DDR3/DDR3L 1600/1333MHz
	Max. Capacity	Up to 8GB
Display	Socket	1 x 204-pin SO-DIMM
	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual channel 24-bit
	VGA	1
	DVI	3 DDI ports support DVI/HDMI/DP
	HDMI	
	DisplayPort	
	Multiple Display	3 independent displays
	Display Interface	VGA up to 2048 x 1536 @60Hz LVDS up to 1920 x 1200 @60Hz 3 x DDI: HDMI/DVI up to 1920 x 1200 @60Hz DP up to 2560 x 1600 @60Hz
Ethernet	Controller	1 x Intel® 82579LM GbE-PHY LAN (AMT 8.0 supported)
Audio	Controller	Support HD audio interface to carrier board
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	N/A
I/O Interface	USB	8 x USB 2.0 (to carrier board) 4 x USB 3.0 (to carrier board)
	Serial	2 x COM ports (to carrier board)
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
Expansion Slot	PCIe x16	1
	PCIe x1	7 x PCI Express GEN. 2.0 lanes
	M.2	N/A
Storage	SATA	2 x SATA 3.0; 2 x SATA 2.0
	DC	N/A
Power Supply	ATX	ATX +12 V and +5 VSB (standby power) AT: +12 V
	Operating Temperature	0 ~ 60°C
Environment	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	95 x 95mm (COM Express Type 6 compact module)
	Weight	0.095 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8 (32/64-bit)

Semi-rugged Terminal

POS System

HMI Panel PC

Embedded System

Embedded Board

COM Express Board

Oseven Board

Pico-ITX Board

3.5" Board

EPIC Board

PICMG 1.0 Board

Mini-ITX Board

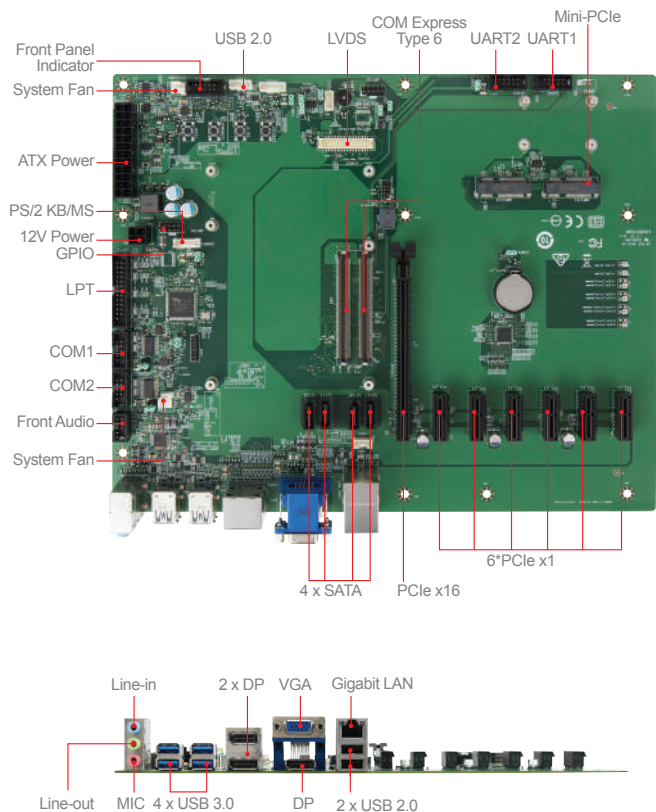
Micro-ATX Board

ATX Board

Mini-PCIe Module

MS-9988

COM Express Type 6 Carrier Board



Features

- Supports VGA, LVDS, and 3 DP ports
- 1 RJ45 for COM Express module board
- 4 USB 3.0, 4 USB 2.0, 2 COM ports and 2 UART
- Supports 4 SATA ports, 6 PCIe x1, 2 Mini-PCle, and PCIe x16

Ordering Information

Part Number	Description
919-9988-002	MS-9988 20 COM Express Carrier M/B, 1*PCle x16, 6*PCle x1, 2*Mini-PCle, 3*DP, 1*VGA, 1*LVDS, 4*SATA3.0, 1*LAN, 4*USB3.0, 1*USB 2.0, 2*COM, 2*UART

Packing List

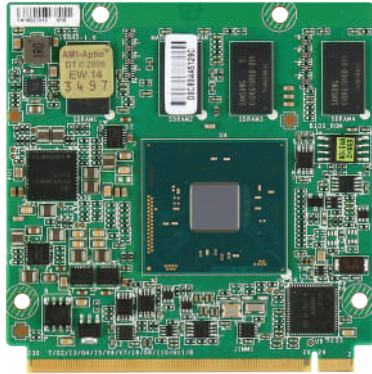
Part Number	Description	Quantity
K14-1018004-V03	COM port cable, 510mm	1
K18-1025011-V03	Parallel port cable, 300mm	1
K1D-1008261-V03	SATA Cable, 500mm	1

Specifications

Processor	CPU	N/A
	BIOS	AMI
Display	Controller	N/A
	LVDS	Dual channel 24-bit (depends on module board)
	VGA	1
	DisplayPort	3
	Multiple Display	3 independent displays
Ethernet	Controller	1 x RJ45 for COM Express module board
	Audio	Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F81866
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Pin header
I/O Interface	USB	4 x USB 3.0 (4 x rear) 4 x USB 2.0 (2 x rear; 2 x internal)
	Serial	2 x COM ports COM1 RS-232/422/485, 0V/5V/12V COM2 RS-232, 0V/5V/12V 2 x UART ports (From COM Express module board)
	Parallel	1
	PS/2	1 (wafer connector)
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
	Expansion Slot	PCIe x16 PCIe x1 M.2 Mini-PCle
Storage	SATA	4 x SATA
Power Supply	DC	N/A
	ATX	ATX-24P, 12V-4P
Environment	Operating Temperature	0 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	305 x 244mm (ATX)
	Weight	0.60 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Depends on CPU Module Board

MS-98H2

Qseven R2.0 CPU Module with Intel® Braswell N3000 Series SoC Platform for Low-Power Solution



Features

- Intel® Pentium®/Celeron® Processor N3000 Series SoC
- Onboard DDR3L 1600 up to 8GB
- Support Intel® GbE LAN
- 3 DDI ports for eDP, DP, and HDMI
- 4 USB 2.0, 2 USB 3.0, and 3 PCIe x1
- Compliant with Qseven specifications revision 2.0

Ordering Information

Part Number	Description
919-98H2-004	MS-98H2 12 Qseven module board Intel Braswell N3710 SoC, Onboard 4GB DDR3L-1600MHz, 1*GbE LAN, 3*PCIe x1, 2*SATA, 2*USB 3.0, 4*USB 2.0, 1*SD, 1*UART, 1*SMBus, 1*I2C
919-98H2-005	MS-98H2 12 Qseven module board Intel Braswell N3160 SoC, Onboard 4GB DDR3L-1600MHz, 1*GbE LAN, 3*PCIe x1, 2*SATA, 2*USB 3.0, 4*USB 2.0, 1*SD, 1*UART, 1*SMBus, 1*I2C

Packing List

Part Number	Description	Quantity
E31-0804880-K08	Standard heatspreader for Qseven module	1
G71-SEDC154-X03/N56	DRIVER CD	1

Specifications

Processor	CPU	Intel® Pentium® processor N3710, QC, 6W Intel® Celeron® processor N3160, QC, 6W
	Frequency	N3710, 1.6 GHz up to 2.56 GHz N3160, 1.6 GHz up to 2.24GHz
	L2 Cache	2MB
	CPU Type	BGA
	Chipset	Integrated in SoC
	BIOS	AMI
Memory	Technology	Dual-channel DDR3L 1600MHz
	Max. Capacity	Up to 8GB
	Socket	Onboard
Display	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	eDP	1
	HDMI	1
	DisplayPort	1
	Multiple Display	3 independent displays
	Display Interface	eDP1.4 up to 2560 x 1600 @60Hz 2 x DDI: HDMI up to 2560 x 1600 @60Hz; up to 3840 x 2160 @30Hz DP1.1a up to 2560 x 1600 @60Hz; up to 3840 x 2160 @30Hz"
Ethernet	Controller	1 x Intel® I211-AT GbE LAN
Audio	Controller	Support HD audio interface to carrier board
Super I/O	Controller	N/A
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	N/A
I/O Interface	USB	4 x USB 2.0 (to carrier board) 2 x USB 3.0 (to carrier board)
	Serial	1 x UART port (to carrier board)
Expansion Slot	PCIe x1	3 x PCI Express GEN. 2.0 lanes
	M.2	N/A
Storage	SATA	2 x SATA 3.0
	CompactFlash	N/A
Power Supply	DC	+5 V and +5 VSB (standby power)
	ATX	N/A
Environment	Operating Temperature	-10 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
Form Factor	Storage Humidity	10 ~ 90%, non-condensing
	Dimensions	70 x 70mm (Qseven CPU module)
Certification	Weight	0.23 Kg
	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Fedora 22 (by request) Linux Ubuntu 15.04 (by request)

Semi-rugged Terminal

POS System

HMI Panel PC

Embedded System

Embedded Board

COM Express Board

Qseven Board

Pico-ITX Board

3.5" Board

EPIC Board

PICMG 1.0 Board

Mini-ITX Board

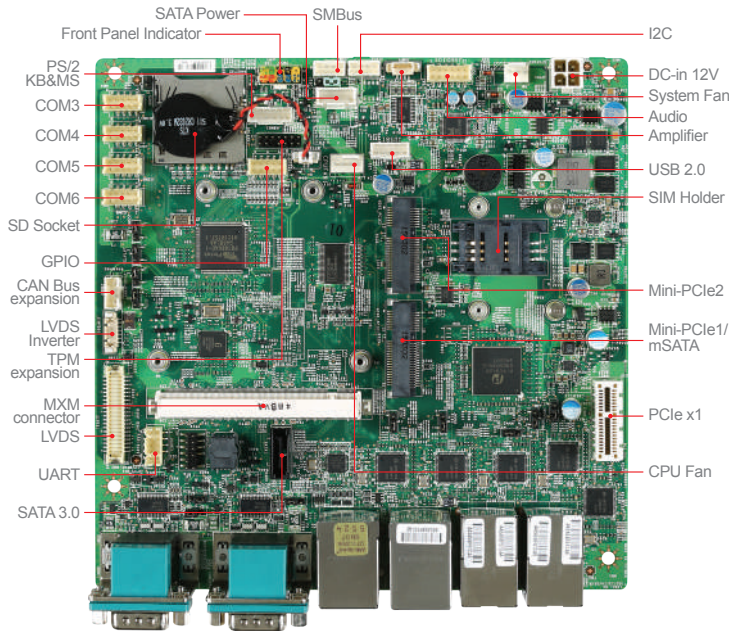
Micro-ATX Board

ATX Board

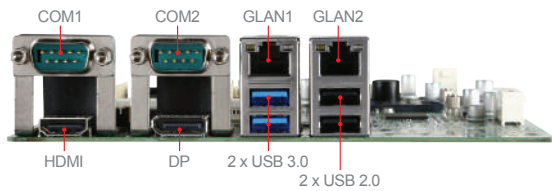
Mini-PCIe Module

MS-99A1

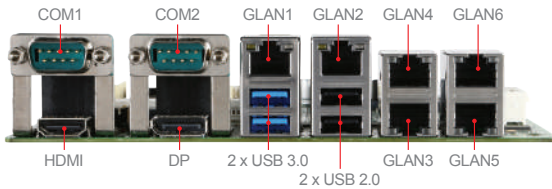
Qseven R2.0 Compliant Carrier Board in Mini-ITX for 6 GLAN & 7 COM Solution



2 LAN SKU



6 LAN SKU



Features

- Supports LVDS, HDMI, and DP ports
- 6 RJ45 (one for Qseven module board)
- 2 USB 3.0, 5 USB 2.0, and 7 COM ports (one for Qseven module board)
- 1 SATA 3.0, 1 SD socket, Dual Mini-PCIe, and 1 mSATA
- 1 SMBus, 1 I2C, and 1 CAN Bus expansion
- Compliant with Qseven specifications revision 2.0

Ordering Information

Part Number	Description
919-99A1-002	MS-99A1 VER 12 STD QSEVEN CARRIER BOARD, MXM CONNECTOR,DP,HDMI,LVDS,6GLAN,5USB-B,6COM,UART,PCIe x1,Mini-PCIe,mSATA,SIM Holder,SMBus,I2C,DC-IN 12V,SATA CABLE ,SATA POWER CABLE,DC-IN CABLE,CD,SINGLE

Specifications

Processor	CPU	N/A
	BIOS	AMI
Memory	Technology	N/A
Display	LVDS	Dual channel 18/24-bit (depends on module board)
	HDMI	1
	DisplayPort	1
	Multiple Display	3 independent displays
	Display Interface	Depends on module board
Ethernet	Controller	5 x Intel® I211-AT GbE LAN (6 GLAN SKU) 1 x Intel® I211-AT GbE LAN (2 GLAN SKU)
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Pin header
I/O Interface	USB	3 x USB 2.0 (2 x rear; 1 x internal) 2 x USB 3.0 (2 x rear)
	Serial	6 x COM ports COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232/422/485, 0V/5V/12V COM3-6: RS-232, 0V/5V/12V 1 x UART Port (from Qseven module board)
	Parallel	N/A
	PS/2	1 (box header)
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
	PCIe x1	1
Expansion Slot	M.2	N/A
	Mini-PCIe	2 x Full-size (one w/ mSATA)
Storage	SATA	1 x SATA 3.0
	mSATA	1
Power Supply	DC	DC-in 12V
	ATX	N/A
Environment	Operating Temperature	-10 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	170 x 170mm (Mini-ITX)
	Weight	0.242 Kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Depends on CPU Module Board

Packing List

Part Number	Description	Quantity
K1D-3008006-V03	SATA Power Cable, 300mm	1
K1D-1008261-V03	SATA Cable, 500mm	1
K10-3004215-V03	DC-IN Cable, 160mm	1

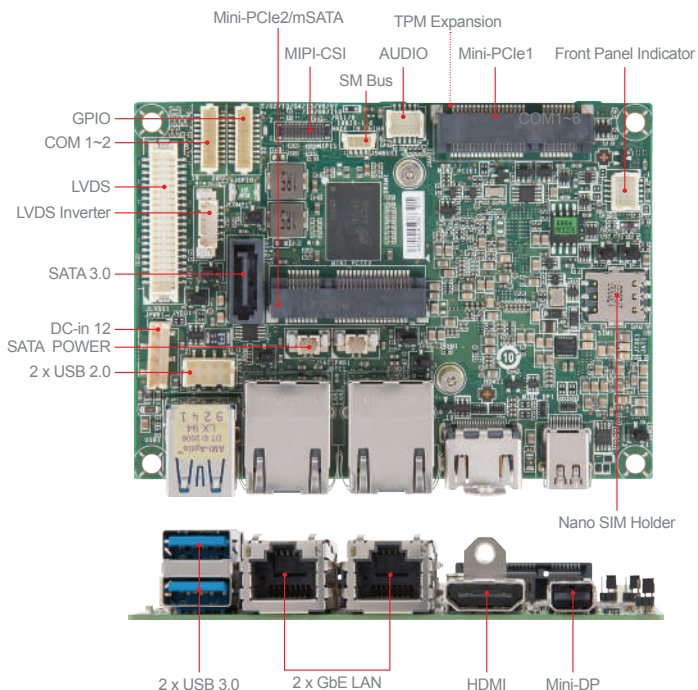
Optional Item

Part Number	Description
K14-1018003-V03	COM Port Cable, 300mm

MS-9816

Pico-ITX SBC with Intel® Apollo Lake/Apollo Lake-I for Fanless, Low-Power, High-Performance, Wide Temperature & Harsh environment Solution

NEW



Features

- Intel® Apollo Lake/Apollo Lake-I Series SoC
- Supports LPDDR4 2133/2400 MHz onboard memory up to 4GB
- 3 independent displays: HDMI, Mini-DP and LVDS
- 2 USB 3.0, 2 USB 2.0, and 2 COM ports
- Dual Mini-PCIe, SATA3.0, mSATA, NANO SIM-Holder
- Apollo Lake-I Series support wide operating temperature : -40 ~ 85°C
- Supports Dual GbE LAN
- Supports MIPI-CSI2.0 interface for Camera
- Compact design for size-sensitive & anti-vibration devices in harsh environments

Ordering Information

Part Number	Description
919-9816-001	MS-9816 10, Apollo Lake N4200, Onboard LPDDR4 4GB, 1*HDMI, 1*LVDS, 1*Mini-DP, 1*MIPI, 2*Mini-PCIe, 2*USB3.0, 2*USB2.0, 1*SATA3.0, 2*COM, 2*LAN, DC 12V, SINGLE
919-9816-002	MS-9816 10, Apollo Lake N3350, Onboard LPDDR4 4GB, 1*HDMI, 1*LVDS, 1*Mini-DP, 1*MIPI, 2*Mini-PCIe, 2*USB3.0, 2*USB2.0, 1*SATA3.0, 2*COM, 2*LAN, DC 12V, SINGLE
919-9816-003	MS-9816 10, Apollo Lake-I E3940, Onboard LPDDR4 4GB, 1*HDMI, 1*LVDS, 1*Mini-DP, 1*MIPI, 2*Mini-PCIe, 2*USB3.0, 2*USB2.0, 1*SATA3.0, 2*COM, 2*LAN, DC 12V, SINGLE
919-9816-004	MS-9816 10, Apollo Lake-I E3930, Onboard LPDDR4 4GB, 1*HDMI, 1*LVDS, 1*Mini-DP, 1*MIPI, 2*Mini-PCIe, 2*USB3.0, 2*USB2.0, 1*SATA3.0, 2*COM, 2*LAN, DC 12V, SINGLE

Packing List

Part Number	Description	Quantity
K14-3018001-V03	COM PORT Cable, 150mm	1
K1B-3008034-V03	USB Cable, 150mm	1
K1D-3010008-V03	SATA Cable with Power, 150mm	1
K1G-3004057-V03	DC Power Cable, 150mm	1
G71-SEDC177-X03	Driver DVD	1

Specifications

		Apollo Lake SKUs	Apollo Lake-I SKUs
		Processor	
Processor	CPU	Intel® Pentium® Processor N4200, QC, 6W Intel® Celeron® Processor N3350, DC, 6W	Intel® Atom™ x5 Processor E3940, QC, 9.5W Intel® Atom™ x5 Processor E3930, DC, 6.5 W
	Frequency	N4200, 1.5 GHz, up to 2.5 GHz N3350, 1.1 GHz, up to 2.3 GHz	E3940, 1.6 GHz, up to 1.8 GHz E3930, 1.3 GHz, up to 1.8 GHz
	L2 Cache	2M	
	CPU Type	BGA	
	Chipset	Integrated in SoC	
Memory	BIOS	AMI	
	Technology	Single-channel LPDDR4 2400MHz	Single-channel LPDDR4 2133MHz
Display	Max. Capacity	Up to 4GB	
	Socket	Onboard	
	Controller	Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	LVDS	Dual Channel 18/24-bit	
	eDP	N/A	
	VGA	N/A	
	DVI	N/A	
	HDMI	1	
	DisplayPort	1 (Mini-Displayport)	
Ethernet	Multiple Display	3 independent displays	
	Display Interface	LVDS up to 1920 x 1200 @60Hz HDMI up to 3840 x 2160 @30Hz Mini-DP up to 4096 x 2160 @60Hz	
Ethernet	Controller	2 x Intel® I211-AT GbE LAN	2 x Intel® I210-IT GbE LAN
	Controller	Realtek® ALC887-VD2-CG HD Audio Codec	
Super I/O	Controller	Fintek F81866AD-I	
	Watchdog Timer	256-level Watchdog Timer	
H/W Monitor	Smart Fan	N/A	
	Controller	Pin header	
I/O Interface	USB	2 x USB 2.0 (2 x internal) 2 x USB 3.0 (2 x rear)	
	Serial	2 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232/422/485, 0V/5V/12V	
	GPIO	16-bits (8 x GPI; 8 x GPO), 5V	
Expansion Slot	Mini-PCIe	1 x Full-size 1 x Half-size (Mini-PCIe Full-size Slot w/ NANO SIM-Holder) (Mini-PCIe Half-size Slot w/ mSATA)	
	SATA	1 x SATA 3.0	
Storage	mSATA	1 (Shared with Mini-PCIe Half-size)	
	Power Supply	DC	DC-in 12V
Environment	ATX	N/A	
	Operating Temperature	-10 ~ 60°C	-40 ~ 85°C
	Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C	-40 ~ 85°C
Form Factor	Storage Humidity	10 ~ 90%, non-condensing	
	Dimensions	101 x 73mm (Pico-ITX)	
Certification	Weight	0.27 kg	
	EMC	FCC, CE, RCM, VCCI, BSMI	
Software Platform	OS Support	Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)	

*1 x MIPI-CSI 2.0 (by request)

Optional Item

Part Number	Description
E31-0805900-K08	Heatspreader for Apollo Lake-I
E31-0805910-K08	Heatspreader for Apollo Lak

MS-98H6

Pico-ITX SBC with Intel® Braswell N3000 Series SoC Platform for Low-Power and Fanless Solution

Specifications

Processor	CPU	Intel® Pentium® processor N3710, QC, 6W Intel® Celeron® processor N3160, QC, 6W Intel® Celeron® processor N3010, DC, 4W
	Frequency	N3710, 1.6 GHz up to 2.56 GHz N3160, 1.6 GHz up to 2.24 GHz N3010, 1.04 GHz up to 2.24 GHz
	L2 Cache	2MB
	CPU Type	BGA
Memory	Chipset	Integrated in SoC
	BIOS	AMI
	Technology	Single-channel DDR3L 1600MHz
Display	Max. Capacity	Up to 2GB
	Socket	Onboard
	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
Ethernet	LVDS	Dual Channel 18/24-bit
	HDMI	1
	DisplayPort	1
	Multiple Display	3 independent displays
Display Interface	LVDS	up to 1920 x 1200 @60Hz
	HDMI	up to 2560 x 1600 @60Hz up to 3840 x 2160 @30Hz
	DP1.1a	up to 2560 x 1600 @60Hz up to 3840 x 2160 @30Hz
	DP	up to 3840 x 2160 @30Hz
Ethernet	Controller	1 x Intel® I211-AT GbE LAN
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	N/A
I/O Interface	USB	2 x USB 2.0 (2 x internal) 2 x USB 3.0 (2 x rear)
	Serial	2 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232/422/485, 0V/5V/12V
	GPIO	16-bits (8 x GPI; 8 x GPO), 5V
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Half-size
Storage	SATA	1 x SATA 3.0
	mSATA	1
Power Supply	DC	DC-in 12V
	ATX	N/A
Environment	Operating Temperature	Heat-Spreader: 100(L) x 72.2(W) x 8(H) mm (standard packing) Heat-Sink: -10~60°C , 100(L) x 72.2(W) x 33(H) mm (by option)
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	100 x 72mm (Pico-ITX)
	Weight	0.27 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit) Linux Fedora 21 (by request) Linux Ubuntu14.04 (by request)

Features

- Intel® Braswell N3000 Series SoC
- Onboard 2GB DDR3L memory
- 3 independent displays: HDMI, DP, and LVDS
- SATA 3.0, mSATA (Full-size), Mini-PCIe (Half-size), and Intel® GbE LAN
- 2 USB 3.0, 2 USB 2.0 ports, and 2 COM ports
- 16-bit GPIO (8*GPI; 8*GPO)

Ordering Information

Part Number	Description
919-98H6-004	Intel Braswell N3710 SoC, Onboard 2GB DDR3L, HDMI, DP, GbE LAN, 2*USB3.0, 2*COM, Mini-PCIe, mSATA, I2C, DC-IN 12V,SATA CABLE WITH POWER,USB CABLE,COM PORT CALBE,DC-IN CABLE,CD,SINGLE
919-98H6-005	Intel Braswell N3160 SoC, Onboard 2GB DDR3L, HDMI, DP, GbE LAN, 2*USB3.0, 2*COM, Mini-PCIe, mSATA, I2C, DC-IN 12V,SATA CABLE WITH POWER,USB CABLE,COM PORT CALBE,DC-IN CABLE,CD,SINGLE
919-98H6-006	Intel Braswell N3010 SoC, Onboard 2GB DDR3L, HDMI, DP, GbE LAN, 2*USB3.0, 2*COM, Mini-PCIe, mSATA, I2C, DC-IN 12V,SATA CABLE WITH POWER,USB CABLE,COM PORT CALBE,DC-IN CABLE,CD,SINGLE

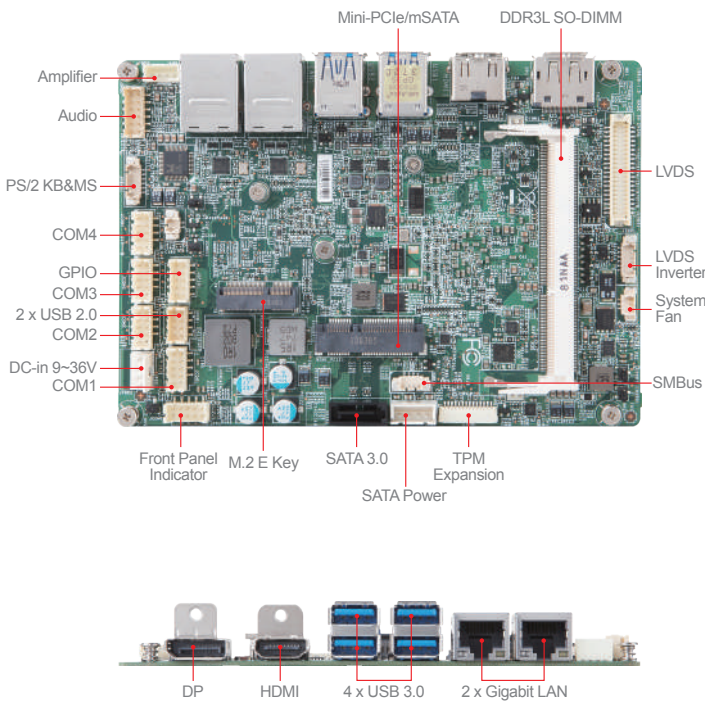
Packing List

Part Number	Description	Quantity
K14-3018001-V03	COM PORT Cable, 150mm	1
K1B-3008034-V03	USB Cable, 150mm	1
K1D-3010008-V03	SATA Cable with Power, 150mm	1
K1G-3004057-V03	DC Power Cable, 150mm	1
G71-SEDC149-X03	Driver DVD	1

MS-98J8

3.5" SBC with Intel® Apollo Lake/Apollo Lake-I for High-Performance, Low-Power & Fanless Solution

NEW



Features

- Intel® Apollo Lake/Apollo Lake-I Series SoC
- Supports DDR3L 1866/1600 MHz SO-DIMM memory up to 8GB
- 3 independent displays: HDMI, DP, and LVDS outputs
- Supports 4 USB 3.0, 2 USB 2.0, and 4 COM ports
- Supports Dual GbE LAN, Mini-PCIe, SATA, mSATA, and M.2 E Key 2230
- Supports Wide-Range DC-in 9~36V

Ordering Information

Part Number	Description
919-98J8-001	MS-98J8 10 OPT:A Intel Apollo Lake N3350,DDR3L,DP+HDMI+LVDS, 1*SATA3.0+2*GbE LAN+1*M.2+1*Mini-PCIe+2*USB2.0+4*USB3.0+4*COM,DC-in 9V~36V, SINGLE
919-98J8-002	MS-98J8 10 OPT:B Intel Apollo Lake-I E3940,DDR3L,DP+HDMI+LVDS, 1*SATA3.0+2*GbE LAN+1*M.2+1*Mini-PCIe+2*USB2.0+4*USB3.0+4*COM,DC-in 9V~36V, SINGLE

Packing List

Part Number	Description	Quantity
K14-1009062-V03	COM PORT Cable, 250mm	1
K1B-3008034-V03	USB Cable, 150mm	1
K1D-1012064-V03	SATA Cable with Power, 200mm	1
K1G-3004069-V03	DC Power Cable, 150mm	1
G71-SEDC182-X03/N56	Driver DVD	1

Optional Item

Part Number	Description
E31-0806191-K08	Heatspreader for Apollo Lake-I
E31-0806190-K08	Heatspreader for Apollo Lake

Specifications

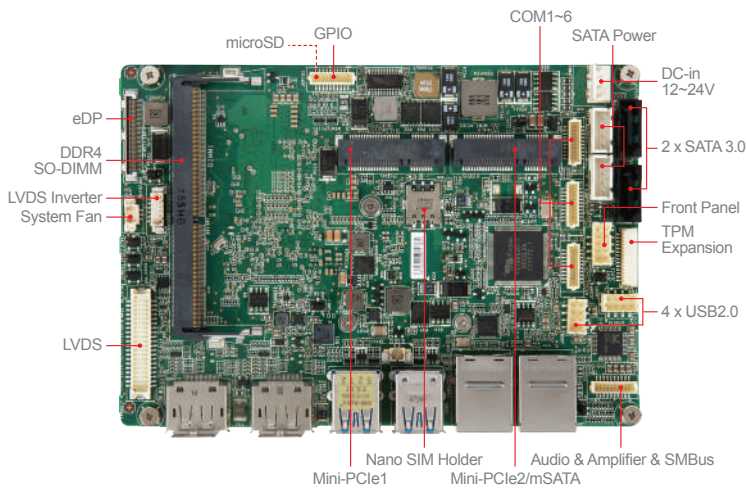
Processor	CPU	Intel® Pentium™ N4200 Processor, QC, 6W Intel® Celeron™ N3350 Processor, DC, 6W Intel® Atom™ X5-E3940 Processor, QC, 9.5W Intel® Atom™ X5-E3930 Processor, DC, 6.5W
	Frequency	N4200, 1.1 GHz, up to 2.5 GHz N3350, 1.1 GHz, up to 2.4 GHz E3940, 1.6 GHz, up to 1.8 GHz E3930, 1.3 GHz, up to 1.8 GHz
	L2 Cache	2M
	CPU Type	BGA
	Chipset	Integrated in SoC
Memory	BIOS	AMI
	Technology	Single Channel for DDR3L 1866/1600 MHz
	Max. Capacity	Up to 8GB
	Socket	1 x 204pin SO-DIMM
Display	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual channel 18/24-bit
	eDP	N/A
	VGA	N/A
	DVI	N/A
	HDMI	1
	DisplayPort	1
	Multiple Display	3 independent displays
	Display Interface	LVDS up to 1920 x 1200 @60Hz HDMI up to 3840 x 2160 @30Hz DP up to 4096 x 2160 @60Hz
Ethernet	Controller	2 x Realtek® RTL8111H GbE LAN
Audio	Controller	Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F81867AD-I
	Watchdog Timer	256-level Watchdog Timer
H/W Monitor	Smart Fan	Yes
	TPM	Controller
I/O Interface	USB	4 x USB 3.0 (4 x rear) 2 x USB 2.0 (2 x internal)
	Serial	4 x COM ports (Internal) COM1: RS-232/422/485, 0V/5V/12V COM2~4: RS-232
	Parallel	N/A
	PS/2	1 (wafer connector)
	GPIO	8-bit (4 x GPI; 4 x GPO), 5V
	Expansion Slot	PCIe x 16
PCIe x 4		N/A
PCIe x 1		N/A
PCI		N/A
M.2		1 x E Key (PCIe x1, USB2.0), 2230
Storage	Mini-PCIe	1 x Full-size (w/ mSATA)
	SATA	1 x SATA 3.0
	IDE	N/A
	eSATA	N/A
	CFast	N/A
	mSATA	1 (Shared with Mini-PCIe)
	CompactFlash	N/A
Power Supply	DC	DC-in 9~36V
	ATX	N/A
Environment	Operating Temperature	-10 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	146 x 102mm (3.5")
	Weight	0.33 kg
Certification	EMC	CE, FCC Class B, BSMI, VCCI, RCM
Software Platform	OS Support	Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

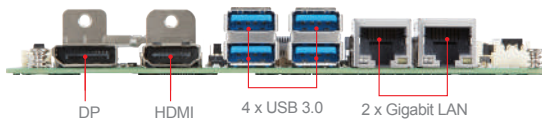
MS-98H3

3.5" SBC with Intel® Kaby Lake-U/Skylake-U for Fanless, Low-Power & High-Performance Solution

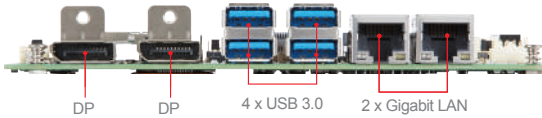
NEW



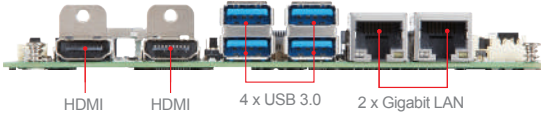
Standard : DP+HDMI



Optional : 2 DP



Optional : 2 HDMI



Features

- Intel® Kaby Lake-U/Skylake-U Series SoC
- Supports DDR4 2133 MHz SO-DIMM memory up to 16GB
- 3 independent displays: HDMI, DP, eDP, and LVDS outputs
- 4 USB 3.0, 4 USB 2.0, and 6 COM ports
- Dual Mini-PCIe, 2 SATA3.0, mSATA, NANO SIM-Holder, Dual GbE LAN and Micro SD slot
- Supports DC-in 12~24V

Ordering Information

Part Number	Description
919-98H3-001	MS-98H3 11 Intel Kaby Lake-U i7-7600U,DDR4 SO DIMM+DP+HDMI+LVDS+eDP+2*Mini-PCIe+2*LAN+ 2*SATA3.0+4*USB3.0+2*USB 2.0+6*COM+Micro SD,DC 12V~24V
919-98H3-002	MS-98H3 11 OPT.A Intel Kaby Lake-U i5-7300U,DDR4 SO DIMM+DP+HDMI+LVDS+eDP+2*Mini-PCIe+2*LAN+ 2*SATA3.0+4*USB3.0+2*USB 2.0+6*COM+Micro SD,DC 12V~24V
919-98H3-003	MS-98H3 11 OPT.B Intel Kaby Lake-U i3-7100U,DDR4 SO DIMM+DP+HDMI+LVDS+eDP+2*Mini-PCIe+2*LAN+ 2*SATA3.0+4*USB3.0+2*USB 2.0+6*COM+Micro SD,DC 12V~24V
919-98H3-004	MS-98H3 11 OPT.C Intel Kaby Lake-U 3965U,DDR4 SO DIMM+DP+HDMI+LVDS+eDP+2*Mini-PCIe+2*LAN+ 2*SATA3.0+4*USB3.0+2*USB 2.0+6*COM+Micro SD,DC 12V~24V
919-98H3-005	MS-98H3 11 OPT.D Intel Skylake-U i7-6600U,DDR4 SO DIMM+DP+HDMI+LVDS+eDP+2*Mini-PCIe+2*LAN+ 2*SATA3.0+4*USB3.0+2*USB 2.0+6*COM+Micro SD,DC 12V~24V
919-98H3-006	MS-98H3 11 OPT.E Intel Skylake-U i5-6300U,DDR4 SO DIMM+DP+HDMI+LVDS+eDP+2*Mini-PCIe+2*LAN+ 2*SATA3.0+4*USB3.0+2*USB 2.0+6*COM+Micro SD,DC 12V~24V
919-98H3-007	MS-98H3 11 OPT.F Intel Skylake-U i3-6100U,DDR4 SO DIMM+DP+HDMI+LVDS+eDP+2*Mini-PCIe+2*LAN+ 2*SATA3.0+4*USB3.0+2*USB 2.0+6*COM+Micro SD,DC 12V~24V
919-98H3-008	MS-98H3 11 OPT.G Intel Skylake-U 3955U,DDR4 SO DIMM+DP+HDMI+LVDS+eDP+2*Mini-PCIe+2*LAN+ 2*SATA3.0+4*USB3.0+2*USB 2.0+6*COM+Micro SD,DC 12V~24V

Specifications

Processor	CPU	7th/6th Gen Intel® Embedded Mobile Kaby Lake-U/Skylake-U Core™ i7/i5/i3/Celeron® Processor, DC, 15W	
	Frequency	2.0GHz~3.4GHz (Depends on CPU)	
	L2 Cache	2MB~4MB (Depends on CPU)	
	CPU Type	BGA	
	BIOS	AMI	
Memory	Technology	Single-channel DDR4 2133MHz	
	Max. Capacity	Up to 16GB	
	Socket	1 x 260-pin SO-DIMM	
	Controller	Intel® HD Graphics	
Display	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	LVDS	Dual Channel 18/24-bit	
	eDP	1 (Share with LVDS Singnal)	
	HDMI	1(HDMI1 Co-lay DP1 & HDMI2 Co-lay DP2 by option)	
Ethernet	DisplayPort	1(DP1 Co-lay HDMI1 & DP2 Co-lay HDMI2 by option)	
	Multiple Display	3 independent displays	
	Display Interface	LVDS	up to 1920 x 1200 @60Hz
		eDP	up to 4096 x 2304 @60Hz
Audio	HDMI1/HDMI2	HDMI1.4 up to 4096 x 2160 @24Hz	
	DP1/DP2	up to 4096 x 2304 @60Hz	
Super I/O	Controller	1 x Intel® I210-AT GbE LAN	
	Controller	1 x Intel® I219LM GbE-PHY LAN (AMT 11.x supported)	
H/W Monitor	Controller	Realtek® ALC887-VD2-CG HD Audio Codec	
	Controller	Fintek F81866AD-I	
TPM	Watchdog Timer	256-level Watchdog Timer	
	Smart Fan	Yes	
I/O Interface	Controller	Pin header	
	USB	USB	4 x USB 3.0 (4 x Rear) 4 x USB 2.0 (4 x Internal)
		Serial	6 x COM ports (Internal) COM1: RS-232/422/485, 0V/5V/12V, support auto flow control COM2~6: RS-232, 0V/5V/12V (RS-422/485 Optional)
	GPIO	GPIO	16-bits (8 x GPI; 8 x GPO), 5V
Expansion Slot	Mini-PCIe	2 x Full-size (Mini-PCIe1 Slot w/ NANO SIM-Holder) (Mini-PCIe2 Slot w/ mSATA)	
	SATA	2 x SATA 3.0	
Storage	mSATA	1 (Shared with Mini-PCIe2)	
	DC	DC-in 12~24V	
Environment	Operating Temperature	-10 ~ 60°C Note: Thermal Test w/ Airflow:0.7m/s	
	Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing	
Form Factor	Dimensions	146 x 102mm (3.5")	
	Weight	0.59 kg	
Certification	EMC	FCC, CE, RCM, VCCI, BSMI	
	Software Platform	OS Support	Windows 7 (32/64-bit) (Skylake-ULT Only) Windows 8.1 (64-bit) (Skylake-ULT Only) Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)

*1 x microSD slot

Packing List

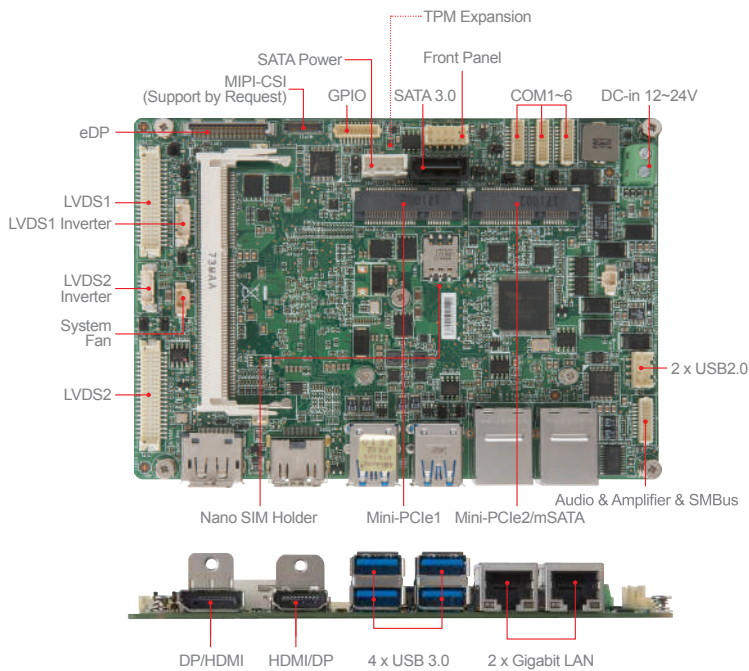
Part Number	Description	Quantity
G71-SEDC173-N56 / G71-SEDC173-X03	Driver CD	1
K1G-3004069-V03	DC Power Cable, 150mm	1
K14-3018001-V03	COM Port Cable, 150mm	1
K1B-3008034-V03	USB Cable, 150mm	1
K1D-1012064-V03	SATA Cable with Power, 200mm	1

Optional Item

Part Number	Description
E31-2100170-K08	Heatspreader

MS-98E6

3.5" SBC with Intel® Apollo Lake/Apollo Lake-I for Fanless, Low-Power, High-Performance & Wide Temperature Solution



Features

- Intel® Apollo Lake/Apollo Lake-I Series SoC
- Supports DDR3L 1866/1600 MHz SO-DIMM memory up to 8GB
- 3 independent displays: HDMI, DP, eDP and LVDS
- 4 USB 3.0, 2 USB 2.0, and 6 COM ports
- Dual Mini-PCIe, SATA3.0, mSATA, NANO SIM-Holder, Dual GbE LAN and Micro SD slot
- Supports MIPI-CSI2.0 interface for Camera
- Apollo Lake-I Series support operating temperature : -40 ~ 85°C
- Supports DC-in 12~24V

Ordering Information

Part Number	Description
919-98E6-001	MS-98E6 11 Intel Apollo Lake N4200,DDR3L SO DIMM+DP+HDMI+2LVDS+eDP+2Mini-PCIe+2LAN+SATA3.0+4USB3.0+2USB 2.0+6COM+MIPI+Micro SD,DC 12V~24V,Non-WT, SINGLE
919-98E6-002	MS-98E6 11 OPT:A Intel Apollo Lake N3350,DDR3L SO DIMM+DP+HDMI+2LVDS+eDP+2Mini-PCIe+2LAN+SATA3.0+4USB3.0+2USB 2.0+6COM+MIPI+Micro SD,DC 12V~24V,Non-WT, SINGLE
919-98E6-003	MS-98E6 11 OPT:B Intel Apollo Lake-I E3940,DDR3L SO DIMM+DP+HDMI+2LVDS+eDP+2Mini-PCIe+2LAN+SATA3.0+4USB3.0+2USB 2.0+6COM+MIPI+Micro SD,DC 12V~24V,Non-WT, SINGLE
919-98E6-004	MS-98E6 11 OPT:C Intel Apollo Lake-I E3950,DDR3L SO DIMM+DP+HDMI+2LVDS+eDP+2Mini-PCIe+2LAN+SATA3.0+4USB3.0+2USB 2.0+6COM+MIPI+Micro SD,DC 12V~24V,WT, SINGLE
919-98E6-005	MS-98E6 11 OPT:D Intel Apollo Lake-I E3940,DDR3L SO DIMM+DP+HDMI+2LVDS+eDP+2Mini-PCIe+2LAN+SATA3.0+4USB3.0+2USB 2.0+6COM+MIPI+Micro SD,DC 12V~24V,WT, SINGLE
919-98E6-006	MS-98E6 11 OPT:E Intel Apollo Lake-I E3930,DDR3L SO DIMM+DP+HDMI+2LVDS+eDP+2Mini-PCIe+2LAN+SATA3.0+4USB3.0+2USB 2.0+6COM+MIPI+Micro SD,DC 12V~24V,WT, SINGLE

Packing List

Part Number	Description	Quantity
K1B-3008034-V03	USB Cable, 150mm	1
K1D-1012064-V03	DC Power Cable, 150mm	1
K14-3018001-V03	COM PORT Cable, 150mm	1
K1B-3008034-V03	DC Power Cable, 150mm (For 919-98E6-001/002/003)	1
K1G-3002031-V03	DC Power Cable, 150mm (For 919-98E6-004/005/006)	1
G71-SEDC172-X03	Driver DVD	1

Optional Item

Part Number	Description
E31-0805840-K08	Heatspreader For Apollo Lake-I
E31-0805850-K08	Heatspreader For Apollo Lake

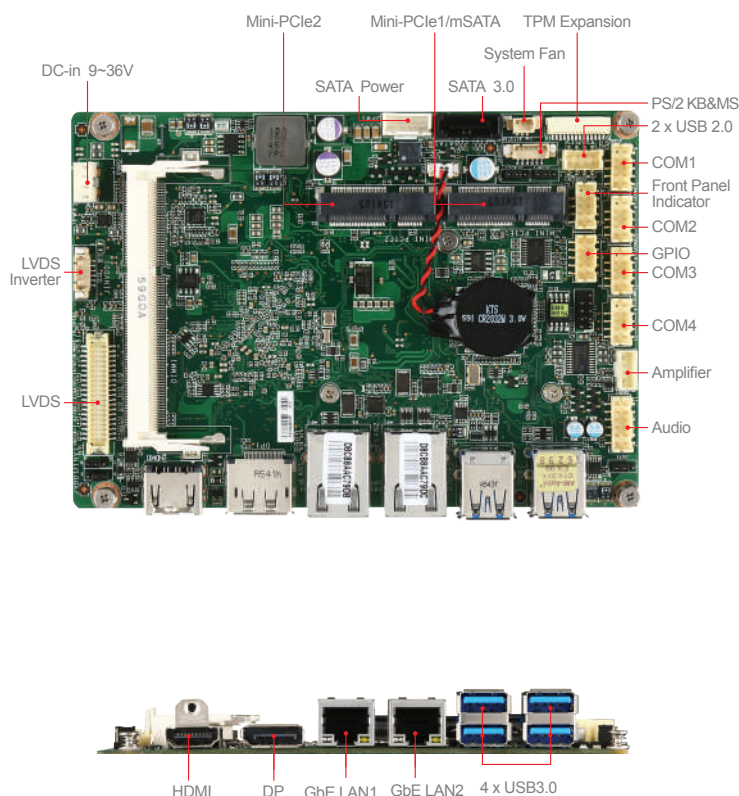
Specifications

		Apollo Lake SKUs	Apollo Lake-I SKUs	
			Intel® Pentium® Processor N4200, QC, 6W Intel® Celeron® Processor N3350, DC, 6W	Intel® Atom™ x7 Processor E3950, QC, 12W Intel® Atom™ x5 Processor E3940, QC, 9.5W Intel® Atom™ x5 Processor E3930, DC, 6.5W
Processor	CPU			
	Frequency	N4200, 1.1 GHz, up to 2.5 GHz N3350, 1.1 GHz, up to 2.4 GHz	E3950, 1.6 GHz, up to 2.0 GHz E3940, 1.6 GHz, up to 1.8 GHz E3930, 1.3 GHz, up to 1.8 GHz	
	L2 Cache	1M~2M (Depends on CPU)		
	CPU Type	BGA		
	Chipset	Integrated in SoC		
	BIOS	AMI		
Memory	Technology	Single-channel DDR3L 1866/1600 MHz		
	Max. Capacity	Up to 8GB		
	Socket	1 x 204-pin SO-DIMM		
	Controller	Intel® HD Graphics		
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM		
	LVDS	2 x Dual Channel 18/24-bit (LVDS1 Share with eDP Signal, LVDS2 Share with DP1 Signal)		
Display	eDP	1 (Share with LVDS1 Signal)		
	VGA	N/A		
	DVI	N/A		
	HDMI	1(HDMI1 Co-lay DP1/LVDS2 & HDMI2 Co-lay DP2 by option)		
	DisplayPort	1(DP1 Co-lay HDMI1/LVDS2 & DP2 Co-lay HDMI2 by option)		
	Multiple Display	3 independent displays		
	Display Interface	LVDS1/LVDS2 up to 1920 x 1200 @60Hz eDP up to 4096 x 2160 @60Hz HDMI1/HDMI2 up to 3840 x 2160 @30Hz DP1/DP2 up to 4096 x 2160 @60Hz		
	Ethernet	Controller	2 x Intel® I211-AT GbE LAN	2 x Intel® I210-IT GbE LAN
	Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec	
	Super I/O	Controller	Fintek F81867AD-I	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer		
	Smart Fan	Yes		
TPM	Controller	Pin header		
	USB	4 x USB 3.0 (4 x Rear) 2 x USB 2.0 (2 x Internal)		
I/O Interface	Serial	6 x COM ports (Internal) COM1: RS-232/422/485, 0V/5V/12V, support auto flow control COM2~6: RS-232, 0V/5V/12V (RS-422/485 by Optional)		
	Parallel	N/A		
	PS/2	N/A		
	GPIO	16-bits (8 x GPI; 8 x GPO), 5V		
	PCIe x16	N/A		
	PCI	N/A		
Expansion Slot	M.2	N/A		
	Mini-PCIe	2 x Full-size (Mini-PCIe1 Slot w/ NANO SIM-Holder) (Mini-PCIe2 Slot w/ mSATA)		
	SATA	1 x SATA 3.0		
Storage	mSATA	1 (Shared with Mini-PCIe2)		
	Power Supply	DC	DC-in 12~24V (Box header with 4pin)	DC-in 12~24V (Phoenix connector with 2pin)
	ATX	N/A		
Environment	Operating Temperature	-10 ~ 60°C	-40 ~ 85°C	
	Operating Humidity	10 ~ 90%, non-condensing		
	Storage Temperature	-20 ~ 80°C	-40 ~ 85°C	
	Storage Humidity	10 ~ 90%, non-condensing		
Form Factor	Dimensions	146 x 102mm (3.5")		
	Weight	0.34 kg	0.59 kg	
Certification	EMC	FCC, CE, RCM, VCCI, BSMI		
Software Platform	OS Support	Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)		
		*1 x MIPI-CSI 2.0 (by request) *1 x microSD slot		

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

MS-9818

3.5" SBC with Intel® Celeron® Processor N3010/N3160 for High-Performance, Low-Power & Fanless Solution



Features

- Intel® Braswell N3000 Series SoC
- Supports DDR3L 1333/1600 MHz SO-DIMM memory up to 8GB
- 3 independent displays: HDMI, DP and LVDS
- 4 USB 3.0, 2 USB 2.0, and 4 COM ports
- Dual Mini-PCIe, SATA, mSATA, and Dual GbE LAN
- Supports DC-in 9~36V

Ordering Information

Part Number	Description
919-9818-003	MS-9818 10 OPTB, 3.5-INCH, INTEL CELERON N3160, 1*DDR3L SO-DIMM, DP, HDMI, LVDS, 2*MINI-PCIE, 2*LAN, 1*SATA3.0, 1*MSATA, 6*USB (4*USB 3.0+2*USB 2.0), 4*COM, DC-IN 9~36V
919-9818-004	MS-9818 10 OPTC, 3.5-INCH, INTEL CELERON N3010, 1*DDR3L SO-DIMM, DP, HDMI, LVDS, 2*MINI-PCIE, 2*LAN, 1*SATA3.0, 1*MSATA, 6*USB(4*USB 3.0+2*USB 2.0), 4*COM, DC-IN 9~36V

Packing List

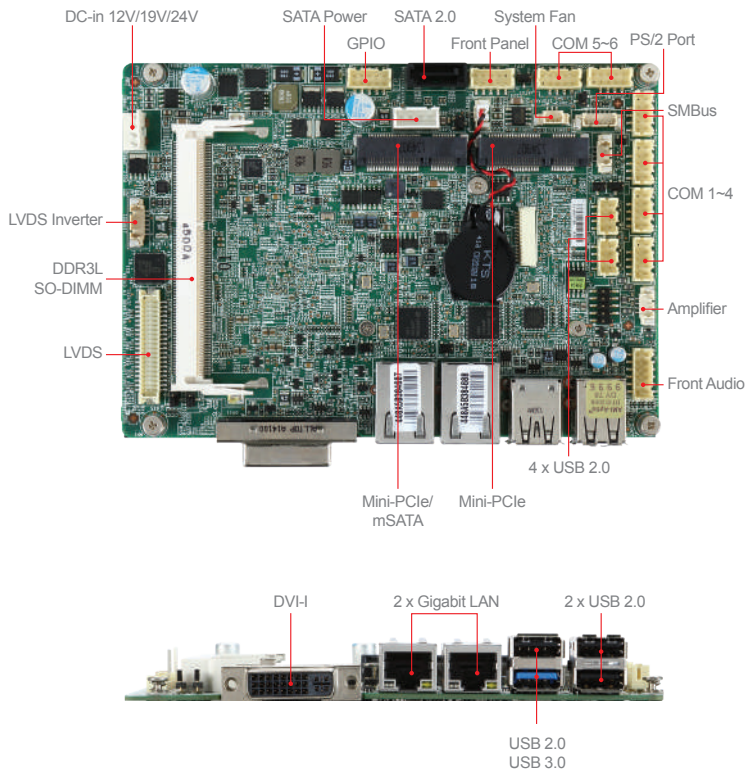
Part Number	Description
K10-3002145-V03	DC LOCKABLE CABLE, 120mm
K1B-3008034-V03	USB2.0 CABLE, 150mm
K14-1009062-V03	INT COM PORT CABLE, 250mm
K1D-1012064-V03	SATA Power CABLE, 200mm
G71-SEDC152-N56 / X03	DRIVER CD

Specifications

Processor	CPU	Intel® Celeron® Processor N3160, QC, 6W Intel® Celeron® Processor N3010, DC, 4W
	Frequency	N3160, 1.6 GHz up to 2.24 GHz N3010, 1.04 GHz up to 2.24 GHz
	L2 Cache	2MB
	CPU Type	BGA
	Chipset	Integrated in SoC
Memory	BIOS	AMI
	Technology	Single-channel DDR3L 1600MHz
	Max. Capacity	Up to 8GB
	Socket	1 x 204-pin SO-DIMM
Display	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual Channel 18/24-bit
	HDMI	1
	DisplayPort	1
	Multiple Display	3 independent displays
Display Interface	Display Interface	LVDS up to 1920 x 1200 @60Hz HDMI up to 2560 x 1600 @60Hz; up to 3840 x 2160 @30Hz DP1.1a up to 2560 x 1600 @60Hz; up to 3840 x 2160 @30Hz
	Ethernet	Controller
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Pin header
I/O Interface	USB	2 x USB 2.0 (2 x internal) 4 x USB 3.0 (4 x rear)
	Serial	4 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2~4: RS-232
	PS/2	1 (box header)
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
	M.2	N/A
Expansion Slot	Mini-PCIe	2 x Full-size (Mini-PCIe1 Slot w/ mSATA)
	Storage	SATA
	mSATA	1 (Shared with Mini-PCIe1)
Power Supply	DC	DC-in 9~36V
	ATX	N/A
Environment	Operating Temperature	-10 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	146 x 102mm (3.5")
	Weight	0.33 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Fedora 21 (by request) Linux Ubuntu 14.04.03 (by request)

MS-98G6

3.5" SBC with Intel® Bay Trail-D/M Series Platform for High-Performance, Low-Power & Fanless Solution



Features

- Intel® Bay Trail-D/M Series Processors
- Supports DDR3L 1333 MHz SO-DIMM memory up to 8 GB
- DVI-I and LVDS displays
- Dual GbE LAN, USB 3.0, and 6 COM
- Supports dual Mini-PCIe, SATA and mSATA

Ordering Information

Part Number	Description
919-98G6-001	MS-98G6 10 Intel Bay Trail D-J1900, DDR3L SO DIMM+DVI-I+LVDS+2*Mini-PCIe+2*LAN+ 1*SATA2.0+1*USB3.0+7*USB 2.0+6*COM, DC 12V/19V/24V
919-98G6-002	MS-98G6 10 OPT: A Intel Bay Trail M-N2930,DDR3L SO DIMM+DVI-I+LVDS+2*Mini-PCIe+2*LAN+ 1*SATA2.0+1*USB3.0+7*USB 2.0+6*COM, DC 12V/19V/24V

Packing List

Part Number	Description	Quantity
G71-SEDC164-N56	Driver DVD	1
K10-3002145-V03	DC Power Cable, 120mm	1
K14-1009062-V03	COM Port Cable, 250mm	1
K1B-3008034-V03	USB Cable, 150mm	1
K1D-1012064-V03	SATA Cable with Power, 200mm	1

Specifications

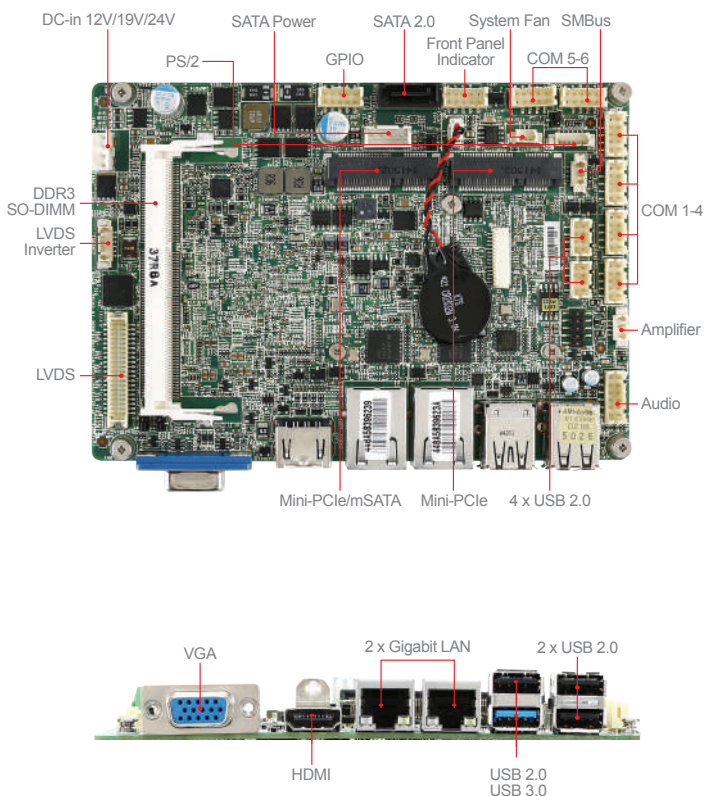
Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W Intel® Celeron® Processor N2930, QC, 7.5W
	Frequency	J1900, 2 GHz N2930, 1.83 GHz
	L2 Cache	2MB
	CPU Type	BGA
	Chipset	N/A
Memory	BIOS	AMI
	Technology	Single-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB
Display	Socket	1 x 204-pin SO-DIMM
	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual channel 18/24-bit
	DVI	1 (DVI-I)
Ethernet	Multiple Display	2 independent displays
	Display Interface	LVDS up to 1920 x 1200 @60Hz DVI-I up to 1920 x 1200 @60Hz
Ethernet	Controller	2 x Intel® I210-AT GbE LAN
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	N/A
I/O Interface	USB	7 x USB 2.0 (4 x internal; 3 x rear) 1 x USB 3.0 (1 x rear)
	Serial	6 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2-6: RS-232, 0V/5V/12V
	Parallel	N/A
	PS/2	1 (wafer connector)
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
Expansion Slot	M.2	N/A
	Mini-PCIe	2 x Full-size (one w/ mSATA)
Storage	SATA	1 x SATA 2.0
	mSATA	1
Power Supply	DC	DC-in 12V/19V/24V
	ATX	N/A
Environment	Operating Temperature	-10 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	146 x 102mm (3.5")
	Weight	0.31 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Linux Fedora 20 (by request) Linux Ubuntu 13.10 (by request)

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

MS-98F6

3.5" SBC with Intel® Bay Trail-D/M Series Platform for High-Performance, Low-Power & Fanless Solution

Semi-rugged Terminal
POS System
Panel PC
HMI
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module



Features

- Intel® Bay Trail-D/M Series Processor
- DDR3L 1333 MHz SO-DIMM Memory up to 8GB
- HDMI, VGA and LVDS Displays
- Dual GbE LAN, USB 3.0 and 6 COM
- Supports dual Mini-PCIe and SATA and mSATA

Ordering Information

Part Number	Description
919-98F6-003	MS-98F6 11 Intel Bay Trail D-J1900,DDR3L SO DIMM+VGA+HDMI+LVDS+2*Mini-PCIe+2*LAN+ 1*SATA2.0+1*USB3.0+7*USB 2.0+6*COM,DC 12V/19V/24V
919-98F6-004	MS-98F6 11 OPT: A Intel Bay Trail M-N2930,DDR3L SO DIMM+VGA+HDMI+LVDS+2*Mini-PCIe+2*LAN+ 1*SATA2.0+1*USB3.0+7*USB 2.0+6*COM,DC 12V/19V/24V

Packing List

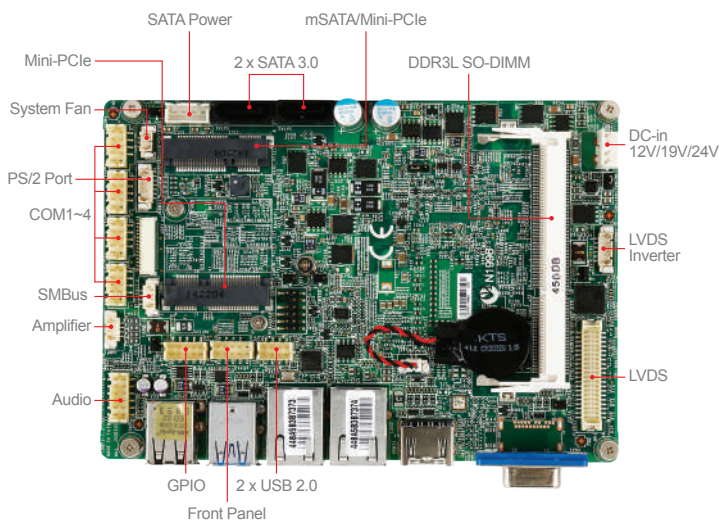
Part Number	Description	Quantity
G71-SEDC163-N56	Driver DVD	1
K10-3002145-V03	DC Power Cable, 120mm	1
K14-1009062-V03	COM Port Cable, 250mm	1
K1B-3008034-V03	USB Cable, 150mm	1
K1D-1012064-V03	SATA Cable with Power, 200mm	1

Specifications

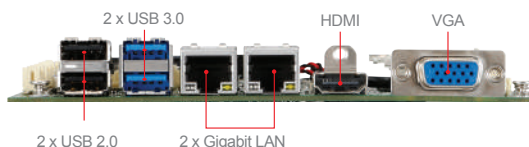
Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W Intel® Celeron® Processor N2930, QC, 7.5W
	Frequency	J1900, 2 GHz N2930, 1.83 GHz
	L2 Cache	2MB
	CPU Type	BGA
	Chipset	N/A
Memory	BIOS	AMI
	Technology	Single-channel DDR3L 1333 MHz
	Max. Capacity	Up to 8GB
	Socket	1 x 204-pin SO-DIMM
Display	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual channel 18/24-bit
	VGA	1
	HDMI	1
	Multiple Display	2 independent displays
Display Interface	Display Interface	VGA up to 2560 x 1600 @60Hz HDMI up to 1920 x 1080 @60Hz LVDS up to 1920 x 1200 @60Hz
	Ethernet	Controller
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
TPM	Controller	N/A
I/O Interface	USB	7 x USB 2.0 (4 x internal; 3 x rear) 1 x USB 3.0 (1 x rear)
	Serial	6 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2-6: RS-232, 0V/5V/12V
	PS/2	1 (wafer connector)
Expansion Slot	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
	M.2	N/A
Storage	Mini-PCIe	2 x Full-size (one w/ mSATA)
	SATA	1 x SATA 2.0
Power Supply	mSATA	1
	DC	DC-in 12V/19V/24V
Environment	ATX	N/A
	Operating Temperature	-10 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	146 x 102mm (3.5")
	Weight	0.31 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Linux Fedora 20 (by request) Linux Ubuntu 13.10 (by request)

MS-98F3

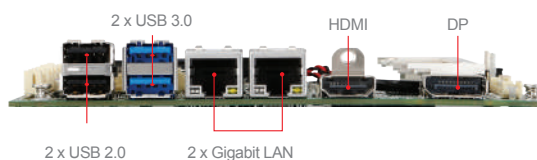
3.5" SBC with Intel® HSW/BDW ULT Series Platform for High-Performance, Low-Power & Fanless Solution



919-98F3-009/919-98F3-011/919-98F3-013
919-98F3-014/919-98F3-016/919-98F3-017



919-98F3-015/919-98F3-018



Features

- Intel® HSW/BDW ULT Series Processors
- Supports DDR3L 1600 MHz SO-DIMM memory up to 8GB
- HDMI and VGA/DP and LVDS display interfaces
- Dual GbE LAN, USB 3.0, and 4 COM
- Dual Mini-PCle, dual SATA 3.0, and mSATA

Ordering Information

Part Number	Description
919-98F3-009	MS-98F31609-98F3-110/809-98F3-008 VER11 STD Intel HSW ULT i3-4010U,DDR3 SO DIMM+VGA+HDMI+LVDS+2*Mini-PCle+2*LAN+2*SATA3.0+2*USB3.0+4*USB 2.0+4*COM,DC 12V/19V/24V
919-98F3-011	MS-98F31609-98F3-130/809-98F3-008 VER11 OPT:B Intel HSW ULT i5-4300U,DDR3 SO DIMM+VGA+HDMI+LVDS+2*Mini-PCle+2*LAN+2*SATA3.0+2*USB3.0+4*USB 2.0+4*COM,DC 12V/19V/24V
919-98F3-013	MS-98F31609-98F3-150/809-98F3-010 VER11 OPT:D Intel BDW ULT i3-5010U,DDR3 SO DIMM+VGA+HDMI+LVDS+2*Mini-PCle+2*LAN+2*SATA3.0+2*USB3.0+4*USB 2.0+4*COM,DC 12V/19V/24V
919-98F3-014	MS-98F31609-98F3-160/809-98F3-010 VER11 OPT:E Intel BDW ULT i5-5350U,DDR3 SO DIMM+VGA+HDMI+LVDS+2*Mini-PCle+2*LAN+2*SATA3.0+2*USB3.0+4*USB 2.0+4*COM,DC 12V/19V/24V
919-98F3-015	MS-98F31609-98F3-170/809-98F3-010 VER11 OPT:F Intel BDW ULT i3-5010U,DDR3 SO DIMM+DP+HDMI+LVDS+2*Mini-PCle+2*LAN+2*SATA3.0+2*USB3.0+4*USB 2.0+4*COM,DC 12V/19V/24V
919-98F3-016	MS-98F31609-98F3-180/809-98F3-010 VER11 OPT:G Intel BDW ULT i5-5350U,DDR3 SO DIMM+VGA+HDMI+LVDS+2*Mini-PCle+2*LAN+2*SATA3.0+2*USB3.0+4*USB 2.0+4*COM,DC 12V/19V/24V
919-98F3-017	MS-98F31609-98F3-210/809-98F3-010 VER11 OPT:J Intel BDW ULT i7-5650U,DDR3L SO-DIMM, VGA+HDMI+LVDS+2*Mini-PCle+2*LAN+2*SATA3+2*USB3+4*USB2+4*COM+DC-IN 12V/19V/24V, SATA CABLE+SATA POWER CABLE+USB CABLE+COM CALBE+DC POWER CABLE, CD, SINGLE
919-98F3-018	MS-98F31609-98F3-220/809-98F3-010 VER11 OPT:K Intel BDW ULT i7-5650U,DDR3 SO DIMM+DP+HDMI+LVDS+2*Mini-PCle+2*LAN+2*SATA3.0+2*USB3.0+4*USB 2.0+4*COM,DC 12V/19V/24V

Specifications

Processor	CPU	Intel® Core™ i5-4300U/i3-4010U Processors, DC, 15W Intel® Core™ i7-5650U/i5-5350U/i3-5010U/3765U Processors, DC, 15W
	Frequency	i5-4300U, 1.9GHz, up to 2.9GHz i3-4010U, 1.7GHz i7-5650U, 2.2GHz, up to 3.1GHz i5-5350U, 1.8GHz, up to 2.9GHz i3-5010U, 2.1GHz 3765U, 1.9GHz
	L2 Cache	2MB~4MB (Depends on CPU)
	CPU Type	BGA
	Chipset	N/A
Memory	BIOS	AMI
	Technology	Single-channel for DDR3L 1600 MHz
	Max. Capacity	Up to 8GB
	Socket	1 x 204-pin SO-DIMM
Display	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual channel 18/24-bit
	VGA	1 (optional)
	HDMI	1
	DisplayPort	1 (optional)
	Multiple Display	3 independent displays
Display Interface	VGA up to 1920 x 1200 @60Hz HDMI up to 2560 x 1600 @60Hz LVDS up to 1920 x 1200 @60Hz DP up to 3840 x 2160 @60Hz	
	Ethernet	Controller
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
I/O Interface	USB	4 x USB 2.0 (2 x internal; 2 x rear) 2 x USB 3.0 (2 x rear with USB 2.0 signal)
	Serial	4 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2~4: RS-232, 0V/5V/12V
	PS/2	1 (pin header)
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
	M.2	N/A
Expansion Slot	Mini-PCle	1 x Full-size (w/ mSATA) 1 x Half-size
	SATA	2 x SATA 3.0
Storage	mSATA	1
Power Supply	DC	DC-in 12V/19V/24V
Environment	Operating Temperature	-10 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	146 x 102mm (3.5")
	Weight	0.56 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 7 (64-bit) Windows 8.1 (32/64-bit) Windows 10 (64-bit) Linux Fedora 19 (by request) Linux Ubuntu 13.04 (by request)

Packing List

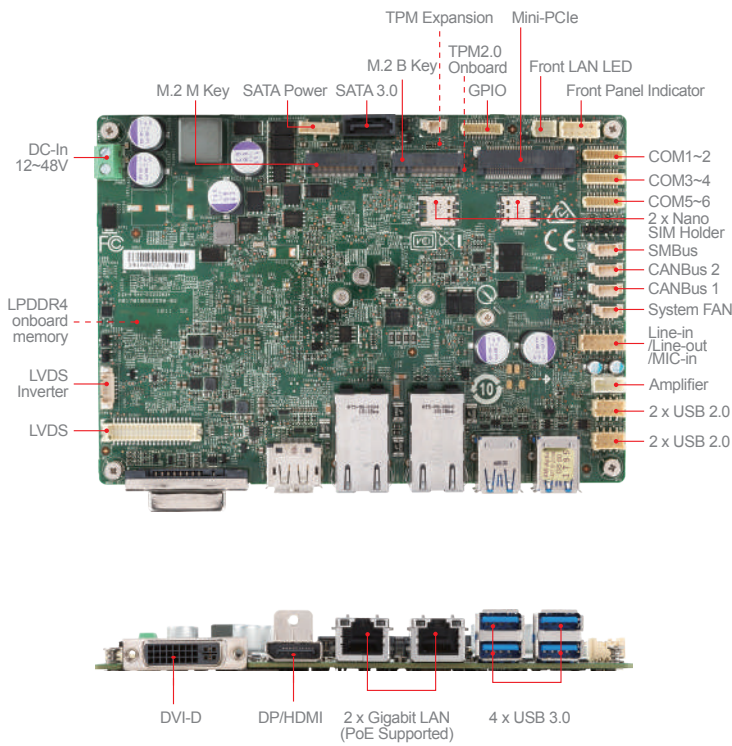
Part Number	Description	Quantity
G71-SEDC161-N56 (HSW ULT SKU) G71-SEDC162-N56 (BDW ULT SKU)	Driver DVD	1
K10-3002145-V03	DC Power Cable, 120mm	1
K14-1009062-V03	COM Port Cable, 250mm	1
K1B-3008034-V03	USB Cable, 150mm	1
K1D-1012064-V03	SATA Cable with Power, 200mm	1
K1D-3008006-V03	SATA Cable, 300mm	1

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PiCMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCle Module

MS-98H5

EPIC SBC with Intel® Apollo Lake/Apollo Lake-I for Fanless, Low-Power, PoE, CANBus & Wide Temperature Solution

NEW



Features

- Supports Dual GbE LAN with IEEE PoE 802.3af & 2 channel CANBus 2.0B
- Supports 3 independent displays : DVI-D, DP (Co-Lay HDMI) and LVDS
- Supports LPDDR4 2133/2400 MHz onboard memory up to 4GB
- Supports 4 USB 3.0, 4 USB 2.0, and 6 COM ports (all with power)
- Mini-PCle & M.2 B Key 3042 with NANO SIM-Holder , SATA 3.0, M.2 M Key 2242 for storage
- Apollo Lake-I Series support wide operating temperature : -40 ~ 85°C
- Supports wide voltage 12~48V for in-vehicle application
- Compact design for anti-vibration devices in harsh environments

Ordering Information

Part Number	Description
Coming soon	

Packing List

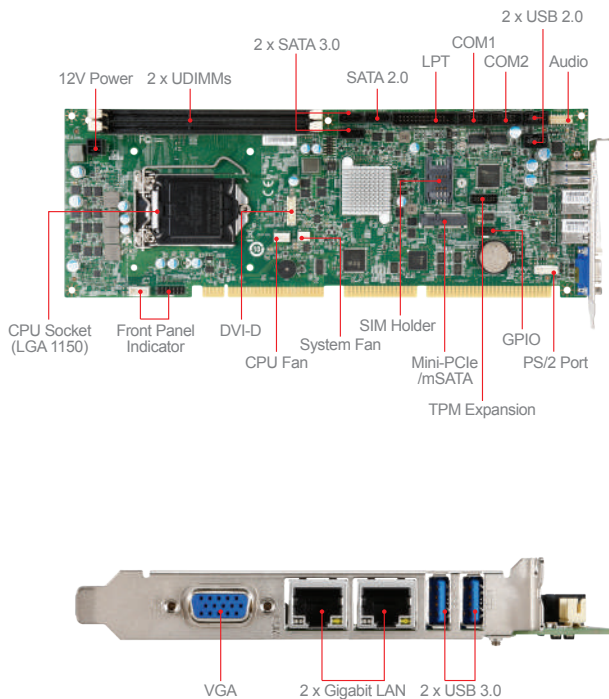
Part Number	Description
Coming soon	

Specifications

Processor	CPU	Intel® Pentium® Processor N4200, QC, 6W Intel® Celeron® Processor N3350, DC, 6W	Intel® Atom™ x7 Processor E3950, QC, 12W Intel® Atom™ x5 Processor E3940, QC, 9.5W Intel® Atom™ x5 Processor E3930, DC, 6.5W	
	Frequency	N4200, 1.1 GHz, up to 2.5 GHz N3350, 1.1 GHz, up to 2.4 GHz	E3950, 1.6 GHz, up to 2.0 GHz E3940, 1.6 GHz, up to 1.8 GHz E3930, 1.3 GHz, up to 1.8 GHz	
Memory	L2 Cache	2M		
	CPU Type	BGA		
	Chipset	Integrated in SoC		
	BIOS	AMI		
Memory	Technology	Single-channel LPDDR4 2400MHz	Single-channel LPDDR4 2133/2400MHz	
	Max. Capacity	Up to 4 GB		
Display	Socket	Onboard		
	Controller	Intel® HD Graphics		
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM		
	LVDS	Dual Channel 18/24-bit		
	eDP	N/A		
	VGA	N/A		
	DVI	1 (DVI-D)		
	HDMI	1 (by BOM option)		
	DisplayPort	1 (Co-lay HDMI)		
	Multiple Display	3 independent displays		
Display Interface	LVDS up to 1920 x 1200 @60 Hz DVI-D up to 1920 x 1200 @60 Hz HDMI up to 3840 x 2160 @30Hz DP up to 4096 x 2160 @60Hz			
	Controller	2 x Intel® I211-AT GbE LAN	2 x Intel® I210-IT GbE LAN (w/ PoE IEEE 802.3af)	
Ethernet	Controller	Realtek® ALC887 HD Audio Codec		
Audio	Controller	Fintek F81867D-I		
Super I/O	Watchdog Timer	256-level Watchdog Timer		
	Smart Fan	Yes		
H/W Monitor	Controller	Pin header (Default) Infineon SLB965TT 2.0 (by BOM option)	Infineon SLB965XT 2.0 (Default)	
	TPM			
I/O Interface	USB	4 x USB 3.0 (rear) 4 x USB 2.0 (internal)		
	Serial	6 x COM ports (internal) COM1~2: RS-232/422/485, 0V/5V/12V COM3~6: RS-232, 0V/5V/12V		
	Parallel	N/A		
	PS/2	N/A		
	GPIO	16-bits (8 x GPI; 8 x GPO), 5V		
	PCIe x 16	N/A		
	PCIe x 4	N/A		
Expansion Slot	PCIe x 1	N/A		
	PCI	N/A		
	M.2	1 x M Key (SATA 3.0), 2242 1 x B Key (PCIe x1, USB2.0), 3042		
	Mini-PCle	1 x Full-size (w/ SIM holder)		
	SATA	1 x SATA 3.0		
	IDE	N/A		
	eSATA	N/A		
Storage	CFast	N/A		
	mSATA	N/A		
	CompactFlash	N/A		
	Power Supply	DC	DC-in 12V~48V	
	ATX	N/A		
Environment	Operating Temperature	-10 ~ 60°C	-40 ~ 85°C	
	Operating Humidity	10 ~ 90%, non-condensing		
	Storage Temperature	-20 ~ 80°C	-40 ~ 85°C	
	Storage Humidity	10 ~ 90%, non-condensing		
Form Factor	Dimensions	165 x 115mm (EPIC)		
	Weight	0.42 kg	0.67 kg	
Certification	EMC	FCC, CE, RCM, VCCI, BSMI		
Software Platform	OS Support	Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)		

MS-98G7

PICMG 1.0 SBC with 4th Gen Intel® Desktop Haswell/Haswell Refresh Platform for High-Performance Solution



Features

- Intel® Desktop Haswell & Haswell Refresh Core™ i7/i5/i3/Pentium®/Celeron® Processor
- Dual-channel DDR3/DDR3L 1333/1600MHz
- 2 independent displays: VGA and DVI-D
- 2 Intel® GbE LAN, 2 COM with power, 2 USB 3.0, 4 USB 2.0
- 2 SATA 3.0, SATA 2.0, mSATA

Ordering Information

Part Number	Description
919-98G7-106	MS-98G7 11 OPT:C Intel Haswell Processor+Intel H81, 2*DDR3 UDIMM, VGA,DVI-D, 3*SATA,2*LAN,6*USB,2*COM,m-SATA, 1 x Mini-PCIe,1*SIM Holder,ATX power

Packing List

Part Number	Description
Bulk Packing	N/A

Optional Item

Part Number	Description
K1D-1008261-V03	SATA 3.0 Cable, 500mm
K18-1025011-V03	Parallel Cable, 300mm
K1B-3008034-V03	USB 2.0 Cable, 150mm

Specifications

Processor	CPU	4th Gen Intel® Desktop Haswell/Haswell refresh Core™ i7/i5/i3/Pentium/Celeron Processor, Max. 95W
	Frequency	2.4GHz-4.0GHz (Depends on CPU)
	L2 Cache	2M-8M (Depends on CPU)
	CPU Type	Socket (LGA 1150)
	Chipset	Intel® H81
Memory	BIOS	AMI
	Technology	Dual-channel DDR3/DDR3L 1333/1600MHz
	Max. Capacity	Up to 16GB
Display	Socket	2 x 240-pin UDIMMs
	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	VGA	1
	DVI	1 (DVI-D, pin-header)
Ethernet	Multiple Display	2 independent displays
	Display Interface	VGA up to 1920 x 1200 @60Hz DVI-D up to 1920 x 1200 @60Hz
	Controller	1 x Intel® I210-AT GbE LAN 1 x Intel® I217-LM GbE LAN
Audio	Controller	Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F81866
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Pin header
I/O Interface	USB	2 x USB 3.0 (rear) 4 x USB 2.0 (internal)
	Serial	2 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232, 0V/5V/12V
	Parallel	1
	PS/2	1 (wafer connector)
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Full-size (w/ mSATA)
Storage	SATA	2 x SATA 3.0 1 x SATA 2.0
	mSATA	1
Power Supply	ATX	ATX/AT-Power 12V-4P, power from PICMG1.0 backplane
Environment	Operating Temperature	0 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	338 x 122mm (PICMG 1.0)
	Weight	0.40 kg
Certification	EMC	FCC, CE
Software Platform	OS Support	Windows XP (32-bit) Windows 7 (32/64-bit) Windows 8 (32/64-bit) Linux Fedora 19 (by request) Linux Ubuntu 10.04 (by request)

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

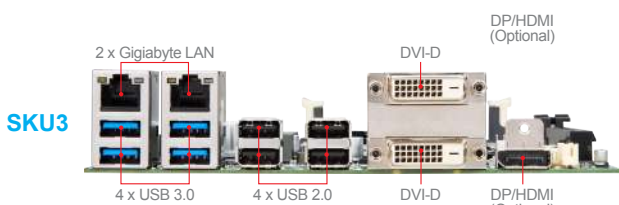
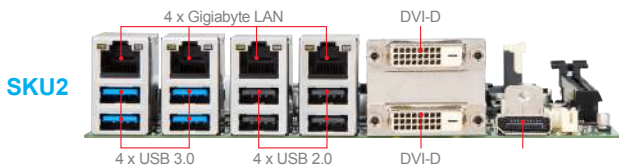
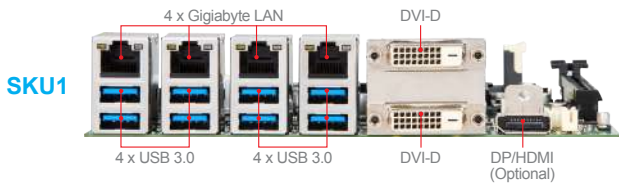
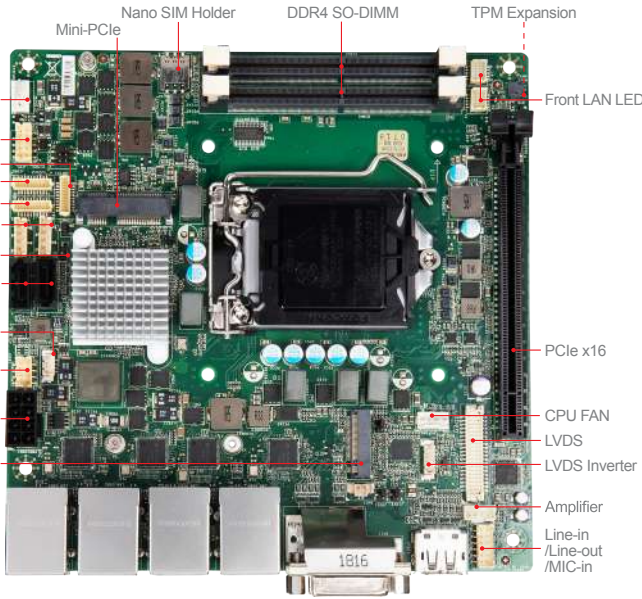
MS-98K1

Mini-ITX with 7th/6th Gen Intel® Kaby Lake/Skylake Processor with Multi-LAN, Expansion Capability & Wide Voltage with High-Performance Solution

NEW

Specifications

		SKU1	SKU2	SKU3
Processor	CPU	7th Gen Intel® Desktop Kaby Lake-S i7-7700/i7-7700T/i5-7500/i5-7500T/i3-7101E/i3-7101TE, Max 65W 6th Gen Intel® Desktop Skylake-S i7-6700/i7-6700TE/i5-6500/i5-6500TE/i3-6100/i3-6100TE/G4400/G4400TE/G3900/G3900TE, Max 65W		
	Frequency	2.3GHz~4.0GHz (Depends on CPU)		
	L2 Cache	2M ~ 8M (Depends on CPU)		
	CPU Type	Socket (LGA 1151)		
	Chipset	Intel® Q170 Express	Intel® H110 Express	
	BIOS	AMI		
Memory	Technology	Dual-channel DDR4 (non-ECC) 2133MHz/2400MHz		
	Max. Capacity	Up to 32 GB		
	Socket	2 x 260-pin SO-DIMMs		
	Controller	Intel® HD Graphics		
Display	Graphic Memory	Shared system memory up to 1.7 GB SDRAM		
	LVDS	1 x Dual channel 18/24-bit		
	DVI	2 (DVI-D)		
	HDMI	1 (Co-lay with DP by Optional)		
	DisplayPort	1		
	Multiple Display	3 independent displays	2 independent displays	
Ethernet	Controller	4 x Intel® I210-AT GbE LAN (Front LAN LED Supported)	4 x Intel® I211-AT GbE LAN (Front LAN LED Supported)	2 x Intel® I211-AT GbE LAN (Front LAN LED Supported)
		4 x USB 3.0	4 x USB 3.0	2 x USB 3.0
Audio	Controller	Realtek® ALC887 HD Audio Codec		
Super I/O	Controller	Fintek F81866AD-I		
H/W Monitor	Watchdog Timer	256-level Watchdog Timer		
	Smart Fan	Yes		
TPM	Controller	Infineon SLB9665TT 2.0	Pin header (Default) Infineon SLB9665TT 2.0 (by BOM option)	
		USB	8 x USB3.0 (rear) 3 x USB2.0 (internal)	4 x USB3.0 (rear) 5 x USB2.0 (4 x rear; 1 x internal)
I/O Interfaces	Serial	4 x COM ports (Internal)	4 x COM ports (Internal)	
		COM1: RS-232/422/485, RI/5V/12V COM2-4: RS-232/422/485, 0V/5V/12V	COM1: RS-232/422/485, RI/5V/12V COM2-4: RS-232, 0V/5V/12V	
	Parallel	N/A		
	GPIO	16-bits (8 x GPI; 8 x GPO), 5V		
	PCIe x16	1 (Maximum 75W Supported)		
Expansion Slot	M.2	1 x M Key (PCIe x4 NVMe, SATA3.0), 2242/2280	1 x M Key (SATA3.0), 2242/2280	
	Mini-PCIe	1 x Full-size (w/ SIM holder)		
Storage	SATA	2 x SATA 3.0		
Power Supply	DC Input	DC-in 12 ~24V		
	AC Input	N/A		
Environment	Operating Temperature	-10 ~ 60°C		
	Operating Humidity	10 ~ 90%, non-condensing		
	Storage Temperature	-20 ~ 80°C		
	Storage Humidity	10 ~ 90%, non-condensing		
Form Factor	Dimensions	170 x 170mm (Mini-ITX)		
	Weight	0.42 kg	0.39 kg	
Certification	EMC	FCC, CE, RCM, VCCI, BSMI (Class A)		
Software Platform	OS Support	Windows 7 (32/64-bit) (Skylake-S Series only)		
		Windows 8.1 (64-bit) (Skylake-S Series only) Windows 10 (64-bit) Linux Fedora 23 (by request) Linux Ubuntu 16.04 (by request)		



Features

- 3 or 2 independent displays with multiple video outputs (2 DVI-D, DP/HDMI, LVDS)
- Supports maximum 4 Intel® GbE LAN
- Supports DDR4-2400MHz SO-DIMM memory up to 32GB
- Supports 2 SATA 3.0 ports, M.2 M Key 2242/2280 for storage
- Supports PCIe x16, and Mini-PCIe slot with SIM Holder
- Supports maximum 8 USB 3.0 ports, 4 COM ports & 16Bit GPIO
- Supports wide voltage DC-in 12~24V

Ordering Information

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Packing List

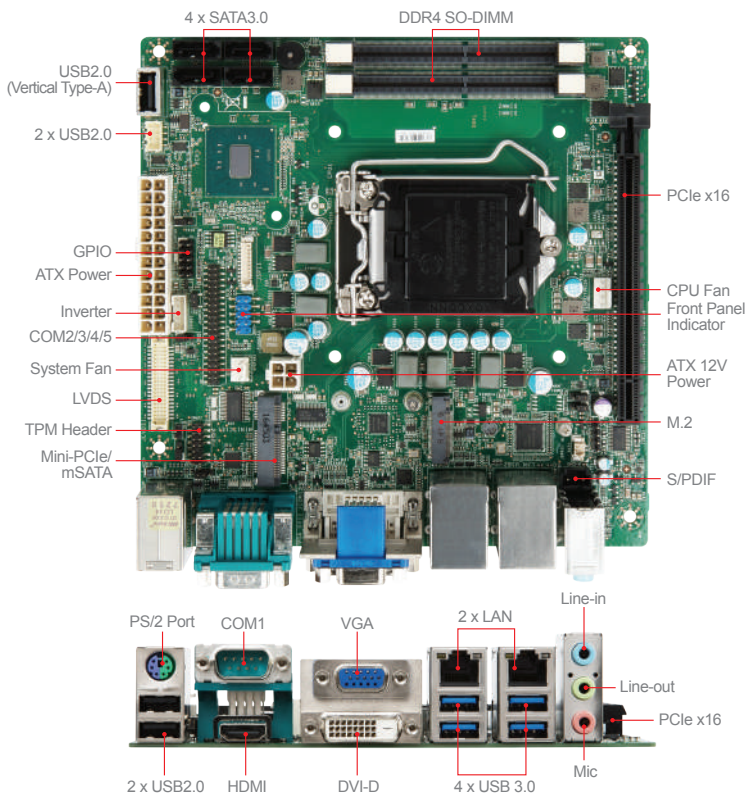
Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

Optional Item

Part Number	Description
Please check MSI IPC website at http://ipc.msi.com for details.	

MS-98E1

Mini-ITX with 7th/6th Gen Intel® Kaby Lake/Skylake Processor with Superior I/O & Expansion Capability for High-Performance Solution



Features

- 3 independent displays with multiple video outputs (LVDS, HDMI, DVI-D, VGA)
 - Supports DirectX 11.1 and Intel® Clear Video Technology (up to 1080P)
 - 4 SATA 3.0 ports for RAID
 - Supports m-SATA function by Mini-PCIe slot
 - Plenty USB ports for more peripherals(USB3.0*4, USB2.0*4, Vertical Type USB2.0*1)
-
- 2 independent displays with multiple video outputs (LVDS, HDMI, DVI-D, VGA)
 - Supports DirectX 11.1 and Intel® Clear Video Technology (up to 1080P)
 - 3 SATA 3.0 ports for faster and high-capacity storage
 - Supports m-SATA function by Mini-PCIe slot
 - Plenty USB ports for more peripherals(USB3.0*4, USB2.0*4, Vertical Type USB2.0*1)

Ordering Information

Part Number	Description
919-98E1-001	V1.1 Intel KabyLake-S/Skylake-S +C236+2*DDR4 LVDS+HDMI+DVI-D+VGA+4*SATAIII+2*GbE LAN+5*COM+1*mini-PCIe +1*M.2+ATX,SINGLE
919-98E1-002	V1.1 OPT:A Intel KabyLake-S/Skylake-S +H110+2*DDR4 LVDS+HDMI+DVI-D+VGA+3*SATAIII+2*GbE LAN+5*COM+1*mini-PCIe +ATX,SINGLE

Packing List

Part Number	Description
K1D-1008261-V03	SATA Cable, 500mm
E21-98E1010-C22	I/O SHIELD

Optional Item

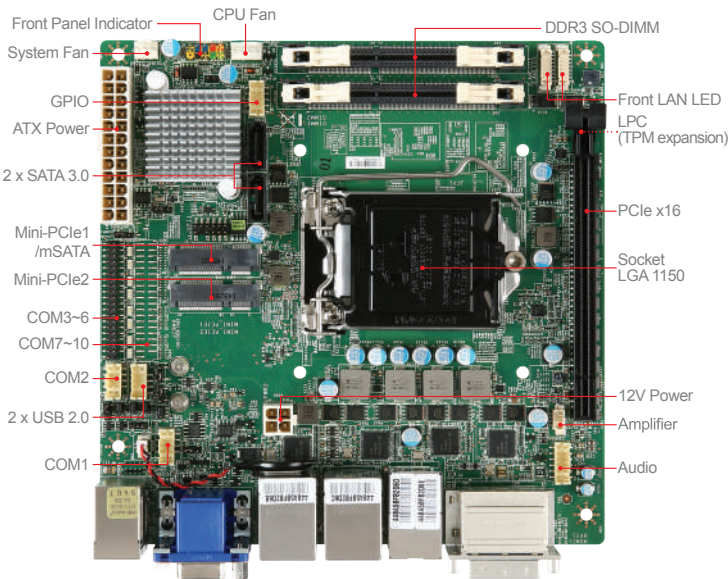
Part Number	Description
K14-1036004-V03	COM Port Cable, 200mm

Processor	C236 SKU	H110 SKU	
	7th/6th Gen Intel® Desktop Kaby Lake/Skylake Xeon/7/5/3/ Pentium®/Celeron® Series Processor, Max. 95W	7th/6th Gen Intel® Desktop Kaby Lake/Skylake Core™ 7/5/3/ Pentium®/Celeron® Series Processor, Max. 95W	
Frequency	2.3GHz~4.0GHz (Depends on CPU)		
L2 Cache	2M ~ 8M (Depends on CPU)		
CPU Type	Socket (LGA 1151)		
Chipset	Intel® C236 Express	Intel® H110 Express	
BIOS	AMI		
Memory	Technology	Dual-channel DDR4 (ECC) 2133MHz/2400MHz (7th Gen)	Dual-channel DDR4 (non-ECC) 2133MHz/2400MHz (7th Gen)
	Max. Capacity	Up to 32GB	
Socket	2 x 260-pin SO-DIMMs		
Controller	Intel® HD Graphics		
Graphic Memory	Shared system memory up to 1.7 GB SDRAM		
Display	LVDS	1	
	eDP	N/A	
	VGA	1	
	DVI	1 (DVI-D)	
	HDMI	1	
	DisplayPort	N/A	
	Multiple Display	3 independent displays	2 independent displays
Display Interface	LVDS up to 1920 x 1200 @60Hz HDMI up to 4096 x 2160 @24Hz DVI-D up to 1920 x 1200 @60Hz VGA up to 1920 x 1200 @60Hz		
Ethernet	Controller	1 x Intel® I219-LM GbE-PHY 1 x Intel® I211-AT PCIe GbE LAN(Co-lay I210-AT)	
Audio	Controller	Realtek® ALC887 HD Audio Codec	
Super I/O	Controller	Fintek F81866AD-I	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	
	Smart Fan	Yes	
TPM	Controller	Pin header	
I/O Interface	USB	4 x USB 3.0 (4 x rear) 4 x USB 2.0 (2 x rear; 2 x internal) 1 x USB 2.0 (Vertical, internal)	
	Serial	5 x COM ports (COM1: rear, COM2-4: internal) COM1: RS-232/422/485, 0V/5V/12V COM2-5: RS-232, 0V/5V/12V	
	Parallel	N/A	
	PS/2	1	
Expansion Slot	GPIO	8-bits (4 x GPI, 4 x GPO), 5V	
	PCIe x 16	1	
	M.2	1 x M Key (PCIe x4, SATA3.0), 2242	N/A
Storage	Mini-PCIe	1 x Full-size, mSATA	
	SATA	4 x SATA 3.0	3 x SATA 3.0
mSATA	1 (shared w/ Mini-PCIe)		
Power Supply	DC	N/A	
ATX	ATX-Power 24P, 12V-4P		
Environment	Operating Temperature	0 ~ 60°C	
	Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C	
Form Factor	Storage Humidity	10 ~ 90%, non-condensing	
	Dimensions	170 x 170mm (Mini-ITX)	
Weight	0.37 kg		
Certification	EMC	FCC, CE, RCM, VCCI, BSMI	
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Fedora 23 (by request) Linux Ubuntu 16.04 (by request)	

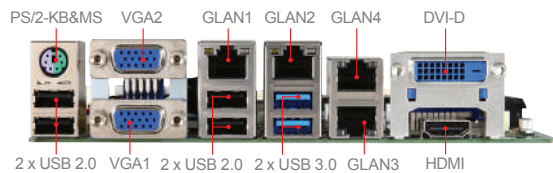
Semi-rugged Terminal
POS System
Panel PC
HMI
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

MS-98H1

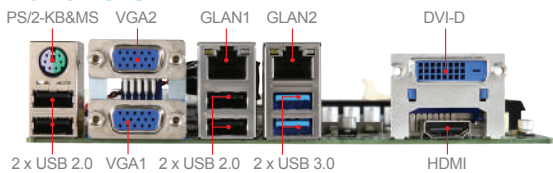
Mini-ITX with 4th Gen Intel® Desktop Haswell/Haswell Refresh Platform for 4 GLAN, 10 COM & 3 Independent Displays



4 LAN+6 COM SKU



2 LAN+10 COM SKU



Features

- Intel® Desktop Haswell & Haswell Refresh Core™ i7/i5/i3/ Pentium®/Celeron® Processor
- Supports 4 Intel® GbE LAN
- 3 or 2 independent displays with dual VGA, DVI-D, and HDMI outputs
- Support 10 COM ports (all with power)
- 2 SATA 3.0, 8 USB ports, 1 PCIe x16 and 2 Mini-PCIe

Ordering Information

Part Number	Description
919-98H1-101	MS-98H1 V1.0 Mini-ITX, Intel Haswell Processor+Intel H81, 2*DDR3/DDR3L SO-DIMM+1*DVI-D+1*HDMI+2*VGA+4*GbE LAN+6*COM+8*USB Port ,ATX power
919-98H1-102	MS-98H1 V1.0 Mini-ITX, Intel Haswell Processor+Intel H81, 2* DDR3/DDR3L SO-DIMM+1*DVI-D+1*HDMI+2*VGA+2*GbE LAN+10*COM+8*USB Port ,ATX power
919-98H1-103	MS-98H1 V1.0 Mini-ITX, Intel Haswell Processor+Intel Q87, 2* DDR3/DDR3L SO-DIMM+1*DVI-D+1*HDMI+2*VGA+2*GbE LAN+10*COM+8x USB Port ,ATX power

Packing List

Part Number	Description	Quantity
E21-98H10X0-C22	I/O SHEILDING	1

Specifications

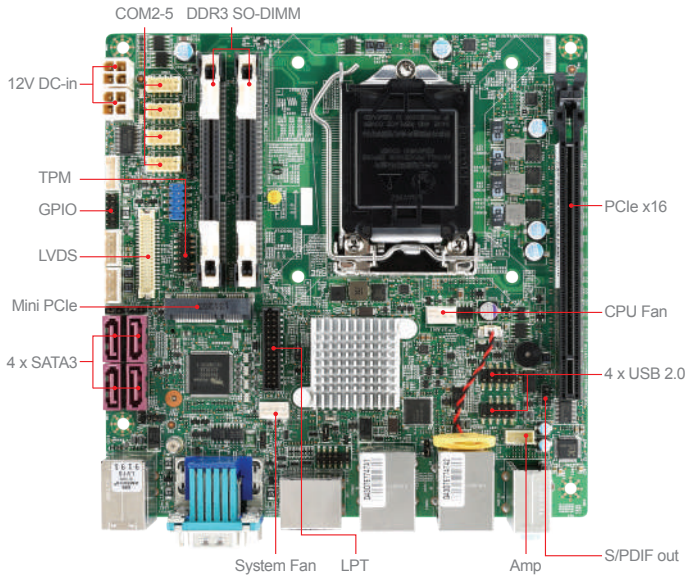
Processor	CPU	4th Gen Intel® Desktop Haswell/ Haswell Refresh Core™ i7/i5/i3/Celeron®/ Pentium® Processor, Max. 95W
	Frequency	2.4GHz~4.0 GHz (Depends on CPU)
	L2 Cache	2M~8M (Depends on CPU)
	CPU Type	Socket (LGA 1150)
	Chipset	Intel® Q87/H81 Express
Memory	BIOS	AMI
	Technology	Dual-channel DDR3/DDR3L 1066/1333/1600MHz
	Max. Capacity	Up to 16GB
	Socket	2 x 204-pin SO-DIMMs
Display	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	VGA	2
	DVI	1 (DVI-D)
	HDMI	1
	Multiple Display	3 independent displays (Q87 SKU) 2 independent displays (H81 SKU)
	Display Interface	VGA1 up to 1920 x 1080 @60Hz VGA2 up to 1920 x 1080 @60Hz DVI-D up to 1920 x 1200 @60Hz HDMI up to 1920 x 1200 @60Hz
Ethernet	Controller	4 x Intel® I210-AT GbE LAN 2 x Intel® I211-AT GbE LAN (depends on SKU)
Audio	Controller	Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F81866D
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Pin header
I/O Interface	USB	2 x USB 3.0 (rear) 6 x USB 2.0 (2 x rear; 2 x internal)
	Serial	10 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232/422/485, 0V/5V/12V COM3~6: RS-232, 0V/5V/12V COM7~10: RS-232, 0V/5V/12V (depends on SKU)
	Parallel	N/A
	PS/2	1
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
	PCIe x16	1
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Full-size(W/ mSATA) 1 x Half-size
Storage	SATA	2 x SATA 3.0
	mSATA	1 (shared w/ Mini-PCIe)
Power Supply	DC	N/A
	ATX	ATX-Power 24P, 12V-4P
Environment	Operating Temperature	-10 ~ 60°C
	Operating Humidity	10~90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10~90%, non-condensing
Form Factor	Dimensions	170 x 170mm (Mini-ITX)
	Weight	0.37 kg
Certification	EMC	FCC Class A, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows XP (32-bit) Windows 7 (32/64-bit) Windows 8/8.1 (32/64-bit) Windows 10 (64-bit) Linux Fedora 19 (by request) Linux Ubuntu 13.04 (by request)

Optional Item

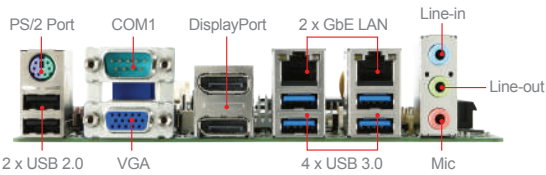
Part Number	Description
K14-1036004-V03	COM Port Cable, 200mm

MS-98C7

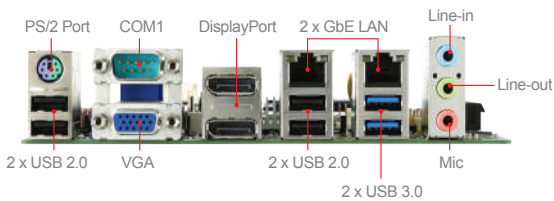
Mini-ITX with 4th Gen Intel® Haswell/Haswell Refresh Platform for Multi-Displays & High-Performance Solution



MS-98C7 with Q87



MS-98C7 with H81



Features

- 4th Gen Intel® Core™ i7/i5/i3/Celeron®/Pentium® processors (formerly Haswell) w/ Intel® H81/Q87 chipset
- 3 independent displays: VGA, LVDS and dual DisplayPorts
- Supports DDR3/DDR3L memory up to 16GB
- Supports dual Intel® GbE LAN

Ordering Information

Part Number	Description
919-98C7-005	MS-98C7 10 Mini-ITX, Q87, Haswell Mbl, 2x DDR3 SO-DIMM, LVDSx1/VGAx1/DPx2, 4x SATA III, 2x GbE LAN, 10x USB, 5x COM DC Power (ROHS)
919-98C7-006	MS-98C7 10 OPT A Mini-ITX, H81, Haswell Mbl, 2x DDR3 SO-DIMM, LVDSx1/VGAx1/DPx2, 2x SATA III, 1x SATA II, 2x GbE LAN, 8x USB, 5x COM DC Power (ROHS)

Packing List

Part Number	Description
E21-98C7010-C22	I/O shield
K14-1018003-V03	INT COM PORT CABLE, 300mm
K1D-1008261-V03	INT SATA CABLE, 500mm
K1D-3008006-V03	INT SATA CABLE, POWER, 200/300mm
K39-3002004-E06	EXT OTHER CABLE, PS2 Y-CABLE/2/190mm

Specifications

Processor	CPU	4th Gen Intel® Desktop Haswell/ Haswell Refresh Core™ i7/i5/i3/Celeron®/ Pentium® Processor, Max. 65W
	Frequency	2.2GHz~4.4GHz (Depends on CPU)
	L2 Cache	2M ~ 8M (Depends on CPU)
	CPU Type	Socket (LGA 1150)
	Chipset	Intel® H81/Q87 Express
Memory	BIOS	AMI
	Technology	Dual-channel DDR3/DDR3L 1333/1600MHz
	Max. Capacity	Up to 16GB
	Socket	2 x 204-pin SO-DIMMs
	Controller	Intel® HD Graphics
Display	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual channel 24-bit (add chrontel 7511B chipset)
	VGA	1
	DisplayPort	2
	Multiple Display	2 independent displays (H81 SKU) 3 independent displays (Q87 SKU)
Ethernet	Display Interface	LVDS up to 1920 x 1200 @60Hz VGA up to 1920 x 1200 @60Hz DP up to 3840 x 2160 @60Hz
	Controller	1 x Intel® I217-LM GbE PHY (iAMT 9.0 supported) 1 x Intel® I210-AT PCIe GbE LAN
Audio	Controller	Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F81866D
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Pin header
I/O Interface	USB	Q87: 6 x USB 2.0 (4 x internal; 2 x rear); 4 x USB 3.0 (rear) H81: 6 x USB 2.0 (2 x internal; 4 x rear); 2 x USB 3.0 (rear)
	Serial	5 x COM ports (COM1: rear, COM2~5: internal) COM1: RS-232/422/485, 0V/5V/12V COM2: RS-232, w/ WOR function COM3~5: RS-232, 0V/5V/12V
	Parallel	1 (Pin header)
	PS/2	1
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
	PCIe x16	1 (up to 75W)
	M.2	N/A
Expansion Slot	Mini-PCIe	1 x Full-size(W/ mSATA) 1 x Half-size
	SATA	Q87: 4 x SATA 3.0 H81: 2 x SATA 3.0; 1 x SATA 2.0
Storage	mSATA	1 (shared w/ Mini-PCIe)
	DC	DC-in 12V
Power Supply	ATX	N/A
	Operating Temperature	0 ~ 60°C
Environment	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	170 x 170mm (Mini-ITX)
	Weight	0.37 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows XP (32/64-bit) Windows 7 (32/64-bit) Windows 8 (32/64-bit) Linux Fedora 19 (by request)

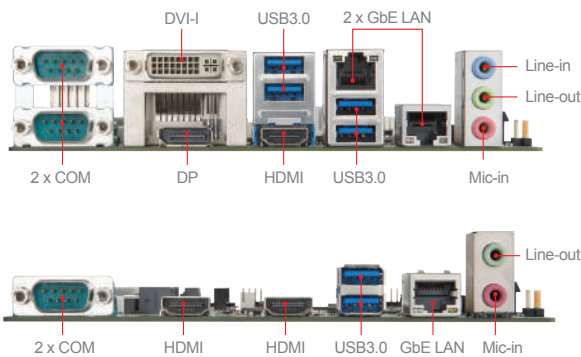
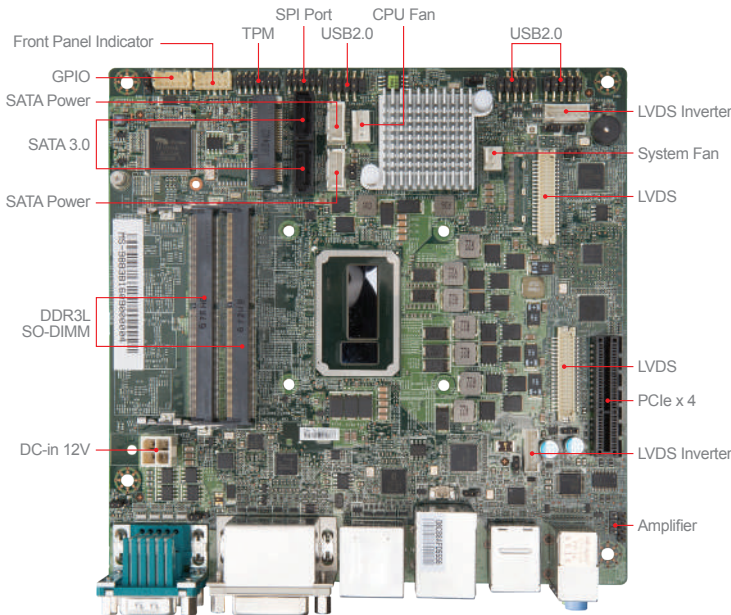
Optional Item

Part Number	Description
K10-3004215-V03	DC-In Cable, 160mm
K1B-3008012-E06	USB 2.0 Cable, 330mm

MS-98B3

Mini-ITX SBC with Intel® Skylake/Kaby Lake for Multi Displays and High Graphic Performance Solutions

NEW



Features

- Embedded Motherboard for high graphic performance application, medical, gaming or high-end digital signage
- Supports Intel® Skylake/Kaby Lake Mobile H Core™ i series & equip Intel® GT4e graphic engine by CPU SKU, up to 45 W
- Full HW decode & encode HEVC H.265 high-efficient video media
- Supports 2 x DDR4, 1866/2133 MHz memory up to 32GB, ECC by SKU with CM236 PCH
- Multi displays support up to 4K/2K HD resolution, 60Hz
- Supports dual GbE LAN, iAMT 11.0 (Intel IOTG Core i5/i7 CPU + QM170/CM236)
- Supports 1xPCIe(x4), 6xUSB2.0, 4xUSB3.0, 2xRS-232/422/485, 2xSATA3.0, 2xmini-PCIe

Ordering Information

Part Number	Description
Coming soon	

Packing List

Part Number	Description	Quantity
Coming soon		

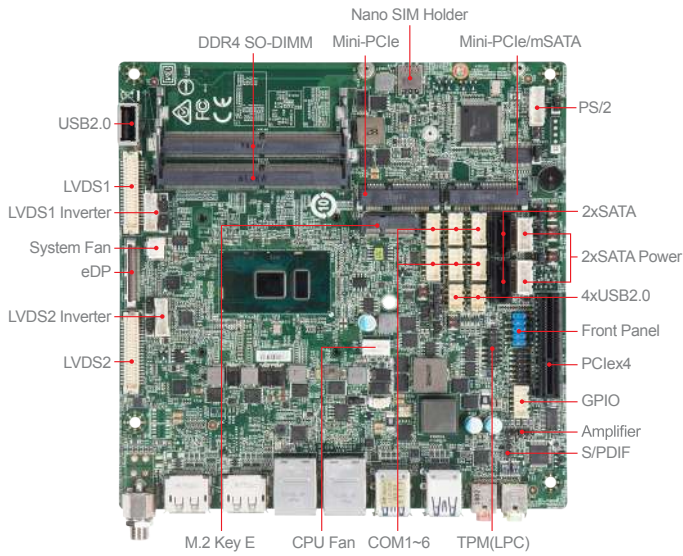
Specifications

Processor	CPU	6th/7th Gen Intel® Mobile-H Kaby Lake/ Skylake Core™ Xeon® / Core™ i7/i5/i3/ Celeron® Processor, Max. 45W	
	Frequency	2.3GHz-3.9 GHz (Depends on CPU)	
	L2 Cache	3M~8M (Depends on CPU)	
	CPU Type	BGA	
	Chipset	Intel® HM170/QM170/CM236 Express	
Memory	BIOS	AMI	
	Technology	Dual-channel DDR4 1866/2133 MHz	
	Max. Capacity	Up to 32GB	
Display	Socket	2 x 260-pin SO-DIMMs	
	Controller	Intel® Iris™ Graphics/HD Graphics (depends on CPU)	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	LVDS	2 x Dual channel 24-bit (LVDS1 co-design with eDP, LVDS2 co-design with DVI-D)	
	eDP	1	
	DVI	1 (DVI-I)	N/A
	HDMI	2(1 x HDMI2.0, 1 x HDMI1.4 colay with DP)	
	DisplayPort	1(Colay with HDMI1.4)	
	Multiple Display	3 independent displays	
	Display Interface	LVDS up to 1920 x 1200 @60Hz	LVDS up to 1920 x 1200 @60Hz
eDP up to 4096 x 2160 @60Hz		eDP up to 4096 x 2160 @60Hz	
Ethernet	Controller	Intel® I219-LM LAN PHY Intel® I210 colay I211 LAN	Intel® I219-LM LAN PHY
	Controller	Realtek® ALC887 HD Audio (co-lay ALC888)	
Super I/O	Controller	Fintek F81866AD-I	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	
	Smart Fan	Yes	
TPM	Controller	Pin header(default) TPM2.0 infineon SLB 9665 (By BOM option)	
I/O Interface	USB	4 x USB3.0 (rear) 6 x USB2.0 (inter- nal)	2 x USB3.0 (rear) 6 x USB2.0 (inter- nal)
	Serial	2 x COM ports (rear) RS-232/422/485, 0V/5V/12V	1 x COM port (rear) RS-232/422/485, 0V/5V/12V
	PS/2	N/A	
Expansion Slot	GPIO	8-bits (4 x GPI; 4 x GPO),5V	
	PCIe x4	1	
	PCI	N/A	
Storage	M.2	N/A	
	Mini-PCIe	1 x Full-size colay mSATA 1 x Half-size	
Power Supply	SATA	2 x SATA3.0	
	mSATA	1 (Support by mini PCIe slot)	
Environment	DC	DC-in 12V	
	ATX	N/A	
	Operating Temperature	0 ~ 60°C	
Form Factor	Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing	
Certification	Dimensions	170 x 170mm (Mini-ITX)	
	Weight	0.37 kg	
Software Platform	EMC	FCC, CE, RCM, VCCI, BSMI	
	OS Support	Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Kernel 4.4	

MS-98J4

Mini-ITX with Intel® Kaby Lake/Skylake ULT Platform for Low Power, Low Profile, Multi-Displays and High Performance Solutions

NEW



SKU1: 2HDMI



SKU2: 2DP



SKU3: 1DP



Features

- Intel® Kaby Lake-U & Skylake-U (TDP-15W), Dual Core/Quad Core
- Support 2*DDR4 SO-DIMM up to 32GB 2133MHz Memory
- 3 independent displays with 2 x LVDS available (DP/HDMI, LVDS/DP/HDMI2.0, eDP/LVDS)
- Support 2 x Intel GbE LAN, 4 x USB 3.0, 5 x USB 2.0, 6 x COM (w/ Power)
- Support 2*SATA3.0, 1*M.2 (M key) , 1*M.2 (E key), 2*Mini-PCIe Full-size Slots (one shared mSATA; one w/SIM holder)
- Support DC-In 12V~24V (OVP & OCP)
- Support TPM2.0
- Low profile design, optional support low profile thermal solution

Ordering Information

Part Number	Description
919-98J4-101	MS-98J4\609-98J4-030\809-98J4-105 VER:10 OPT:C, Mini-ITX, KabyLake Core i5-8250U, 2*DDR4, 1*PCIex4, 2*HDMI, 2*LVDS, 1*eDP, 5*USB2, 4*USB3, 4*COM, 2*Mini-PCIe, 1*M.2 E Key, 1*M.2 M Key, 2*LAN, 2*SATA, DC Jack, 1*SATA CABLE, I/O SHIELD, DRIVER CD, BULK, For Channel
919-98J4-102	MS-98J4\609-98J4-010\809-98J4-106 VER:10 OPT:A, Mini-ITX, KabyLake Core i5-7300U, 2*DDR4, 1*PCIex4, 2*DP, 2*LVDS, 1*eDP, 5*USB2, 4*USB3, 4*COM, 2*Mini-PCIe, 1* M.2 E Key, 1*M.2 M Key, 2*LAN, 2*SATA, DC Jack, 1*SATA CABLE, I/O SHIELD, DRIVER CD, BULK, For Channel
919-98J4-103	MS-98J4\609-98J4-020\809-98J4-107 VER:1.0 OPT:B, Mini-ITX, Skylake Core i3-6100U, 2*DDR4, 1*DP, 2*LVDS, 4*USB2, 4*USB3, 2*COM, 2*Mini-PCIe, 1*M.2 E Key, 1*LAN, 2*SATA, DC CONN, 1*SATA CABLE, 1*POWER CABLE, I/O SHIELD, DRIVER CD, BULK, For Channel

Packing List

Part Number	Description
K1D-1012064-V03	SATA Cable ,200mm
K10-3004215-V03	DC Power Cable, 160mm
E21-98J4010-C22	I/O Shield(SKU1, 2xHDMI)
E21-98J4020-C22	I/O Shield(SKU2, 2xDP)
E21-98J4030-C22	I/O Shield(SKU3, 1xDP)
G71-SEDC188-N56/X03	Driver CD

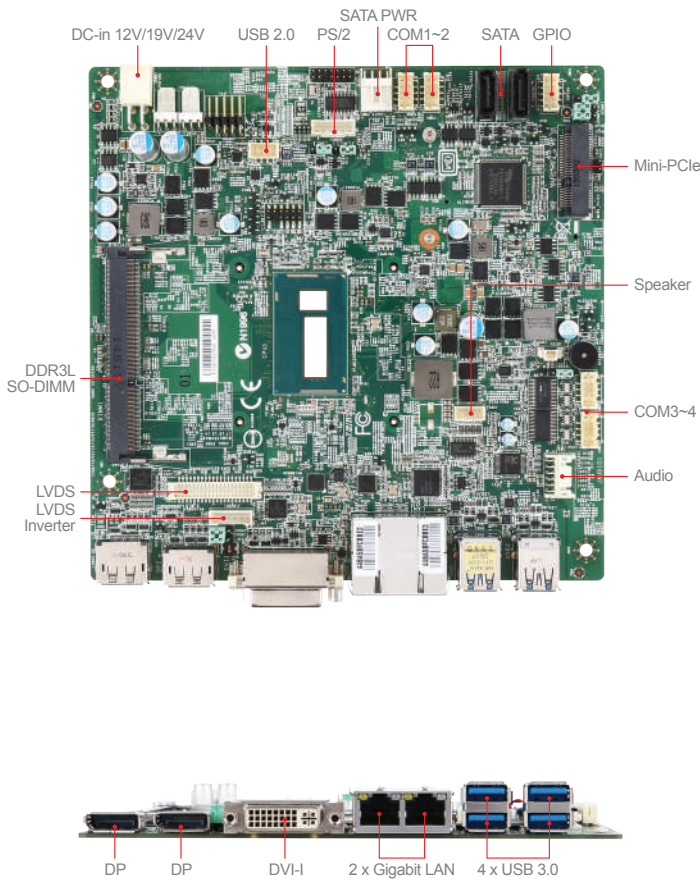
Specifications

Processor	CPU	7th/6th Gen Intel® Mobile Kaby Lake/Skylake-ULT Core™ i7/i5/i3/Celeron® Processor,DC/ QC, Max. 15W		
	Frequency	Depends on CPU		
	L2 Cache	Depends on CPU		
	CPU Type	BGA		
	Chipset	Integrated		
Memory	BIOS	AMI		
	Technology	Dual-channel DDR4 2133 MHz SDRAM		
	Max. Capacity	Up to 32GB		
	Socket	2 x 260-pin SO-DIMMs		
	Controller	Intel® HD Graphics		
Display	Graphic Memory	Shared system memory up to 1.7 GB SDRAM		
	LVDS	2 x Dual channel 24-bit (LVDS1 co-design with eDP, LVDS2 co-design with DP2/HDMI2.0)		
	eDP	1 (Co-design with LVDS1)		
	VGA	N/A		
	DVI	N/A		
	HDMI	2 (1 x HDMI1.4 colay with DP1, 1 x HDMI2.0 colay with DP2)		
	DisplayPort	2 (DP1 colay with HDMI1.4, DP2 colay with HDMI2.0)		
	Multiple Display	3 independent displays		
	Display Interface	LVDS up to	1920 x 1200 @60Hz	
		eDP up to	4096 x 2304 @60Hz	
DP up to		4096 x 2304 @60Hz		
Ethernet	Controller	1 x Intel® I219LM GbE LAN PHY	1 x Intel® I211-AT GbE LAN	
		1 x Intel® I211-AT/ I210-AT GbE LAN		
Audio	Controller	Realtek® ALC887/888S HD Audio Codec		
Super I/O	Controller	Fintek F81866AD-I		
H/W Monitor	Watchdog Timer	256-level Watchdog Timer		
	Smart Fan	Yes		
TPM	Controller	Infineon SLB9665TT2.0(default) Pin header (By BOM option)		
I/O Interface	USB	4 x USB 3.0 (rear)	4 x USB 3.0 (rear)	
		5 x USB 2.0 (4 x internal, 1 x vertical connector)	4 x USB 2.0 (4 x internal)	
	Serial	6 x COM Ports (Internal)	COM1~2: RS-232/422/485, 0V/5V/12V, RI support (RS-232/422/485 by Optional , RS485 support 1000M+)	2 x COM Ports (Internal)
		COM3~4: RS-232, 0V/5V/12V		COM3~4: RS-232, 0V/5V/12V
		COM3~6: RS-232, 0V/5V/12V (depends on SKU)		
		Parallel	N/A	
		PS/2	1 (pin header)	
		GPIO	8-bits (4 x GPI; 4 x GPO), 5V	
	Expansion Slot	PCIe x16	N/A	
		PCIe x4	1	N/A
PCIe x1		N/A		
M.2		1 x E Key 2230 for Wi-Fi/BT module 1 x M Key (PCIe x4 NVMe, SATA3.0), 2280 for SSD	1 x E Key 2230 for Wi-Fi/BT module	
Storage	Mini-PCIe	1 x Full-size(w/mSATA) 1 x Full/Half-size(w/ SIM Holder)		
	SATA mSATA	2 x SATA 3.0 1 (shared w/ Mini-PCIe)		
Power Supply	DC	DC-in 12V~24V		
	ATX	N/A		
Environment	Operating Temperature	-10 ~ 60°C		
	Operating Humidity	10 ~ 90%, non-condensing		
	Storage Temperature	-20 ~ 80°C		
	Storage Humidity	10 ~ 90%, non-condensing		
Form Factor	Dimensions	170 x 170mm (Mini-ITX)		
	Weight	0.34 kg		
Certification	EMC	FCC, CE, RCM, VCCI, BSMI		
Software Platform	OS Support	Windows 7 (32/64-bit) (Skylake-U Only)		
		Windows 8.1 (64-bit) (Skylake-U Only) Windows 10/ Windows 10 IoT Enterprise (64-bit) Linux Kernel 4.x (Fedora 25 & Ubuntu 16.04)		

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

MS-98H4

Mini-ITX with 5th Gen Intel® Broadwell ULT Platform for Multi-Displays



Features

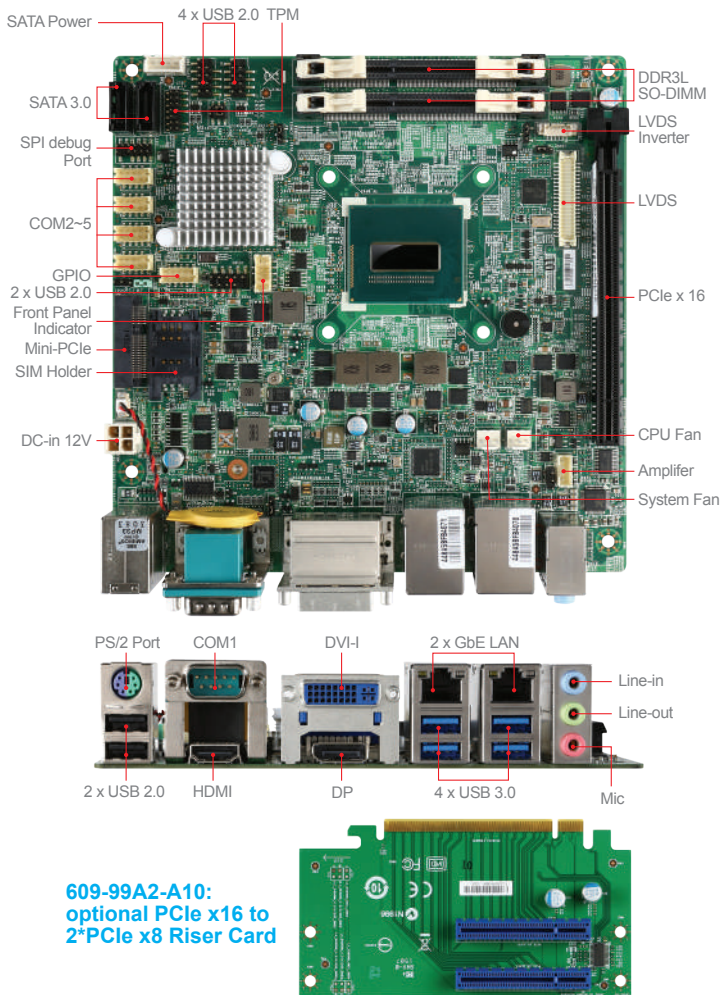
- 5th Gen Intel® Broadwell ULT SoC processors
- Embedded Mini-ITX Motherboard for Fanless computer in Digital Signage, touch panel PC, tablet application
- Supports DDR3L 1600MHz SO-DIMM memory up to 16GB
- 3 independent displays: LVDS, HDMI, DP, VGA, DVI-D
- 2 x GbE LAN, 4 x USB 3.0, 4 x COM (w/ Power)
- 2xSATA 3.0, 2xfull-size Mini-PCle (one shared mSATA or SIM holder)
- Supports wide voltage DC-in 12/19/24V

Specifications

Processor	CPU	5th Gen Intel® Mobile Broadwell ULT Core™ i3/i5/i7 processor
	Frequency	Depends on CPU
	L2 Cache	Depends on CPU
	CPU Type	BGA
	Chipset	Integrated
Memory	BIOS	AMI
	Technology	Dual-channel DDR3L 1333/1600 MHz
	Max. Capacity	Up to 16GB
Display	Socket	2 x 204-pin SO-DIMMs
	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	1 x Dual channel 18/24-bit (Colay with DP)
	eDP	N/A
	VGA	1 (shared w/ DVI-D)
	DVI	1 (DVI-D, shared w/ VGA)
	HDMI	N/A
	DisplayPort	2
	Multiple Display	3 independent displays
Display Interface		LVDS up to 1920 x 1200 @60Hz HDMI up to 4096 x 2304 @30Hz DP up to 3840x 2160 @60Hz DVI-I up to 1920x 1200 @60Hz
Ethernet	Controller	1 x Intel® I218LM GbE LAN PHY 1 x Intel® I210-AT GbE LAN
Audio	Controller	Realtek® ALC887/888S HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Infineon SLB9635TT 1.2 (by BOM option)
I/O Interface	USB	4 x USB 3.0 (rear) 2 x USB 2.0 (internal)
	Serial	4 x COM ports (by SKU) COM1: RS-232/422/485, 0V/5V/12V COM2~4: RS-232, 0V/5V/12V
	Parallel	N/A
	PS/2	1 (pin header)
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
	PCIe x16	N/A
Expansion Slot	PCIe x4	N/A
	PCIe x1	N/A
	PCI	N/A
	M.2	N/A
	Mini-PCle	2 x Full-size (one w/ SIM holder or mSATA)
	SATA	2 x SATA 3.0
	IDE	N/A
Storage	eSATA	N/A
	CFast	N/A
	mSATA	1 (shared w/ Mini-PCle)
	CompactFlash	N/A
	DC	DC-in 12V/19V/24V
Power Supply	ATX	N/A
	Operating Temperature	-10 ~ 60°C
Environment	Operating Humidity	10~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10~ 90%, non-condensing
Form Factor	Dimensions	170 x 170mm (Mini-ITX)
	Weight	0.37 kg
Certification	EMC	FCC, CE, RCM, VCCI
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Linux Fedora Core 21 Linux Ubuntu 15.04

MS-98G5

Mini-ITX SBC with 4th Gen Intel® Core™, Intel® HM86/QM87, Multi-Displays & High-Performance for Digital Signage & Gaming Solution



609-99A2-A10:
optional PCIe x16 to
2*PCIe x8 Riser Card

Features

- Embedded Motherboard for high graphic performance application, medical, gaming or high-end digital signage
- Intel Haswell/Broadwell Mobile Core i7/i5/i3/Celeron Processor
- 3 independent displays with HDMI, DP, DVI-I, and LVDS
- Dual GbE LAN with iAMT (EIA+QM87)
- 2 x DDR3L 1333/1600 MHz memory up to 16GB
- 1 x PCIe(x16) with riser card extends to x8+x8 or x8+x4+x4
- 8 x USB 2.0; 4 x USB 3.0; 5 x COM; SATA 3.0 supported
- 2 x full-size Mini-PCIe (one shared mSATA or SIM holder)
- Auto-switch DC power 12/19V

Ordering Information

Part Number	Description
919-98G5-001	MS-98G5/609-98G5-010/809-98G5-003 STD VER 1.0, OPT A, Intel i5-4210H, HM86, 2*DDR3L, 1*COOLER, 1*COM CABEL, 1*I/O SHIELD, 1*SATA CABLE, 1*PS2 Y CABLE
919-98G5-002	MS-98G5/609-98G5-020/809-98G5-003 STD VER 1.0, OPT E, Intel i5-4410E, QM87, 2*DDR3L, 1*COOLER, 1*COM CABEL, 1*I/O SHIELD, 1*SATA CABLE, 1*PS2 Y CABLE
919-98G5-003	MS-98G5/609-98G5-030/809-98G5-003 STD VER 1.0, OPT F, Intel i7-4700EQ, QM87, 2*DDR3L, 1*COOLER, 1*COM CABEL, 1*I/O SHIELD, 1*SATA CABLE, 1*PS2 Y CABLE

Packing List

Part Number	Description
E32-2100030-K08	Cooler
E21-98G5010-C22	I/O Shielding
K39-3002004-E06	PS2 Y-cable, 190mm
K14-1018003-V03	COM Port Cable, 300mm
K1D-1012064-V03	SATA Cable, 200mm
G71-SEDC140-X03	CD

Specifications

Processor	CPU	4th Gen Intel® Mobile Haswell-H Core™ i7/i5/i3/Celeron® Mobile Processor, Max. 47W
	Frequency	2.2GHz~3.6 GHz (Depends on CPU)
	L2 Cache	3M~6M (Depends on CPU)
	CPU Type	BGA
	Chipset	Intel® HM86/QM87 Express
Memory	BIOS	AMI
	Technology	Dual-channel DDR3L 1333/1600 MHz SDRAM
	Max. Capacity	Up to 16GB
Display	Socket	2 x 204-pin SO-DIMMs
	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual channel 24-bit
	DVI	1 (DVI-I)
	HDMI	1
	DisplayPort	1
	Multiple Display	3 independent displays
	Display Interface	LVDS up to 1920 x 1200 @60Hz DVI up to 1920 x 1200 @60Hz DP up to 3840 x 2160 @60Hz HDMI up to 3840 x 2160 @24Hz
	Ethernet	Controller
Audio	Controller	Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Pin header
I/O Interface	USB	4 x USB3.0 (rear) 8 x USB2.0 (6 x internal; 2 x rear)
	Serial	5 x COM ports (COM1: rear, COM2~5: internal) COM1: RS-232/422/485, 0V/5V/12V COM2~5: RS-232
	PS/2	1
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
Expansion Slot	PCIe x16	1 (up to 75W, w/ riser card to extend to x8+x8 or x8+x4+x4)
	PCI	N/A
	M.2	N/A
	Mini-PCIe	QM87: 1 x Full-size, mSATA (w/ SIM Holder) 1 x Half-size HM86: 1 x Half-size
Storage	SATA	QM87: 2 x SATA 3.0 HM86: 1 x SATA 3.0; 1 x SATA 2.0
	mSATA	1
Power Supply	DC	DC-in 12V/19V
	ATX	N/A
Environment	Operating Temperature	0 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	170 x 170mm (Mini-ITX)
	Weight	0.35 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8 (32-bit)

MS-98B1

Mini-ITX with Intel® Apollo Lake SoC Series for Fanless, Low-Power, High-Performance, Multi-Displays & Multi-Functions Solution

NEW

Specifications

Processor	CPU	Intel® Celeron® Processor N3350, DC, 6W Intel® Atom™ x5 Processor E3940, QC, 9.5 W
	Frequency	N3350, 1.1 GHz, up to 2.4 GHz E3940, 1.6 GHz, up to 1.8 GHz
	L2 Cache	2MB
	CPU Type	BGA
	Chipset	Integrated in SoC
Memory	BIOS	AMI
	Technology	Dual-channel DDR3L 1866 MHz
Display	Max. Capacity	Up to 8GB
	Socket	2 x 204-pin SO-DIMMs
	Controller	Intel® HD Graphics
Display	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	1 x Dual channel 18/24-bit (Signal shared w/ eDP)
	eDP	1 (by BOM option)
	VGA	N/A
	DVI	N/A
	HDMI	1 (Co-lay DP)
	DisplayPort	2 (One Signal shared w/ eDP)
	Multiple Display	3 independent displays
	Display Interface	LVDS up to 1920 x 1200 @60 Hz eDP up to 4096 x 2160 @60Hz HDMI up to 3840 x 2160 @30Hz DP up to 4096 x 2160 @60Hz
	Ethernet	Controller
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec
Super I/O	Controller	Fintek F81867AD-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Pin header (default) Infineon SLB9665TT 2.0 (by BOM option)
	I/O Interface	USB
Serial		6 x COM ports (Internal) COM1~2: RS-232/422/485, 0V/5V/12V COM3~6: RS-232, w/o Power
Parallel		N/A
PS/2		1 (pin header)
GPIO		16-bits (8 x GPI; 8 x GPO), 5V
PCIe x16		N/A
PCIe x4		N/A
Expansion Slot	PCIe x1	1
	PCI	N/A
	M.2	1 x M Key (SATA 3.0), 2242 1 x E Key (PCIe x1, USB2.0), 2230
	Mini-PCIe	N/A
Storage	SATA	2 x SATA 3.0 (SATA2 share with M.2 M Key)
	mSATA	N/A
Power Supply	DC	DC-in 12V/19/24V
	ATX	N/A
Environment	Operating Temperature	-10 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	170 x 170mm (Mini-ITX)
	Weight	0.37 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)

Features

- Intel® Apollo Lake/Apollo Lake-I Series SoC
- 3 independent displays : 1 x LVDS/eDP, 2 x DP, 1 x HDMI (Co-lay DP) for flexible display applications
- Supports Dual DDR3L 1866MHz SO-DIMM memory up to 8GB
- Supports Dual SATA 3.0 ports, M.2 M Key 2242 for storage
- Supports Dual Intel® GbE LAN, PCIe x1 and M.2 E Key 2230
- Supports 6 COM ports, 9 USB ports & 16Bit GPIO
- TPM supported with onboard chip or pin header
- Supports DC-in 12V/19/24V

Ordering Information

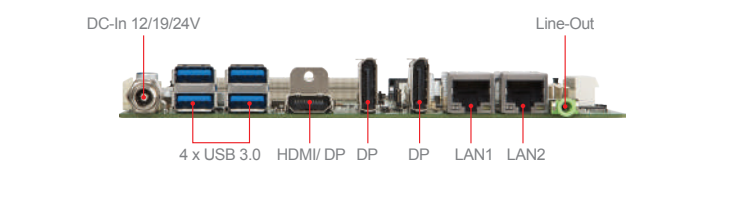
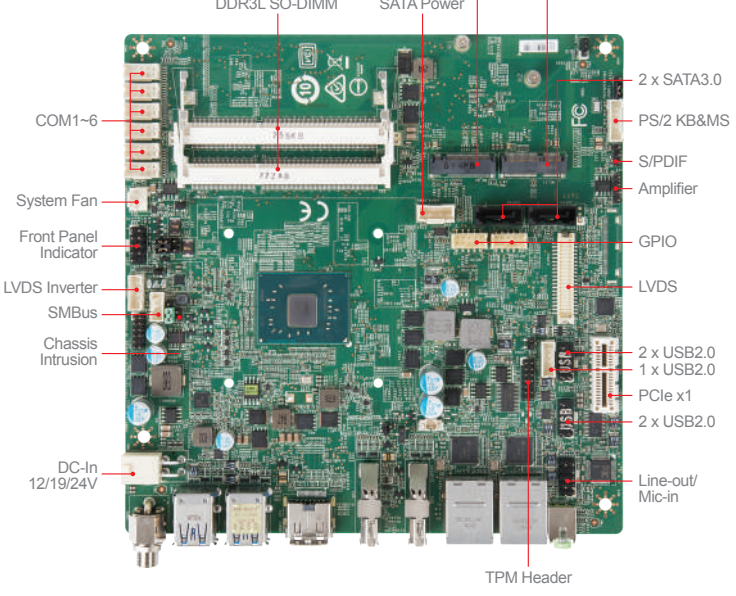
Part Number	Description
919-98B1-101	MS-98B1 10 OPT:A Intel E3940, DP+DP+HDMI+LVDS, 2*DDR3L SO-DIMMs, 2*LAN, 2*SATA 3.0, Audio, 2*M.2 Slot, 4*USB 3.0, 5*USB 2.0, PCIe x1, DC-in 12V/19V/24V, BULK
919-98B1-102	MS-98B1 10 OPT:C Intel N3350, DP+DP+HDMI+LVDS, 2*DDR3L SO-DIMMs, 2*LAN, 2*SATA 3.0, Audio, 2*M.2 Slot, 4*USB 3.0, 5*USB 2.0, PCIe x1, DC-in12V/19V/24V, BULK

Packing List

Part Number	Description	Quantity
K14-1009062-V03	COM Port Cable, 250mm	1
K1D-1012115-V03	SATA Cable with Power, 230mm	1
E21-98B1010-C22	I/O SHIELDING	1

Optional Item

Part Number	Description
K14-1018003-V03	COM port cable, 300mm
K1B-3008012-E06	USB 2.0 Cable, 330mm

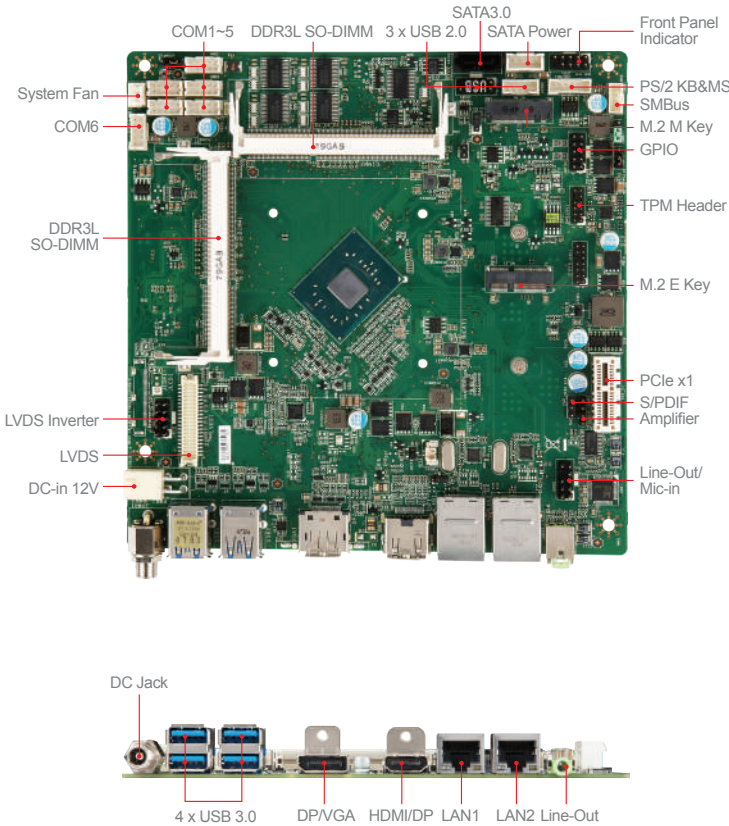


Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

MS-98J0

Mini-ITX with Intel® Apollo Lake SoC Series for Fanless, Low-Profile, Multi-Displays Solution

NEW



Features

- Intel® Apollo Lake/Apollo Lake-I Series SoC
- 3 independent displays : 1 x LVDS/eDP, 1 x DP (Co-lay VGA), 1 x HDMI (Co-lay DP) for flexible display applications
- Supports DDR3L 1866MHz SO-DIMM memory up to 8GB
- Supports SATA 3.0 port, M.2 M Key 2242 for storage
- Supports Dual GbE LAN, PCIe x1 and M.2 E Key 2230
- Supports 6 COM ports & 7 USB ports
- TPM supported with onboard chip or pin header
- Supports DC-in 12V

Ordering Information

Part Number	Description
919-98J0-101	MS-98J0 10 OPT:A Intel E3940, DP+HDMI+LVDS,2* DDR3L SO-DIMM, 2*LAN,1*SATA-3.0, Audio, 2*M.2 Slot, 4*USB 3.0, 3*USB 2.0, PCIe x1, DC-in12V, BULK
919-98J0-102	MS-98J0 10 OPT:B Intel N3350, DP+HDMI+LVDS,2*DDR3L SO-DIMM, 2*LAN,1*SATA-3.0, Audio, 2*M.2 Slot, 4*USB 3.0, 3*USB 2.0, PCIe x1, DC-in12V, BULK

Packing List

Part Number	Description	Quantity
K1D-1012115-V03	SATA Cable with Power, 230mm	1
E21-98J0010-C22	I/O SHIELDING	1

Optional Item

Part Number	Description
K14-1009062-V03	COM Port Cable, 250mm
K14-1018003-V03	COM port cable, 300mm
K1B-3008012-E06	USB 2.0 Cable, 330mm

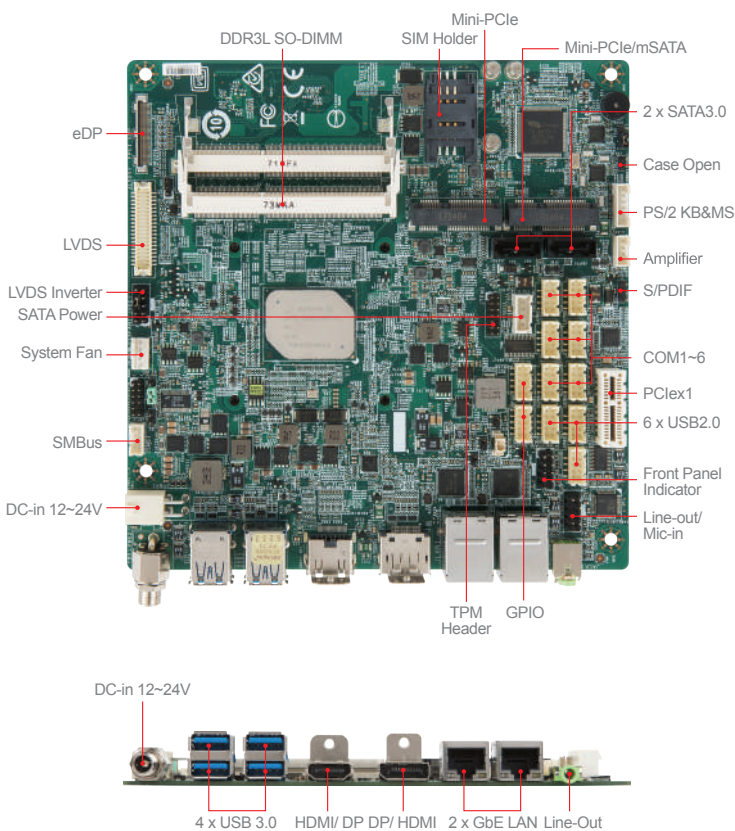
Specifications

Processor	CPU	Intel® Celeron® Processor N3350, DC, 6W Intel® Atom™ x5 Processor E3940, QC, 9.5W
	Frequency	N3350, 1.1 GHz, up to 2.4 GHz E3940, 1.6 GHz, up to 1.8 GHz
	L2 Cache	2MB
	CPU Type	BGA
Memory	Chipset	Integrated in SoC
	BIOS	AMI
	Technology	Dual-channel DDR3L 1866 MHz
	Max. Capacity	Up to 8GB
Display	Socket	2 x 204-pin SO-DIMMs
	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	1 x Dual channel 18/24-bit
	eDP	1 (by BOM option)
	VGA	1 (by BOM option)
	DVI	N/A
	HDMI	1 (Co-lay DP)
	DisplayPort	1 (Co-lay VGA)
	Multiple Display	3 independent displays
Display Interface	LVDS up to 1920 x 1200 @60 Hz eDP up to 4096 x 2160 @60Hz HDMI up to 3840 x 2160 @30Hz DP up to 4096 x 2160 @60Hz VGA up to 1920 x 1080 @60Hz	
Ethernet	Controller	2 x Realtek® RTL8111H-CG
Audio	Controller	Realtek® ALC887-VD2-CG HD Audio Codec
Super I/O	Controller	Fintek F81867D-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Pin header (default) Infineon SLB9665TT 2.0 (by BOM option)
I/O Interface	USB	4 x USB3.0 (rear) 3 x USB2.0 (internal)
	Serial	6 x COM ports (Internal) COM1: RS-232/422/485, 0V/5V/12V COM2-6: RS-232, w/o Power
	Parallel	N/A
	PS/2	1 (pin header)
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
Expansion Slot	PCIe x 16	N/A
	PCIe x 4	N/A
	PCIe x 1	1
	PCI	N/A
	M.2	1 x M Key (SATA 3.0), 2242 1 x E Key (PCIe x1, USB2.0), 2230
	Mini-PCIe	N/A
	Storage	SATA
IDE		N/A
eSATA		N/A
CFast		N/A
mSATA		N/A
Power Supply	DC	DC-in 12V
	ATX	N/A
Environment	Operating Temperature	-10 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	170 x 170mm (Mini-ITX)
	Weight	0.37 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 10 (64-bit) Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

MS-9892

Mini-ITX with Intel® Apollo Lake/Apollo Lake-I for Fanless, Low-Power, High-Performance & Wide Temperature Solution



Features

- Intel® Apollo Lake/Apollo Lake-I Series SoC
- 3 independent displays : 1 x LVDS/eDP, 1 x DP, 1 x HDMI
- Supports Dual DDR3L 1866MHz SO-DIMM memory up to 8GB
- Supports Dual SATA 3.0 ports, mSATA for storage
- Supports Dual Intel® GbE LAN, PCIe x1 and Mini-PCle slot
- Supports 6 COM ports & 10 USB ports for flexible applications
- TPM supported with onboard chip or pin header
- Apollo Lake-I Series support wide operating temperature : -40 ~ 85°C
- Supports DC-in 12~24V

Ordering Information

Part Number	Description
919-9892-001	MS-9892 10 Intel Apollo Lake-I E3940, 2*DDR3L 4*USB3.0,6*USB2.0,6*COM,1*HDMI,1*DP,1*eD-P,1*LVDS,2*LAN,1*MiniPCle,1*PClex1,2*SATA,1*mSATA, DC12~24V,WT
919-9892-002	MS-9892 10 OPT: A Intel Apollo Lake-I E3930, 2*DDR3L,4*USB3.0,6*USB2.0,6*COM,1*HDMI, 1*DP,1*eD-P,1*LVDS,2*LAN,1*MiniPCle,1*PClex1,2*SATA,1*mSATA, DC12~24V,WT
919-9892-003	MS-9892 1.0 OPT: B Intel Apollo Lake N4200, 2*DDR3L,4*USB3.0,6*USB2.0,6*COM,1*HDMI,1*DP,1*eD-P,1*LVDS, 2*LAN, 1*MiniPCle,1*PClex1,2*SATA,1*mSATA,DC12~24V
919-9892-004	MS-9892 1.0 OPT: C Intel Apollo Lake E3940, 2*DDR3L,4*USB3.0,6*USB2.0,6*COM,1*HDMI,1*DP,1*eD-P,1*LVDS, 2*LAN, 1*MiniPCle,1*PClex1,2*SATA,1*mSATA,DC12~24V
919-9892-005	MS-9892 1.0 OPT: D Intel Apollo Lake N3350, 2*DDR3L,4*USB3.0,6*USB2.0,6*COM,1*HDMI,1*DP,1*eD-P,1*LVDS, 2*LAN, 1*MiniPCle,1*PClex1,2*SATA,1*mSATA,DC12~24V

Packing List

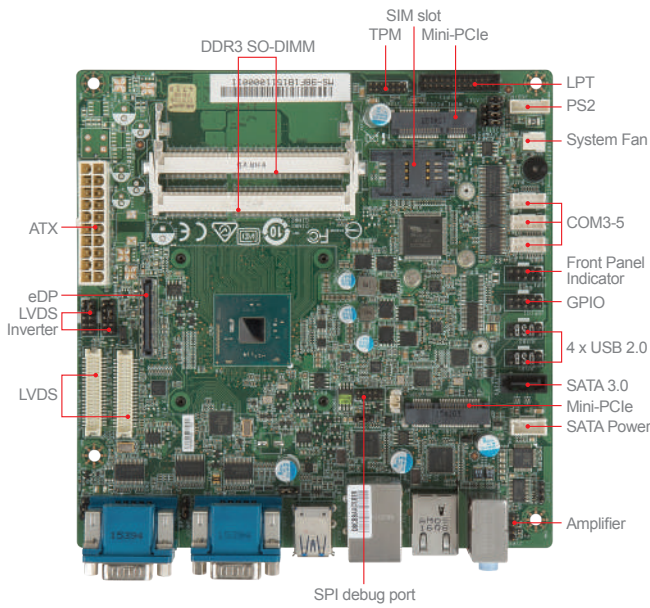
Part Number	Description
K14-1018003-V03	COM Port Cable, 300mm
K1D-1012115-V03	SATA Cable with Power, 230mm

Specifications

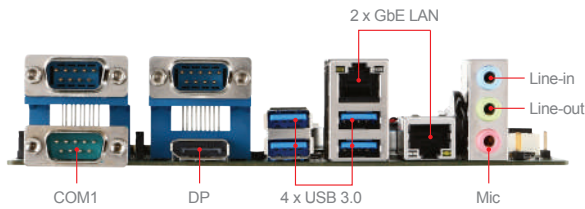
		Apollo Lake SKUs	Apollo Lake-I SKUs	
Processor	CPU	Intel® Pentium® Processor N4200, QC, 6W Intel® Celeron® Processor N3350, DC, 6W	Intel® Atom™ x5 Processor E3940, QC, 9W Intel® Atom™ x5 Processor E3930, DC, 6W	
	Frequency	N4200, 1.1 GHz, up to 2.5 GHz N3350, 1.1 GHz, up to 2.4 GHz	E3940, 1.6 GHz, up to 1.8 GHz E3930, 1.3 GHz, up to 1.8 GHz	
	L2 Cache	1M~2M (Depends on CPU)		
	CPU Type	BGA		
	Chipset	Integrated in SoC		
Memory	BIOS	AMI		
	Technology	Dual-channel DDR3L 1866 MHz		
	Max. Capacity	Up to 8GB		
Display	Socket	2 x 204-pin SO-DIMMs		
	Controller	Intel® HD Graphics		
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM		
	LVDS	1 x Dual channel 18/24-bit		
	eDP	1 (colay with LVDS)		
	HDMI	1 (colay with DP)		
	DisplayPort	1 (colay with HDMI)		
	Multiple Display	3 independent displays		
	Display Interface	LVDS up to 1920 x 1200 @60 Hz eDP up to 4096 x 2160 @60Hz HDMI up to 3840 x 2160 @30Hz DP up to 4096 x 2160 @60Hz		
		Ethernet		
Ethernet	Controller	2 x Intel® I211-AT GbE LAN	2 x Intel® I210-IT GbE LAN	
	Controller	Realtek® ALC887-VD2-CG HD Audio Codec		
Super I/O	Controller	Fintek F81867D-I		
H/W Monitor	Watchdog Timer	256-level Watchdog Timer		
	Smart Fan	Yes		
TPM	Controller	Pin header (Default) Infineon SLB9665TT 2.0 (by BOM option)	Pin header (Default) Infineon SLB9665XT 2.0 (by BOM option)	
		USB	4 x USB3.0 (Rear) 6 x USB2.0 (Internal)	
I/O Interface	Serial	6 x COM ports (Internal) COM1/2: RS-232/422/485, 0V/5V/12V COM3~6: RS-232, W/O Power		
	Parallel	N/A		
	PS/2	1 (pin header)		
	GPIO	16-bits (8 x GPI; 8 x GPO), 5V		
	PCIe x 1	1		
Expansion Slot	M.2	N/A		
	Mini-PCle	1 x Full-size (w/ SIM holder) 1 x Full-size (W/ mSATA)		
Storage	SATA	2 x SATA3.0 (SATA2 share with mSATA)		
	mSATA	1 (shared w/SATA2)		
Power Supply	DC	DC-in 12V~24V		
	ATX	N/A		
Environment	Operating Temperature	-10 ~ 60°C	-40 ~ 85°C	
	Operating Humidity	10 ~ 90%, non-condensing		
	Storage Temperature	-20 ~ 80°C	-40 ~ 85°C	
	Storage Humidity	10 ~ 90%, non-condensing		
Form Factor	Dimensions	170 x 170mm (Mini-ITX)		
	Weight	0.37 kg		
Certification	EMC	FCC, CE, RCM, VCCI, BSMI		
Software Platform	OS Support	Windows 10 (64-bit)		
		Linux Fedora 25 (by request) Linux Ubuntu 16.04 (by request)		

MS-98F1

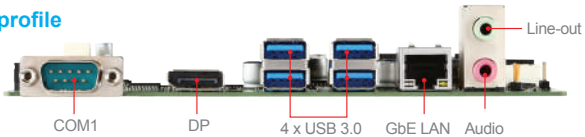
Mini-ITX with Intel® Atom™ Braswell Platform for Multi-Displays, Low-Power and DC/ATX Solution



Full



Low profile



Features

- Intel® Atom™ Braswell Series SoC processor
- Embedded Mini-ITX Motherboard with Rich I/O ports, Low power and fanless design
- 3 independent displays with optional inputs: 1 DP, 1 LVDS & 1 x eDP or 1 DP & 2 LVDS
- 4 USB 2.0, 4 USB 3.0, Optional SKU with 4 or 6 COM; SATA3.0 supported
- Dual Intel® LAN and dual mini-PCle slots
- TPM supported with onboard chip or pin header
- Dual full-size Mini-PCle (one shared mSATA or SIM holder)
- Power input: DC 12V/19/24V or ATX (depends on SKU)

Ordering Information

Part Number	Description
919-98F1-104	MS-98F1\609-98F1-040\809-98F1-105\VER 11 OPT:D Intel N3160,2*DDR3L,1*DP,1*LVDS,1*LVDS colay eD-P,6*COM,4*USB3.0, 4*USB2.0, 2*Gbe LAN,1*SATA3.0, 2*Mini-PCle,ATX Power,1*SATA cable,1*CD,1*I/O Shield, Bulk, For channel
919-98F1-103	MS-98F1\609-98F1-030\809-98F1-104\VER 11 OPT:C Intel N3060,2*DDR3L,1*DP,1*LVDS,1*LVDS colay eDP,4*COM,4*USB3.0, 4*USB2.0, 1*Gbe LAN,1*SATA3.0, 2*Mini-PCle,DC Power, 1*SATA cable,1*Power cable,1*CD,1*I/O Shield,Bulk, For Channel

Packing List

Part Number	Description
K1D-1012064-V03	SATA CABLE
K10-3004215-V03	DC POWER CABLE For OPT: C
E21-98F1010-C22	I/O SHIELDING For OPT: C
E21-98F1020-C22	I/O SHIELDING For OPT: D
G71-SEDC153-N56/X03	DRIVER CD

Specifications

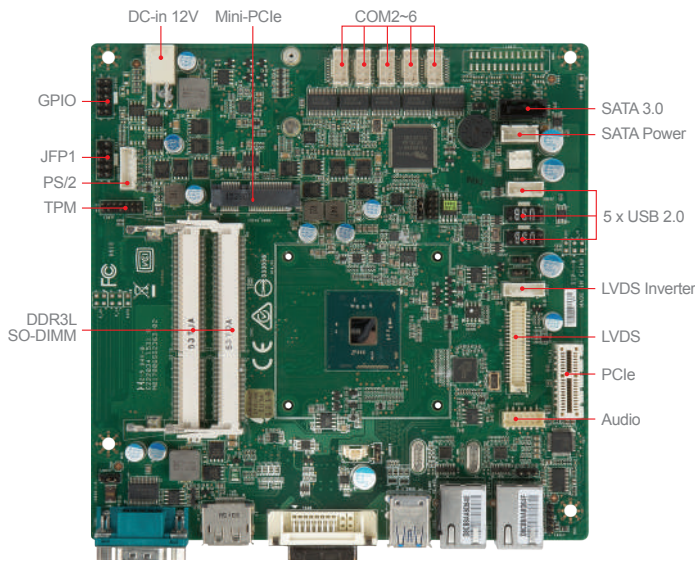
Processor	CPU	Intel® Pentium processor N3710, QC, 6W Intel® Celeron processor N3160, QC, 6W Intel® Celeron processor N3060, DC, 6W Intel® Celeron processor N3010, DC, 4W	
	Frequency	N3710, 1.6 GHz, up to 2.56 GHz N3160, 1.6 GHz, up to 2.24 GHz N3060, 1.6 GHz, up to 2.48 GHz N3010, 1.04 GHz, up to 2.24 GHz	
	L2 Cache	2MB	
	CPU Type	BGA	
Memory	Chipset	Integrated	
	BIOS	AMI	
	Technology	Dual-channel DDR3L 1333/1600 MHz	
	Max. Capacity	Up to 8GB	
Display	Socket	2 x 204-pin SO-DIMM	
	Controller	Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	LVDS	2 x Dual channel 18/24-bit	
	eDP	1 (co-layer with LVDS)	
	DisplayPort	1	
	Multiple Display	3 independent displays	
Display Interface	Display Interface	LVDS up to 1920 x 1200 @60Hz DP up to 3840 x 2160 @30Hz eDP up to 2560 x 1600 @60Hz	
	Controller	2 x Intel® i210-AT 1 x Intel® i210-AT GbE LAN GbE LAN	
Ethernet	Controller	Realtek® ALC887 co-layer ALC888S	
Audio	Controller	Fintek F81866AD-I	
Super I/O	Watchdog Timer	256-level Watchdog Timer	
H/W Monitor	Smart Fan	Yes	
	TPM	Controller	Pin header (default) Infineon SLB9635TT 1.2 (by BOM option) Pin header
I/O Interface	USB	4 x USB3.0 (rear)	4 x USB3.0 (rear)
		4 x USB2.0 (internal)	4 x USB2.0 (internal)
	Serial	6 x COM ports (COM1-2: rear, COM3-6: internal)	4 x COM ports (COM1: rear, COM3: internal)
		COM1&5: RS-232/422/485, 0V/5V/12V	COM1: RS-232/422/485, 0V/5V/12V
		COM2-4: RS-232,0V/5V/12V	COM5: RS-232,0V/5V/12V
		COM6: RS-232 w/o power	COM6: RS-232 w/o power
Parallel	1		
PS/2	1 (pin header)		
Expansion Slot	GPIO	8-bits (4 x GPI; 4 x GPO), 5V	
	M.2	N/A	
Storage	Mini-PCle	2 x Full/Half-size (one w/ SIM holder)	
	SATA	1 x SATA 3.0	
Power Supply	mSATA	1 (support by mini PCIe slot)	
	CompactFlash	N/A	
Environment	DC	DC-in 12V/19V/24V	
	ATX	ATX Power 20P	
	Operating Temperature	0 ~ 60°C	
	Operating Humidity	10 ~ 90%, non-condensing	
Form Factor	Storage Temperature	-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing	
	Dimensions	170 x 170mm (Mini-ITX)	
Certification	Weight	0.37 kg	
	EMC	FCC, CE, RCM, VCCI, BSMI	
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Fedora 23 Linux Ubuntu 15.10	

Optional Item

Part Number	Description
K14-1018003-V03	COM port cable, 300mm
K1B-3008012-E06	USB 2.0 Cable, 330mm

MS-9810

Mini-ITX with Intel® Atom™ Braswell Platform for Low-Power, Low profile and Fanless Solution



919-9810-103



919-9810-104



Features

- Intel® Atom™ Braswell Series SoC processor
- Embedded Mini-ITX Motherboard with low power, slim and fanless design
- 3 independent displays : DP/HDMI , DVI-D and LVDS
- 5 x USB 2.0, 2 x USB 3.0, 6 x COM, and SATA3.0 supported
- TPM supported with onboard chip or pin header
- Supports DC 12V power
- Entry level with best-value for choice

Ordering Information

Part Number	Description
919-9810-103	MS-9810\609-9810-030\809-9810-103 STD VER 1.0, FANLESS, Braswell CPU N3160, 1*SATA CABLE,1*Power CABLE,I/O Shield, BULK
919-9810-104	MS-9810\609-9810-040\809-9810-104 STD VER 1.0, FANLESS, Braswell CPU N3060, 1*SATA CABLE,1*Power CABLE,I/O Shield, BULK

Packing List

Part Number	Description
E21-9810010-C22	I/O Shielding (2 x LAN)
E21-9810020-C22	I/O Shielding (1 x LAN)
G71-SEDC146-N56	Driver CD
K1D-1012064-V03	SATA Cable, 200mm
K10-3004215-V03	DC power cable, 160mm

Specifications

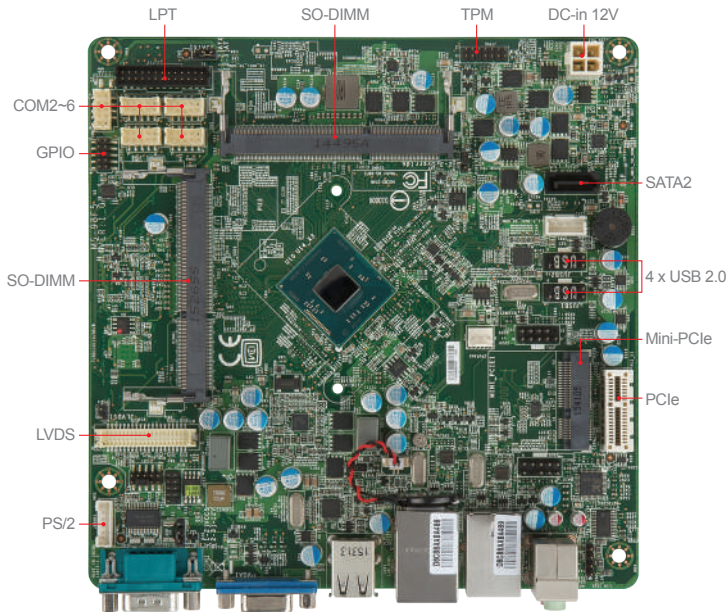
Processor	CPU	Intel® Pentium processor N3710, QC, 6W Intel® Celeron processor N3160, QC, 6W Intel® Celeron processor N3060, DC, 6W Intel® Celeron processor N3010, DC, 4W
	Frequency	N3710, 1.6 GHz, up to 2.56 GHz N3160, 1.6 GHz, up to 2.24 GHz N3060, 1.6 GHz, up to 2.48 GHz N3010, 1.04 GHz, up to 2.24 GHz
	L2 Cache	2MB
	CPU Type	BGA
	Chipset	Integrated
Memory	BIOS	AMI
	Technology	Dual-channel DDR3L 1333/1600 MHz
	Max. Capacity	Up to 8GB
Display	Socket	2 x 204-pin SO-DIMMs (1 slot for opt SKU)
	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual channel 24-bit
	DVI	1 (DVI-D)
	HDMI	1 (colay with DP)
	DisplayPort	1 (colay with HDMI)
	Multiple Display	3 independent displays
	Display Interface	LVDS up to 1920 x 1200 @60Hz DP up to 3840 x 2160 @30Hz HDMI up to 1920 x 1200 @60Hz DVI up to 1920 x 1200 @60Hz
	Ethernet	Controller
Audio	Controller	Realtek® ALC887 co-lay ALC888S
Super I/O	Controller	Fintek F81866AD-I
	Watchdog Timer	256-level Watchdog Timer
H/W Monitor	Smart Fan	Yes
	TPM	Controller
I/O Interface	USB	2 x USB 3.0 (rear) 5 x USB 2.0 (internal)
	Serial	6 x COM ports (COM1: rear, COM2-5: internal) COM1: RS-232/422/485, 0V/5V/12V COM2-6: RS-232, w/o power
	Parallel	1 (by BOM option)
	PS/2	1 (pin header)
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
	PCIe x 1	1
Expansion Slot	M.2	N/A
	Mini-PCIe	1 x Full-size co-lay mSATA, support Half-size card
Storage	SATA	1 x SATA 3.0
	mSATA	1 (support by mini PCIe slot)
Power Supply	DC	DC-in 12V
	ATX	N/A
Environment	Operating Temperature	0 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
Form Factor	Storage Humidity	10 ~ 90%, non-condensing
	Dimensions	170 x 170mm (Mini-ITX)
Certification	Weight	0.37 kg
	EMC	FCC, CE, RCM, VCCI
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Fedora 20 Linux Ubuntu 14.04.3

Optional Item

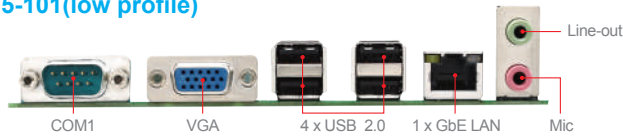
Part Number	Description
K14-1018003-V03	COM port cable, 300mm
K1B-3008012-E06	USB 2.0 Cable, 330mm

MS-98F5

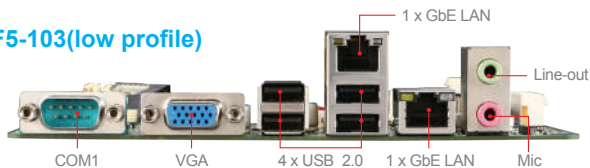
Mini-ITX with Intel® Atom™ Bay Trail for Low-Power and Low-Profile Solution



919-98F5-101(low profile)



919-98F5-103(low profile)



Features

- Intel® Celeron® Processor J1900/N2930 Quad Core 1.86/2GHz processor (formerly BayTrail)
- Embedded Mini-ITX Motherboard with low power, slim and fanless design
- 2 independent displays: LVDS and VGA
- Supports 6xCOMs and 8xUSB 2.0
- Entry level with best-value for choice

Ordering Information

Part Number	Description
919-98F5-101	MS-98F5MS-98F5/609-98F5-010/809-98F5-102/MS-98F5 VER 10 OPT A FOR MS-98F5 STD SKU, 1 LAN, 1 SO-DIMM BULK
919-98F5-103	MS-98F5MS-98F5/609-98F5-020/809-98F5-101/MS-98F5 VER 10 OPT B FOR MS-98F5 STD SKU, 2 LAN, 2 SO-DIMM BULK

Packing List

Part Number	Description
E21-98F5010-C22	I/O Shield (2 x LAN)
E21-98F5020-C22	I/O Shield (1 x LAN)
G71-SEDC117-X03	Driver CD
K10-3004215-V03	DC power cable, 160mm
K1D-1012064-V03	SATA cable, 200mm

Specifications

Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W Intel® Celeron® Processor N2930, QC, 7.5W
	Frequency	J1900, 2.0 GHz, up to 2.42 GHz N2930, 1.83 GHz, up to 2.16 GHz
	L2 Cache	2 MB
	CPU Type	BGA
	Chipset	Integrated
Memory	BIOS	AMI
	Technology	Dual-channel DDR3L 1333/1066 MHz
	Max. Capacity	Up to 8GB
Display	Socket	2 or 1 x 204-pin SO-DIMMs (depends on SKU)
	Controller	Intel® HD Graphics
Ethernet	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual Channel 24-bit (add chrontel 7511B chipset)
	VGA	1
	Multiple Display	2 independent displays
	Display Interface	VGA up to 2560 x 1600 @60Hz LVDS up to 1920 x 1200 @60Hz
Audio	Controller	Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Pin header
	USB	8 x USB 2.0 (4 x internal; 4 x rear)
I/O Interface	Serial	6 x COM ports (COM1: rear, COM2-6: internal) COM1: RS-232, 0V/5V/12V COM2-6: RS-232, w/o power
	Parallel	1 (Pin header)
	PS/2	1 (Pin header)
	GPIO	8-bits (4 x GPI, 4 x GPO), 3.3V
	PCIe x1	1
Expansion Slot	M.2	N/A
	Mini-PCle	1 x Full-size (w/ mSATA)
Storage	SATA	1 x SATA 2.0
	mSATA	1
Power Supply	DC	DC-in 12V
	ATX	N/A
Environment	Operating Temperature	0 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
Form Factor	Storage Humidity	10 ~ 90%, non-condensing
	Dimensions	170 x 170mm (Mini-ITX)
Certification	Weight	0.37 kg
	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8 (32/64-bit) Windows 10 (64-bit)

Optional Item

Part Number	Description
K14-1018003-V03	COM port cable, 300mm
K1B-3008012-E06	USB 2.0 cable, 330mm

Semi-rugged Terminal

POS System

HMI Panel PC

Embedded System

Embedded Board

COM Express Board

Oseven Board

Pico-ITX Board

3.5" Board

EPIC Board

PICMG 1.0 Board

Mini-ITX Board

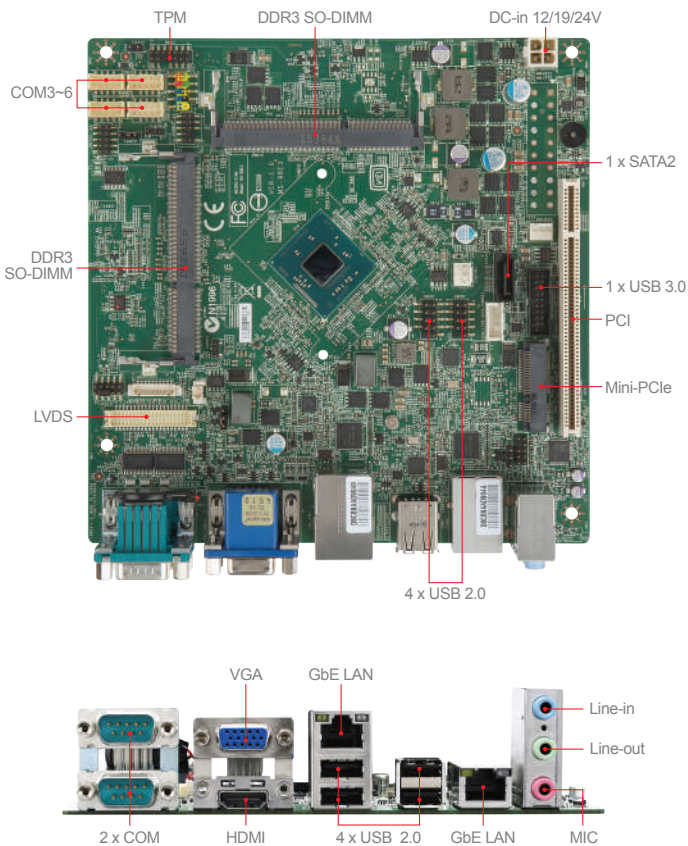
Micro-ATX Board

ATX Board

Mini-PCIe Module

MS-98E3

Mini-ITX with Intel® Atom™ Bay Trail for Multi-Displays and DC/ATX Solution



Features

- Intel® Celeron® Processor J1900/N2930 Quad Core 1.86/2GHz processor (formerly BayTrail)
- Embedded Mini-ITX Motherboard with low power and fanless design
- 2 independent displays: HDMI, VGA, and LVDS
- Supports 6xCOMs, 8xUSB 2.0, 1xUSB 3.0
- Low power and fanless design
- Power input: DC 12V/19/24V or ATX (by BOM)

Ordering Information

Part Number	Description
919-98E3-001	MS-98E3 10 Intel Bay Trail D sku-J1900, DC, 1*Mini PCI_E+2*DDR3L SO DIMM, 1*PCI, 1*mini PCIe (with msata function), 8*USB 2.0, 1*USB 3.0, 6*COM
919-98E3-002	MS-98E3 10 OPT: A Intel Bay Trail D sku-J1900, ATX-, 1*Mini PCI_E+2*DDR3L SO DIMM, 1*PCI, 1*mini PCIe (with msata function), 8*USB 2.0, 1*USB 3.0, 6*COM

Packing List

Part Number	Description	Quantity
K10-3004215-V03	DC power cable, 160mm	1
K1D-1012064-V03	SATA cable, 200mm	1
E21-98E3020-C22	I/O shield	1
G71-SEDC113-X03	Driver CD	1

Specifications

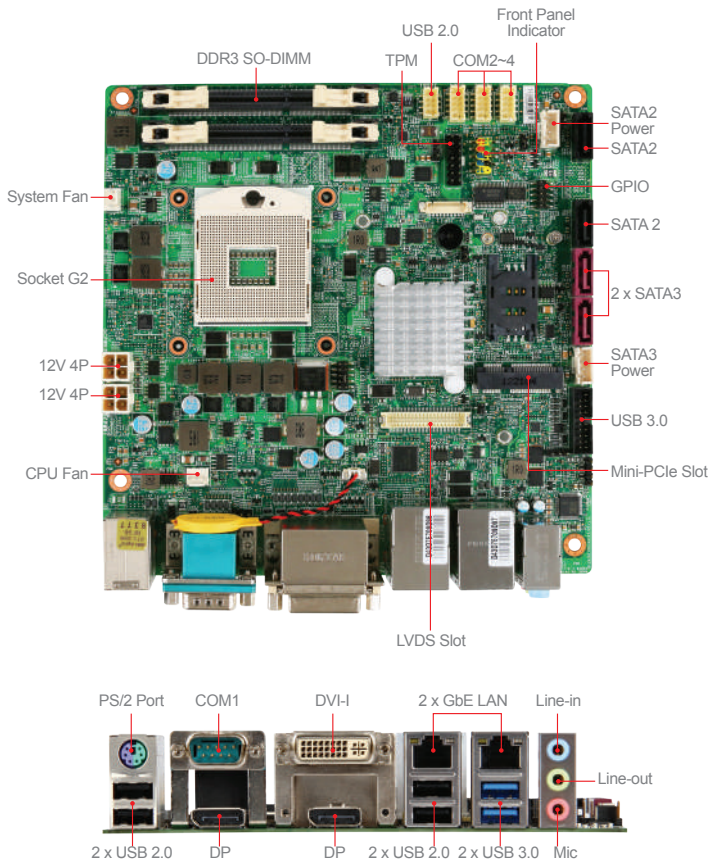
Processor	CPU	Intel® Celeron® Processor J1900, QC, 10W Intel® Celeron® Processor N2930, QC, 7.5W	
	Frequency	J1900, 2.0 GHz, up to 2.42 GHz N2930, 1.83 GHz, up to 2.16 GHz	
	L2 Cache	2 MB	
	CPU Type	BGA	
	Chipset	Integrated	
Memory	BIOS	AMI	
	Technology	Dual-channel DDR3L 1333/1066 MHz	
	Max. Capacity	Up to 8GB	
	Socket	2 x 204-pin SO-DIMMs	
Display	Controller	Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	LVDS	Dual Channel 24-bit (add chrontel 7511B chipset)	
	VGA	1	
	HDMI	1	
	Multiple Display	2 independent displays	
	Display Interface	VGA up to 2560 x 1600 @60Hz HDMI up to 1920 x 1080 @60Hz LVDS up to 1920 x 1200 @60Hz	
Ethernet	Controller	2 x Intel® i210-AT GbE LAN	
Audio	Controller	Realtek® ALC887 HD Audio Codec	
Super I/O	Controller	Fintek F81866AD-I	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	
	Smart Fan	Yes	
	TPM	Controller	Pin header
I/O Interface	USB	8 x USB 2.0 (4 x internal; 4 x rear) 1 x USB 3.0 (internal)	
	Serial	6 x COM ports (COM1~2: rear, COM3~6: internal) COM1: RS-232/422/485, 0V/5V/12V COM2~6: RS-232, 0V/5V/12V	
	PS/2	1 (Pin header)	
	GPIO	8-bits (4 x GPI, 4 x GPO), 5V	
	Expansion Slot	PCI	1
		M.2	N/A
		Mini-PCIe	1 x Full-size (w/ mSATA)
Storage	SATA	1 x SATA 2.0	
	mSATA	1	
Power Supply	DC	DC-in 12V/19V/24V	
	ATX	ATX-Power 20P	
Environment	Operating Temperature	0 ~ 60°C	
	Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing	
Form Factor	Dimensions	170 x 170mm (Mini-ITX)	
	Weight	0.37 kg	
Certification	EMC	FCC, CE, RCM, VCCI, BSMI	
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8 (64-bit)	

Optional Item

Part Number	Description
K14-1018003-V03	COM port cable, 300mm
K1B-3008012-E06	USB2.0 cable, 330mm

MS-98C8

Mini-ITX SBC 3rd Gen Intel® Core™ & Celeron® Processor and Intel® HM76/QM77 for Multi-Displays & High-Performance Solutions



Features

- Embedded Motherboard for high graphic performance application, Medical or Gaming or High-end Digital Signage
- Supports Intel® Ivy Bridge and Sandy Bridge Mobile series CPU
- Supports standard and low-voltage DDR3 SO-DIMM memory up to 16GB (for Ivy Bridge only)
- 3 independent displays: DP, DP, DVI-I and LVDS
- Great 3D graphic performance with high definition up to 1080p
- Supports DirectX 11
- Supports SATA 3.0 and mSATA by mini-PCle slot

Ordering Information

Part Number	Description
919-98C8-003	HM76 2*DDR3 SODIMM, 2*miniPCle, 2*LAN, 1*DVI-I, 2*DP, 1*LVDS, 4*com port, 6*USB 2.0, 4*USB 3.0
919-98C8-004	QM77 2*DDR3 SODIMM, 2*miniPCle, 2*LAN, 1*DVI-I, 2*DP, 1*LVDS, 4*com port, 6*USB 2.0, 4*USB 3.0

Packing List

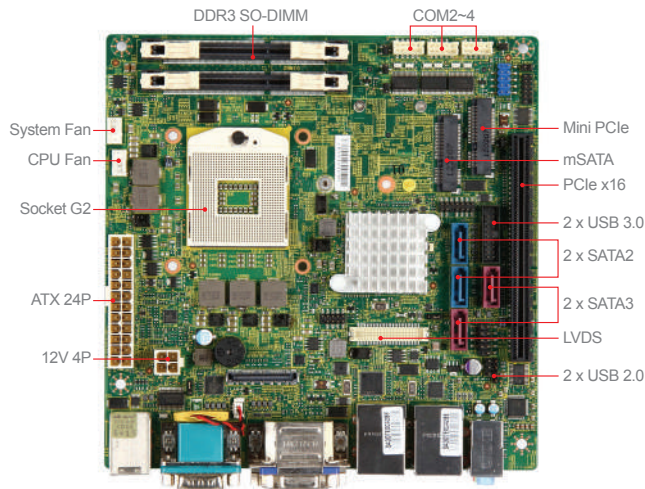
Part Number	Description
E21-98C8010-C22	I/O SHIELDING
E32-0800383-A21	MECH FANSINK
K39-3002004-E06	PS2 Y-Cable, 190mm
K14-1018003-V03	COM PORT CABLE, 300mm
K1D-1012064-V03	SATA CABLE, 200mm
E93-0000118-H06	CPU BACK PLATE
G71-SEDC094-J24	DRIVER CD

Specifications

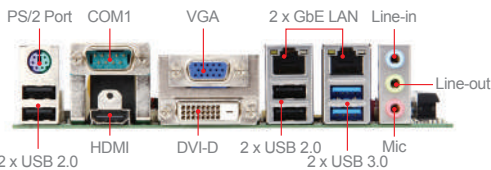
Processor	CPU	3rd Gen Intel® Mobile Ivy bridge/Sandy bridge Core™ i7/i5/i3/Celeron®/Pentium® Processors, Max. 45W
	Frequency	1.0 GHz~3.8 GHz (Depends on CPU)
	L2 Cache	2M~8M (Depends on CPU)
	CPU Type	Socket G2 (rPGA 989)
	Chipset	Intel® HM76/QM77 Express
Memory	BIOS	AMI
	Technology	Dual-channel DDR3 1066/1333/1600 MHz
	Max. Capacity	Up to 16GB
	Socket	2 x 204-pin SO-DIMMs
Display	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual channel 18/24-bit
	DVI	1 (DVI-I)
	DisplayPort	2
	Multiple Display	2 independent displays (SNB CPU only) 3 independent displays (IVB CPU only)
	Display Interface	LVDS up to 1920 x 1200 @60Hz DP up to 2560 x 1600 @60Hz DVI-I up to 1920 x 1200 @60Hz
Ethernet	Controller	1 x Intel® 82579 PHY GbE LAN 1 x Intel® I210-AT PCIe GbE LAN
Audio	Controller	Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F81866D
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Pin header
I/O Interface	USB	6 x USB 2.0 (4 x rear; 2 x internal) 4 x USB 3.0 (2 x rear; 2 x internal)
	Serial	4 x COM ports (COM1: rear, COM2~4: internal) COM1: RS-232/422/485, 0V/5V/12V COM2~4: RS-232, 0V/5V/12V
	PS/2	1
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
Expansion Slot	M.2	N/A
	Mini-PCle	1 x Full-size 1 x Half-size, mSATA
Storage	SATA	2 x SATA 3.0 2 x SATA 2.0
	mSATA	1
Power Supply	DC	DC-in 12V/19V
	ATX	N/A
Environment	Operating Temperature	0 ~ 70°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
Form Factor	Storage Humidity	10 ~ 90%, non-condensing
	Dimensions	170 x 170mm (Mini-ITX)
Certification	Weight	0.35 kg
	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8 (32-bit)

MS-9899

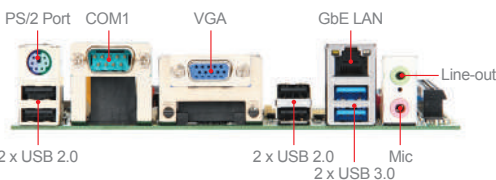
Mini-ITX with 3rd Gen Intel® Core™ & Celeron® Processor and Intel® HM76/QM77 for Multi-Displays



MS-9899 with QM77



MS-9899 with HM76



Features

- Supports Intel® Ivy Bridge and Sandy Bridge Mobile series CPU
- Supports standard and low-voltage DDR3 SO-DIMM memory up to 16GB
- 4 types of display interface: VGA, HDMI, DVI and LVDS
- Supports SATA 3.0, mSATA, and CFAST slots

Ordering Information

Part Number	Description
919-9899-001	MS-9899 QM77, SNB/IVB Mbl, 2x DDR3 SO-DIMM, VGA/DVI-D/HDMI, 4x SATA, 2x GbE LAN, 10x USB, 4x COM ATX Power (ROHS)
919-9899-002	MS-9899 HM76, SNB/IVB Mbl, 2x DDR3 SO-DIMM, VGA, 4x SATA, 1x GbE LAN, 10x USB, 4x COM ATX Power (ROHS)
919-9899-003	MS-9899 QM77, SNB/IVB Mb, 2x DDR3 SO-DIMM, VGA/DVI-D/HDMI, 4x SATA, 2x GbE LAN, 10x USB, 4x COM, No CFAST, ATX Power (ROHS)

Packing List

Part Number	Description
E32-0800383-A21	FANSINK, 60*60*25mm
K1D-1008132-V03	SATA CABLE, 500mm
E21-9899010-C22	I/O shield for QM77
E21-9899020-C22	I/O shield for HM76
E93-0000039-H06	RETENTION BACKPLATE
K14-1018003-V03	COM PORT CABLE, 300mm
K39-3002004-E06	PS2 Y CABLE, 190mm

Specifications

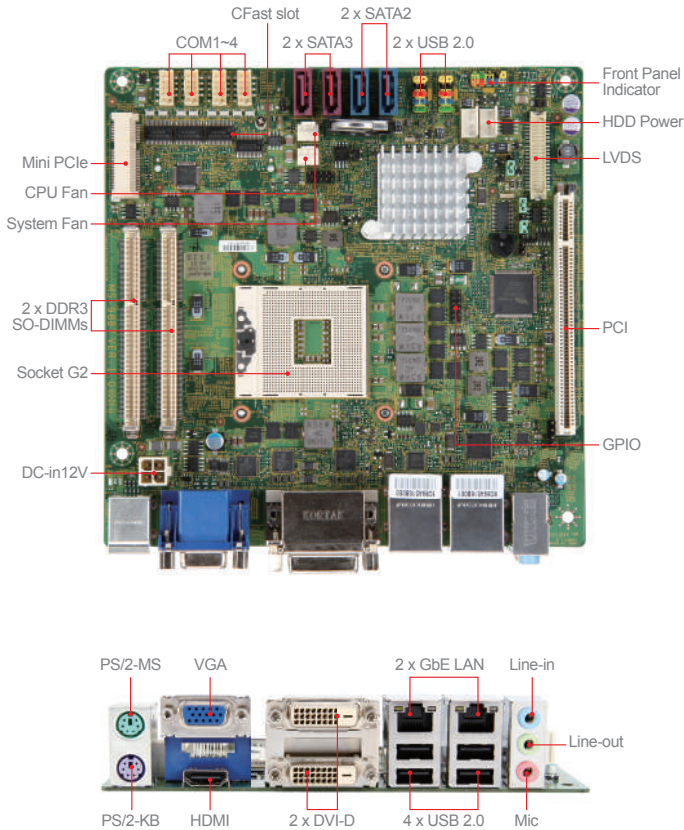
Processor	CPU	3rd Intel® Core™ i7/i5/i3 Mobile Processor
	Frequency	Depends on CPU
	L2 Cache	Depends on CPU
	CPU Type	Socket G2 (rPGA 989)
	Chipset	Intel® QM77/HM76 Express
Memory	BIOS	AMI
	Technology	Dual-channel DDR3/DDR3L 1066/1333/1600MHz
	Max. Capacity	Up to 16GB
	Socket	2 x 204-pin SO-DIMMs
	Controller	Intel® HD Graphics
Display	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual channel 24-bit
	VGA	1
	DVI	1 (DVI-D; only for QM77)
	HDMI	1 (only for QM77)
	Multiple Display	2 Independent displays
	Display Interface	LVDS up to 1920 x 1200 @60 Hz DVI-D up to 2560 x 1600 @60 Hz VGA up to 2560 x 1600 @60 Hz HDMI up to 2560 x 1600 @60 Hz
Ethernet	Controller	1 x Intel® 82579LM GbE LAN PHY iAMT 8.0 (QM77 only) 1 x Intel® 82583V GbE LAN
	Controller	Realtek® ALC887 HD Audio Codec
Audio	Controller	Fintek F81866D
Super I/O	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
H/W Monitor	Controller	Pin header
I/O Interface	USB	4 x USB 3.0 (2 x rear; 2 x internal) 6 x USB 2.0 (4 x rear; 2 x internal)
	Serial	4 x COM ports (COM1: rear, COM2-4: internal) COM1: RS-232/422/485, 0V/5V/12V COM2-4: RS-232, 0V/5V/12V (no power selection jumper for HM76)
	PS/2	1
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
	PCIe x16	1
	M.2	N/A
Expansion Slot	Mini-PCIe	1 x Full-size
	SATA	2 x SATA 3.0 2 x SATA 2.0
	CFAST	1 (QM77 only)
Storage	mSATA	1
	DC	N/A
Power Supply	ATX	ATX-Power 24P, 12V-4P
	Operating Temperature	0 ~ 60°C
Environment	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	170 x 170mm (Mini-ITX)
	Weight	0.37 kg
Certification	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows XP (32/64-bit) Windows 7 (32/64-bit) Windows 8 (32/64-bit)

Optional Items

Part Number	Description
K1B-3008012-E06	USB 2.0 Cable, 330mm

MS-9887

Mini-ITX with 2nd Gen Intel® Mobile Huron River Platform for Multi-Displays Solution



Features

- Intel® Socket G2 Core™ i3/i5/i7 processor
- 12V DC power input
- Supports iAMT 7.0
- Supports SATA RAID 0/1/5/10
- AMI UEFI BIOS supported
- Dual independent displays w/ multiple display ports

Ordering Information

Part Number	Description
919-9887-003	MS-9887, QM67, 2 x DDR3 SO-DIMM, 2 x SATA 2.0, 2 x SATA 3.0, 1 x CFast Card, 2xGbE LAN, 8 x USB, 4xCOM, DC power
919-9887-004	MS-9887, HM65, 2 x DDR3 SO-DIMM, 2 x SATA 2.0, 2 x SATA 3.0, 1 x CFast Card, 2xGbE LAN, 8 x USB, 4xCOM, DC power

Packing List

Part Number	Description	Quantity
G71-SEDC049-J24	PACK CD	1
E32-0800381-A21	MECH FANSINK	1
G18-S100124-H36	PACK ACCESSORY BOX	1
K14-1018003-V03	COM PORT CABLE, 300mm	1
E21-9887010-C22	I/O SHEILDING	1
E93-0000039-H06	RETENTION BACKPLATE	1

Optional Item

Part Number	Description
K10-3004215-V03	DC-In Cable, 160mm
K1B-3008012-E06	USB 2.0 Cable, 330mm

Specifications

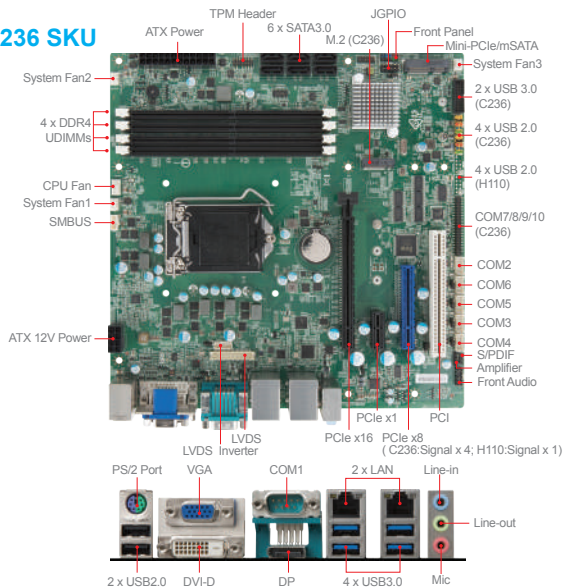
Processor	CPU	2nd Gen Intel® Mobile Sandy Bridge Core™ i7/i5/i3/Pentium®/Celeron® Processor, Max. 55W
	Frequency	1.1 GHz~3.7 GHz (Depends on CPU)
	L2 Cache	1.5M~8M (Depends on CPU)
	CPU Type	Socket G2 (rPGA-989)
Memory	Chipset	Intel® HM65 Express (without iAMT function) Intel® QM67 Express (wth iAMT 7.0)
	BIOS	AMI
	Technology	Dual-channel DDR3 1066/1333/1600MHz
Display	Max. Capacity	Up to 16GB
	Socket	2 x 204-pin SO-DIMMs
	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	Dual channel 18/24-bit
	VGA	1
	DVI	2 (DVI-D)
	HDMI	1
	Multiple Display	2 independent displays
	Display Interface	LVDS up to 1920 x 1080 @60Hz VGA up to 1920 x 1080 @60Hz DVI-D up to 2560 x 1600 @60Hz HDMI up to 1920 x 1200 @60Hz
Ethernet	Controller	1 x Intel® 82579LM GbE LAN PHY 1 x Intel® 82574L GbE LAN
Audio	Controller	Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F71889AD
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Infineon SLB9635TT1.2
I/O Interface	USB	8 x USB 2.0 (4 x rear; 4 x internal)
	Serial	4 x COM ports (internal) COM1: RS-232/422/485, 0V/5V/12V COM2~4: RS-232, 0V/5V/12V
	PS/2	1
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
	PCI	1
	M.2	N/A
Expansion Slot	Mini-PCIe	1 x Full-size
	SATA	2 x SATA 3.0; 2 x SATA 2.0 (all support RAID 0, 1, 5, 10)
Storage	CFast	1
	Power Supply	DC DC-in 12V ATX N/A
Environment	Operating Temperature	0 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	170 x 170mm (Mini-ITX)
	Weight	0.32 kg
Certification	EMC	FCC Class A, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows XP (32/64-bit) Windows 7 (32/64-bit)

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCIe Module

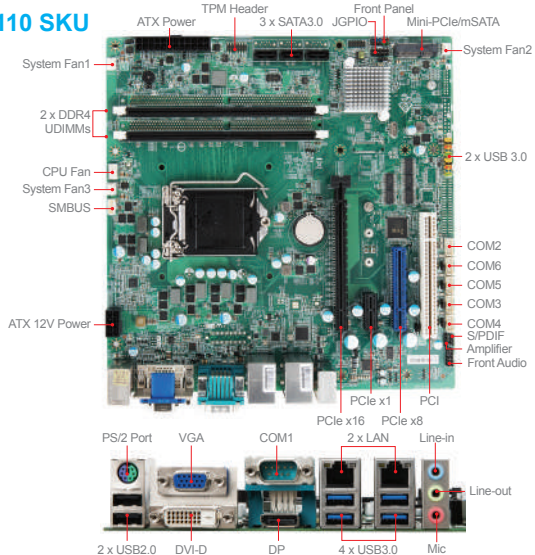
MS-98E2

Micro-ATX with 7th/6th Gen Intel® Kaby Lake/Skylake, Superior I/O & Expansion Capability for High-Performance Solution

C236 SKU



H110 SKU



Features

- 10 COM ports for flexible applications
- Supports 3 System FANs
- 3 independent displays: LVDS, DP, DVI-D and VGA
- Supports DirectX 11.1 and Intel® Clear Video Technology (up to 1080P)
- Multiple expansion slots: PCIe x16, PCIe x8 (x4 signal), PCIe x1, and PCI
- 6 SATA 3.0 ports for RAID
- M.2 supports high speed PCIe NVMe SSD storage
- Supports m-SATA function by Mini-PCIe slot
- Plenty USB ports for more peripherals (6 USB 2.0, 6 USB 3.0)

- 6 COM ports for flexible applications
- Supports 3 System FANs
- 2 independent displays: DP, DVI-D and VGA
- Supports DirectX 11.1 and Intel® Clear Video Technology (up to 1080P)
- Multiple expansion slots: PCIe x16, PCIe x1, PCIe x8 (x1 signal), and PCI
- 3 SATA 3.0 ports for faster and high-capacity storage
- Supports m-SATA function by Mini-PCIe slot
- Plenty USB ports for more peripherals (6 USB 2.0, 4 USB 3.0)

Ordering Information

Part Number	Description
919-98E2-001	VER 1.1 OPTA,9.6-INCH, Intel Skylake-S/KabyLake-S +C236,4*DDR4, DP, VGA, LVDS, DVI, 1*Mini-PCIe, 2*LAN, 6*SATA3.0, 6*USB3.0, 6*USB2.0, 10*COM, ATX Power,single for channel
919-98E2-002	VER 1.1 OPTB,9.6-INCH, Intel Skylake-S/KabyLake-S +H110, 2*DDR4, DP, VGA, DVI, 1*Mini-PCIe, 2*LAN, 3*SATA3.0, 4*USB3.0, 6*USB2.0, 6*COM, ATX Power,single for channel

Specifications

	C236 SKU	H110 SKU
Processor	CPU	7th/6th Gen Intel® Desktop Kaby Lake/ Skylake Xeon/i7/i5/i3/Pentium®/Celeron® Series Processor, Max 95W
	Frequency	2.3GHz~4.0GHz (Depends on CPU)
	L2 Cache	2M ~ 8M (Depends on CPU)
	CPU Type	Socket (LGA 1151)
	Chipset	Intel® C236 Express
Memory	Technology	Dual-channel DDR4 (ECC) 2133MHz/2400MHz (7th Gen)
	Max. Capacity	Up to 64 GB
	Socket	4 x 288-pin Long-DIMMs
Display	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	1
	eDP	N/A
	VGA	1
	DVI	1 (DVI-D)
	DisplayPort	1
Display Interface	Multiple Display	3 independent displays
	Display Interface	LVDS up to 1920 x 1200 @60Hz DP up to 4096 x 2304 @60Hz DVI-D up to 1920 x 1200 @60Hz VGA up to 1920 x 1200 @60Hz
Ethernet	Controller	1 x Intel® I219-LM GbE-PHY 1 x Intel® I210-AT PCIe GbE LAN
Audio	Controller	Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F81866AD-1 + F81216H
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
TPM	Controller	Pin header
I/O Interface	USB	6 x USB 3.0 (4 x rear, 2 x internal) 6 x USB 2.0 (2 x rear, 4 x internal)
	Serial	10 x COM ports (COM1: rear, COM2-5: internal) COM1: RS-232/422/485, 0V/5V/12V COM2-6: RS-232, 0V/5V/12V COM7-10: RS-232, without power
	Parallel	N/A
	PS/2	1
	GPIO	8-bits (4 x GPI, 4 x GPO), 5V
	PCIe x16	1
	PCIe x8	1*PCIe x8 (x4 signal)
	PCIe x4	N/A
	PCIe x1	1
	PCI	1
Storage	M.2	1 x M Key (PCIe x4, SATA3.0), 2242/2280/2280
	Mini-PCIe	1 x Full-size, mSATA
	SATA	6 x SATA 3.0
Power Supply	mSATA	1
	DC	N/A
Environment	ATX	ATX-Power 24P, 12V-8P
	Operating Temperature	0 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
Form Factor	Storage Humidity	10 ~ 90%, non-condensing
	Dimensions	244 x 244 mm (uATX)
Certification	Weight	0.73 kg
	EMC	FCC, CE, RCM, VCCI, BSMI
Software Platform	OS Support	Windows 7 (32/64-bit) Windows 8.1 (64-bit) Windows 10 (64-bit) Linux Fedora 23 (by request) Linux Ubuntu 16.04 (by request)

Packing List

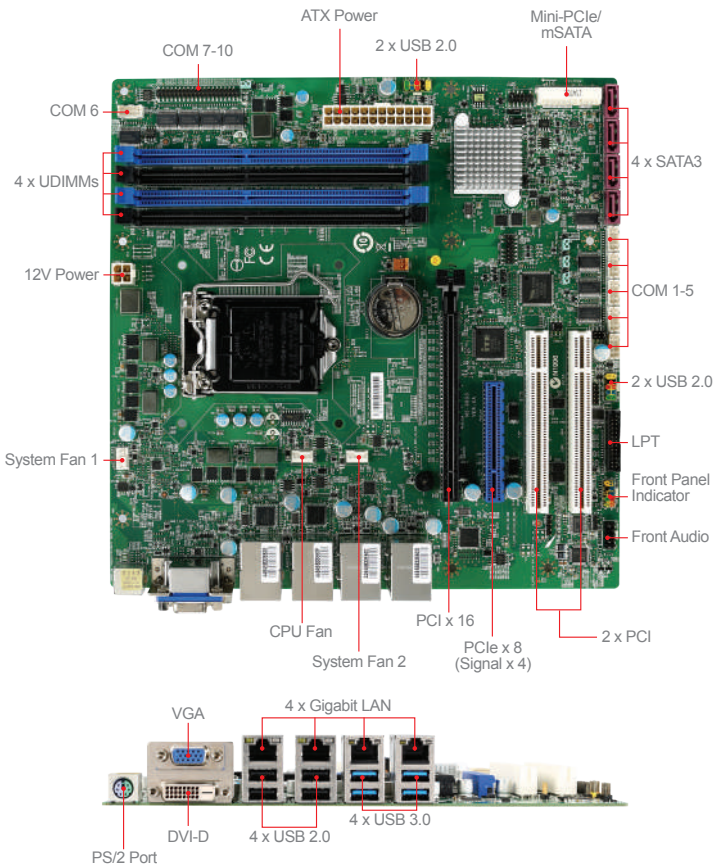
Part Number	Description
K1D-1008261-V03	SATA Cable, 500mm
K14-1018003-V03	COM PORT Cable, 300mm
E21-98E2010-C22	I/O SHIELD

Optional Item

Part Number	Description
K14-1036004-V03	COM Port Cable, 200mm
K1B-3008012-E06	USB 2.0 Cable, 330mm

MS-98G3

Micro-ATX with 4th Gen Intel® Haswell/Haswell Refresh Platform for Q87, 4 LAN, 10 COM & USB 3.0 for Vision Applications



Features

- Supports Intel® Haswell Desktop CPU
- Max Support 32GB DDR3 1600MHz Memory
- 2 independent displays: VGA and DVI
- 4 GbE LAN, 10 COM, and 4 USB 3.0
- Supports Mini-PCIe/mSATA Slot

Ordering Information

Part Number	Description
919-98G3-001	MS-98G3, Q87 Haswell / Haswell Re-Flash Desktop CPU, 4 x DDR3 Long DIMM, VGA/DVI-D, 4 x SATA3.0, 4 x GbE LAN, 10 x COM, 4 x USB3.0, 8 x USB2.0

Packing List

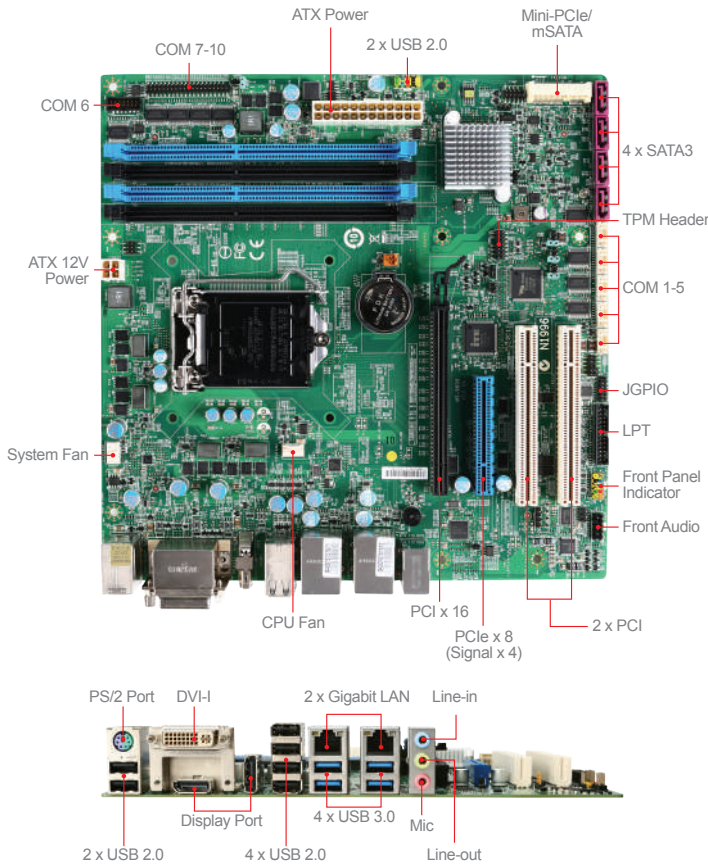
Part Number	Description	Quantity
K14-1018003-V03	COM PORT Cable, 300mm	1
K1D-1008261-V03	SATA CABLE, SIGNAL, 500mm	2
E21-98G3010-C22	IO Shielding	1
G71-SEDC125-X03	Driver CD	1

Specifications

Processor	CPU	4th Gen Intel® Desktop Haswell/ Haswell Refresh Core™ i7/i5/i3/Celeron®/ Pentium® Processors, Max. 95W	
	Frequency	2.2GHz~4.4GHz (Depends on CPU)	
	L2 Cache	2M ~ 8M (Depends on CPU)	
	CPU Type	Socket (LGA 1150)	
	Chipset	Intel® Q87 Express	
Memory	Technology	Dual-channel DDR3 1066/1333/1600MHz	
	Max. Capacity	Up to 32GB	
	Socket	4 x 240-pin Long-DIMMs	
	Controller	Intel® HD Graphics	
Display	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	VGA	1	
	DVI	1 (DVI-D)	
	Multiple Display	2 independent displays	
	Display Interface	VGA up to 1920 x 1080 @60Hz DVI up to 2560 x 1600 @60Hz	
Ethernet	Controller	1 x Intel® I217-LM GbE-PHY 3 x Intel® I210-AT PCIe GbE LAN	
Audio	Controller	Realtek® ALC887 HD Audio Codec	
Super I/O	Controller	Fintek F81866AD-I + F81216AD	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	
	Smart Fan	Yes	
TPM	Controller	Pin header	
I/O Interface	USB	8 x USB 2.0 (4 x rear; 4 x internal) 4 x USB 3.0 (4 x rear)	
	Serial	10 x COM ports (internal) COM1~4: RS-232, 0V/5V/12V COM5: RS-232/422/485, 0V/5V/12V COM6: RS-232/422/485, without power COM7~10: RS-232, 0V/5V/12V	
	Parallel	1	
	PS/2	1	
	GPIO	8-bits (4 x GPI, 4 x GPO), 5V	
	Expansion Slot	PCIe x16	1
		PCIe x4	1*PCIe x8 (x4 signal)
		PCI	2
		M.2	N/A
		Mini-PCIe	1 x Full-size, mSATA
Storage	SATA	4 x SATA 3.0	
	mSATA	1	
Power Supply	DC	N/A	
	ATX	ATX-Power 24P, 12V-4P	
Environment	Operating Temperature	0 ~ 60°C	
	Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C	
Form Factor	Storage Humidity	10 ~ 90%, non-condensing	
	Dimensions	244 x 244mm (uATX)	
	Weight	0.6 kg	
Certification	EMC	FCC, CE, RCM, VCCI, BSMI	
Software Platform	OS Support	Windows XP (32-bit) Windows 7 (32/64-bit) Windows 8 (32/64-bit)	

MS-98D6

Micro-ATX with 4th Gen Intel® Haswell/Haswell Refresh Platform for Superior I/O & Expansion Capability for High-Performance Solution



Features

- 10 COM ports for flexible applications
- 3 independent displays: DVI-I and DP
- Supports DirectX 11.1 and Intel® Clear Video Technology (up to 1080P)
- Multiple expansion slots: PCIe x16, PCI x8 (x4 signal) and 2*PCI
- 4 SATA 3.0 ports for faster and high-capacity storage
- Supports m-SATA function by Mini-PCIe slot
- Plenty USB ports for more peripherals (USB 2.0*8 USB 3.0*4)

Ordering Information

Part Number	Description
919-98D6-001	MS-98D6 10 OPT: A Q87+2*PCIe+1*Mini-Pcie+2*P-CI+4*SATA3.0+1*mSATA+4*DDR3+2*DP+1*DVI+8*USB 2.0+4*USB3.0+10*COM+2*Gbe LAN+ATX Power

Packing List

809-98D6-002

Part Number	Description	Quantity
E21-98D6010-C22	IO SHIELD FOR MS-98D6	1
K14-1018003-V03	INT COM PORT CABLE,300mm	1
K1D-1008261-V03	INT SATA CABLE,500mm	2

Specifications

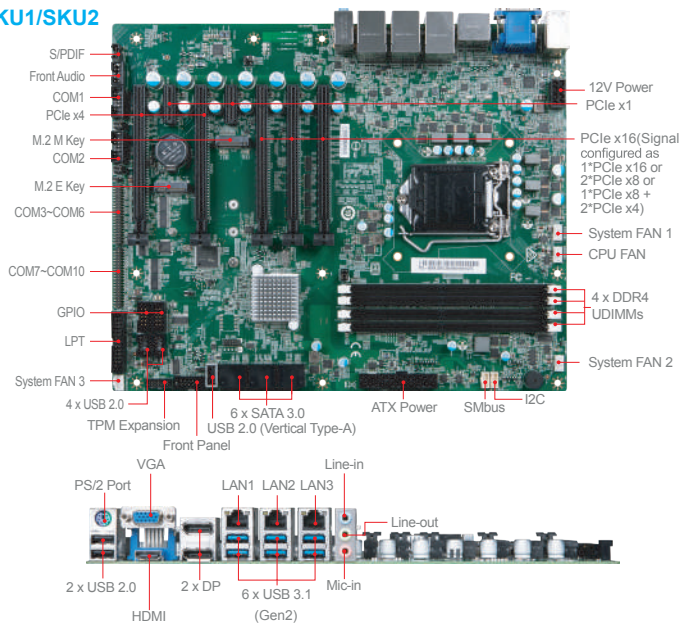
Processor	CPU	4th Gen Intel® Desktop Haswell/ Haswell Refresh Core™ i7/i5/i3/Celeron®/ Pentium® Processors, Max. 95W	
	Frequency	2.2GHz~4.4GHz (Depends on CPU)	
	L2 Cache	2M ~ 8M (Depends on CPU)	
	CPU Type	Socket (LGA 1150)	
	Chipset	Intel® Q87 Express	
Memory	BIOS	AMI	
	Technology	Dual-channel DDR3 1066/1333/1600MHz	
	Max. Capacity	Up to 32GB	
Display	Socket	4 x 240-pin Long-DIMMs	
	Controller	Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	DVI	1 (DVI-I)	
	DisplayPort	2	
	Multiple Display	3 independent displays	
	Display Interface	DP up to 3840 x 2160 @60Hz DVI up to 1920 x 1200 @60Hz	
Ethernet	Controller	1 x Intel® I217-LM GbE-PHY 1 x Intel® I210-AT PCIe GbE LAN	
Audio	Controller	Realtek® ALC887 HD Audio Codec	
Super I/O	Controller	Fintek F81866AD-I + F81216AD	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	
	Smart Fan	Yes	
TPM	Controller	Pin header	
I/O Interface	USB	8 x USB 2.0 (6 x rear; 2 x internal) 4 x USB 3.0 (4 x rear)	
	Serial	10 x COM ports (internal) COM1~4: RS-232, 0V/5V/12V COM5: RS-232/422/485, 0V/5V/12V COM6: RS-232/422/485, without power COM7~10: RS-232, 0V/5V/12V (COM1 & COM2 support WOR)	
	Parallel	1	
	PS/2	1	
	GPIO	8-bits (4 x GPI, 4 x GPO), 5V	
	Expansion Slot	PCIe x16	1
		PCIe x8	1*PCIe x8 (x4 signal)
		PCI	2
		M.2	N/A
	Storage	Mini-PCIe	1 x Full-size, mSATA
SATA		4 x SATA 3.0	
	mSATA	1	
Power Supply	DC	N/A	
	ATX	ATX-Power 24P, 12V-4P	
Environment	Operating Temperature	0 ~ 60°C	
	Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing	
Form Factor	Dimensions	244 x 244mm (uATX)	
	Weight	0.73 kg	
Certification	EMC	FCC, CE, RCM, VCCI, BSMI	
Software Platform	OS Support	Windows XP (32-bit) Windows 7 (32/64-bit) Windows 8 (32/64-bit)	

MS-98K9

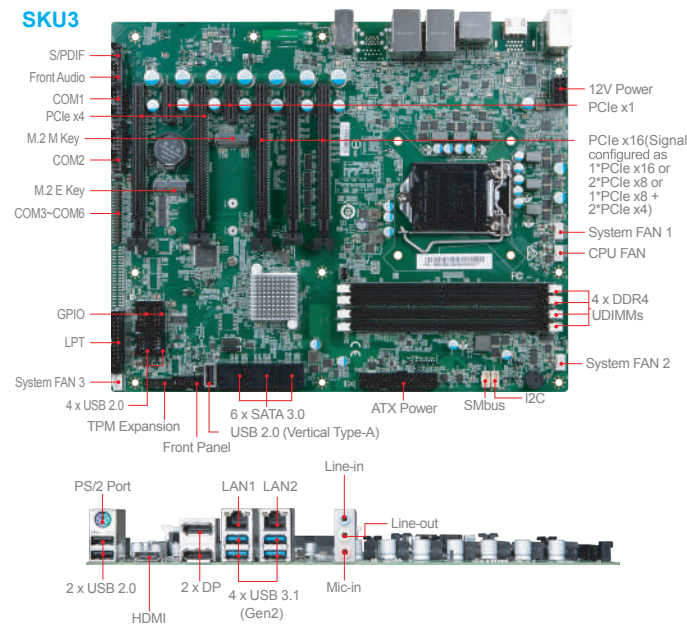
ATX with 8th Gen Intel® Coffee Lake-S Xeon®, Core™ i7/i5/i3, Pentium®, Celeron® Processor & Intel® C246/Q370 for High-Performance Solution

NEW

SKU1/SKU2



SKU3



Features

- Intel® Coffee Lake-S Series CPU to maximize performance
- 4 DDR4 2666MHz UDIMMs slots up to 64GB memory
- Supports dual DP, VGA, HDMI, 3 Intel® GbE LAN and AMT 12.x
- Supports 6 SATA 3.0, 6 USB 3.1(Gen2), 7 USB 2.0 and 10 COM ports for flexible applications
- Supports 3 PCIe x16 (Signal configured as 1 PCIe x16 or 2 PCIe x8 or 1 PCIe x8 + 2 PCIe x4), 2 PCIe x4 (PCIe x16 Slot Type) and 2 PCIe x1 Slots

Ordering Information

Part Number	Description
919-98K9-001	MS-98K9/609-98K9-010/809-98K9-005 VER10 Intel Coffee Lake-S C246, 4*DDR4 Long DIMM, 3*PCIex16, 2*PCIex4, 2*PCIex1, HDMI, 2*DP, VGA, TPM2.0, 3*LAN, 6*USB3.1, 7*USB2.0, 6*SATA3.0, 2*M.2, 1 0*COM, ATX POWER, RoHS, SINGLE, For Channel
919-98K9-002	MS-98K9/609-98K9-020/809-98K9-006 VER10 OPT-A Intel Coffee Lake-S Q370, 4*DDR4 Long DIMM, 3*PCIe x16, 2*PCIe x4, 2*PCIe x1, HDMI, 2*DP, VGA, TPM2.0, 3*LAN, 6*USB3.1, 7*USB2.0, 6*SATA3.0, 2*M.2, 10*COM, ATX POWER, RoHS, SINGLE, For Channel
919-98K9-003	MS-98K9/609-98K9-030/809-98K9-007 VER10 OPT-B Intel Coffee Lake-S Q370, 4*DDR4 Long DIMM, 3*PCIe x16, 2*PCIe x4, 2*PCIe x1, HDMI, 2*DP, 2*LAN, 4*USB3.1, 7*USB2.0, 6*SATA3.0, 2*M.2, 6*COM, ATX POWER, RoHS, SINGLE, For Channel

Specifications

	SKU1	SKU2	SKU3	
Processor	CPU	8th Gen Intel® Desktop Coffee Lake-S Xeon® /i7/i5/i3/ Pentium®/Celeron® Series Processor, Max 95W		
	Frequency	2.1GHz~4.7GHz (Depends on CPU)		
	L2 Cache	2MB~12MB (Depends on CPU)		
	CPU Type	Socket (LGA 1151)		
	Chipset	Intel® C246 Express	Intel® Q370 Express	
	BIOS	AMI UEFI		
Memory	Technology	Dual-channel DDR4 (ECC/non-ECC) 2666MHz	Dual-channel DDR4 (non-ECC) 2666MHz	
	Max. Capacity	Up to 64GB		
	Socket	4 x 288-pin UDIMMs		
Display	Controller	Intel® HD Graphics		
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM		
	VGA	1	N/A	
	HDMI	1		
	DisplayPort	2		
	Multiple Display	3 independent displays		
	Display Interface	VGA up to 1920 x 1200 @60Hz HDMI up to 4096 x 2160 @24Hz DP up to 4096 x 2304 @60Hz	HDMI up to 4096 x 2160 @24Hz DP up to 4096 x 2304 @60Hz	
Ethernet	Controller	1 x Intel® I219-LM GbE LAN PHY 2 x Intel® I210-AT GbE LAN	1 x Intel® I219-LM GbE LAN PHY 1 x Intel® I210-AT GbE LAN	
		Audio	Controller	Realtek® ALC887-VD2-CG Audio Codec
Super I/O	Controller	Fintek F8186AD-I		
H/W Monitor	Watchdog Timer	256-level Watchdog Timer		
	Smart Fan	Yes		
TPM	Controller	Infineon SLB 9665TT2.0	Box header (Default) Infineon SLB9665TT2.0 (by BOM option)	
		I/O Interfaces	USB	6 x USB 3.1 Gen2 (6 x rear) 7 x USB 2.0 (2 x rear, 5 x internal with one Vertical Type-A)
Serial	10 x COM ports (internal) COM1~2: RS-232/422/485, Ring/0V/5V/12V, Auto-flow Control COM3~10: RS-232, 0V/5V/12V			6 x COM ports (Internal) COM1~2: RS-232/422/485, Ring/0V/5V/12V, Auto-flow Control COM3~6: RS-232, 0V/5V/12V
	Parallel		Yes	
	PS/2		1 x PS/2 port by Y-cable for keyboard and mouse	
	GPIO		16-bits (8 x GPI; 8 x GPO), 5V	
Expansion Slot	PCIe x16		3 (Signal configured as 1 PCIe x16 or 2 PCIe x8 or 1 PCIe x8 + 2 PCIe x4)	
	PCIe x4	2 (PCIe x16 Slot Type; 1*PCIe x4 NVMe)		
	PCIe x1	2		
Storage	SATA	6 x SATA 3.0 (Support RAID 0/1/5/10, SATA Port 6 share with M.2 M Key)		
		Power Supply	ATX	ATX-Power 24P, 12V-8P
Environment	Operating Temperature	-10 ~ 60°C		
		Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C		
		Storage Humidity	10 ~ 90%, non-condensing	
Form Factor	Dimensions	305 x 244mm (ATX)		
	Weight	0.70 kg		
Certification	EMC	CE, FCC Class B, BSMI, RCM, VCCI		
Software Platform	OS Support	Windows 10 (64-bit)		
		Linux Kernel 4.x (by request)		

Packing List

Part Number	Description	Quantity
K1B-3008012-E06	INT USB2.0, 330mm	1
K14-1018004-V03	INT COM PORT CABLE, 510mm	1
K1D-1008261-V03	INT SATA CABLE, 500mm	2
E21-98K9010-C22	I/O Shielding	1
G71-SEDC192-N56	Driver CD	1

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCle Module

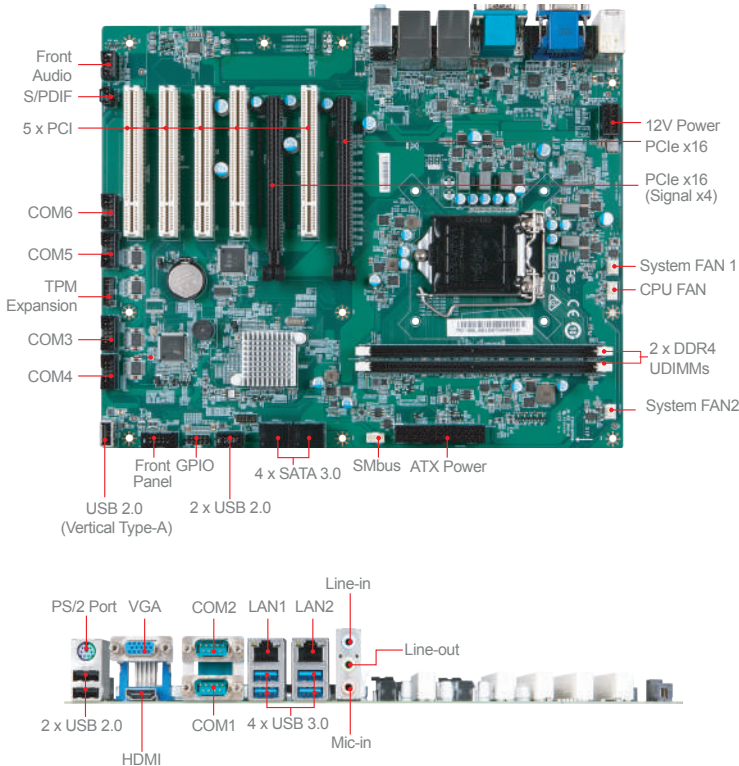
MS-98L9

ATX with 7th/6th Gen Intel® Kaby Lake/Skylake Core™ i7/i5/ i3, Pentium®, Celeron® Processor & Intel® H110 for Mainstream Solution

NEW

Specifications

Processor	CPU	7th/6th Gen Intel® Desktop Kaby Lake/Skylake i7/i5/i3/ Pentium® /Celeron® Series Processor, Max 65W	
	Frequency	2.3GHz-4.2GHz (Depends on CPU)	
	L2 Cache	2MB-8MB (Depends on CPU)	
	CPU Type	Socket (LGA 1151)	
	Chipset	Intel® H110 Express	
Memory	BIOS	AMI UEFI	
	Technology	Dual-channel DDR4 2133/2400MHz	
	Max. Capacity	Up to 32GB	
	Socket	2 x 288-pin UDIMMs	
	Controller	Intel® HD Graphics	
Display	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	LVDS	N/A	
	eDP	N/A	
	VGA	1	
	DVI	N/A	
	HDMI	1	
	DisplayPort	N/A	
	Multiple Display	2 independent displays	
	Display Interface	VGA up to 1920 x 1200 @60Hz	
		HDMI up to 4096 x 2160 @24Hz	
Ethernet	Controller	1 x Intel® I219-LM GbE LAN PHY 1 x Intel® I211-AT GbE LAN	
Audio	Controller	Realtek® ALC887-VD2-CG Audio Codec	
Super I/O	Controller	Fintek F81866AD-I	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	
	Smart Fan	Yes	
TPM	Controller	Box header	
I/O Interfaces	USB	4 x USB 3.0 (4 x rear) 5 x USB 2.0 (2 x rear, 3 x internal with one Vertical Type-A)	
	Serial	6 x COM ports (2 x rear, 4 x Internal) COM1: RS-232/422/485, 0V/5V/12V, Auto-flow Control COM2-6: RS-232, COM2: 0V/5V/12V	
	PS/2	1 x PS/2 port by Y-cable for keyboard and mouse	
	GPIO	8-bits (4 x GPI; 4 x GPO by default), 5V 8-bits (8 x GPI or 8 x GPO by request), 5V	
	PCIe x16	1	
	PCIe x4	1 (PCIe x16 Slot Type)	
Expansion Slot	PCIe x1	N/A	
	PCI	5	
	M.2	N/A	
	Mini-PCIe	N/A	
	SATA	4 x SATA 3.0	
Storage	IDE	N/A	
	eSATA	N/A	
	CFast	N/A	
	mSATA	N/A	
	CompactFlash	N/A	
Power Supply	DC Input	N/A	
	ATX	ATX-Power 24P, 12V-8P	
Environment	Operating Temperature	-10 ~ 60°C	
	Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing	
	Dimensions	305 x 244mm (ATX)	
Form Factor	Weight	0.70 kg	
	Certification	EMC	CE, FCC Class B, BSMI, RCM, VCCI
Software Platform	OS Support	Windows 7 (32/64-bit) (Skylake-S Series CPU Only)	
		Windows 8.1 (64-bit) (Skylake-S Series CPU Only)	
		Windows 10 (64-bit)	
		Linux Fedora 23 (by request)	
		Linux Ubuntu 16.04 (by request)	



Features

- Intel® Kaby Lake-S/Skylake-S Series CPU to maximize performance
- 2 DDR4 2133/2400MHz UDIMMs slots up to 32GB memory
- Supports VGA, HDMI and dual Intel® GbE LAN
- Supports 4 SATA 3.0, 4 USB 3.0, 5 USB 2.0 and 6 COM ports for flexible applications
- Supports 1 PCIe x16, 1 PCIe x4 and 5 PCI Slots

Ordering Information

Part Number	Description
919-98L9-001	MS-98L9/609-98L9-010/809-98L9-005 VER11 Intel Kaby Lake-S/Skylake-S H110,2*DDR4,1*PCIe x16,1*PCIe x4, 5*PCI,HDMI,VGA,2*LAN,4*USB3.0,5*USB2.0,4*SATA3.0,6*COM,ATX POWER,RoHS,SINGLE,For Channel

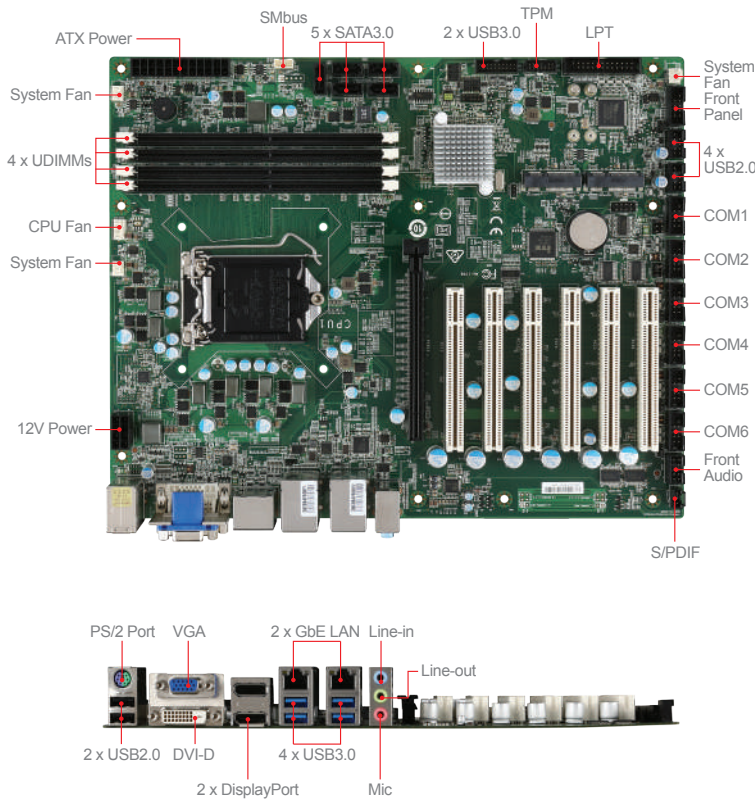
Packing List

Part Number	Description	Quantity
K1D-1008261-V03	SATA Cable, 500mm	2
E21-98L9010-C22	I/O SHIELDING	1
G71-SEDC193-N56	Driver CD	1

MS-98H9 V2.0

ATX with 7th/6th Gen Intel® Core™ i7/i5/ i3 Pentium®/Celeron® Processor & Intel® Q170 for High-Performance Solution

NEW



Features

- Intel® Kaby Lake-S/Skylake-S Series CPU to maximize performance
- 4 DDR4 2133MHz UDIMMs slots up to 64 GB memory
- Supports DisplayPort, DVI-D, dual Intel® GbE LAN and AMT 11.0
- Supports 6 COM ports, 5 SATA 3.0, 1 mSATA, 6 USB 3.0 and 6 USB 2.0 for flexible applications
- Supports 1 PCIe x16 and 6 PCI Slots

Ordering Information

Part Number	Description
919-98H9-006	MS-98H9 20 OPT:A LGA1151,Q170,4*D-DR4,1*DVI-D+1*VGA+2*DisplayPort 1.2a+6*USB3.0+6*USB2.0+5*SATA3.0+1*mSATA+6*COM+1*PCIe+6*PCI+2*GBE LAN+ATX POWER

Packing List

Part Number	Description	Quantity
K1B-3008012-E06	USB Cable, 330mm	1
K14-1018004-V03	COM Port Cable, 510mm	1
K39-3002004-E06	PS/2 Y-Cable, 190mm	1
K18-1025011-V03	LPT Cable, 300mm	1
K1D-1008261-V03	SATA Cable, 500mm	2
E21-98H9010-C22	I/O SHIELDING	1
G71-SEDC148-N56/X03	Driver CD	1

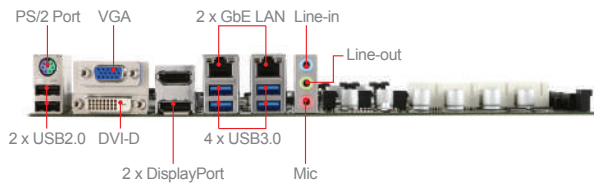
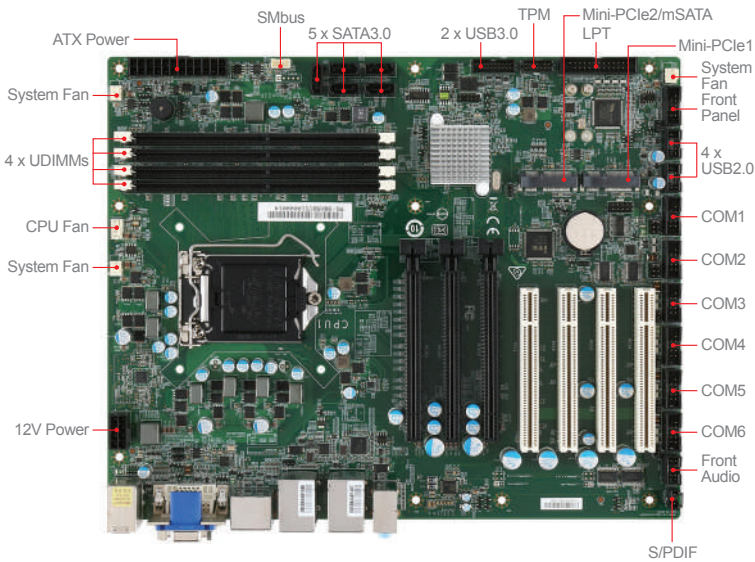
Specifications

Processor	CPU	7th/6th Gen Intel® Desktop Kaby Lake/ Skylake i7/i5/i3/Pentium®/ Celeron® Series Processor, Max 95W
	Frequency	2.6GHz~4.5GHz(Depends on CPU)
	L2 Cache	2MB~8MB (Depends on CPU)
	CPU Type	Socket (LGA 1151)
	Chipset	Intel® Q170 Express
Memory	BIOS	AMI UEFI
	Technology	Dual-channel DDR4 (non-ECC) 2133MHz
	Max. Capacity	Up to 64GB
	Socket	4 x 288-pin UDIMMs
Display	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	LVDS	N/A
	eDP	N/A
	VGA	1 (Non Hot Plug)
	DVI	1 (DVI-D)
	HDMI	N/A
	DisplayPort	2
	Multiple Display	3 independent displays
	Display Interface	VGA up to 1920 x 1080 @60Hz DVI-D up to 1920 x 1200 @60Hz DP up to 4096 x 2304 @60Hz
Ethernet	Controller	1 x Intel® I219-LM GbE LAN PHY 1 x Intel® I210-AT GbE LAN
Audio	Controller	Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I
H/W Monitor	Watchdog Timer	256-level Watchdog Timer
	Smart Fan	Yes
TPM	Controller	Box header
I/O Interface	USB	6 x USB 2.0 (2 x rear; 4 x internal) 6 x USB 3.0(4 x rear; 2 x internal)
	Serial	6 x COM ports (internal) COM1~2: RS-232/422/485, 0V/5V/12V COM3~6: RS-232, 0V/5V/12V
	Parallel	Yes
	PS/2	1 x PS/2 port by Y-cable for keyboard and mouse
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
Expansion Slot	PCIe x16	1
	PCIe x4	N/A
	PCIe x1	N/A
	PCI	6
	M.2	N/A
	Mini-PCIe	2 x Full-size (one w/ mSATA)
Storage	SATA	5 x SATA 3.0 (Support RAID 0/1/5/10)
	IDE	N/A
	eSATA	N/A
	CFast	N/A
	mSATA	1
	CompactFlash	N/A
Power Supply	DC	N/A
	ATX	ATX-Power 24P, 12V-8P
Environment	Operating Temperature	-10 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
Form Factor	Storage Humidity	10 ~ 90%, non-condensing
	Dimensions	305 x 244mm (ATX)
Certification	Weight	0.70 kg
	EMC	FCC, CE, RCM, VCCI, BSMI (Class B)
Software Platform	OS Support	Windows 7 (32/64-bit) (Skylake-S Series CPU Only) Windows 8.1 (64-bit) (Skylake-S Series CPU Only) Windows 10 (64-bit) Linux Fedora 23 (by request) Linux Ubuntu 16.04 (by request)

Semi-rugged Terminal
POS System
HMI Panel PC
Embedded System
Embedded Board
COM Express Board
Oseven Board
Pico-ITX Board
3.5" Board
EPIC Board
PICMG 1.0 Board
Mini-ITX Board
Micro-ATX Board
ATX Board
Mini-PCle Module

MS-98H9

ATX with 7th/6th Gen Intel® Core™ Xeon/i7/i5/ i3 Pentium®/Celeron® Processor & Intel® C236/Q170/H110 for High-Performance Solution



Features

- Intel® Kaby Lake-S/Skylake-S Series CPU to maximize performance
- 4 DDR4 2133MHz UDIMMs slots up to 64GB memory
- Supports DisplayPort, DVI-D, dual Intel® GbE LAN and AMT 11.0
- 5 SATA 3.0, 1 mSATA, 6 COM, 6 USB 3.0, 6 USB 2.0
- 1 PCIe x16, dual PCIe x4 and 4 PCI Slots

Ordering Information

Part Number	Description
919-98H9-001	LGA1151, C236,4*DDR4, 1*DVI-D+1*VGA+2*DisplayPort 1.2a+6*USB3.0+6*USB2.0+5*SATA3.0+1*mSATA+6*COM+2*GBE LAN+ATX POWER
919-98H9-002	OPT: A LGA1151, Q170, 4*DDR4, 1*DVI-D+1*VGA+2*DisplayPort 1.2a+6*USB3.0+6*USB2.0+5*SATA3.0+1*mSATA+6*COM+2*GBE LAN+ATX POWER
919-98H9-003	OPT: B LGA1151, H110,2*DDR4, 1*DVI-D+1*VGA+2*DisplayPort 1.2a+4*USB3.0+4*USB2.0+4*SATA3.0+6*COM+2*GBE LAN+ATX POWER

Packing List

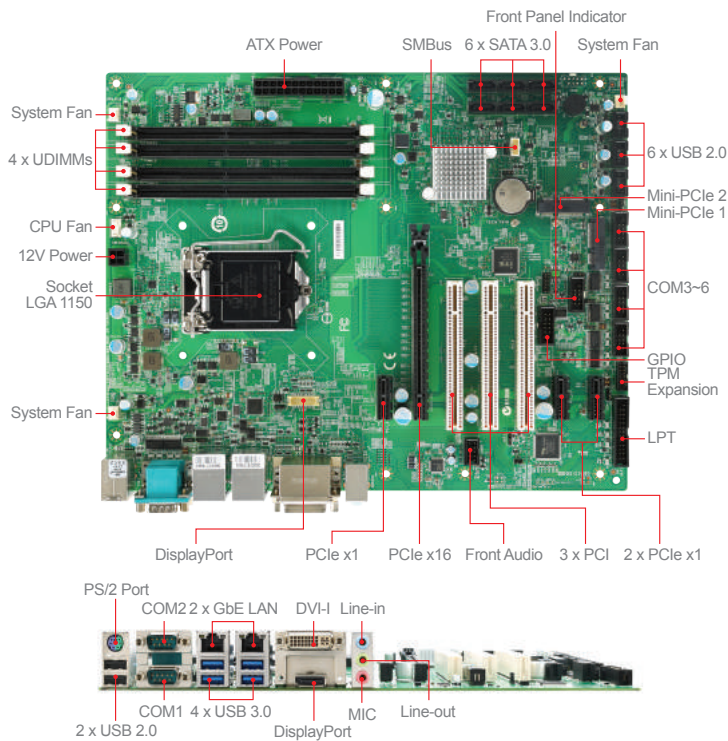
Part Number	Description	Quantity
K1B-3008012-E06	USB 2.0 Cable, 330mm	1
K14-1018004-V03	COM Port Cable, 510mm	1
K39-3002004-E06	PS/2 Y-Cable, 190mm	1
K18-1025011-V03	LPT Cable, 300mm	1
K1D-1008261-V03	SATA Cable, 500mm	2
E21-98H9010-C22	I/O SHIELDING	1
G71-SEDC148-N56/X03	DRIVER DVD	1

Specifications

		C236 SKU	Q170 SKU	H110 SKU
Processor	CPU	7th/6th Gen Intel® Desktop Kaby Lake/Skylake Xeon/i7/i5/i3/Pentium®/Celeron® Series Processor, Max 95W	7th/6th Gen Intel® Desktop Kaby Lake/Skylake i7/i5/i3/Pentium®/Celeron® Series Processor, Max 95W	
	Frequency	2.6 GHz~4.5 GHz (Depends on CPU)		
	L2 Cache	2MB~8MB (Depends on CPU)		
	CPU Type	Socket (LGA 1151)		
Memory	Chipset	Intel® C236 Express	Intel® Q170 Express	Intel® H110 Express
	BIOS	AMI UEFI		
	Technology	Dual-channel DDR4 (ECC) 2133MHz		
	Max. Capacity	Up to 64GB		Up to 32GB
Display	Socket	4 x 288-pin UDIMMs		2 x 288-pin UDIMMs
	Controller	Intel® HD Graphics		
Ethernet	Graphic Memory	Shared system memory up to 1.7 GB SDRAM		
	VGA	1 (Non Hot Plug)		
	DVI	1 (DVI-D)		
	DisplayPort	2		
	Multiple Display	3 independent displays		
Audio	Display Interface	VGA up to 1920 x 1080 @60Hz DVI-D up to 1920 x 1200 @60Hz DP up to 4096 x 2304 @60Hz		
	Controller	1 x Intel® I219-LM GbE LAN PHY (Support Intel® AMT 11) 1 x Intel® I210-AT GbE LAN		
Super I/O	Controller	Realtek® ALC887 HD Audio Codec		
H/W Monitor	Controller	Fintek F81866AD-I		
TPM	Watchdog Timer	256-level Watchdog Timer		
	Smart Fan	Yes		
I/O Interface	Controller	Box header		
	USB	6 x USB3.0 (4 x rear, 2 x internal) 6 x USB2.0 (2 x rear, 4 x internal)	4 x USB3.0 (4 x rear) 4 x USB2.0 (2 x rear, 2 x internal)	
	Serial	6 x COM ports (internal) COM1~2: RS-232/422/485, 0V/5V/12V COM3~6: RS-232, 0V/5V/12V		
	Parallel	1		
	PS/2	1 x PS/2 port by Y-cable for keyboard and mouse		
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V		
	PCIe x16	1		
Expansion Slot	PCIe x4	2		1
	PCI	4		
	M.2	N/A		
	Mini-PCIe	2 x Full-size (one w/ mSATA)		N/A
Storage	SATA	5 x SATA 3.0 (Support RAID 0/1/5/10)		4 x SATA 3.0
	mSATA	1		N/A
Power Supply	DC	N/A		
	ATX	ATX-Power 24P, 12V-8P		
Environment	Operating Temperature	-10 ~ 60°C		
	Operating Humidity	10 ~ 90%, non-condensing		
	Storage Temperature	-20 ~ 80°C		
	Storage Humidity	10 ~ 90%, non-condensing		
Form Factor	Dimensions	305 x 244mm (ATX)		
	Weight	0.70 kg		
Certification	EMC	FCC, CE, RCM, VCCI, BSMI (Class B)		
Software Platform	OS Support	Windows 7 (32/64-bit) (Skylake-S Series CPU Only) Windows 8.1 (64-bit) (Skylake-S Series CPU Only) Windows 10 (64-bit) Linux Fedora 23 (by request) Linux Ubuntu 16.04 (by request)		

MS-98B5

ATX with 4th Gen Intel® Core™ i7/i5/i3/Pentium®/Celeron® Processor and Intel® H81/Q87 for High-Performance Solution



Features

- Intel® Haswell Series CPU to maximize performance
- 4 DDR3/DDR3L 1600MHz UDIMMs up to 32GB
- Supports DisplayPort, DVI-I, Dual Intel® GbE LAN and AMT 9.0
- 6 SATA 3.0, 6 COM, 4 USB 3.0, 8 USB 2.0
- Supports ATX power

Ordering Information

Part Number	Description
919-98B5-001	MS-98B5 10 Q87, ATX, LGA1150, 4*DDR3, 1*D-VI-I+2*DisplayPort 1.2a +4*USB3.0+8*USB2.0+6*SATA3.0+6*COM+2*GbE LAN+ATX POWER, RoHS
919-98B5-002	MS-98B5 10 OPT.A, H81, ATX, LGA1150, 2*DDR3, 1*D-VI-I+2*DisplayPort 1.2a +2*USB3.0+8*USB2.0+2*SATA3.0+2*SATA2.0+6*COM+2*GbE LAN+ATX POWER, RoHS

Packing List

Part Number	Description	Quantity
K14-1018004-V03	Internal COM Port Cable with Bracket, 510mm	2
K18-1025011-V03	Internal LPT Cable with Bracket, 300mm	1
K1B-3008012-E06	Internal USB2.0, 330mm	1
K1D-1008261-V03	SATA Cable, 500mm	2
K39-3002004-E06	External PS/2 Y-Cable, 190mm	1
E21-98B5010-C22	I/O Shielding	1
G71-SEDC159-N56	Driver DVD	1

Specifications

Processor	CPU	4th Gen Intel® Core™ i7/i5/i3/Pentium®/Celeron® Processor, Max. 95W
	Frequency	2.4GHz~4.0 GHz (Depends on CPU)
	L2 Cache	2M~8M (Depends on CPU)
	CPU Type	Socket (LGA 1150)
	Chipset	Intel® H81/Q87 Express
Memory	BIOS	AMI
	Technology	Dual-channel DDR3/DDR3L 1333/1600MHz
	Max. Capacity	Up to 32GB
	Socket	4 x 240-pin DIMMs
Display	Controller	Intel® HD Graphics
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM
	DVI	1 (DVI-I)
	DisplayPort	1
	Multiple Display	2 independent displays (H81 SKU) 3 independent displays (Q87 SKU)
	Display Interface	VGA up to 1920 x 1080 @60Hz DVI-D up to 2560 x 1600 @60Hz DP up to 2560 x 1600 @60Hz
Ethernet	Controller	1 x Intel® I217-LM GbE LAN PHY 1 x Intel® I210-AT GbE LAN
Audio	Controller	Realtek® ALC887 HD Audio Codec
Super I/O	Controller	Fintek F81866AD-I
	Watchdog Timer	256-level Watchdog Timer
H/W Monitor	Smart Fan	Yes
	TPM	Controller
I/O Interface	USB	8 x USB 2.0 (Q87: 2 x rear; 6 x internal; H81: 4 x rear; 4 x internal) 4 x USB 3.0 (Q87: 4 x rear; H81: 2 x rear)
	Serial	6 x COM ports (COM1~2: rear, COM3~6: internal) COM1~2: RS-232/422/485, 0V/5V/12V COM3~6: RS-232, 0V/5V/12V
	Parallel	1
	PS/2	1 x PS/2 port by Y-cable for keyboard and mouse
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V
	PCIe x16	1
Expansion Slot	PCIe x1	3
	PCI	3
	M.2	N/A
	Mini-PCIe	2 x Full-size (Q87 only)
	Storage	SATA
Power Supply	DC	N/A
	ATX	ATX-Power 24P, 12V-4P
Environment	Operating Temperature	0 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	305 x 244mm (ATX)
	Weight	0.70 kg
Certification	EMC	FCC, CE, RCM VCCI, BSMI (Class A)
Software Platform	OS Support	Windows XP (32/64-bit) Windows 7 (32/64-bit) Windows 8 (32/64-bit) Windows 10 (64-bit)

Semi-Integrated Terminal

POS System

HMI Panel PC

Embedded System

Embedded Board

COM Express Board

7seven Board

Pico-ITX Board

3.5" Board

EPIC Board

PI/CMG 1.0 Board

Mini-ITX Board

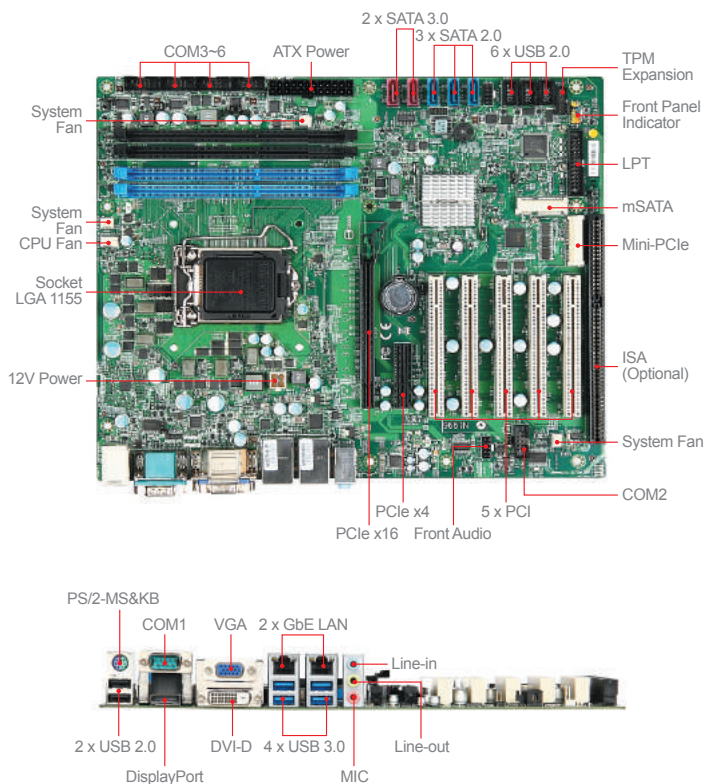
Micro-ATX Board

ATX Board

Mini-PCIe Module

MS-98A9

ATX with 3rd Gen Intel® Core™ i7/i5/i3/Pentium®/Celeron® Processor and Intel® Q77 for High-Performance Solution



Features

- Intel® Ivy Bridge and Sandy Bridge Series CPU to maximize performance
- Supports 4 DDR3 1600MHz UDIMM up to 32GB
- Supports DisplayPort, DVI-D, VGA and dual Intel® GbE LAN
- 2 SATA 3.0, 3 SATA 2.0, mSATA, 6 COM, 4 USB 3.0, and 8 USB 2.0
- Supports AMT 8.0
- Supports ISA slot (optional)
- Supports ATX power

Ordering Information

Part Number	Description
919-98A9-001	MS-98A9 VER 1.1 INTEL IVY BRIDGE+Q77, 4*DDR3, 1*VGA+1*DVI,1*DP, 10*USB 2.0, 4*USB 3.0, 2*GbE LAN, 1*Mini-PCle, 1*mSATA, 3*SATA2, 2*SATA3, with ISA
919-98A9-002	MS-98A9 VER 1.1 INTEL IVY BRIDGE+Q77, 4*DDR3, 1*VGA+1*DVI,1*DP, 10*USB 2.0, 4*USB 3.0, 2*GbE LAN, 1*Mini-PCle, 1*mSATA, 3*SATA2, 2*SATA3, without ISA

Packing List

Part Number	Description	Quantity
K14-1018004-V03	Internal COM Port Cable with Bracket, 510mm	2
K18-1025011-V03	Internal LPT Cable with Bracket, 300mm	1
K1B-3008012-E06	Internal USB2.0, 330mm	1
K39-3002004-E06	External PS/2 Y-Cable, 190mm	1
K1D-1080054-E06	SATA Cable, 625mm	2
E21-98A9010-C22	I/O Shielding	1
G71-SEDC078-J24	Driver DVD	1

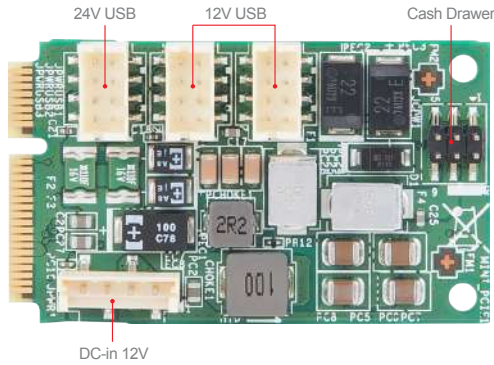
Specifications

Processor	CPU	3rd Gen Intel® Core™ i7/i5/i3/Pentium®/Celeron® Processor, Max.95W	
	Frequency	2.8GHz~3.9 GHz (Depends on CPU)	
	L2 Cache	3M~8M (Depends on CPU)	
	CPU Type	Socket (LGA 1155)	
	Chipset	Intel® Q77 Express	
Memory	BIOS	AMI	
	Technology	Dual-channel DDR3 1333/1600MHz	
	Max. Capacity	Up to 32GB	
Display	Socket	4 x 240-pin DIMMs	
	Controller	Intel® HD Graphics	
	Graphic Memory	Shared system memory up to 1.7 GB SDRAM	
	VGA	1	
	DVI	1 (DVI-D)	
	DisplayPort	1	
	Multiple Display	2 independent displays (SNB CPU only) 3 independent displays (IVB CPU only)	
	Display Interface	VGA up to 1920 x 1080 @60Hz DVI-D up to 1920 x 1200 @60Hz DP up to 2560 x 1600 @60Hz HDMI up to 1920 x 1200 @60Hz	
	Ethernet	Controller	1 x Intel® 82579LM GbE LAN PHY 1 x Intel® 82583V GbE LAN
		Controller	Realtek® ALC887 HD Audio Codec
Audio	Controller	Realtek® ALC887 HD Audio Codec	
Super I/O	Controller	Fintek F81866	
H/W Monitor	Watchdog Timer	256-level Watchdog Timer	
	Smart Fan	Yes	
TPM	Controller	Pin header	
I/O Interface	USB	4 x USB 3.0 (rear) 8 x USB 2.0 (2 x rear; 6 x internal)	
	Serial	6 x COM ports (COM1: rear, COM2~6: internal) COM1~2: RS-232/422/485, 0V/5V/12V COM3~6: RS-232, 0V/5V/12V	
	Parallel	1	
	PS/2	1	
	GPIO	8-bits (4 x GPI; 4 x GPO), 5V	
	Expansion Slot	PCIe x16	1
		PCIe x4	1
PCI		5	
M.2		N/A	
Mini-PCle		1 x Full-size	
Storage	SATA	2 x SATA 3.0; 3 x SATA 2.0 (support RAID 0, 1, 5, 10)	
	mSATA	1	
Power Supply	DC	N/A	
	ATX	ATX-Power 24P, 12V-4P	
Environment	Operating Temperature	0 ~ 60°C	
	Operating Humidity	10 ~ 90%, non-condensing	
	Storage Temperature	-20 ~ 80°C	
	Storage Humidity	10 ~ 90%, non-condensing	
Form Factor	Dimensions	305 x 244mm (ATX)	
	Weight	0.75 kg	
Certification	EMC	FCC Class A, CE, RCM, VCCI, BSMI	
Software Platform	OS Support	Windows XP (32/64-bit) Windows 7 (32/64-bit) Windows 8 (32/64-bit)	
		* 1 x ISA Slot (optional)	

MS-99C5

Full-Size Mini-PCle SBC in Multi-I/O Function with Power USB & Expansion Card for POS Application

NEW



Features

- Multi-I/O function with 1*24V power USB, 2*12V power USB and 1*cash drawer
- Mini-PCle interface can meet various system expansion requests
- Supports cash drawer with RJ11 by cable (for POS application)

Ordering Information

Part Number	Description
Coming soon	

Packing List

Part Number	Description
Coming soon	

POS Application



Specifications

I/O Interface	USB	1 x 24V Power USB (by cable) 2 x 12V Power USB (by cable)
Power Supply	DC	DC-in 12V
Environment	Operating Temperature	0 ~ 60°C
	Operating Humidity	10 ~ 90%, non-condensing
	Storage Temperature	-20 ~ 80°C
	Storage Humidity	10 ~ 90%, non-condensing
Form Factor	Dimensions	47.75 x 30mm (Full-Size Mini-PCle)
	Weight	0.01kg
Certification	EMC	CE, FCC Class A, BSMI, VCCI, RCM
Software Platform	OS Support	Windows XP (32/64-bit) Windows 7 (32/64-bit) Windows 8.1 (32/64-bit) Windows 10 (32/64-bit) Linux/Fedora 25 Ubuntu 16.04

Compatible Embedded Boards & Systems

Form Factor	Model	CPU
Pico-ITX	MS-98I6	Intel® Apollo Lake/Apollo Lake-I
	MS-98H6	Intel® Braswell
3.5"	MS-98H3	Intel® Kaby Lake-U /Skylake-U
	MS-98E6	Intel® Apollo Lake/Apollo Lake-I
	MS-98I8	Intel® Braswell
	MS-98G6	Intel® Bay Trail-D/M
	MS-98F6	Intel® Bay Trail-D/M
	MS-98F3	Intel® Haswell-U/Broadwell-U
Mini-ITX	MS-98E1	Intel® Kaby Lake-S/Skylake-S
	MS-98B3	Intel® Kaby Lake-U/Skylake-U
	MS-98J4	Intel® Kaby Lake-U/Skylake-U
	MS-98H4	Intel® Broadwell-U
	MS-98B1	Intel® Apollo Lake/Apollo Lake-I
	MS-98J0	Intel® Apollo Lake/Apollo Lake-I
3.5"	MS-9892	Intel® Apollo Lake/Apollo Lake-I
	MS-98F1	Intel® Braswell
	MS-98I0	Intel® Braswell
	MS-98F5	Intel® Bay Trail-D/M
	MS-98E3	Intel® Bay Trail-D/M
	Compact-Size Box PC	MS-9A89
MS-9A69		Intel® Broadwell-U/Bay Trail D/M
MS-9A88		Intel® Braswell
Palm-Size Box PC	MS-9A79	Intel® Apollo Lake/Apollo Lake-I



msi[®] ***IPC***

E-mail: ipcsales@msi.com

Website: <http://ipc.msi.com/>

Tel: +886 2 3234-5599



The ASA (American Soybean Association) has granted authorization of permit. The use of soy ink demonstrates MSI's commitment to protect and restore the natural resources.

- All functions above are optional for all of MSI products.
- MSI is a trademark of Micro-Star Int'l Co.,Ltd.
- Specifications are subject to change without notice.
- All brand names are registered trademarks of their respective owners.
- Any configuration other than original product specification is not guaranteed.
- Product lists may or may not be available in other countries or regions of the world.

