



EMBEDDED COMPUTING

Vol.19

iBASE
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4. CPU Cards

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About IBASE



Core Activities

Design and Manufacture of Robust Industrial Computing Platforms



HEADQUARTERS
Taipei, Taiwan



FOUNDED
February 2000



CHAIRMAN
C. S. Lin



CAPITAL
US\$58.1M



EMPLOYEE
700
(Worldwide)



Stock Quote
TPEX 8050
(Since 2003)

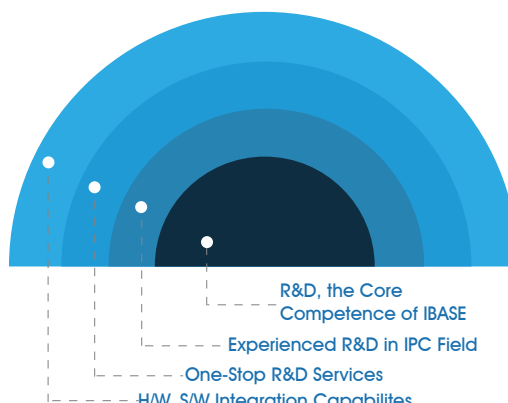
Company Profile

IBASE Technology specializes in the design and manufacture of robust industrial PC products, delivering high quality products and excellent service since its establishment in 2000. IBASE carries out manufacturing and quality control at its own facilities in Taiwan that are certified with ISO 9001, ISO 13485 and ISO 14001 standards. Current product offerings comprise of x86- and RISC-based industrial motherboards, embedded systems, panel PCs, network appliances and digital signage players. The company is publicly listed in the Taipei Exchange (TPEX: 8050) and is now a leading global provider of innovative industrial and embedded computing products.



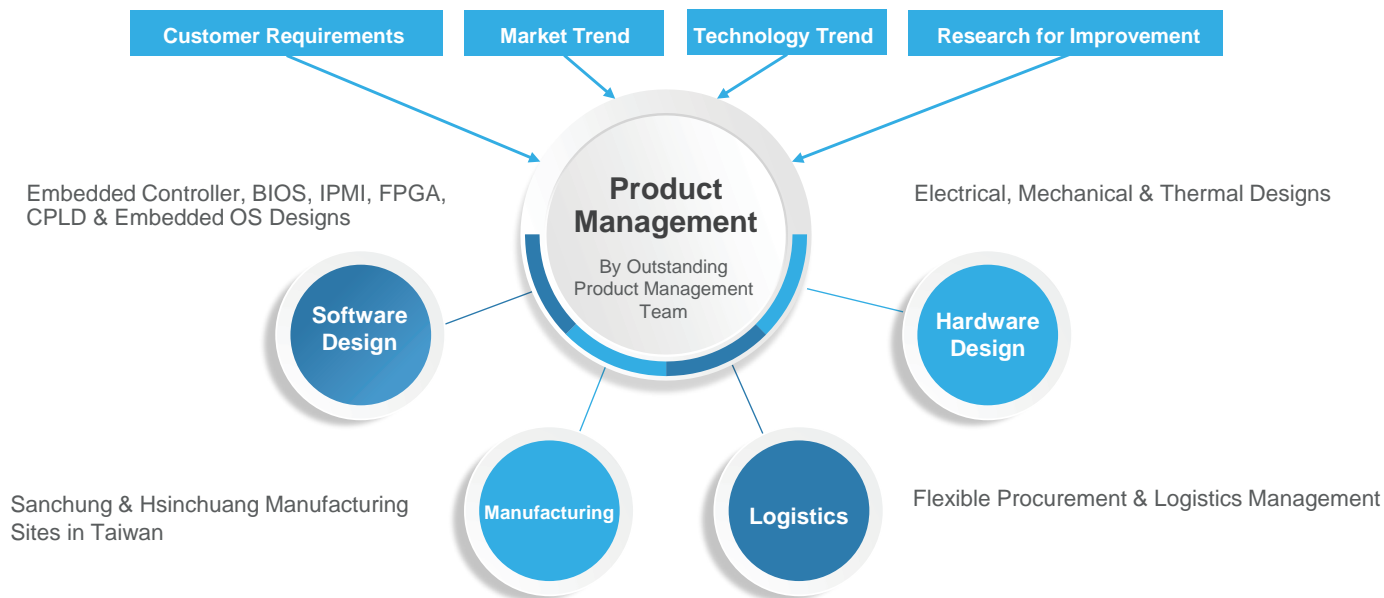
R&D Capabilities

IBASE's R&D team boasts of talented electronics, layout, system, mechanical hardware, BIOS, firmware as well as software engineers. Half of the team members are seasoned with more than 15 years of experience in their respective fields, while the other 45 percent carry more than five years of experience. Because of their accumulated expertise, the R&D team is able to design and create new products for the demanding and dynamic market.

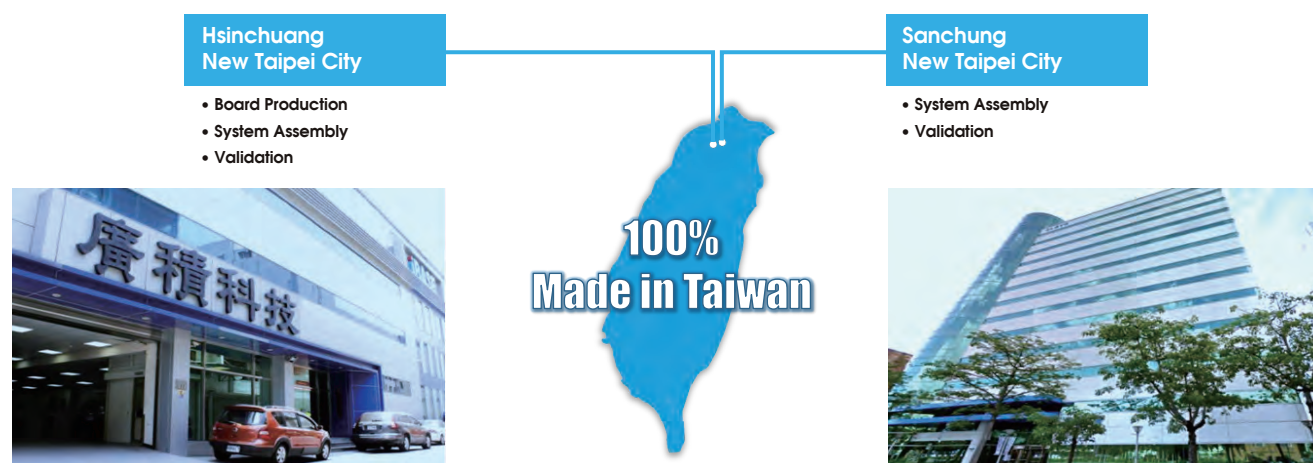


Design+, Manufacture+, Service+

Set up to become a global leading provider of embedded board and system solutions, IBASE manufacturers and supplies cutting-edge products based on the latest technologies to match market demands. Our R&D and product management teams have the expertise to design and develop products that are innovative and meet customers' requirements and design specifications. We attach great importance to research and development, investing heavily in manpower and resources to continuously provide high-quality innovative products. IBASE is also committed to compliance with environmental policies by working to prevent pollution with non-use of banned or restricted substances in our production process and products, helping our customers respond to their environmental challenges.



IBASE Manufacturing Sites



Certifications



Comparison Table

CPU Module

Models	ET860	ET870	ET950	ET960
Form Factor	COM Express Type 6	COM Express Type 6 (R3.0)	COM Express Type 6 Basic	COM Express Type 6
CPU Socket Supported	BGA1170 SoC on board	FCBGA1296 SoC on board	BGA1364 CPU on board	BGA1364 CPU on board
CPU	Intel® Atom™ Processor E3845/ E3827	Intel® Atom™ Processor E3930/ E3950	4th Gen Intel® Core™ i7/i5/i3	5th Gen Intel® Core™ i7
CPU Max. Frequency	Up to 1.91GHz	Up to 2.5GHz	Up to 2.7GHz	Up to 3.40GHz
PCH	N/A	N/A	Intel® QM87 PCH	Intel® QM87 PCH
Memory Type	2x DDR3L SO-DIMM	2x DDR3L SO-DIMM	2x DDR3L SO-DIMM	2x DDR3L SO-DIMM
Max. Memory Size	8GB	16GB	16GB	16GB
BIOS	AMI	AMI	AMI	AMI
Graphics Controller	Intel® Core™ i integrated Gen7 graphics	Intel® Gen9-LP w/ 18 EUs graphics	Intel® Core™ i integrated Gen8 graphics	Intel® Core™ i integrated graphics
Video Output	18/24-bit single-channel LVDS (on Carrier Board)	24-bit dual-channel LVDS (on Carrier Board)	18/24-bit single-channel LVDS (on Carrier Board)	18/24-bit single-channel LVDS (on Carrier Board)
Ethernet	Intel® I210IT PCI-E Gigabit LAN	Intel® I210IT PCI-E Gigabit LAN	Intel® I217LM PCI-E Gigabit LAN PHY	Intel® I218LM PCI-E Gigabit LAN PHY
Audio	Realtek ALC662 (on Carrier Board)	Realtek ALC662 (on Carrier Board)	Realtek ALC662 (on Carrier Board)	Realtek ALC662 (on Carrier Board)
SATA	2x SATA III ports (on Carrier Board)	2x SATA III ports	2x SATA II 2x SATA III ports (on Carrier Board)	2x SATA II 2x SATA III ports (on Carrier Board)
I/O Chip	NCT5523D (on board)	F81804U-I (on board)	NCT5523D (on board)	NCT5523D (on board)
Parallel Port	1 SPP/EPP/ECP port (on Carrier Board)	1 SPP/EPP/ECP port (on Carrier Board)	1 SPP/EPP/ECP port (on Carrier Board)	1 SPP/EPP/ECP port (on Carrier Board)
Serial Port	2x RS232 COM ports (on Carrier Board)	2x COM ports (TX/RX) (on Carrier Board)	2x RS232 COM ports (on Carrier Board)	2x RS232 COM ports (on Carrier Board)
USB 2.0	8x USB 2.0 (via Carrier Board)	4x USB 2.0 (via Carrier Board)	4x USB 2.0 (via Carrier Board)	4x USB 2.0 (via Carrier Board)
USB 3.0/ 3.1	1x USB 3.0 (via Carrier Board)	3x USB 3.0 (via Carrier Board)	4x USB 3.0 (via Carrier Board)	4x USB 3.0 (via Carrier Board)
TPM	N/A	2.0	1.2	N/A
KB / MS	On Carrier Board	N/A	On Carrier Board	On Carrier Board
Hardware Monitor	Yes	Yes	Yes	Yes
Storage Device Interface	MicroSD	N/A	N/A	N/A
Watchdog Timer	256 levels	256 levels	256 levels	256 levels
Expansion slots	1x PCI-E (x1) on Carrier Board (IP411)	4x PCI-E(x1)	2x PCI-E(x1), 1x PCI-E(x4), 1x PCI-E(x16), 1x Mini PCI-E on Carrier Board (IP409)	2x PCI-E(x1), 1x PCI-E(x4), 1x PCI-E(x16), 1x Mini PCI-E on Carrier Board
Digital I/O	4-in / 4-out on Carrier Board (IP411)	4-in / 4out on Carrier Board (IP419)	4-in / 4-out on Carrier Board (IP409)	4-in / 4-out on Carrier Board (IP409)
Power Input	On Carrier Board	On Carrier Board	On Carrier Board	On Carrier Board
Power Consumption	Intel® Atom™ E3845 1.91GHz w/ 2GB DDR3L-1600 +12V: 0.91A; +5V: 0.13A +5VSB: 0.05A; +3.3V: 0.24A	Intel® Atom™ E3950 1.6GHz w/ 2x 8GB DDR3L-1600 +12V: 2.18A	Intel® Core™ i7-4700EQ 2.4 GHz w/ 4GB DDR3-1600+12V: 5.24A; +5V: 0.66A+3.3V: 0.23A	Intel® Core™ i7-5850EQ 2.70GHz w/ 4GB DDR3L-1600+12V: 6.1A; +5V: 0.19A+5VSB: 0.06A; +3.3V: 0.20A
Dimensions (L x W)	95mm x 95mm	95mmx 95mm	95mmx 125mm	95mmx 125mm
Extra Features	Two 220-pin COM Express Type 6 interface connectors to Carrier Board (for USB, expansion slots, SATA, LVDS, VGA, DVI, DisplayPort, LAN, audio, LPC, GPIO), Boot on LAN	Two 220-pin COM Express Type 6 interface connectors to Carrier Board (for USB, expansion slots, SATA, LVDS, VGA, DVI, DisplayPort, LAN, audio, LPC, GPIO), Boot on LAN	Two 220-pin COM Express Type 6 interface connectors to Carrier Board (for USB, expansion slots, SATA, LVDS, VGA, DVI, DisplayPort, LAN, audio, LPC, GPIO), Boot on LAN	Two 220-pin COM Express Type 6 interface connectors to Carrier Board (for USB, expansion slots, SATA, LVDS, VGA, DVI, DisplayPort, LAN, audio, LPC, GPIO), Boot on LAN
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1 CPU Modules

2 Disk-Size SBCCs

3 Motherboards

4 CPU Cards

Comparison Table

CPU Module

Models	ET970	ET975	ET976	ET977
Form Factor	COM Express Type 6	COM Express Type 6	COM Express Type 6	COM Express Type 6 (R3.0)
CPU Socket Supported	BGA1440 CPU on board	FCBGA1356 CPU onboard	BGA1140 on board	BGA1140 on board
CPU	7th Gen Intel® Xeon® / Core™ i7/i5/i3	7th Gen Intel® Core™ i7/i5/i3	AMD Ryzen™ V1000 series embedded APU	AMD Ryzen™ V1000 / R1000 series Embedded APU
CPU Max. Frequency	Up to 3.7GHz	Up to 3.9GHz	Up to 3.8GHz	Up to 3.8GHz
PCH	Intel® CM238/QM175/QM170 PCH	N/A	N/A	N/A
Memory Type	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM	DDR4 on board Memory	2x DDR4 SO-DIMM
Max. Memory Size	32GB	32GB	8GB	32GB
BIOS	AMI	AMI	AMI	AMI
Graphics Controller	Intel® Core™ i integrated graphics	Intel® Core™ i integrated graphics	AMD Radeon™ Vega GPU integrated	AMD Radeon™ Vega GPU integrated
Video Output	24-bit dual-channel LVDS (on Carrier Board)	24-bit dual-channel LVDS (on Carrier Board)	24-bit dual-channel LVDS Or eDP (on Carrier Board)	24-bit dual-channel LVDS or eDP (on Carrier Board)
Ethernet	Intel® I219LM PCI-E Gigabit LAN PHY	Intel® I219LM PCI-E Gigabit LAN PHY	Intel® I211AT PCI-E Gigabit LAN	Intel® I211A PCI-E Gigabit LAN
Audio	Realtek ALC662 (on Carrier Board)	Realtek ALC662 (on Carrier Board)	AMD V1000 series APU built-in HD interface	AMD Ryzen™ built-in HD audio controller
SATA	4x SATA III ports (on Carrier Board)	2x SATA III ports (on Carrier Board)	2x SATA III ports	2x SATA III via carrier board
I/O Chip	NCT5523D (on board)	NCT5523D (on board)	F81804U-I (on board)	Fintek F81804U-I
Parallel Port	1 SPP/EPP/ECP port (on Carrier Board)	1 SPP/EPP/ECP port (on Carrier Board)	1 SPP/EPP/ECP port (on Carrier Board)	1 SPP/EPP/ECP port (on Carrier Board)
Serial Port	2x RS-232 COM ports (on Carrier Board)	2x RS-232 COM ports (on Carrier Board)	2x RS-232 COM ports (on Carrier Board)	2x UART (Tx/Rx only)
USB 2.0	8x USB 2.0 (via Carrier Board)	8x USB 2.0 (via Carrier Board)	8x USB 2.0 (via Carrier Board)	8x USB2.0 ports (Via Carrier Board)
USB 3.0/ 3.1	4x USB 3.0 (via Carrier Board)	4x USB 3.0 (via Carrier Board)	4x USB 3.1 (via Carrier Board)	1x USB3.1(10G), 3x USB3.1 (via Carrier Board)
TPM	2.0	2.0	2.0	2.0
KB / MS	On Carrier Board	On Carrier Board	N/A	N/A
Hardware Monitor	Yes	Yes	Yes	Yes
Storage Device Interface	N/A	eMMC5.0 (option)	N/A	N/A
Watchdog Timer	256 levels	256 levels	256 levels	256 levels
Expansion slots	8x PCI-E(x1), 1x PCI-E(x16)	4x PCI-E(x1), 1x PCI-E(x4)	8x PCI-E(x1) 1x PCI-E(x1)	V1000: 1x PEG(8x), 4x PCI-E(1x)(Gen3), 2x PCI-E(1x)(Gen2) R1000: 1x PEG(4x), 3x PCI-E(1x)(Gen3), 3x PCI-E(1x)(Gen2)
Digital I/O	4-in / 4-out on Carrier Board (IP413)	N/A	4-in / 4-out on Carrier Board (IP418)	4-in/ 4-out on Carrier Board (IP418)
Power Input	On Carrier Board	On Carrier Board	On Carrier Board	On Carrier Board
Power Consumption	Intel® i7-7820EQ, 3.0GHz w/ 16GB DDR4-2400 +12V: 4.48A; +5V: 0.65A +3.3V: 0.27A, +5VBS: 0.13A	Intel® i7-7600U, 2.8GHz w/ 8GB DDR4-2133 +12V: 3.47A; +5V: 1.4A +3.3V: 0.33, +5VBS: 0.10A	Intel® i7-7600U, 2.8GHz w/ 8GB DDR4-2133 +12V: 3.47A; +5V: 1.4A +3.3V: 0.33, +5VBS: 0.10A	TBD
Dimensions (L x W)	95mmx 125mm	95mmx 95mm	125mm x 95mm	125mm x 95mm
Extra Features	Two 220-pin COM Express Type 6 interface connectors to Carrier Board (for USB, expansion slots, SATA, LVDS, VGA, DVI, DisplayPort, LAN, audio, LPC, GPIO), Boot on LAN	Two 220-pin COM Express Type 6 interface connectors to Carrier Board (for USB, expansion slots, SATA, LVDS, VGA, DVI, DisplayPort, LAN, audio, LPC), Boot on LAN	Two 220-pin COM Express Type 6 interface connectors to Carrier Board (for USB, expansion slots, SATA, LVDS, VGA, DVI, DisplayPort, LAN, audio, LPC, GPIO), Boot on LAN	Two 220-pin COM Express Type 6 interface connectors to Carrier Board (for USB, expansion slots, SATA, LVDS, VGA, DVI, DisplayPort, LAN, audio, LPC, GPIO), Boot on LAN
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1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

Comparison Table

CPU Module

Models	ET875	ET876	IBQ800	ET839
Form Factor	COM Express Type 10 (R3.0)	COM Express Type 10 (R3.0)	QSeven (R2.1)	ETX (3.0)
CPU Socket Supported	FCBGA1296 SoC on board	FCBGA1296 SoC on board	FCBGA1296 SoC on board	BGA1170 SoC on board
CPU	Intel® Atom™ Processor E3930/ E3950	Intel® Atom™ Processor E3950/E3940/ E3930 Intel® Pentium® QC N4200 Intel® Celeron® DC N3350	Intel® Atom™ Processor E3930/ E3940/ E3950	Intel® Atom™ Processor E3845
CPU Max. Frequency	Up to 2.5GHz	Up to 2.5GHz	Up to 2.5GHz	1.91GHz
PCH	N/A	N/A	N/A	N/A
Memory Type	LPDDR4 Onboard Memory	Onboard DDR3L memory	LPDDR4 Onboard Memory	1x DDR3L SO-DIMM
Max. Memory Size	8GB	4GB	8GB	8GB
BIOS	AMI	AMI	AMI	AMI
Graphics Controller	Intel® Gen9-LP w/ 18 EUs graphics	Intel® SoC integrated Gen9-LP graphics	Intel® Gen9-LP w/ 18 EUs graphics	Intel® Gen7 graphics
Video Output	24-bit dual-channel LVDS (on Carrier Board)	24-bit dual-channel LVDS or eDP (on Carrier Board)	24-bit dual-channel LVDS (on Carrier Board)	18/24-bit single-channel LVDS (on Carrier Board)
Ethernet	Intel® I210IT PCI-E Gigabit LAN	Intel® I210IT PCI-E Gigabit LAN	Intel® I210IT PCI-E Gigabit LAN	Intel® I210IT PCI-E Gigabit LAN
Audio	Realtek ALC662 (on Carrier Board)	Intel® Atom™ SoC built-in HD audio controller	Realtek ALC662 (on Carrier Board)	Realtek ALC662
SATA	2x SATA III ports	2x SATA III via Carrier Board	2x SATA III ports	1x SATA II port
I/O Chip	F81804U-I (on board)	Fintek F81804U-I	F81804U-I (on board)	NCT6102D (on board)
Parallel Port	1 SPP/EPP/ECP port (on Carrier Board)	1 SPP/EPP/ECP port (on Carrier Board)	N/A	1 SPP/EPP/ECP port (on Carrier Board)
Serial Port	2x COM ports (TX/RX) (on Carrier Board)	2x UART (Tx/Rx only)	1x UART (TX/RX) (on Carrier Board)	2x RS232 COM ports, TTL Level (on Carrier Board)
USB 2.0	4x USB 2.0 (via Carrier Board)	8x USB 2.0 (via Carrier Board)	4x USB 2.0 (via Carrier Board)	4x USB 2.0 (via Carrier Board)
USB 3.0/ 3.1	2x USB 3.0 (via Carrier Board)	2x USB 3.0 (via Carrier Board)	3x USB 3.0 (via Carrier Board)	N/A
TPM	2.0	2.0	2.0	N/A
KB / MS	N/A	N/A	N/A	On Carrier Board
Hardware Monitor	Yes	Yes	Yes	Yes
Storage Device Interface	eMMC5.0 (option)	eMMC 5.0 up to 32GB (optional)	eMMC5.0 (option)	N/A
Watchdog Timer	256 levels	256 levels	256 levels	256 levels
Expansion slots	4x PCI-E(x1)	4x PCI-E(x1)	4x PCI-E(x1)	On Carrier Board
Digital I/O	4-in / 4out on Carrier Board (IP417)	4-in/ 4-out on Carrier Board (IP417)	4-in / 4out on Carrier Board (IP416)	4-in / 4-out on Carrier Board (IP412)
Power Input	On Carrier Board	On Carrier Board	On Carrier Board	On Carrier Board
Power Consumption	Intel® Atom™ Processor E3950 1.60GHz w/ Onboard LPDDR4 2400MHz 8GB +12V: 1.587A	TBD	Intel® Atom™ E3950 1.6GHz w/ 8GB LPDDR4 1600 +12V: 1.7121A	Intel® Atom™ E3845 1.91GHz w/ 2x 4GB DDR3L-1600 +5V: 1.92A
Dimensions (L x W)	84mmx 55mm	84mm x 55mm	70mmx 70mm	95mmx 114mm
Extra Features	One 220-pin COM Express Type 10 interface connector to Carrier Board (for USB, expansion slots, SATA, LVDS, DisplayPort, LAN, audio, LPC, GPIO) Boot on LAN	One 220-pin COM Express Type 6 interface connectors to Carrier Board (for USB, expansion slots, SATA, LVDS, VGA, DVI, DisplayPort, LAN, audio, LPC, GPIO), Boot on LAN	One 230-pin golden finger Qseven interface connector to Carrier Board (for USB, expansion slots, SATA, LVDS, DisplayPort, LAN, audio) Boot on LAN	Four 100-pin ETX interface connectors to Carrier Board (for PCI, USB, Audio, ISA, LVDS, VGA, COM ports, LPT, PS/2 KB/MS, LAN, IDE, LPC), Boot on LAN
Page No.	P1-11	P1-10	P1-14	P1-15

1 CPU Modules

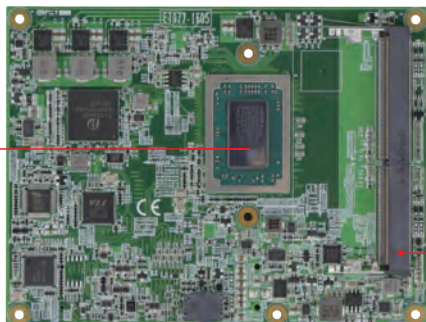
2 Disk-Size SBGs

3 Motherboards

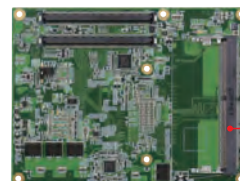
4 CPU Cards



AMD Ryzen™ V1000 / R1000 series Embedded APU



DDR4 SO-DIMM Socket



DDR4 SO-DIMM Socket

Features

- Onboard AMD Ryzen™ Embedded V1000/ R1000 processor
- 2x DDR4-2400 SO-DIMM sockets, Max. 32GB, ECC compatible
- Supports 3x independent displays, HDMI/DVI/ DisplayPort & LVDS or eDP via carrier board
- 4x USB 3.1, 8x USB 2.0, 2x SATA III
- Supports TPM (2.0)

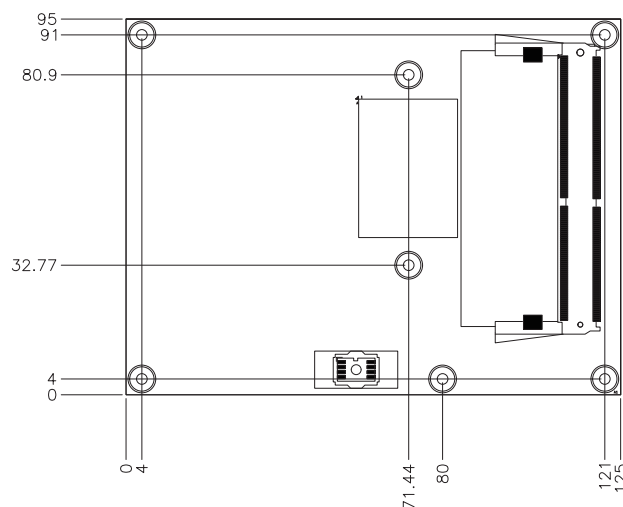
Specifications

CPU	Onboard AMD Ryzen™ Embedded V1000 / R1000
PCH	N/A
Memory Type	2x DDR4 SO-DIMM, Max. 32GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion slots	V1000: 1x PEG(8x)(Gen3), 4x PCI-E(1x)(Gen3), 2x PCI-E(1x) R1000: 1x PEG(4x)(Gen3), 3x PCI-E(1x)(Gen3), 3x PCI-E(1x)
Graphics Controller	AMD Radeon™ Vega GPU integrated
Video Output	V1000: 3x DDI R1000: 2x DDI 1x LVDS or 1x eDP (By option)
Ethernet	Intel® I211IA PCI-E Gigabit LAN
I/O Chip	Fintek F81804U-I
Serial Port	2x UART (Tx/Rx only)
USB 2.0	8x USB2.0 ports [USB 2.0 Hub x 3ports, (VL822-Q7)]
USB 3.0/ 3.1	1x USB3.1 port (10G), 3x USB3.1ports (VL822-Q7)
Serial ATA	2x SATA III via carrier board
Audio	AMD Ryzen™ built-in HD audio controller
TPM	TPM (2.0)
Others	Digital I/O (4in/4-out)
Dimensions (L X W)	125mm x 95mm (4.92" x 3.74")
Power Consumption	TBD
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60)

Ordering Information

ET977-1807LV	COM Express (Type 6) CPU Module with AMD Ryzen™ V1807B QC APU (3.8GHz), DDR4 dual-channel memory, supports LVDS
ET977-1605	COM Express (Type 6) CPU Module with AMD Ryzen™ V1605B QC APU (3.6GHz), DDR4 dual-channel memory, supports eDP
ET977-1605LV	COM Express (Type 6) CPU Module with AMD Ryzen™ V1605B QC APU (3.6GHz), DDR4 dual-channel memory, supports LVDS
ET977-1606LV	COM Express (Type 6) CPU Module with AMD Ryzen™ R1606G DC APU (3.5GHz), DDR4 dual-channel memory, supports LVDS

Dimensions and Drawing

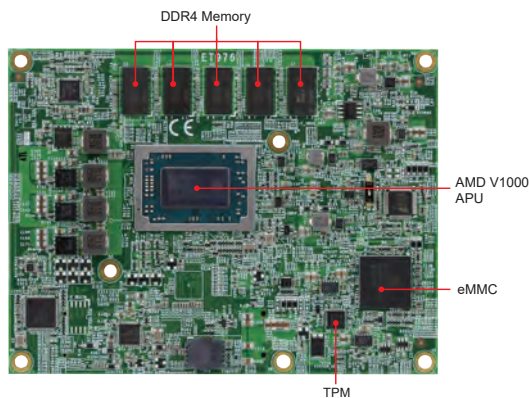


1 CPU Modules

2 Disk-Size SBCs

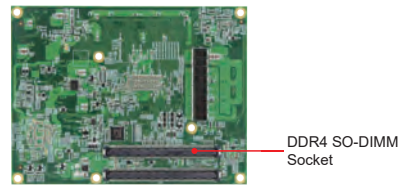
3 Motherboards

4 CPU Cards



Features

- Onboard AMD Ryzen™ Embedded V1000 processor
- Onboard DDR4 memory, Max. 8GB
- 3x independent displays, HDMI/DVI/DisplayPort & LVDS or eDP via carrier board
- 4x USB 3.1, 8x USB 2.0, 2x SATA III
- Supports TPM (2.0)



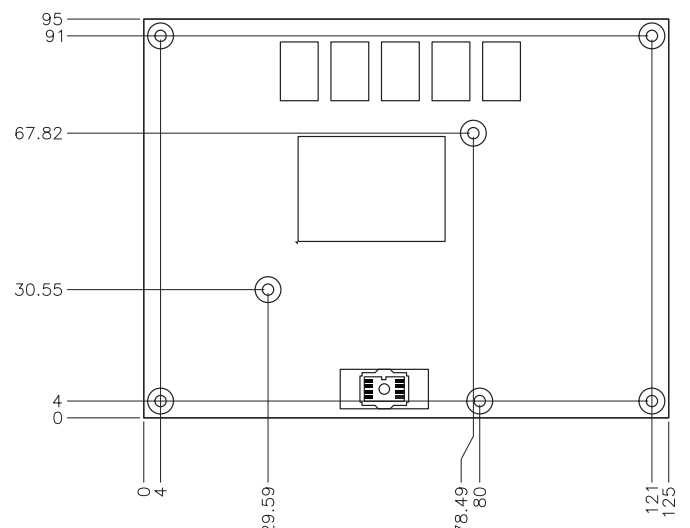
Specifications

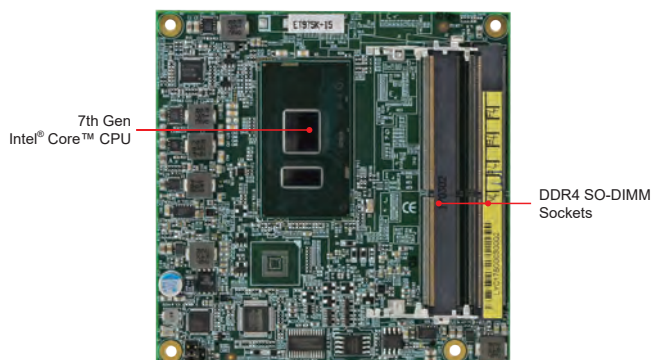
CPU	Onboard AMD Ryzen™ Embedded V1000
PCH	N/A
Memory Type	Onboard Memory, DDR4, Max. 8GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion slots	1x PEG(x8) 8x PCI-E(x1)
Graphics Controller	AMD Radeon™ Vega GPU integrated
Video Output	2x DDI 1x LVDS or 1x eDP (By option)
Ethernet	Intel® I210IT PCI-E Gigabit LAN
I/O Chip	Fintek F81804U-I
Serial Port	2x UART (Tx/Rx only)
USB 2.0	8x USB 2.0 via carrier board
USB 3.0/ 3.1	4x USB 3.1 via carrier board
Serial ATA	2x SATA III via carrier board
Audio	AMD Ryzen™ built-in HD audio controller
TPM	TPM (2.0)
Others	Digital I/O (4in/4-out)
Dimensions (L X W)	125mm x 95mm (4.92" x 3.74")
Power Consumption	AMD V1807B, 3.35GHz w/ 4GB DDR4-2666 +12V: 6.28A; +5V: 0.28A, +5VSB: 0.16A, +3.3V: 0.52A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60)

Ordering Information

ET976-1605LV-G	COM Express (Type 6) CPU Module with AMD Ryzen™ V1605B QC APU (3.6GHz), LVDS, 8GB DDR4 memory on board
ET976-1605LV-4G	COM Express (Type 6) CPU Module with AMD Ryzen™ V1605B QC APU (3.6GHz), LVDS, 4GB DDR4 memory on board
ET976-1605-8G	COM Express (Type 6) CPU Module with AMD Ryzen™ V1605B QC APU (3.6GHz), 8GB DDR4 memory on board
ET976-1605-4G	COM Express (Type 6) CPU Module with AMD Ryzen™ V1605B QC APU (3.6GHz), 4GB DDR4 memory on board
ET976-1202LV-E4G	COM Express (Type 6) CPU Module with AMD Ryzen™ V1202B DC APU (3.2GHz), LVDS, 4GB DDR4 memory on board with ECC
ET976-1202LV-4G	COM Express (Type 6) CPU Module with AMD Ryzen™ V1202B DC APU (3.2GHz), LVDS, 4GB DDR4 memory on board
HESET976-A	Heatsink with cooler for ET976
HSET976-1	Heat spreader for ET976

Dimensions and Drawing





Features

- Onboard 7th Gen Intel® Core™ i7/i5/i3 processors
- 2x DDR4 SO-DIMM, Max. 32GB
- Supports 2x DDI port or DDI + VGA
- 1x Intel® PCI-E GbE LAN
- Watchdog timer
- 8x USB 2.0, 4x USB 3.0, 2x COM, 2x SATA III
- 4x PCI-E(x1), 1x PCI-E(x4)
- Supports TPM (2.0), eMMC5.0 (optional)

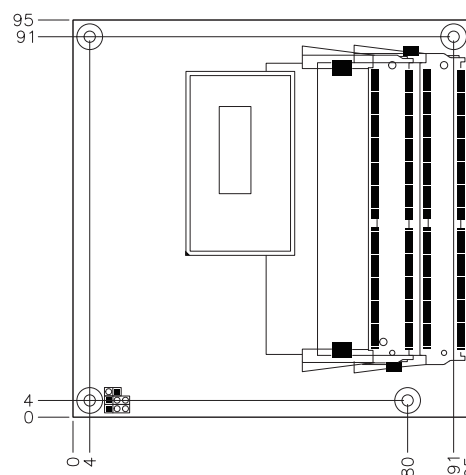
Specifications

CPU	Onboard 7th Gen Intel® Core™ U-Series processors
PCH	N/A
Memory Type	2x DDR4 SO-DIMM, Max. 32GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	eMMC 5.0 up to 32GB (optional)
Expansion slots	4x PCI-E(x1), 1x PCI-E(x4)
Graphics Controller	7th Gen Intel® Core™ U-Series processor integrated graphics, Supports DVI, HDMI, DisplayPort, LVDS
Video Output	24-bit dual-channels LVDS on Carrier Board
Ethernet	Intel® I219LM LAN PHY
I/O Chip	Nuvoton NCT5523D on board (Supports Tx/Rx only)
Serial Port	2x COM port (Tx/Rx only)
USB 2.0	8x USB 2.0 via baseboard
USB 3.0/ 3.1	4x USB 3.0 via baseboard
Serial ATA	2x SATA III via Carrier Board
Audio	7th Gen Intel® Core™ U-Series processor built-in HD Audio
TPM	TPM (2.0)
Others	N/A
Dimensions (L X W)	95mm x 95mm (3.74" x 3.74")
Power Consumption	Intel® i7-7600U, 2.8GHz w/8GB DDR4-2133 +12V: 3.47A; +5V: 1.4A +3.3V: 0.33, +5VBS: 0.10A
Operating Temperature	-20°C~60°C (-4°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	10% ~ 90% (non-condensing)

Ordering Information

ET975K-I7	COM Express (Type 6) CPU Module w/ Intel® Core™ i7-7600U, DDR4 dual-channel memory, 2x DDI
ET975K-I7V	COM Express (Type 6) CPU Module w/ Intel® Core™ i7-7600U, DDR4 dual-channel memory, 1x DDI+ 1x VGA
ET975K-I5	COM Express (Type 6) CPU Module w/ Intel® Core™ i5-7300U, DDR4 dual-channel memory, 2x DDI
ET975K-I5V	COM Express (Type 6) CPU Module w/ Intel® Core™ i5-7300U, DDR4 dual-channel memory, 1x DDI+1x VGA
ET975K-I3 (MOQ)	COM Express (Type 6) CPU Module w/ Intel® Core™ i3-7100U, DDR4 dual-channel memory, 2x DDI
ET975S-I7V	COM Express (Type 6) CPU Module w/ Intel® Core™ i7-6600U, DDR4 dual-channel memory, 1x DDI+1x VGA
ET975K-I7	COM Express (Type 6) CPU Module w/ Intel® Core™ i7-7600U, DDR4 dual-channel memory, 2x DDI
HSET975-A	Heatsink with Fan for ET975
HSET975-1	Heat Spreader for ET975

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

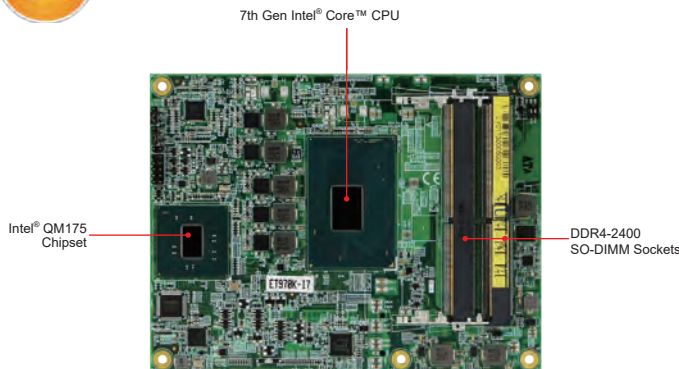
3 Motherboards

4 CPU Cards

ET970

COM Express

7th Gen Intel® Xeon® E3 / Core™ i7/i5/i3 COM Express (Type 6) CPU Module w/ Intel® QM175 & CM238 PCH



Features

- Onboard 7th Gen Intel® Xeon® E3/ Core™ i7/i5/i3 processors
- 2x DDR4-2400 SO-DIMM, Max. 32GB
- 1x Intel® PCI-E GbE LAN
- Watchdog timer, Digital I/O
- 8x USB 2.0, 4x USB 3.0, 2x COM, 4x SATA III
- Supports 3x independent displays
- Supports TPM (2.0)
- 8x PCI-E(x1), 1x PCI-E(x16)

1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

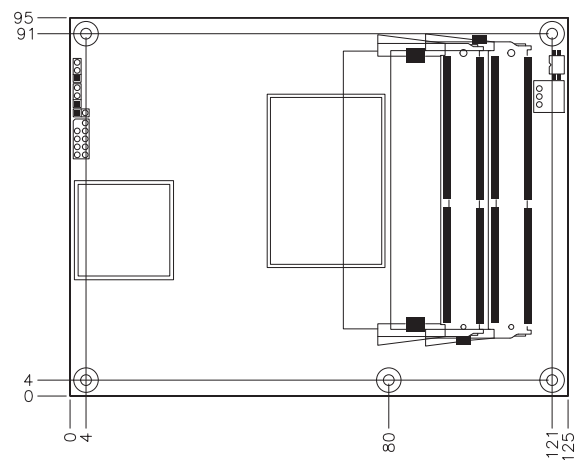
Specifications

CPU	BGA1440 for 7th Gen Intel® Xeon® E3/ Core™ i7/i5/i3 processors
PCH	Intel® QM175 & CM238 & HM175 PCH
Memory Type	2x DDR4-2400 SO-DIMM, Max 32GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion slots	8x PCI-E (x1), 1x PCI-E(x16)
Graphics Controller	7th Gen Intel® Core™ processor integrated graphics, Supports DVI, HDMI, DisplayPort, LVDS
Video Output	24-bit dual-channels LVDS on Carrier Board
Ethernet	Intel® I219LM LAN PHY/Intel® I219V LAN GbE
I/O Chip	Nuvoton NCT5523D
Serial Port	(Supports Tx/Rx only) 2x COM port
USB 2.0	8x USB 2.0 via Carrier Board
USB 3.0/ 3.1	4x USB 3.0 via Carrier Board
Serial ATA	4x SATA III via Carrier Board
Audio	Intel® QM175 PCH built-in HD audio w/ Realtek ALC662 codec on Carrier Board (IP413)
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out)
Dimensions (L X W)	95mm x 125mm (3.74" x 4.92")
Power Consumption	Intel® i7-7820EQ, 3.0GHz w/16GB DDR4-2400 +12V: 4.48A; +5V: 0.65A +3.3V: 0.27A, +5VBS: 0.13A
Operating Temperature	0°C~60°C (32°F~140°F) -40°C~75°C (-40°F~167°F)(ET970K-I3)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	10%~90% (non-condensing)

Ordering Information

ET970K-X3G	COM Express (Type 6) CPU Module w/ Intel® Xeon® E3-1505M V6 (3.0GHz), CM238 PCH, DDR4 dual-channel memory
ET970K-I7	COM Express (Type 6) CPU Module w/ Intel® Core™ i7-7820EQ (3.0GHz~3.7GHz), QM175 PCH, DDR4 dual-channel memory
ET970K-I5	COM Express (Type 6) CPU Module w/ Intel® Core™ i5-7440EQ (2.9GHz~3.6GHz), QM175 PCH, DDR4 dual-channel memory
ET970K-I3	COM Express (Type 6) CPU Module w/ Intel® Core™ i3-71001E (2.9GHz), HM175 PCH, DDR4 dual-channel memory
ET970S-I7	COM Express (Type 6) CPU Module w/ Intel® Core™ i7-6820EQ (2.8GHz), QM170 PCH, DDR4 dual-channel memory
HSET970-B	Heatsink with fan for ET970
HSET970-2	Heat Spreader with fan for ET970

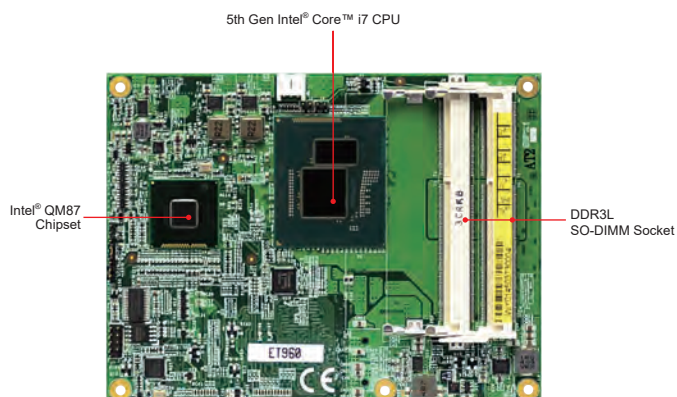
Dimensions and Drawing



ET960

COM Express

5th Gen Intel® Core™ i7 COM Express (Type 6) CPU Module w/ Intel® QM87 PCH



Features

- Onboard 5th Gen Intel® Core™ i7 mobile processors
- 2x DDR3L SO-DIMM, Max. 16GB
- Single Gigabit LAN via Carrier Board (IP409)
- 2x SATA II, 2x SATA III, 4x USB 3.0, 4x USB 2.0, 2x COM via carrier Board (IP409)
- Supports 3x independent displays, DisplayPort/DVI-I/DVI-D/LVDS via Carrier Board (IP409)
- Supports HD audio via Carrier Board (IP409)

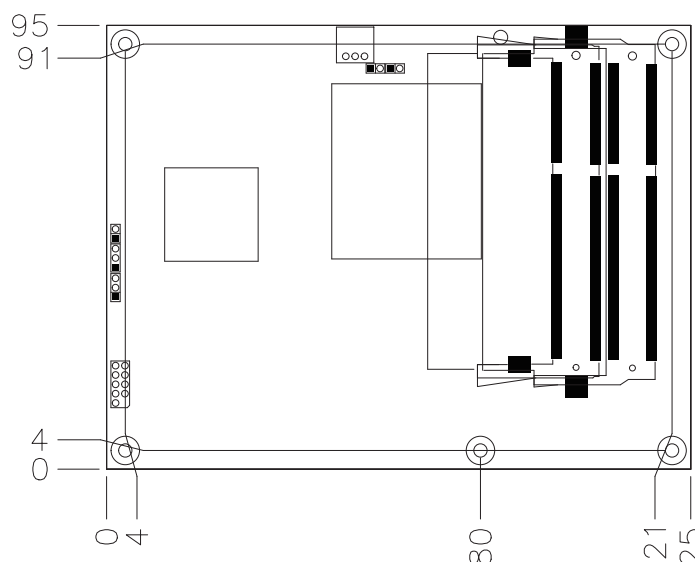
Specifications

CPU	5th Gen Intel® Core™ i7 mobile processors on board
PCH	Intel® QM87 PCH
Memory Types	2x DDR3L SO-DIMM, Max. 16GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion slots	1x PCI-E(x16), 1x PCI-E(x4), 2x PCI-E(x1), 1x Mini PCI-E on Carrier Board (IP409)
Graphics Controller	Intel® 5th Gen Core™ Processor integrated graphics, Supports DVI-D, DVI-I, DisplayPort, LVDS
Video Output	24-bit single-channel LVDS on Carrier Board (IP409)
Ethernet	1x Intel® I218LM Gigabit LAN PHY
I/O Chip	Nuvoton NCT5523D
Serial Port	2x COM port (Tx/Rx only)
USB 2.0	4x USB 2.0 via Carrier Board (IP409)
USB 3.0/ 3.1	4x USB 3.0 via Carrier Board (IP409)
Serial ATA	2x SATA II, 2x SATA III via Carrier Board (IP409)
Audio	Intel® QM87 PCH built-in audio with Realtek ALC662 codec on Carrier Board (IP409)
TPM	N/A
Others	Digital I/O (4-in / 4-out) on Carrier Board (IP409)
Dimensions (L X W)	95mm x 125mm (3.74" x 4.92")
Power Consumption	Intel® Core™ i7-5850EQ 2.7GHz w/ 2x 4GB DDR3L-1600 +12V : 6.5A ; +5V : 0.75A +3.3V : 0.2A ; +5VSB : 0.06A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @ 60°C)

Ordering Information

ET960-Q26	COM Express (Type 6) CPU Module w/ Intel® Core™ i7-5700EQ (2.6GHz), QM87 PCH, DDR3L dual-channel memory
ET960-Q27e	COM Express (Type 6) CPU Module w/ Intel® Core™ i7-5850EQ (2.7GHz), QM87 PCH, DDR3L dual-channel memory
IP409	Flex ATX COM Express (Type 6) Carrier Board
HSET950-BGA-1	Heatsink w/ fan for ET950 / ET960
HSET950-BGA-2	Heat Spreader for ET950 / ET960

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

ET950

COM Express

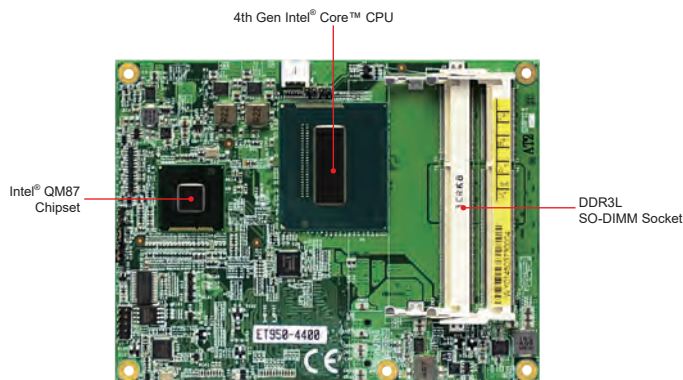
4th Gen Intel® Core™ i7/i5/i3 COM Express (Type 6) CPU Module w/ Intel® QM87 PCH

1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards



Specifications

CPU	Onboard 4th Gen Intel® Core™ i7/i5/i3 QC/DC processors
PCH	Intel® QM87 PCH
Memory Type	2x DDR3L SO-DIMM, Max. 16GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion slots	1x PCI-E(x16), 1x PCI-E(x4), 2x PCI-E(x1), 1x Mini PCI-E on Carrier Board (IP409)
Graphics Controller	4th Gen Intel® Core™ processor integrated graphics, Supports DVI-D, DVI-I, DisplayPort, LVDS
Video Output	24-bit single-channel LVDS on Carrier Board (IP409)
Ethernet	1x Intel® I217LM Gigabit LAN PHY
I/O Chip	Nuvoton NCT5523D
Serial Port	2x COM port (Tx/Rx only)
USB 2.0	4x USB 2.0 via Carrier Board (IP409)
USB 3.0/ 3.1	4x USB 3.0 via Carrier Board (IP409)
Serial ATA	2x SATA II, 2x SATA III via Carrier Board (IP409)
Audio	Intel® QM87 PCH built-in audio w/ Realtek ALC662 codec on Carrier Board (IP409)
TPM	TPM (1.2)
Others	Digital I/O (4-in / 4-out) on Carrier Board (IP409)
Dimensions (L X W)	95mm x 125mm (3.74" x 4.49")
Power Consumption	Intel® Core™ i7-4700EQ 2.4 GHz w/ 4GB DDR3-I600 +12V: 5.24A; +5V: 0.66A +3.3V: 0.23A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

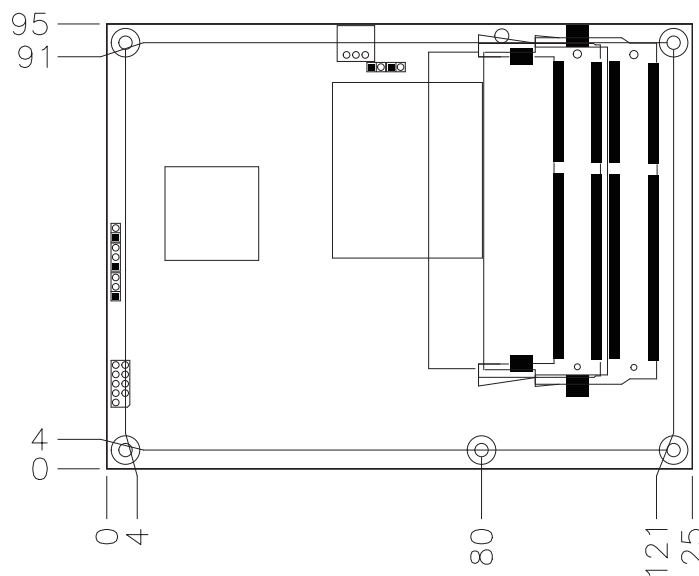
Features

- Onboard 4th Gen Intel® Core™ i7/i5/i3 QC/DC processors
- 2x DDR3L SO-DIMM, Max. 16GB
- Single Gigabit LAN via Carrier Board (IP409)
- 2x SATA II, 2x SATA III, 4x USB 3.0, 4x USB 2.0, 2x COM via Carrier Board (IP409)
- Supports 3x independent displays, DisplayPort/ DVI-I/ DVI-D/ LVDS via Carrier Board (IP409)
- Supports HD audio via Carrier Board (IP409)

Ordering Information

ET950-4700	COM Express (Type 6) CPU Module w/ Intel® Core™ i7-4700EQ(2.4GHz), QM87 PCH, DDR3 dual-channel memory
ET950-4400	COM Express (Type 6) CPU Module w/ Intel® Core™ i5-4400E(2.7GHz), QM87 PCH, DDR3 dual-channel memory
ET950-4100	COM Express (Type 6) CPU Module w/ Intel® Core™ i3-4100E(2.4GHz), QM87 PCH, DDR3 dual-channel memory
IP409	Flex ATX COM Express (Type 6) Carrier Board
HSET950-BGA-1	Heatsink with fan for ET950 / ET960
HSET950-BGA-2	Heat Spreader for ET950 / ET960

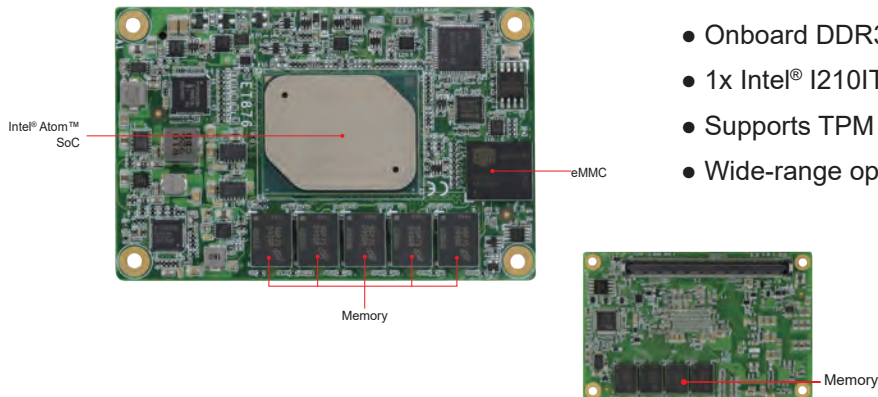
Dimensions and Drawing



ET876

COM Express

Intel® Atom™ x7/x5 / Pentium® / Celeron® COM Express Type 10 (R3.0) CPU Module



Features

- Onboard Intel® Atom™ x7-E3950, 2.0GHz or x5-E3940 1.8GHz or x5-E3930, 1.8GHz [i-Temp support]
- Onboard DDR3L memory
- 1x Intel® I210IT PCI-E Gigabit LAN
- Supports TPM (2.0), eMMC5.0 (optional)
- Wide-range operating temperature

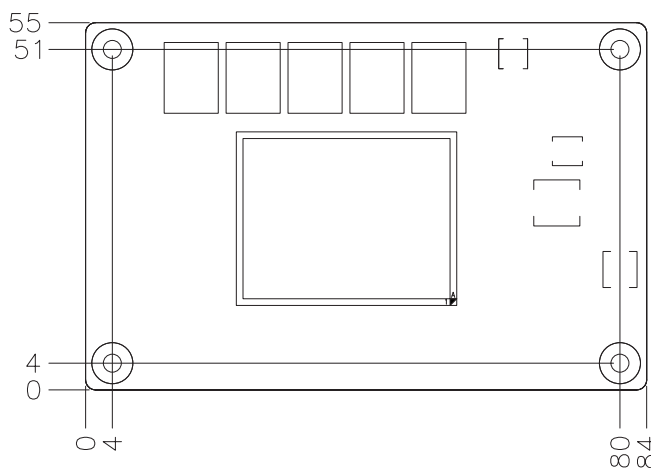
Specifications

CPU	Intel® Atom™ QC x7/ E3950 (1.6GHz~2.0GHz) Intel® Atom™ QC x5/ E3940 (1.6 GHz~1.8GHz) Intel® Atom™ DC x5/ E3930 (1.3 GHz~1.8GHz) Intel® Pentium® QC N4200 (1.10GHz~ 2.50GHz) Intel® Celeron® DC N3350 (1.10GHz~ 2.40GHz)
PCH	Integrated in Intel® SoC
Memory Type	Onboard memory, DDR3L 1600MHz, 4GB with ECC
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	eMMC 5.0 up to 32GB (optional)
Expansion slots	4x PCI-E(x1)
Graphics Controller	Intel® SoC integrated Gen9-LP graphics
Video Output	1x DDI 1x LVDS or 1x eDP (optional)
Ethernet	Intel® I210IT PCI-E Gigabit LAN
I/O Chip	Fintek F81804U-I
Serial Port	2x UART (Tx/Rx only)
USB 2.0	8x USB 2.0 via Carrier Board
USB 3.0/ 3.1	2x USB 3.0 via Carrier Board
Serial ATA	2x SATA III via Carrier Board
Audio	Intel® Atom™ SoC built-in HD audio controller
TPM	TPM (2.0)
Others	I2C
Dimensions (L X W)	84mm x 55mm (3.3" x 2.17")
Power Consumption	TBD
Operating Temperature	-20°C ~ 60°C (-4°F~176°F)(ET876-420/ET876-335) -40°C ~ 85°C (-40°F~185°F)(ET876-x7/x5)
Storage Temperature	-40°C ~ 90°C (-40°F ~ 194°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

ET876-X7LV	COM Express (Type 10) CPU Module with Intel® Atom™ x7/ E3950 (2.0GHz) on board, LVDS, 4GB DDR3L memory on board
ET876-X5QLV	COM Express (Type 10) CPU Module with Intel® Atom™ x5/ E3940 (1.8GHz) on board, LVDS, 4GB DDR3L memory on board
ET876-X5LV	COM Express (Type 10) CPU Module with Intel® Atom™ x5/ E3930 (1.8GHz) on board, LVDS, 4GB DDR3L memory on board
ET876-420LV	COM Express (Type 10) CPU Module with Intel® Pentium® N4200 (2.5GHz) on board, LVDS, 4GB DDR3L memory on board
ET876-335LV	COM Express (Type 10) CPU Module with Intel® Celeron® N3350 (2.4GHz) on board, LVDS, 4GB DDR3L memory on board
IP417	Mini-ITX COM Express Type 10 (R3.0) Carrier Board

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

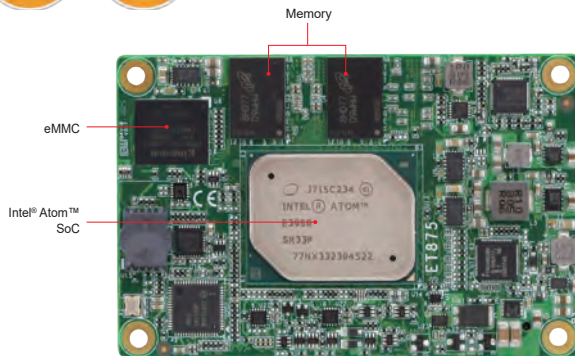
3 Motherboards

4 CPU Cards

ET875

COM Express

Intel® Atom™ x7/x5 / Pentium® / Celeron® COM Express Type 10 (R3.0) CPU Module



1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

Specifications

CPU	Intel® Atom™ DC x5/ E3930 (1.3 GHz~1.8GHz) Intel® Atom™ QC x5/ E3940 (1.6 GHz~1.8GHz) Intel® Atom™ QC x7/ E3950 (1.6GHz~2.0GHz) Intel® Pentium® QC N4200 (1.10GHz~ 2.50GHz) Intel® Celeron® DC N3350 (1.10GHz~ 2.40GHz)
PCH	Integrated in Intel SoC
Memory Types	Onboard memory, LPDDR4, Max 8GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	eMMC 5.0 up to 32GB (optional)
Expansion slots	4x PCI-E(x1)
Graphics Controller	Intel® SoC integrated Gen9-LP graphics
Video Output	1x DDI 1x LVDS or 1x eDP (option)
Ethernet	Intel® I210IT PCI-E Gigabit LAN
I/O Chip	Fintek F81804U-I
Serial Port	2x UART (Tx/Rx only)
USB 2.0	8x USB 2.0 via Carrier Board
USB 3.0/ 3.1	2x USB 3.0 via Carrier Board
Serial ATA	2x SATA III via Carrier Board
Audio	Intel® Atom™ SoC built-in HD audio controller
TPM	TPM (2.0)
Others	I2C
Dimensions (L X W)	84mm x 55mm (3.3" x 2.17")
Power Consumption	Intel® Atom™ Processor E3950 1.60GHz w/ Onboard LPDDR4 2400MHz 8GB + 12V: 1.587A
Operating Temperature	-20°C ~ 60°C (-4°F~176°F)(ET875-420/ET875-335) -40°C ~ 85°C (-40°F~185°F)(ET875-x7/x5)
Storage Temperature	-40°C ~ 90°C (-40°F ~ 194°F)
Relative Humidity	90% (non-condensing @60°C)

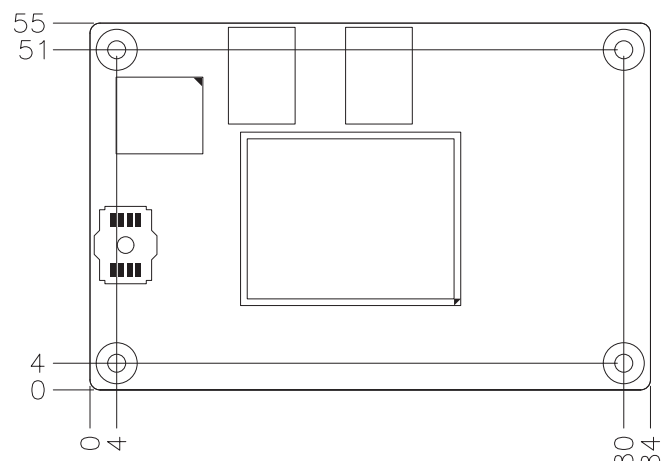
Features

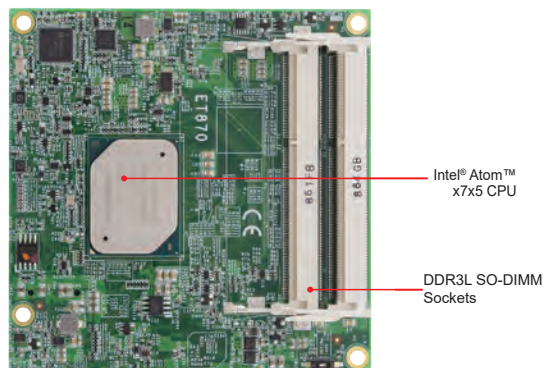
- Onboard Intel® Atom™ x7-E3950, 2.0GHz/ x5-E3940 1.8GHz or x5-E3930, 1.8GHz [i-Temp support]
- Onboard LPDDR4 memory
- 1x Intel I210IT PCI-E Gigabit LAN
- Supports TPM (2.0), eMMC5.0 (optional)
- Wide-range operating temperature

Ordering Information

ET875F1-X7	COM Express (Type 10) CPU Module with Intel® Atom™ x7/ E3950 (2.0GHz) on board, eDP, 4GB LPDDR4 memory on board
ET875F1-X5Q	COM Express (Type 10) CPU Module with Intel® Atom™ x5/ E3940 (1.8GHz) on board, eDP, 4GB LPDDR4 memory on board
ET875F1-X5QLV	COM Express (Type 10) CPU Module with Intel® Atom™ x5/ E3940 (1.8GHz) on board, LVDS, 4GB LPDDR4 memory on board
ET875F1-X5	COM Express (Type 10) CPU Module with Intel® Atom™ x5/ E3930 (1.8GHz) on board, eDP, 4GB LPDDR4 memory on board
ET875F1-420LVM8G	COM Express (Type 10) CPU Module with Intel® Pentium® N4200 (2.5GHz), LVDS, 8GB LPDDR4 memory on board, eMMC 32GB
ET875F1-335	COM Express (Type 10) CPU Module with Intel® Celeron® N3350 (2.4GHz), eDP, 4GB LPDDR4 memory on board
ET875-X-B	Heatsink with Fan for ET875-x7/x5Q/x5
HSET875-X-1	Heat spreader for ET875-x7/x5Q/x5
HSET875-A	Heatsink with Fan for ET875-420/335
HSE875-1	Heat spreader for ET875-420/335
IP417	Mini-ITX COM Express Type 10 (R3.0) Carrier Board

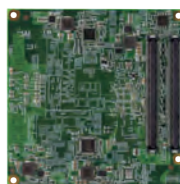
Dimensions and Drawing





Features

- Onboard Intel® Atom™ x7-E3950 @2.0GHz or x5-E3930 @1.8GHz [i-Temp support]
- 2x DDR3L-1866 SO-DIMM sockets, Max. 16GB
- Supports 2x independent displays, DisplayPort/ DVI-D/ LVDS or eDP via Carrier Board (IP419)
- Supports HD audio via Carrier Board (IP419)
- Wide-range operating temperature



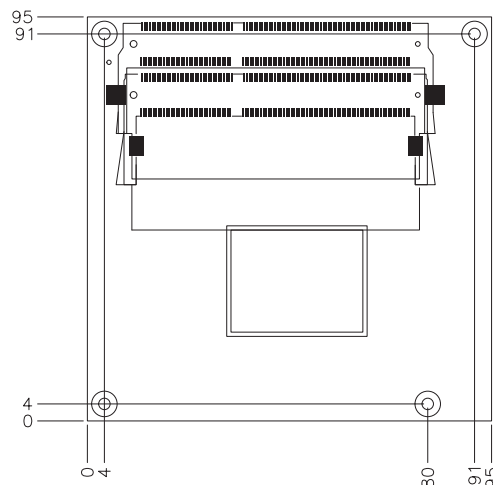
Specifications

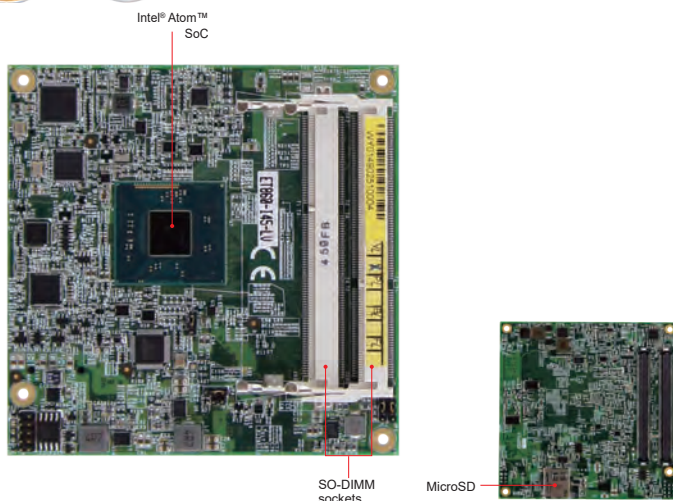
CPU	Intel® Atom™ DC x5/ E3930 (1.3 GHz~1.8GHz) Intel® Atom™ QC x5/ E3940 (1.6 GHz~1.8GHz) Intel® Atom™ QC x7/ E3950 (1.6GHz~2.0GHz)
PCH	Integrated in Intel® SoC
Memory Type	2x DDR3L-1866 SO-DIMM sockets, Max. 16GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion slots	4x PCI-E(x1)
Graphics Controller	Intel® SoC integrated Gen9 18EUs graphics
Video Output	Supports 2x DDI (DisplayPort / DVI-D) 1x 24-bit dual-channel or eDP
Ethernet	Intel® I210IT PCI-E Gigabit LAN
I/O Chip	Fintek F81804U-I
Serial Port	2x COM ports (Tx/Rx only))
USB 2.0	4x USB 2.0 via Carrier Board
USB 3.0/ 3.1	3x USB 3.0 via Carrier Board
Serial ATA	2x SATA III via Carrier Board
Audio	Intel® Atom™ SoC built-in HD Audio
TPM	TPM (2.0)
Others	Digital I/O (4-in / 4-out)
Dimensions (L X W)	95mm x 95mm
Power Consumption	Intel® Atom™ E3950 1.6GHz w/ 2x 8GB DDR3L-1600 + 12V: 2.18A
Operating Temperature	-40°C ~85°C (-40°F ~ 185°F)
Storage Temperature	-40°C ~ 90°C (-40°F ~ 194°F)
Relative Humidity	10~90% (non-condensing)

Ordering Information

ET870-I50	COM Express (Type 6) CPU Module with Intel® Atom™ x7-E3950 (2.0GHz) SoC, DDR3L dual-channel memory, eDP support
ET870-I50LV	COM Express (Type 6) CPU Module with Intel® Atom™ x7-E3950 (2.0GHz) SoC, DDR3L dual-channel memory, LVDS support
ET870-I40	COM Express (Type 6) CPU Module with Intel® Atom™ x5-E3940 (1.8GHz) SoC, DDR3L dual-channel memory, eDP support
ET870-I40LV	COM Express (Type 6) CPU Module with Intel® Atom™ x5-E3940 (1.8GHz) SoC, DDR3L dual-channel memory, LVDS support
ET870-I30	COM Express (Type 6) CPU Module with Intel® Atom™ x5-E3930 (1.8GHz) SoC, DDR3L dual-channel memory, eDP support
ET870-I30LV	COM Express (Type 6) CPU Module with Intel® Atom™ x5-E3930 (1.8GHz) SoC, DDR3L dual-channel memory, LVDS support
HSET870-A	Heatsink for ET870
HSET870-1	Heat spreader for ET870
IP419	Mini-ITX COM Express Type 6 (R3.0) Carrier Board

Dimensions and Drawing





Features

- Onboard Intel® Atom™ E3845/E3827
- 2x DDR3L SO-DIMM, Max. 8GB
- Single Gigabit LAN via Carrier Board (IP411)
- 2x SATA II, 1x USB 3.0, 8x USB 2.0, 2x COM via Carrier Board (IP411)
- Supports 2x independent displays, DisplayPort/CRT/LVDS via Carrier Board (IP411)
- Supports HD audio via Carrier Board (IP411)
- Wide-range operating temperature

1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

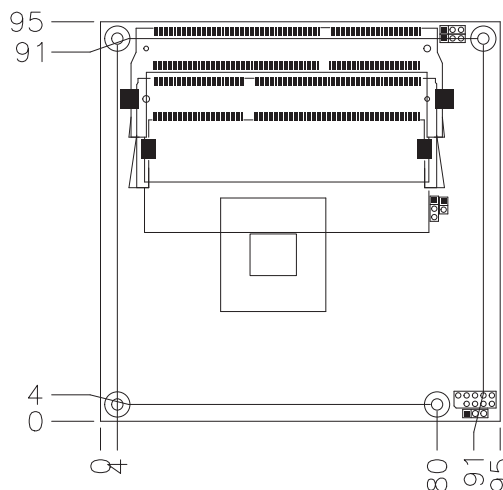
Specifications

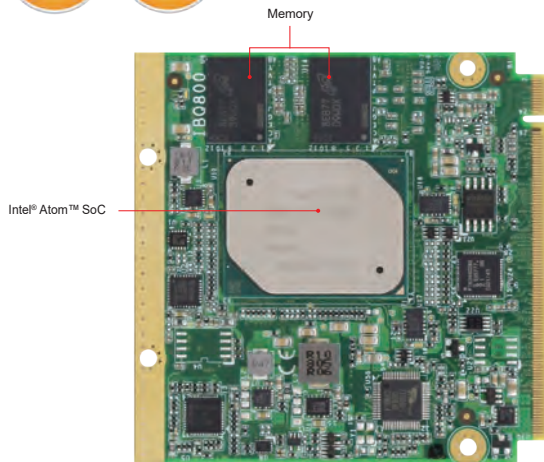
CPU	Intel® Atom™ Processor E3845/E3827
PCH	Integrated in Intel® Atom™ SoC
Memory Type	2x DDR3L@1.35V SO-DIMM, Max. 8GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage device interface	N/A
Expansion slots	1x PCI-E(x1)
Graphics Controller	Intel® Atom™ E3845/E3827 SoC integrated graphics Supports CRT, DisplayPort & LVDS
Video Output	24-bit single-channel LVDS on Carrier Board (IP411)
Ethernet	1x Intel® I210IT Gigabit LAN
I/O Chip	Nuvoton NCT5523D
Serial Port	2x COM ports (Tx/Rx only)
USB 2.0	8x USB 2.0 via Carrier Board (Supports 6x USB 2.0 only on IP411)
USB 3.0/ 3.1	1x USB 3.0 via Carrier Board (IP411)
Serial ATA	2x SATA III ports via Carrier Board (IP411)
Audio	Intel® Atom™ E3845/E3827 SoC built-in audio with Realtek ALC662 codec on Carrier Board (IP411)
TPM	N/A
Others	MicroSD slot on board@ rear side Digital I/O (4-in / 4-out) on Carrier Board (IP411)
Dimensions (L x W)	95mm x 95mm (3.74" x 3.74")
Power Consumption	Intel® Atom™ E3845 1.91GHz w/ 2x 2GB DDR3L-1600 +12V: 0.91A; +5V: 0.13A; +5VSB: 0.05A; +3.3V: 0.24A
Operating Temperature	-40°C~85°C (-40°F~185°F)
Storage Temperature	-40°C~90°C (-40°F~194°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

ET860-I45-LV	COM Express (Type 6) CPU Module w/ Intel® Atom™ Processor E3845 (1.91GHz) SoC, DDR3L dual-channel memory, LVDS
ET860-I27-LV	COM Express (Type 6) CPU Module w/ Intel® Atom™ Processor E3827 (1.75GHz) SoC, DDR3L dual-channel memory, LVDS
IP411	Mini-ITX COM Express (Type 6) Carrier Board
HSET860-BGA-A	Heatsink for ET860
HSET860-BGA-1	Heat Spreader for ET860

Dimensions and Drawing





Features

- Onboard Intel® Atom™ x5-E3930, 1.8GHz or x7-E3950, 2.0GHz [i-Temp support]
- Onboard LPDDR4 memory
- 1x Intel I210IT PCI-E Gigabit LAN
- Supports TPM (2.0), eMMC5.0 (optional)
- Wide-range operating temperature

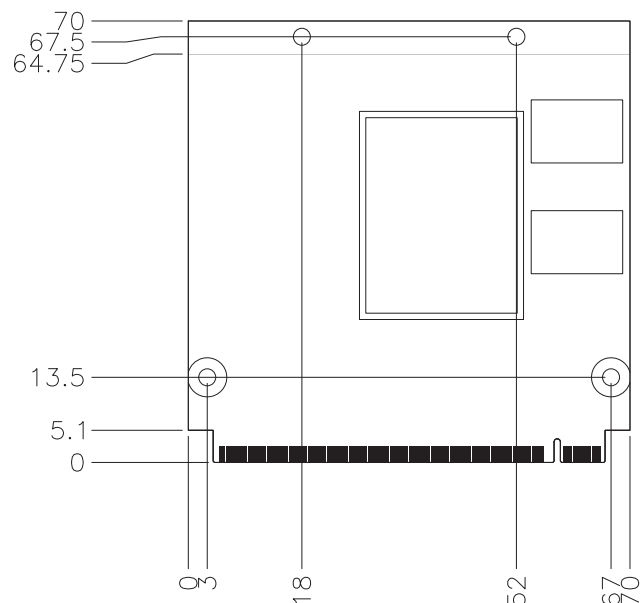
Specifications

CPU	Intel® Atom™ QC x5/ E3930 (1.3 GHz~1.8GHz) Intel® Atom™ QC x5/ E3940 (1.6 GHz~1.8GHz) Intel® Atom™ QC x7/ E3950 (1.6 GHz~2.0GHz)
PCH	Integrated in Intel® SoC
Memory Type	Onboard memory, LPDDR4, Max 8GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	eMMC 5.0 up to 32GB (optional)
Expansion slots	4x PCI-E(x1)
Graphics Controller	Intel® SoC integrated Gen9-LP graphics
Video Output	Supports 1x DDI port, 1x eDP or 1x dual-channel LVDS (By option)
Ethernet	1x Intel® I210IT PCI-E Gigabit LAN
I/O Chip	Fintek F81804U-I
Serial Port	1x COM port (RX/TX/RTS/CTS only)
USB 2.0	4x USB 2.0, derived from Qseven CPU module
USB 3.0/ 3.1	3x USB 3.0, derived from Qseven CPU module
Serial ATA	2x SATA III via Carrier Board
Audio	Intel® Atom™ SoC built-in HD audio controller
TPM	TPM (2.0)
Others	SD, from SoC CPU
Dimensions (L X W)	70mm x 70mm (2.75" x 2.75 ")
Power Consumption	Intel® Atom™ E3950 1.6GHz w/ 8GB memory, DDR4 1600 +12V: 1.7121A
Operating Temperature	-40°C ~ 85°C (-40°F~185°F)
Storage Temperature	-40°C ~ 90°C (-40°F ~ 194°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

IBQ800F1-X7LV	Qseven CPU module with Intel® Atom™ E3950 (2.0GHz), 4GB LPDDR4 memory on board, LVDS support
IBQ800F1-X7	Qseven CPU module with Intel® Atom™ E3950 (2.0GHz), 4GB LPDDR4 memory on board, eDP support
IBQ800F1-X5QLV	Qseven CPU module with Intel® Atom™ E3940 (1.8GHz), 4GB LPDDR4 memory on board, LVDS support
IBQ800F1-X5Q	Qseven CPU module with Intel® Atom™ E3940 (1.8GHz), 4GB LPDDR4 memory on board, eDP support
IBQ800F1-X5LV	Qseven CPU module with Intel® Atom™ E3930 (1.8GHz), 4GB LPDDR4 memory on board, LVDS support
IBQ800F1-X5	Qseven CPU module with Intel® Atom™ E3930 (1.8GHz), 4GB LPDDR4 memory on board, eDP support
IP416	Qseven (R2.1) Carrier Board

Dimensions and Drawing



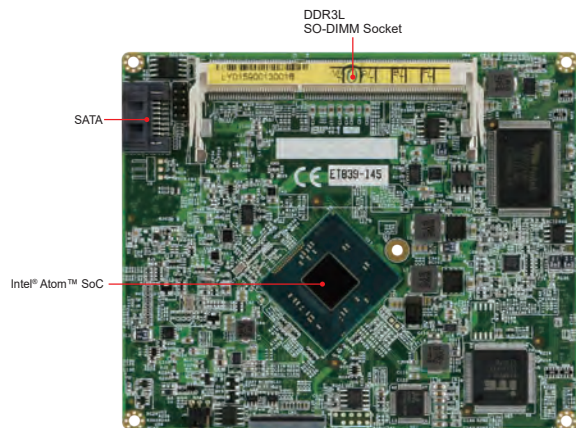


1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards



Features

- Onboard Intel® Atom™ Processor E3845, 1.91GHz
- 1x DDR3L SO-DIMM, Max. 8GB
- Supports CRT, LVDS and 1x DDI
- 1x 10/100Mbps LAN
- Watchdog timer, LPC to ISA
- 1x SATA II, 2x IDE, 4x USB 2.0, 2x COM
- Wide-range operating temperature



ET839 with heat spreader

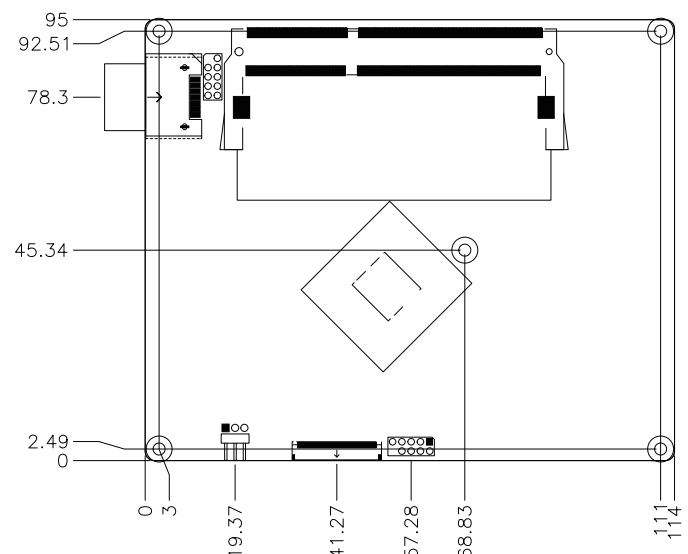
Specifications

CPU	Intel® Atom™ Processor E3845 SoC, 1.91GHz
PCH	Integrated in Intel® Atom™ SoC
Memory Types	1x DDR3L SO-DIMM, Max. 8GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion slots	4x ETX connectors for PCI bus, USB, audio, CRT, LVDS, LAN, COM ports, LPT, IDE, PS/2 keyboard/mouse and ISA bus
Graphics Controller	Intel® Atom™ SoC integrated Gen. 7 4Eus graphics
Video Output	Supports CRT, 24-bit dual-channel LVDS & 1x DDI port
Ethernet	Realtek 8106E 10/100Mbps LAN
I/O Chip	Nuvoton NCT6102D 1x keyboard, 1x mouse, 1x printer
Serial Port	2x RS232
USB 2.0	4x USB 2.0 via Carrier Board
USB 3.0/ 3.1	N/A
Serial ATA	1x SATA 2.0 port on board (3.0Gb/sec)
Audio	Intel® Atom™ SoC built-in HD Audio w/ Realtek ALC662 codec
TPM	N/A
Others	Fintek F85226 (LPC to ISA)
Dimensions (L X W)	95mm x 114mm (3.74" x 4.49")
Power Consumption	Intel® Atom™ E3845 1.91GHz w/ 2x 4GB DDR3L-1600 +5V : 1.92A
Operating Temperature	-40°C~85°C (-40°F~185°F)
Storage Temperature	-40°C~90°C (-40°F~194°F)
Relative Humidity	10%~90% (non-condensing)

Ordering Information

ET839-I45D1	ETX (3.0) CPU Module w/ Intel® Atom™ processor E3845 SoC, CRT, LVDS and 10/100 LAN, heat spreader included
IP412	ETX(3.0) Carrier Board
HSET838-BGA-1	Heat spreader for ET839

Dimensions and Drawing



Comparison Table

Carrier Board

Models	IP409	IP411	IP412	IP413
Form Factor	Flex ATX form factor	Mini-ITX form factor	Micro ATX form factor	ATX form factor
Module Interface	COM Express Type 6	COM Express Type 6	ETX (3.0)	COM Express Type 6
Video Output	18/24-bit dual-channel LVDS DVI-I / DVI-D / DisplayPort on board	18/24-bit dual-channel LVDS VGA/2x DVI-D	18/24-bit dual-channel LVDS Analog CRT	18/24-bit dual-channel LVDS DVI-D / HDMI / DisplayPort on board
Ethernet	1x RJ45 connector	2x RJ45 connector	1x RJ45 connector	1x RJ45 connector
Audio	ALC662 w/ 5.1 CH	ALC662 w/ 5.1 CH	N/A	ALC662 w/ 5.1 CH
SATA	2x SATA III + 2x SATA II	2x SATA III	N/A	4x SATA III
I/O Chip	Fintek F81846AD-I	Fintek F81846AD-I	N/A	Fintek F81846AD-I
Parallel Port	1x Parallel port	1x Parallel port	1x Parallel port	1x Parallel port
Serial Port	4x COM ports (2 ports via rear I/O, 2 ports via pin header)	2x COM ports via rear I/O	2x COM ports (1 port via rear I/O, 1 port via pin header)	4x COM ports (2 ports on rear I/O, 2 ports via pin header)
USB 2.0	4x USB 2.0 via pin header	8x USB 2.0 (2 ports on rear I/O, 6 ports via pin header)	2x USB 2.0 via rear I/O	4x USB 2.0 (2 ports via rear I/O, 2 ports via pin header)
USB 3.0/ 3.1	4x USB 3.0 on rear I/O	1x USB 3.0 via rear I/O	N/A	4x USB 3.0 via rear I/O
KB / MS	1x KB/MS connector	N/A	1x PS/2 KB/MS connector	1x KB/MS connector
Hardware Monitor	Yes	Yes	Yes	Yes
Watchdog Timer	256 levels	256 levels	256 levels	256 levels
Expansion slots	1x PCI-E(x16) slot 1x PCI-E(x4) slot 3x PCI-E(x1) slots 1x Mini PCI-E socket (full-size)	1x PCI-E(x1) slot	3x PCI slots 1x ISA slot	1x PCI-E(x16) slot 1x PCI-E(x4) slot 3x PCI-E(x1) slots 1x Mini PCI-E socket (full-size)
Digital I/O	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out
Power Connector	20+4-pin connector for ATX	20+4-pin connector for ATX	20+4-pin connector for ATX	20+4-pin connector for ATX or DC-in 12V only
Dimensions (L x W)	190mmx 228mm (9"x 7.5")	170mmx 170mm (6.7"x 6.7")	244mmx 244mm (9.6"x 9.6")	305mmx 244mm (12"x 9.6")
Extra Features	Compatible with ET950/ET960	Compatible with ET860	Compatible with ET839	Compatible with ET970/ET975
Page No.	P.1-18	P.1-24	P.1-23	P.1-22

1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

Comparison Table

Carrier Board

Models	IP416	IP417	IP418	IP419
Form Factor	Micro ATX form factor Qseven	Mini-ITX form factor	ATX form factor	Mini-ITX form factor
Module Interface	Qseven CPU Module (R2.1)	COM Express Type 10 (3.0)	COM Express Type 6 (3.0)	COM Express Type 6 (3.0)
Video Output	18/24-bit dual-channel LVDS DisplayPort on board	18/24-bit single-channel LVDS DisplayPort on board	18/24-bit single-channel LVDS eDP DVI-D / HDMI / DisplayPort on board	18/24-bit dual-channel LVDS DVI-D / DisplayPort on board
Ethernet	1x RJ45 connector	2x RJ45 connector	2x RJ-45	2x RJ45 connector
Audio	ALC662 w/ 5.1 CH	ALC662 w/ 5.1 CH	ALC662 w/ 5.1 CH	ALC662 w/ 5.1 CH
SATA	2x SATA III	2x SATA III	2x SATA III	2x SATA III
Super I/O Chipset	Fintek F81846D-I	Fintek F81964D-I	Fintek F81964D-I	Fintek F81964D-I
Parallel Port	N/A	N/A	1x Parallel port	1x Parallel port
Serial Port	5x COM ports (4 ports via rear I/O, 1 port via pin header)	4x COM ports (4 ports via rear I/O, 2 ports via pin header)	2x COM ports	4x COM ports
USB 2.0	2x USB 3.0 via rear I/O 2x USB 2.0 (2 port via onboard vertical, 1 port share with micro USB)	4x USB 2.0 (4 ports via rear I/O)	4x USB 2.0	4x USB 2.0 (2 ports via rear I/O, 2 ports via onboard pin header, 1 port share with micro USB)
USB 3.0/ 3.1	2x USB 3.0 via rear I/O	2x USB 3.0 via rear I/O	4x USB 3.0 via rear I/O	2x USB 3.0 via rear I/O
KB / MS	N/A	1x KB/MS connector	N/A	N/A
Hardware Monitor	Yes	Yes	Yes	Yes
Watchdog Timer	256 levels	256 levels	256 levels	256 levels
Expansion slots	4x PCI-E(x1) slots 1x Mini PCI-E sockets (full-size)	1x PCI-E(x1) slot 2x Mini PCI-E sockets (full-size & half-size)	1x PCIx1 6 slot 5x PCI-Ex1 slots 2x Mini PCI-E sockets	1x PCI-E(x1) slot 1x M.2 (B Key) socket
Digital I/O	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out
Power Connector	2x 2-pin connector for DC-in 12V only	2x 2-pin connector for DC-in 12V only	20+4-pin connector for ATX or DC-in 12V only	2x 2-pin connector for DC-in 12V only
Dimensions (L x W)	244mmx 244mm (9.6"x9.6")	170mmx 170mm (6.7"x6.7")	305mmx 244mm (12"x 9.6")	170mmx 170mm (6.7"x6.7")
Extra Features	Compatible with IBQ800	Compatible with ET875	Compatible with ET976 / ET977	Compatible with ET870
Page No.	P.1-21	P.1-20	P.1-19	P.1-18

1 CPU Modules

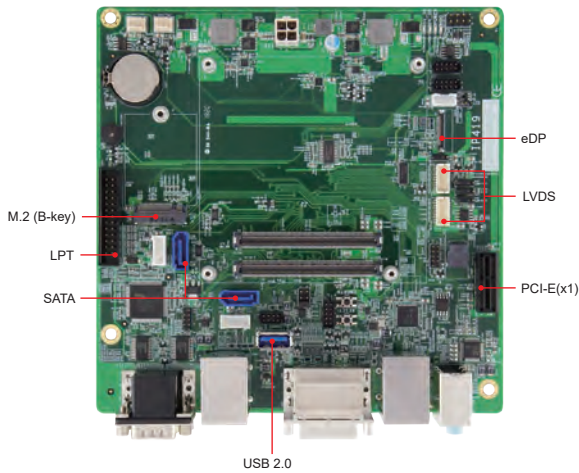
2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

IP419

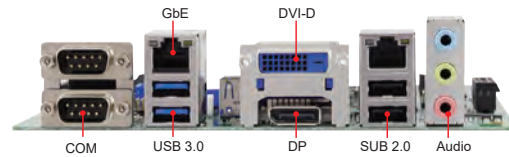
Carrier Board COM Express Type 6 (R3.0) Carrier Board



Features

- Supports 4x USB 2.0, 3x USB 3.0, 2x SATA III
- 1x PCI-E(x1) slot, 1x M.2 socket
- 1x eDP or 1x LVDS, 1x DisplayPort, 1x DVI-D
- 2x LAN connectors

I/O View



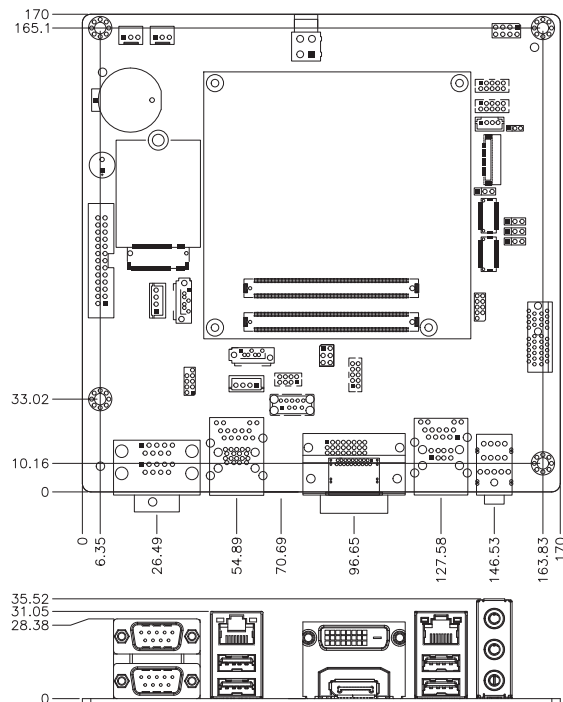
Specifications

Form Factor	Mini-ITX
Module Interface	COM Express Type 6 (R3.0)
Expansions slots	1x PCI-E(x1) slot 1x M.2 socket
Mini Type slots	N/A
Video Output	2x DDI (1x DisplayPort 1x DVI-D) 1x LVDS or 1x eDP (By option) 1x 18/24-bit dual-channel LVDS or 1x eDP (optionl)
Ethernet	LAN1: Derived from COM Express CPU module LAN2: 1x Intel I210IT
I/O Chip	Fintek F81964D-I
Serial Port	4x COM ports -2x COM ports (from Super I/O) -2x COM ports (from CPU module, TX/RX)
USB 2.0	Derived from COM Express module 4x USB 2.0, (one port for OTG)
USB 3.0/ 3.1	2x USB 3.0
Serial ATA	Deried from COM Express module 2x SATA III
Audio	Onboard ALC662 w/ 5.1 CH audio
Digital I/O	4-in/4-out
Watchdog	256 levels
KB/MS	N/A
Parallel	1x Parallel port via box header
Dimensions (L X W)	170 mm x 170 mm (6.7" x 6.7")
Power	DC-in (12V) 2x 2-pin connector for 12V DC power-in
Operating Temperature	-20°C~70°C (-4°F~94°F)
Storage Temperature	-40°C~90°C (-40°F~194°F)
Relative Humidity	10% ~ 90% (non-condensing)

Ordering Information

IP419	Mini-ITX COM Express Type 6 Carrier Board, Supports LVDS or eDP
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Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

IP418

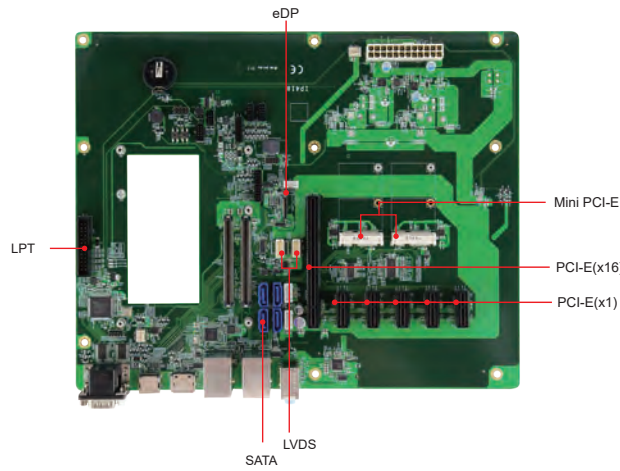
Carrier Board COM Express Type 6 (R3.0) Carrier Board

1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

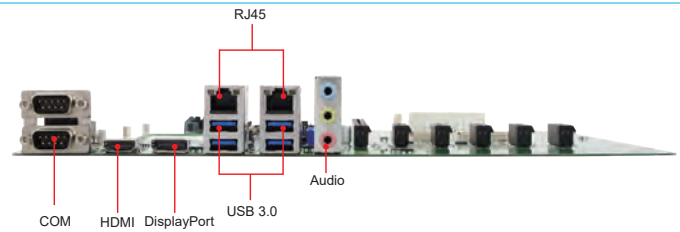
4 CPU Cards



Features

- ATX form factor with PICMG COM.0 R3.0 Type 6 pin-out
- Supports 1x VGA, 1x DisplayPort, 1x HDMI, 1x DVI-D
- Supports 1x eDP or 1x LVDS
- 1x PCI-E (x16), 5x Mini-PCI-E(x1), 2x Mini PCI-E sockets
- ATX power connector / DC-in (12V only)

I/O View



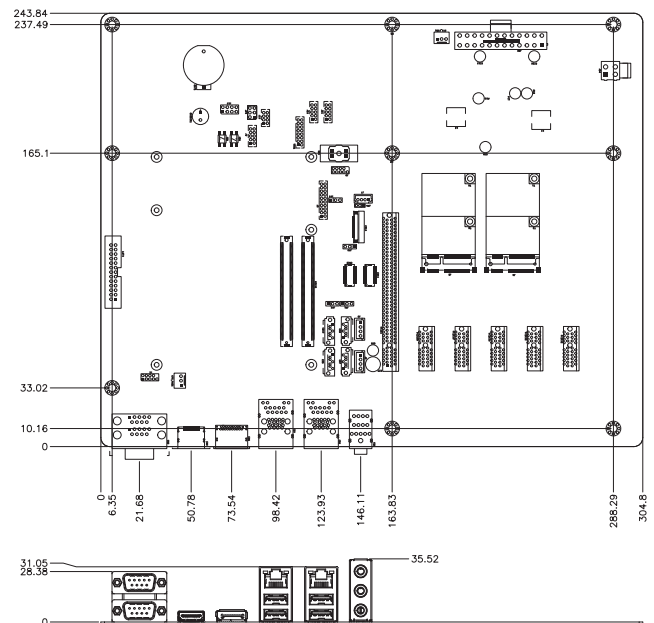
Specifications

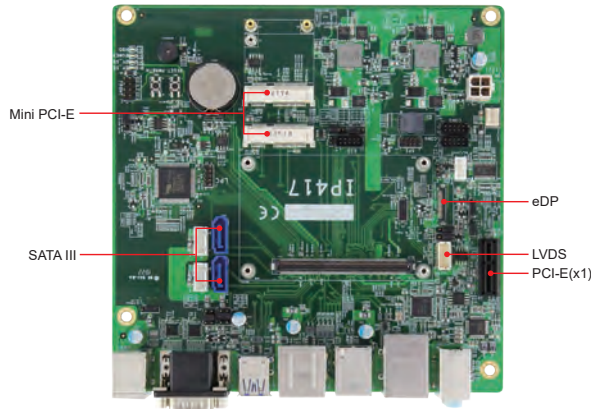
Form Factor	ATX
Module Interface	COM Express Type 6 (R3.0)
Expansions slots	1x PCI-E(16x) slot 5x PCI-E(1x) slot
Mini Type slots	2x MiniPCI-E socket
Video Output	1x VGA 3x DDI (1xDisplayPort, 1x HDMI, 1x DVI-D) 1x dual channel LVDS or 1x eDP (Depends on CPU module)
Ethernet	LAN1: Derived from COM Express CPU module LAN2: 1x Intel® I210IT
I/O Chip	Fintek F81964D-I
Serial Port	2x COM ports (RS232)
USB 2.0	4x USB 2.0
USB 3.0/ 3.1	4x USB 3.0
Serial ATA	Derived form COM Express CPU module 4x SATA III
Audio	Onboard ALC662 w/ 5.1 CH audio
Digital I/O	4-in/4-out
Watchdog	256 levels
KB/MS	N/A
Parallel	1x Parallel port via box header
Dimensions (L X W)	305mm x 244mm (12" x 9.6")
Power	ATX/ DC-IN 12V (only) 20+4-pin connector for ATX 2x 2-pin connector for 12V DC power-in (IP418-DC only)
Operating Temperature	-40°C~85°C (-40°F~185°F)
Storage Temperature	-40°C~90°C (-40°F~194°F)
Relative Humidity	10% ~ 90% (non-condensing)

Ordering Information

IP418	COM Express Type 6 Carrier Board, supports ATX
IP418-DC	COM Express Type 6 Carrier Board, supports DC-in

Dimensions and Drawing

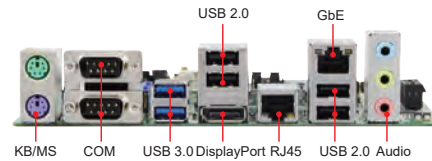




Features

- 1x PCI-E (x1), 2x Mini PCI-E sockets (full-size & half-size)
- 8x USB 2.0, 2x USB 3.0
- Supports 1x eDP or 1x LVDS (depend by COMe module), 1x DisplayPort
- 2x LAN connectors

I/O View



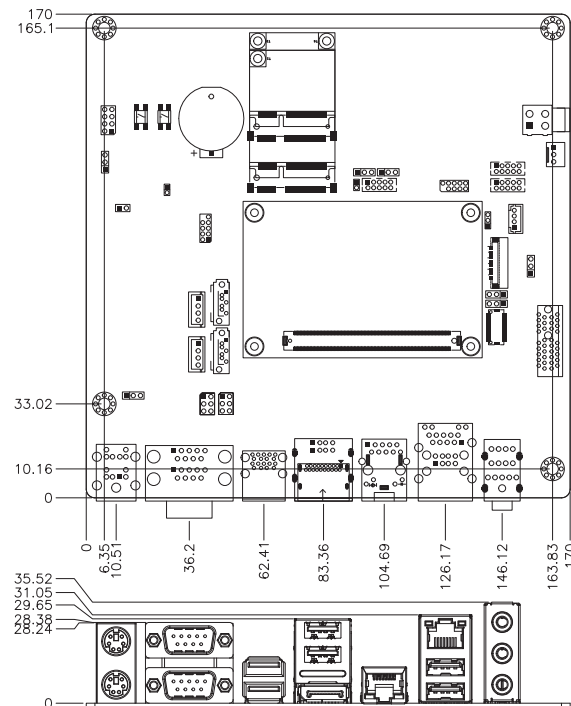
Specifications

Form Factor	Mini ITX
Module Interface	COM Express Type 10 (R3.0)
Expansions slots	1x PCI-E(x1) slot
Mini Type slots	1x MiniPCI-E socket (full-size) 1x MiniPCI-E socket (half-size)
Video Output	1x DisplayPort 1x LVDS or 1 x eDP (By option)
Ethernet	LAN1: Derived from COM Express CPU module LAN2: 1x Intel I210IT
I/O Chip	Fintek F81846D-I
Serial Port	2x COM ports (RS232)
USB 2.0	8x USB 2.0
USB 3.0/ 3.1	2x USB 3.0
Serial ATA	2x SATA III
Audio	Onboard ALC662 w/ 5.1 CH audio
Digital I/O	4-in/4-out
Fan Connector	1x 3-pin
Watchdog	256 levels
KB/MS	Yes
Dimensions (L X W)	170mm x 170mm (9.6" x 9.6")
Power	DC-in 12V only
Operating Temperature	-40°C~85°C (-40°F~185°F)
Storage Temperature	-40°C~90°C (-40°F~194°F)
Relative Humidity	10%~90% (non-condensing)

Ordering Information

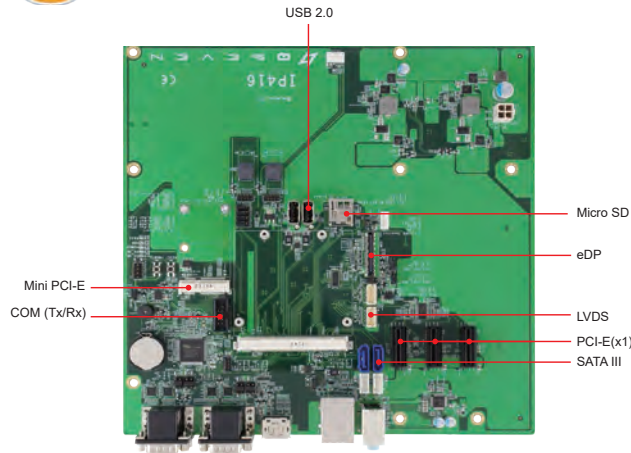
IP417	COM Express Type 10 Carrier Board, supports eDP or LVDS
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Dimensions and Drawing



IP416

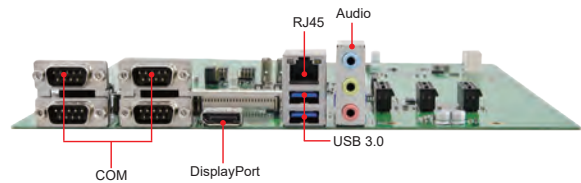
Carrier Board Qseven Carrier Board



Features

- 2x USB 2.0, 2x USB 3.0
- 3x PCI-E(x1) slots, 1x MiniPCI-E socket (full-size)
- Supports 1x eDP or 1x LVDS, 1x DisplayPort
- 1x LAN, 1x Micro SD

I/O View



Specifications

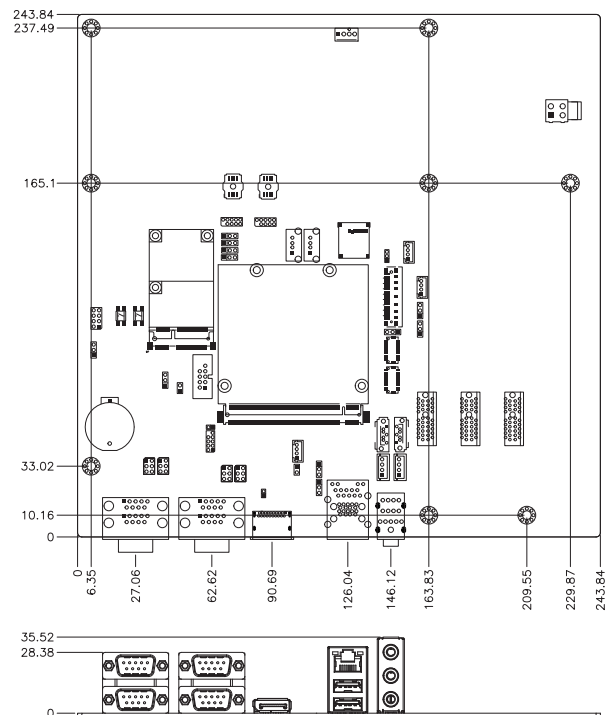
Form Factor	Micro ATX
Module Interface	Qseven CPU Module (R2.1)
Expansions slots	3x PCI-E(x1) slot
Mini Type slots	1x MiniPCI-E socket (full-size, reserve one hole for half-size)
Video Output	1x DisplayPort, 1x LVDS or 1x eDP (By option)
Ethernet	LAN: Derived from Qseven CPU module
I/O Chip	Fintek F81846D-1
Serial Port	4x COM RS232 & 1x COM (Tx/Rx only) from Qseven module
USB 2.0	2x USB 2.0
USB 3.0/ 3.1	2x USB 3.0
Serial ATA	2x SATA III
Audio	Onboard ALC662 w/ 5.1 HD audio codec
Digital I/O	4-in/4-out
Watchdog	256 levels
KB/MS	Yes
Parallel	N/A
Dimensions (L X W)	244mm x 244mm (9.6" x 9.6")
Power	DC-in 12V
Operating Temperature	-40°C~85°C (-40°F~185°F)
Storage Temperature	-40°C~90°C (-40°F~194°F)
Relative Humidity	10% ~ 90% (non-condensing)

Ordering Information

IP416

Micro ATX Qseven Carrier Board

Dimensions and Drawing



1 CPU Modules

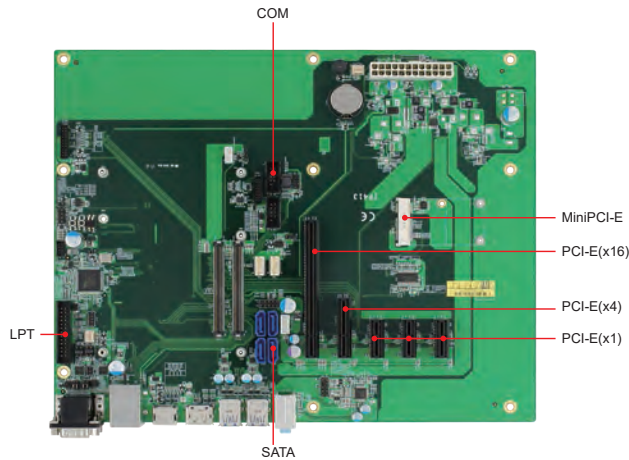
2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

IP413

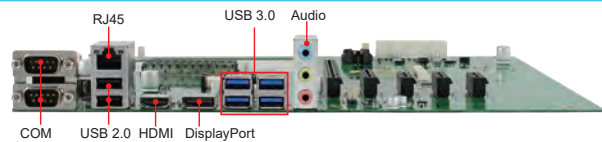
Carrier Board ATX COM Express Type 6 Carrier Board



Features

- 1x PCI-E(x16), 1x PCI-E(x4), 3x PCI-E(x1) expansion slots
- Edge connectors for dual COM, RJ45+ 1x dual USB (2.0), 1x DP, 1x HDMI, 2x dual USB 3.0, audio connector (Line-out, Line-in & Mic.)
- Onboard headers for 2x COM (from COMe module), 1x KB/MS, 2x USB (2.0), DVI-D, CRT, LVDS, 4x SATA III, 1x LPT, COM Express (Type 6) connectors
- ATX power connector / DC-in (12V only)

I/O View



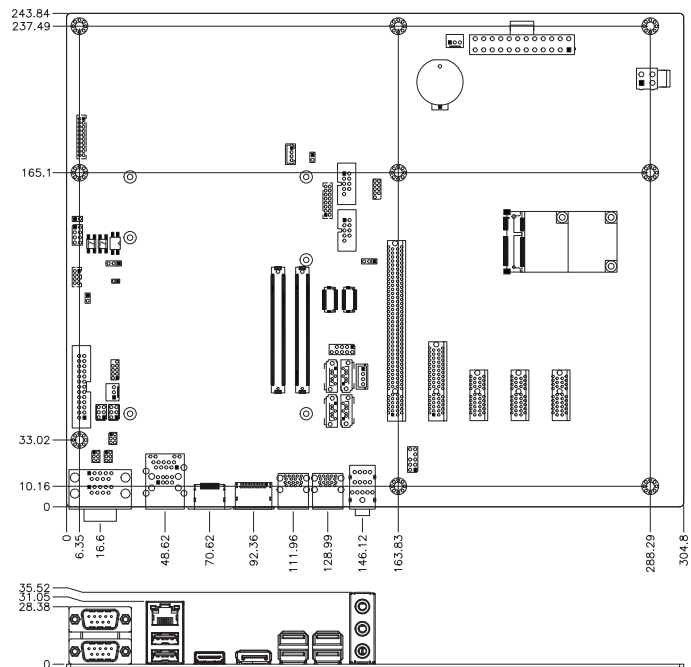
Specifications

Form Factor	ATX
Module Interface	COM Express Type 6
Expansions slots	1x PCI-E(x16) slot 1x PCI-E(x4) slot 3x PCI-E(x1) slots
Mini Type slots	1x MiniPCI-E socket (full-size, reserved one hole for half-size)
Video Output	1x VGA 3x DDI (1x DisplayPort, 1x DVI-D, 1x HDMI) 1x 18/24-bit dual-channel LVDS
Ethernet	Derived from COM Express CPU module
I/O Chip	Fintek F81846D-I
Serial Port	4x COM ports -2x COM ports (from Super I/O) -2x COM ports (from CPU module, TX/RX)
USB 2.0	Derived from COM Express module 4x USB 2.0
USB 3.0/ 3.1	4x USB 3.0
Serial ATA	Derived from COM Express CPU module 4x SATA III
Audio	Onboard ALC662 w/ 5.1 CH audio
Digital I/O	4-in/4-out
Watchdog	256 levels
KB/MS	Yes
Parallel	1x Parallel port via box header
Dimensions (L X W)	305mm x 244mm (12" x 9.6")
Power	ATX / DC-in 12V (only) 20+4-pin connector for ATX 2x 2-pin connector for 12V DC power-in (IP413-DC only)
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	10% ~ 90% (non-condensing)

Ordering Information

IP413	ATX COM Express Type 6 Carrier Board, Supports ATX
IP413-DC	ATX COM Express Type 6 Carrier Board, Supports DC-in

Dimensions and Drawing

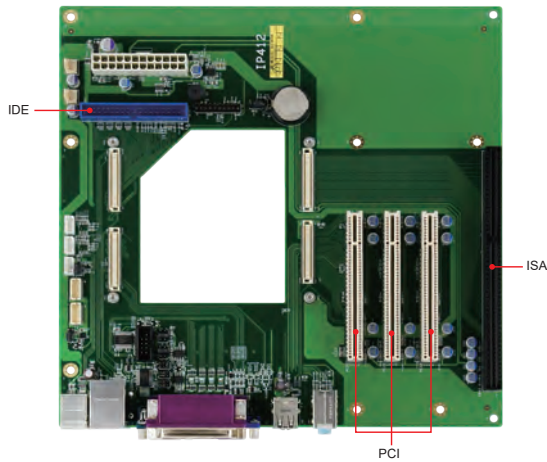


1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards



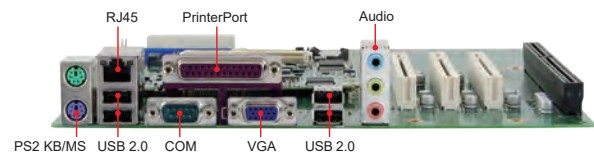
Specifications

Form Factor	Micro ATX
Module Interface	ETX (3.0)
Expansions slots	3x PCI slot 1x ISA slot
Mini Type slots	N/A
Video Output	Derived from ETX module 1x CRT 1x 18/24-bit dual-channel LVDS
Ethernet	Derived from ETX module for 10/100 LAN
I/O Chip	N/A
Serial Port	1x DB-9 connector for COM1 (RS232/422/485) 1x pin header for COM2 (RS232 only)
USB 2.0	Derived from ETX module 4x USB 2.0
USB 3.0/ 3.1	N/A
Serial ATA	N/A
Audio	Derived from ETX module Via audio jack for AC97 out
Digital I/O	4-in/4-out
Watchdog	256 levels
KB/MS	PS/2 KB/MS stack connector
Parallel	1x Parallel port connector
Dimensions (L X W)	244mm x 244mm (9.6" x 9.6")
Power	20+4-pin connector for ATX
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	10% ~ 90% (non-condensing)

Features

- Supports 1x ISA, 3x PCI expansion slots
- Edge connector for PS/2 keyboard & mouse, RJ45 + dual USB (2.0), COM, VGA, printer port, dual USB 2.0, audio connector (Line-out, Line-in & Mic.)
- Onboard header for COM, LVDS, IDE, ETX connectors

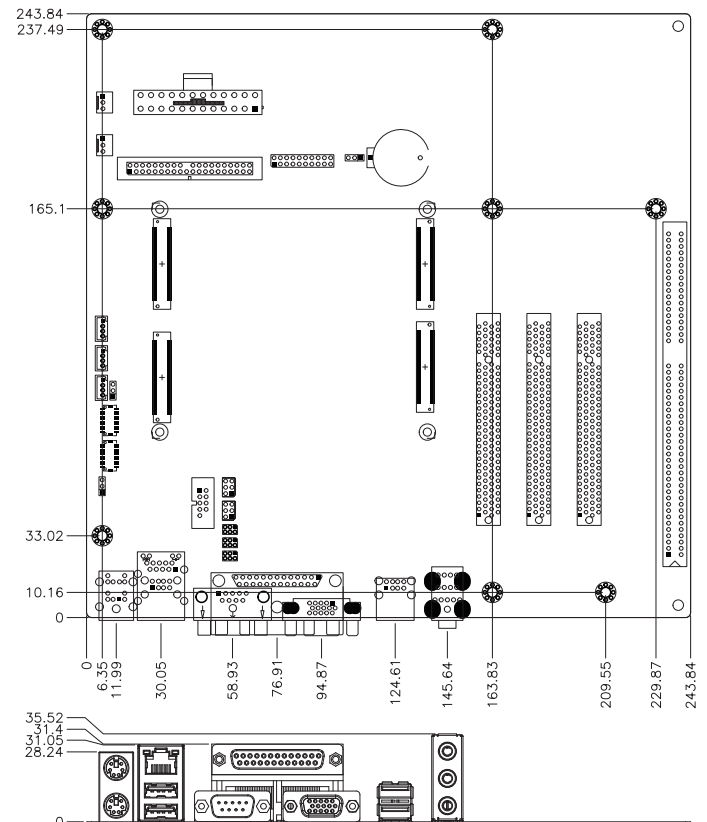
I/O View



Ordering Information

IP412	Mico ATX ETX (3.0) Carrier Board
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Dimensions and Drawing





Features

- Mini-ITX COM Express Carrier Board for compact-size COMe module
- Supports DVI-D, VGA, 24-bit dual-channel LVDS
- 4x COM, 1x printer port, 1x USB 3.0, 8x USB 2.0, 2x SATA III
- Onboard dual PCI-E Gigabit LAN
- 1x PCI-E(x1)

I/O View



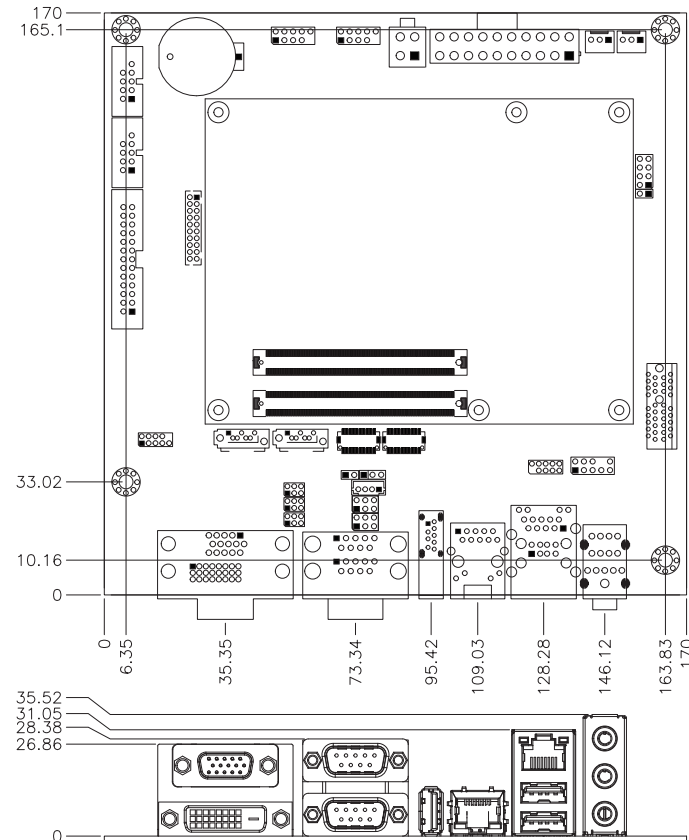
Specifications

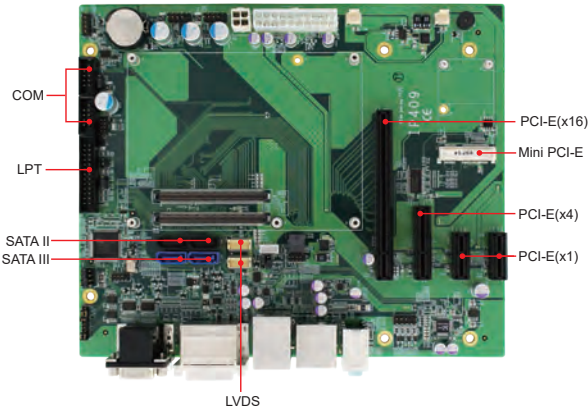
Form Factor	Mini-ITX
Module Interface	COM Express Type 6
Expansions slots	1x PCI-E(x1) slot
Mini Type slots	N/A
Video Output	1x VGA 2x DDI (1 x DVI-D, 1 x DVI-D shared with LVDS) 1x 18/24-bit dual-channel LVDS
Ethernet	Derived from COM Express CPU module as GbE#1 Intel® I210IT PCI-E Gigabit LAN x 1 as GbE #2
I/O Chip	Fintek F81846AD-I
Serial Port	4x COM ports -2x COM ports (from Super I/O) -2x COM ports (from CPU module, TX/RX)
USB 2.0	Derived from COM Express CPU module 8x USB 2.0
USB 3.0/ 3.1	1x USB 3.0
Serial ATA	Derived from COM Express CPU module 2x SATA III
Audio	Onboard ALC662 w/ 5.1 HD audio codec
Digital I/O	4-in/4-out
Watchdog	256 levels
KB/MS	Yes
Parallel	1x Parallel port via pin header
Dimensions (L X W)	170mm x 170mm (6.7" x 6.7")
Power	20+4pins connector for ATX
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	10% ~ 90% (non-condensing)

Ordering Information

IP411	Mini-ITX COM Express Type 6 Carrier Board
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Dimensions and Drawing





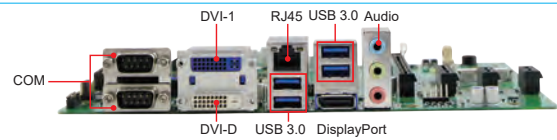
Specifications

Form Factor	Flex ATX
Module Interface	COM Express Type 6
Expansions slots	1x PCI-E(x16) slot 1x PCI-E(x4) slot 2x PCI-E(x1) slot
Mini Type slots	1x MiniPCI-E socket (full-size, reserved one hole for half-size)
Video Output	1x VGA 3x DDI (1 x DVI-D, 1 x DVI-I, 1 x DisplayPort) 1x 18/24-bit dual-channel LVDS
Ethernet	Derived from COM Express CPU module
I/O Chip	Fintek F81846D-I
Serial Port	4x COM ports -2x COM from super I/O (RS232) -2x COM from CPU module (TX/RX)
USB 2.0	4x USB 2.0
USB 3.0/ 3.1	4x USB 3.0
Serial ATA	Derived from COM Express module 2x SATA III 2x SATA II
Audio	Onboard ALC662 w/ 5.1 HD audio codec
Digital I/O	4-in/4-out
Watchdog	256 levels
KB/MS	N/A
Parallel	1x Parallel port via pin header
Dimensions (L X W)	190mm x 228mm (7.5"x 9.0")
Power	20+4pins connector for ATX
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	10% ~ 90% (non-condensing)

Features

- Supports Fintek F81846AD-I Super I/O
- 1x PCI-E(x16), 1x PCI-E(x4), 2x PCI-E(x1), 1x MiniPCI-E socket (full-size)
- Edge connectors for 2x COM (from onboard Super I/O), DVI-I, DVI-D, RJ45+ dual USB 3.0, DisplayPort + dual USB 3.0, audio connector (Line-out, Lin-in & Mic.)
- Onboard headers for 2x COM (from COMe module), 1x KB/MS, 2x SATA III, 2x SATA II, 2x LVDS, 4x USB 2.0

I/O View

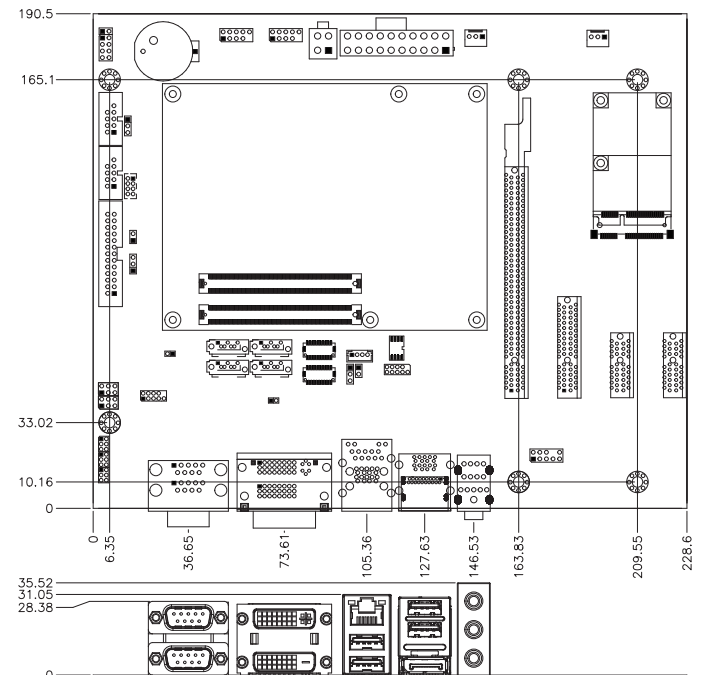


Ordering Information

IP409

Flex ATX COM Express Type 6 Carrier Board

Dimensions and Drawing



Comparison Table

3.5" Disk-Size SBC

Models	IB811	IB818	IB822
Form Factor	3.5" SBC	3.5" SBC	3.5" SBC
CPU Socket supported	CPU on board	CPU on board	CPU on board
CPU	Intel® Atom™ Processor E3950/E3930 Intel® Pentium® Processor N4200 Intel® Celeron® Processor N3350	Intel® Atom™ Processor E3950/E3930 Intel® Pentium® Processor N4200 Intel® Celeron® Processor N3350	Intel® Pentium® Silver/ Celeron® processor
CPU Max. Frequency	up to 2.0GHz/ 1.8GHz/ 2.5GHz/ 2.4GHz	up to 2.0GHz/ 1.8GHz/ 2.5GHz/ 2.4GHz	up to 2.8 GHz / 2.6GHz
PCH	N/A	N/A	N/A
Memory Type	2x DDR3L SO-DIMM	1x DDR3L SO-DIMM	2x DDR4 SO-DIMM
Max. Memory Size	8GB	8GB	8GB
BIOS	AMI	AMI	AMI
Graphics Controller	Intel® Gen9-LP w/ 18 EUs graphics	Intel® Gen9-LP w/ 18 EUs graphics	Intel® UHD Graphics 605
Video Output	24-bit dual-channel LVDS or eDP HDMI & DisplayPort on board	18/24-bit dual-channel LVDS HDMI on board	18/24-bit dual-channel LVDS or eDP HDMI / DisplayPort on board
Ethernet	2x Intel® I210IT PCI-E Gigabit LAN or 2x Intel® I211AT PCI-E Gigabit LAN	2x Intel® I210IT PCI-E Gigabit LAN or 1x Intel® I210AT PCI-E Gigabit LAN	2x Intel® I211AT PCI-E Gigabit LAN
Audio	Built-in ALC283 HD audio codec	Built-in ALC283 HD audio codec	Built-in ALC233-VB2-CG HD audio codec
SATA	2x SATA III ports	2x SATA III ports	2x SATA III ports
I/O Chip	F81946D-I	F81946D-I	F81964D-I
Serial Port	3x RS232 1x RS232/422/485 (Jumperless selection)	3x RS232 1x RS232/422/485 (Jumperless selection)	3x RS232 1x RS232/422/485 (Jumperless selection)
USB 2.0	2x USB 2.0 via pin header	2x USB 2.0 ports via pin header	2x USB 2.0 via pin header
USB 3.0/ 3.1	4x USB 3.0 via rear I/O	4x USB 3.0 ports on board	4x USB 3.0 on board
Hardware Monitor	Yes	Yes	Yes
TPM	N/A	N/A	N/A
Storage Device Interface	mSATA via Mini PCI-E	mSATA via Mini PCI-E	N/A
Watchdog Timer	256 levels	256 levels	256 levels
Digital I/O	4-in / 4-OUT	4-in/4-out	4-in/4-out
Mini Type Slots	1x Mini PCI-E(x1), 1x M.2(B-key)	2x Mini PCI-E(x1)	1x PCI-E(x1) 1x M.2 (B-key), 1xM.2 (E-key)
Power input	DC-in 9V~36V	DC-in 12V~24V	DC-in 12V~24V
Power Consumption	Intel® Atom™ E3900 1.3GHz w/ 2x Transcend DDR3L 1600 4GB +12V: 1.2A	Intel® Atom™ E3950, 1.6GHz w/ 8GB DDR3L +12V: 1.09A, Intel® Pentium® N4200, 1.1GHz w/ 8GB DDR3L +12V: 1.09A	Intel® Celeron® J4005 2.0GHz w/ 2x 8GB DDR4-2133 +12V: 1.58A
Dimensions (L x W)	147mmx 102mm	147mmx 102mm	102mmx 147mm
Extra Features	LAN Wakeup, Eup / Erp	LAN Wakeup	ISmart 3.5
Page No.	P2-6	P2-5	P2-9

1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

Comparison Table

3.5" Disk-Size SBC

Models	IB897	IB898	IB899	IB903
Form Factor	3.5" SBC	3.5" SBC	3.5" SBC	3.5" SBC
CPU Socket supported	CPU on board		CPU on board	CPU on board
CPU	Intel® Atom™ Processor E3845/ E3827/E3815	Intel® Atom™ Processor E3825/ E3815	Intel® Pentium® Processor N3710 / Intel® Celeron® Processor N3010	AMD Embedded G-Series SOC
CPU Max. Frequency	1.91GHz / 1.75GHz / 1.46GHz	1.33GHz / 1.46GHz	up to 2.56GHz/ 2.24GHz	up to 2.0 GHz
PCH	N/A	N/A	N/A	N/A
Memory Type	2x DDR3L SO-DIMM	1x DDR3L SO-DIMM	2x DDR3L SO-DIMM	1x DDR3L/ SO-DIMM
Max. Memory Size	8GB	4GB	8GB	8GB
BIOS	AMI	AMI	AMI	AMI
Graphics Controller	Intel® Gen.7 w/4EUs graphics	Intel® Gen7 w/ 4EUs graphics	Intel® Gen8 graphics	AMD Radeon™ HD8000 series graphics
Video Output	24-bit dual-channel LVDS DisplayPort on board	24-bit dual-channel LVDS DisplayPort & VGA on board	24-bit dual-channel LVDS DVI-D & VGA on board	18/24-bit dual-channel LVDS DVI-I on board
Ethernet	2x Intel® I210IT PCI-E Gigabit LAN	1x Intel® I210IT PCI-E Gigabit LAN	2x Intel® I211AT PCI-E Gigabit LAN	2x Realtek 8111G-CG PCI-E Gigabit LAN
Audio	Built-in ALC269 HD audio codec, 2W amplifier	Built-in ALC269 HD audio codec with integrated 2 amplifier	Built-in ALC662 HD audio codec	Built-in ALC269 HD audio codec with integrated 2W amplifier
SATA	2x SATA II ports	2x SATA II ports	2x SATA III ports	2x SATA III ports
I/O Chip	NCT5523D	NCT5523D	NCT5523D	F81846AD-I
Serial Port	1x RS232 1x RS232/422/485 (Jumperless selection)	1x RS232 1x RS232/422/485 (Jumperless selection)	1x RS232 1x RS232/422/485 (Jumperless selection)	3x RS232 1x RS232/422/485 (Jumperless selection)
USB 2.0	3x USB 2.0 (1x rear I/O + 2x via pin header)	3x USB 2.0 (1x rear I/O + 2x via pin header)	2x USB 2.0 (via pin header)	4x USB 2.0 via pin header
USB 3.0/ 3.1	1x USB 3.0 via rear I/O	1x USB 3.0 via rear I/O	4x USB 3.0 via rear I/O	2x USB 3.0 via rear I/O
Hardware Monitor	Yes	Yes	Yes	Yes
TPM	N/A	N/A	N/A	N/A
Storage Device Interface	mSATA via Mini PCI-E, MicroSD slot	mSATA via Mini PCI-E	mSATA via Mini PCI-E	mSATA via Mini PCI-E
Watchdog Timer	256 levels	256 levels	256 levels	256 levels
Digital I/O	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out
Mini Type Slots	2x Mini PCI-E(x1)	3x Mini PCI-E(x1)	2x Mini PCI-E(x1)	2x Mini PCI-E(x1)
Power input	DC-in 9V~30V	DC-in 12V	DC-in 12V~24V	DC-in 9V~24V
Power Consumption	Intel® Atom™ E3827 @ 1.75GHz w/ 2x 2GB DDR3L-1600 +12V: 1.29A Intel® Atom™ E3845 @ 1.91GHz w/ 2x 2GB DDR3L-1600 +12V: 1.57A	Intel® Atom™ E3825 1.33GHz w/ 4GB DDR3L-1600 +12V: 0.65A	Intel® Pentium® N3700 1.6GHz w/ 2x 4GB DDR3L-1600 +12V: 1.5A	AMD GX-420CA SoC with Radeon™ HD Graphics 2.0GHz w/ 2GB DDR3-1333 +12V: 2.91A
Dimensions (L x W)	147mmx 102mm	147mmx 102mm	147mmx 102mm	147mmx 102mm
Extra Features	LAN Wakeup, iSMART	LAN Wakeup, iSMART	LAN Wakeup, iSMART	LAN Wakeup, iSMART
Page No.	P2-8	P2-7	P2-10	P2-18

1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

Comparison Table

3.5" Disk-Size SBC

Models	IB908	IB909	IB915
Form Factor	3.5" SBC	3.5" SBC	3.5" SBC
CPU Socket supported	CPU on board	CPU on board	CPU on board
CPU	4th Gen Intel® Core™ U-Series processor	5th Gen Intel® Core™ U-Series processor	6th Gen Intel® Core™ U-Series processor
CPU Max. Frequency	up to 1.9GHz	up to 2.2GHz	up to 3.4GHz
PCH	N/A	N/A	N/A
Memory Type	2x DDR3L SO-DIMM	2x DDR3L SO-DIMM	2x DDR3L SO-DIMM
Max. Memory Size	16GB	16GB	16GB
BIOS	AMI	AMI	AMI
Graphics Controller	Intel® Core™ i integrated HD 4000 / HD 5000	Intel® Core™ i integrated HD 5500 / HD 6000	Intel® Core™ i integrated HD GT2-520
Video Output	24-bit dual-channel LVDS DVI-I on board	24-bit dual-channel LVDS DVI-I on board	24-bit dual-channel LVDS & eDP DisplayPort on board
Ethernet	IB908AF: Intel® I218LM LAN PHY IB908F: Intel® I218V LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2 nd LAN)	Intel® I218LM/V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN	Intel® I219LM/V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN
Audio	Built-in ALC269 audio codec, 2W amplifier	Built-in ALC269 HD audio codec with integrated 2W amplifier	Built-in ALC662 HD audio codec
SATA	2x SATA III ports	2x SATA III ports	2x SATA III ports
I/O Chip	NCT6102D	NCT6102D	F81846AD-I
Serial Port	1x RS232 1x RS232/422/485 (jumperless selection)	1x RS232 1x RS232/422/485	3x RS232 1x RS232/422/485 (jumper-less selection)
USB 2.0	2x USB 2.0 via pin header	4x USB 2.0 via pin header	2x USB 2.0 via pin header
USB 3.0/ 3.1	2x USB 3.0 via rear I/O	2x USB 3.0 via rear I/O	1x USB 3.1 Type C + 4x USB 3.0 via rear I/O
Hardware Monitor	Yes	Yes	Yes
TPM	N/A	N/A	N/A
Storage Device Interface	mSATA via Mini PCI-E	mSATA via Mini PCI-E	mSATA via Mini PCI-E
Watchdog Timer	256 levels	256 levels	256 levels
Digital I/O	4-in/4-out	4-in/4-out	4-in/4-out
Mini Type Slots	2x Mini PCI-E(x1)	2x Mini PCI-E(x1)	1x Mini PCI-E(x1)
Power input	DC-in 9V~24V	DC-in 9V~24V	DC-in 9V~24V
Power Consumption	Intel® Core™ i7-4650U @1.70 GHz w/ 2x Transcend 2GB DDR3L-1600 +12V: 2.75A	Intel® Core™ i5-5350U 1.80GHz w/ 8GB DDR3L-1600 +12V: 3.84A	Intel® Core™ i3-6100U 2.3GHz w/ 2x DDR3L-1600 4GB +12V: 2.36A Intel® Core™ i7-6600U 2.6GHz w/ 2x DDR3L-1600 4GB +12V: 2.27A
Dimensions (L x W)	147mm x 102mm	147mm x 102mm	147mm x 102mm
Extra Features	LAN Wakeup, iSMART, RAID	Built-in iAMT (10.0), RAID LAN Wakeup, iSMART	Built-in iAMT (11.0), RAID LAN Wakeup, iSMART
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1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

Comparison Table

3.5" Disk-Size SBC

Models	IB916	IB917	IB918	IB919
Form Factor	3.5" SBC	3.5" SBC	3.5" SBC	3.5" SBC
CPU Socket supported	CPU on board	CPU on board	CPU on board	CPU on board
CPU	7th Gen Intel® Core™ U-Series processor	7th Gen Intel® Core™ U-Series processor	AMD Ryzen™ embedded V1000/R1000 series	8th Gen Intel® Core™ U-Series processor
CPU Max. Frequency	up to 3.9GHz	up to 3.9GHz	3.6GHz/ 2.3GHz	up to 4.7GHz
PCH	N/A	N/A	N/A	N/A
Memory Type	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM
Max. Memory Size	32GB	32GB	32GB	32GB
BIOS	AMI	AMI	AMI	AMI
Graphics Controller	Intel® Core™ U-Series processor integrated graphics	Intel® Core™ U-Series processor integrated graphics	AMD V-Series APU built-in GPU	Intel 8th Gen Core™ i / U-Series built-in Gen. 9 graphics, up to 24EU
Video Output	N/A eDP/ HDMI / DisplayPort on board	24-bit dual-channel LVDS HDMI / DisplayPort on board	2x HDMI2.0 24-bit LVDS dual-channel eDP	24-bit dual-channel LVDS or eDP 2x DisplayPort
Ethernet	IB916AF: Intel® I219LM LAN PHY IB916F: Intel® I219V LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2nd LAN)	IB916AF: Intel® I219LM LAN PHY IB916F: Intel® I219V LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2nd LAN)	Intel® I211AT GbE	Intel® I219LM GbE PHY (IB919AF series) Intel® I219V GbE PHY (IB918EF series) Intel® I211AT as 2nd GbE
Audio	Built-in ALC662 HD audio codec	Built-in ALC662 HD audio codec	Built-in ALC269Q-VC3-GR HD audio codec with 2W amplifier	Built-in ALC269Q-VC3-GR HD audio codec with 2W amplifier
SATA	2x SATA III ports	2x SATA III ports	2x SATA III ports	2x SATA III ports
I/O Chip	F81846AD-I	F81846AD-I	F81964D-I	Fintek F81964D-I
Serial	3x RS232 1x RS232/422/485 (jumper-less selection)	3x RS232 1x RS232/422/485 (jumper-less selection)	3x RS232 1x RS232/422/485 (jumper-less selection)	3x RS232 1x RS232/422/485 (jumper-less selection)
USB 2.0	2x USB 2.0 via pin header	2x USB 2.0 via pin header	1x USB 2.0 via pin header	2x USB2.0 via pin header
USB 3.0/ 3.1	4x USB 3.0 via rear I/O	4x USB 3.0 via rear I/O	2x USB 3.1 via rear I/O 2x USB 3.0 via rear I/O from eDP Lanes	1x USB 3.1 Type C 4x USB 3.1 via rear I/O
Hardware Monitor	Yes	Yes	Yes	Yes
TPM	2.0	2.0	2.0	2.0
Storage Device Interface	mSATA via Mini PCI-E	mSATA via Mini PCI-E	1x M.2 (M-Key)	1x M.2
Watchdog Timer	256 levels	256 levels	256 levels	256 levels
Digital I/O	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out
Mini Type Slots	1x Mini PCI-E(x1)	1x Mini PCI-E(x1)	1x M.2 (B-key), 1x M.2 (E-key)	1x M.2 (B-key), 1x M.2 (E-key)
Power input	DC-in 9V~24V	DC-in 9V~24V	DC-in 12V~24V	DC-in 9~24V
Power Consumption	Intel® i7-7300U, 2.6GHz w/ 8GB DDR4-2133, +12V: 2.06A, Intel® i3-7100U, 2.4GHz w/ 8GB DDR4-2133, +12V: 2.24A	Intel® i7-7600U, 2.8GHz w/ 8GB DDR4-2133, +12V: 3.46A Intel® i3-7100U, 2.4GHz w/ 8GB DDR4-2133, +12V: 2.68A	AMD Ryzen™ Embedded V1605B 2.00GHz w/ 2x 16GB DDR4-2400 +12V: 2.55A AMD Ryzen™ Embedded R1606G 2.6GHz w/ 2x 16GB DDR4-2400 +12V: 2.34A	Intel® Core™ i7-8665UE 1.70GHz w/2x DDR4-2400 16GB +12V: 2.25A Intel® Core™ i3-8145UE 2.20GHz w/2x DDR4-2400 16GB +12V: 2.24A
Dimensions (L x W)	147mm x 102mm	147mm x 102mm	147mm x 102mm	147mm x 102mm
Extra Features	Built-in iAMT (11.0), RAID LAN Wakeup, iSMART	Built-in iAMT (11.0), RAID LAN Wakeup, iSMART	EuP/ErP LAN Wakeup	LAN Wakeup, EuP/ErP
Page No.	P2-13	P2-12	P2-17	P2-11

1 CPU Modules

2 Disk-Size SBCs

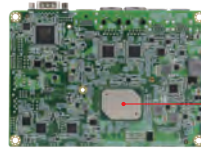
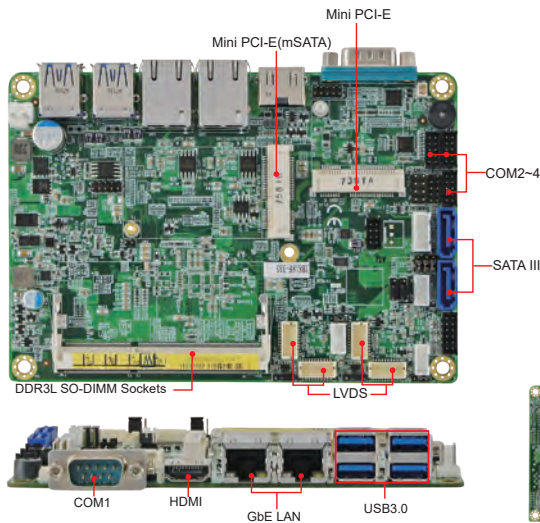
3 Motherboards

4 CPU Cards

IB818

3.5" Disk-Size SBC

Intel® Atom™ x7/x5/ Pentium® / Celeron® 3.5-inch Disk-Size SBC



IB818 with Heat spreader



IB818 with Heatsink

Features

- Onboard Intel® Atom™ x7-E3950, 2.0GHz or x5-E3940/x5-E3930 SoC, 1.8GHz [i-Temp support]
- Onboard Intel® Pentium® N4200, 2.5GHz or Celeron® N3350, 2.4GHz
- 1x DDR3L-1866 SO-DIMM, Max. 8GB
- Supports HDMI 1.4b, **Dual LVDS(18/24bit)**
- 2x Intel® I210IT PCI-E Gigabit LAN or I211AT PCI-E Gigabit LAN
- Watchdog timer, Digital I/O, mSATA, EuP/ErP
- 4x USB 3.0, 2x USB 2.0, 4x COM, 2x SATA III
- 1x Mini PCI-E slot (full-size), 1x Mini PCI-E slot (half-size)
- Wide-range operating temperature in certain models

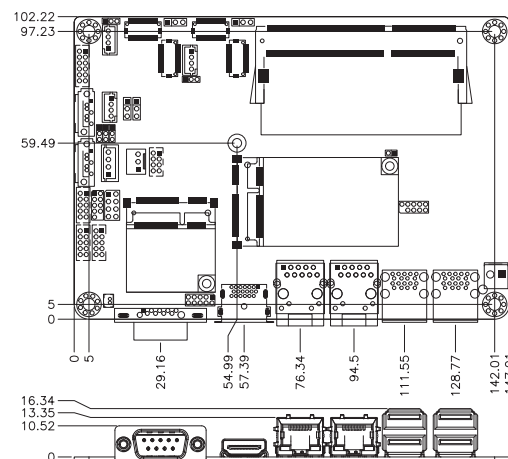
Specifications

CPU	Intel® Atom™ QC x7/ E3950 (1.6~2.0 GHz) Intel® Atom™ QC x5/ E3940 (1.6 GHz~1.8GHz) Intel® Atom™ DC x5/ E3930 (1.3 GHz~1.8GHz) Intel® Pentium® QC N4200 (1.1~2.5 GHz) Intel® Celeron® DC N3350 (1.1~ 2.4 GHz)
PCH	Integrated in Intel® SoC
Memory Type	1x DDR3L SO-DIMM, Max 8GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA (Via full-size Mini PCI-E)
Mini Type Slots	2x Mini PCI-E (1x full-size, 1x half-size)
Graphics Controller	Intel® SoC integrated Gen9 18EUs graphics
Video Output	Supports HDMI(1.4b), Dual LVDS (18/24bit)
Ethernet	IB818F-I50 2x Intel® I210IT PCI-E Gigabit LAN IB818F-420/335: 2x Intel® I211AT PCI-E Gigabit LAN
I/O Chip	Fintek F81964D-I
Serial Port	1x RS232/422/485 (jumperless selection) 3x RS232
USB 2.0	2x USB 2.0 via pin-header
USB 3.0/ 3.1	4x USB 3.0 on board
Serial ATA	2x SATA III
Audio	Intel® Atom™ SoC built-in HD audio controller + Realtek ALC283 Codec w/ class-D speaker amplifier
TPM	N/A
Others	Digital I/O, +12V~+24V DC-in, EuP/ErP
Dimensions (L x W)	102 x 147 mm (4" x 5.8")
Power Consumption	Intel® Atom™ E3950, 1.6GHz w/ 8GB DDR3L +12V: 1.09A Intel Pentium N4200, 1.1GHz w/ 8GB DDR3L +12V: 1.09A
Operating Temperature	E3950: -40°C~+85°C (-40°F~185°F) N4200/N3350: 0°C~+60°C (32°F~140°F)
Storage Temperature	-40°C~90°C (-40°F~194°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

IB818F-I50	Intel® Atom™x7/ E3950 (1.6GHz~2.0 GHz) 3.5-inch Disk-Size SBC w/ dual GbE LAN, HDMI, 2x LVDS (18/24-bit LVDS dual-channel), EuP/ErP, 12V~24V DC-in, wide temp support
IB818F-I40	Intel® Atom™x7/ E3950 (1.6GHz~1.8 GHz) 3.5-inch Disk-Size SBC w/ dual GbE LAN, HDMI, 2x LVDS (18/24-bit LVDS dual-channel), EuP/ErP, 12V~24V DC-in, wide temp support
IB818F-I30	Intel® Atom™x7/ E3950 (1.3GHz~1.8 GHz) 3.5-inch Disk-Size SBC w/ dual GbE LAN, HDMI, 2x LVDS (18/24-bit LVDS dual-channel), EuP/ErP, 12V~24V DC-in, wide temp support
IB818F-420	Intel® Pentium® N4200 (1.1GHz~2.5GHz) 3.5-inch Disk-Size SBC w/ dual GbE LAN, HDMI, 2x LVDS (18/24-bit LVDS dual-channel), EuP/ErP, 12V~24V DC-in
IB818F-335	Intel® Celeron® N3350 (1.1GHz~2.4GHz) 3.5-inch Disk-Size SBC w/ dual GbE LAN, HDMI, 2x LVDS (18/24-bit LVDS dual-channel), EuP/ErP, 12V~24V DC-in
HSIB818-I	Heatsink for IB818F-I50/ I40/ I30
HSIB818-I-1	Heatsink for IB818F-I50/ IB818F-I40/ IB818F-I30
HSIB818-1	Heat spreader for IB818F-420/ IB818F-335
HSIB818	Heat spreader for IB818F-420/ IB818F-335
IB76A-1	Cable kit w/ USB, COM, Power, SATA+Power

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

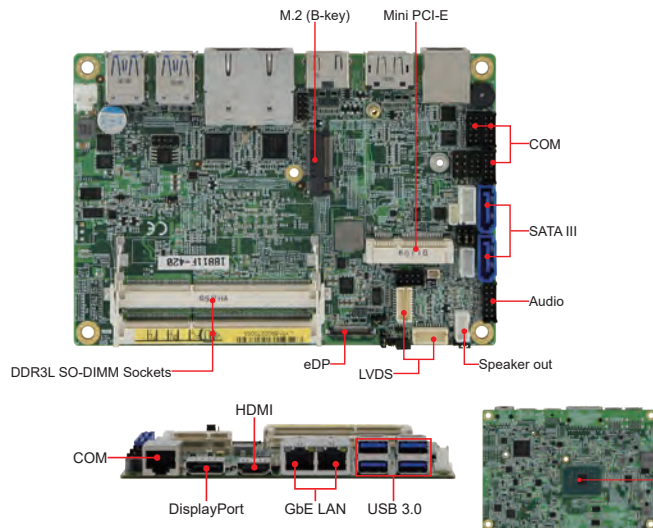
3 Motherboards

4 CPU Cards

IB811

3.5" Disk-Size SBC

Intel® Atom™ x7/x5/ Pentium® / Celeron® 3.5-inch Disk-Size SBC



Features

- Onboard Intel® Atom™ x7-E3950, 2.0GHz or x5-E3940/x5-E3930 SoC, 1.8GHz [i-Temp support]
- Onboard Intel® Pentium® N4200, 2.5GHz or Celeron® N3350, 2.4GHz
- 2x DDR3L-1866/1600 SO-DIMM, Max. 8GB
- Supports HDMI(1.4b), DisplayPort and eDP/ 24 bit dual-channel LVDS
- 2x Intel® I210IT PCI-E Gigabit LAN or I211AT PCI-E Gigabit LAN
- Watchdog timer, Digital I/O, mSATA, EuP/ErP
- 4x USB 3.0, 2x USB 2.0, 4x COM, 2x SATA III
- 1x Mini PCI-E slot (full-size), 1x M.2 (B-key)
- Wide-range operating temperature in certain models

1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

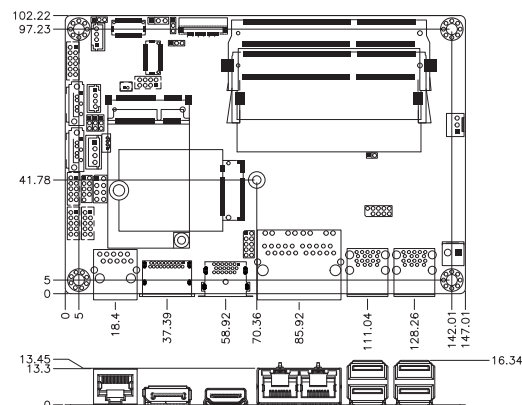
Specifications

CPU	Intel® Atom™ QC x7 /E3950 (1.6GHz~2.0GHz, 2MB cache) Intel® Atom™ QC x5 /E3940 (1.6GHz~1.8GHz, 2MB cache) Intel® Atom™ DC x5 / E3930 (1.3GHz~1.8GHz, 2MB cache) Intel® Pentium® QC N4200 (1.1GHz~2.5GHz, 2MB cache) Intel® Celeron® DC N3350 (1.1GHz~2.4GHz, 2MB cache)
PCH	Integrated in Intel® SoC
Memory Type	2x DDR3L SO-DIMM, Max 8GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA
Mini Type Slots	1x Mini PCI-E (full-size), 1x Mini PCI-E (full-size), 1x M.2 (B-key, type:3042/2242)
Graphics Controller	Intel® SoC integrated Gen9 18EUs graphics
Video Output	Supports HDMI(1.4b), DP(1.2), eDP/24-bit dual-channel LVDS
Ethernet	IB811F-150/140/130: 2x Intel® I210IT PCI-E Gigabit LAN IB811F-420/335: 2x Intel® I211AT PCI-E Gigabit LAN
I/O Chip	Fintek F81964D-1
Serial Port	1x RS232/422/485 (jumperless selection) 3x RS232
USB 2.0	2x USB 2.0 via pin-header
USB 3.0/ 3.1	4x USB 3.0 on board
Serial ATA	2x SATA III
Audio	Intel® Atom™ SoC built-in HD audio controller + Realtek ALC283QHD Codec w/ class-D speaker amplifier
TPM	TPM 2.0
Others	Digital I/O, +9V~ +36V DC-In, EuP/ErP
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® Atom™ E3900 1.3GHz w/ 2x DDR3L 1600 4GB +12V: 1.2A
Operating Temperature	E3950/E3940/E3930: -40°C~85°C (-40°F~185°F) N4200/N3350: 0°C~60°C (32°F~140°F)
Storage Temperature	-40°C~90°C (-40°F~194°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

IB811F-150	Intel® Atom™ x7/ E3950 (1.6GHz~2.0GHz) 3.5-inch Disk-Size SBC w/ dual GbE LAN, HDMI, DisplayPort & eDP or LVDS (24-bit LVDS dual-channel), mSATA, M.2, EuP/ErP, 9V~36V DC-in, wide temp. support
IB811F-140	Intel® Atom™ x5/ E3940 (1.6GHz~1.8GHz) 3.5-inch Disk-Size SBC w/ dual GbE LAN, HDMI, DisplayPort & eDP or LVDS (24-bit LVDS dual-channel), mSATA, M.2, EuP/ErP, 9V~36V DC-in, wide temp. support
IB811F-130	Intel® Atom™ x5/ E3930 (1.3~1.8GHz) 3.5-inch Disk-Size SBC w/ dual GbE LAN, HDMI, DisplayPort & eDP or LVDS (24-bit LVDS dual-channel), mSATA, M.2, EuP/ErP, 9V~36V DC-in, wide temp. support
IB811F-420	Intel® Pentium® N4200 (1.1~2.5GHz) 3.5-inch Disk-Size SBC w/ dual GbE LAN, HDMI, DisplayPort & eDP or LVDS (24-bit LVDS dual-channel), mSATA, M.2, EuP/ErP, 9V~36V DC-in
IB811F-335	Intel® Celeron® N3350 (1.1~2.4GHz) 3.5-inch Disk-Size SBC w/ dual GbE LAN, HDMI, DisplayPort & eDP or LVDS (24-bit LVDS dual-channel), mSATA, M.2, EuP/ErP, 9V~36V DC-in
HSIB811-B	Heatsink for IB811F-420/ 335
HSIB811-I	Heatsink for IB811F-150/ 140/ 130
HSIB811-1	Heat spreader for IB811F-420/ 335
HSIB811-1-1	Heat spreader for IB811F-150/ 140/ 130
IB76A-1	Cable kit w/ USB, COM, Power, SATA + Power

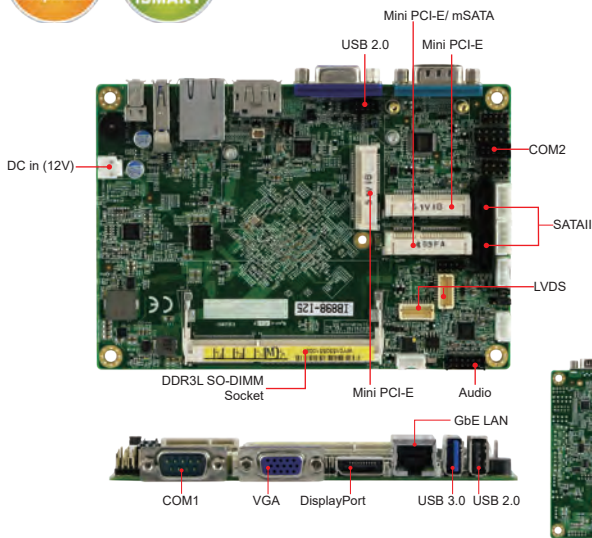
Dimensions and Drawing



IB898

3.5" Disk-Size SBC

Intel® Atom™ Processor E3800 Series 3.5-inch Disk-Size SBC



IB898 with Heat spreader

IB898 with Heatsink

Features

- Onboard Intel® Atom™ E3845 QC/ E3825 DC/ E3815 SC SoC, 1.9GHz/1.33GHz/1.46GHz
- 1x DDR3L-1066 SO-DIMM, Max. 4GB
- Supports VGA, DisplayPort and 24-bit dual-channel LVDS
- 1x Intel® I210IT PCI-E Gigabit LAN
- Watchdog timer, Digital I/O, mSATA, iSMART
- 3x USB 2.0, 1x USB 3.0, 2x COM, 2x SATA II
- 3x Mini PCI-E slots (2x full-size, 1x half-size)
- Wide-range operating temperature

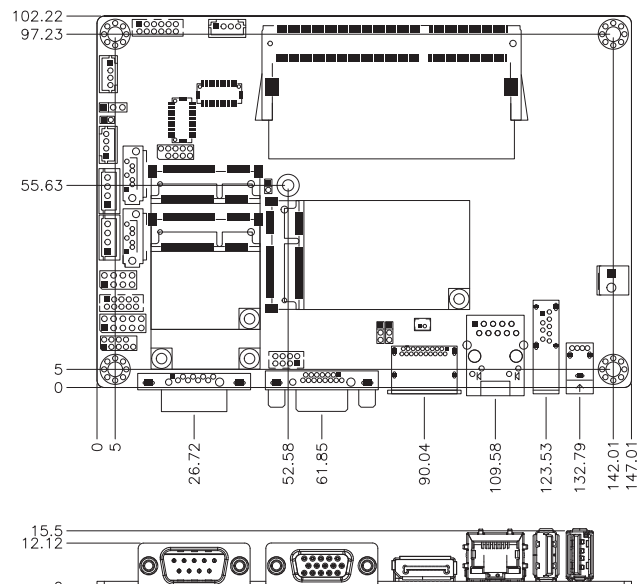
Specifications

CPU	Intel® Atom QC E3845 (1.9GHz, 2MB cache) Intel® Atom™ DC E3825 (1.33GHz, 1MB cache) Intel® Atom™ SC E3815 (1.46GHz, 512KB cache)
PCH	Integratd in Intel® Atom™ SoC
Memory Type	1x DDR3L-1066 SO-DIMM, Max 4GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA
Mini Type Slots	3x Mini PCI-E (2x full-size, 1x half-size)
Graphics Controller	Intel® Atom™ SoC integrated Gen7 4EUs graphics
Video Output	Supports CRT, DisplayPort, and 24-bit dual-channel LVDS
Ethernet	1x Intel® I210IT PCI-E Gigabit LAN
I/O Chip	Nuvoton NCT5523D
Serial Port	1x RS232/422/485 (jumperless selection) 1x RS232
USB 2.0	1x USB 2.0 on board 2x USB 2.0 via pin header
USB 3.0/ 3.1	1x USB 3.0 on board
Serial ATA	2x SATA II
Audio	Intel® Atom™ SoC built-in HD Audio controller + Realtek ALC269QHD codec w/ class-D amplifier
TPM	N/A
Others	Digital I/O, +12V DC-In, iSMART Wide-range operating temperature
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® Atom™ E3825 1.33GHz w/ 4GB DDR3L-1600 +12V: 0.65A
Operating Temperature	-40°C~85°C (-40°F~185°F)
Storage Temperature	-40°C~90°C (-40°F~194°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

IB898-I25D1	Intel® Atom™ E3825 (1.33GHz) 3.5-inch Disk Size SBC w/ PCI-E GbE LAN, CRT, DisplayPort & LVDS (24-bit LVDS dual-channel), mSATA, iSMART, wide temp support
IB898-I15D1	Intel® Atom™ E3815 (1.46GHz) 3.5-inch Disk Size SBC w/ PCI-E GbE LAN, CRT, DisplayPort & LVDS (24-bit LVDS dual-channel), mSATA, iSMART 3.1, wide temp support
IB898-I45D1(MOQ)	Intel® Atom™ E3845 (1.9GHz) 3.5-inch Disk Size SBC w/ PCI-E GbE LAN, CRT, DisplayPort & LVDS (24-bit LVDS dual-channel), mSATA, iSMART, wide temp support
HSIB898-BGA-A	Heatsink for IB898
HSIB898-BGA-1	Heat spreader for IB898
IB76A-1	Cable kit w/ USB, COM, Power, SATA + Power cable

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

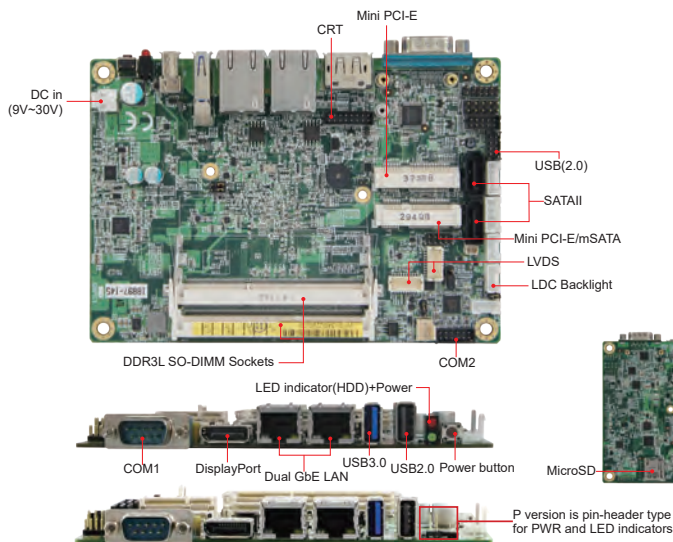
3 Motherboards

4 CPU Cards

IB897

3.5" Disk-Size SBC

Intel® Atom™ Processor E3800 Series 3.5-inch Disk-Size SBC



IB897 with Heat spreader



IB897 with Heatsink

Features

- Onboard Intel® Atom™ E3845/E3827/E3815 SoC, 1.91GHz/1.75GHz/1.46GHz
- 2x DDR3L-1333 SO-DIMM, Max. 8GB
- Supports VGA, DisplayPort and 24-bit dual-channel LVDS
- 2x Intel® I210IT PCI-E Gigabit LAN
- Watchdog timer, Digital I/O, mSATA, iSMART
- 3x USB 2.0, 1x USB 3.0, 2x COM, 2x SATA II, 1x MicroSD slot
- 2x Mini PCI-E slots (1x full-size, 1x half-size)
- Wide-range operating temperature

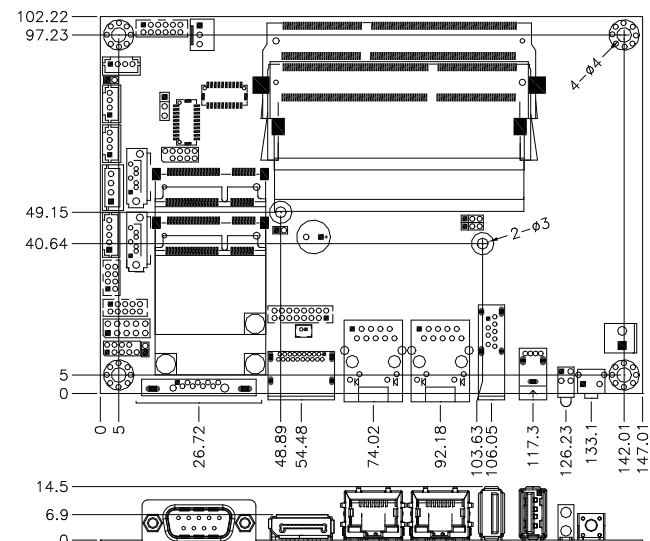
Specifications

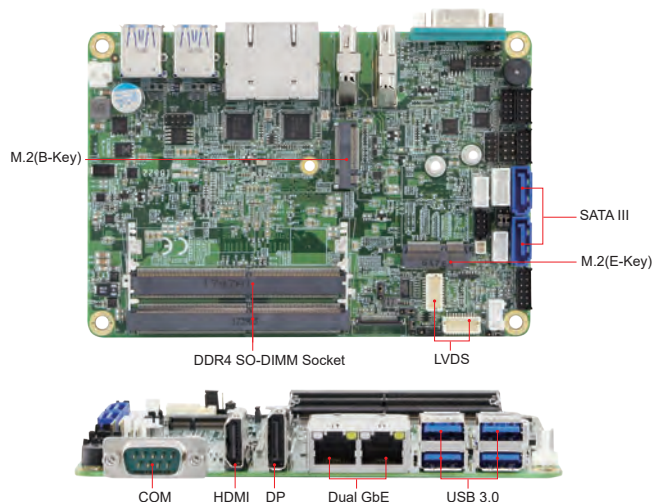
CPU	Intel® Atom™ QC E3845 (1.91GHz, 2MB cache) Intel® Atom™ DC E3827 (1.75GHz, 1MB cache) 2nd Atom™ SC E3815 (1.46GHz, 512k cache)
PCH	Integrated in Intel® Atom™ SoC
Memory Type	2x DDR3L-1333 SO-DIMM, Max 8GB (Non-ECC) 1x DDR3L-1333 SO-DIMM, (IB897-215 only)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA, 1x MicroSD
Mini Type Slots	2x Mini PCI-E (1x full-size, 1x half-size)
Graphics Controller	Intel® Atom™ SoC integrated Gen7 4EUs graphics
Video Output	Supports CRT, DisplayPort, and 24-bit dual-channel LVDS
Ethernet	2x Intel® I210IT PCI-E Gigabit LAN
I/O Chip	Nuvoton NCT5523D
Serial Port	1x RS232/422/485 (jumperless selection) 1x RS232
USB 2.0	1x USB 2.0 on board 2x USB 2.0 via pin header
USB 3.0/ 3.1	1x USB 3.0 on board
Serial ATA	2x SATA III
Audio	Intel® Atom™ SoC built-in HD Audio controller + Realtek ALC269Q HD codec w/ class-D amplifier
TPM	N/A
Others	Digital I/O, +9V~ +30V DC-In, iSMART
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® Atom™ E3845 @ 1.91GHz w/ 2x Transcend 2GB DDR3L-1600 +12V: 1.57A
Operating Temperature	-40°C~85°C (-40°F~185°F)
Storage Temperature	-40°C~90°C (-40°F~194°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

IB897-I45	Intel® Atom™ E3845(1.91GHz) 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, CRT, DisplayPort & LVDS, mSATA, iSMART
IB897-I27	Intel® Atom™ E3827(1.75GHz) 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, CRT, DisplayPort & LVDS, mSATA, iSMART
IB897-I15	Intel® Atom™ E3815(1.46GHz) 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, CRT, DisplayPort & LVDS, mSATA, iSMART
IB897-I45P	Intel® Atom™ E3845(1.91GHz) 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, CRT, DisplayPort & LVDS, mSATA, iSMART, pin-header type for power button and LED
IB897-I27P	Intel® Atom™ E3827(1.75GHz) 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, CRT, DisplayPort & LVDS, mSATA, iSMART, pin-header type for power button and LED
HSIB897-BGA	Heatsink for IB897
HSIB897-BGA-1	Heat spreader for IB897
IB76-1	Cable kit w/ USB, COM, power, SATA + power, VGA

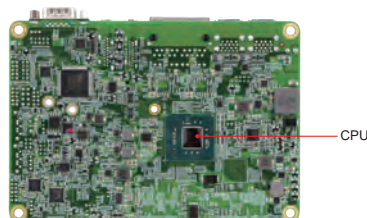
Dimensions and Drawing





Features

- Onboard Pentium® Silver / Celeron® SoC
- 2x DDR4-2400 SO-DIMM sockets, Max, 8GB
- Supports HDMI(2.0a), DisplayPort and eDP or 18/24-bit dual-channel LVDS
- 2x Intel® 211AT PCI-E Gigabit LAN
- 2x M.2 sockets (B/ E key)
- Digital I/O, iSMART, Watchdog timer



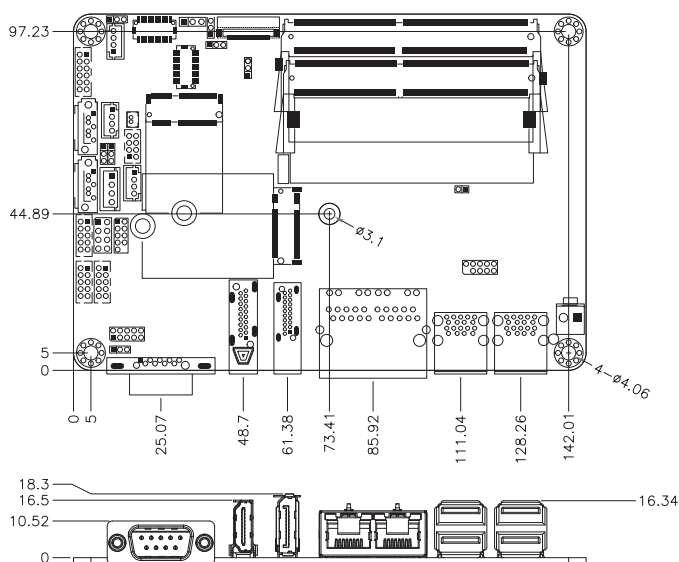
Specifications

CPU	Intel® Pentium® Silver/ Celeron® Processor
PCH	Integrated in Intel® SoC
Memory Type	2x DDR4-2400 SO-DIMM sockets, Max, 8GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Mini Type Slots	1x M.2 (B-key, type: 2242) 1x M.2 (E-key, type: 2230)
Graphics Controller	Intel® UHD Graphics 605
Video Output	Supports HDMI(2.0a), DisplayPort and eDP or 18/24-bit dual-channel LVDS
Ethernet	2x Intel® 210AT PCI-E Gigabit LAN
I/O Chip	Fintek F81964D-I 3x RS232 1x RS232/422/485 (jumperless selection)
USB 2.0	2x USB 2.0
USB 3.0/ 3.1	4x USB 3.0 (5Gb/s)
Serial ATA	2x SATA III
Audio	Intel® Pentium® / Celeron® SoC built-in HD Audio controller + Realtek ALC233-VB2-CG Codec w/ class-D speaker amplifier
TPM	N/A
Others	iSMART 3.5, Digital I/O, 12V~24V (DC-in)
Dimensions (L x W)	102mm x 147mm
Power Consumption	Intel® Celeron® J4005 2.0GHz w/ 2x 8GB DDR4-2133 + 12V: 1.58A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

IB822F-J5005	Intel® Pentium® Silver J5005 (1.5GHz~2.8GHz) 3.5-inch Disk-Size SBC w/ dual GbE LAN, HDMI(2.0a), DisplayPort, & eDP or 18/24-bit dual-channel LVDS), 2x M.2, 12V~24V DC-in
IB822-J4005	Intel® Celeron® J4005 DC SoC (2.0GHz/2.7GHz), 3.5-inch Disk-Size SBC w/ Dual GbE LAN , HDMI(2.0a), DisplayPort, eDP or LVDS(24-bit /dual-channel) 2x M.2, 12V~24V DC-in
IB822-B	Heatsink for IB822 series
IB822-1	Heatsink spreader for IB822 series
IB76A-1	Cable kit with SATA + power cable, COM, USB, Audio, power cable

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

IB899

3.5" Disk-Size SBC

Intel® Pentium® / Celeron® 3.5-inch Disk-Size SBC

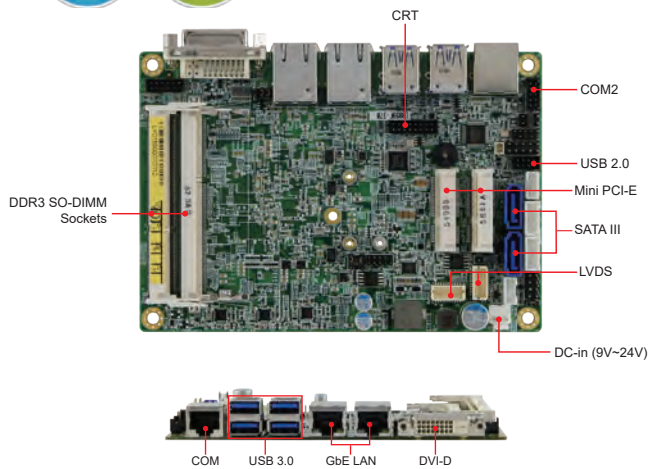


1 CPU Modules

2 Disk-Size SBCs

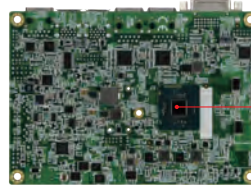
3 Motherboards

4 CPU Cards



Features

- Onboard Intel® Pentium® QC N3710, up to 2.56GHz or Celeron® DC N3010, up to 2.24GHz
- 2x DDR3L SO-DIMM sockets, Max. 8GB
- Supports VGA, DVI-D and 24-bit dual-channel LVDS
- 2x Intel® I211-AT PCI-E Gigabit LAN
- Watchdog timer, Digital I/O, mSATA, iSMART
- 4x USB 3.0, 2x USB 2.0, 2x COM, 2x SATA III
- 2x Mini PCI-E slots (1x full-size, 1x half-size)



IB899 with Heatsink

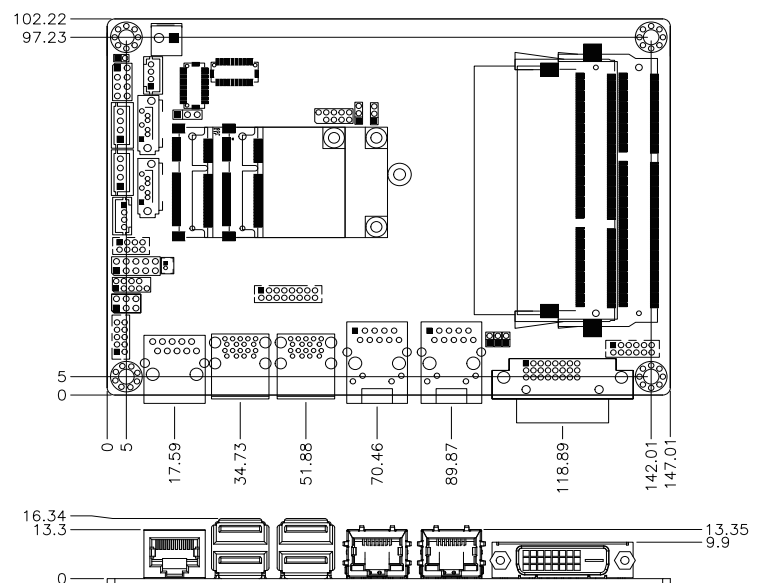
Specifications

CPU	Intel® Pentium® N3710, up to 2.56GHz or Celeron® N3010, up to 2.24GHz
PCH	N/A
Memory Type	2x DDR3L SO-DIMM sockets, Max. 8GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA
Mini Type Slots	2x Mini PCI-E (1x full-size, 1x half-size)
Graphics Controller	Intel® Pentium® SoC integrated Gen8 graphics
Video Output	Supports DVI-D, CRT 24-bit dual-channel LVDS
Ethernet	2x Intel® I211-AT PCI-E Gigabit LAN
I/O Chip	Nuvoton NCT5523D
Serial Port	1x RS232/422/485 (jumperless selection) 1x RS232
USB 2.0	2x USB 2.0 via pin header
USB 3.0/3.1	4x USB 3.0 on board
Serial ATA	2x SATA III
Audio	Intel® Pentium® SoC built-in HD audio controller + Realtek ALC662 codec
TPM	N/A
Others	Digital I/O, +9V~+24V DC-in, iSMART
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® Pentium® N3700 1.6GHz w/ 2x 4GB DDR3L-1600, +12V: 1.5A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

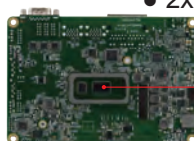
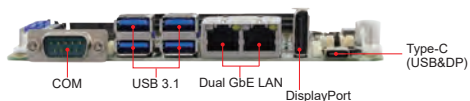
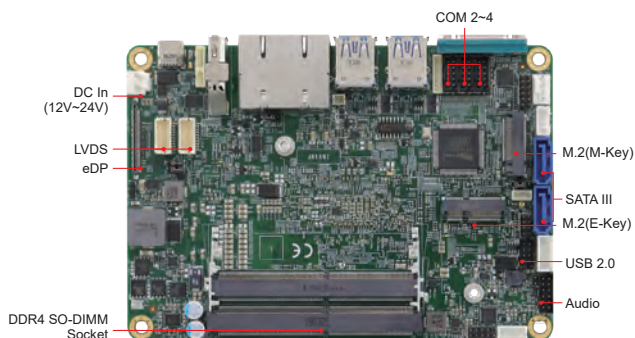
IB899F-371	Intel® Pentium® N3710(2.56GHz) on board, 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, CRT, DVI-D & LVDS (24-bit LVDS dual-channel), mSATA, iSMART,
IB899F-301	Intel® Celeron® N3010(2.24GHz) on board, 3.5-inch Disk-size SBC, w/ dual PCI-E GbE LAN, CRT, DVI-D & LVDS (24-bit LVDS dual-channel), mSATA, iSMART
HSIB899-BGA-A	Heatsink for IB899
HSIB899-BGA-1	Heat Spreader for IB899
IB81	Cable kit w/ USB, COM, power, SATA + power, VGA, audio

Dimensions and Drawing



IB919

3.5" Disk-Size SBC 8th Gen Intel® Core™ i7/i5/i3 / Celeron® 3.5" Disk-Size SBC



Specifications

CPU	8th Gen Intel® Core™ i7-8665UE (1.7GHz/4.4GHz) 8th Gen Intel® Core™ i5-8365UE (1.6GHz/4.1GHz) 8th Gen Intel® Core™ i3-8145UE (2.2GHz/3.9GHz) Intel® Celeron® 4305UE (2.0GHz)
PCH	Integrated in 8th Gen Intel® Core™ / Celeron® processor
Memory Type	DDR4-2400 SO-DIMM, Max. 32GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x M.2 (M-Key)
Mini Type Slots	1x M.2 (M2280, Support NVMe) 1x M.2 (E2230, Support CNV)
Graphics Controller	Intel® UHD Graphics 620
Video Output	2x DisplayPort (DP connector & Type C), eDP or 24-bit dual-channel LVDS
Ethernet	IB919AF series : Intel® I219LM Gigabit LAN PHY IB919EF series: Intel® I219V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2nd LAN)
I/O Chipset	Fintek F81964D-I 1x RS232/422/485 (Jumperless selection) 3x RS232
USB 2.0	2x USB2.0 (Pin-header)
USB 3.0/ 3.1	4x USB3.1 (Type A) 1x USB Type-C
Serial ATA	2x SATA III
Audio	Built-in HD with Realtek ALC269 w/ class-D amplifier
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out), +9 (Non-tolerance) ~+24V DC-in (+20%), EuP/ErP
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® Core™ i7-8665UE 1.70GHz w/ 2x DDR4-2400 16GB +12V: 2.25A Intel® Core™ i3-8145UE 2.20GHz w/2x DDR4-2400 16GB +12V: 2.24A
Operating Temperature	0°C~60°C
Storage Temperature	-20°C~80°C
Relative Humidity	90% (non-condensing@60°C)

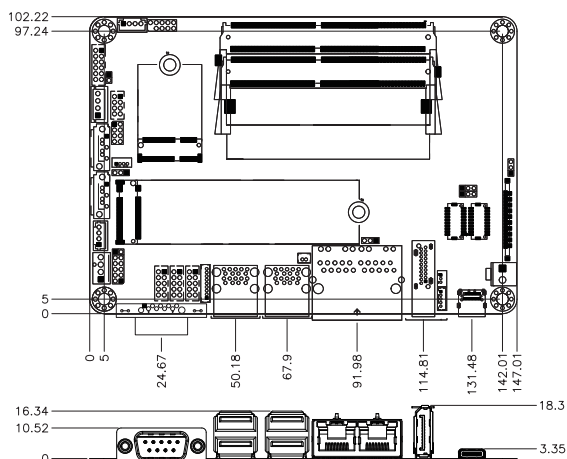
Features

- Onboard 8th Gen Intel® Core™ i7/i5/i3 / Celeron® processor
- 2x DDR4-2400 SO-DIMM, Max.32GB, Non-ECC
- 2x DisplayPort (DP connector & Type C), eDP or 24-bit dual-channel LVDS
- 2x Intel® PCI-E GbE LAN
- Watchdog timer, Digital I/O, TPM (2.0)
- 2x USB 2.0, 4x USB3.1 (Type A), 1x USB Type-C, 2x SATA III
- 2x M.2 sockets (M/E-Key)

Ordering Information

IB919AF-8665	3.5" SBC with Intel® Core i7-8665UE (1.7GHz/4.4GHz) on board, I211AT GbE LAN + I219LM GbE LAN, USB Type C (USB 3.1+DP), VGA (DisplayPort + DP or LVDS), 2x SATA III, 4x COM, 2x M.2 (M2280 & E2230), DC-in (9V~24V), Support iAMT 11.0, TPM (2.0), Optional Heatsink, w/o cable kit, (RoHS)
IB919AF-8365	3.5" Intel® Core i5-8365UE (1.6GHz/4.1GHz) on board, I211AT GbE LAN + I219LM GbE LAN, USB Type C (USB 3.1+DP), VGA (DisplayPort + DP or LVDS), 2x SATA III, 4x COM, 2x M.2 (M2280 & E2230), DC-in (9V~24V), Support iAMT 11.0, TPM (2.0), Optional Heatsink, w/o cable kit, (RoHS)
IB919EF-8145	3.5" Intel® Core i3-8145UE (2.2GHz/3.9GHz) on board, I211AT GbE LAN + I219V GbE LAN, USB Type C (USB 3.1+DP), VGA (DisplayPort + DP or LVDS), 2x SATA III, 4x COM, 2x M.2 (M2280 & E2230), DC-in (9V~24V), EuP/ErP, TPM (2.0), Optional Heatsink, w/o cable kit, (RoHS)
IB919EF-4305	3.5" Intel® Celeron® 4305UE (2.0GHz) on board, I211AT GbE LAN + I219V GbE LAN, USB Type C (USB 3.1+DP), VGA (DisplayPort + DP or LVDS), 2x SATA III, 4x COM, 2x M.2 (M2280 & E2230), DC-in (9V~24V), EuP/ErP, TPM (2.0), Optional Heatsink, w/o cable kit, (RoHS)
HSIB919-A	Heatsink for IB919
HSIB919-1	Heat spreader for IB919
IB76A-1	Cable Kit w/USB, COM, Power cable, SATA+Power cable for IB919 series

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

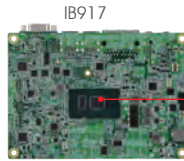
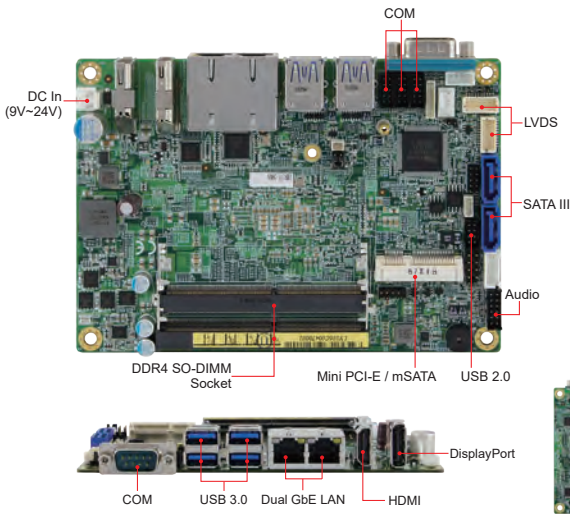
3 Motherboards

4 CPU Cards

IB917

3.5" Disk-Size SBC

7th Gen Intel® Core™ U-Series 3.5-inch Disk-Size SBC



IB917 with Heat spreader

IB917 with Heatsink

Specifications

CPU	BGA1356 for 7th Gen Intel® Core™ U-Series i7/i5/i3/ Celeron® DC processors, up to 3.4GHz
PCH	Integrated in 7th Gen Intel® Core™ U-Series processor
Memory Type	2x DDR4-2133 SO-DIMM, Max 32GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA
Mini Type Slots	1x Mini PCI-E (full-size)
Graphics Controller	7th Gen Intel® Core™ U-Series processor integrated graphics
Video Output	Supports DisplayPort, HDMI and 24-bit dual-channel LVDS
Ethernet	IB917AF series: Intel® I219LM LAN PHY IB917F series: Intel® I219V LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2nd LAN)
I/O Chip	Fintek F81846AD-I
Serial Port	1x RS-232/422/485 (jumperless selection), 3x RS232
USB 2.0	2x USB 2.0 via pin header
USB 3.0/ 3.1	4x USB 2.0 via pin header
Serial ATA	2x SATA III
Audio	7th Gen Intel® Core™ U-Series processor built-in HD audio controller + Realtek ALC662 codec
TPM	TPM (2.0)
Others	Digital I/O, +9V~ +24V DC-in, iSMART
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® i7-7600U, 2.8GHz w/ 8GB DDR4-2133+12V: 3.46A Intel® i3-7100U, 2.4GHz w/ 8GB DDR4-2133+12V: 2.68A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

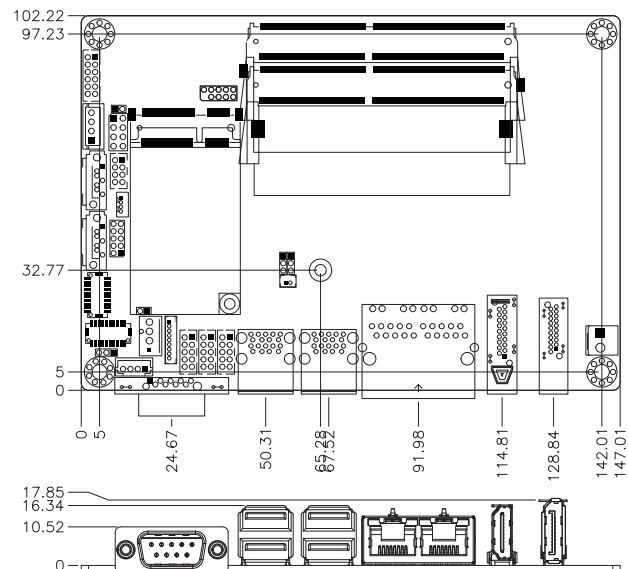
Features

- Onboard 7th Gen Intel® Core™ U-Series processor
- 2x DDR4-2133 SO-DIMM, Max 32GB, Non-ECC
- Supports DisplayPort, HDMI and 24-bit dual-channel LVDS (IB917)/eDP(IB916)
- 2x Intel® PCI-E GbE LAN
- Watchdog timer, Digital I/O, mSATA, iSMART, TPM (2.0)
- 2x USB 2.0, 4x USB 3.0, 4x COM, 2x SATA III
- 1x Mini PCI-E slot

Ordering Information

IB917AF-7600	Intel® Core™ i7-7600U(2.8GHz/3.9GHz), 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, DP & HDMI, LVDS(24-bit LVDS dual-channel), TPM (2.0), iSMART, mSATA, iAMT(1.1.6)
IB917AF-7300	Intel® Core™ i5-7300U(2.6GHz/3.5GHz), 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, DP & HDMI, LVDS (24-bit LVDS dual-channel), TPM (2.0), mSATA, iSMART
IB917F-7100	Intel® Core™ i3-7100U(2.4GHz), 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, DP & HDMI, LVDS(24-bit LVDS dual-channel), TPM (2.0), mSATA, iSMART
IB917F-3965 (MOQ)	Intel® Celeron® 3965U(2.2GHz), 3.5-inch Disk-size SBC, w/ dual PCI-E GbE LAN, DP & HDMI, LVDS(24-bit LVDS dual-channel), TPM (2.0), mSATA, iSMART
HSIB916-A	Heatsink for IB917/IB916
HSIB916-1	Heat spreader for IB917/IB916
IB76A-1	Cable kit w/ USB, COM, Power, SATA + Power cable

Dimensions and Drawing



1 CPU Modules

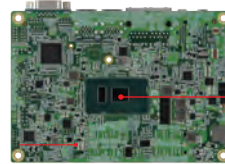
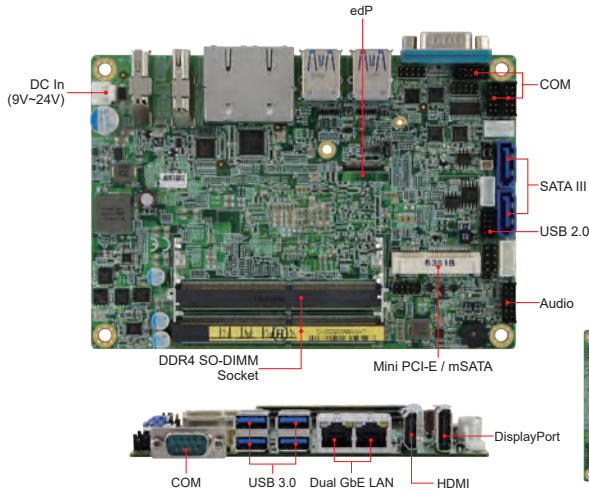
2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

IB916

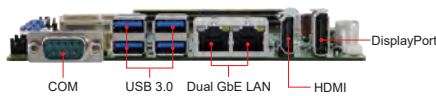
3.5" Disk-Size SBC 7th Gen Intel® Core™ U-Series 3.5-inch Disk-Size SBC



IB916 with Heat spreader



IB916 with Heatsink



Features

- Onboard 7th Gen Intel® Core™ U-Series processor
- 2x DDR4-2133 SO-DIMM, Max 32GB, Non-ECC
- Supports eDP, DisplayPort and HDMI 1.4
- 2x Intel® PCI-E GbE LAN
- Watchdog timer, Digital I/O, mSATA, iSMART, TPM (2.0)
- 2x USB 2.0, 4x USB 3.0, 4x COM, 2x SATA III
- 1x Mini PCI-E slot

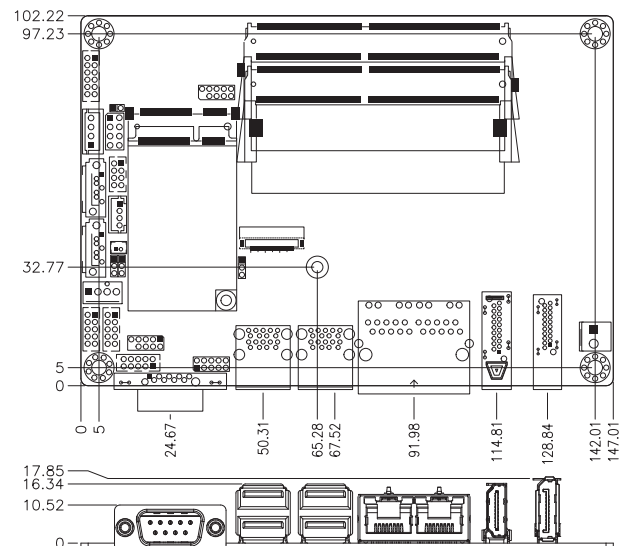
Specifications

CPU	BGA1356 for 7th Gen Intel® Core™ U-Series i7/i5/i3/ Celeron® DC processors, up to 3.4GHz
PCH	Integrated in 7th Gen Intel® Core™ U-Series processor
Memory Type	2x DDR4-2133 SO-DIMM, Max 32GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA
Mini Type Slots	1x Mini PCI-E (full-size)
Graphics Controller	7th Gen Intel® Core™ U-Series processor integrated graphics
Video Output	Supports eDP, DisplayPort and HDMI
Ethernet	IB916AF series: Intel® I219LM LAN PHY IB916F series: Intel® I219V LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2nd LAN)
I/O Chip	Fintek F81846AD-I
Serial Port	1x RS232/422/485 (jumperless selection), 3x RS232
USB 2.0	2x USB 2.0 via pin header
USB 3.0/ 3.1	4x USB 2.0 via pin header
Serial ATA	2x SATA III
Audio	7th Gen Intel® Core™ U-Series processor built-in HD audio controller + Realtek ALC662 codec
TPM	TPM (2.0)
Others	Digital I/O, +9V~ +24V DC-in, iSMART
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® i5-7300U, 2.6GHz w/ 8GB DDR4-2133, +12V: 2.06A, Intel® i3-7100U, 2.4GHz w/ 8GB DDR4-2133, +12V: 2.24A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

IB916AF-7600	Intel® Core™ i7-7600U(2.8GHz/3.9GHz), 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, eDP, DP & HDMI, TPM (2.0), iSMART, mSATA, iAMT(11.6)
IB916AF-7300	Intel® Core™ i5-7300U(2.6GHz/3.5GHz), 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, eDP, DP & HDMI, TPM (2.0), mSATA, iSMART
IB916F-7100	Intel® Core™ i3-7100U(2.4GHz), 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, eDP, DP & HDMI, TPM (2.0), mSATA, iSMART
IB916F-3965 (MOQ)	Intel® Celeron® 3965U(2.2GHz), 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, eDP, DP & HDMI, TPM (2.0), mSATA, iSMART
HSIB916-A	Heatsink for IB917/IB916
HSIB916-1	Heat spreader for IB917/IB916
IB76A-1	Cable kit w/ USB, COM, Power, SATA + Power cable

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

IB915

3.5" Disk-Size SBC

6th Gen Intel® Core™ U-Series 3.5-inch Disk-Size SBC

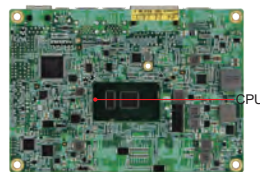
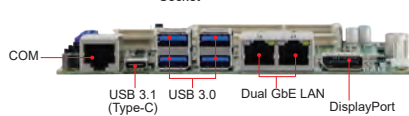
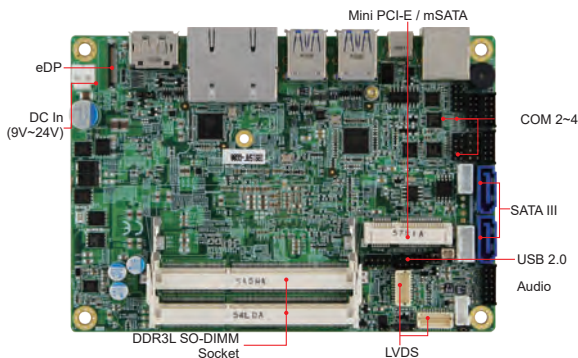


1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards



IB915 with Heat spreader



IB915 with Heatsink

Specifications

CPU	BGA1356 for 6th Gen Intel® Core™ U-Series i7/i5/i3/ Celeron® DC processors, up to 3.4GHz
PCH	Integrated in 6th Gen Intel® Core™ U-Series processor
Memory Type	2x DDR3L-1600 SO-DIMM, Max 16GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA
Mini Type Slots	1x Mini PCI-E (full-size)
Graphics Controller	6th Gen Intel® Core™ U-Series processor integrated graphics
Video Output	Supports eDP, DisplayPort and 24-bit dual-channel LVDS
Ethernet	IB915AF: Intel® I219LM LAN PHY IB915F: Intel® I219V LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2nd LAN)
I/O Chip	Fintek F81846AD-1
Serial Port	1x RS232/422/485 (jumperless selection), 3x RS232
USB 2.0	2x USB2.0 on via pin header
USB 3.0/ 3.1	1x USB 3.1 (Type-C) 4x USB3.0 on board
Serial ATA	2x SATA III
Audio	6th Gen Intel® Core™ U-Series processor built-in HD audio controller + Realtek ALC662 codec
TPM	N/A
Others	Digital I/O, +9V~ +24V DC-in, iSMART
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Max. Power Requirement	Intel® Core™ i3-6100U 2.3GHz w/ 2x DDR3L-1600 4GB, +12V: 2.36A Intel® Core™ i7-6600U 2.6GHz w/ 2x DDR3L-1600 4GB, +12V: 2.27A
Power Consumption	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

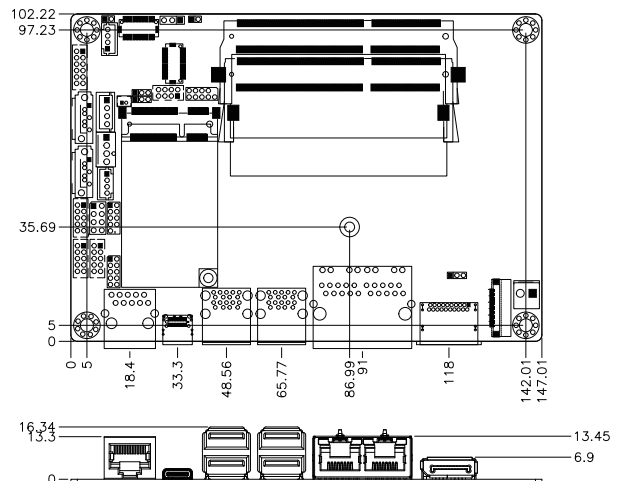
Features

- Onboard 6th Gen Intel® Core™ U-Series processor
- 2x DDR3L-1600 SO-DIMM, Max. 16GB
- Supports eDP, DP and 24bit dual-channel LVDS
- 2x Intel® PCI-E Gigabit LAN
- Watchdog timer, Digital I/O, mSATA, iSMART
- 2x USB 2.0, 4x USB 3.0, 1x USB 3.1 (Type-C), 4x COM, 2x SATA III
- 1x Mini PCI-E slot

Ordering Information

IB915AF-6600	Intel® Core™ i7-6600U(2.6GHz/3.4GHz) 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, eDP, DP & LVDS (24-bit LVDS dual-channel), mSATA, iSMART, iAMT(11.0)
IB915AF-6300	Intel® Core™ i5-6300U(2.4GHz/3GHz) 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, eDP, DP & LVDS (24-bit LVDS dual-channel), mSATA, iSMART, iAMT(11.0)
IB915F-6100	Intel® Core™ i3-6100U(2.3GHz) 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, eDP, DP & LVDS (24-bit LVDS dual-channel), mSATA, iSMART
IB915F-3955 (MOQ)	Intel® Celeron® 3955U (2GHz) 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, eDP, DP & LVDS (24-bit LVDS dual-channel), mSATA, iSMART
HSIB915-BGA-A	Heatsink for IB915
HSIB915-BGA-1	Heat spreader for IB915
IB76A-1	Cable kit w/ USB, COM, Power, SATA + Power cable

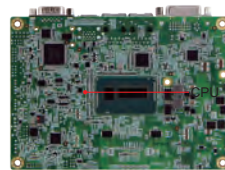
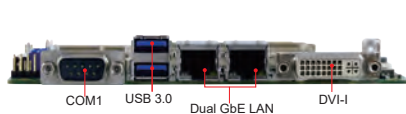
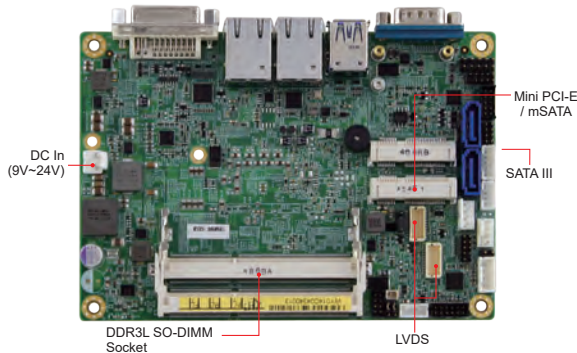
Dimensions and Drawing



IB909

3.5" Disk-Size SBC

5th Gen Intel® Core™ U-Series 3.5-inch Disk-Size SBC



IB909 with Heat spreader



IB909 with Heatsink

Specifications

CPU	Intel® Core™ i7-5650U processor (2.2GHz) Intel® Core™ i5-5350U processor (1.8GHz) Intel® Core™ i3-5010U processor (2.1GHz)
PCH	Integrated in Intel® 5th Gen Core™ i U-Series processor
Memory Type	2x DDR3L-1600 SO-DIMM, Max 16GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	2x mSATA
Mini Type Slots	2x Mini PCI-E (1x full-size, 1x half-size)
Graphics Controller	5th Gen Intel® Core™ i U-Series processor integrated graphics
Video Output	Support DVI-I and 24-bit dual-channel LVDS
Ethernet	IB909AF: Intel® I218LM LAN PHY IB909F: Intel® I218V LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2nd LAN)
I/O Chip	Nuvoton NCT6102D
Serial Port	1x RS232/422/485 (jumperless selection) 1x RS232
USB 2.0	2x USB 2.0 on via pin header
USB 3.0/ 3.1	2x USB 3.0 on board
Serial ATA	2x SATA III
Audio	5th Gen Intel® Core™ i U-Series processor built-in HD audio controller + Realtek ALC269Q-VC3 w/ class-D speaker amplifier
TPM	N/A
Others	Digital I/O, +9V~ +24V DC-in, iSMART
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® Core™ i5-5350U 1.80GHz w/ 8GB DDR3L-1600, +12V: 3.84A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

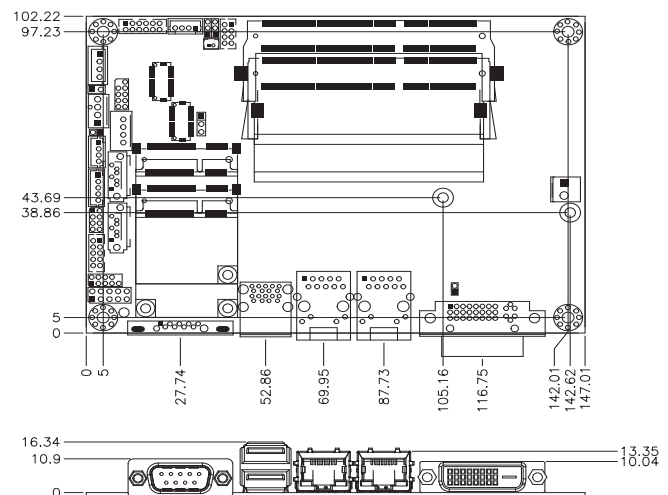
Features

- Onboard 5th Gen Intel® Core™ U-Series processor
- 2x DDR3L-1600 SO-DIMM, Max. 16GB
- Supports DVI-I and 24bit dual-channel LVDS
- 2x Intel® PCI-E GbE LAN
- Watchdog timer, Digital I/O, mSATA, iSMART
- 2x USB 3.0, 2x USB 2.0, 2x COM, 2x SATA III
- 2x Mini PCI-E slot, mSATA

Ordering Information

IB909AF-5650	Intel® Core™ i7-5650U(2.2GHz) 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, DVI-I & LVDS(24-bit LVDS dual-channel), mSATA, iSMART, iAMT(10.0)
IB909AF-5350	Intel® Core™ i5-5350U(1.8GHz) 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, DVI-I & LVDS(24-bit LVDS dual-channel), mSATA, iSMART, iAMT(10.0)
IB909F-5010	Intel® Core™ i3-5010U(2.1GHz)3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, DVI-I & LVDS(24-bit LVDS dual-channel), mSATA, iSMART
HSIB909	Heatsink for IB909
HSIB908-BGA-2	Heat Spreader for IB909/IB908
IB75	Cable Kit w/ SATA+power cable, USB, COM, power cable

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

IB908

3.5" Disk-Size SBC 4th Gen Intel® Core™ U-Series 3.5" Disk-Size SBC

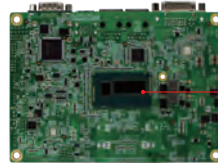
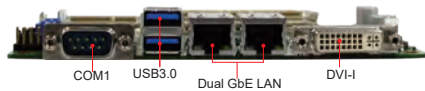
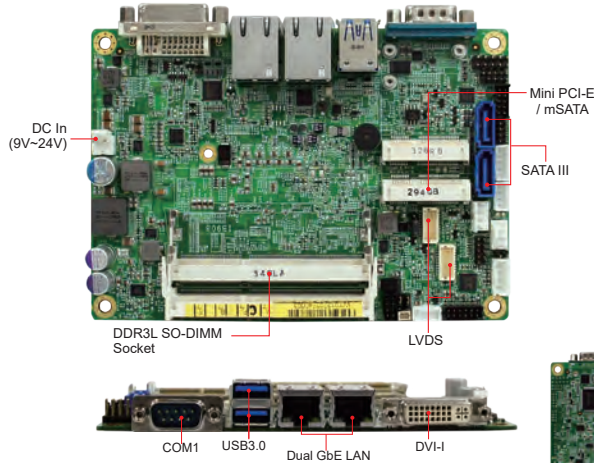


1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards



IB908 with Heat spreader



IB908 with Heatsink

Features

- Onboard 4th Gen Intel® Core™ U-Series processor
- 2x DDR3L-1600 SO-DIMM, Max 16GB
- Supports DVI-I and 24bit dual-channel LVDS
- 2x Intel® PCI-E GbE LAN
- Watchdog timer, Digital I/O, iSMART, iAMT(9.5)
- 2x USB 3.0, 2x USB 2.0, 2x COM, 2x SATA III
- 2x Mini PCI-E slot, mSATA

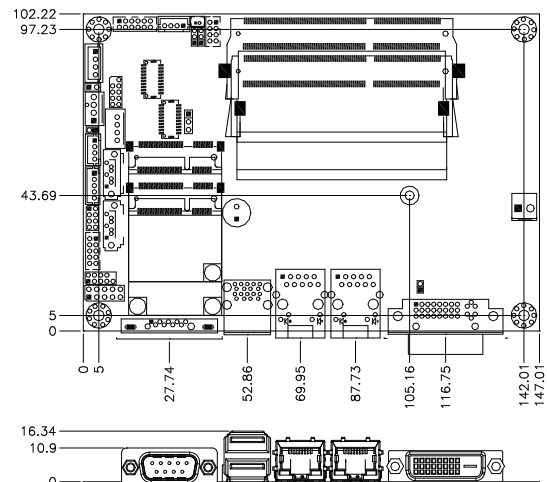
Specifications

CPU	Intel® Core™ i7-4650U processor (1.7GHz) Intel® Core™ i5-4300U processor (1.9GHz) Intel® Celeron® 2980U processor (1.6GHz)
PCH	Integrated in 4th Gen Intel® Core™ i U-Series processor
Memory Type	2x DDR3L-1600 SO-DIMM, Max 16GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	2x mSATA
Mini Type Slots	2x Mini PCI-E (1x full-size, 1x half-size)
Graphics Controller	4th Gen Intel® Core™ i U-Series processor integrated graphics
Video Output	Supports DVI-I and 24-bit dual-channel LVDS
Ethernet	IB908AF: Intel® I218LM LAN PHY IB908F: Intel® I218V LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2nd LAN)
I/O Chip	Nuvoton NCT6102D
Serial Port	1x RS232/422/485 (jumperless selection) 1x RS232
USB 2.0	2x USB2.0 via pin header
USB 3.0/ 3.1	2x USB3.0 on board
Serial ATA	2x SATA III
Audio	4th Gen Intel® Core™ i U-series processor built-in HD audio controller w/ Realtek ALC269Q-VC2-GR codec w/ class-D speaker amplifier
TPM	N/A
Others	Digital I/O, +9V~ +24V DC-In, iSMART
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® Core™ i7-4650U @1.70 GHz w/ 2x 2GB DDR3L-1600 +12V: 2.75A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

IB908AF-4650	Intel® Core™ i7-4650U(1.7GHz) 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, DVI-I & LVDS(24-bit LVDS dual-channel), mSATA, iSMART, iAMT (9.5)
IB908AF-4300	Intel® Core™ i5-4300U(1.9GHz) 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, DVI-I & LVDS(24-bit LVDS dual-channel), mSATA, iSMART, iAMT (9.5)
IB908F-2980 (MOQ)	Intel® Celeron® 2980U(1.6GHz) 3.5-inch Disk-Size SBC w/ dual PCI-E GbE LAN, DVI-I & LVDS (24-bit LVDS dual-channel), mSATA, iSMART
HSIB908-BGA	Heatsink for IB909/IB908
HSIB908-BGA-2	Heat Spreader for IB909/IB908
IB75	Cable kit w/ SATA+power cable, USB, COM, power cable

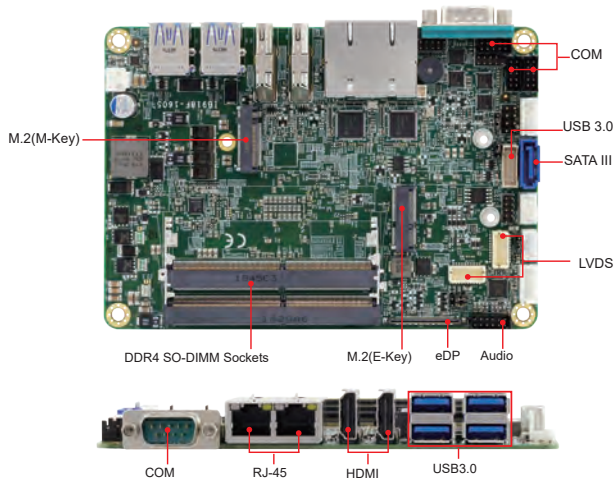
Dimensions and Drawing



IB918

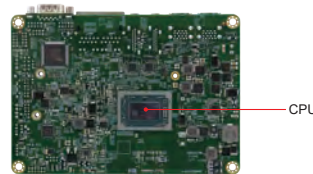
3.5" Disk-Size SBC

AMD Ryzen™ Embedded V1000/R1000 SoC 3.5-inch Disk-Size SBC



Features

- AMD Ryzen™ Embedded V1000/R1000 SoC on board
- 2x DDR4 SO-DIMM, Max. 32GB
- 2x PCI-E Gigabit LAN
- 2x HDMI, 1x eDP, 1x 24-bit LVDS dual-channel
- 1x USB2.0, 4x USB3.1, 1x SATA III, 4x COM
- 2x M.2 sockets (M/ E key)



IB918 heatsink with fan

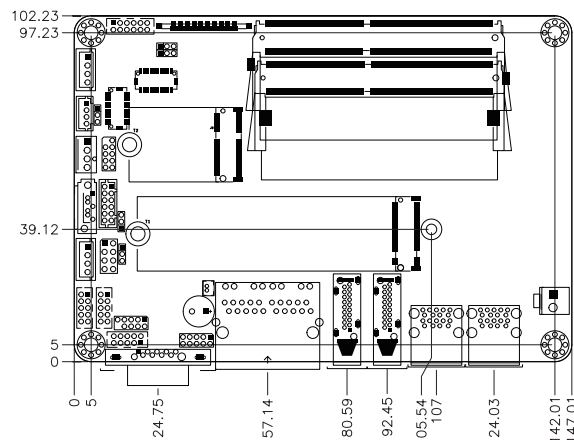
Specifications

CPU	AMD Ryzen™ Embedded V1000/R1000 SoC on board
PCH	N/A
Memory Type	DDR4-2400 SO-DIMM, Max. 32GB, supports ECC
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x M.2 (M-key)
Mini Type Slots	1x M.2 (M-key, type:2280, NVMe) 1x M.2 (E-key, type:2230, CNVI)
Graphics Controller	AMD Raden™ Vega integrated
Video Output	2x HDMI(2.0a), 1x 24-bit dual channel LVDS & eDP
Ethernet	2x Intel® I211AT PCI-E Gigabit LAN
I/O Chip	Fintek F81964D-I
Serial Port	1x RS232/422/485 (Jumperless selection) 3x RS232
USB 2.0	1x USB 2.0 on board
USB 3.0/ 3.1	4x USB 3.1 on board
Serial ATA	1x SATA III
Audio	Built-in audio w/ Realtek ALC269Q-VC3-GR, w/ class-D amplifier
TPM	TPM (2.0)
Others	Digital I/O(4-in/ 4-out), EuP/ErP, +12V~+24V DC-in (+/-10%)
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	AMD Ryzen™ Embedded V1 605B 2.00GHz w/ 2x 16GB DDR4-2400 +12V: 2.55A AMD Ryzen™ Embedded R1 606G 2.6GHz w/ 2x 16GB DDR4-2400 +12V: 2.34A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing@60°C)

Ordering Information

IB918F-1605	AMD Ryzen™ V1 605B QC APU (2.0GHz~3.6GHz) on board 3.5-inch Disk-Size w/ dual LAN, 2x HDMI, eDP & LVDS (24-bit dual-channel), EuP/ErP, 12V~24V DC-in
IB918F-1202	AMD Ryzen™ V1 202B DC APU (2.3GHz~3.3GHz) on board 3.5-inch Disk-Size w/ dual LAN, 2x HDMI, eDP & LVDS (24-bit dual-channel), EuP/ErP, 12V~24V DC-in
IB918F-1606G	AMD Ryzen™ R1 606G DC (2.6GHz~3.5GHz) on board 3.5-inch Disk Size w/ dual GbE LAN, 2x HDMI (2.0a), eDP, EuP/Erp, 12V~24V DC-in
IB918F-1505G	AMD Ryzen™ R1 505G DC (2.4GHz~3.3GHz) on board 3.5-inch Disk Size w/ dual GbE LAN, 2x HDMI (2.0a), eDP, EuP/Erp, 12V~24V DC-in
HSIB918-A	Heat sink with fan for IB918
HSIB918-1	Heat spreader for IB918
IB90	Cable kit w/ PW87,PK1H,SATA-53A,USB-168 for V1000 series
IB91	Cable kit w/ PW87,PK1H,SATA-53A,USB-172 for R1000 series

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

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IB903

3.5" Disk-Size SBC

AMD Embedded G-Series 3.5-inch Disk-Size SBC

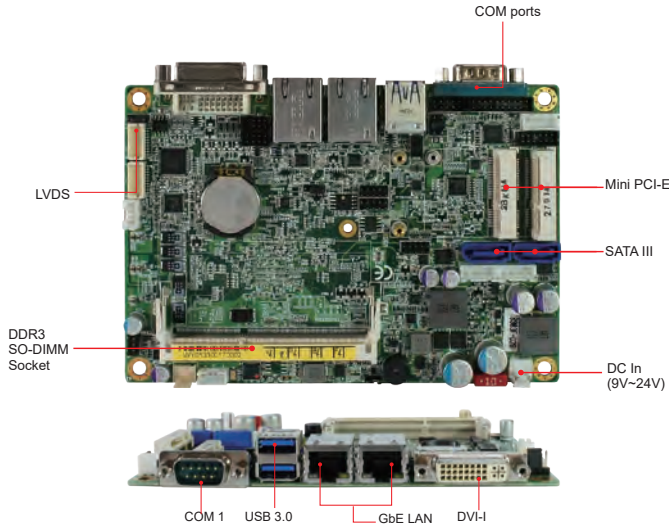


1 CPU Modules

2 Disk-Size SBCs

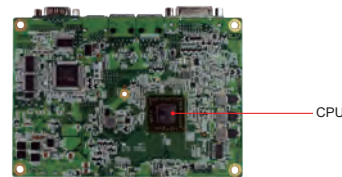
3 Motherboards

4 CPU Cards



Features

- Onboard AMD Embedded G-Series processor
- 1x DDR3/ DDR3L SO-DIMM, Max. 8GB
- Supports DVI-I and 24-bit dual-channel LVDS
- 2x Realtek RTL8111G-CG PCI-E Gigabit LAN
- Watchdog timer, Digital I/O, mSATA, iSMART
- 2x USB3.0, 4x USB 2.0, 4x COM, 2x SATA III



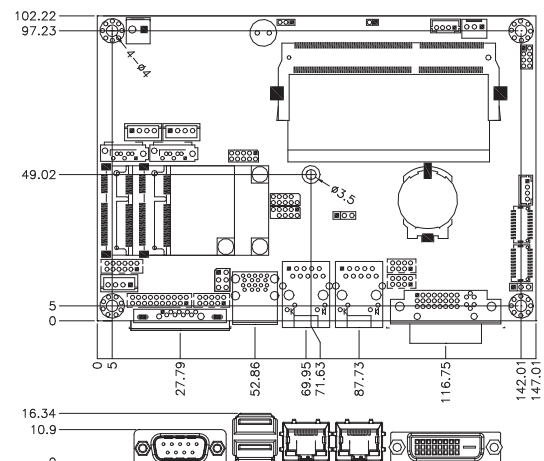
Specifications

CPU	IB903FC-Q24: GX-424CC SoC (2.4GHz, 2MB cache) IB903FC-12: GX-212JC SoC (1.2GHz, 1MB cache) IB903F-Q2G: GX-420CA SoC (2.0GHz, 2MB cache) IB903F-Q15: GX-415GA SoC (1.5GHz, 2MB cache) IB903F-16: GX-217GA SoC (1.65GHz, 1MB cache)
PCH	Integrated in APU
Memory Type	1x DDR3/ DDR3L SO-DIMM, Max. 8GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA (Thru Mini PCI-E)
Mini Type Slots	2x Mini PCI-E
Graphics Controller	AMD Embedded G-Series SoC built-in GPU (AMD Radeon™ HD8000 series)
Video Output	Supports DVI-I and 24-bit dual-channel LVDS
Ethernet	2x Realtek RTL8111G-CG PCI-E Gigabit LAN
Connector	2x RJ-45 on board
I/O Chip	Fintek F81846AD-I
Serial Port	1x RS232/422/485 (jumperless selection), 3x RS232
USB 2.0	4x USB 2.0 via pin header
USB 3.0/ 3.1	2x USB 3.0 on board
Serial ATA	2x SATA III
Audio	AMD Embedded G-Series SoC built-in audio controller w/ Realtek ALC269Q-VC2-GR HD codec w/ class-D speaker amplifier
TPM	N/A
Others	Digital I/O, +9V~+24V DC In, iSMART
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	AMD GX-420CA SoC with Radeon™ HD Graphics 2.00GHz w/ Unigen 2GB DDR3-1333 +12V: 2.91A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

IB903FC-Q24	AMD Embedded G-Series GX-424CC SoC (2.4GHz) 3.5-inch Disk-Size SBC w/ DVI-I & LVDS (24-bit dual-channel), dual PCI-E Gigabit LAN, mSATA, iSMART
IB903FC-12	AMD Embedded G-Series GX-212JC SoC (1.2GHz) 3.5-inch Disk-Size SBC w/ DVI-I & LVDS (24-bit dual-channel), dual PCI-E Gigabit LAN, mSATA, iSMART
IB903F-Q2G	AMD Embedded G-Series GX-420CA SoC (2.0GHz) 3.5-inch Disk-Size SBC w/ DVI-I & LVDS (24-bit dual-channel), dual PCI-E Gigabit LAN, mSATA, iSMART
IB903F-Q15	AMD Embedded G-Series GX-415GA SoC (1.5GHz) 3.5-inch Disk-Size SBC w/ DVI-I & LVDS (24-bit dual-channel), dual PCI-E Gigabit LAN, mSATA, iSMART
IB903F-16	AMD Embedded G-Series GX-217GA SoC (1.65GHz) 3.5-inch Disk-Size SBC w/ DVI-I & LVDS (24-bit dual-channel), dual PCI-E Gigabit LAN, mSATA, iSMART
IB68A	Cable Kit for IB903F series, w/ SATA + power cable, COM, USB, power cable
HSIB903-BGA	Heatsink w/ fan for IB903F series
HSIB903-BGA-1	Heat spreader for IB903F series

Dimensions and Drawing



Comparison Table

ATX Motherboard

Models	MB980	MB990
Form Factor	ATX	ATX
CPU Socket	LGA1150	LGA1151
CPU	4th Gen Intel® Core™ i7/i5/i3 / Pentium® / Celeron®	7th/6th Gen Intel® Core™ i7/i5/i3 / Pentium® / Celeron® DT CPU
CPU Max. Frequency	Up to 3.10GHz	Up to 4.0GHz
PCH	Intel® Q87 PCH	Intel® Q170 PCH
Memory Types	4x DDR3 DIMM	4x DDR4 DIMM
Max. Memory Size	32GB	64GB
BIOS	AMI	AMI
Graphics Controller	Intel® Core™ i integrated graphics	Intel® Core™ i integrated graphics
Video Output	DVI-I/ DVI-D/ DisplayPort on board	HDMI(2.0)/ DVI-D/ DisplayPort on board
Ethernet	Intel® I217LM Gigabit LAN PHY, Intel® I211AT PCI-E Gigabit LAN	Intel® I219LM Gigabit LAN PHY, Intel® I211AT PCI-E Gigabit LAN
Audio	Built-in ALC892 HD audio codec	Built-in ALC892 HD audio codec
SATA	6x SATA III ports	6x SATA III ports
I/O Chip	F81866AD-I	F81866AD-I
Parallel Port	N/A	N/A
Serial Port	5x RS232 1x RS232/422/485 (jumperless selection)	5x RS232 1x RS232/422/485 (jumperless selection)
USB 2.0	10x USB 2.0	4x USB 2.0
USB 3.0/ 3.1	4x USB 3.0	6x USB 3.0
TPM	1.2	1.2
KB / MS	N/A	N/A
Hardware Monitor	Yes	Yes
Storage Device Interface	N/A	N/A
Watchdog Timer	256 levels	256 levels
Digital I/O	4-in/4-out	4-in/4-out
Expansion Slots	1x PCI-E (x16), 1x PCI-E (x4) 1x PCI-E (x1), 4x PCI	1x PCI-E (x16), 1x PCI-E (x8) 1x PCI-E (x4), 1x PCI-E (x1) 3x PCI
Mini Type Slots	N/A	1x Mini PCI-E
Power input	ATX type	ATX type
Power Consumption	Intel® Core™ i7-4770 3.10GHz w/ 2x 4GB DDR3-1333 +3.3V: 0.72A; +5V: 1.07A +5VSB: 0.08A; +12V: 4.98A	Intel® Core™ i7-6700 3.4GHz w/ 4x 4GB DDR4-2133 +12V: 7.12A; +5V: 1.99A +3.3V: 0.43A; +5VSB: 0.15A
Dimensions (L x W)	305mmx 244mm	305mmx 244mm
Extra Features	Built-in iAMT (9.0), LAN Wakeup, iSMART, vPro, RAID	Built-in iAMT (11.0), LAN Wakeup, iSMART, vPro, RAID
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1 CPU Modules

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Comparison Table

ATX Motherboard

Models	MB991	MB995	MB997
Form Factor	Micro ATX	ATX	ATX
CPU Socket	LGA1151	LGA1151	LGA1151
CPU	7th/6th Gen Intel®Xeon® / Core™ i7/i5/i3/ Pentium® / Celeron® DT CPU	8th Gen Intel®Xeon® E/ Core™ i7/i5/i3 DT processors	9th Gen Intel® Core™ i7/i5/i3/ Pentium® / Celeron® DT CPU
CPU Max. Frequency	Up to 4.0GHz	Up to 4.7GHz	Up to
PCH	Intel® C236 / Q170 PCH	Intel® C246 / Q370 PCH	Intel® C246 / Q370 / H310 PCH
Memory Types	2x DDR4 DIMM	4x DDR4 DIMM	4x DDR4 DIMM
Max. Memory Size	64GB	64GB	64GB
BIOS	AMI	AMI	AMI
Graphics Controller	Intel® Core™ i integrated graphics	8th Gen Intel® Xeon® E/Core™ i7/i5/i3 processors integrated	9th Gen Intel® Xeon® E/Core™ i7/i5/i3 processors integrated
Video Output	2x HDMI	HDMI(2.0a)/ DisplayPort/ DVI-D on board	HDMI (2.0a)/ DisplayPort/ DVI-D on board
Ethernet	Intel® I219LM Gigabit LAN PHY, Intel® I211AT PCI-E Gigabit LAN	Intel I219LM GbE PHY MB995VF: Intel® I210AT GbE MB995VF: Intel® I211AT GbE	LAN 1: Intel® I219V GbE PHY for MB997EF; Intel® I219LM GbE PHY for MB997AF/ MB997AF-10G LAN 2: Intel® I210AT GbE (MB997-10G), Intel® I211AT GbE (MB997VF/ EF) LAN3: Intel® X550-AT for MB997AF-10G only
Audio	Built-in ALC662 HD audio codec	Built-in ALC888S-VD2-GR codec	Built-in ALC662-VD0-GR audio codec
SATA	6x SATA III ports	6x SATA III ports (MB995VF-C246) 4x SATA III ports (MB995VF)	4x SATA III ports
I/O Chip	F81846AD-1	F81966D-I	NC T668D-T
Parallel Port	N/A	N/A	N/A
Serial Port	6x RS232 2x RS232/422/485 (jumperless selection)	4x RS232 2x RS232/422/485 (jumperless selection)	4x RS232 2x RS232/422/485 (jumperless selection)
USB 2.0	4x USB 2.0	N/A	N/A
USB 3.0/ 3.1	6x USB 3.0	4x USB 3.1 5x USB 3.0	4x USB 3.1 Gen2 (10Gbps) 5x USB 3.1 Gen1 (5Gbps)
TPM	2.0	2.0	2.0
KB / MS	N/A	box header	N/A
Hardware Monitor	Yes	Yes	Yes
Storage Device Interface	NVMe	NVMe	NVMe
Watchdog Timer	256 levels	256 levels	256 levels
Digital I/O	4-in/4-out	4-in/4-out	4-in/4-out
Expansion Slots	1x PCI-E (x16) 1x PCI-E (x8) 2x PCI-E (x4)	1x PCI-E (x16), 1x PCI-E (x4), 1x PCI-E (x1), 3x PCI,	1x PCI-E (x16), 1x PCI-E (x4), 1x PCI-E (x1), 2x PCI
Mini Type Slots	1x Mini PCI-E 1x M.2 (2280)(M-key)	1x MiniPCI-E, 2x M.2 (E/ M-key)	1x MiniPCI-E, 2x M.2 (E/ M-key)
Power input	ATX type	ATX type	ATX type
Power Consumption	Intel® Core™ i7-6700, 3.4GHz, w/ 4x 8GB DDR4-2133 12V: 7.1A +5V: 1.81A +5VSB: 0.11A +3.3V: 0.70A	Intel® Core™ i7-8700 3.4GHz w/ 4x 4GB DDR4-2400 +12V: 5.56A +5V: 1.65A +5VSB: 0.25A +3.3V: 0.65A	TBD
Dimensions (L x W)	244mmx 244mm	305mmx 244mm	305mmx 244mm
Extra Features	Built-in iAMT (11.6), LAN Wakeup, TPM (2.0), iSMART, RAID	Built-in iAMT (11.6), LAN Wakeup, iSMART, TPM (2.0), vPro, RAID	Built-in iAMT (11.6), LAN Wakeup, iSMART, TPM (2.0), RAID
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1 CPU Modules

2 Disk-Size SBGs

3 Motherboards

4 CPU Cards

Recommended 9th/8th Gen Intel® Desktop Processors List

Processor	Base ~ Turbo	TDP	Compatible IBASE M/B, Mini-ITX, CPU Card Models	
Xeon® E-2278GEL	2.00 GHz ~ 3.90 GHz	35W	MB995/ MI998/ IB995/MB997	
Xeon® E-2278GE	3.30 GHz~ 4.7GHz	80W	MI998/ IB995/MB997	V
Xeon® E-2226GE	3.40 GHz ~ 4.6GHz	80W	MI998/ IB995/MB997	V
i9-9900	3.10 GHz ~ 5.00 GHz	65W	MB995/ MI998/ IB995/ MB997	
i9-9900T	2.10 GHz ~ 4.40 GHz	35W	MB995/ MI998/ IB995/ MB997	
i7-9700E	2.60 GHz ~ 4.40 GHz	65W	MB995/ MI998/ IB995/ MB997	V
i7-9700TE	1.80 GHz ~ 3.80GHz	35W	MB995/ MI998/ IB995/ MB997	V
i5-9500E	3.00 GHz ~ 4.20GHz	65W	MB995/ MI998/ IB995/ MB997	V
i5-9500TE	2.20 GHz ~ 3.60 GHz	35W	MB995/ MI998/ IB995/ MB997	V
i3-9100E	3.10 GHz ~ 3.70 GHz	65W	MB995/ MI998/ IB995/ MB997	V
i3-9100TE	2.20 GHz ~ 3.20 GHz	35W	MB995/ MI998/ IB995/ MB997	V
i7-8700T	2.40 GHz ~ 4.00 GHz	35W	MB995/ MI998/ IB995/ MB997	V
i7-8700	3.20 GHz ~ 4.60 GHz	65W	MB995/ MI998/ IB995/ MB997	V
i5-8500	3.00 GHz ~ 4.10 GHz	65W	MB995/ MI998/ IB995/ MB997	V
i5-8500T	2.10 GHz ~ 3.5 GHz	35W	MB995/ MI998/ IB995/ MB997	V
i3-8100	3.60 GHz	65W	MB995/ MI998/ IB995/ MB997	V
i3-8100T	3.10 GHz	35W	MB995/ MI998/ IB995/ MB997	V
G4900	3.10GHz	54W	MB995/ MI998/ IB995/ MB997	V
G4900T	2.90GHz	35W	MB995/ MI998/ IB995/ MB997	V
G5400	3.70GHz	58W	MB995/ MI998/ IB995/ MB997	V
G5400T	3.10GHz	35W	MB995/ MI998/ IB995/ MB997	V

1 CPU Modules

2 Disk-Size SBCs

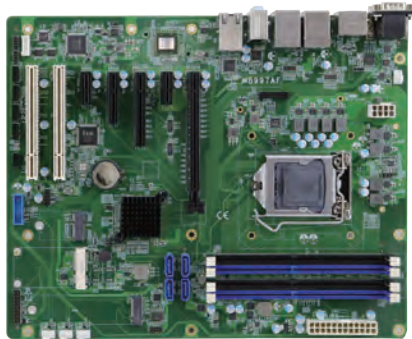
3 Motherboards

4 CPU Cards

MB997

ATX Motherboard 9th Gen Intel® Xeon® E / Core™ i7/i5/i3 ATX Motherboard w/ Intel® C246/ Q370 PCH

NEW



1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

Features

- 9th Gen Intel® Xeon® E/ Core™ i7/i5/i3 processors
- 4x DDR4 DIMM, Max. 64GB
- Intel® processor integrated graphics supports HDMI (2.0a), DVI-D, and DisplayPort
- Dual Intel® Gigabit LAN, and Intel® 10GbE LAN
- 4x USB3.1, 2x USB 2.0, 2x SATA 3.0, 6x COM
- 1x PCI-E (x16), 1x PCI-E(x8)(Gen3.0), 1x PCI-E(x4), 2x PCI-E(X1), 2x PCI
- Watchdog timer, Digital I/O, iAMT (11.6), TPM(2.0), iSMART (4.0)

Specifications

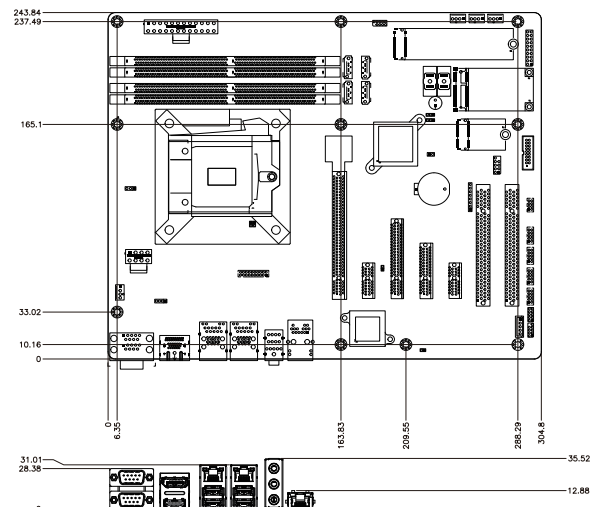
CPU Socket	LGA1151
CPU	9th Gen Intel® Xeon® E/ Core™ i7/i5/i3 HC/QC/DC processors, up to
PCH	Intel® C246 PCH: MB997AF-10G Intel® Q370 PCH: MB997AF Intel® H310 PCH: MB997EF
Memory Types	4x DDR4-2666 / 2400 MHz, Max. 64GB (Supports ECC by CPU SKUs)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	NVMe
Expansion Slots	1x PCI-E (X16) (GEN3.0), 1x PCI-E (X8)(Gen3.0), 2x PCI-E (X1), 2x PCI
Mini Type Slots	1x MiniPCI-E, 1x M.2 (M-Key, type:M2280), 1x M.2 (E-Key, type: E2230)
Graphics Controller	9th Gen Core i7/i5/i3 processors integrated
Video Output	1x HDMI2.0a, 1x DVI-D, 1x DisplayPort (1.2)
Ethernet	LAN 1: Intel® I219V GbE PHY for MB997EF; Intel® I219LM GbE PHY for MB997AF-10G/ B997AF-10G LAN 2: Intel® I210AT GbE (MB997-10G), Intel® I211AT GbE (MB997VF/ EF) LAN3: Intel® X550-AT for MB997AF-10G only
I/O Chip	Nuvoton NC T6686D-T
Serial Port	4x RS323, 2x RS232/422/485
USB 2.0	2x USB2.0 via pin header
USB 3.0/ 3.1	4x USB3.1 Gen2 (10Gpbs) 2x USB3.1 Gen1 (5Gpbs) via pin-header for MB997AF/ MB997AF-10G
Serial ATA	4x SATA 3.0
Audio	Intel® CNL PCH-H built-in High Definition Audio controller + Realtek audio codec ALC662-VD0-GR w/ 5.1 channels

TPM	TPM (2.0)
Others	Digital I/O(4-in/4-out), iAMT (11.6), RAID, iSMART (4.0), EuP/ErP
Dimensions (L x W)	305mm x 244mm (12" x 9.6")
Power Consumption	TBD
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MB997AF-10G	LGA1151 C246 ATX Motherboard w/ HDMI, DisplayPort, DVI-D, dual Gigabit LAN, single 10GbE, RAID, iAMT (11.6), TPM (2.0), iSMART (4.0)
MB997AF	LGA1151 Q370 ATX Motherboard w/ HDMI, DisplayPort, DVI-D, dual Gigabit LAN, RAID, iAMT (11.6), TPM (2.0), iSMART (4.0)
MB997EF	LGA1151 H310 ATX Motherboard w/ HDMI, DisplayPort, DVI-D, dual Gigabit LAN, TPM (2.0), EuP/ErP

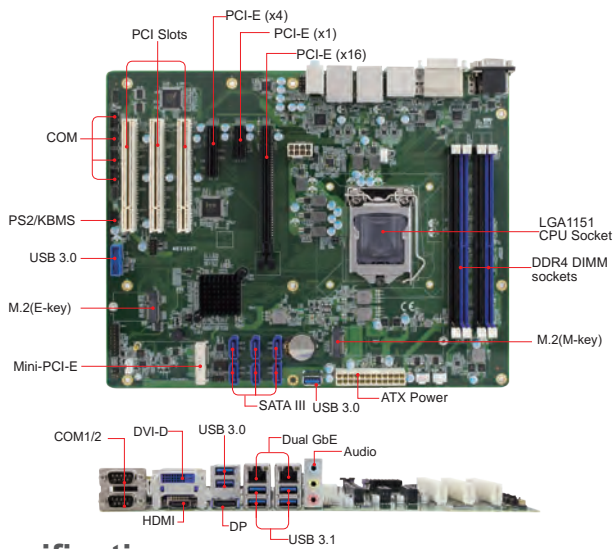
Dimensions and Drawing



MB995

ATX Motherboard

8th Gen Intel® Xeon® E / Core™ i7/i5/i3 ATX Motherboard
w/ Intel® C246/ Q370 PCH



Specifications

CPU Socket	LGA1151
CPU	8th Gen Intel® Xeon® E / Core™ i7/i5/i3 HC/QC/DC processors, up to 4.7GHz
PCH	MB995VF-C246: Intel® C246 PCH MB995VF: Intel® Q370 PCH
Memory Types	4x DDR4-2666/ 2400 DIMM, Max. 64GB (supports ECC by CPU SKUs)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	mSATA , NVMe
Expansion Slots	1x PCI-E (x16), 1x PCI-E (x4), 1x PCI-E (x1)
Mini Type Slots	3x PCI, 1x MiniPCI-E, 1x M.2 (M-key, type:2280) 1x M.2 (E-key, type:2230)
Graphics Controller	8th Gen Intel® Core™ i7/i5/i3 processors integrated
Video Output	1x HDMI (2.0a), 1x DisplayPort (1.2), 1x DVI-D
Ethernet	LAN 1: Intel® I219LM GbE PHY LAN 2: MB995VF-C246: Intel® I210AT GbE MB995VF: Intel® I211AT GbE
I/O Chip	Fintek F81966D-I
Serial Port	4x RS232, 2x RS232/422/485 (jumperless selection)
USB 2.0	2x USB 2.0 via pin-header
USB 3.0/ 3.1	4x USB 3.1 on board 5x USB 3.0: -2 ports on board, 2 ports via box-headers -1 port via on board vertical type connector
Serial ATA	MB995VF-C246: 6x SATA III MB995VF: 4x SATA III
Audio	Intel® C246/Q370 PCH built-in HD Audio controller +Realtek audio codec ALC888S-VD2-GR w/ 7.1 channels

Features

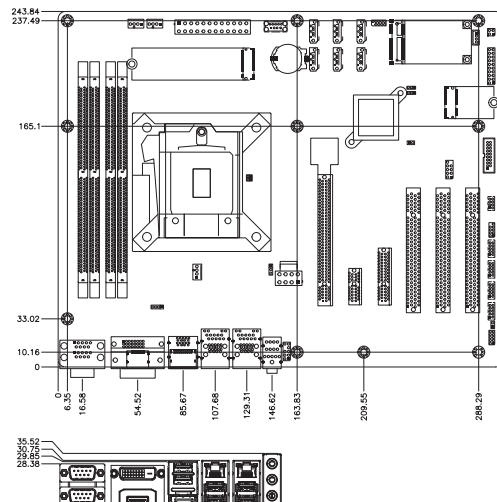
- 8th Gen Intel® Xeon® E / Core™ i7/i5/i3 HC/QC/DC processors, up to 4.7GHz
- 4x DDR4 DIMM, Max. 64GB
- Intel® processor integrated graphics supports DVI-D, HDMI (2.0a) and DisplayPort
- Dual Intel® Gigabit LAN
- 4x USB 3.1, 5x USB 3.0, 6x COM, 6x SATA III
- 1x PCI-E (x16), 1x PCI-E (x4), 1x PCI-E (x1), 3x PCI, 1x Mini PCI-E, 2x M.2 (E/ M-key)
- Watchdog timer, Digital I/O, iAMT (11.6), TPM(2.0), vPro, iSMART

TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out), iAMT (11.6), RAID, iSMART (3.5), EuP/ErP
Dimensions (L x W)	305mm x 244mm (12" x 9.6")
Power Consumption	Intel® Core™ i7-8700 3.4GHz w/ 4x 4GB DDR4-2400 +12V: 5.56A +5V: 1.65A +5VSB: 0.25A +3.3V: 0.65A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MB995VF-C246	LGA1151 C246 ATX motherboard w/ HDMI, DVI-D, DisplayPort (1.2), dual Gigabit LAN, RAID, iAMT (11.6), TPM (2.0), iSMART (3.5)
MB995VF	LGA1151 Q370 ATX motherboard w/ HDMI, DVI-D, DisplayPort (1.2), dual Gigabit LAN, RAID, iAMT (11.6), TPM (2.0), iSMART (3.5)

Dimensions and Drawing



1 CPU Modules

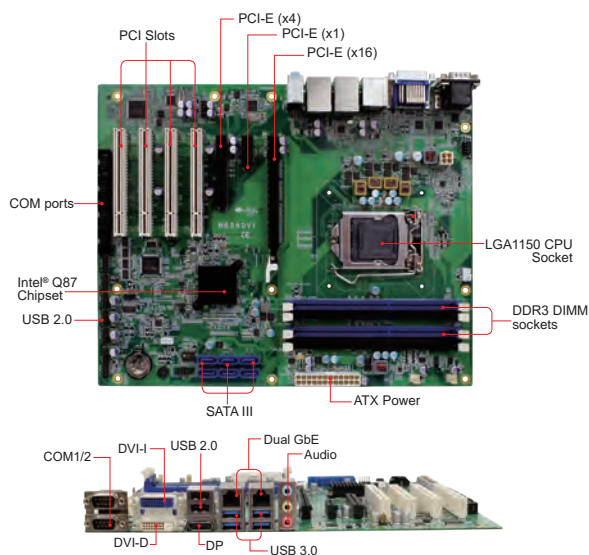
2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

MB980

ATX Motherboard 4th Gen Intel® Core™ i7/i5/i3/ Pentium® ATX Motherboard w/ Intel® Q87 PCH



Specifications

CPU Socket	LGA1150
CPU	4th Gen Intel® Core™ i7/i5/i3/ Pentium® / Celeron® processors, up to 3.4GHz
PCH	Intel® Q87 PCH
Memory Types	4x DDR3 DIMM, Max. 32GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	4x PCI, 1x PCI-E (x16), 1x PCI-E (x4), 1x PCI-E (x1)
Mini Type Slots	N/A
Graphics Controller	4th Gen Intel® Core™ i7/i5/i3/ Pentium® processor integrated
Video Output	Supports DVI-I, DVI-D and DisplayPort
Ethernet	Intel® I217LM Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN
LAN Connector	RJ-45 on board
I/O Chip	Fintek F81866AD-I
Serial Port	5x RS232, 1x RS232/422/485 (jumperless selection)
USB 2.0	2x USB 2.0 on board 8x USB 2.0 via pin-header
USB 3.0/ 3.1	4x USB 3.0 on board
Serial ATA	6x SATA III
Audio	Intel® Q87 PCH built-in HD audio + Realtek ALC892 codec
TPM	N/A
Others	Digital I/O (4-in/4-out), EuP/ErP, RAID, TPM (1.2), iAMT (9.0), iSMART
Dimensions (L x W)	305mm x 244mm (12" x 9.6")
Power Consumption	Intel® Core™ i7-4770 3.10GHz w/ 2x 4GB DDR3-1333 +12V: 4.98A; +5V: 1.07A; +5VSB: 0.08A; +3.3V: 0.72A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

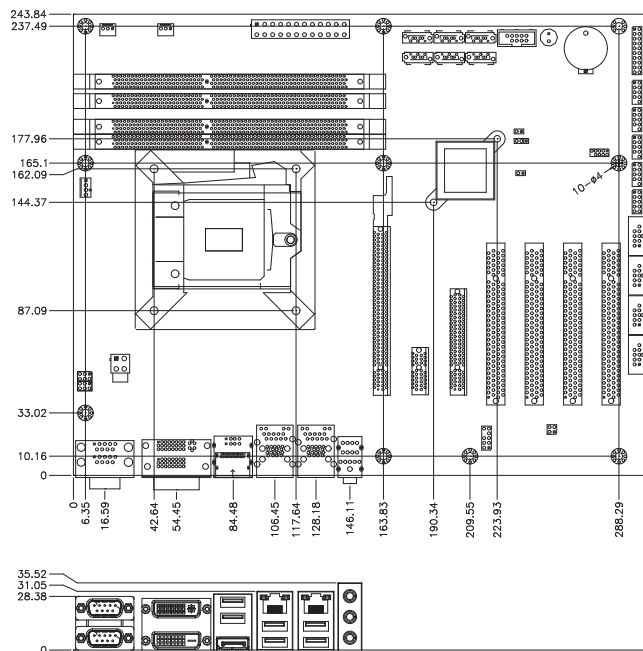
Features

- 4th Gen Intel® i7/i5/i3/ Pentium® / Celeron® processors, up to 3.4GHz
- 4x DDR3 DIMM, Max. 32GB
- Intel® processor integrated graphics, supports DVI-I, DVI-D and DisplayPort
- Dual Intel® Gigabit LAN
- 10x USB 2.0, 4x USB 3.0, 6x COM, 6x SATA III
- 4x PCI, 1x PCI-E (x16), 1x PCI-E (x4), 1x PCI-E (x1)
- Watchdog timer, Digital I/O, iAMT (9.0), vPro, iSMART

Ordering Information

MB980VF	LGA1150 Q87 ATX motherboard w/ DVI-I, DVI-D, DisplayPort, dual Gigabit LAN, RAID, EuP/ErP compliant, iAMT (9.0), vPro, iSMART
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Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

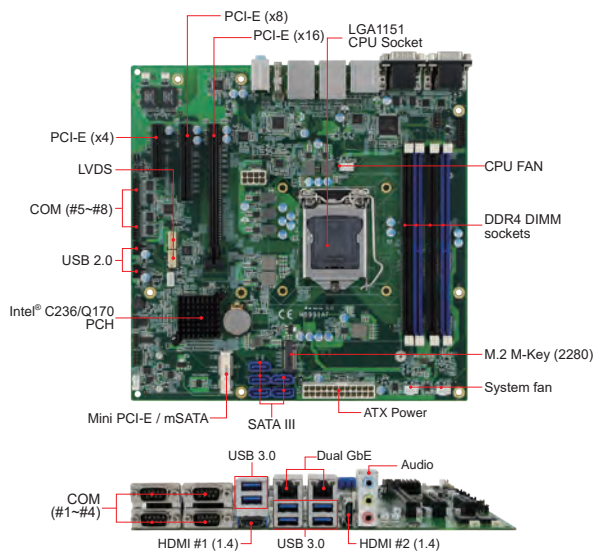
4 CPU Cards

MB991

Micro ATX Motherboard

7th/6th Gen Intel® Xeon E3 / Core™ i7/i5/i3 Pentium®/Celeron®

Micro ATX Motherboard w/ Intel® C236 PCH



Features

- 7th/ 6th Gen Intel® Xeon E3/Core™ i7/i5/i3 / Pentium® / Celeron® QC/DC processors, up to 4.2GHz
- 4x DDR4 DIMM, Max. 64GB
- Intel® processor integrated graphics, supports HDMI, LVDS
- Dual Intel® Gigabit LAN
- 4x USB 2.0, 6x USB 3.0, 8x COM, 5x SATA III
- 1x PCI-E (x16) [(x8) Link], 1x PCI-E (x8), 1x PCI-E (x4)
- 1x Mini PCI-E, 1x M.2 M-key (2280)
- Watchdog timer, Digital I/O, iAMT (11.6), TPM (2.0), iSMART

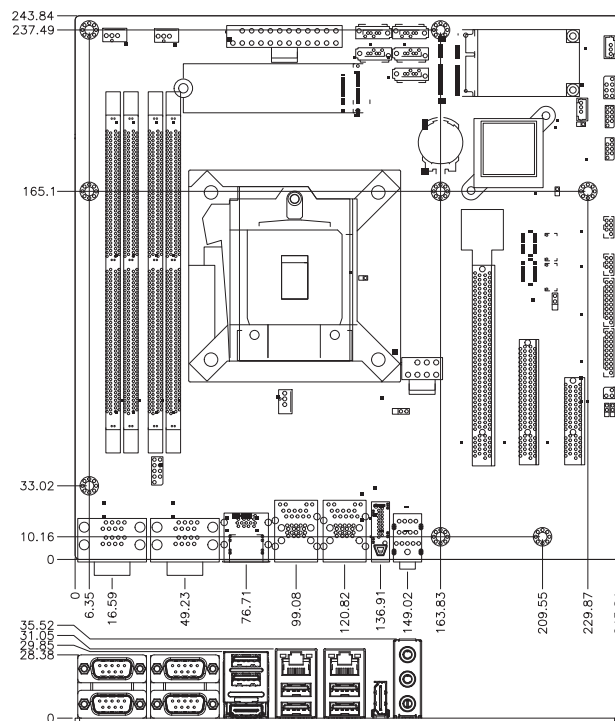
Specifications

CPU Socket	LGA1151
CPU	7th/6th Gen Intel® Xeon E3/Core™ i7/i5/i3/ Pentium® / Celeron® QC/ DC processors, up to 4.2GHz
PCH	MB991AF-C236: Intel® C236 PCH MB991AF: Intel® Q170 PCH
Memory Types	4x DDR4 DIMM, Max. 64GB (supports ECC by CPU SKUs)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA via Mini PCI-E (Thru SATA III) 1x M.2 slot [Thru PCI-E (x1) x4](NVMe)
Expansion Slots	1x PCI-E (x16), 1x PCI-E (x8), 1x PCI-E (x4) 1x M.2 (2280)
Mini Type Slots	1x Mini PCI-E
Graphics Controller	7th/6th Gen Intel® Core™ i7/i5/i3/ Pentium®/ Celeron® processor Integrated
Video Output	2x HDMI (1.4) and LVDS
Ethernet	Intel® I219LM Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN
I/O Chip	Fintek F81846AD-I + F81504D
Serial Post	6x RS232, 2x RS232/422/485 (jumperless selection)
USB 2.0	4x USB 2.0 via pin-header
USB 3.0/ 3.1	6x USB 3.0 on board
Serial ATA	5x SATA III
Audio	Intel® C236 / Q170 PCH built-in HD audio + Realtek ALC662 codec
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out), RAID, iAMT (11.6), iSMART
Dimensions (L x W)	244mm x 244mm (9.6" x 9.6")
Power Consumption	Intel® Core i7-6700, 3.4GHz, w/ 4x 8GB DDR4-2133 12V: 7.1A +5V: 1.81A +5VSB: 0.11A +3.3V, 0.70A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MB991AF-C236	LGA1151 C236 Micro ATX motherboard w/ 2x HDMI (1.4) and LVDS, dual Gigabit LAN, RAID, iAMT (11.6), TPM (2.0), iSMART
MB991AF	LGA1151 Q170 Micro ATX motherboard w/ 2x HDMI (1.4) and LVDS, dual Gigabit LAN, RAID, iAMT (11.6), TPM (2.0), iSMART

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

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Comparison Table

Mini-ITX Motherboard

Models	MI805	MI808	MI811	MI963
Form Factor	Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX
CPU Socket	CPU on board	FCBGA1170	FCBGA1296	APU on board
CPU	Intel® Celeron® QC J1900 SoC	Intel® Pentium® N3710 / Celeron® N3010 SoC	Intel® Pentium® N4200 / Celeron® N3350 SoC	AMD Embedded G-Series SoC
CPU Max. Frequency	2.00GHz	Up to 2.56GHz/ 2.24GHz	Up to 2.5GHz/ 2.4Ghz	Up to 2.4GHz
PCH	N/A	N/A	N/A	N/A
Memory Type	2x DDR3L SO-DIMM	2x DDR3L SO-DIMM	2x DDR3L SO-DIMM	2x DDR3 DIMM
Max. Memory Size	8GB	8GB	8GB	8GB
BIOS	AMI	AMI	AMI	AMI
Graphics Controller	Intel® Gen7 w/ 4EUs graphics	Intel® Gen8 w/ 16 EUs graphics	Intel® Gen9-LP w/ 18 EUs graphics	AMD Radeon™ HD8000 series graphics
Video Output	DVI-D on board	VGA, DVI-D on board	HDMI, DVI-D on board	2x HDMI on board
Ethernet	2x Intel® I211AT PCI-E Gigabit LAN	Intel® I211AT PCI-E Gigabit LAN	Intel® I211AT PCI-E Gigabit LAN	2x Intel® I211AT PCI-E Gigabit LAN
Audio	Built-in ALC269 audio codec w/ 2.3W amplifier	Built-in ALC269 audio codec w/ 2W amplifier	Built-in ALC283 audio codec w/ 2W amplifier	Built-in ALC662 HD audio codec
SATA	2x SATA II ports	2x SATA III ports	2x SATA III ports	2x SATA III ports
I/O Chip	NCT6106D	F81866AD-I	F81846AD-I	F81846AD-I
Parallel Port	N/A	N/A	N/A	N/A
Serial Port	5x RS232 1x RS232/422/485 (jumperless selection)	3x RS232 1x RS232/422/485 (jumperless selection)	3x RS232 1x RS232/422/485 (jumperless selection)	3x RS232 1x RS232/422/485 (jumperless selection)
USB 2.0	2x USB 2.0 on rear I/O 2x USB 2.0 via pin header	2x USB 2.0 via pin header	2x USB 2.0 (2 ports via rear/I/O + 2 ports via pin header)	4x USB 2.0 via rear I/O 2x USB 2.0 (via pin header)
USB 3.0/3.1	1x USB 3.0 on rear I/O	4x USB 3.0 on rear I/O	4x USB 3.0 on rear I/O	2x USB 3.0 via rear I/O
TPM	N/A	2.0 (optional)	N/A	N/A
KB / MS	N/A	PS/2	N/A	N/A
Hardware Monitor	Yes	Yes	Yes	Yes
Storage Device Interface	mSATA	mSATA or CFast	mSATA	N/A
Watchdog Timer	256 levels	256 levels	256 levels	256 levels
Digital I/O	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out
Expansion Slots	1x PCI-E (x1)	1x PCI-E (x1)	1x PCI-E (x1)	1x PCI-E (x4)
Mini Type Slots	1x Mini PCI-E (x1)	1x Mini PCI-E (x1)	1x Mini PCI-E (x1)	N/A
Power input	DC In 12V ~ 24V	DC In 12V or DC in 18V~ 24V	ATX or DC in 12V~ 24V	ATX type
Power Consumption	Intel® Celeron® J1900 2GHz 8GB DDR3L-1600 +12V: 1.28A	Intel® Pentium® N3700 1.6GHz w/ 2x 4GB DDR3L-1600 +19V: 1.01A	Intel® Pentium® N4200 2.5GHz w/ 2x DDR3L-1600 4GB +12V: 1.27A	AMD GX-424CC 2.4GHz w/ 2x DDR3L-1600 8G +12V: 1.56A; +5V: 1.75A +5VSB: 0.13A; +3.3V: 0.23A
Dimensions (L x W)	170mm x 170mm	170mm x 170mm	170mm x 170mm	170mm x 170mm
Extra Features	iSMART(3.0). LAN Wakeup	LAN Wakeup, SIM card slot iSMART(3.1)	LAN Wakeup	LAN Wakeup
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Comparison Table

Mini-ITX Motherboard

Models	MI979	MI980	MI981	MI982
Form Factor	Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX
CPU Socket	BGA 968 APU on board	BGA 1364 CPU on board	LGA1150	LGA1150
CPU	AMD Embedded R/G series SoC	4th Gen Intel® Core™ i7 / i5 / Celeron®	4th Gen Intel® Core™ DT i7/i5/i3 processors	4th Gen Intel® Core™ i7/i5/i3/ Pentium®/ Celeron®
CPU Max. Frequency	Up to 3.4GHz	Up to 2.40GHz	Up to 4.0GHz	Up to 4.0GHz
PCH	N/A	Intel® QM87 (MI980VF) Intel® HM86 (MI980F)	Intel® Q87 PCH	Intel® H81
Memory Type	2x DDR4 SO-DIMM	2x DDR3 SO-DIMM	2x DDR3 SO-DIMM	2x DDR3 SO-DIMM
Max. Memory Size	16GB	16GB	16GB	16GB
BIOS	AMI	AMI	AMI	AMI
Graphics Controller	AMD Radeon™ HD9000 series graphics	Intel® Core™ i integrated graphics	Intel® Core™ i integrated graphics	Intel® Core™ i integrated graphics
Video Output	HDMI(1.4b), DisplayPort on board	DVI-I, DVI-D and DisplayPort on board	DVI-D and DP on board	VGA, DVI-D and DP on board
Ethernet	Intel® I211AT PCI-E Gigabit LAN	Intel® I217LM/V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN	Intel® I217LM Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN	Intel® I217LM Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN
Audio	Built-in ALC662 HD audio codec	Built-in ALC892 HD audio codec	Built-in ALC892 HD audio codec	Built-in ALC892 HD audio codec
SATA	2 x SATA III ports	MI980VF: 4x SATA III, 2x SATA II MI980F: 2x SATA III, 2x SATA II	4x SATA III ports	4x SATA III ports
I/O Chip	NCT6116D	F81866AD-I	F81866AD-I	F81866AD-I
Parallel Port	N/A	N/A	N/A	N/A
Serial Port	5x RS232 1x RS232/422/485 (jumperless selection)	5x RS232 1x RS232/422/485 (jumperless selection)	5x RS232 1x RS232/422/485 (jumperless selection)	5x RS232 1x RS232/422/485 (jumperless selection)
USB 2.0	2x USB 2.0 (via rear I/O) 2 x USB 2.0 (via pin header)	6x USB 2.0 (2x rear I/O + 4x via pin header)	6x USB 2.0 via pin header	6x USB 2.0 (2x rear I/O + 2x via pin header)
USB 3.0/ 3.1	2 x USB3.0 via rear I/O	4x USB 3.0 (2x rear I/O)	6x USB 3.0 via rear I/O	2x USB 3.0 (2x rear I/O)
TPM	N/A	1.2	1.2	N/A
KB / MS	N/A	N/A	N/A	N/A
Hardware Monitor	Yes	Yes	Yes	Yes
Storage Device Interface	mSATA, M.2	mSATA	mSATA	N/A
Watchdog Timer	256 levels	256 levels	256 levels	256 levels
Digital I/O	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out
Expansion Slots	1x PCI-E (x8)	1x PCI-E (x16)	1x PCI-E (x16)	1x PCI-E (x16)
Mini Type Slots	1x MiniPCI-E (x1) 1x M.2	2x Mini PCI-E (x1)	2x Mini PCI-E (x1)	2x Mini PCI-E (x1)
Power input	ATX type DC-IN (12V~24V)	ATX type	ATX type	ATX type
Power Consumption	AMD RX-421BD, 2.1GHz, w/ 2x 16GB DDR4-2133 +12V: 4.22A; +5V: 2.98A +5VSB: 0.13A; +3.3V: 0.31A	Intel® Core™ i5-4402E 1.60GHz w/ 2x 2GB DDR3-1333 +12V: 2.01A; +5V: 0.73A +5VSB: 1.70A; +3.3V: 0.29A	Intel® Core™ i5-4570S 2.9GHz 2x Unigen DDR3-1333 2GB +12V: 6.29A; +5V: 2.51A +5VSB: 0.55A; +3.3V: 0.76A	Intel® Core™ i7-4770TE 2.3GHz w/ 2GB DDR3-1333 +12V: 3.54A; +5V: 1.28A +5VSB: 0.23A; +3.3V: 0.46A
Dimensions (L x W)	170mm x 170mm	170mm x 170mm	170mm x 170mm	170mm x 170mm
Extra Features	LAN Wakeup	iAMT (9.0) / vPro [MI980VF], LAN Wakeup, iSMART	iAMT (9.1), LAN Wakeup, iSMART	LAN Wakeup, iSMART
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Comparison Table

Mini-ITX Motherboard

Models	MI985	MI987	MI988	MI990	MI991
Form Factor	Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX
CPU Socket	BGA 1364 CPU on board	LGA1150	BGA 1140 APU on board	BGA 1440 CPU on board	LGA
CPU	5th Gen Intel® Core™ i7	4th Gen Intel® Core™ DT i7/i5/i3 processors (Max. 45W TDP)	AMD Embedded Zen Core CPU	6th Gen Intel® Xeon® / Core™ i7/i5/i3/ Celeron®	7th/6th Gen Intel® Xeon® / Core™ i7/i5/i3/ Pentium® / Celeron® DT CPU
CPU Max. Frequency	Up to 3.40GHz	Up to 2.7GHz		Up to 3.70GHz	Up to 4.0GHz
PCH	Intel® QM87	Intel® Q87 (MI987AF) Intel® H81 (MI987EF)	N/A	Intel® CM236 (MI990VF) Intel® HM170 (MI990EF)	Intel® C236(MI991AF-C236) Intel® Q170(MI991AF) Intel® H110(MI991EF)
Memory Type	2x DDR3 SO-DIMM	2x DDR3 SO-DIMM	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM
Max. Memory Size	16GB	16GB	32GB	32GB	32GB
BIOS	AMI	AMI	AMI	AMI	AMI
Graphics Controller	Intel® Core™ i integrated graphics	Intel® Core™ i integrated graphics	AMD V-series APU built-in GPU	Intel® Core™ i integrated graphics	Intel® Core™ i integrated graphics
Video Output	DVI-I, DVI-D and DP on board	HDMI and DP on board	HDMI(2.0)/ DP on board	HDMI(2.0), DVI-D and DP on board	HDMI/ DVI-D/ DP on board
Ethernet	Intel® I218LM Gigabit LAN PHY, Intel® I211AT PCI-E Gigabit LAN	Intel® I217LM/V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN	Intel® I211AT Gigabit LAN PHY	Intel® I219LM/V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN	Intel® I219LM/V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN
Audio	Built-in ALC892 HD audio codec	Built-in ALC662 HD audio codec	Built-in ALC662 HD audio codec	Built-in ALC892 HD audio codec	Built-in ALC662 HD audio codec
SATA	4x SATA III ports 2x SATA II ports	2x SATA III ports	1x SATA III port	MI990VF: 4x SATA III ports MI990EF: 2x SATA III ports	MI991VF: 4x SATA III ports MI991EF: 3x SATA III ports
I/O Chip	F81866AD-I	NCT5523D	NCT6116D	F81866AD-I	F81846AD-I
Parallel Port	N/A	N/A	N/A	N/A	N/A
Serial Port	5x RS232 1x RS232/422/485 (jumperless selection)	1x RS232 1x RS232/422/485 (jumperless selection)	2x RS232/422/485 (jumperless selection) 4x RS232	5x RS232 1x RS232/422/485 (jumperless selection)	3x RS232 1x RS232/422/485 (jumperless selection)
USB 2.0	6x USB 2.0 (2x rear I/O + 4x via pin header)	MI987AF: 6x USB 2.0 via pin header MI987EF: 2x USB 2.0 on board 4x USB 2.0 via pin header	N/A	4x USB 2.0 (4x via pin header)	MI991AF: 2x USB 2.0 via pin header MI991EF: 2x USB 2.0 on board 2x USB 2.0 via pin header
USB 3.0/ 3.1	4x USB 3.0 (2x rear I/O)	MI987AF: 4x USB 3.0 on board MI987EF: 2x USB 3.0	4x USB3.1 real I/O	6x USB 3.0 (6x rear I/O)	MI991AF: 6x USB 3.0 on board MI991EF: 4x USB 3.0
TPM	2.0	1.2	N/A	2.0	1.2
KB / MS	N/A	N/A	N/A	N/A	N/A
Hardware Monitor	Yes	Yes	Yes	Yes	Yes
Storage Device Interface	mSATA	mSATA	mSATA, M.2	mSATA, M.2	mSATA
Watchdog Timer	256 levels	256 levels	256 levels	256 levels	256 levels
Digital I/O	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out
Expansion Slots	1x PCI-E (x16)	1x PCI-E (x4)	1x PCI-E (x8)	1x PCI-E (x16)	1x PCI-E (x16)
Mini Type Slots	2x Mini PCI-E (x1)	2x Mini PCI-E (x1)	1x Mini PCI-E 1x M.2	2x Mini PCI-E (x1) 1x M.2	2x Mini PCI-E (x1)
Power input	ATX type	DC In 19V	ATX type/ DC-IN (12V~24V)	ATX type	ATX type
Power Consumption	Intel® Core™ i7-5850EQ 2.70GHz w/ 4GB DDR3L-1600 +12V: 3.37A; +5V: 0.83A +5VSB: 0.08A; +3.3V: 0.51A	Intel® Core™ i7-4770TE 2.30GHz w/ 2x 2GB DDR3-1333 +19V: 6.08A	AMD Ryzen™ Embedded V1807B 3.35GHz w/ 2x 8GB DDR4-2133 +24V: 2.55A	Intel® Core™ i5-6400EQ 2.4GHz w/ 2x 8GB DDR4-2133 +12V: 2.84A; +5V: 1.45A +5VSB: 0.058A; +3.3V: 0.52A	Intel® Core™ i5-6500TE 2.3GHz w/ 2x DDR4-2133 4GB +12V: 3.56A; +5V: 1.28A +5VSB: 0.08A; +3.3V: 0.32A
Dimensions (L x W)	170mm x 170mm	170mm x 170mm	170mm x 170mm	170mm x 170mm	170mm x 170mm
Extra Features	iAMT (10.0), LAN Wakeup, iSMART	iAMT (9.0) [MI987AF], LAN Wakeup, iSMART	LAN wakeup iSMART	iAMT (11.0) / vPro [MI990VF], LAN Wakeup, iSMART	iAMT (11.0), LAN Wakeup, iSMART
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Comparison Table

Mini-ITX Motherboard

Models	MI992	MI995	MI996	MI998	MBD301
Form Factor	Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX
CPU Socket	BGA 1440 CPU on board	BGA 1440 CPU on board	FCBGA1440	LGA1151	AMD AM4
CPU	7th Gen Intel® Xeon® / Core™ i7/i5/i3 processors	8th Gen Intel® Xeon® / Core™ i7/i5/i3 processors	Intel 9th Gen Intel® Xeon® E / Core™ i7/i5/i3, Celeron processors	Intel® 9th /8th Gen. Xeon®-E / Core™ / Pentium® / Celeron® processors	AMD AM4 socket processors
CPU Max. Frequency	Up to 3.7GHz	Up to 4.2GHz	Up to 4.2GHz	Up to 4.9GHz	N/A
PCH	Intel® CM238 / HM175	Intel® CM246 PCH Intel® QM370 PCH	Intel® CM246 PCH: MI996VF-X28/26 Intel® QM370 PCH: MI996VF-9850/ 9400 Intel® HM370 PCH: MI996EF-9100/ 4930	Intel C246, Q370/ H310	AMD X470
Memory Type	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM	2 X DDR4 SO-DIMM
Max. Memory Size	32GB	32GB	32GB	32GB	64GB
BIOS	AMI	AMI	AMI	AMI	AMI
Graphics Controller	Intel® Core™ i integrated graphics	Intel® Core™ i integrated graphics	9th Gen Intel® Xeon® / Core™ i7/i5/i3 processor integrated graphics	Intel® 9th /8th Gen. Core™ processor integrated HD Gfx	AMD Radeon™ Vega GPU integrated
Video Output	DVI-D/ HDMI(1.4) / DP on board	HDMI(2.0a) / DVI-D/ DP/ eDP on board	Supports eDP, HDMI(2.0a), DisplayPort (1.2) and DVI-D	eDP or 24-bit dual-channel LVDS	1x DisplayPort (1.2) for AM4 APU series
Ethernet	Intel® I219LM/V Gigabit LAN PHY, Intel® I211AT PCI-E Gigabit LAN	Intel® I219LM/V Gigabit LAN PHY, Intel® I210AT PCI-E Gigabit LAN, Intel® I211AT PCI-E Gigabit LAN	Intel® I219LM Gigabit LAN PHY, Intel® I219V Gigabit LAN PHY, Intel® I210AT Gigabit LAN, Intel® I211AT Gigabit LAN	Intel® I219LM GbE PHY, Intel® I219V GbE PHY, Intel® I210AT, Intel® I211AT	1x Realtek RTL8111H
Audio	Built-in ALC892 HD audio codec	Built-in ALC888S HD audio codec	built-in HD Audio controller + Realtek ALC888S w/ 7.1 channels	Built-in ALC888S-VD2-GR codec	Built-in HD audio w/ ALC662 codec for 5.1 channel
SATA	MI992VF: 4 x SATA III ports MI992EF: 2 x SATA III ports	MI995VF-X27: 4x SATA III MI995VF-8850/8400, MI995EF-8100: 2x SATA III	MI996VF-X26/28: 4x SATA III MI996VF-9850 MI996EF-9100: 2x SATA III	4x SATA III ports	3x SATA III
I/O Chip	F81866AD-I	F81964D-I	F81964D-I	F81964D-I	Fintek F81439
Parallel Port	N/A	N/A	N/A	N/A	N/A
Serial Port	4x RS232 2x RS232/422/485 (jumperless selection)	2x RS232 2x RS232/422/485 (jumperless selection)	2x RS232/422/485 (jumperless selection) 2x RS232	2x RS232/422/485 (jumperless selection) 2x RS232	COM #1 (RS232/422/485) (jumper-less selection) COM #2~COM #4 (RS232 only)
USB 2.0	4x USB 2.0 via rear I/O	4x USB 2.0 (via pin header)	4x USB 2.0 (via pin header)	2x USB 2.0 (via pin header)	N/A
USB 3.0/ 3.1	6x USB 3.0 via rear I/O	6x USB 3.1 (on board)	6x USB 3.1 (via rear I/O)	6x USB 3.0 via rear I/O (MI998AF) 4x USB 3.0 via rear I/O (MI998EF)	6x USB 3.1 Gen1
TPM	2.0	2.0	2.0	2.0	N/A
KB / MS	N/A	N/A	N/A	N/A	N/A
Hardware Monitor	Yes	Yes	Yes	Yes	Yes
Storage Device Interface	mSATA, M.2	mSATA, M.2	mSATA 1x M.2 (E-Key) 1x M.2 (M-Key)	1x M.2 (E-Key) 1x M.2 (M-Key)	N/A
Watchdog Timer	256 levels	256 levels	256 levels	256 levels	256 levels
Digital I/O	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out	N/A
Expansion Slots	1x PCI-E (x16)	1x PCI-E (x16)	1x PCI-E (x16)	1x PCI-E (x16)	1x PCI-E (x16) slot supports single at x16 (PCI-E2) for AM4 Pure CPU series 1x PCI-E (x16) slot supports single at x8 (PCI-E2) for AM4 APU series
Mini Type Slots	1x Mini PCI-E 1x M.2	1x Mini PCI-E 2x M.2	1x Mini PCI-E 1x M.2 (M-key, type:2280, NVMe) 1x M.2 (E-Key, type:2230, CNV)	2x M.2	1x Mini PCI-E (full-sized) 1x M.2 socket (Key E) 1x SIM card slot
Power input	ATX type	ATX type	ATX type	ATX type	ATX type
Power Consumption	Intel® Xeon E3-1505M v6, 3.00GHz, w/ 2x 4GB DDR4-2133 +12: 3.95A +5V: 1.50A +5VSB: 0.06A +3.3V: 0.35A	Intel® Core™ i5-8400H, 2.50GHz, w/ 2 x 16GB DDR4-2133 +12V: 3.01A +5V: 1.43A +5VSB: 0.15A +3.3V: 0.32A	Intel® Xeon E-2176G, 3.7GHz w/ 8GB DDR4-2400 +12V: 7.73A +5V: 1.59A +5VBS: 0.17A +3.3V: 0.32A	TBD	AMD Ryzen™ Embedded AM4 CPU/APU 3.0GHz w/ 2x 8GB DDR4-2400 +12V: 2.55A
Dimensions (L x W)	170mm x 170mm	170mm x 170mm	170mm x 170mm	170mm x 170mm	170mm x 170mm
Extra Features	iAMT (11.6), LAN Wakeup, iSMART, RAID	iAMT (11.6)/ vPro(MI995VF), LAN Wakeup, iSMART, RAID, EuP/ErP (MI995EF)	iAMT (11.6), LAN Wakeup, iSMART, EuP/ ErP, RAID, vPro(MI996VF)	iAMT (11.6), LAN Wakeup, EuP/ErP/N/A	
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1 CPU Modules

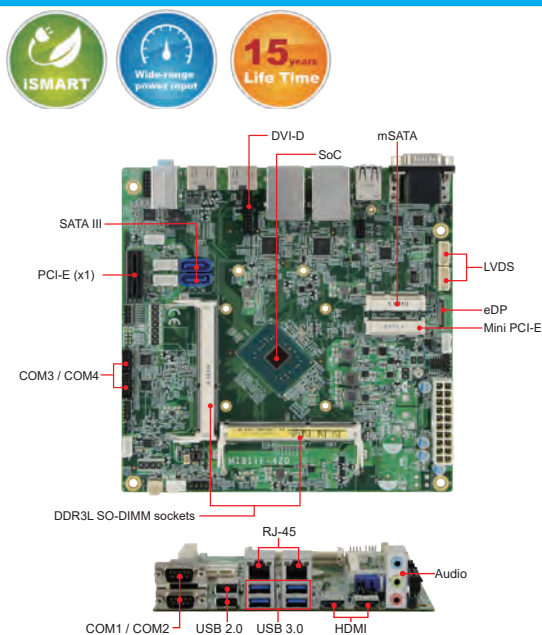
2 Disk-Size SBCCs

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MI811

Mini-ITX Motherboard Intel® Pentium® / Celeron® Mini-ITX Motherboard



Features

- Onboard Intel® Pentium® QC N4200 @ 2.5GHz or Celeron® DC N3350 @ 2.4GHz on board
- 2x DDR3L SO-DIMM sockets, Max. 8GB
- Supports HDMI, HDMI / DVI-D and eDP / 24-bit dual channel LVDS
- 2x Intel® I211-AT PCI-E Gigabit LAN
- Watchdog timer, Digital I/O
- 4x USB 3.0, 4x USB 2.0, 4x COM, 2x SATA III
- 1x PCI-E (x1), 1x Mini PCI-E, 1x mSATA

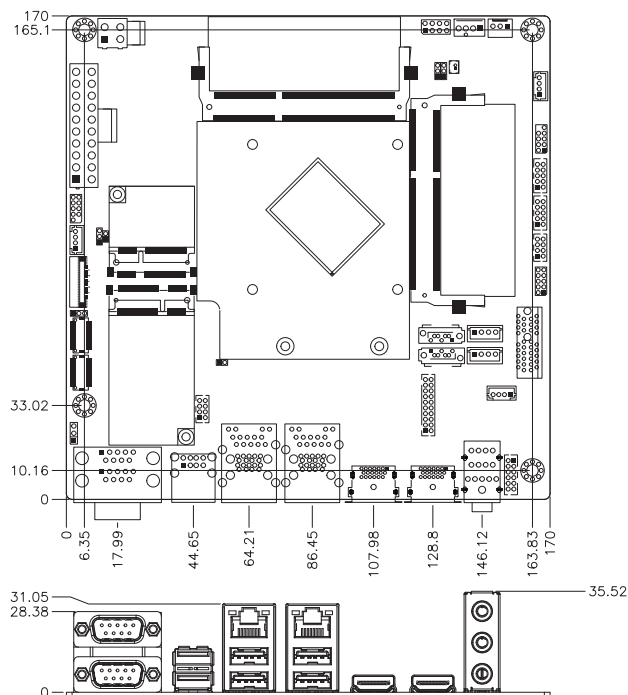
Specifications

CPU Socket	FCBGA1296
CPU	Intel® Pentium® QC N4200 @ 1.1GHz ~ 2.5GHz Intel® Celeron® DC N3350 @ 1.1GHz ~ 2.4GHz
PCH	N/A
Memory Types	2x DDR3L-1866 SO-DIMM socket, Max. 8GB
BIOS	AMI
Watchdog Timer	256 levels
Storage Device Interface	1x mSATA
H/W Monitor	Yes
Mini Type Slots	1x Mini PCI-E
Expansion Slots	1x PCI-E (x1)
Graphics Controller	Intel® Pentium® SoC integrated Intel® Gen 9 graphics
Video Output	Supports HDMI, 2nd HDMI or DVI-D, eDP or 24-bit dual-channel LVDS
Ethernet	Intel® I211AT PCI-E Gigabit LAN
I/O Chip	Fintek F81846AD-I
Serial Port	1x RS232/422/485 (jumpertless selection), 3x RS232
USB 2.0	2x USB 2.0 ports on board 2x USB via pin header
USB 3.0/ 3.1	4x USB 3.0 on board
Serial ATA	2x SATA III
Audio	Intel® Pentium® SoC built-in high-definition audio controller + Realtek ALC283 w/ 2.1 channels+ amplifier
TPM	N/A
Others	Digital I/O (4-in/4-out); ATX or 12V~24V DC-in; EuP/ErP
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Pentium® N4200 2.5GHz w/ 2x DDR3L 1600 4GB +12V: 1.27A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MI811F-420	Intel® Pentium® N4200(1.1~2.5GHz) on board Mini-ITX motherboard with heatsink, w/ HDMI#1, HDMI#2 or DVI-D, eDP or LVDS, 2x PCI-E Gigabit LAN, ATX-in
MI811F-420D	Intel® Pentium® N4200(1.1~2.5GHz) on board Mini-ITX motherboard with heatsink, w/ HDMI#1, HDMI#2 or DVI-D, eDP or LVDS, 2x PCI-E Gigabit LAN, 12V~24V DC-in
MI811F-335	Intel® Celeron® N3350(1.1~2.4GHz) on board Mini-ITX motherboard with heatsink,w/ HDMI#1, HDMI#2 or DVI-D, eDP or LVDS, 2x PCI-E Gigabit LAN, ATX-in
MI811F-335D	Intel® Celeron® N3350(1.1~2.4GHz) on board Mini-ITX motherboard with heatsink, w/ HDMI#1, HDMI#2 or DVI-D, eDP or LVDS, 2x PCI-E Gigabit LAN, 12V~24V DC-in

Dimensions and Drawing



1 CPU Modules

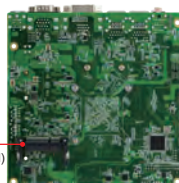
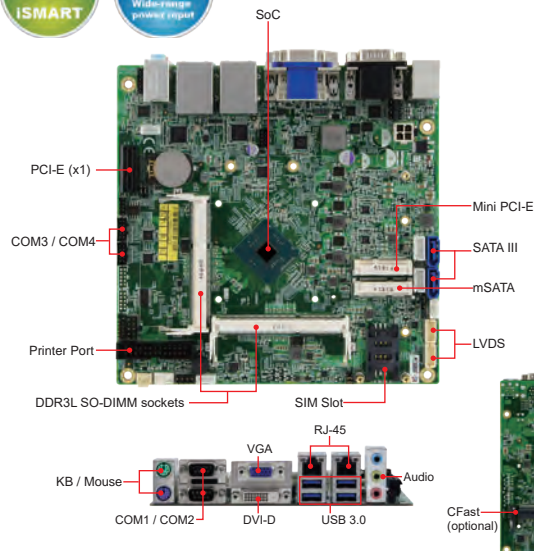
2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

MI808

Mini-ITX Motherboard Intel® Pentium® / Celeron® Mini-ITX Motherboard



Features

- Onboard Intel® Pentium® QC N3710, up to 2.56GHz or Celeron® DC N3010, up to 2.24GHz
- 2x DDR3L SO-DIMM sockets, Max. 8GB
- Supports VGA, DVI-D and 24-bit dual-channel LVDS
- 2x Intel® I211-AT PCI-E Gigabit LAN
- Watchdog timer, Digital I/O, iSMART, TPM (2.0)
- 4x USB 3.0, 2x USB 2.0, 4x COM, 2x SATA III
- 1x PCI-E (x1), 1x Mini PCI-E, 1x mSATA, 1x CFast

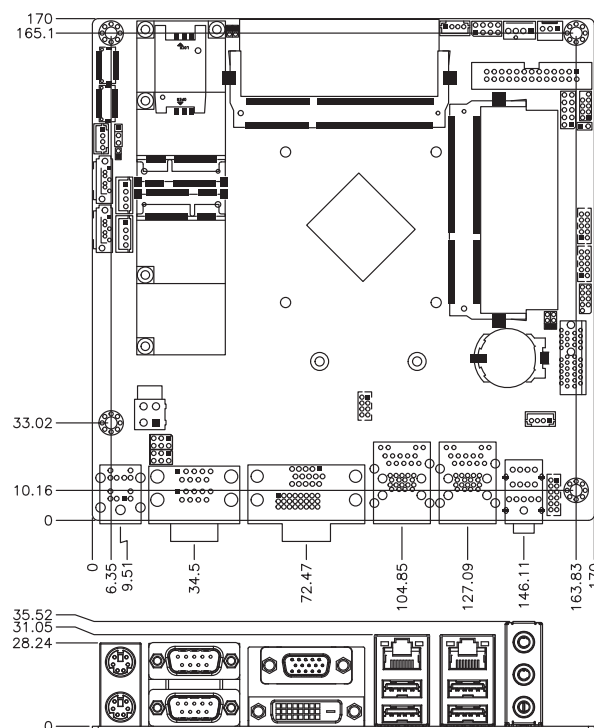
Specifications

CPU Socket	FCBGA1170
CPU	Intel® Pentium® N3710, up to 2.4GHz or Celeron® N3010, up to 2.24GHz
PCH	N/A
Memory Types	2x DDR3L-1600 SO-DIMM socket, Max. 8GB
BIOS	AMI
Watchdog Timer	256 levels
Storage Device Interface	1x mSATA, 1x CFast (optional)
H/W Monitor	Yes
Expansion Slots	1x PCI-E (x1)
Mini Type Slots	1x Mini PCI-E
Graphics Controller	Intel® Pentium® SoC integrated Intel® Gen 8 graphics
VGA Memory	Shared memory
Video Output	Supports DVI-D, CRT 24-bit dual-channel LVDS
Ethernet	Intel® I211AT PCI-E Gigabit LAN
LAN Connector	RJ-45 on board
I/O Chipset	Fintek F81846AD-I 1x RS232/422/485 (jumperless selection) 3x RS232, PS/2 keyboard/mouse 1x printer port
USB 2.0	2x USB 2.0 via pin-header
USB 3.0/ 3.1	4x USB 3.0 on board
Serial ATA	2x SATA III
Audio	Intel® Pentium SoC built-in HD audio controller + Realtek ALC269 with 2.1 channel + amplifier
TPM	TPM(2.0)
Others	Digital I/O (4-in/4-out); 12V DC-in or 18V~24V; iSMART; TPM(2.0); SIM card slot, CFast (optional)
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Pentium® Processor N3710 1.6GHz w/ 2x 4GB DDR3L-1600 +19V: 1.01A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MI808F-371	Intel® Pentium® N3710 (2.56GHz) on board Mini-ITX motherboard with heatsink, DVI-D, VGA & LVDS, 2x PCI-E Gigabit LAN, iSMART 3.2, TPM(2.0), DC-in 12V only
MI808FW-371	Intel® Pentium® N3710 (2.56GHz) on board Mini-ITX motherboard with heatsink, DVI-D, VGA & LVDS, 2x PCI-E Gigabit LAN, iSMART 3.2, TPM(2.0), 18V~24V DC-in
MI808F-301 (w/ MOQ)	Intel® Celeron® N3010 (2.24GHz) on board Mini-ITX motherboard with heatsink, DVI-D, VGA & LVDS, 2x PCI-E Gigabit LAN, iSMART 3.2, TPM(2.0), DC-in 12V only
MI808FW-301 (w/ MOQ)	Intel® Celeron® N3010 (2.24GHz) on board Mini-ITX motherboard with heatsink, DVI-D, VGA & LVDS, 2x PCI-E Gigabit LAN, iSMART 3.2, TPM(2.0), 18V~24V DC-in

Dimensions and Drawing



1 CPU Modules

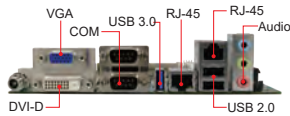
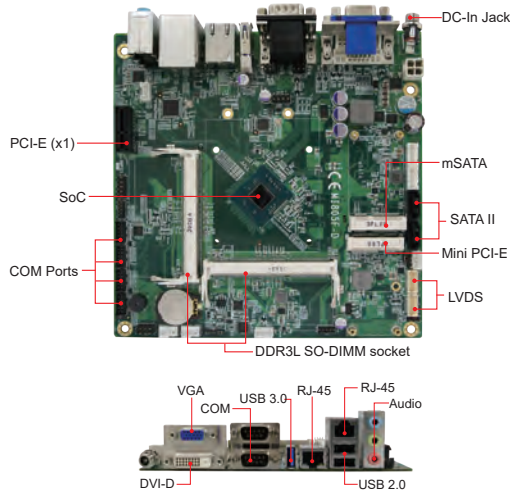
2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

MI805

Mini-ITX Motherboard Intel® Celeron® J1900 Mini-ITX Motherboard



Features

- Onboard Intel® Celeron® J1900(2.0GHz) SoC
- 2x DDR3L SO-DIMM, Max. 8GB
- Supports VGA, DVI-D and 24-bit dual-channel LVDS
- Onboard dual PCI-E Gigabit LAN
- Watchdog timer, Digital I/O, iSMART
- 1x USB 3.0, 4x USB 2.0, 6x COM, 2x SATA II
- 1x PCI-E (x1), 1x Mini PCI-E, 1x mSATA

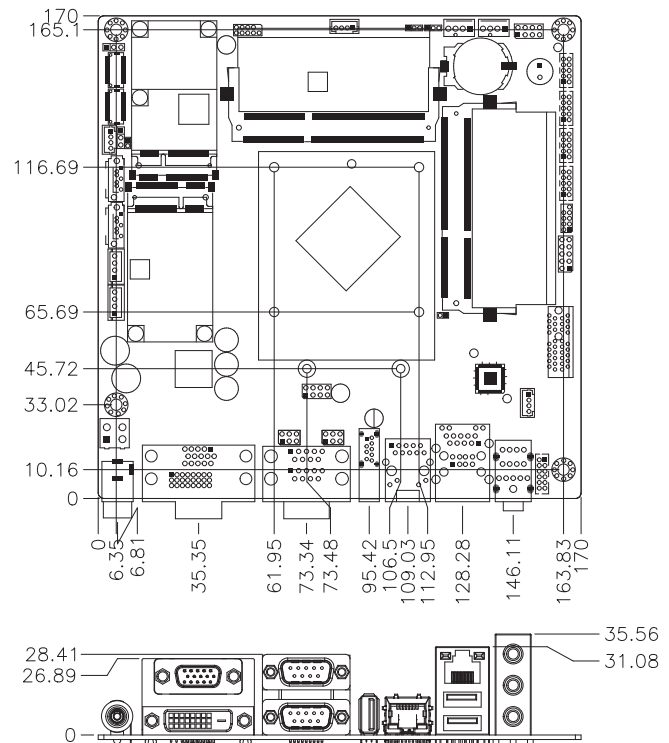
Specifications

CPU Socket	FCBGA1170
CPU	Intel® Celeron® J1900 SoC (2.0GHz, 2MB cache)
PCH	N/A
Memory Types	2x DDR3L-1333 SO-DIMM, Max. 8GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	mSATA
Expansion Slots	1x PCI-E (x1)
Mini Type Slots	1x Mini PCI-E
Graphics Controller	Intel® Celeron® J1900 integrated Gen7 graphics
Video Output	Supports DVI-D, CRT 24-bit dual-channel LVDS
Ethernet	Intel® I211AT PCI-E Gigabit LAN
I/O Chip	Nuvoton NCT6106D
Serial Port	1x RS232/422/485, 5x RS232
USB 2.0	2x USB 2.0 on board 2x USB 2.0 via pin header
USB 3.0/ 3.1	1x USB 3.0 on board
Serial ATA	2x SATA III
Audio	Intel® Celeron® J1900 built-in audio w/ Realtek ALC269 codec
TPM	N/A
Others	12V~24V DC-In, iSMART, Digital I/O (4-in/4-out)
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Celeron® J1900 2GHz w/ 8GB DDR3L-1600 + 12V: 1.28A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MI805F-D	Intel® Celeron® J1900 2GHz SoC Mini-ITX motherboard w/ DVI-D, VGA & LVDS, 2x PCI-E Gigabit LAN, iSMART, with heatsink
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Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

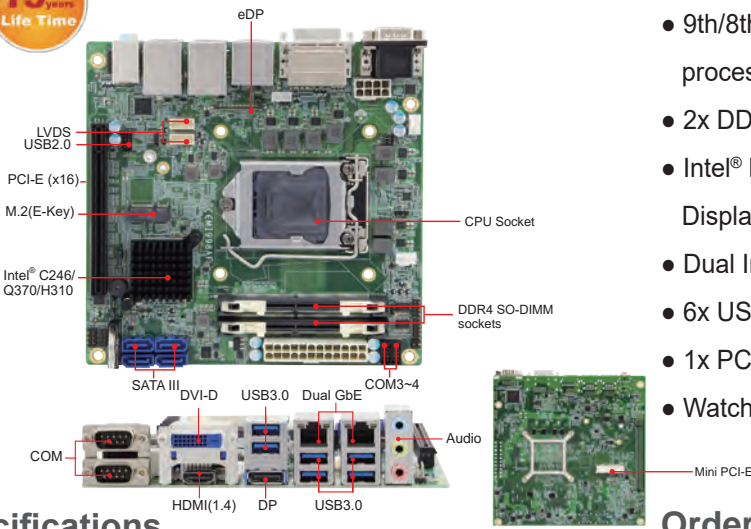
4 CPU Cards

MI998

Mini-ITX Motherboard

9th/8th Gen Intel® Xeon® E / Core™ / Pentium® / Celeron®
Mini-ITX Motherboard w/ Intel® C246 PCH

15 years
Life Time



1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

Specifications

CPU Socket	LGA1151
CPU	9th/8th Gen Intel® Xeon® E / Core™ / Pentium® / Celeron® processors, up to 4.7GHz
PCH	MI998AF-C246: Intel® C246 PCH MI998AF: Intel® Q370 PCH MI998EF: Intel® H310 PCH
Memory Types	2x DDR4 SO-DIMM, Max. 32GB (supports ECC by CPU SKU)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	NVMe
Expansion Slots	1x PCI-E (x16)
Mini Type Slots	1x M.2 (E-key, type:2230) 1x M.2 (M-key, type:2280)
Graphics Controller	Intel® UHD Graphics P630
Video Output	Supports, DVI-D, HDMI (1.4), DisplayPort(1.2), and eDP or 24-bit Dual channel LVDS
Ethernet	1st LAN MI998AF-C246 & MI998AF: Intel® I219LM MI998EF: Intel® I219V 2nd LAN MI998AF-C246: Intel® I210AT MI998AF & MI998EF: Intel® I211AT
I/O Chip	MI998AF-C246: COM1 ~ COM2 (RS232/422/485) MI998AF: COM1 ~ COM2 (RS232/422/485) MI998EF: COM1 ~ COM2 (RS232) COM3 ~ COM4: RS232
USB 2.0	MI998AF-C246 / MI998AF: 2x USB2.0 MI998EF: 2x USB2.0
USB 3.0/ 3.1	MI998AF-C246 / MI998AF: 6x USB3.0 MI998EF: 4x USB3.0
SATA	4x SATA III
Audio	Intel® C246/ Q370/ H110 PCH-H built-in HD audio controller + Realtek Codec ALC888S-VD2-GR
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out); RAID, iAMT (11.6) or Eup/ErP
Dimensions (L x W)	170mm x 170mm
Power Consumption	Intel® i7-8700, w/ DDR4-2400 8GB +12V: 6.36A; +5V: 1.46A; +5VSB: 0.07A; +3.3V: 0.37A
Operating Temperature	0°C ~ 60°C (32°F ~ 140°F)
Storage Temperature	-20°C ~ 80°C (-4°F ~ 176°F)
Relative Humidity	90% (non-condensing @60°C)

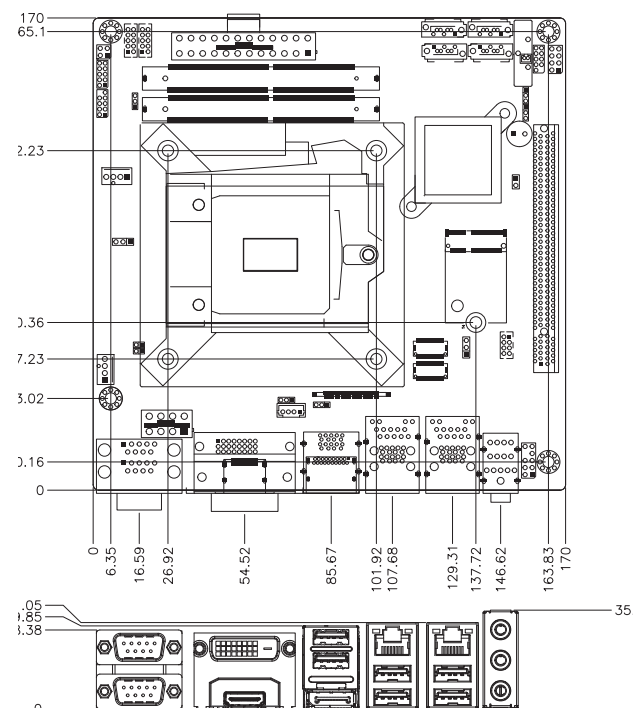
Features

- 9th/8th Gen Intel® Xeon® E / Core™ / Pentium® / Celeron® processors, up to 4.7GHz
- 2x DDR4 SO-DIMM, Max. 32GB, ECC compatible
- Intel® Processor integrated graphics, supports DVI-D, HDMI, DisplayPort and 24-bit dual channel LVDS or eDP
- Dual Intel® Gigabit LAN
- 6x USB3.0, 2x USB2.0, 4x COM, 4x SATA III
- 1x PCI-E (x16), 2x M.2
- Watchdog timer, Digital I/O, iAMT (11.6), TPM (2.0)

Ordering Information

MI998AF-C246	LGA1151 C246 Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, LVDS, Dual Gigabit LAN, RAID, iAMT(11.6), TPM(2.0)
MI998AFE-C246	LGA1151 C246 Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, eDP, Dual Gigabit LAN, RAID, iAMT(11.6), TPM(2.0)
MI998AF	LGA1151 Q370 Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, LVDS, Dual Gigabit LAN, RAID, iAMT(11.6), TPM(2.0)
MI998AFE	LGA1151 Q370 Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, eDP, Dual Gigabit LAN, RAID, iAMT(11.6), TPM(2.0)
MI998EF	LGA1151 H310 Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, LVDS, Dual Gigabit LAN, TPM(2.0)
MI998EFE	LGA1151 H310 Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, eDP, Dual Gigabit LAN, TPM(2.0)

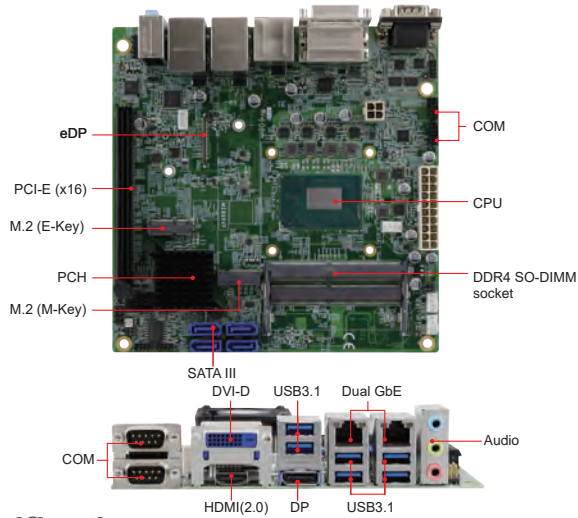
Dimensions and Drawing



MI996

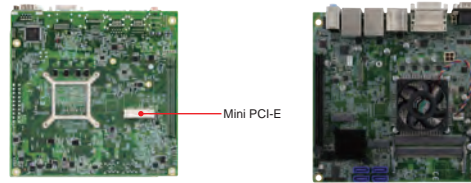
Mini-ITX Motherboard

9th Gen Intel® Xeon® E / Core™ i7/i5/i3 Celeron® Mini-ITX Motherboard
w/ Intel® CM246 PCH



Features

- Onboard 9th Gen Intel® Xeon® E / Core™ i7/i5/i3 Celeron
- 2x DDR4 SO-DIMM sockets, Max. 32GB
- Supports eDP, HDMI(2.0a) / DVI-D and DisplayPort
- 2x Intel® Gigabit LAN
- 6x USB 3.1, 4x USB 2.0, 4x COM, 4x SATA III
- 1x PCI-E (x16), 1x Mini PCI-E, 2x M.2
- Watchdog timer, Digital I/O, iAMT (11.6), TPM(2.0), iSMART, vPRO (MI996VF series)



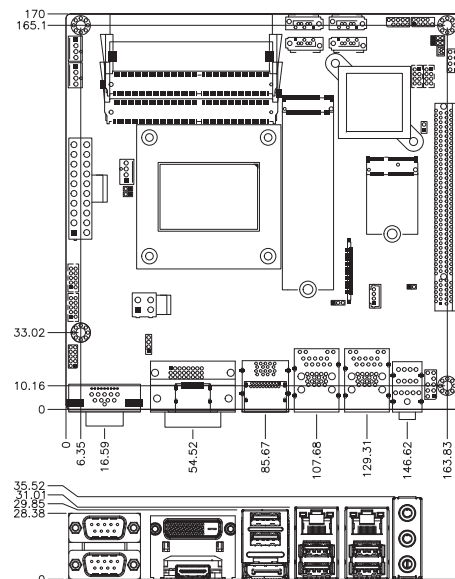
Specifications

CPU Socket	FCBGA1440
CPU	9th Gen Intel® Xeon® E / Core™ i7/i5/i3 processors
PCH	Intel® CM246 PCH: MI996VF-X28/26 Intel® QM370 PCH: MI996VF-9850/ 9400 Intel® HM370 PCH: MI996EF-9100/ 4930
Memory Types	2x DDR4-2666 SO-DIMM socket, Max. 32GB (supports ECC by CPU SKUs)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	mSATA, M.2
Expansion Slots	1x PCI-E (x16)
Mini Type Slots	1x Mini PCI-E 1x M.2 (M-key, type:2280, NVMe) 1x M.2 (E-Key, type:2230, CNVi)
Graphics Controller	9th Gen Intel® Xeon® / Core™ i7/i5/i3 processor integrated
Video Output	Supports eDP, HDMI(2.0a), DisplayPort and DVI-D
Ethernet	LAN 1: MI996VF-Series: Intel® I219LM Gigabit LAN PHY MI996EF: Intel® I219V Gigabit LAN PHY LAN 2: MI996VF-X26/28: Intel® I210AT Gigabit LAN MI996VF-9100/MI996EF-9100: Intel® I211AT Gigabit LAN
I/O Chip	Fintek F81964D-1
Serial Port	2x RS232/422/485, 2x RS232
USB 2.0	4x USB 2.0 via pin header
USB 3.0/ 3.1	6x USB3.1 on board
Serial ATA	MI996VF-X26/28: 4x SATA III MI996VF-9850, MI996EF-9100: 2x SATA III
Audio	Intel® [CNL PCH-H integrated] built-in HD audio controller + Realtek ALC888S w/ 7.1 channels
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out); TPM 2.0, iSMART, EuP/ErP, RAID, iAMT (11.6), ATX
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	TBD
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MI996VF-X28	FCBGA1440 Intel® CM246/ Xeon® E-2276ME Mini-ITX motherboard, w/ HDMI (2.0a), DisplayPort, DVI-D and eDP, dual Gigabit LAN, TPM (2.0), RAID, vPro, iAMT (11.6), iSMART (3.8), CPU cooler on board
MI996VF-9850	FCBGA1440 Intel® QM370/ Core™ i7-9850HE Mini-ITX motherboard, w/ HDMI (2.0a), DisplayPort, DVI-D and eDP, dual Gigabit LAN, TPM (2.0), RAID, vPro, iAMT (11.6), iSMART (3.8), CPU cooler on board
MI996VF-9400	FCBGA1440 Intel® QM370/ Core™ i5-9400H Mini-ITX motherboard, w/ HDMI (2.0a), DisplayPort, DVI-D and eDP, dual Gigabit LAN, TPM (2.0), RAID, vPro, iAMT (11.6), iSMART (3.8), CPU cooler on board
MI996EF-9100	FCBAG1440 Intel® HM370/ Core™ i3-9100HL Mini-ITX motherboard, w/ HDMI (2.0a), DisplayPort, DVI-D and eDP, dual Gigabit LAN, TPM (2.0), EuP/ErP, CPU cooler on board
MI996EF-4930	FCBAG1440 Intel® HM370/ Celeron™ G4930E Mini-ITX motherboard, w/ HDMI (2.0a), DisplayPort, DVI-D and eDP, dual Gigabit LAN, TPM (2.0), EuP/ErP, CPU cooler on board

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

MI995

Mini-ITX Motherboard 8th Gen Intel® Xeon® E / Core™ i7/i5/i3 Mini-ITX Motherboard w/ Intel® CM246 PCH

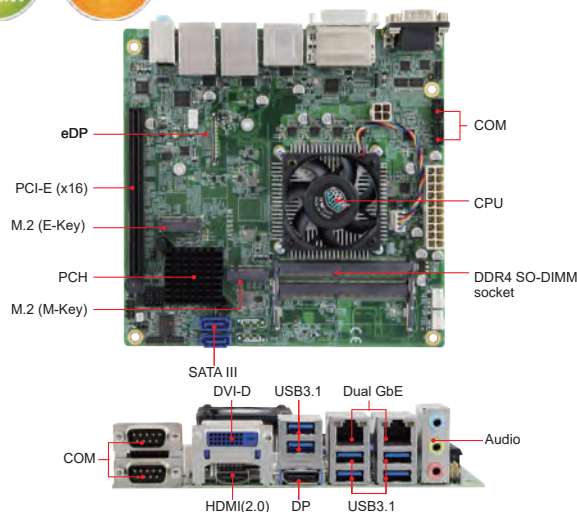


1 CPU Modules

2 Disk-Size SBCs

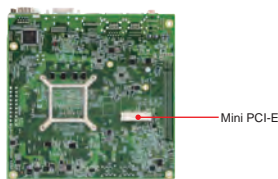
3 Motherboards

4 CPU Cards



Features

- 8th Gen Intel® Xeon® E / Core™ i7/i5/i3
- 2x DDR4 SO-DIMM sockets, Max. 32GB
- Supports eDP, HDMI(2.0a) / DVI-D and DisplayPort
- 2x Intel® Gigabit LAN
- 6x USB 3.1, 4x USB 2.0, 4x COM, 4x SATA III
- 1x PCI-E (x16), 1x Mini PCI-E, 2x M.2
- Watchdog timer, Digital I/O, iAMT (11.6), TPM(2.0), iSMART, vPRO (MI995VF series)



Specifications

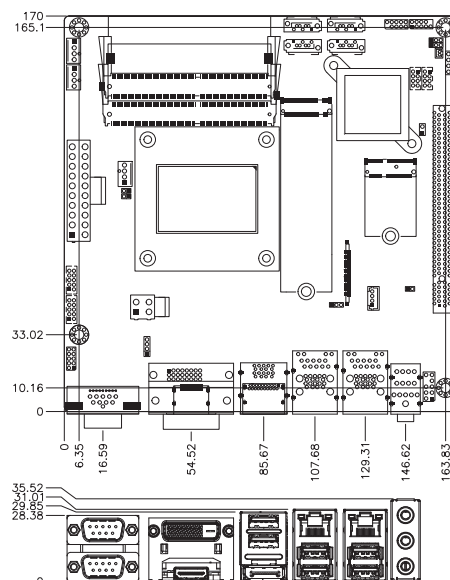
CPU Socket	FCBGA1440
CPU	8th Gen Intel® Xeon® E / Core i7/i5/i3 processors
PCH	MI995VF-X27: Intel® CM246 PCH MI995VF-8850/8400: Intel® QM370 PCH MI995EF-8100: Intel® HM370 PCH
Memory Types	2x DDR4-2666 SO-DIMM socket, Max. 32GB (supports ECC by CPU SKUs)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	mSATA, M.2
Expansion Slots	1x PCI-E (x16)
Mini Type Slots	1x Mini PCI-E 1x M.2 (M-key, type:2280, NVMe) 1x M.2 (E-Key, type:2230, CNV)
Graphics Controller	8th Gen Intel® Xeon® / Core™ i7/i5/i3 processor integrated
Video Output	Supports eDP, HDMI(2.0a), DisplayPort and DVI-D
Ethernet	LAN 1: MI995VF-Series: Intel® I219LM Gigabit LAN PHY MI995EF: Intel® I219V Gigabit LAN PHY LAN 2: MI995VF-X27: Intel® I210AT Gigabit LAN MI995VF-8850/8400/MI995EF-8100: Intel® I211AT Gigabit LAN
I/O Chip	Fintek F81964D-I
Serial Port	2x RS232/422/485, 2x RS232
USB 2.0	4x USB 2.0 via pin header
USB 3.0/ 3.1	6x USB3.1 on board
Serial ATA	MI995VF-X27: 4x SATA III MI995VF-8850/8400, MI995EF-8100: 2x SATA III
Audio	Intel® [CNL PCH-H integrated] built-in HD audio controller + Realtek ALC888S w/ 7.1 channels
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out); TPM 2.0, iSMART, Eup/ErP, RAID, iAMT (11.6), ATX
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Core™ i5-8400H, 2.50GHz, w/ 2 x 16GB DDR4-2133 +12V: 3.01A +5V: 1.43A +5VSB: 0.15A +3.3V: 0.32A

Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

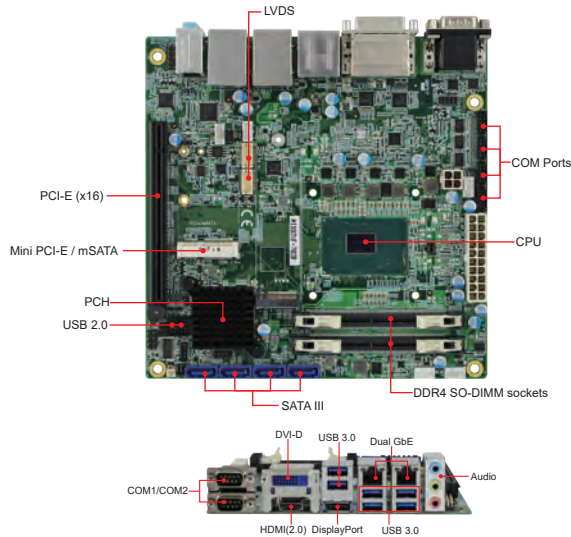
MI995VF-X27	FCBGA1440 Intel® CM246/ Xeon® E-2176M Mini-ITX motherboard, w/ HDMI (2.0a), DisplayPort, DVI-D and eDP, dual Gigabit LAN, TPM (2.0), RAID, vPro, iAMT (11.6), iSMART (3.5), CPU cooler on board
MI995VF-8850	FCBGA1440 Intel® QM370/ Core™ i7-8850H Mini-ITX motherboard, w/ HDMI (2.0a), DisplayPort, DVI-D and eDP, dual Gigabit LAN, TPM (2.0), RAID, vPro, iAMT (11.6), iSMART (3.5), CPU cooler on board
MI995VF-8400	FCBGA1440 Intel® QM370/ Core™ i5-8400H Mini-ITX motherboard, w/ HDMI (2.0a), DisplayPort, DVI-D and eDP, dual Gigabit LAN, TPM (2.0), RAID, vPro, iAMT (11.6), iSMART (3.5), CPU cooler on board
MI995EF-8100 (Coming soon)	FCBGA1440 Intel® HM370/ Core™ i3-8100H Mini-ITX motherboard, w/ HDMI (2.0a), DisplayPort, DVI-D and eDP, dual Gigabit LAN, TPM (2.0), EuP/ErP, CPU cooler on board

Dimensions and Drawing



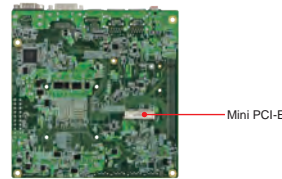
MI992

Mini-ITX Motherboard 7th/6th Gen Intel® Xeon® E3 / Core™ i7/i5/i3 Mini-ITX Motherboard w/ Intel® CM238 PCH



Features

- Onboard 7th Gen Intel® Xeon® E3 / Core™ i7/i5/i3
- 2x DDR4 SO-DIMM, Max.32GB, ECC
- Intel® processor integrated graphics, supports DVI-D, HDMI 1.4, DisplayPort and 24-bit dual-channel LVDS
- 2x Intel® Gigabit LAN
- 6x USB 3.0, 4x USB 2.0, 4x SATA III, 4x COM
- 1x PCI-E (x16), 2x Mini PCI-E, 1x mSATA, 1x M.2
- Watchdog timer, Digital I/O, iAMT 11.6, TPM 2.0, vPro, iSMART



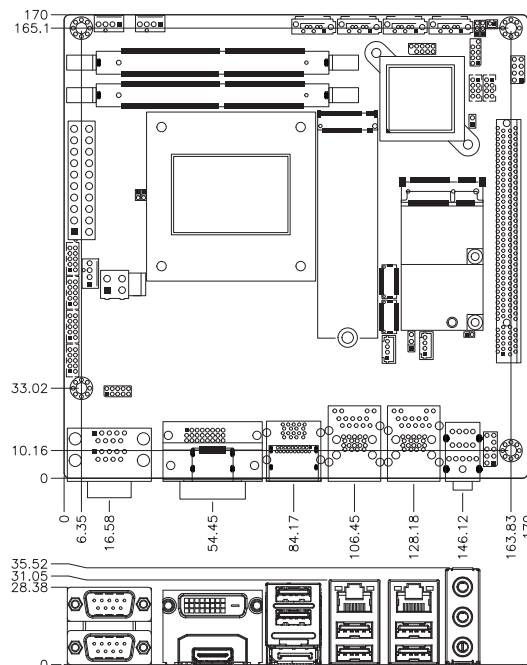
Specifications

CPU Socket	BGA1440
CPU	7th Gen Intel® Xeon® E3 / Core™ i7/i5/i3 processors, up to 3.7GHz
PCH	MI992VF series: Intel® CM238 PCH MI992EF series: HM175 PCH
Memory Types	2x DDR4 SO-DIMM, Max.32GB (supports ECC by CPU SKUs)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA via Mini PCI-E (via SATA III and PCI-E) 1x M.2 slot (Thru SATA III and PCI-E)
Expansion Slots	1x PCI-E (x16)
Mini Type Slots	2x Mini PCI-E 1x M.2
Graphics Controller	7th Gen Intel® Xeon® / Core™ i7/i5/i3 processor integrated
Video Output	Supports DVI-D, HDMI (1.4), DisplayPort and 24-bit dual-channel LVDS
Ethernet	MI992VF series: Intel® I219LM Gigabit LAN PHY MI992EF series: Intel® I219V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2nd LAN)
I/O Chip	Fintek F81846AD-I
USB 2.0	4x USB 2.0 via pin-header
USB 3.0/ 3.1	6x USB 3.0 on board
Serial ATA	MI992VF series: 4x SATA III MI992EF series: 2x SATA III
Audio	Intel® CM238 / HM175 PCH built-in HD audio + Realtek ALC892 codec
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out), RAID, IAMT (11.6), iSMART
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Core i7-7820EQ, 3.00GHz, w / 2x 4GB DDR4-2133 +12V: 4.67A +5V: 1.39A +5VSB: 0.05A +3.3V: 0.35A
Operating Temperature	0°C ~ 60°C (32°F ~ 140°F)
Storage Temperature	-20°C ~ 80°C (-4°F ~ 176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MI992VF-X3G	BGA1440 Intel® CM238/ Xeon® E3-1505M v6(3.0GHz) Mini-ITX Motherboard w/ DVI-D, HDMI (1.4), DisplayPort, LVDS, dual Gigabit LAN, RAID, iAMT (11.6), TPM (2.0), vPro, iSMART, CPU cooler on board
MI992VF-7820	BGA1440 Intel® CM238/ Core™ i7-7820EQ(3.0GHz) Mini-ITX Motherboard w/ DVI-D, HDMI (1.4), DisplayPort, LVDS, dual Gigabit LAN, RAID, iAMT (11.6), TPM (2.0), vPro, iSMART, CPU cooler on board
MI992VF-7440	BGA1440 Intel® CM238/ Core™ i5-7440EQ(2.9GHz) Mini-ITX Motherboard w/ DVI-D, HDMI (1.4), DisplayPort, LVDS, dual Gigabit LAN, RAID, iAMT (11.6), TPM (2.0), vPro, iSMART, CPU cooler on board
MI992EF-7100	BGA1440 Intel® HM175/ Core™ i3-7100E(2.9GHz) Mini-ITX Motherboard w/ DVI-D, HDMI (1.4), DisplayPort, LVDS, dual Gigabit LAN, RAID, EuP/ErP compliant, iSMART, CPU cooler on board

Dimensions and Drawing



1 CPU Modules

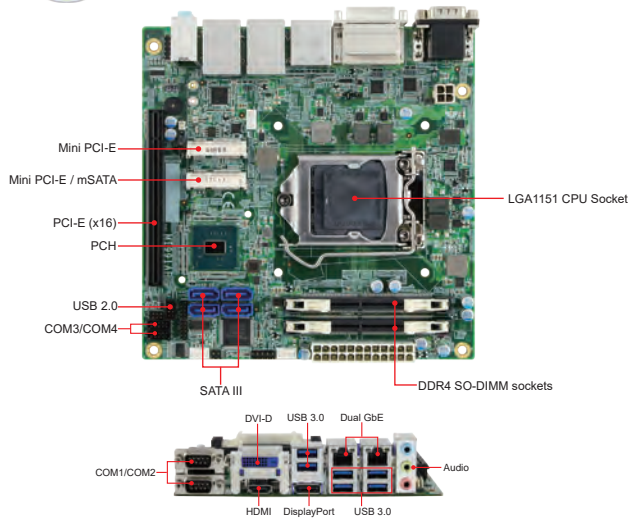
2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

MI991

Mini-ITX Motherboard 7th/6th Gen Intel® Xeon® E3 / Core™ i7/i5/i3 / Pentium®/Celeron® Mini-ITX Motherboard w/ Intel® C236 PCH



Features

- 7th/6th Gen Intel® Xeon® E3 / Core™ i7/i5/i3/ Pentium® / Celeron® QC/DC processors, up to 4.0GHz
- 2x DDR4 SO-DIMM, Max. 32GB, ECC compatible
- Intel® Processor integrated graphics, supports DVI-D, HDMI and DisplayPort
- Dual Intel® Gigabit LAN
- 2x USB 2.0, 6x USB 3.0, 4x COM, 4x SATA III
- 2x Mini PCI-E slots, 1x mSATA, 1x PCI-E (x16)
- Watchdog timer, Digital I/O, iAMT (11.0), TPM (1.2), iSMART

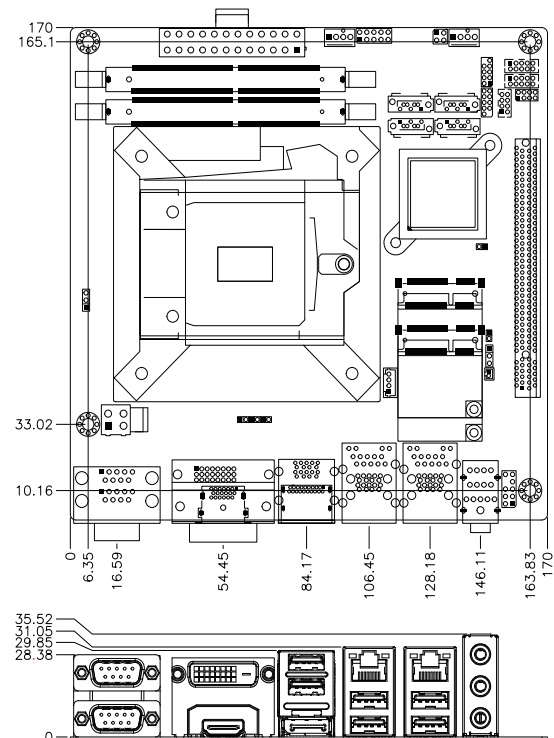
Specifications

CPU Socket	LGA1151
CPU	7th/6th Gen Intel® Xeon® E3/ Core™ i7/i5/i3/ Pentium®/ Celeron® QC/ DC processors, up to 4.0GHz
PCH	MI991AF-C236: Intel® C236 PCH MI991AF: Intel® Q170 PCH MI991EF: Intel® H110 PCH
Memory Types	2x DDR4 SO-DIMM, Max. 32GB (supports ECC by CPU SKUs)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA
Expansion Slots	1x PCI-E (x16)
Mini Type Slots	2x Mini PCI-E
Graphics Controller	7th/6th Gen Intel® Xeon®/ Core™ i7/i5/i3/ Pentium® processor Integrated
Video Output	Supports DVI-D, HDMI and DisplayPort
Ethernet	MI991AF: Intel® I219LM Gigabit LAN PHY MI991EF: Intel® I219V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN(as 2nd LAN)
I/O Chip	Fintek F81846D-I
Serial Port	3x RS232, 1x RS232/422/485 (jumperless selection)
USB 2.0	MI991EF: 2x USB 2.0 on board 2x USB 2.0 via pin-header
USB 3.0/ 3.1	MI991AF series: 6x USB 3.0 on board MI991EF: 4x USB 3.0
Serial ATA	MI991AF series: 4x SATA III MI991EF: 3x SATA III
Audio	Intel® C236/ Q170/ H110 PCH built-in HD audio + Realtek ALC662 codec
TPM	TPM (1.2)
Others	Digital I/O(4-in/4-out), EuP/ErP, RAID, iAMT (11.0), iSMART
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Core™ i5-6500TE 2.3GHz w/ 2x DDR4-2133 4GB +12V: 3.56A; +5V: 1.28A; +5VSB: 0.08A; +3.3V: 0.32A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MI991AF-C236	LGA1151 C236 Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, dual Gigabit LAN, RAID, iAMT (11.0), TPM (1.2), iSMART (3.0)
MI991AF	LGA1151 Q170 Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, dual Gigabit LAN, RAID, iAMT (11.0), TPM (1.2), iSMART (3.0)
MI991EF	LGA1151 H110 Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, dual Gigabit LAN, EuP/ErP, iSMART (3.0)

Dimensions and Drawing



1 CPU Modules

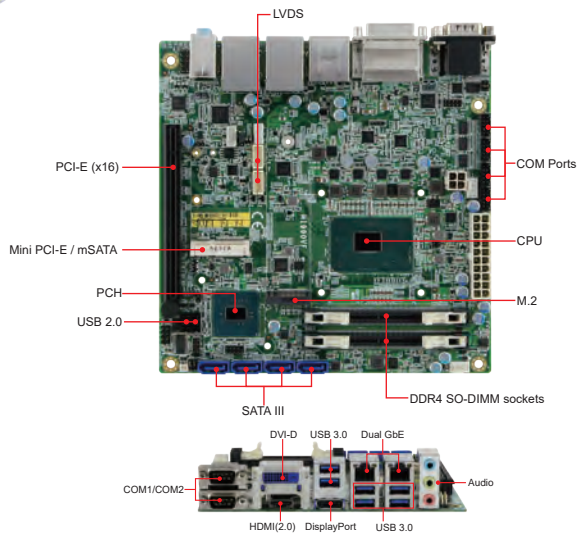
2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

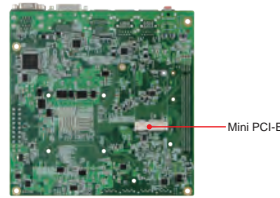
MI990

Mini-ITX Motherboard 6th Gen Intel® Xeon® E3 / Core™ i7/i5/i3 / Celeron® Mini-ITX Motherboard w/ Intel® CM236 PCH



Features

- Onboard 6th Gen Intel® Xeon® E3 / Core™ i7/i5/i3 / Celeron® QC/DC processors, up to 3.7GHz
- 2x DDR4 SO-DIMM, Max. 32GB, ECC compatible
- Intel® Processor integrated graphics device, supports DVI-D, HDMI (2.0), DisplayPort and 24-bit dual-channel LVDS
- 2x Intel® Gigabit LAN
- 4x USB 2.0, 6x USB 3.0, 6x COM, 4x SATA III
- 1x PCI-E (x16), 2x Mini PCI-E, 1x mSATA, 1x M.2
- Watchdog timer, Digital I/O, iAMT (11.0), TPM (2.0), vPro, iSMART 3.0



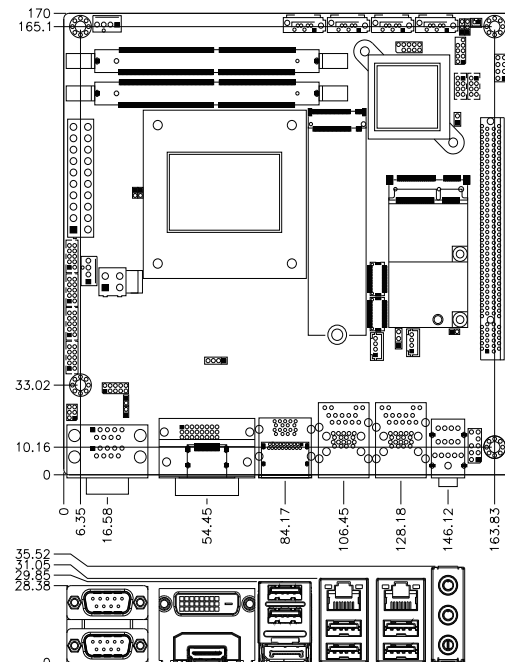
Specifications

CPU Socket	BGA1440
CPU Socket	6th Gen Intel® Xeon® E3 / Core™ i7/i5/i3 / Celeron® QC/ DC processors, up to 3.7GHz
PCH	MI990VF series: Intel® CM236 PCH MI990EF series: Intel® HM170 PCH
Memory Types	2x DDR4 SO-DIMM, Max. 32GB (supports ECC by CPU SKUs)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA via Mini PCI-E (Thru SATA III) 1x M.2 slot (Thru SATA III & PCI-E)
Expansion Slots	1x PCI-E (x16)
Mini Type Slots	2x Mini PCI-E 1x M.2
Graphics Controller	6th Gen Intel® Xeon® / Core™ i7/ i5/ i3 / Celeron® processor integrated
Video Output	Supports DVI-D, HDMI (2.0), DisplayPort and 24-bit dual-channel LVDS
Ethernet	MI990VF series: Intel® I219LM Gigabit LAN PHY MI990EF series: Intel® I219V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2nd LAN)
I/O Chipset	Fintek F81866AD-1
Serial Port	5x RS232 1x RS232/422/485 (jumperless selection)
USB 2.0	4xs USB 2.0 via pin-header
USB 3.0/ 3.1	6x USB 3.0 on board
Serial ATA	MI990VF series: 4x SATA III MI990EF series: 2x SATA III
Audio	Intel® CM236 / HM170 PCH built-in HD audio + Realtek ALC892 codec
TPM	TPM (2.0)
Others	Digital I/O(4-in/4-out), RAID, iAMT (11.0), iSMART
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Core™ i5-6400EQ 2.4GHz w/ 2x 8GB DDR4-2133 +12V: 2.84A; +5V: 1.45A; +5VSB: 0.058A; +3.3V: 0.52A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MI990VF-X28E	BGA1440 Intel® CM236/ Xeon® E3-1505M v5(2.8GHz) Mini-ITX motherboard w/ DVI-D, HDMI (2.0), DisplayPort, LVDS, dual Gigabit LAN, RAID, iAMT (11.0), TPM (2.0), vPro, iSMART (3.0), CPU cooler on board
MI990VF-6820E	BGA1440 Intel® CM236/ Core™ i7-6820EQ(2.8GHz) Mini-ITX motherboard w/ DVI-D, HDMI (2.0), DisplayPort, LVDS, dual Gigabit LAN, RAID, iAMT (11.0), TPM (2.0), vPro, iSMART (3.0), CPU cooler on board
MI990VF-6440E	BGA1440 Intel® CM236/ Core™ i5-6440EQ(2.7GHz) Mini-ITX motherboard w/ DVI-D, HDMI (2.0), DisplayPort, LVDS, dual Gigabit LAN, RAID, iAMT (11.0), TPM (2.0), vPro, iSMART (3.0), CPU cooler on board
MI990EF-6100E	BGA1440 Intel® HM170/ Core™ i3-6100E(2.7GHz) Mini-ITX motherboard w/ DVI-D, HDMI (2.0), DisplayPort, LVDS, dual Gigabit LAN, RAID, EuP/ErP compliant, iSMART (3.0), CPU cooler on board

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

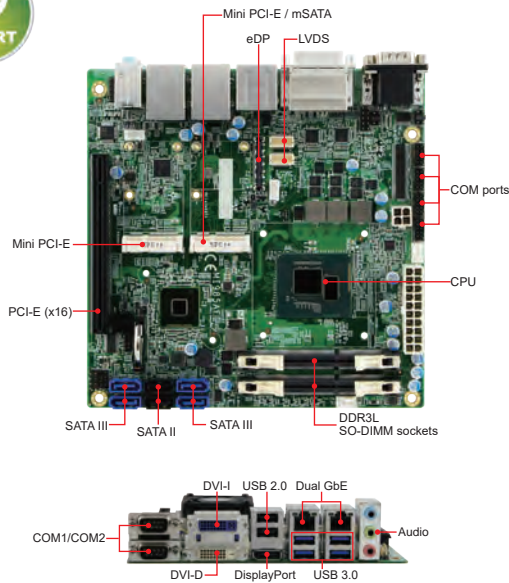
3 Motherboards

4 CPU Cards

MI985

Mini-ITX Motherboard

5th Gen Intel® Core™ i7 Mini-ITX Motherboard w/ Intel® QM87 PCH



Features

- Onboard 5th Gen Intel® Core™ i7 QC processors
- 2x DDR3L SO-DIMM, Max. 16GB
- Integrated graphics, supports DVI-I/ DVI-D / LVDS/ DisplayPort
- 2x Intel® PCI-E Gigabit LAN
- Watchdog timer, Digital I/O, TPM(2.0), iAMT (10.0), iSMART 3.1
- 6x USB 2.0, 4x USB 3.0, 6x COM, 4x SATA III, 2x SATA II
- 1x PCI-E (x16), 2x Mini PCI-E (x1)

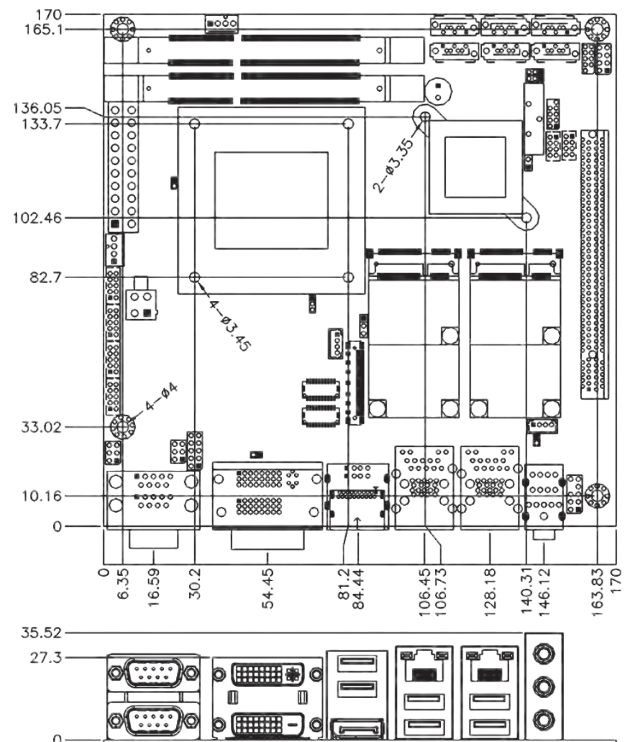
Specifications

CPU Socket	BGA1364
CPU	5th Gen Intel® mobile Core™ i7 QC processors
PCH	Intel® QM87 PCH
Memory Types	2x DDR3L SO-DIMM, Max. 16GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	1x PCI-E (x16)
Mini Type Slots	2x Mini PCI-E (x1)
Graphics Controller	Intel® 5th Gen Core™ i7 integrated graphics supports CRT, DVI, DisplayPort, LVDS / eDP
Video Output	Supports 24-bit dual-channel LVDS/eDP DVI-I, DVI-D, DisplayPort
Ethernet	Intel® I218LM PHY Intel® I211AT PCI-E Gigabit LAN
I/O Chip	Fintek F81866AD-I
Serial Port	5x RS232, 1x RS232/422/485 (jumperless selection)
USB 2.0	2x USB 2.0 on board 4x USB 2.0 via pin-header
USB 3.0/ 3.1	4x USB 3.0 on board
Serial ATA	4x SATA III 2x SATA II
Audio	Intel® QM87 PCH built-in HD audio controller + ALC892 with 7.1 channel
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out), ATX power connector, iSMART
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Core™ i7-5850EQ 2.70GHz w/ 4GB DDR3L-1600 +12V: 3.37A; +5V: 0.83A; +5VSB: 0.08A; +3.3V: 0.51A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MI985AF-Q26	BGA1364 Intel® QM87/Core™ i7-5700EQ (2.6GHz) Mini-ITX motherboard w/ DVI-I, DVI-D, DisplayPort, LVDS, dual Gigabit LAN, iAMT (10.0), TPM (2.0), iSMART
MI985AF-Q27e	BGA1364 Intel® QM87/Core™ i7-5850EQ (2.7GHz) Mini-ITX motherboard w/ DVI-I, DVI-D, DisplayPort, LVDS, dual Gigabit LAN, iAMT (10.0), TPM (2.0), iSMART

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

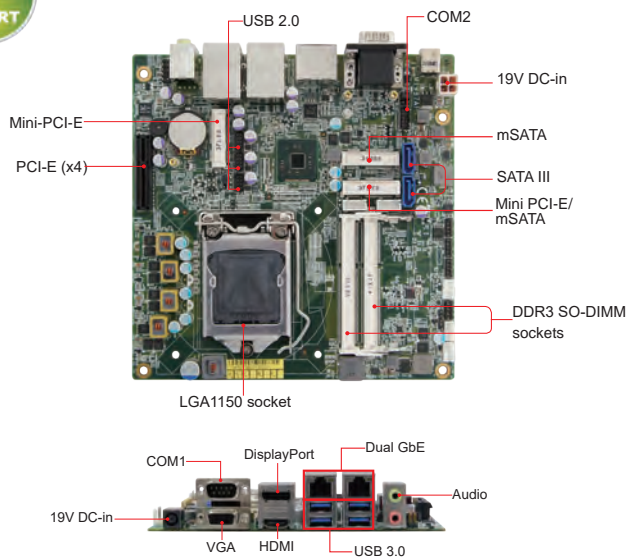
3 Motherboards

4 CPU Cards

MI987

Mini-ITX Motherboard

4th Gen Intel® Core™ i7/i5/i3 Mini-ITX Motherboard
w/ Intel® Q87 PCH



Specifications

CPU Socket	LGA1150
CPU	4th Gen Intel® Core™ DT i7/i5/i3 processors (Max. 45W TDP)
PCH	MI987AF: Intel® Q87 PCH MI987EF: Intel® H81 PCH
Memory Types	2x DDR3-1600 SO-DIMM, Max. 16GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	2x mSATA
Expansion Slots	1x PCI-E (x4) slot
Mini Type Slots	2x Mini PCI-E (1x full-size, 1x half-size)
Graphics Controller	4th Gen Intel® Core™ DT i7/i5/i3 processors integrated graphics
Video Output	Supports VGA, HDMI and DisplayPort
Ethernet	MI987AF: Intel® I217LM Gigabit LAN PHY MI987EF: Intel® I217V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2 nd LAN)
I/O Chip	Nuvoton NCT5523D 1x RS232/422/485 (jumperless selection) 1x RS232
USB 2.0	MI987AF: 6x USB 2.0 via pin header MI987EF: 2x USB 2.0 on board 4x USB 2.0 via pin header
USB 3.0/ 3.1	MI987AF: 4x USB 3.0 on board MI987EF: 2x USB 3.0
Serial ATA	2x SATA III
Audio	Intel® Q87/H81 PCH built-in HD audio controller + Realtek ALC662 w/ 5.1 channel
TPM	TPM (1.2)
Others	19V DC-In, Digital I/O, iSMART
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Core™ i7-4770TE 2.30GHz w/ 2x 2GB DDR3-1333 + 19V: 6.08 A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

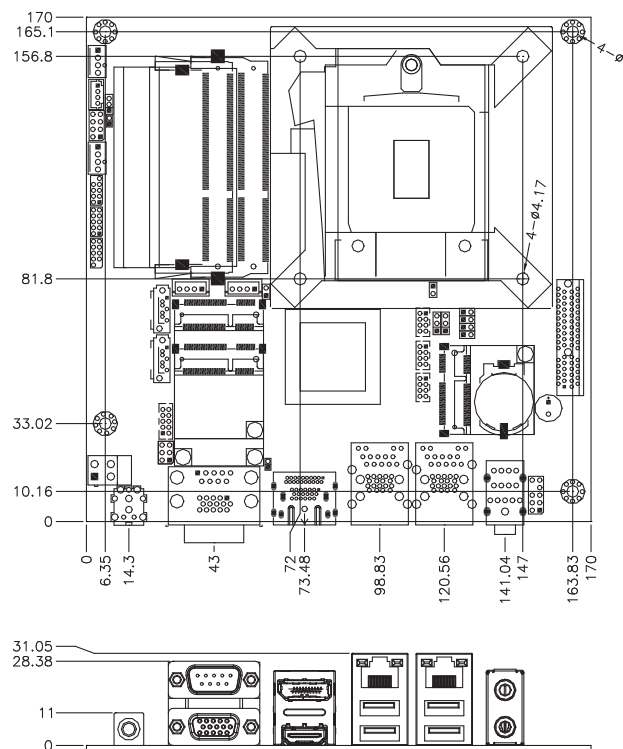
Features

- 4th Gen Intel® Core™ i7/i5/i3 processor (maximum 45W TDP), up to 2.7GHz
- 2x DDR3-1600 SO-DIMM, Max. 16GB
- Supports VGA, HDMI and DisplayPort
- 2x Intel® PCI-E Gigabit LAN
- 4x USB 3.0, 6x USB 2.0, 2x COM, 2x SATA III
- 2x Mini PCI-E slots, 2x mSATA, 1x PCI-E (x4)
- Watchdog timer, Digital I/O, iAMT (9.0), TPM(1.2), iSMART

Ordering Information

MI987AF	LGA1150 Q87 Mini-ITX motherboard w/ VGA, HDMI, DisplayPort, dual Gigabit LAN, TPM (1.2), iAMT (9.0), iSMART
MI987EF	LGA1150 H81 Mini-ITX motherboard w/ VGA, HDMI, DisplayPort, dual Gigabit LAN, TPM (1.2), EuP/ErP, iSMART

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

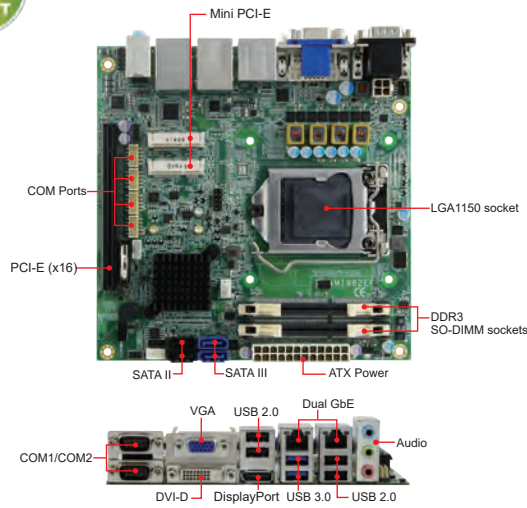
3 Motherboards

4 CPU Cards

MI982

Mini-ITX Motherboard

4th Gen Intel® Core™ i7/i5/i3 / Pentium® Mini-ITX Motherboard
w/ Intel® H81 PCH



Features

- 4th Gen Intel® Core™ i7/i5/i3 processor, up to 4.0GHz
- 2x DDR3-1600 SO-DIMM, Max.16GB
- Supports DVI-D, VGA and DisplayPort
- 2x Intel® PCI-E Gigabit LAN
- 2x USB 3.0, 6x USB 2.0, 6x COM, 2x SATA III, 2x SATA II
- 2x Mini PCI-E slots, 1x PCI-E (x16)
- Watchdog timer, Digital I/O, iSMART 3.0

1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

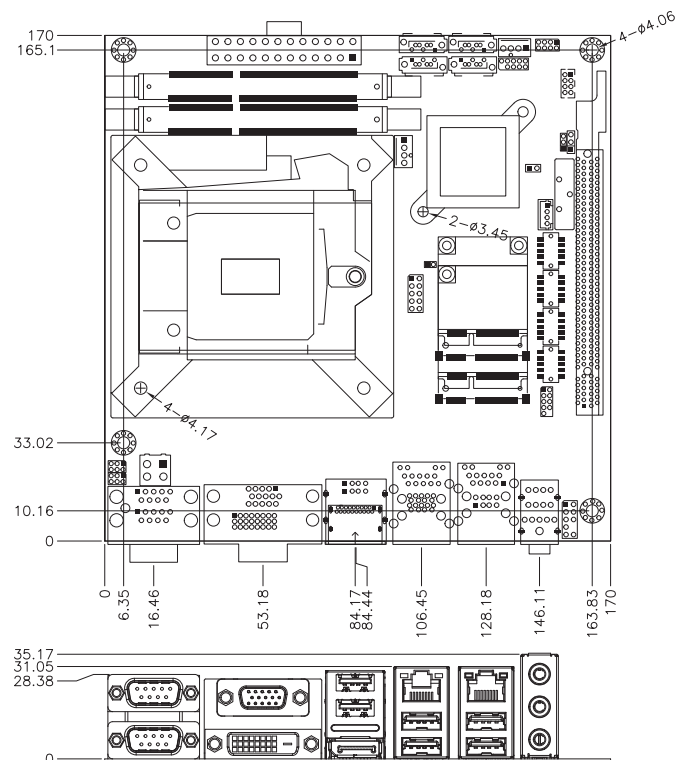
Specifications

CPU Socket	LGA1150
CPU	4th Gen Intel® Core™ DT i7/i5/i3/Pentium® processors
PCH	Intel® H81 PCH
Memory Types	2x DDR3-1600 SO-DIMM, Max. 16GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	1x PCI-E (x16) slot
Mini Type Slots	2x Mini PCI-E (1x full-size, 1x half-size)
Graphics Controller	4th Gen Intel® Core™ DT i7/i5/i3/ Pentium processors integrated graphics
Video Output	Supports VGA, DVI-D and DisplayPort
Ethernet	Intel® I217LM Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2nd LAN)
I/O Chip	Fintek F81866AD-I
Serial Port	1x RS232/422/485 (jumperless selection) 5x RS232
USB 2.0	4x USB 2.0 on board 2x USB 2.0 via pin header
USB 3.0/ 3.1	2x USB 3.0 on board
Serial ATA	4x SATA III
Audio	Intel® H81 PCH built-in HD audio controller + Realtek ALC892 with 7.1 channel
TPM	N/A
Others	Digital I/O [4-in/4-out], iSMART 3.0, EuP/ErP
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Core™ i7-4770TE 2.3GHz w/ 2GB DDR3-1333 +12V: 3.54A; +5V: 1.28A; +5VSB: 0.23A; +3.3V: 0.46A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MI982EF	LGA1150 H81 Mini-ITX motherboard w/ VGA, DVI-D, DisplayPort, dual Gigabit LAN, EuP/ErP, iSMART (3.0)
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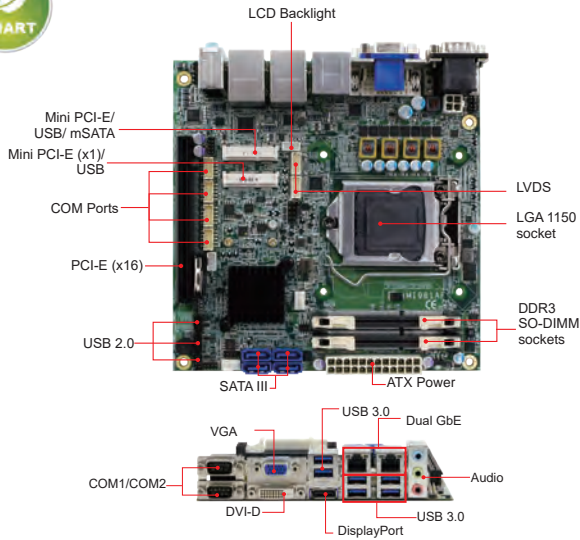
Dimensions and Drawing



MI981

Mini-ITX Motherboard

4th Gen Intel® Xeon® E3 / Core™ i7/i5/i3 / Pentium® / Celeron®
Mini-ITX Motherboard w/ Intel® Q87 PCH



Specifications

CPU Socket	LGA1150
CPU	4th Gen Intel® Xeon® E3/ Core™ DT i7/i5/i3 /Pentium®/ Celeron® processors
PCH	Intel® Q87 PCH
Memory Types	2x DDR3-1600 SO-DIMM, Max.16GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
Storage Device Interface	1x mSATA
H/W Monitor	Yes
Expansion Slot	1x PCI-E (x16) slot
Mini Type Slots	2x Mini PCI-E (1x full-size, 1x half-size)
Graphics Controller	4th Gen Intel® Core™ DT i7/i5/i3 processors integrated graphics
Video Output	Supports VGA, DVI-D, LVDS and DisplayPort
Ethernet	Intel® I217LM Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN(as 2nd LAN)
I/O Chip	Fintek F81866AD-I
Serial Port	1x RS232/422/485 (jumperless selection) 5x RS232
USB 2.0	6x USB 2.0 via pin header
USB 3.0/ 3.1	6x USB 3.0 on board
Serial ATA	4x SATA III
Audio	Intel® Q87 PCH built-in HD audio controller + Realtek ALC892 w/ 7.1 channel
TPM	TPM (1.2)
Others	Digital I/O [4-in/4-out], TPM (1.2), iAMT (9.1), iSMART(3.0)
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Core™ i5-4570S 2.9GHz 2x DDR3-1333 2GB +12V: 6.29A ; +5V: 2.51A; +5VSB: 0.55A; +3.3V: 0.76A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

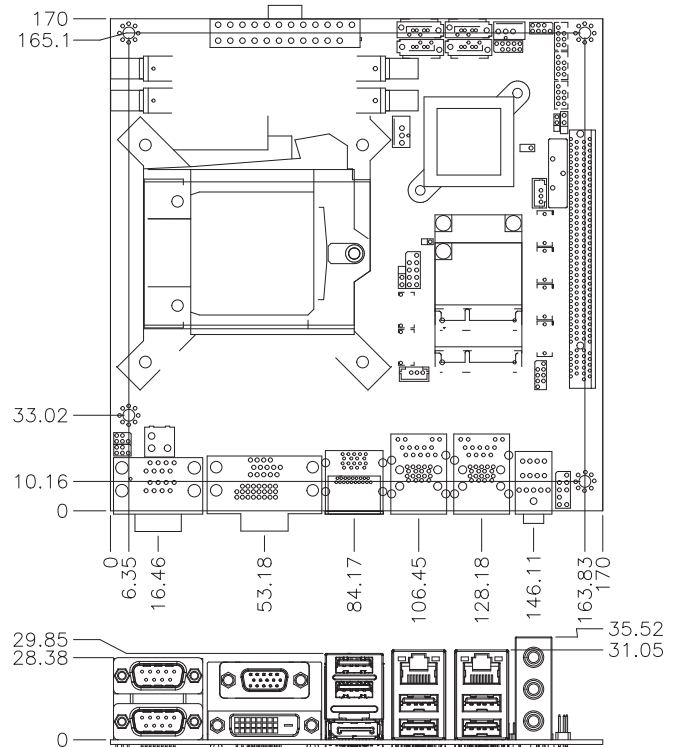
Features

- 4th Gen Intel® Xeon® E3/ Core™ i7/i5/i3 Pentium® / Celeron® Processor, up to 4.0GHz
- 2x DDR3-1600 SO-DIMM, Max.16GB
- Supports DVI-D, VGA, LVDS and DisplayPort
- 2x Intel® PCI-E Gigabit LAN
- 6x USB 3.0, 6x USB 2.0, 6x COM, 4x SATA III
- 2x Mini PCI-E slots, 1x mSATA, 1x PCI-E (x16)
- Watchdog timer, Digital I/O, iAMT (9.1), TPM(1.2), iSMART3.0

Ordering Information

MI981AF	LGA1150 Q87 Mini-ITX motherboard w/ VGA, DVI-D, LVDS, DisplayPort, dual Gigabit LAN, TPM (1.2), iAMT (9.1), iSMART(3.0)
MI981AF-C226	LGA1150 C226 Mini-ITX motherboard w/ VGA, DVI-D, LVDS, DisplayPort, dual Gigabit LAN, TPM (1.2), iAMT (9.1), iSMART(3.0)

Dimensions and Drawing



1 CPU Modules

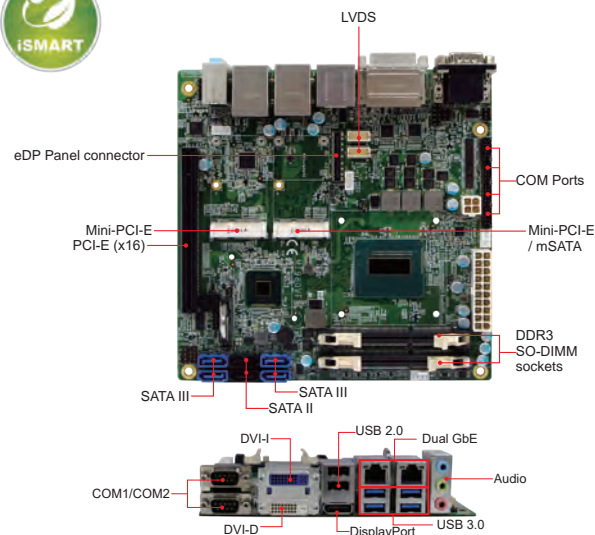
2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

MI980

Mini-ITX Motherboard 4th Gen Intel® Core™ i7/i5/i3 / Celeron® Mini-ITX Motherboard w/ Intel® QM87 PCH



1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

Specifications

CPU Socket	BGA1364
CPU	4th Gen Intel® mobile Core™ i7/i5/i3 / Celeron® QC / DC processors
PCH	MI980VF Series: Intel® QM87 PCH MI980F: Intel® HM86 PCH
Memory Types	2x DDR3/DDR3L SO-DIMM, Max. 16GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA via Mini PCI-E (Thru SATA III)
Expansion Slots	1x PCI-E (x16)
Mini Type Slots	2x Mini PCI-E (x1)
Graphics Controller	4th Gen Intel® Core™ i7/i5/i3 / Celeron® integrated graphics, supports CRT, DVI, DisplayPort, LVDS / eDP
Video Output	Supports 24-bit dual-channel LVDS/eDP, DVI-I, DVI-D, DisplayPort
Ethernet	MI980VF Series: Intel® I217LM Gigabit LAN PHY MI980F: Intel® I217V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2 nd LAN)
I/O Chip	Fintek F81866AD-I
Serial Port	1x RS232/422/485 (jumperless selection), 5x RS232
USB 2.0	2x USB 2.0 on board, 4x USB 2.0 via pin-header
USB 3.0 / 3.1	4x USB 3.0 ports on board
Serial ATA	MI980VF Series: 4x SATA III, 2x SATA II MI980F: 2x SATA III, 2x SATA II
Audio	Intel® QM87 / HM86 PCH built-in HD audio controller + ALC892 w/ 7.1 channel
TPM	TPM (1.2)
Others	Digital I/O (4-in/4-out), ATX power connector, iSMART
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Core™ i5-4402E 1.60GHz w/ 2x 2GB DDR3-1333 +12V: 2.01A; +5V: 0.73A; +5VSB: 1.70A; +3.3V: 0.29A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

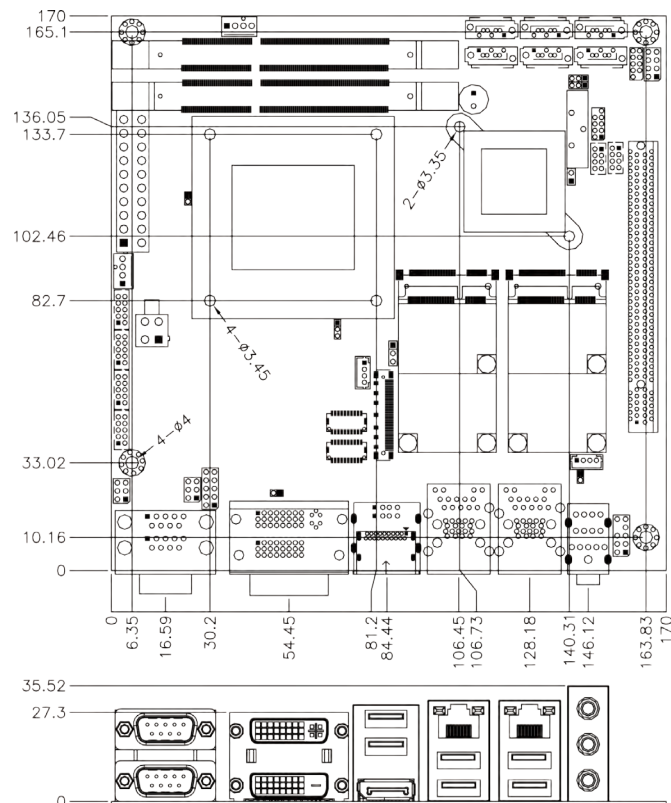
Features

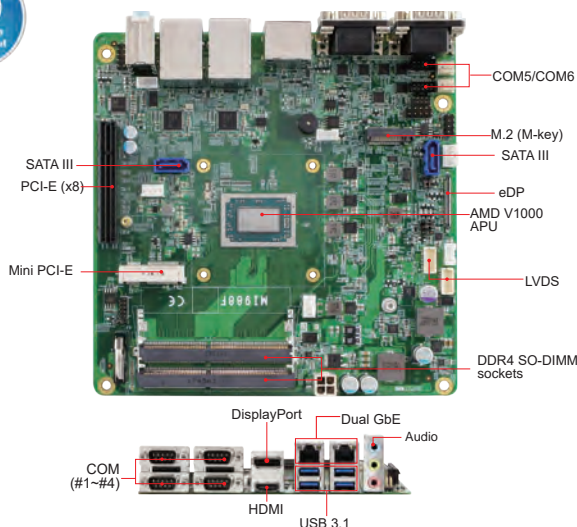
- Onboard 4th Gen Intel® Core™ i7/i5/i3/ Celeron® QC / DC processors
- 2x DDR3/DDR3L SO-DIMM, Max. 16GB
- Integrated graphics, supports DVI-I/ DVI-D/ LVDS or eDP/ DisplayPort
- 2x Intel® PCI-E Gigabit LAN
- 6x USB 2.0, 4x USB 3.0, 6x COM, 4x SATA III, 2x SATA II
- 1x PCI-E (x16), 2x Mini PCI-E (x1)
- Watchdog timer, Digital I/O, iAMT (9.0), vPro, iSMART

Ordering Information

MI980VF-4700EQ	Intel® QM87/Core™ i7-4700EQ (2.4GHz) Mini-ITX motherboard w/ DVI-I, DVI-D, DisplayPort, LVDS, dual Gigabit LAN, iAMT (9.0), RAID, TPM (1.2), vPro, iSMART, CPU cooler on board
MI980VF-4400E	Intel® QM87/Core™ i5-4400E (2.7GHz) Mini-ITX motherboard w/ DVI-I, DVI-D, DisplayPort, LVDS, dual Gigabit LAN, iAMT (9.0), RAID, TPM (1.2), vPro, iSMART, CPU cooler on board
MI980F-4100E	Intel® HM86 /Core™ i3-4100E (2.4GHz) Mini-ITX motherboard w/ DVI-I, DVI-D, DisplayPort, LVDS, dual Gigabit LAN, EuP/ErP compliant, iSMART, CPU cooler on board

Dimensions and Drawing





Specifications

CPU Socket	BGA 1140 APU on board
CPU	AMD Ryzen™ Embedded V1000 on board
PCH	N/A
Memory Types	DDR4 SO-DIMM, supports ECC 2x DDR4-2666, Max. 32GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x M.2 (supports NVMe)
Expansion Slots	1x PCI-E (x8), 1x M.2 (M-key, type: 2280)
Mini Type Slots	1x Mini PCI-E
Graphics Controller	AMD Radeon™ Vega GPU integrated
Video Output	1x HDMI (2.0a), 1x DisplayPort (1.2) 1x eDP or 1x 24-bit dual-channel LVDS
Ethernet	2x Intel® I211AT PCI-E Gigabit LAN
I/O Chip	Nuvoton NCT6116D
Serial Port	2x RS232/422/485 (jumperless selection) 4x RS232
USB 2.0	N/A
USB 3.0/ 3.1	4x USB 3.1 on board
Serial ATA	2x SATA III
Audio	Built-in HD audio w/ALC662 codec for 5.1 channel
TPM	N/A
Others	Digital I/O (4-in/4-out), iSMART, +12V~+24V DC-in
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	AMD Ryzen™ Embedded V1807B 3.35GHz w/ 2x 8GB DDR4-2133 +24V: 2.55A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

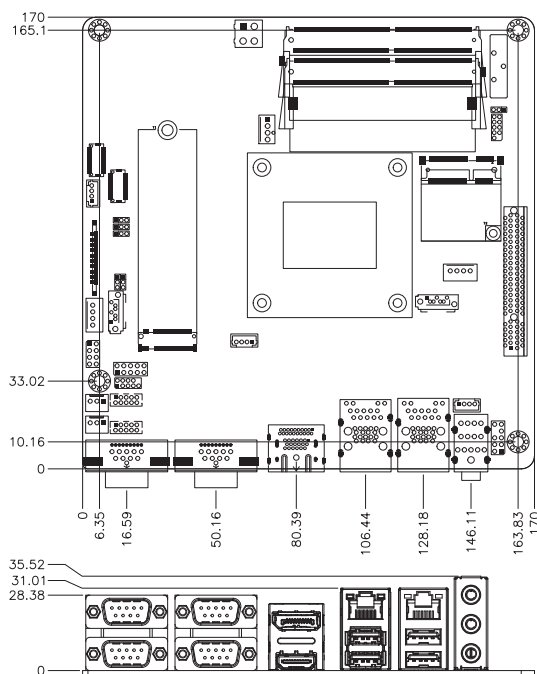
Features

- AMD Ryzen™ Embedded V1000 on board
- 2x DDR4 SO-DIMM, Max. 32GB
- 2x PCI-E Gigabit LAN
- 1x HDMI(2.0a), 1x DisplayPort (1.2), 1x eDP or 1x 24-bit dual-channel LVDS
- 4x USB3.1, 2x SATA III, 6x COM
- 1x PCI-E (x8), 1x Mini PCI-E socket, 1x M.2 (M-key)

Ordering Information

MI988F-1807	AMD Ryzen™ V1807B QC APU (3.35GHz/3.8GHz) on board Mini-ITX motherboard, with HDMI (2.0), DP, eDP or LVDS, dual Gigabit LAN, iSAMRT, +12V~+24V DC-in
MI988F-1756	AMD Ryzen™ V1756B QC APU (3.25GHz/3.6GHz) on board Mini-ITX motherboard, with HDMI (2.0), DP, eDP or LVDS, dual Gigabit LAN, iSAMRT, +12V~+24V DC-in
MI988F-1202	AMD Ryzen™ V1202B DC APU (2.3GHz/3.3GHz) on board Mini-ITX motherboard, with HDMI (2.0), DP, eDP or LVDS, dual Gigabit LAN, iSMART, +12V~+24V DC-in

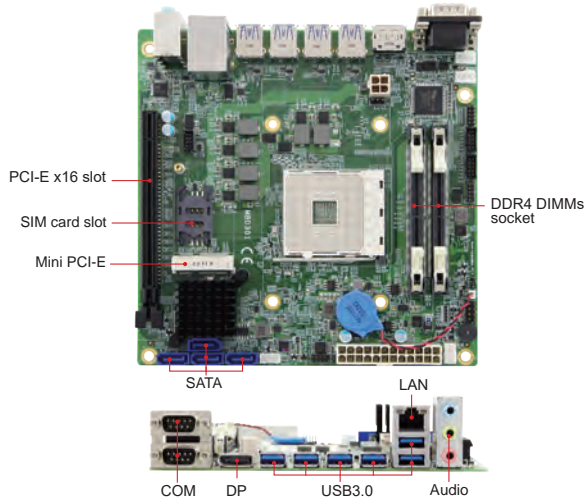
Dimensions and Drawing



MBD301

Mini-ITX Motherboard

AMD Ryzen™ 3000 Series Processors Mini-ITX Motherboard



Features

- IBASE iCONTROL intelligent energy-saving & Observer Hardware remote monitoring technologies
- AMD Ryzen™ 3000 Series Processor with Vega Graphics Processors
- 2x DDR4 2400MHz SO-DIMM, Max. 64GB
- 1x DisplayPort for 2nd Generation AMD APU
- 1x PCI-E x16 (default) or 2x PCI-E x8 (optional with riser card)
- 6x USB3.1, 2x COM, 1x Gigabit LAN
- 1x M.2 (E-key), 1x Mini PCI-E socket (full-size), 1x SIM slot

Specifications

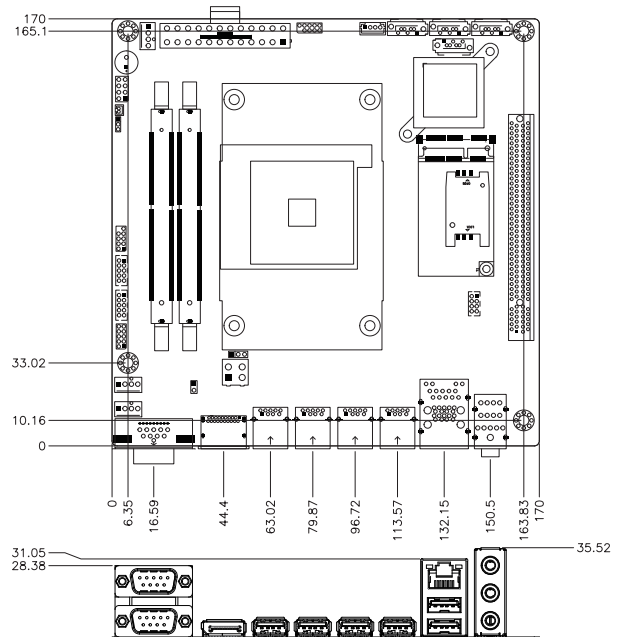
CPU Socket	AMD AM4
CPU	AMD AM4 socket
PCH	AMD X470
Memory Types	2 X DDR4 SO-DIMM memory slots; Max. 64GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	YES
Storage Device Interface	N/A
Expansion Slots	1x PCI-E (x16) slot supports single at x16 (PCI-E2) for AM4 Pure CPU series 1x PCI-E (x16) slot supports single at x8 (PCI-E2) for AM4 APU series
Mini Type Slots	1x Mini PCI-E (full-sized) 1x M.2 socket (Key E) 1x SIM card slot
Graphics Controller	AMD Radeon™ Vega GPU integrated
Video Output	1x DisplayPort (1.2) for AM4 APU series
Ethernet	1x Realtek RTL8111H
I/O Chip	Fintek F81439
Serial Port	COM #1 (RS232/422/485) (jumper-less selection) COM #2~COM #4 (RS232 only)
USB 2.0	N/A
USB 3.0	6x USB 3.1 Gen1
Serial ATA	3x SATA III
Audio	Built-in HD audio w/ ALC662 codec for 5.1 channel
TPM	N/A
Others	2x 5 pin-header x1 for Digital I/O(5-in/5-out), 1x COM port header / DF-11 2x5 box header x 2 for COM3/4 (RS232 only) 1x CPU Fan Connector (4-pin) 2x Chassis fan connectors (4-pin) (Smart fan Speed Control) 1x ATX standard 24-pin type & 4-pin type (+12V only) 1x USB 2.0 Headers (Support 2 USB 2.0 ports) 2-pin connector for RTC battery iSMART
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")

Power Consumption	AMD Ryzen™ Embedded AM4 CPU/APU 3.0GHz w/ 2x 8GB DDR4-2400 + 12V: 2.55A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MBD301	AMD Ryzen™ Desktop (X470) Mini-ITX motherboard, with 6x USB3.1, 2x COMs, 1x Gigabit LAN, iSMART, +12V DC-in
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Dimensions and Drawing



1 CPU Modules

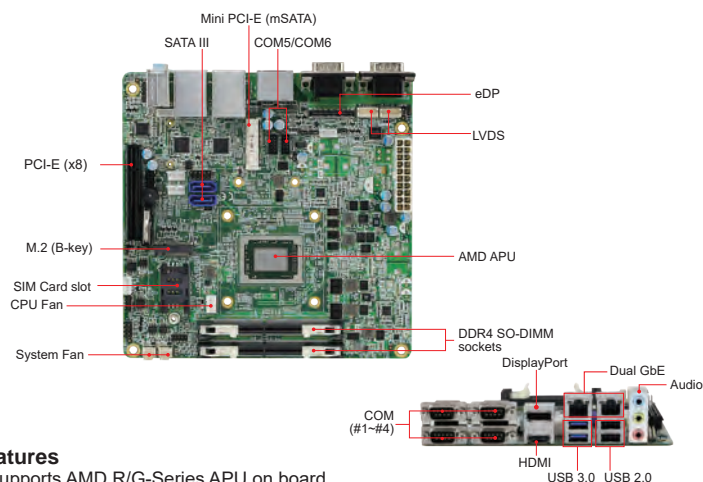
2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

MI979

Mini-ITX Motherboard AMD Embedded R-Series / G-Series Mini-ITX Motherboard



Features

- Supports AMD R/G-Series APU on board, up to 3.4GHz
- 2x DDR4 SO-DIMM, Max. 32GB supports ECC
- 2x PCI-E Gigabit LAN
- 1x HDMI, 1x DisplayPort & 24-bit dual-channel LVDS or eDP
- Watchdog timer, Digital I/O, iSMART
- 2x SATA III, 2x USB 3.0, 4x USB 2.0, 6x COM, 1x mSATA
- 1x PCI-E (x8), 1x Mini PCI-E, 1x M.2 (B-key)
- 1x SIM card slot

Specifications

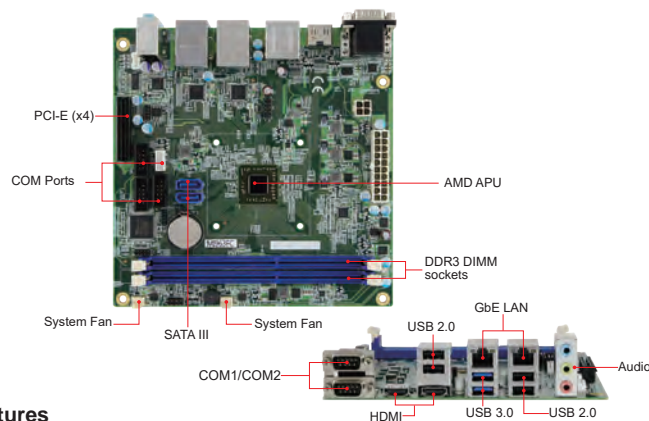
CPU Socket	BGA 968 APU on board
CPU	AMD R/G-Series APU on board, up to 3.4GHz
PCH	N/A
Memory Types	2x DDR4 SO-DIMM Max. 32GB, supports ECC (R-series) 1x DDR4 SO-DIMM Max. 16GB, (G-Series)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA (via Mini PCI-E)
Expansion Slots	1x PCI-E (x8)
Mini Type Slots	1x Mini PCI-E 1x M.2 (B-key, type: 2230/3030)
Graphics Controller	AMD R/G-Series APU built-in Radeon HD9000 series graphics core
Video Output	HDMI, DisplayPort & 24-bit dual-channel LVDS or eDP
Ethernet	2x Intel® I211-AT Gigabit LAN
I/O Chip	Nuvoton NCT6116D
Serial Port	1x RS232/422/485 (jumperless selection) 5x RS232
USB 2.0	2x USB 2.0 on board 2x USB 2.0 via pin header
USB 3.0	2x USB 3.0 on board
Serial ATA	2x SATA III (6.0Gb/sec.)
Audio	Built-in HD audio w/ ALC662 codec for 5.1 channel
TPM	N/A
Others	Digital I/O (4-in/4-out), iSMART, SIM card slot
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	AMD RX-421BD, 2.1GHz, w/ 2 x 16GB DDR4-2133 +12V: 4.22A; +5V: 2.98A; +5VSB: 0.13A; +3.3V: 0.31A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MI979MF-421	AMD RX-421BD APU on board (2.1GHz/3.4GHz) Mini-ITX motherboard w/ HDMI + DP & LVDS or eDP, dual Gigabit LAN, iSMART, ATX
MI979MF-421D	AMD RX-421BD APU on board (2.1GHz/3.4GHz) Mini-ITX motherboard w/ HDMI + DP & LVDS or eDP, dual Gigabit LAN, iSMART, DC-in (12V~24V)
MI979BF-217	AMD GX-217GI APU on board (1.7GHz/2.0GHz) Mini-ITX motherboard w/ HDMI + DP, dual Gigabit LAN, iSMART, ATX

MI963

Mini-ITX Motherboard AMD Embedded G-Series Mini-ITX Motherboard



Features

- Onboard AMD Embedded G-Series GX-424CC SoC, 2.4GHz
- 2x DDR3 DIMM, Max. 8GB
- Supports 2x HDMI
- 2x Intel® PCI-E Gigabit LAN
- Watchdog timer, Digital I/O
- 6x USB 2.0, 2x USB 3.0, 6x COM, 2x SATA III
- 1x PCI-E (x8) [(x4) Link]

Specifications

CPU Socket	APU on board
CPU	AMD Embedded G-Series GX-424CC SoC (2.4GHz)
PCH	Integrated
Memory Types	2x DDR3 DIMM, Max. 8GB (ECC compatible)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	1x PCI-E (x8)[(x4) Link] 1x PCI-E (x1)
Mini Type Slots	N/A
Graphics Controller	AMD Embedded G-Series SoC built-in GPU (AMD Radeon™ HD8000 series)
Video Output	Supports 2x HDMI
Ethernet	2x Intel® I211AT PCI-E Gigabit LAN
I/O Chip	Fintek F81846AD-I
Serial Port	5x RS232, 1x RS232/422/485 (jumperless selection)
USB 2.0	4x USB 2.0 on board 2x USB 2.0 via pin-header
USB 3.0	2x USB 3.0 on board
Serial ATA	2x SATA III
Audio	AMD Embedded G-Series SoC built-in audio controller w/ Realtek ALC662QHD codec Extra 3W + 3W amplifier
TPM	N/A
Others	Digital I/O (4-in/4-out), ATX power connector
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	AMD GX-424CC 2.4GHz w/ 2x DDR3L-1600 8G +12V: 1.56A; +5V: 1.75A; +5VSB: 0.13A; +3.3V: 0.23A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

Ordering Information

MI963FC-222	AMD Embedded G-Series GX-222GC APU on board Mini-ITX motherboard, w/ 2x HDMI, PCI-E, dual Gigabit LAN
MI963FC-424	AMD Embedded G-Series GX-424CC APU on board Mini-ITX motherboard, w/ 2x HDMI, PCI-E, dual Gigabit LAN

1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

Comparison Table

Full-Size CPU Card

1 CPU Modules

2 Disk-Size SBGs

3 Motherboards

4 CPU Cards

Models	IB980	IB981
Form Factor	Full-Size CPU Card(PICMG®1.3)	Full-Size CPU Card(PICMG®1.0)
CPU Socket	LGA1150	LGA1150
CPU Max. Frequency	4th Gen Intel® Core™ i7/i5/i3 / Pentium® / Celeron® QC/ DC processors	4th Gen Intel® Core™ i7/i5/i3 / Pentium® / Celeron® QC/ DC processors
CPU Speed	Up to 4.4GHz	Up to 4.4GHz
PCH	Intel® Q87 PCH	IB981AF-C236: Intel® C236 IB981AF: Intel® Q87 IB981F: Intel® Q87
Memory Type	2x DDR3 DIMM	2x DDR3 DIMM
Max. Memory Size	16GB	16GB
BIOS	AMI	AMI
Graphics Controller	4th Gen Intel® Core™ i7/i5/i3 / Pentium® Processor integrated HD 4000 graphics	4th Gen Intel® Core™ i7/i5/i3 / Pentium® Processor integrated HD 4000 graphics
Video Output	24-bit dual-channel LVDS(IB980AF) via level-shifter ASM1442K	24-bit dual-channel LVDS(IB981AF) via level-shifter ASM1442K
Ethernet	Intel® i217LM(IB980AF) Gigabit LAN PHY Intel® i217V(IB980F) Gigabit LAN PHY Intel® i211AT PCI-E Gigabit LAN	Intel® i217LM Gigabit LAN PHY Intel® i217V(IB981F) Gigabit LAN PHY Intel® i211AT PCI-E Gigabit LAN
Audio	Built-in ALC662 HD audio codec 5.1CH	Built-in ALC662 HD audio codec 5.1CH
SATA	4x SATA III ports	4x SATA3.0 ports (IB981AF-C236 / IB981AF) 2x SATA3.0 ports (IB981F)
I/O Chip	F81846AD-I	F81846AD-I
Parallel Port	1x SPP/EPP/ECP port	1x SPP/EPP/ECP port
Serial Port	3x RS232 1x RS232/422/485	3x RS232 1x RS232/422/485
USB 2.0	4x USB 2.0 via pin header Optional 4 ports through IP314 backplane	4x USB2.0 (2x via pin header, 2x via onboard USB connector)
USB 3.0/3.1	4x USB 3.0 (2x rear I/O + 2x via pin header)	4x USB3.0 (IB981AF-C236/ IB981AF) (2x rear I/O, 2x via pin header) 2x USB3.0 rear I/O (IB981F)
KB / MS	via pin header	via pin header
Hardware Monitor	Yes	Yes
Storage Device Interface	mSATA(Thru Mini PCI-E)	mSATA(Thru Mini PCI-E)
Watchdog Timer	256 levels	256 levels
Digital I/O	4-in/4-out	4-in/4-out
Expansion Slots	4x PCI, 4x PCI-E (x1) or 1x PCI-E (x4), 1x PCI-E (x16) from backplane	N/A
Mini Type Slots	1x Mini PCI-E socket on board	1x Mini PCI-E socket
TPM	1.2	2.0 (IB981AF-C236/ IB981AF)
Power Input	ATX type	ATX type
Power Consumption	Intel® Core™ i7-4770S CPU @ 3.10GHz w/ 2x DDR3-1333 2GB +3.3V: 0.34A; +5V: 2.11A +5VSB: 0.1A; +12V: 5.54A	Intel® i7-4770S, 3.10GHz w/ 2x DDR3-1600 8GB +12V: 3.34A, +5V: 2.04A +5VBS: 0.25A, +3.3V: 0.03A
Dimensions (L x W)	338mm x 126mm	338mm x 126mm
Extra Features	iAMT (9.0) (IB980AF), RAID(0&1, 10, 5), iSMART (3.0), LAN Wakeup	iAMT (9.1) and TPM (2.0)(IB981AF-C236/ IB981AF), RAID (0&1, 5, 10), LAN Wakeup
Page No.	P. 4-5	P. 4-6

Comparison Table

Full-Size CPU Card

Models	IB990	IB995
Form Factor	Full-Size CPU Card(PICMG®1.3)	Full-Size CPU Card (PICMG®1.3)
CPU Socket	LGA1151	LGA1151
CPU	6th Gen Intel® Xeon® / Core™ i7/i5/i3 / Pentium® / Celeron® DT CPU	9th/8th Gen Intel® Xeon® E / Core™ i7/i5/i3 / Pentium® / Celeron® DT CPU
CPU Max. Frequency	Up to 4.0GHz	Up to 4.7GHz
PCH	IB990AF-C236: Intel® C236 IB990AF: Intel® Q170	IB995AF-C246: Intel® C246 IB995AF: Intel® Q370 IB995EF: Intel® H310
Memory Type	2x DDR4 DIMM	2x DDR4 DIMM
Max. Memory Size	32GB	32GB
BIOS	AMI	AMI
Graphics Controller	Intel® Core™ i integrated graphics	Intel UHD Graphics P630
Video Output	N/A DVI-D, VGA and DVI-I on board	24-bit dual-channel LVDS DVI-D and DVI-I on board
Ethernet	Intel® I219LM Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN	LAN 1: Intel® I219LM Gigabit LAN PHY (IB995AF-C246/IB995AF) Intel® I219V Gigabit LAN PHY (IB995EF) LAN2: Intel® I210AT Gigabit LAN PHY (IB995AF-C246) Intel® I211AT PCI-E Gigabit LAN (IB995AF/IB995EF)
Audio	Built-in ALC662 HD audio codec 5.1CH	Built-in ALC662 HD audio codec 5.1CH
SATA	6x SATA III ports (IB990AF-C236) 4x SATA III port (IB990AF)	5x SATA III ports (IB995AF-C246) 3x SATA III ports (IB995AF) 2x SATA III ports (IB995EF)
I/O Chip	F81846AD-I	F81964D-I
Parallel Port	1x SPP/EPP/ECP port	1x SPP/EPP/ECP port
Serial Port	3x RS232 1x RS232/422/485	3x RS232 1x RS232/422/485
USB 2.0	2x USB 2.0 via pin header Optional 4 ports through IP314 backplane	6x USB 2.0 (via pin header for IB995AF-C246/IB995AF, 1x via M.2, 1x via onboard Vertical type A)
USB 3.0/3.1	3x USB 3.0 (1x rear I/O + 2x via pin header)	5x USB3.0 (1x via real panel, 4x via box header for IB995AF-C246/IB995AF, 2x via box header for IB995EF)
KB / MS	Combo PS/2	Combo PS/2
Hardware Monitor	Yes	Yes
Storage Device Interface	N/A	2x M.2
Watchdog Timer	256 levels	256 levels
Digital I/O	4-in/4-out	4-in/4-out
Expansion Slots	4x PCI, 4x PCI-E (x1) or 1x PCI-E (x4), 1x PCI-E (x16) from backplane	4x PCI, 4x PCI-E (x1) or 1x PCI-E (x4), 1x PCI-E (x16) from backplane
Mini Type Slots	1x Mini PCI-E socket on board	1x M.2 (M-Key, type:2280, supports CNVI) 1x M.2 (E-Key, type:2230, supports NVMe)
TPM	1.2 (IB990VF)	2.0
Power Input	ATX type	ATX type
Power Consumption	Intel® Xeon® Processor E3-1225 v5 w/ 2x DDR4-2133 4GB +12V: 5.67A; +5V: 1.88A +5VSB: 0.09A; +3.3V: 0.08A	TBD
Dimensions (L x W)	338mm x 126mm	338mm x 126mm
Extra Features	iAMT (11.0), RAID(0&1, 5), LAN Wakeup	iAMT (11.6), RAID(0&1, 5), LAN Wakeup
Page No.	P. 4-4	P. 4-3

1 CPU Modules

2 Disk-Size SBCs

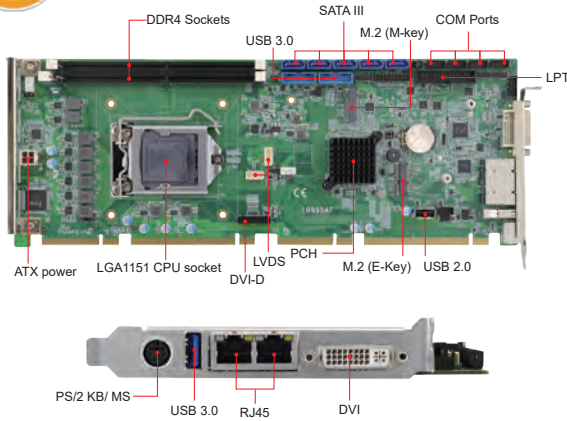
3 Motherboards

4 CPU Cards

IB995

Full-Size CPU Card

9th/8th Gen Intel® Xeon® E / Core™ i7/i5/i3 / Pentium® / Celeron®
PICMG 1.3 Full-Size CPU Card w/ Intel® C246



1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

Specifications

CPU Socket	LGA1151
CPU	9th/8th Gen Intel® Xeon® E / Core™ i7/i5/i3 DT processors
PCH	IB995AF-C246: Intel® C246 PCH IB995AF: Intel® Q370 PCH IB995EF: Intel® H310 PCH
Memory Types	2x DDR4-2166/2400MHz DIMM, Max. 32GB (ECC compatible)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x M.2 (supports NVMe)
Expansion Slots	4x PCI, 4x PCI-E (x1) or 1x PCI-E (x4) 1x PCI-E (x16) from backplane
Mini Type Slots	1x M.2 (M-Key, type:2280, supports NVMe) 1x M.2 (E-Key, type:2230, supports CNVi)
Graphics Controller	Intel® UHD Graphics P630
Video Output	Supports DVI-D, DVI-I, 24-bit dual channel LVDS
Ethernet	IB995AF-C246& IB995AF: Intel® I219LM Gigabit LAN PHY IB995EF: Intel® I219V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2nd LAN) IB995AF-C246: Intel® I210AT PCI-E Gigabit LAN (as 2nd LAN)
I/O Chip	Fintek F81964D-1
Serial Port	1x RS232/422/485 (jumperless selection) 3x RS232
USB 2.0	2x USB 2.0 on board 1x USB 2.0 via on board USB vertical connector 1x USB 2.0 via M.2 (E-key)
USB 3.0	5x USB 3.0 on board for IB995AF series 3x USB 3.0 on board for IB995EF
Serial ATA	5x SATA III for IB995AF-C246 3x SATA III for IB995AF 2x SATA III for IB995EF
Audio	Intel® PCH built-in HD audio controller + Realtek ALC662 w/5.1 channel
TPM	TPM (2.0)
Others	Digital I/O (4-in/ 4-out), RAID, iAMT (11.6)
Dimensions (L x W)	338mm x 126mm (13.3" x 4.96")

Features

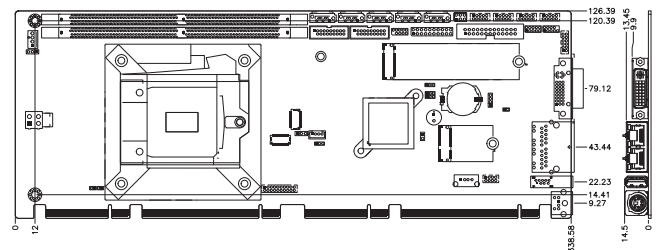
- 9th/8th Gen Intel® Xeon® E / Core™ i7/i5/i3 Pentium® QC/DC Processor, up to 4.7GHz
- 2x DDR4 DIMM, Max. 32GB
- 2x PCI-E Gigabit LAN
- Intel® processor integrated graphics, supports DVI-I/ DVI-D/ LVDS
- 3x USB 2.0, 5x USB 3.0, 5x SATA III, 4x COM
- 2x M.2 socket (M/ E key)

Power Consumption	Intel® Xeon processor i7-9700K w/ 2x DDR4 2133 16GB +12V: 8.21A +5VSB: 0.26A +5V: 1.16A +3.3V: 0.6A
Operating Temperature	0°C ~ 60°C(32°F ~ 140°F)
Storage Temperature	-20°C ~ 80°C(-4°F ~ 140°F)
Relative Humidity	90%(non-condensing @60°C)

Ordering Information

IB995AF-C246	LGA1151 C246 PICMG1.3 Full-Size CPU Card w/ DVI-I, DVI-D, LVDS, Dual Gigabit LAN, iAMT (11.6), 5x SATA III
IB995AF	LGA1151 Q370 PICMG1.3 Full-Size CPU Card w/ DVI-I, DVI-D, LVDS, Dual Gigabit LAN, iAMT (11.6), 3x SATA III
IB995EF	LGA1151 H310 PICMG1.3 Full-Size CPU Card w/ DVI-I, DVI-D, LVDS, Dual Gigabit LAN, 2x SATA III

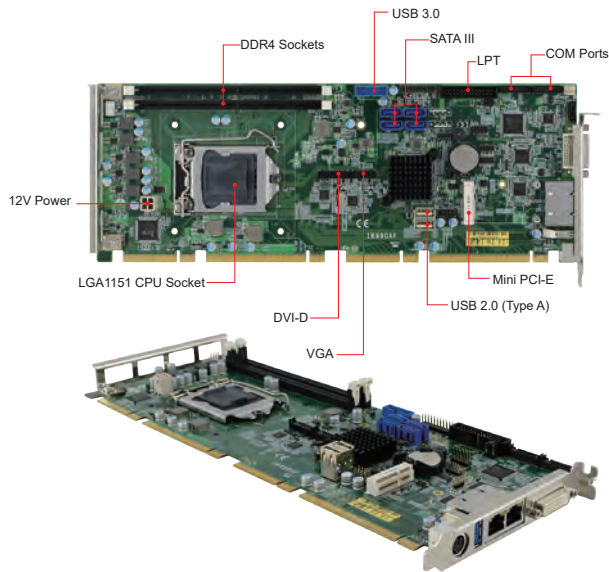
Dimensions and Drawing



IB990

Full-Size CPU Card

7th/6th Gen Intel® Xeon® E3 / Core™ i7/i5/i3 / Pentium® / Celeron®
PICMG 1.3 Full-Size CPU Card w/ Intel® C236 PCH



Features

- 7th/6th Gen Intel® Xeon® E3 /Core™ i7/i5/i3 / Pentium® QC/DC Processor, up to 4.0 GHz
- 2x DDR4- 2133 DIMM, Max. 32GB, ECC compatible
- Intel® processor integrated graphics, supports DVI-I, CRT, DVI-D
- 2x Intel® PCI-E Gigabit LAN
- 3x USB 3.0, 2x USB 2.0, 4x COM, 6x SATA III
- 1x Mini PCI-E slot
- Watchdog timer, Digital I/O, iAMT (11.0)



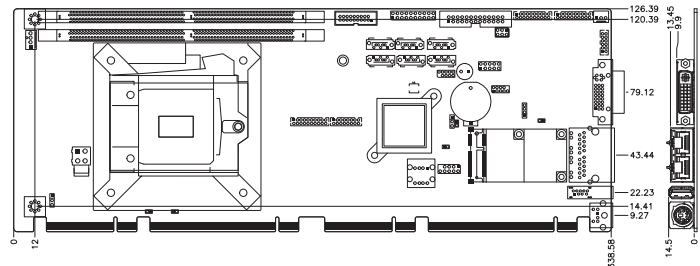
Specifications

CPU Socket	LGA1151
CPU	7th/6th Gen Intel® DT Xeon® E3 & Core™ i7/i5/i3 / Pentium®/ Celeron® QC/DC processors
PCH	IB990AF-C236: Intel® C236 PCH IB990AF: Intel® Q170 PCH
Memory Types	2x DDR4-2133 DIMM, Max 32GB (ECC compatible)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	4x PCI, 4x PCI-E (x1) or 1x PCI-E (x4) 1x PCI-E (x16) from backplane
Mini Type Slots	1x Mini PCI-E
Graphics Controller	7th/6th Gen Intel® Core™ DT Xeon® E3 & Core™ i7/i5/i3/ Pentium®/ Celeron® integrated graphics
Video Output	Support DVI-I, VGA, DVI-D
Ethernet	Intel® I219LM Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN(as 2nd LAN)
I/O Chip	Fintek F81846AD-I 1x RS232/422/485 (jumperless selection) 3x RS232, 1x LPT
USB 2.0	2x USB 2.0 (Type A) 1x USB 2.0 via Mini PCI-E
USB 3.0	3x USB 3.0 on board
Serial ATA	6x SATA III
Audio	Intel® C236 PCH built-in HD audio controller + Realtek ALC662 w/ 5.1 channel
TPM	TPM (1.2) (IB990VF)
Others	Digital I/O(4-in/4-out), RAID, iAMT (11.0), TPM (1.2)(IB990AF only)
Dimensions (L x W)	338mm x 126mm (13.31" x 4.96")
Max. Power Requirement	Intel® Xeon® processor E3-1225 v5 w/ 2x DDR4-2133 4GB +12V: 5.67A; +5V: 1.88A; +5VSB: 0.09A; +3.3V: 0.08A
Operating Temperature	0°C ~ 60°C(32°F ~ 140°F)
Storage Temperature	-20°C ~ 80°C(-4°F ~ 140°F)
Relative Humidity	90%(non-condensing @60°C)

Ordering Information

IB990AF-C236	LGA1151 C236 PICMG 1.3 Full-Size CPU Card w/ DVI-I, VGA, DVI-D, dual Gigabit LAN, iAMT (11.0), 6x SATA III
IB990AF	LGA1151 Q170 PICMG 1.3 Full-Size CPU Card w/ DVI-I, VGA, DVI-D, dual Gigabit LAN, iAMT (11.0), 4x SATA III

Dimensions and Drawing



1 CPU Modules

2 Disk-Size SBCs

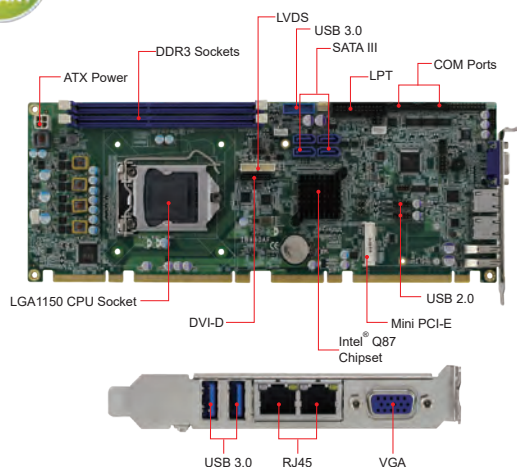
3 Motherboards

4 CPU Cards

IB980

Full-Size CPU Card

4th Gen Intel® Core™ i7/i5/i3 / Pentium® / Celeron®
PICMG 1.3 Full-Size CPU Card w/ Intel® Q87 PCH



Features

- 4th Gen Intel® Core™ i7/i5/i3 / Pentium® / Celeron® QC/DC processor, up to 4.4 GHz
- 2x DDR3-1600 DIMM, Max 16GB
- Intel® processor integrated graphics device, supports VGA, DVI-D
- 24-bit dual-channel LVDS
- iSMART 3.0 - auto-scheduler, power resume, low temperature guardian, LVDS brightness control
- 2x Intel® PCI-E Gigabit LAN
- 4x USB 3.0, 4x USB 2.0, 4x COM, 4x SATA III
- 1x Mini PCI-E slot (supports mSATA)
- Watchdog timer, Digital I/O, TPM (1.2), RAID iAMT (9.0) [IB980AF only]

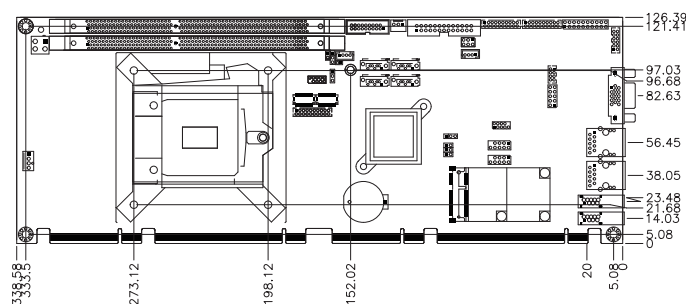
Specifications

CPU Socket	LGA1150
CPU	4th Gen Intel® Core™ DT i7/i5/i3 / Pentium® / Celeron® QC/DC processors
PCH	Intel® Q87 PCH
Memory Types	2x DDR3-1600 DIMM, Max 16GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
Storage Device Interface	1x mSATA
H/W Monitor	Yes
Expansion Slots	4x PCI, 4x PCI-E (x1) or 1x PCI-E (x4) 1x PCI-E (x16) from backplane
Mini Type Slots	1x Mini PCI-E
Graphics Controller	4th Gen Intel® Core™ DT i7/i5/i3 processors integrated graphics
Video Output	Supports VGA, DVI-D 24-bit dual-channel LVDS interface (IB980AF only)
Ethernet	IB980AF: Intel® I217LM Gigabit LAN PHY IB980F: Intel® 217V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN (as 2nd LAN)
I/O Chip	Fintek F81846AD-I
Serial Port	1x RS232/422/485 (jumperless selection) 3x RS232, 1x LPT
USB 2.0	4x USB 2.0 via pin header Optional 4ports via IP314 backplane
USB 3.0	4x USB 3.0 (2x rear I/O + 2x via pin header)
Serial ATA	4x SATA III
Audio	Intel® Q87 PCH built-in HD audio controller + Realtek ALC662 w/ 5.1 channel
TPM	TPM (1.2)
Others	Digital I/O (4-in/4-out), iSMART, TPM (1.2), RAID, iAMT (9.0) (IB980AF only)
Dimensions	338mm x 126mm (13.31" x 4.96")
Max. Power Requirement	Intel® Core™ i7-4770S CPU @ 3.10GHz 2x DDR3-1333 2GB +12V: 5.54A; +5V: 2.11A; +5VSB: 0.1A; +3.3V: 0.34A
Operating Temperature	0°C~60°C(32°F~140°F)
Storage Temperature	-20°C~80°C(-4°F~176°F)
Relative Humidity	90%(non-condensing @60°C)

Ordering Information

IB980AF	LGA1150 Q87 Full-Size CPU Card w/ VGA, DVI-D, 24-bit LVDS, dual Gigabit LAN, TPM (1.2), iAMT (9.0), iSMART (3.0)
IB980F	LGA1150 Q87 Full-Size CPU Card w/ VGA, DVI-D, dual Gigabit LAN, TPM (1.2), iSMART (3.0)
IP380L	PICMG 1.3 Backplane w/ 1x PCI-E (x16), 3x PCI-E (x1)

Dimensions and Drawing

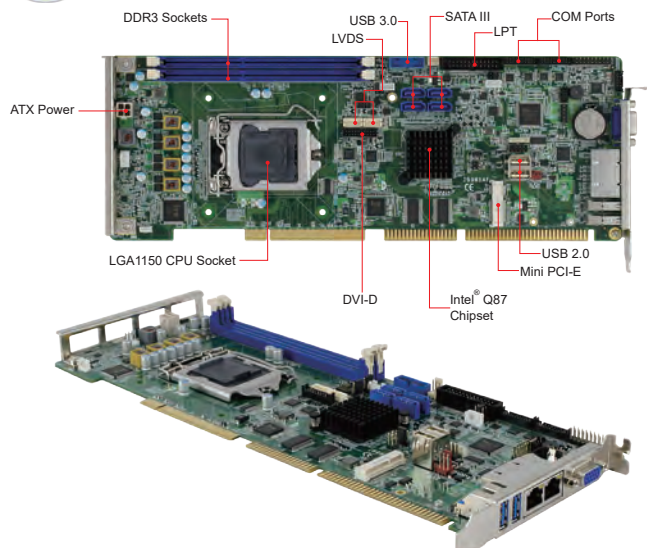


1 CPU Modules

2 Disk-Size SBCs

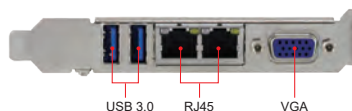
3 Motherboards

4 CPU Cards



Features

- 4th Gen Intel® Core™ i7/i5/i3 / Pentium® / Celeron® processor, up to 4.0 GHz
- 2x DDR3 / DDR3L-1600 DIMM, Max. 16GB, ECC
- Intel® processor integrated graphics, supports VGA, DVI-D
- 24-bit dual-channel LVDS
- 2x Intel® PCI-E Gigabit LAN
- 4x USB 3.0, 4x USB 2.0, 4x COM, 4x SATA III
- 1x Mini PCI-E slot (supports mSATA)
- Watchdog timer, Digital I/O, iSMART, TPM 2.0 , iAMT



Specifications

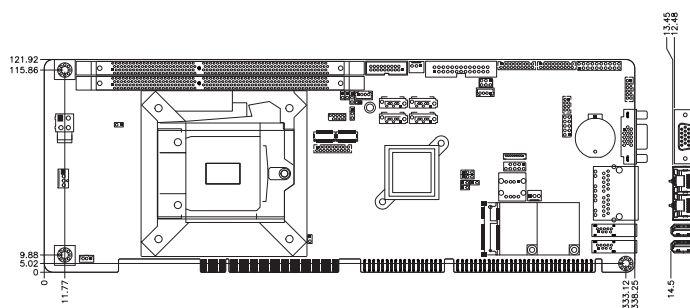
CPU Socket	LGA1150
CPU	4th Gen Intel® Core™ i7/i5/i3 / Pentium® / Celeron® processor
PCH	IB981AF-C226: Intel® C226 PCH IB981AF: Intel® Q87 PCH IB981F: Intel® H81 PCH
Memory Types	2x DDR3/ DDR3L-1600 DIMM, Max 16GB (ECC compatible)
BIOS	AMI
Watchdog Timer	256 levels
Storage Device Interface	N/A
H/W Monitor	Yes
Expansion Slots	N/A
Mini Type Slots	1x Mini PCI-E
Graphics Controller	4th Gen Intel® Core™ i7/i5/i3 processors integrated graphics
Video Output	Supports VGA, DVI-D 24-bit dual-channel LVDS interface
Ethernet	IB981AF: Intel® I217LM Gigabit LAN PHY IB981F: Intel® I217V Gigabit LAN PHY Intel® I211AT PCI-E Gigabit LAN(as 2nd LAN)
I/O Chip	Fintek F81846AD-I
Serial Port	3x RS232 1x RS232/422/485
USB 2.0	4x USB2.0 (2x via pin header, 2x via onboard USB connector)
USB 3.0	4x USB3.0 (IB981AF-C236/ IB981AF) (2x rear I/O, 2x via pin header) 2x USB3.0 rear I/O (IB981F)
Serial ATA	IB981AF: 4x SATA III IB981F: 2x SATA III
Audio	Intel® Q87 PCH built-in HD audio controller + Realtek ALC662 w/ 5.1 channel
TPM	2.0 (IB981AF-C236/ IB981AF)
Others	Digital I/O(4-in/4-out), iSMART RAID, TPM (2.0), iAMT [IB981AF only]
Dimensions (L x W)	338mm x 126mm (13.31" x 4.96")

Power Consumption	Intel® i7-4770S, 3.10GHz w/ 2x DDR3-1600 8GB +12V: 3.34A, +5V: 2.04A +5VBS: 0.25A, +3.3V: 0.03A
Operating Temperature	0°C~60°C(32°F~140°F)
Storage Temperature	-20°C~80°C(-4°F~176°F)
Relative Humidity	90%(non-condensing @60°C)

Ordering Information

IB981AF-C226	LGA1150 C226 Full-size CPU Card w/ VGA, DVI-D, 24-bit LVDS, dual Gigabit LAN, iSMART, TPM (2.0), RAID
IB981AF	LGA1150 Q87 Full-size CPU Card w/ VGA, DVI-D, 24-bit LVDS, dual Gigabit LAN, iSMART, TPM (2.0), RAID
IB981F	LGA1150 H81 Full-size CPU Card w/ VGA, DVI-D, 24-bit LVDS, dual Gigabit LAN, iSMART

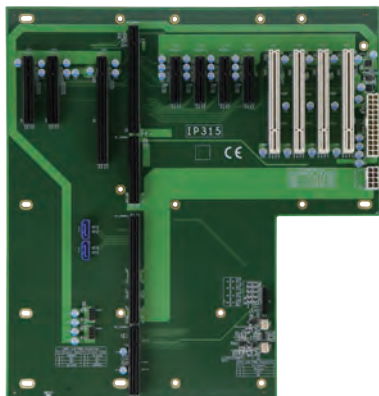
Dimensions and Drawing



Backplane

IP315

PICMG 1.3 12-Slot Backplane



Features

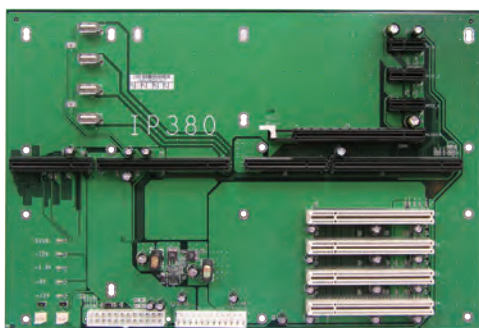
- 4-layer PCB
- AT / ATX power connector, ATX power outlet
- 4x CPI, 1x PCI-E(x16), 2x PCI-E(x8), 4x PCI-E(x4)
- Size: 310mm x 327 mm (12.2" x 12.9")

Ordering Information

IP315	PICMG 1.3 12-slot Backplane W/ 1x PCI-E(16x), 2x (PCI-Ex8), 4x PCI-E(x4), 4x PCI slot
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IP380L

PICMG 1.3 8-Slot Backplane



Features

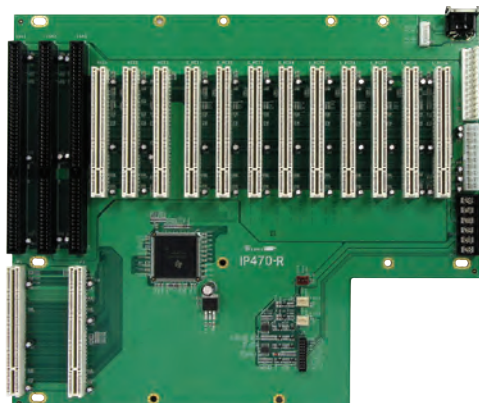
- 4-layer PCB
- AT / ATX power connector
- 1x PCI-E 16-lane slot, 3x PCI-E 1-lane slots
- PICMG 1.3 connector(A: PCI-E x16, B: PCI-E x8, C: PCI-E x16, D: PCI-E x8), 4x PCI(32-bit) slots
- Size: 221mm x 328mm (8.7" x 12.9")

Ordering Information

IP380L	PICMG 1.3 8-slot Backplane with 1x PCI-E 16-lane and 3x PCI-E 1-lane, 4x PCI
--------	--

IP470

PICMG 1.0 14-Slot Backplane



Features

- 4-layer PCB
- AT / ATX power connector, DC power outlet terminal
- 12x PCI, 2x ISA
- LED power indicators for +5V, -5V, +12V, -12V, 3.3V, +5VSB
- Size: 264.2mm x 311.2mm (10.4"x 12.3")

Ordering Information

IP470	PICMG 1.0 14-Slot Backplane w/ 12 PCI, 2 ISA lane slots
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1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

Mini PCI-E Cards for Expansion

Mini PCI-E Card

IBD182



Features:

- PCI-E to 2x RS232
- XR17V352 chipset
- 50.95mm x 30mm

IBD183



Features:

- USB to UART,
1x RS232+ 1x RS422/485
- XR21V1412 chipset
- 50.95mm x 30mm

IBD184



Features:

- PCI-E to 4x RS232
- XR17V354 chipset
- 50.95mm x 30mm

IBD185



Features:

- USB to GPIO
- 16-in /16-out
- STM32F103V8 chipset
- 50.95mm x 30mm

IBD186



Features:

- PCI-E to 2x RS232
w/ Isolation
- XR17V352 &
2x LTM2882CY-3
chipset
- 50.95mm x 30mm

IBD188



Features:

- PCI-E to 8x RS232
- XR17V358 chipset
- 50.95mm x 30mm

IBD190



Features:

- PCI-E to 1x GbE LAN
- 1x Intel® I211-AT chipset
- 50.95mm x 30mm

IBD192



Features:

- PCI-E to 2x GbE LAN
- 2x Intel® I211-AT or
2x Intel® I210-AT chipset
- 50.95mm x 30mm

IBD193



Features:

- PCI-E to MRAM storage
- 1x MR2A16ACYS35 chipset
- 50.95mm x 30mm

IBD194



Features:

- USB to 2nd VGA Display
- Resolution up to 1920x
1080 (Max.)
- DisplayLink DL-165
chipset
- 50.95 mm x 30 mm

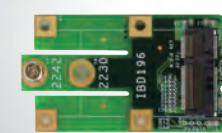
IBD195



Features:

- PCI-E to 2x CAN Bus
- Dual channel isolation
- 50.95mm x 30mm

IBD196



Features:

- Mini-PCI-E to M.2 E key
- 54.5mm x 30mm

1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

Embedded Function Cards

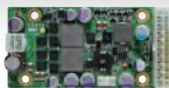
Daughter Boards and Function Cards



ID107

Features

- 55mm x 47mm
- Amplifier board
- TI TPA3110D2 on board



ID452

Features

- 90mm x 45mm
- 12V~24V DC-in to ATX power interface board



ID450-R

Features

- 90mm x 45mm
- 12V DC-in to ATX power interface board



IB-CFAST

Features

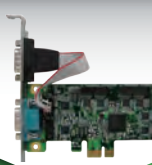
- 72.4mm x 57.5mm
- SATA + power connector (CFAST socket)



IBP358-4

Features

- 103.06 mm x 55.27 mm
- PCI-E (1x) to 4x RS232 COM ports
- EXAR XR17V354 chipset



IBP358

Features

- 103.06 mm x 55.27 mm
- PCI-E (1x) to 8x RS232 COM ports
- EXAR XR17V358 chipset

Riser Cards



IP115

Features

- 139.7mm x 51.38mm
- 1x PCI interface to PCI



IP116-R

Features

- 139.7mm x 55.34mm
- 1x PCI-E (x16) interface to PCI-E (x16) slot



IP118

Features

- 119.63mm x 64.5mm
- 1x PCI-E (x16) interface to PCI-E (x16) slot



IP119

Features

- 123.96mm x 55.50mm
- 1x PCI-E (x16) interface to PCI-E (x16) slot



IP155

Features

- 139.7mm x 75.74mm
- ASM1083 chipset
- 1x PCI interface to 2x PCI slot

1 CPU Modules

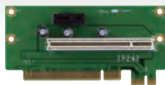
2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

Embedded Function Cards

Riser Cards



IP242

Features

- 130mm x 65mm
- 1x PCI + PCI-E (x1) interface to PCI slot + 1x PCI-E (x1)



IP245

Features

- 130mm x 60mm
- IT8893E chipset
- PCI-E (x1) interface to 2x PCI slot



IP246

Features

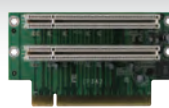
- 30mm x 60mm
- IT8893E & PEX8603 chipset
- 1x PCI-E (x1) to PCI + 1x PCI-E (x1) slot



IP271

Features

- 129.97mm x 51.25mm
- 1x PCI interface to PCI slot



IP340

Features

- 110mm x 62.5mm
- 2x PCI interface to PCI slot



IP390-R

Features

- 139.7mm x 75.74mm
- 1x PCI + PCI-E (x1) interface to PCI slot + 1x PCI-E (x1)



IP403

Features

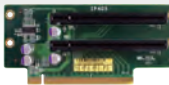
- 144.6 mm x 68.3mm
- PCI-E (x16) interface to 2x Mini PCI-E



IP404

Features

- 139.7mm x 75.74mm
- PCI-E (x16) interface to 2x PCI-E (x8)



IP405

Features

- 139.25mm x 62.78mm
- PCI-E (x16) interface to 2x PCI-E (x8)



IP406

Features

- 123mm x 50.77mm
- 1x PCI-E (x1) interface to Mini PCI-E + 1x SIM card slot

1 CPU Modules

2 Disk-Size SBCs

3 Motherboards

4 CPU Cards

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DOWNLOAD
EMBEDDED COMPUTING CATALOG

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