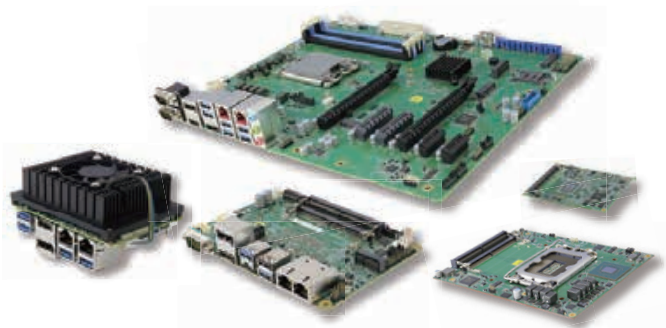
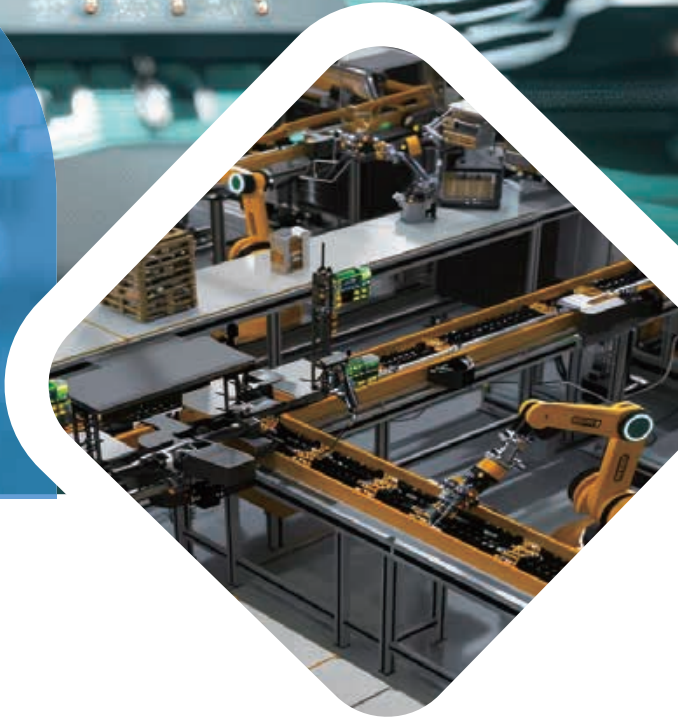


Vol.25

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# EMBEDDED COMPUTING



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# About IBASE

**Design & Manufacturing of Robust Computing Platforms**



Taipei, Taiwan  
Headquarters

<b>Stock Code</b>  <b>TPEX 8050</b> <small>(Since 2003)</small>	<b>Employees</b>  <b>1,010</b> <small>(Group)</small> <b>770</b> <small>(IBASE HQ)</small>
<b>Capital</b>  <b>US\$ 66.2M</b>	<b>Revenue</b>  <b>US\$ 172M</b> <small>(2025/Group)</small>

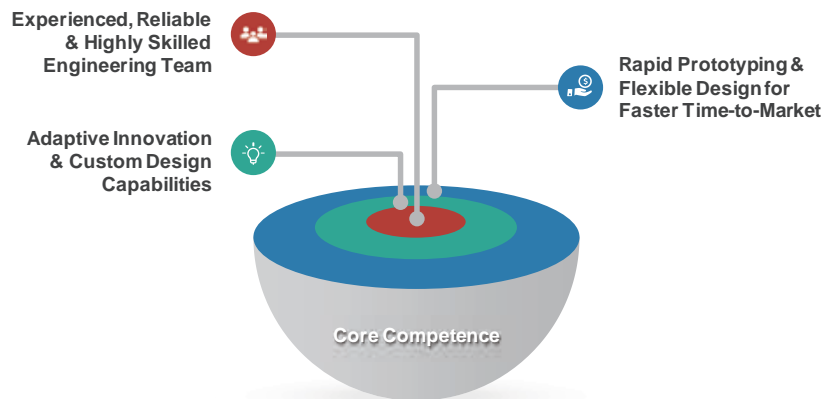
## Company Profile

IBASE Technology specializes in the design and manufacture of robust industrial PC products and has been serving the global market since its establishment in 2000. All manufacturing and quality control operations are conducted in IBASE's own facilities in Taiwan, which are certified to ISO 9001, ISO 13485, ISO 14001, and ISO 27001 standards. The company's current product offerings include x86 and RISC-based industrial motherboards, embedded systems, Edge AI computers, panel PCs, network appliances, and digital signage players. IBASE is publicly listed on the Taipei Exchange (TPEX: 8050) and has become a leading global provider of innovative industrial and embedded computing solutions.



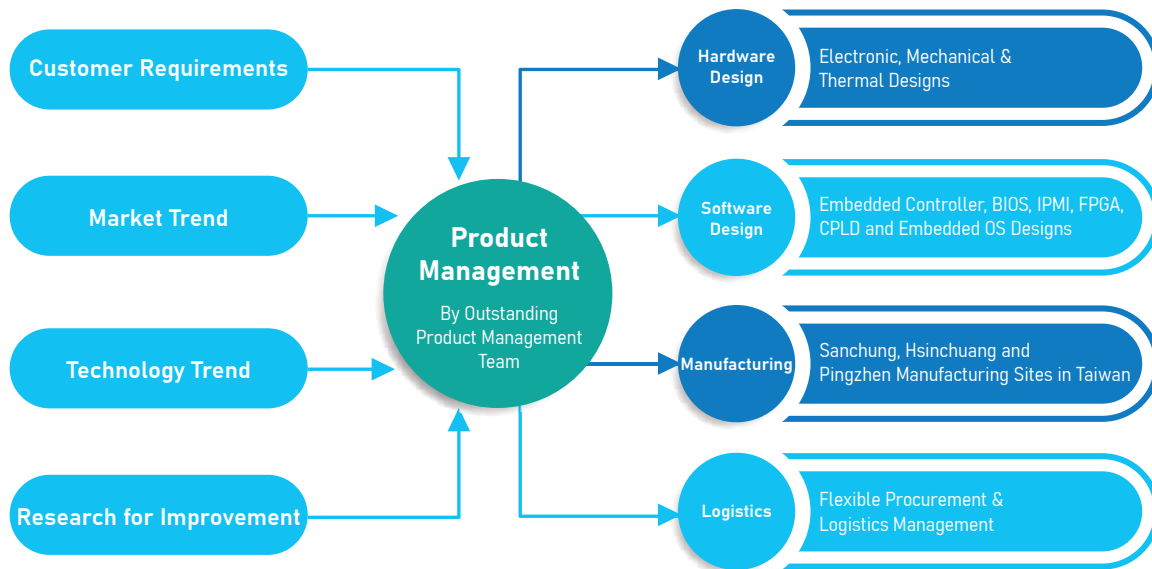
## Core Competence – R&D Design Capabilities

IBASE excels in delivering advanced R&D design capabilities through a team of experienced, reliable, and highly skilled engineers. Our core expertise lies in adaptive innovation and customized design solutions tailored to diverse industry requirements. By leveraging rapid prototyping and flexible design processes, we help customers accelerate time-to-market and gain a competitive edge in today's fast-evolving technology landscape. From concept to completion, IBASE prioritizes precision, efficiency, and reliability—making us a trusted partner for businesses seeking advanced industrial computing solutions.



# Design & Manufacturing Services

Established to become a leading global provider of embedded board and system solutions, IBASE manufactures and supplies cutting-edge products based on the latest technologies to meet market demands. Our R&D and product management teams have the expertise to design and develop innovative products that meet customer requirements and design specifications. We place great importance on research and development, investing heavily in manpower and resources to consistently deliver high-quality, innovative products. IBASE is also committed to environmental compliance by working to prevent pollution through the avoidance of banned or restricted substances in our production processes and products, helping our customers address their environmental challenges.



## IBASE Manufacturing Sites

 <p>Taiwan</p>	 <p>Taiwan</p>	 <p>Taiwan</p>	 <p>Vietnam</p>
<p><b>PINGZHEN</b> 18,481 m<sup>2</sup> / 5,591 Ping</p> <ul style="list-style-type: none"> <li>• Board Production</li> <li>• System Assembly</li> <li>• Validation</li> </ul>	<p><b>XINZHUANG</b> 6,070 m<sup>2</sup> / 1,840 Ping</p> <ul style="list-style-type: none"> <li>• System Assembly</li> <li>• Validation</li> </ul>	<p><b>SANCHONG</b> 3,124 m<sup>2</sup> / 945 Ping</p> <ul style="list-style-type: none"> <li>• Board Production</li> <li>• Validation</li> </ul>	<p><b>VINH PHUC</b> 13,500 m<sup>2</sup> / 4,084 Ping</p> <ul style="list-style-type: none"> <li>• Board Production</li> <li>• System Assembly</li> <li>• Validation</li> </ul>

# Comparison Table

## 3.5" Single Board Computer

Models	IB966	IB962	IB96W	IB961
<b>Form Factor</b>	3.5" SBC	3.5" SBC	3.5" SBC	3.5" SBC
<b>CPU Socket</b>	CPU on board	CPU on board	CPU on board	CPU on board
<b>CPU</b>	Intel® Core™ Ultra & Core™ Ultra X 300H Series Processors	Intel® Core™ Ultra 7/5 100 Series mobile processors	13th Gen Intel® Core™ i7/i5/i3 mobile processors	13th Gen Intel® Core™ i7/i5/i3 mobile processors
<b>CPU Max. Frequency</b>	Up to 4.9GHz	Up to 5.0GHz	Up to 4.8GHz	Up to 4.8GHz
<b>PCH</b>	N/A	N/A	N/A	N/A
<b>Memory</b>	2x DDR5 SO-DIMM	2x DDR5 SO-DIMM	1x DDR5 SO-DIMM	1x DDR5 SO-DIMM
<b>Max. Memory Size</b>	128 GB	64GB	32GB	32GB
<b>BIOS</b>	AMI	AMI	AMI	AMI
<b>Graphics Controller</b>	Intel® Core™ Ultra 300H Processor built-in Xe3 Graphics, up to 192EUs	Intel® Core™ Ultra 7/5 100 Series built-in Iris Xe Graphics Up to 128EUs	13th Gen Intel® Core™ i7/i5/i3 mobile processors, built-in Gen13 graphics, Up to 96EUs	13th Gen Intel® Core™ i7/i5/i3 mobile processors, built-in Gen13 graphics, Up to 96EUs
<b>Video Output</b>	24-bit dual-channel LVDS HDMI, DisplayPort, DisplayPort & eDP (Type-C)	24-bit dual-channel LVDS eDP, HDMI2.0, DisplayPort	24-bit dual-channel LVDS eDP 2x DisplayPort	24-bit dual-channel LVDS eDP 2x DisplayPort
<b>Ethernet</b>	1x Intel® I226LM 2.5GbE 1x Intel® I226V 2.5GbE	1x Intel® I226LM 2.5GbE 1x Intel® I226V 2.5GbE	1x Intel® I226LM 2.5GbE 1x Intel® I226V 2.5GbE	1x Intel® I226LM 2.5GbE 1x Intel® I226V 2.5GbE
<b>Audio</b>	Built-in ALC888S HD audio codec	Built-in ALC888S HD audio codec	Built-in ALC888S HD audio codec	Built-in ALC888S HD audio codec
<b>SATA</b>	N/A	2x SATA III ports	2x SATA III ports	2x SATA III ports
<b>I/O Chipset</b>	Fintek F81804U-I	Fintek F81804U-I	Fintek F81804U-I	Fintek F81804U-I
<b>Serial Port</b>	2x RS232/422/485 (jumperless selection)	2x RS232/422/485 (jumperless selection)	2x RS232/422/485 (jumperless selection)	2x RS232/422/485 (jumperless selection)
<b>USB 2.0</b>	1x USB 2.0 Type-A 2x USB 2.0 via pin header	3x USB 3.2 Type-A 5x USB 2.0 via pin header	1x USB 2.0 Type-A 2x USB 2.0 via pin header	1x USB 2.0 Type-A 2x USB 2.0 via pin header
<b>USB 3.X</b>	2x USB 3.2 Type-A	3x USB 3.2 via rear I/O 1x USB 2.0 via rear I/O	3x USB 3.2 via rear I/O	3x USB 3.2 via rear I/O
<b>Hardware Monitor</b>	Yes	Yes	Yes	Yes
<b>TPM</b>	dTPM	dTPM	fTPM	fTPM
<b>Storage Device Interface</b>	2x M.2 (M2280 & M2242 for NVMe)	M.2 (M2280 for NVMe)	M.2 (M2280 for NVMe)	M.2 (M2280 for NVMe)
<b>Watchdog Timer</b>	256 levels	256 levels	256 levels	256 levels
<b>Digital I/O</b>	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out
<b>Mini Type Slots</b>	3x M.2 slots (2x M-Key + E-Key)	3x M.2 slots (M-Key + E-Key + B-Key)	3x M.2 slots (M-Key + E-Key + B-Key)	3x M.2 slots (M-Key + E-Key + B-Key)
<b>Power input</b>	DC-in 12V~24V	DC-in 12V~24V	DC-in 12V~24V	DC-in 12V~24V
<b>Power Consumption</b>	TBD	Intel® Core™ Ultra 7 165H, Up to 5.0GHz w/ 2x 32G DDR5-5600 memory module +12V: 6.83A	Intel® Core™ i7-1370PRE, Up to 4.8GHz w/ 1x 32GB DDR5-4800 memory module +12V: 6.56A	Intel® Core™ i7-1370PE processor, Up to 4.8GHz w/ 1x 32G DDR5-4800 memory module +12V: 6.56A
<b>Dimensions (L x W)</b>	147mm x 102mm	147mm x 102mm	147mm x 102mm	147mm x 102mm
<b>Extra Features</b>	Built-in iAMT (21.0)	Built-in iAMT (18.0)	Built-in iAMT (16.1)	Built-in iAMT (16.1)
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3 Motherboards

4 CPU Cards

5 COM-HPC Module

# Comparison Table

## 3.5" Single Board Computer

IB956	IB953	IB952	IB919
3.5" SBC	3.5" SBC	3.5" SBC	3.5" SBC
CPU on board	CPU on board	CPU on board	CPU on board
11th Gen Intel® Core™ H-Series processor	11th Gen Intel® Core™ U-Series processor	AMD Ryzen™ Embedded V2000 series	8th Gen Intel® Core™ U-Series processor
Up to 4.7GHz	Up to 4.7GHz	Up to 4.15GHz	Up to 4.7GHz
QM580E HM570E	N/A	N/A	N/A
1x DDR4 SO-DIMM	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM
32GB	64GB	64GB	32GB
AMI	AMI	AMI	AMI
11th Gen Intel® Core™ i / H-Series built-in Gen12 graphics, Up to 96EUs	11th Gen Intel® Core™ i / U-Series built-in Gen 12 graphics, Up to 96EUs	AMD Ryzen™ V-Series APU built-in GPU	8th Gen Intel® Core™ i / U-Series Built-in Gen 9 graphics, Up to 24EU
24-bit dual-channel LVDS 3x DisplayPort	24-bit dual-channel LVDS eDP 2x DisplayPort	2x DisplayPort 1.4 24-bit dual-channel LVDS eDP	24-bit dual-channel LVDS or eDP 2x DisplayPort
1x Intel® I226-LM 2.5GbE (IB956AF series) 1x Intel® I226-V 2.5GbE (IB956EF series) Intel® I226-V as 2nd GbE	Intel® I219LM GbE PHY (IB953AF series) Intel® I219V GbE PHY (IB953EF series) Intel® I210AT as 2nd GbE	2x Intel® I211AT or I210AT GbE	Intel® I219LM GbE PHY (IB919AF series) Intel® I219V GbE PHY (IB918EF series) Intel® I211AT or I210AT as 2nd GbE
Built-in ALC888S HD audio codec	Built-in ALC269Q-VC3-GR HD audio codec with 2W amplifier	Built-in ALC888S HD audio codec	Built-in ALC269Q-VC3-GR HD audio codec with 2W amplifier
2x SATA III ports	2x SATA III ports	2x SATA III ports	2x SATA III ports
Fintek F81804U-I	Fintek F81804U-I	Fintek F81804U-I	Fintek F81964D-I
1x RS232 1x RS232/422/485 (Jumperless selection)	2x RS232/422/485 (Jumperless selection)	1x RS232 1x RS232/422/485 (Jumperless selection)	3x RS232 1x RS232/422/485 (Jumperless selection)
2x USB 2.0 via pin header	2x USB 2.0 via pin header 1x USB 2.0 Type-A	2x USB 2.0 via real I/O	2x USB 2.0 via pin header
5x USB 3.1 (Gen.2) via rear I/O 1x USB 3.1 (Gen2) via Type-C	3x USB 3.1 via rear I/O	2x USB 3.1 (Gen.2) via rear I/O 1x USB 3.1 via Type-C	1x USB 3.1 Type-C 4x USB 3.1 via rear I/O
Yes	Yes	Yes	Yes
2.0	2.0	2.0	2.0
1x M.2 (M-Key)	1x M.2 (M-Key)	1x M.2 (M-Key)	1x M.2 (M-Key)
256 levels	256 levels	256 levels	256 levels
4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out
1x M.2 (M-Key), 1x M.2 (E-Key)	1x M.2 (B-Key), 1x M.2 (E-Key), 1x M.2 (M-Key)	1x M.2 (M-Key), 1x M.2 (E-Key)	1x M.2 (B-Key), 1x M.2 (E-Key)
DC-in 12V~24V	DC-in 9V~24V	DC-in 12V~24V	DC-in 9V~24V
Intel® Core™ i7-11850HE 2.6GHz w/ 8GB DDR4-2400 +12V: 5.82A	Intel® Atom® i7-1185G7E 2.80GHz w/ 2x 16GB DDR4-3200 +12V: 3.88A	AMD Ryzen™ Embedded V2748 2.90GHz w/ 2x 16GB DDR4-3200 +12V:7.61A	Intel® Core™ i7-8665UE 1.70GHz w/ 2x 16GB DDR4-2400 +12V: 2.25A Intel® Core™ i3-8145UE 2.20GHz w/ 2x 16GB DDR4-2400 +12V: 2.24A
147mm x 102mm	147mm x 102mm	147mm x 102mm	147mm x 102mm
Built-in iAMT (15)	Built-in iAMT (15), EuP/ErP	EuP/ErP, LAN Wakeup	EuP/ErP, LAN Wakeup
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Remarks: 1. Specifications are subject to change without prior notice. 2. ODM/OEM is available. 3. For user's manual & datasheet download, visit [www.ibase.com.tw](http://www.ibase.com.tw).



# Comparison Table

## 3.5" Single Board Computer

Models	IB918	IB899	IB898	IB897
<b>Form Factor</b>	3.5" SBC	3.5" SBC	3.5" SBC	3.5" SBC
<b>CPU Socket</b>	CPU on board	CPU on board	CPU on board	CPU on board
<b>CPU</b>	AMD Ryzen™ embedded V1000/R1000 series	Intel® Pentium® Processor N3710 / Intel® Celeron® Processor N3010	Intel® Atom® Processor E3825/E3815	Intel® Atom® Processor E3845/E3827/E3815
<b>CPU Max. Frequency</b>	3.6GHz/ 2.3GHz	Up to 2.56GHz/ 2.24GHz	1.33GHz / 1.46GHz	1.91GHz / 1.75GHz / 1.46GHz
<b>PCH</b>	N/A	N/A	N/A	N/A
<b>Memory</b>	2x DDR4 SO-DIMM	2x DDR3L SO-DIMM	1x DDR3L SO-DIMM	2x DDR3L SO-DIMM
<b>Max. Memory Size</b>	32GB	8GB	8GB	16GB
<b>BIOS</b>	AMI	AMI	AMI	AMI
<b>Graphics Controller</b>	AMD Ryzen™ V-Series APU built-in GPU	Intel® Gen8 graphics	Intel® Gen7 w/ 4EUs graphics	Intel® Gen7 w/ 4EUs graphics
<b>Video Output</b>	2x HDMI2 .0 24-bit dual-channel LVDS eDP	24-bit dual-channel LVDS DVI-D & VGA on board	24-bit dual-channel LVDS DisplayPort & VGA on board	24-bit dual-channel LVDS DisplayPort on board
<b>Ethernet</b>	Intel® I211AT or I210AT GbE	2x Intel® I210AT Gigabit LAN	1x Intel® I210IT Gigabit LAN	2x Intel® I210IT Gigabit LAN
<b>Audio</b>	Built-in ALC269Q-VC3-GR HD audio codec with 2W amplifier	Built-in ALC8885 HD audio codec	Built-in ALC269 HD audio codec with integrated 2 amplifier	Built-in ALC269 HD audio codec 2W amplifier
<b>SATA</b>	2x SATA III ports	2x SATA III ports	2x SATA II ports	2x SATA II ports
<b>I/O Chipset</b>	F81964D-I	NCT5523D	NCT5523D	NCT5523D
<b>Serial Port</b>	3x RS232 1x RS232/422/485 (Jumperless selection)	1x RS232 1x RS232/422/485 (Jumperless selection)	1x RS232 1x RS232/422/485 (Jumperless selection)	1x RS232 1x RS232/422/485 (Jumperless selection)
<b>USB 2.0</b>	1x USB 2.0 via pin header	2x USB 2.0 via pin header	1x USB 2.0 via rear I/O 2x USB 2.0 via pin header	1x USB 2.0 via rear I/O 2x USB 2.0 via pin header
<b>USB 3.X</b>	2x USB 3.1 via rear I/O 2x USB 3.0 via rear I/O from eDP Lanes	4x USB 3.0 via rear I/O	1x USB 3.0 via rear I/O	1x USB 3.0 via rear I/O
<b>Hardware Monitor</b>	Yes	Yes	Yes	Yes
<b>TPM</b>	2.0	N/A	N/A	N/A
<b>Storage Device Interface</b>	1x M.2 (M-Key)	mSATA via Mini PCIe	mSATA via Mini PCIe	mSATA via Mini PCIe, MicroSD slot
<b>Watchdog Timer</b>	256 levels	256 levels	256 levels	256 levels
<b>Digital I/O</b>	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out
<b>Mini Type Slots</b>	1x M.2 (B-Key), 1x M.2 (E-Key)	2x Mini PCIe(x1)	3x Mini PCIe(x1)	2x Mini PCIe(x1)
<b>Power input</b>	DC-in 12V~24V	DC-in 12V~24V	DC-in 12V	DC-in 9V~30V
<b>Power Consumption</b>	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® Pentium® N3700 1.6GHz w/ 2x 4GB DDR3L-1600 +12V : 1.5A	Intel® Atom® E3825 1.33GHz w/ 4GB DDR3L-1600 +12V: 0.65A	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
<b>Dimensions (L x W)</b>	147mm x 102mm	147mm x 102mm	147mm x 102mm	147mm x 102mm
<b>Extra Features</b>	EuP/ErP, LAN Wakeup	LAN Wakeup, iSMART	LAN Wakeup, iSMART	LAN Wakeup, iSMART
<b>Page No.</b>	P.1-14	P.1-15	P.1-16	P.1-17

1 Single Board Computers

2 CPU Modules

3 Motherboards

4 CPU Cards

5 COM-HPC Module

# Comparison Table

## 3.5" Single Board Computer

IB839	IB838	IB837	IB836
3.5" SBC	3.5" SBC	3.5" SBC	3.5" SBC
CPU on board	CPU on board	CPU on board	CPU on board
Intel® Atom® Processor x7835RE Intel® Atom® Processor x7211RE	Intel® Core i3-N305 Intel® Processor N50	Intel® Celeron QC J6412 Intel® Celeron QC N6210	Intel® Atom® Processor x6211E Intel® Atom® Processor x6413E Intel® Atom® Processor x6425E
Up to 3.6GHz	Up to 3.8GHz	Up to 2.6GHz	Up to 3.0GHz
N/A	N/A	N/A	N/A
1x DDR5 SO-DIMM	2x DDR5 SO-DIMM	1x DDR4 SO-DIMM	2x DDR4 SO-DIMM
16GB	16GB	16GB	32GB
AMI	AMI	AMI	AMI
Intel® Gen12 UHD graphics	Intel® Gen12-AL w/ 32 EUs graphics	Intel® Gen11 w/ 32 EUs graphics	Intel® Gen11-LP w/ 32 EUs graphics
24-bit dual-channel Type-C & DP++ and eDP or LVDS 1x DisplayPort on board	24-bit dual-channel Type-C & DP++ and eDP or LVDS 1x DisplayPort on board	2x 24-bit dual-channel LVDS 1x DisplayPort on board	24-bit dual-channel LVDS or eDP 2x DisplayPort on board
2x Intel® I226T Gigabit LAN	2x Intel® I226V Gigabit LAN	2x Intel® I226V Gigabit LAN	3x Intel® I226IT 2.5G LAN
Built-in ALC888S HD audio codec with 2W amplifier	Built-in ALC888S HD audio codec with 2W amplifier	Built-in ALC888S HD audio codec with 2W amplifier	Built-in ALC888S HD audio codec with 2W amplifier
1x SATA III port	1x SATA III ports	1x SATA III ports	2x SATA III ports
F81964D-I	F81964D-I	F81966D-I	F81964D-I
3x RS232 1x RS232/422/485 (Jumperless selection)	3x RS232 1x RS232/422/485 (Jumperless selection)	5x RS232 1x RS232/422/485 (Jumperless selection)	3x RS232 1x RS232/422/485 (Jumperless selection)
2x USB 2.0 via pin header	2x USB 2.0 via pin header	2x USB 2.0 via pin header	2x USB 2.0 via pin header
1x Type-C 3x Type-A	1x Type-C 3x Type-A	4x USB 3.1 Type-A	3x USB 3.1 via rear I/O 1x USB 3.1 via Type-C
Yes	Yes	Yes	Yes
dTPM	fTPM	fTPM	TPM (2.0)
M.2 SSD via B-Key	M.2 SSD via B-Key	mSATA via Mini PCIe	mSATA via Mini PCIe
256 levels	256 levels	256 levels	256 levels
4-in / 4-out	4-in / 4-out	4-in / 4-out	4-in / 4-out
1x M.2 (E-Key), 1x M.2 (B-Key)	1x M.2 (E-Key), 1x M.2 (B-Key)	1x Mini PCIe (x1) , 1x M.2 (E-Key), 1x M.2 (B-Key)	1x Mini PCIe (x1), 1x M.2 (E-Key)
DC-in 9V~36V	DC-in 9V~36V	DC-in 12V	DC-in 9V~36V
Intel® N355 Processor, Up to 3.90GHz Transcend TS2GSA64V6E w/ 1x DDR5-5600 16GB +12V : 4.17A	Intel® Core™ i3-N305 1.80GHz w/ 4800 8GB DDR5 ADATA AD5S48008G-S +12V:2.8A	Intel® Celeron® J6412 2.00GHz w/ 8GB DDR4-3200 +12V:1.57A	Intel® Atom® x6425E Processor w/ 2x 16GB DDR4-3200 +12V:1.93A
147mm x 102mm	147mm x 102mm	147mm x 102mm	147mm x 102mm
LAN Wakeup, Eup / Erp	LAN Wakeup, Eup / Erp	LAN Wakeup, Eup / Erp	LAN Wakeup, Eup / Erp
P.1-18	P.1-19	P.1-20	P.1-21

- 1 Single Board Computers
- 2 CPU Modules
- 3 Motherboards
- 4 CPU Cards
- 5 COM-HPC Module

# Comparison Table

## 3.5" Single Board Computer

Models	IB818	IB811	IB301
<b>Form Factor</b>	3.5" SBC	3.5" SBC	3.5" SBC
<b>CPU Socket</b>	CPU on board	CPU on board	CPU on board
<b>CPU</b>	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	Ryzen™ Embedded 8000 series
<b>CPU Max. Frequency</b>	Up to 2.0GHz/ 1.8GHz/ 2.5GHz/ 2.4GHz	Up to 2.0GHz/ 1.8GHz/ 2.5GHz/ 2.4GHz	Up to 5.1GHz
<b>PCH</b>	N/A	N/A	N/A
<b>Memory</b>	1x DDR3L SO-DIMM	2x DDR3L SO-DIMM	2x DDR5 SO-DIMM
<b>Max. Memory Size</b>	8GB	16GB	128GB
<b>BIOS</b>	AMI	AMI	AMI
<b>Graphics Controller</b>	Intel® Gen9-LP w/ 18 EUs graphics	Intel® Gen9-LP w/ 18 EUs graphics	RDNA3 graphics with Up to 6 WGP's
<b>Video Output</b>	18/24-bit dual-channel LVDS HDMI on board	24-bit dual-channel LVDS or eDP HDMI & DisplayPort on board	1x DP 2.1 1x HDMI 2.1 1x eDP 1.5
<b>Ethernet</b>	2x Intel® I210IT Gigabit LAN or 1x Intel® I210AT Gigabit LAN	2x Intel® I210IT Gigabit LAN or 2x Intel® I210AT Gigabit LAN	2x Intel® I226-V 2.5 Gigabit LAN
<b>Audio</b>	Built-in ALC888S HD audio codec with 2W amplifier	Built-in ALC888S HD audio codec with 2W amplifier	Realtek audio codec ALC888S-VD2-GR
<b>SATA</b>	2x SATA III ports	2x SATA III ports	N/A
<b>I/O Chipset</b>	F81964D-I	F81964D-I	Fintek F81956D-I
<b>Serial Port</b>	3x RS232 1x RS232/422/485 (Jumperless selection)	3x RS232 1x RS232/422/485 (Jumperless selection)	COM 1 & 2 : RS-232/422/485 configurable via BIOS Default is RS-232 R/+5V/+12V function can be set by jumper (Default is R) COM 3 & 4: RS232
<b>USB 2.0</b>	2x USB 2.0 ports via pin header	2x USB 2.0 via pin header	4x USB 2.0 (2 for Type-A, 2 for pin Header) (Add +5V source for Panel)
<b>USB 3.X</b>	4x USB 3.0 ports on board	4x USB 3.0 via rear I/O	2x USB 3.2 Gen2 (10Gbps) Type-A
<b>Hardware Monitor</b>	Yes	Yes	Yes
<b>TPM</b>	N/A	N/A	fTPM
<b>Storage Device Interface</b>	mSATA via Mini PCIe	mSATA via Mini PCIe	M.2 (M2280 for NVMe)
<b>Watchdog Timer</b>	256 levels	256 levels	256 levels
<b>Digital I/O</b>	4-in/4-out	4-in / 4-out	4-in/4-out
<b>Mini Type Slots</b>	2x Mini PCIe (x1)	1x Mini PCIe (x1), 1x M.2 (B-Key)	3x M.2 slots (M-Key + E-Key + B-Key)
<b>Power input</b>	DC-in 12V~24V	DC-in 9V~36V	DC-in 12V~24V
<b>Power Consumption</b>	Intel® Atom® E3950, 1.6GHz w/ 8GB DDR3L +12V: 1.09A, Intel® Pentium® N4200, 1.1GHz w/ 8GB DDR3L +12V: 1.09A	Intel® Atom® E3900 1.3GHz w/ 2x Transcend DDR3L 1600 4GB +12V: 1.2A	TBD
<b>Dimensions (L x W)</b>	147mm x 102mm	147mm x 102mm	147mm x 102mm
<b>Extra Features</b>	LAN Wakeup, Eup / Erp	LAN Wakeup, Eup / Erp	1x Smart Fan Connector
<b>Page No.</b>	P.1-22	P.1-23	P.1-24

1 Single Board Computers

2 CPU Modules

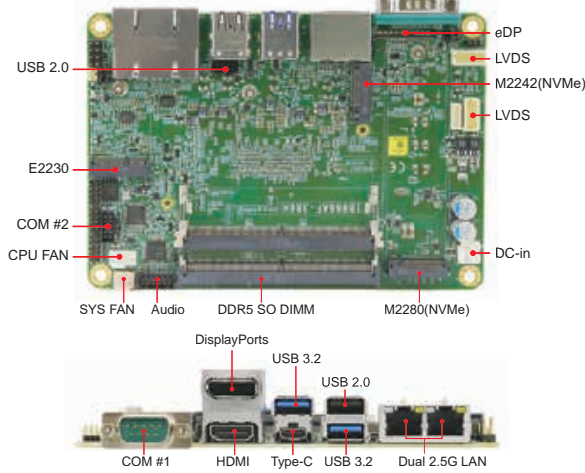
3 Motherboards

4 CPU Cards

5 COM-HPC Module

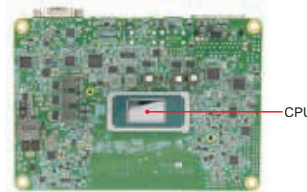


**Preliminary**



### Features

- Intel® Core™ Ultra & Core™ Ultra X 300H Series Processor (Panther Lake-H Platform)
- 2x DDR5 SO-DIMM, Max. 128GB
- Supports HDMI, DisplayPort, DisplayPort (Type-C), LVDS and eDP
- 2x 2.5G LAN, 3x USB 2.0, 2x USB 3.2(Type-A), 2x COM
- 3x M.2 slots (M2280+M2242+E2230), 12V~24V DC-in
- Digital I/O (4-in/4-out), iAMT, dTPM & Watchdog Timer



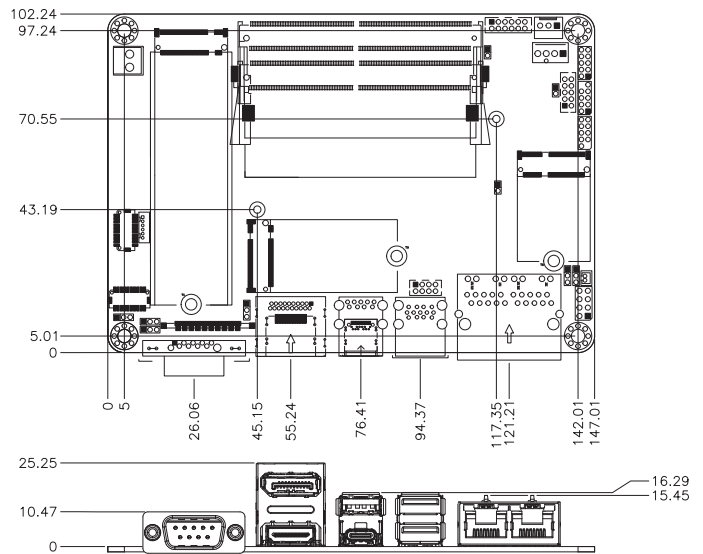
### Specifications

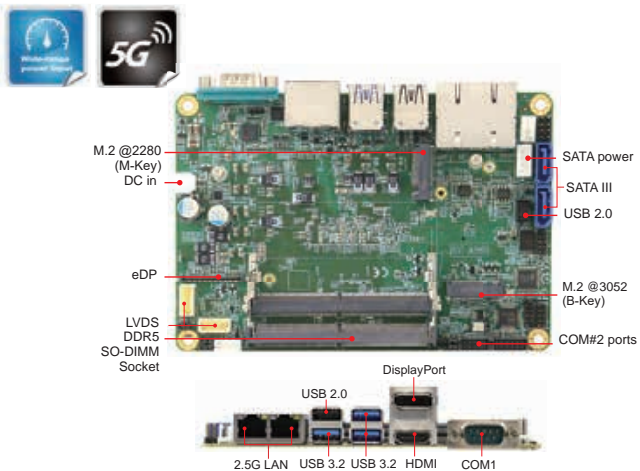
CPU	Intel® Core™ Ultra & Core™ Ultra X 300H Series Processors
PCH	N/A
Memory	2x DDR5 SO-DIMM, 7200MT/s, Non-ECC, Max.128GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	2x M.2 (M2280& M2242 for NVMe)
Mini Type Slots	1x M.2 (M2280, supports NVMe only) 1x M.2 (M2242, supports NVMe only) 1x M.2 (E2230, support CNVi)+WiFi(BT)
Graphics Controller	Intel® Core™ Ultra 300H Processor built-in X3 Graphics
Video Output	HDMI, DisplayPort, DisplayPort(Type-C), LVDS and eDP
Ethernet	Intel® I226LM as 1st LAN, I226V as 2nd LAN
I/O Chipset	Fintek F81804U-I on board
Serial Port	2x RS232/422/485
USB 2.0	3x USB 2.0 (1x Type-A ; 2x via pin headers)
USB 3.X	2x USB 3.2 (Type-A)
Serial ATA	N/A
Audio	Intel® Core™ Ultra processor built-in HD audio + ALC888S codec
TPM	dTPM
Others	Digital I/O (4-in/4-out), iAMT; +12V~+24V DC-in
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
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	10% ~ 90% (non-condensing)

### Ordering Information

IB966AF-358H	Intel® Core™ Ultra & Core™ Ultra X7 358H Series SoC onboard 3.5" SBC,w/ dual 2.5Gb, HDMI + DisplayPort, DisplayPort (Type-C),LVDS & eDP 2x COM, 2x M.2, supports iAMT& dTPM, DC-in (12V~24V), Optional heatsink
HSIB966-B	Heatsink with fan for IB966

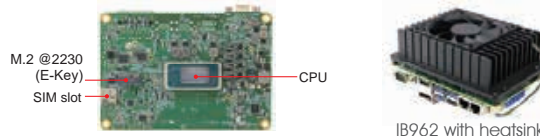
### Dimensions and Drawings





## Features

- Onboard Intel® Core™ Ultra 7/5 100 Series Mobile processors
- 2x DDR5 SO-DIMM, Max. 96GB
- Supports HDMI, DP++, LVDS and eDP
- 1x Intel® I226LM 2.5G LAN, 1x Intel® I226V 2.5G LAN
- 3x USB 3.2, 3x USB 2.0, 2x COM, 2x SATA III
- 3x M.2 slots (M-Key + E-Key + B-Key)
- Supports 5G, digital I/O (4-in/4-out), dTPM & Watchdog Timer



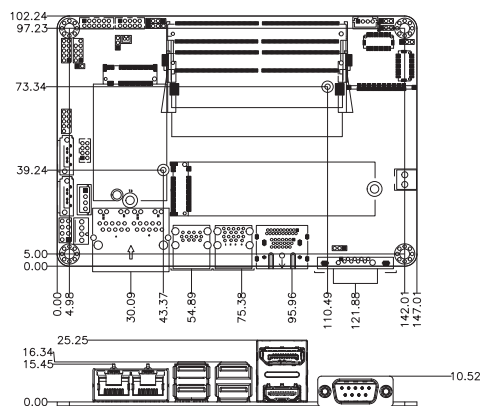
## Specifications

CPU	Intel® Core™ Ultra 7/5 100 Series Mobile processors
PCH	N/A
Memory	2x DDR5 SO-DIMM, 5600MT/s, Non-ECC, Max.96GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	M.2 (M2280 for NVMe)
Mini Type Slots	1x M.2 (M-Key, Type:2280, supports NVMe with PCIe(4x) signal only) 1x M.2 (E-Key, Type:2230, supports CNVi) 1x M.2 (B-Key, Type:3052, supports 5G/LTE)
Graphics Controller	Intel® Core™ Ultra processor series built-in Iris Xe Graphics
Video Output	HDMI, DisplayPort, eDP & LVDS
Ethernet	Intel® I226LM as 1st LAN, I226V as 2nd LAN
I/O Chipset	Fintek F81804U-I on board
Serial Port	2x RS232/422/485
USB 2.0	3x USB 2.0 (1x Type-A ; 2x via pin headers)
USB 3.X	3x USB 3.2 (Type-A)
Serial ATA	2x SATA III
Audio	Intel® Core™ Ultra processor built-in HD audio + ALC888S codec
TPM	dTPM
Others	Digital I/O (4-in/4-out); +12V~+24V DC-in
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® Core™ Ultra 7 165H, Up to 5.0GHz w/ 2x 32GB DDR5-5600 memory module +12V: 6.83A
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

IB962AF-165H	Intel® Core™ Ultra 7 165H onboard 3.5" SBC, w/ I226LM + I226V 2.5G LAN, VGA (HDMI + DP + eDP + LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230/ B3052), supports iAMT & dTPM, DC-in (12V~24V), Optional heatsink, cable kit
IB962AF-165U	Intel® Core™ Ultra 7 165U onboard 3.5" SBC, w/ I226LM + I226V 2.5G LAN, VGA (HDMI + DP + eDP + LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230/ B3052), supports iAMT & dTPM, DC-in (12V~24V), Optional heatsink, cable kit
IB962AF-155H	Intel® Core™ Ultra7 155H 3.5" SBC, w/ I226LM + I226V 2.5G LAN, VGA (HDMI + DP + eDP + LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230/ B3052), DC in (12V~24V), Supports iAMT & dTPM, Optional Heatsink, cable kit
IB962AF-155U	Intel® Core™ Ultra 7 155U onboard 3.5" SBC, w/ I226LM + I226V 2.5G LAN, VGA (HDMI + DP + eDP + LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230/ B3052), supports iAMT & dTPM, DC-in (12V~24V), Optional heatsink, cable kit
IB962AF-135H	Intel® Core™ Ultra 5 135H onboard 3.5" SBC, w/ I226LM + I226V 2.5G LAN, VGA (HDMI + DP + eDP + LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230/ B3052), supports iAMT & dTPM, DC-in (12V~24V), Optional heatsink, cable kit
IB962AF-135U	Intel® Core™ Ultra 5 135U onboard 3.5" SBC, w/ I226LM + I226V 2.5G LAN, VGA (HDMI + DP + eDP + LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230/ B3052), supports iAMT & dTPM, DC-in (12V~24V), Optional heatsink, cable kit
IB962AF-125H	Intel® Core™ Ultra5 125H 3.5" SBC, w/ I226LM + I226V 2.5G LAN, VGA (HDMI + DP + eDP + LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230/ B3052), DC in (12V~24V), Supports iAMT & dTPM, Optional Heatsink, cable kit
IB962AF-125U	Intel® Core™ Ultra 5 125U onboard 3.5" SBC, w/ I226LM + I226V 2.5G LAN, VGA (HDMI + DP + eDP + LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230/ B3052), supports iAMT & dTPM, DC-in (12V~24V), Optional heatsink, cable kit
IB76A	Cable kit w/USB, COM, Power, SATA
HSIB962-B	Heatsink + Cooler for IB962 series
HSIB962-1	Heat Spreader for IB962 series

## Dimensions and Drawings



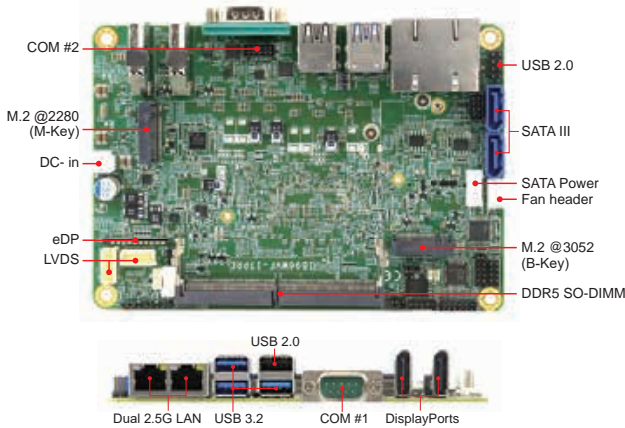
1 Single Board Computers

2 CPU Modules

3 Motherboards

4 CPU Cards

5 COM-HPCC Module



## Features

- Onboard 13th Gen Intel® Core™ i7-1370PRE mobile processor
- 1x DDR5 SO-DIMM, Max. 32GB, Supports IB ECC
- Supports 2x DP++, LVDS, and eDP
- 2x Intel® I226IT PCIe 2.5G LAN
- 3x USB 2.0, 3x USB 3.2, 2x COM, 2x SATA III
- 3x M.2 slots (M-Key + E-Key + B-Key)
- Supports 5G, digital I/O (4-in/4-out), fTPM & Watchdog Timer
- Supports wide-range operating temperature from **-40°C to 75°C**



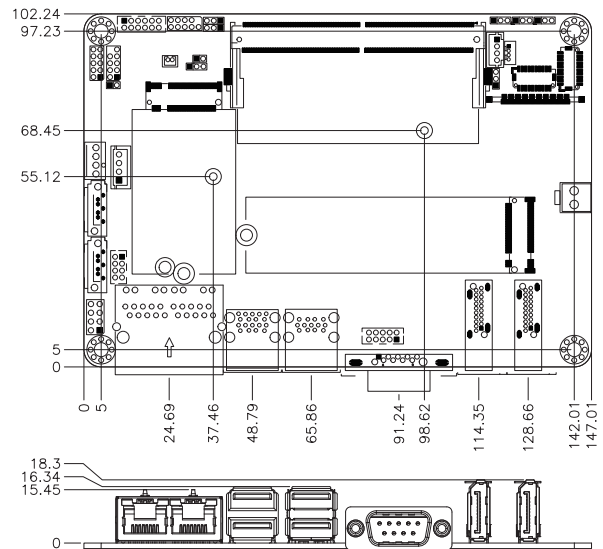
## Specifications

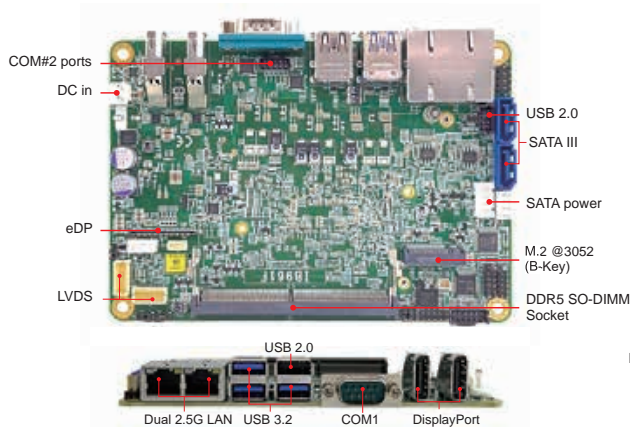
CPU	Onboard 13th Gen Intel® Core™ i7-1370PRE processor, support wide-temp
PCH	N/A
Memory	1x DDR5 SO-DIMM, Max.32GB, supports IB ECC
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	M.2 (M2280 for NVMe) SATA III
Mini Type Slots	1x M.2 (M-Key, Type:2280, with PCIe (4x) signal only, supports NVMe) 1x M.2 (E-Key, Type:2230, with PCIe (1x) & USB 2.0 signal, supports CNV) 1x M.2 (B-Key, Type:3052, with PCIe (1x) & USB 3.2 signal, supports 5G/LTE)
Graphics Controller	13th Gen Intel® Core™ mobile processor integrated graphics
Video Output	2x DisplayPort, eDP, and LVDS
Ethernet	2x Intel® I226IT 2.5G LAN
I/O Chipset	Fintek F81804U-I
Serial Port	2x COM (RS232/422/485)
USB 2.0	3x USB 2.0 (1x Type-A ; 2x via pin headers)
USB 3.X	3x USB 3.2 (Type-A)
Serial ATA	2x SATA III
Audio	Integrated HD audio with ALC888S codec
TPM	fTPM only
Others	Digital I/O (4-in/4-out); <b>+12V~+24V DC-in</b>
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® Core™ i7-1370PRE processor, Up to 4.8GHz w/ 1x 32GB DDR5-5600 memory +24V: 3.82A
Operating Temperature	<b>-40°C~+75°C (-40°F~+167°F)</b>
Storage Temperature	-45°C~+80°C (-49°F~176°F)
Relative Humidity	10% ~ 90% (non-condensing)

## Ordering Information

IB96WVf-I7PRE	Intel® Core™ i7-1370PRE 3.5" SBC, w/ Dual I226IT LAN, VGA (2x DisplayPort + eDP + LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230 & B3052), DC in (12V~24V), supports iAMT, fTPM, Optional heatsink, w/o cable kit, (RoHS 2)
HSIB96W-B	Heatsink with fan for IB96W
HSIB96W-1	Heat spreader for IB96W
IB76A-2	Cable kit w/ USB, COM, Power, SATA + Power

## Dimensions and Drawings





## Features

- Onboard 13th Gen Intel® Core™ i7/i5/i3 mobile processor
- 1x DDR5-5200/4800 SO-DIMM, Max. 32GB
- Supports 2x DisplayPort (1.2), LVDS and eDP
- 2x Intel® PCIe 2.5G LAN
- 3x USB 2.0, 3x USB 3.2, 2x COM, 2x SATA III
- 3x M.2 slots (M-Key + E-Key + B-Key)
- Supports 5G, digital I/O (4-in/4-out), fTPM & Watchdog Timer
- Supports wide-range operating temperature from **-40°C to 75°C (Only IB961AF-I7PRE)**

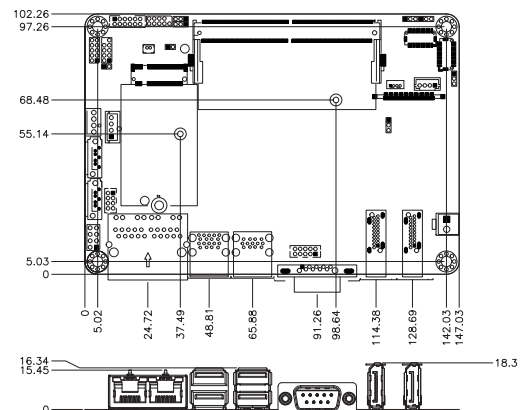
## Specifications

CPU	13th Gen Intel® Core™ i7-1370PRE 13th Gen Intel® Core™ i7-1370PE 13th Gen Intel® Core™ i5-1340PE 13th Gen Intel® Core™ i5-1335UE 13th Gen Intel® Core™ i3-1320PE
PCH	N/A
Memory	1x DDR5 5200/4800 SO-DIMM, Max. 32GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	M.2 (M2280 for NVMe)
Mini PCIe Slots	1x M.2 (M-Key, Type:2280, supports NVMe with PCIe(4x) signal only) 1x M.2 (E-Key, Type:2230, supports CNV) 1x M.2 (B-Key, Type:3052, supports 5G/LTE)
Graphics Controller	13th Gen Intel® Core™ mobile processor integrated graphics
Video Output	2x DisplayPort (1.2), eDP & LVDS
Ethernet	Intel® I226LM/IT as 1st LAN, I226V/IT as 2nd LAN
I/O Chipset	Fintek F81804U-I on board
Serial Port	2x COM port
USB 2.0	3x USB 2.0 (1x Type-A ; 2 via pin headers)
USB 3.X	3x USB 3.2 (3x Type-A)
Serial ATA	2x SATA III
Audio	13th Gen Intel® Core™ P-Series processor built-in HD audio + ALC888S codec
TPM	fTPM
Others	Digital I/O (4-in/4-out) ; <b>+12V~+24V DC-in</b>
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® Core™ i7-1370PE processor, Up to 4.8GHz w/1 x 32G DDR5-4800 memory module +12V: 6.56A
Operating Temperature	0°C~60°C (32°F~140°F) <b>-40°C~75°C (-40°F~167°F) for IB961AF-I7PRE</b>
Storage Temperature	-40°C~80°C (-40°F~176°F)
Relative Humidity	10% ~ 90% (non-condensing)

## Ordering Information

IB961AF-I7P	Intel® Core™ i7-1370PE 3.5" SBC w/ I226LM + I226V 2.5G LAN, VGA (2x DisplayPort (1.2) + eDP + LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230& B3052), DC in (12V~24V), supports iAMT, fTPM, optional heatsink, w/o cable kit, (RoHS 2)
IB961AF-I5P	Intel® Core™ i5-1340PE 3.5" SBC w/ I226LM + I226V 2.5G LAN, VGA (2x DisplayPort (1.2) + eDP + LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230& B3052), DC in (12V~24V), supports iAMT, fTPM, optional heatsink, w/o cable kit, (RoHS 2)
IB961F-I3P	Intel® Core™ i3-1320PE 3.5" SBC w/ I226LM + I226V 2.5G LAN, VGA (2x DisplayPort (1.2) + eDP + LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230& B3052), DC in (12V~24V), supports fTPM, optional heatsink, w/o cable kit, (RoHS 2)
IB961AF-I5U	Intel® Core™ i5-1335UE 3.5" SBC w/ I226LM + I226V 2.5G LAN, VGA (2x DisplayPort (1.2) + eDP + LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230& B3052), DC in (12V~24V), supports iAMT, fTPM, optional heatsink, w/o cable kit, (RoHS 2)
IB961AF-I7PRE	Intel® Core™ i7-1370PRE 3.5" SBC w/ I226IT 2.5G LAN, VGA (2x DisplayPort(1.2) + eDP + LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230& B3052), DC in (12V~24V), supports iAMT, fTPM, Optional heatsink, w/o cable kit, (RoHS 2)
HSIB961-A	Heatsink with fan for IB961
HSIB961-B	Heatsink with fan for IB961AF-I7PRE
HSIB961-1	Heat spreader for IB961

## Dimensions and Drawings



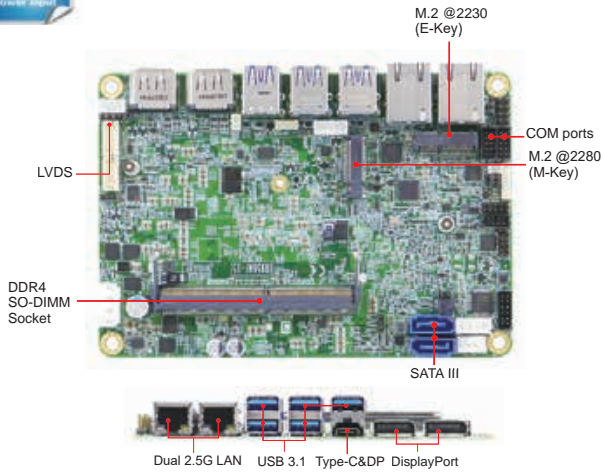
1 Single Board Computers

2 CPU Modules

3 Motherboards

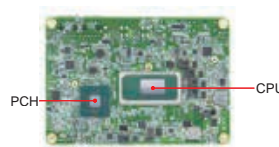
4 CPU Cards

5 COM-HPC Module



### Features

- Onboard 11th Gen Intel® Core™ i7/i5/i3 / Celeron® processor (Tiger Lake H)
- 1x DDR4-3200 SO-DIMM, Max.32GB
- Supports 3x DisplayPort (DP connectors + Type-C connector) and 24-bit dual channel LVDS
- 2x Intel® 2.5 Gigabit LAN
- 6x USB 3.1, 2x USB 2.0, 2x SATA III, 2x COM, 2x M.2
- Watchdog Timer, Digital I/O, iAMT (15), TPM (2.0)



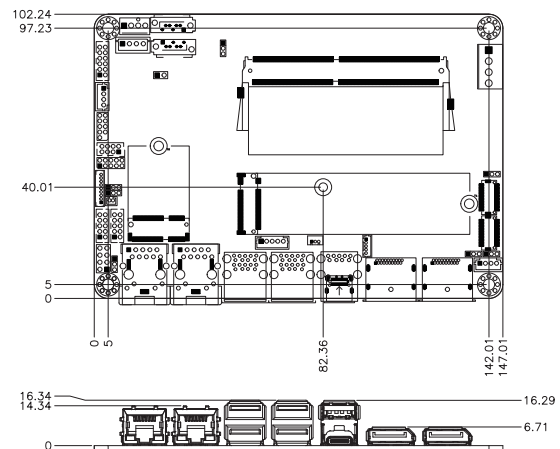
### Specifications

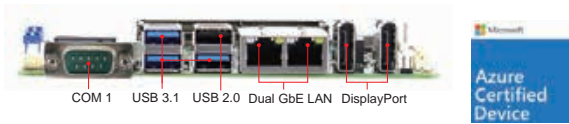
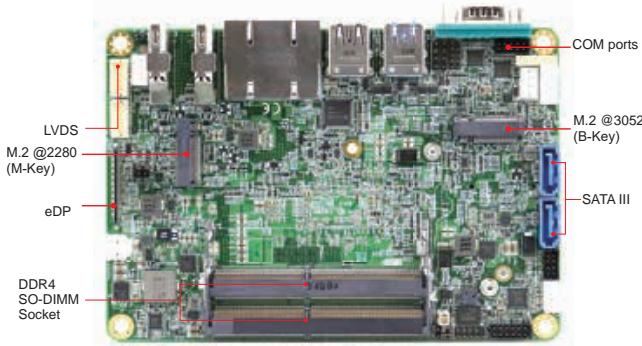
CPU	11th Gen Intel® Core™ i7-11850HE 11th Gen Intel® Core™ i5-11500HE 11th Gen Intel® Core™ i3-11100HE
PCH	IB956AF6-i7/i5: Intel® QM580E IB956EF6-i3: Intel® HM570E
Memory	1x DDR4-3200 SO-DIMM, Max.32GB
BIOS	AMI
Watchdog Timer	256 Levels
H/W Monitor	Yes
Storage Device Interface	NVMe
Mini Type Slots	1x M.2 (M-Key, type:2280, supports NVMe with PCIe(4x)signal only) 1x M.2 (E-Key, type:2230, supports CNVI)
Graphic Controller	11th Gen Intel® Core™ H-series processor integrated graphics
Video Output	3x DisplayPort (1.4) (DP connectors + Type-C connector), and 24-bit dual channel LVDS
Ethernet	1st LAN: IB956AF6-i7/i5: Intel® I226LM IB956EF6-i3: Intel® I226-V 2nd LAN: Intel® I226-V
I/O Chipset	Fintek F81804U-1
Serial Port	1x RS232/422/485, 1x RS232
USB 2.0	2x USB 2.0 via pin header
USB 3.X	QM580E: 6x USB 3.1 (Gen2) HM570E: 4x USB 3.1 (Gen2), 2x USB 3.1(Gen1)
Serial ATA	2x SATA III
Audio	11th Gen Intel® Core™ H-series processor Built-in HD audio controller + Realtek ALC888S
TPM	TPM (2.0)
Others	Digital I/O, +12V ~ +24V DC-in
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® Core™ i7-11850HE 2.6GHz w/ 1x 8GB DDR4-2400 +12V: 5.82A
Operating Temperature	0°C~60°C
Storage Temperature	-20°C~80°C
Relative Humidity	95% (non-condensing @60°C)

### Ordering Information

IB956AF6-i7	Onboard Intel® QM580E / Core™ i7-11850HE, w/ I226LM 2.5GbE LAN + I226V 2.5GbE LAN, 3x DisplayPort (DP+ Type-C) & LVDS (24bit dual-channel), 2x SATA III, 2x COM, 2x M.2 (M2280/ E2230), DC-in (12V~24V), support iAMT 15.0, TPM (2.0), Optional heatsink, w/o cable kit, (RoHS 2)
IB956AF6-i5	Onboard Intel® QM580E/ Core™ i5-11500HE, w/ I226LM 2.5GbE LAN + I226V 2.5GbE LAN, 3x DisplayPort (DP+ Type-C) & LVDS (24bit dual-channel), 2x SATA III, 2x COM, 2x M.2 (M2280/ E2230), DC-in (12V~24V), support iAMT 15.0, TPM (2.0), Optional heatsink, w/o cable kit, (RoHS 2)
IB956EF6-i3	Onboard Intel® HM570E/ Core™ i3-11100HE, w/ 2x I226V 2.5GbE LAN, 3x DisplayPort (DP+ Type-C) & LVDS (24bit dual-channel), 2x SATA III, 2x COM, 2x M.2 (M2280/ E2230), DC-in (12V~24V), TPM (2.0), Optional heatsink, w/o cable kit, (RoHS 2)
HSIB956-A	Heatsink with fan for IB956
HSIB956-1	Heat spreader for IB956
IB92	Cable kit w/ COM, Power, SATA + Power

### Dimensions and Drawings





## Features

- Onboard 11th Gen Intel® Core™ i7/i5/i3 / Celeron® processor
- 2x DDR4-3200 SO-DIMM, Max. 64GB
- Supports 2x DisplayPort, eDP and 24-bit dual-channel LVDS
- 2x Intel® PCIe GbE LAN
- 3x USB 2.0, 3x USB 3.1, 2x SATA III
- 3x M.2 sockets (B-Key/ E-Key and M-Key)
- Watchdog Timer, Digital I/O, TPM (2.0), 5G compatible



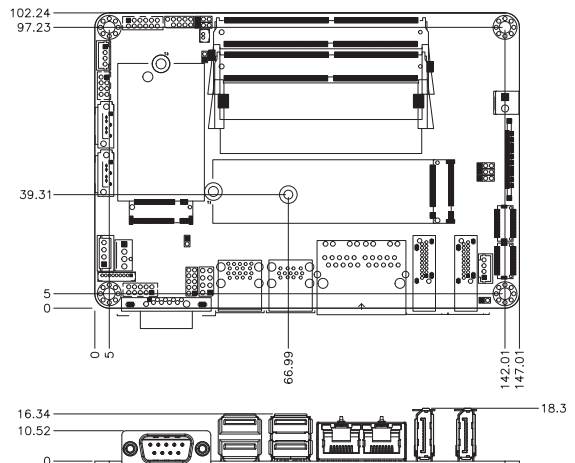
## Specifications

CPU	11th Gen Intel® Core™ i7-1185G7E 11th Gen Intel® Core™ i5-1145G7E 11th Gen Intel® Core™ i3-1115G4E Intel® Celeron® 6305E
PCH	Integrated in 11th Gen Intel® Core™ / Celeron® processor
Memory	DDR4-3200 SO-DIMM, Max. 64GB
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, supports NVMe with PCIe(4x) signal only) 1x M.2 (E-Key, Type:2230, supports CNVi) 1x M.2 (B-Key, Type:3052, supports 5G)
Graphics Controller	Intel® Gen 12 Graphics
Video Output	2x DisplayPort, eDP and 24-bit dual-channel LVDS
Ethernet	IB953AF series: Intel® I219LM Gigabit LAN PHY IB953EF series: Intel® I219V Gigabit LAN PHY Intel® I211AT or I210AT Gigabit LAN (as 2nd LAN)
I/O Chipset	Fintek F81804U-I
Serial Port	2x RS232/422/485 (Jumperless selection)
USB 2.0	2x USB 2.0 (pin-header), 1x USB 2.0 (Type-A)
USB 3.X	3x USB 3.1 (Type-A)
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), EuP/ErP, +12V~+24V DC-in (+/-10%), supports IB ECC (depend on CPU SKU)
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® i7-1185G7E 2.8GHz/ w/ 2x16GB DDR4-3200 +12V: 3.71A Intel® i3-1115G4E 3.00GHz w/ 2x16GB DDR4-3200 +12V: 3.26A
Operating Temperature	0°C~60°C
Storage Temperature	-20°C~80°C
Relative Humidity	95% (non-condensing @60°C)

## Ordering Information

IB953AF-I7	Intel® Core™ i7-1185G7E 3.5" SBC, w/ I211AT or I210AT GbE LAN + I219LM GbE LAN, VGA (2x DisplayPort + eDP and LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230& B3052), DC-in (12V~24V), supports iAMT 15.0, TPM (2.0), Optional heatsink, w/o cable kit, (RoHS 2)
IB953AF-I5	Intel® Core™ i5-1145G7E 3.5" SBC, w/ I211AT or I210AT GbE LAN + I219LM GbE LAN, VGA (2x DisplayPort + eDP and LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230& B3052), DC-in (12V~24V), supports iAMT 15.0, TPM (2.0), Optional heatsink, w/o cable kit, (RoHS 2)
IB953EF-I3	Intel® Core™ i3-1115G4E 3.5" SBC, w/ I211AT or I210AT GbE LAN + I219V GbE LAN, VGA (2x DisplayPort + eDP and LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230& B3052), DC-in (12V~24V), TPM (2.0), supports EuP/ ErP, Optional heatsink, w/o cable kit, (RoHS 2)
IB953EF-CEL	Intel® Celeron® 6305E 3.5" SBC, w/ I211AT or I210AT GbE LAN + I219V GbE LAN, VGA (2x DisplayPort + eDP and LVDS), 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230& B3052), DC-in (12V~24V), TPM (2.0), supports EuP/ ErP, Optional heatsink, w/o cable kit, (RoHS 2)
HSIB953-A	Heatsink with fan for IB953
HSIB953-1	Heat spreader for IB953
IB76A-2	Cable kit w/ USB, COM, Power, SATA + Power

## Dimensions and Drawings



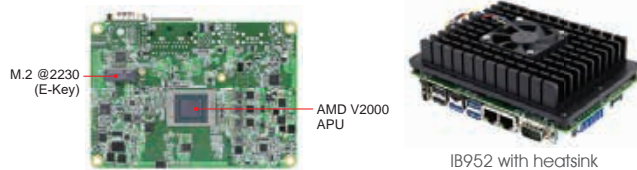
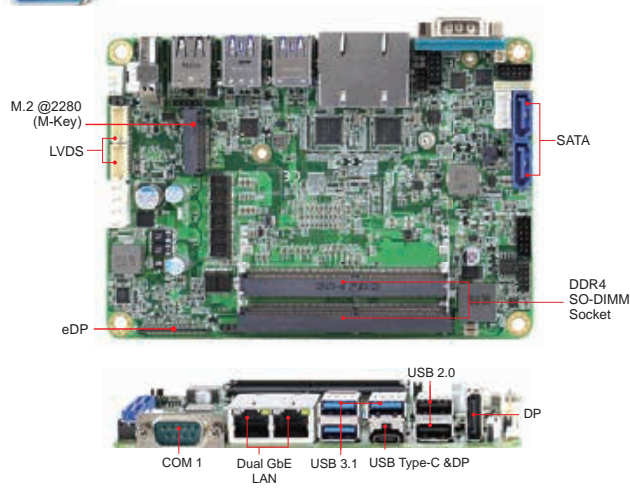
1 Single Board Computers

2 CPU Modules

3 Motherboards

4 CPU Cards

5 COM-HPCC Module



## Features

- AMD Ryzen™ Embedded V2000 on board
- 2x DDR4 SO-DIMM, Max. 64GB
- 2x Gigabit LAN
- Supports 2x DisplayPort (DP connector and Type-C), 1x eDP, 1x 24-bit dual-channel LVDS
- 2x USB 2.0, 3x USB 3.1, 2x SATA III, 2x COM
- 2x M.2 sockets (M-Key/ E-Key)

## Specifications

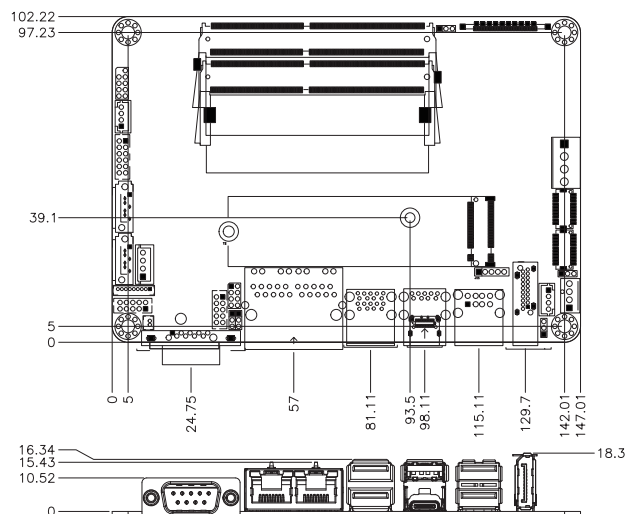
CPU	AMD Ryzen™ Embedded V2000 on board
PCH	N/A
Memory	DDR4-3200 SO-DIMM, Max. 64GB, supports ECC
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x M.2 (M-Key)
Mini Type Slots	1x M.2 (M-Key, type:2280, supports both NVMe and SATA 6Gb/s M.2 SSD) 1x M.2 (E-Key, type:2230)
Graphics Controller	AMD Radeon™ Vega integrated
Video Output	2x DisplayPort (DP connector & Type-C), 1x 24-bit dual-channel LVDS, 1x eDP
Ethernet	2x Intel® I211AT or I210AT Gigabit LAN
I/O Chipset	Fintek F81964
Serial Port	1x RS232/422/485 (Jumperless selection) 3x RS232
USB 2.0	2x USB 2.0 on board
USB 3.X	3x USB 3.1 on board
Serial ATA	2x SATA III
Audio	Built-in audio w/ Realtek ALC888S
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 V2748 2.9GHz w/ 2x 16GB DDR4-3200 +12V: 7.61A AMD Ryzen™ Embedded V2718 1.70GHz w/ 2x 16GB DDR4-3200 +12V: 3.92A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	95% (non-condensing @60°C)

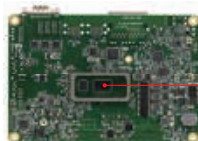
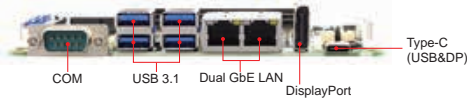
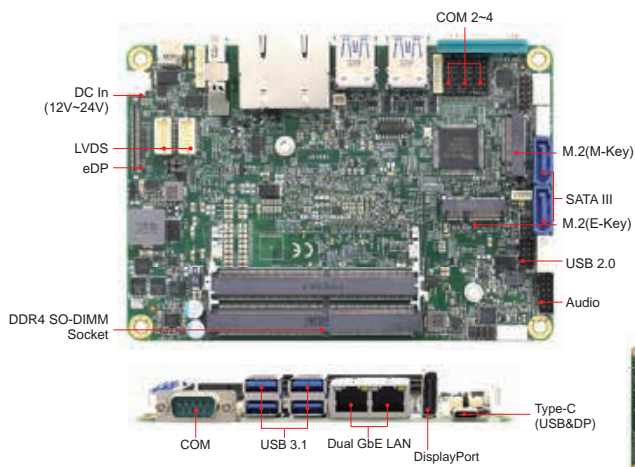
## Ordering Information

IB952F-2748	AMD Ryzen™ V2748 Octa APU (2.9GHz~4.15GHz) on board 3.5" SBC w/ dual LAN, 2x DisplayPort (DP+Type-C), eDP & LVDS (24-bit dual-channel), EuP/ErP, 12V~24V DC-in
IB952F-2718	AMD Ryzen™ V2718 Octa APU (1.7GHz~4.15GHz) on board 3.5" SBC w/ dual LAN, 2x DisplayPort (DP+Type-C), eDP & LVDS (24-bit dual-channel), EuP/ErP, 12V~24V DC-in
HSIB952-A	Heatsink with fan for IB952F-2718
HSIB952-B	Heatsink with fan for IB952F-2748
HSIB952-1	Heat spreader for IB952
IB92	Cable kit w/ COM, Power, SATA + Power

\*Specifications are subject to change without prior notice

## Dimensions and Drawings





## 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® PCIe GbE LAN
- 2x USB 2.0, 4x USB 3.1 (Type-A), 1x USB (Type-C), 2x SATA III
- 2x M.2 sockets (M-Key/ E-Key)
- Watchdog Timer, Digital I/O, TPM (2.0)

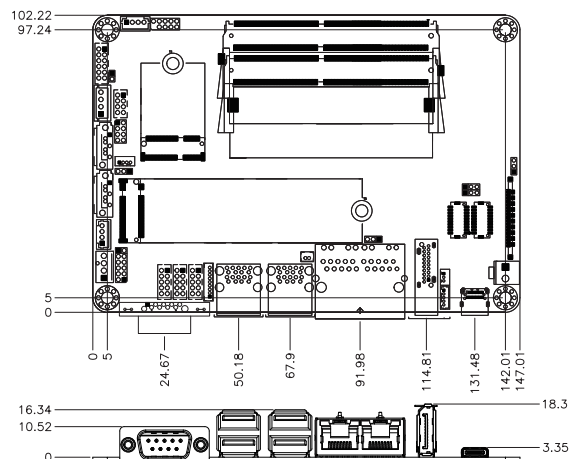
## Specifications

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	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, supports NVMe) 1x M.2 (E2230, supports CNVi)
Graphic 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 or I210AT Gigabit LAN (as 2nd LAN)
I/O Chipset	Fintek F81964D-I
Serial Port	1x RS232/422/485 (Jumperless selection) 3x RS232
USB 2.0	2x USB 2.0 (pin-header)
USB 3.X	4x USB 3.1 (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), +9V (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)

## Ordering Information

IB919AF-8665	Intel® Core™ i7-8665UE (1.7GHz/4.4GHz) 3.5" SBC w/ I211AT or I210AT 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), supports iAMT 11.0, TPM (2.0), Optional heatsink, w/o cable kit, (RoHS)
IB919AF-8365	Intel® Core™ i5-8365UE (1.6GHz/4.1GHz) 3.5" SBC w/ I211AT or I210AT 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), supports iAMT 11.0, TPM (2.0), Optional heatsink, w/o cable kit, (RoHS)
IB919EF-8145	Intel® Core™ i3-8145UE (2.2GHz/3.9GHz) 3.5" SBC w/ I211AT or I210AT 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	Intel® Celeron® 4305UE (2.0GHz) 3.5" SBC w/ 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-2	Cable Kit w/ USB, COM, Power cable, SATA+Power cable for IB919 series

## Dimensions and Drawings



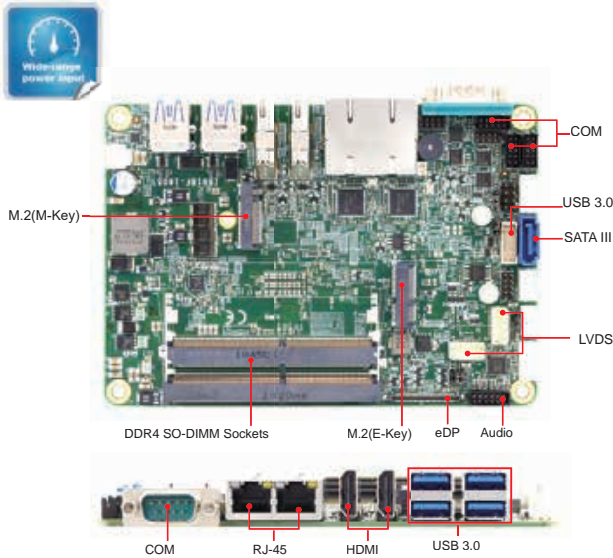
1 Single Board Computers

2 CPU Modules

3 Motherboards

4 CPU Cards

5 COM-HPC Module



## Features

- AMD Ryzen™ Embedded V1000/ R2000/ R1000 Series on board
- 2x DDR4 SO-DIMM, Max. 32GB
- 2x PCIe Gigabit LAN
- 2x HDMI, 1x eDP, 1x 24-bit dual-channel LVDS
- 1x USB 2.0, 4x USB 3.1, 1x SATA III, 4x COM
- 2x M.2 sockets (M-Key/ E-Key)



IB918 with heatsink

## Specifications

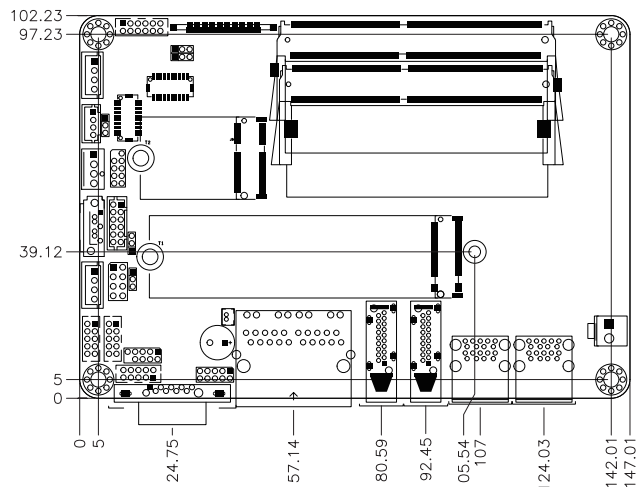
CPU	AMD Ryzen™ Embedded V1000/ R2000/ R1000 series
PCH	N/A
Memory	DDR4-2400 SO-DIMM, Max. 32GB, supports ECC
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x M.2 (M-Key)
Mini PCIe Slots	1x M.2 (M-Key, type: 2280, NVMe) 1x M.2 (E-Key, type: 2230)
Graphics Controller	AMD Radeon™ Vega integrated
Video Output	2x HDMI (2.0a), 1x 24-bit dual-channel LVDS & eDP
Ethernet	2x Intel® I211AT or I210AT Gigabit LAN
I/O Chipset	Fintek F81964D-I
Serial Port	1x RS232/422/485 (Jumperless selection) 3x RS232
USB 2.0	1x USB 2.0 on board
USB 3.X	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 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
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)

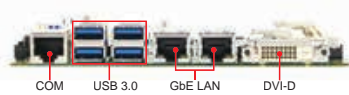
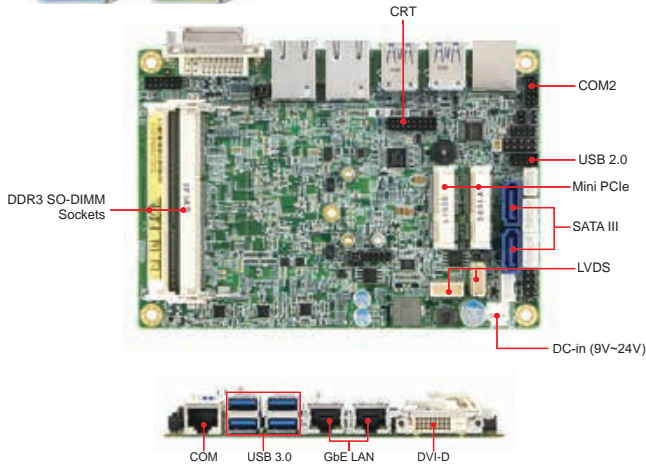
## Ordering Information

IB918F-1605	AMD Ryzen™ V1605B QC APU (2.0GHz~3.6GHz) on board 3.5" SBC w/ dual LAN, 2x HDMI, eDP & LVDS (24-bit dual-channel), EuP/ErP, 12V~24V DC-in
HSIB918-C	Heat sink with fan for IB918
IB918F-2514	3.5" AMD Ryzen™ R2514 (2.1GHz/3.7GHz) onboard, w/ I211AT GbE LAN x2, HDMI(2.0a) x 2 + eDP + LVDS, SATA III x1, COM x4, M.2 x2 (M2280 & E2240), DC-in (12V~24V), EuP/ErP, TPM (2.0), Optional Heatsink, w/o cable kit, (RoHS2)
IB918F-2314	3.5" AMD Ryzen™ R2314 (2.1GHz/3.5GHz) onboard, w/ I211AT GbE LAN x2, HDMI(2.0a) x 2 + eDP + LVDS, SATA III x1, COM x4, M.2 x2 (M2280 & E2240), DC-in (12V~24V), EuP/ErP, TPM (2.0), Optional Heatsink, w/o cable kit, (RoHS2)
IB918F-2312	3.5" AMD Ryzen™ R2312 (2.7GHz/3.5GHz) onboard, w/ I211AT GbE LAN x2, HDMI(2.0a) x 2 + eDP + LVDS, SATA III x1, COM x4, M.2 x2 (M2280 & E2240), DC-in (12V~24V), EuP/ErP, TPM (2.0), Optional Heatsink, w/o cable kit, (RoHS2)

\*Specifications are subject to change without prior notice

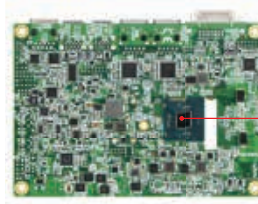
## Dimensions and Drawings





## 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® I211AT or I210AT Gigabit LAN
- 4x USB 3.0, 2x USB 2.0, 2x COM, 2x SATA III
- 2x Mini PCIe slots (1x full-size, 1x half-size)
- Watchdog Timer, Digital I/O, mSATA, iSMART(3.2), TPM(2.0)



IB899 with heatsink

## Specifications

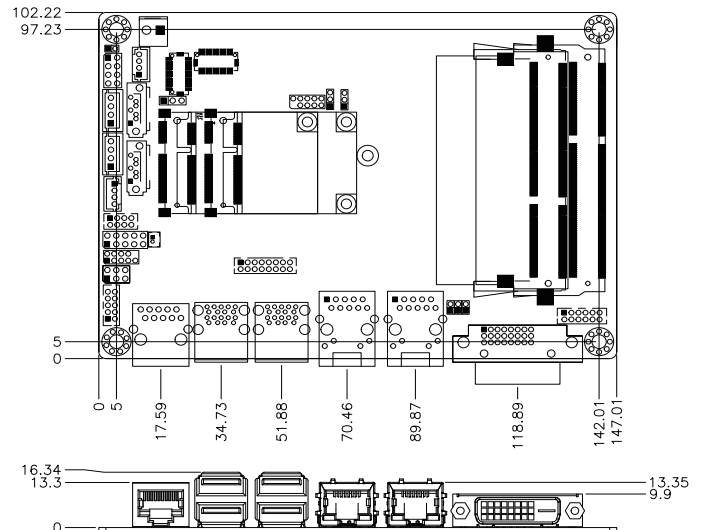
CPU	Intel® Pentium® N3710, up to 2.56GHz or Celeron® N3010, up to 2.24GHz
PCH	N/A
Memory	2x DDR3L SO-DIMM sockets, Max. 8GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA
Mini PCIe Slots	2x Mini PCIe (1x full-size, 1x half-size)
Graphic Controller	Intel® Pentium® SoC integrated Gen-8 graphics
Video Output	Supports DVI-D, CRT 24-bit dual-channel LVDS
Ethernet	2x Intel® I211AT or I210AT Gigabit LAN
I/O Chipset	Nuvoton NCT5523D
Serial Port	1x RS232/422/485 (jumperless selection) 1x RS232
USB 2.0	2x USB 2.0 via pin header
USB 3.X	4x USB 3.0 on board
Serial ATA	2x SATA III
Audio	Intel® Pentium® SoC built-in HD audio controller + Realtek ALC888S codec
TPM	TPM (2.0)
Others	Digital I/O, +9V~ +24V DC-in, iSMART (3.2)
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

IB899FS-371	Intel® Pentium® N3710(2.56GHz) on board, 3.5" SBC w/ dual PCIe GbE LAN, CRT, DVI-D & LVDS (24-bit dual-channel LVDS), mSATA, iSMART
IB899FS-301	Intel® Celeron® N3010(2.24GHz) on board, 3.5" SBC w/ dual PCIe GbE LAN, CRT, DVI-D & LVDS (24-bit dual-channel LVDS), 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

\*(S) means with Realtek ALC888S codec

## Dimensions and Drawings



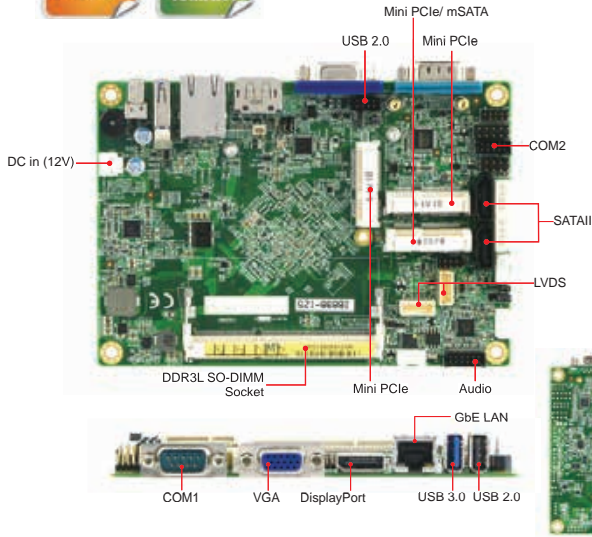
1 Single Board Computers

2 CPU Modules

3 Motherboards

4 CPU Cards

5 COM-HPC Module



## Features

- Onboard Intel® Atom® E3825 DC/ E3815 SC SoC, 1.33GHz/1.46GHz
- 1x DDR3L-1066 SO-DIMM, Max. 8GB
- Supports VGA, DisplayPort and 24-bit dual-channel LVDS
- 1x Intel® I210IT Gigabit LAN
- 3x USB 2.0, 1x USB 3.0, 2x COM, 2x SATA II
- 3x Mini PCIe slots (2x full-size, 1x half-size)
- Watchdog Timer, Digital I/O, mSATA, iSMART
- Supports wide-range operating temperature from -40°C to 85°C

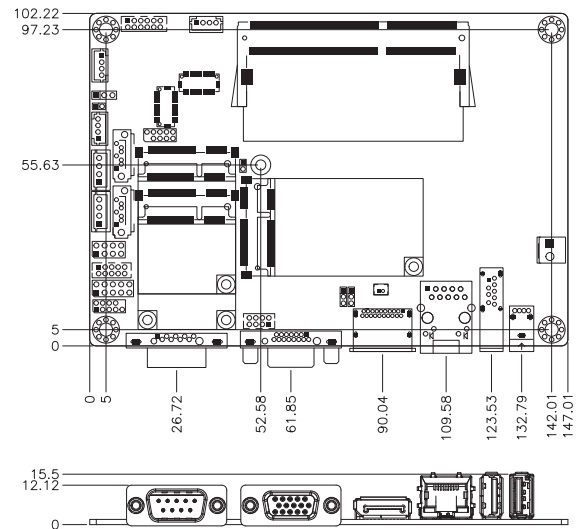
## Specifications

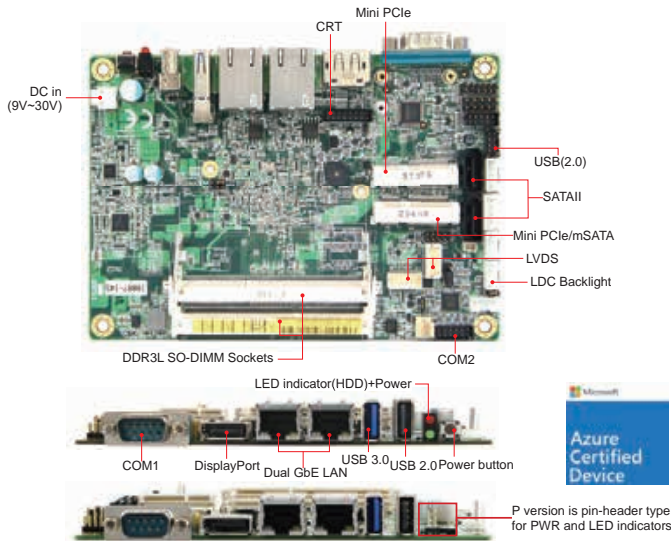
CPU	Intel® Atom® DC E3825 (1.33GHz, 1MB cache) Intel® Atom® SC E3815 (1.46GHz, 512KB cache)
PCH	Integrated in Intel® Atom® SoC
Memory	1x DDR3L-1066 SO-DIMM, Max. 8GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA
Mini PCIe Slots	3x Mini PCIe (2x full-size, 1x half-size)
Graphics Controller	Intel® Atom® SoC integrated Gen7 4EU graphics
Video Output	Supports CRT, DisplayPort, and 24-bit dual-channel LVDS
Ethernet	1x Intel® I210IT Gigabit LAN
I/O Chipset	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.X	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" SBC w/ PCIe GbE LAN, CRT, DisplayPort & LVDS (24-bit dual-channel LVDS), mSATA, iSMART, wide-temp support
IB898-I15D1	Intel® Atom® E3815 (1.46GHz) 3.5" SBC w/ PCIe GbE LAN, CRT, DisplayPort & LVDS (24-bit dual-channel LVDS), mSATA, iSMART 3.1, wide-temp support
HSIB898-BGA-A	Heatsink for IB898
HSIB898-BGA-1	Heat spreader for IB898
IB76A-2	Cable kit w/ USB, COM, Power, SATA + Power cable

## Dimensions and Drawings





## 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 Gigabit LAN
- 3x USB 2.0, 1x USB 3.0, 2x COM, 2x SATA II, 1x MicroSD slot
- 2x Mini PCIe slots (1x full-size, 1x half-size)
- Watchdog Timer, Digital I/O, mSATA, iSMART
- Supports wide-range operating temperature from -40°C to 85°C



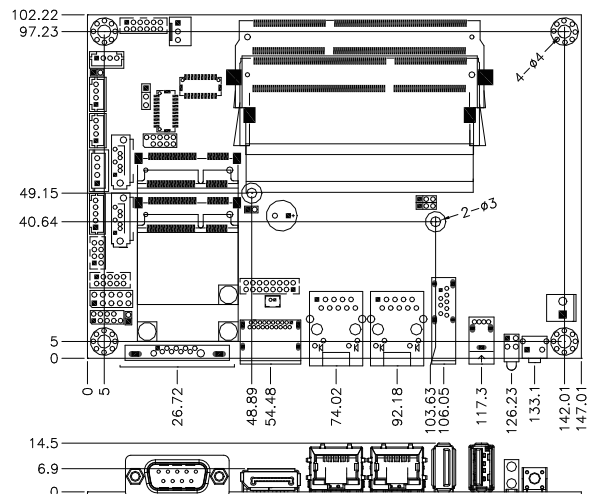
## Specifications

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	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 PCIe Slots	2x Mini PCIe (1x full-size, 1x half-size)
Graphic Controller	Intel® Atom® SoC integrated Gen7 4EU graphics
Video Output	Supports CRT, DisplayPort, and 24-bit dual-channel LVDS
Ethernet	2x Intel® I210IT Gigabit LAN
I/O Chipset	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.X	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" SBC w/ dual PCIe GbE LAN, CRT, DisplayPort & LVDS, mSATA, iSMART
IB897-I27	Intel® Atom® E3827(1.75GHz) 3.5" SBC w/ dual PCIe GbE LAN, CRT, DisplayPort & LVDS, mSATA, iSMART
IB897-I15	Intel® Atom® E3815(1.46GHz) 3.5" SBC w/ dual PCIe GbE LAN, CRT, DisplayPort & LVDS, mSATA, iSMART
IB897-I45P	Intel® Atom® E3845(1.91GHz) 3.5" SBC w/ dual PCIe GbE LAN, CRT, DisplayPort & LVDS, mSATA, iSMART, pin-header type for power button and LED
IB897-I27P	Intel® Atom® E3827(1.75GHz) 3.5" SBC w/ dual PCIe 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
IB76-2	Cable kit w/ USB, COM, power, SATA + power, VGA

## Dimensions and Drawings



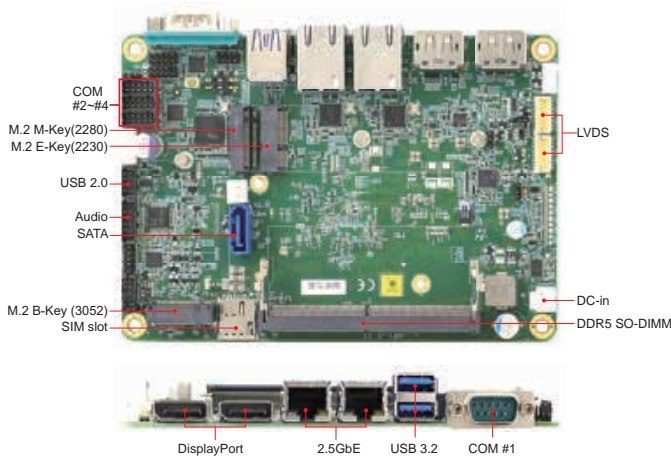
1 Single Board Computers

2 CPU Modules

3 Motherboards

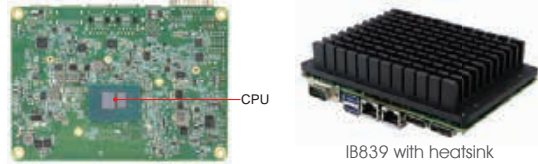
4 CPU Cards

5 COM-HPCC Module



### Features

- Onboard Intel® Atom® x7000RE series or N-Series processor
- 1x DDR5-4800 SO-DIMM, Max. 16GB
- Supports 2x DisplayPort (DP++) and eDP or LVDS
- 2x PCIe 2.5G LAN, 4x COM ports
- 2x USB 3.2 (Type-A), 4x USB 2.0, 1x SATA III
- 3x M.2 sockets (M-Key, E-Key & B-Key)
- +12V~+24V DC wide-range power input
- Watchdog Timer, Digital I/O, dTPM
- **Wide-range operating temperature from -40°C to +85°C**



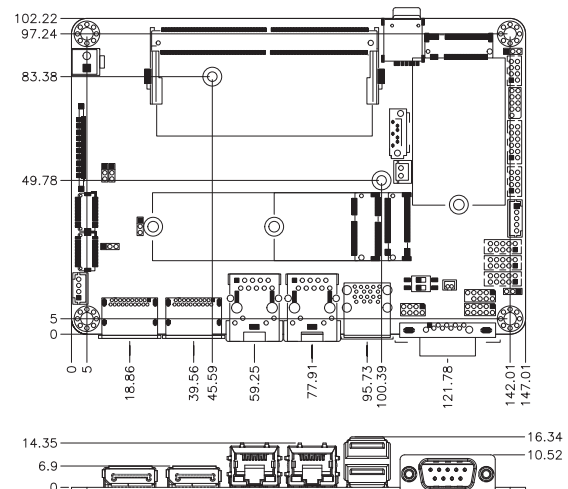
### Specifications

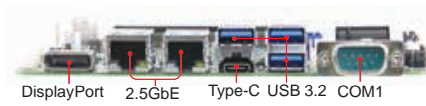
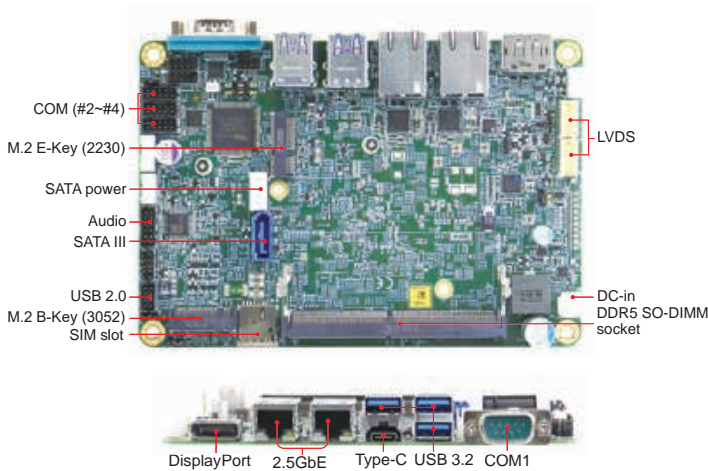
CPU	Intel® Atom® dual-Core x7211RE or Intel® Processor Quad-Core N97
PCH	N/A
Memory	1x DDR5 SO-DIMM, Max. 16GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x M.2 M2280 (SATA)
Mini Type Slots	1x M.2 (E2230), 1x M.2 (B3052)
Graphics Controller	Intel® SoC integrated graphics
Video Output	2x DisplayPorts & eDP or LVDS]
Ethernet	2x Intel® PCIe 2.5G LAN Dual I226IT 2.5G LAN for Atom x7000RE series Dual I226V 2.5G LAN for Processor N series
I/O Chipset	Fintek F81966AB-I
Serial Port	1x RS232/422/485 (Jumperless selection) & 3x RS232
USB 2.0	4x USB 2.0 (pin-header)
USB 3.X	2x Type-A
Serial ATA	1x SATA III
Audio	Built-in HD with Realtek ALC888S
TPM	Infineon SLB9672 series
Others	Digital I/O (4-in/4-out), EuP/ErP, +12V~+24V DC-in
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® N355 Processor, Up to 3.90GHz Transcend TS2GSA64V6E w/ 1x DDR5-5600 16GB +12V : 4.17A
Operating Temperature	0°C~+60°C (+32°F ~+140°F) For Processor N -40°C~+85°C (-40°F ~+185°F) For Atom x7000RE processor (up to 9W TDP)
Storage Temperature	-40°C~85°C (-40°F ~+185°F)
Relative Humidity	10% ~ 90% (non-condensing)

### Ordering Information

IB839F-7433RE	Intel® Atom® x7433RE SoC onboard 3.5-inch SBC, w/ 2x 2.5GbE LAN, 2x DP, LVDS, 4x COM, 3x M.2, TPM, EuP/ErP, +12V~24V DC-in
IB839F-7211RE	Intel® Atom® x7211RE SoC onboard 3.5-inch SBC, w/ 2x 2.5GbE LAN, 2x DP, LVDS, 4x COM, 3x M.2, TPM, EuP/ErP, +12V~24V DC-in
IB839F-N97	Intel® N97 SoC onboard 3.5-inch SBC, w/ 2x 2.5GbE LAN, 2x DP, LVDS, 4x COM, 3x M.2, TPM, EuP/ErP, +12V~24V DC-in
IB839FE-N97	Intel® N97 SoC onboard 3.5-inch SBC, w/ 2x 2.5GbE LAN, 2x DP, eDP, 4x COM, 3x M.2, TPM, EuP/ErP, +12V~24V DC-in
IB839FE-N97R	Intel® N97 SoC onboard 3.5-inch SBC, w/ 2x 2.5GbE LAN, 2x DP, eDP, 4x COM, 3x M.2, TPM, EuP/ErP, +12V~24V DC-in, Right-angle type PWR connector
HSIB838-C	Heatsink for IB839 Quad-core & Dual-core processors (up to 9W)
HSIB838-1	Heat spreader for IB839
IB76A-2	Cable kit w/ USB, COM, Power, SATA + Power

### Dimensions and Drawings





### Features

- Intel® Processor N series SoC (Alder Lake-N)
- 1x DDR5 SO-DIMM, Max. 16GB
- Supports Type-C & DP++ and eDP or LVDS
- 2x Intel® PCIe 2.5G LAN
- 2x USB 2.0, 4x USB 3.2 (1x Type-C + 3x Type-A), 4x COM, 1x SATA III
- 2x M.2 sockets (E-Key + B-Key), Supports CNVi
- 9V~36V wide-range DC input
- Supports fTPM, Watchdog Timer, Digital I/O, 5G



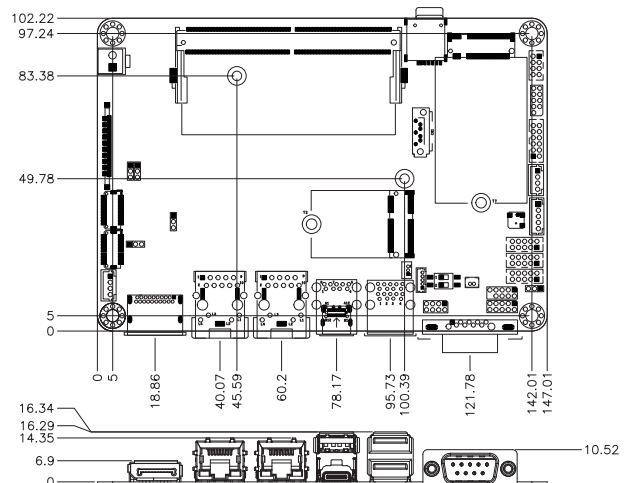
### Specifications

CPU	Intel® Processor N series SoC (Alder Lake-N)
PCH	N/A
Memory	1x DDR5 SO-DIMM, Max. 16GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	M.2(B-Key)
Mini PCIe Slots	2x M.2 sockets (E-Key+B-Key)
Graphics Controller	Intel® SoC integrated Gen12 graphics
Video Output	3x Display [DP connector & Type-C & eDP or LVDS]
Ethernet	2x Intel® I226V LAN
I/O Chipset	Fintek F81964D-I on board
Serial Port	1x RS232/422/485 (Jumperless selection) 3x RS232
USB 2.0	2x USB 2.0 via (pin header)
USB 3.X	1x Type-C+ 3x Type-A
Serial ATA	1x SATA III
Audio	Intel® Processor N-series built-in HD audio + ALC888S codec
TPM	fTPM
Others	Digital I/O (4-in/4-out), EuP/ErP, +9V~+36V DC-in
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® Core™ i3-N305 1.80GHz w/ 4800 8GB DDR5 ADATA AD5S48008G-S +12V:2.8A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-40°C~85°C (-40°F ~185°F)
Relative Humidity	10% ~ 90% (non-condensing)

### Ordering Information

IB838F-N305	Intel® Core i3-N305 SoC on board 3.5" SBC w/ 2x 2.5GbE, DisplayPort + Type-C + LVDS, 4x COM, 2x M.2 (E-Key+B-Key), 1x SATA III, fTPM, DC-in (9V~36V)
IB838FE-N305	Intel® Core i3-N305 SoC on board 3.5" SBC w/ 2x 2.5GbE, DisplayPort + Type-C + eDP, 4x COM, 2x M.2 (E-Key+B-Key), 1x SATA III, fTPM, DC-in (9V~36V)
IB838F-N97	Intel® N97 SoC onboard 3.5" SBC w/ 2x 2.5GbE, DisplayPort + Type-C + LVDS, 4x COM, 2x M.2 (E-Key + B-Key), 1x SATA III, fTPM, DC-in (9V~36V)
IB838F-N50	Intel® N50 SoC on board 3.5" SBC w/ 2x 2.5GbE, DisplayPort + Type-C + LVDS, 4x COM, 2x M.2 (E-Key+B-Key), 1x SATA III, fTPM, DC-in (9V~36V)
IB838FE-N50	Intel® N50 SoC on board 3.5" SBC w/ 2x 2.5GbE, DisplayPort + Type-C + eDP, 4x COM, 2x M.2 (E-Key+B-Key), 1x SATA III, fTPM, DC-in (9V~36V)
HSIB838-A	Heatsink for IB838F(E)-N50 & IB838F-N97
HSIB838-C	Heatsink for IB838F-N305
HSIB838-1	Heat spreader for IB838 series

### Dimensions and Drawings



1 Single Board Computers

2 CPU Modules

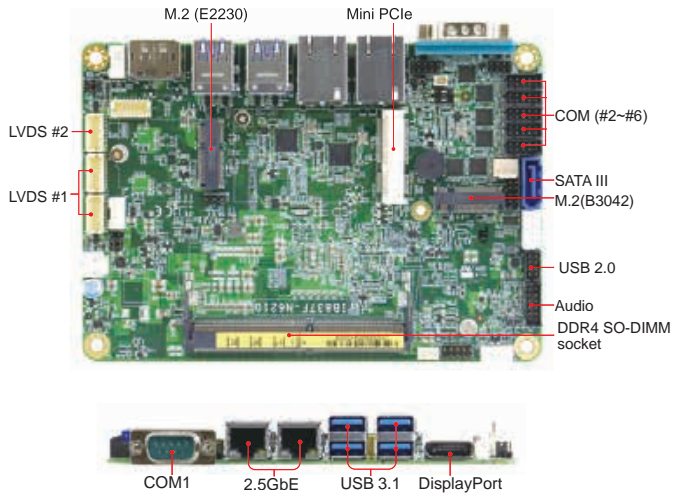
3 Motherboards

4 CPU Cards

5 COM-HPC Module

## Features

- Onboard Intel® Celeron® N & J series processor
- 1x DDR4-3200 SO-DIMM, Max. 16GB
- Supports 1x DisplayPort & 2x dual channel LVDS
- 2x I226V PCIe 2.5G LAN, 6x COM ports
- 4x USB 3.1, 2x USB 2.0, 1x SATA III (shared with M/2 B-Key)
- 2x M.2 sockets (E-Key & B-Key), 1x Mini PCIe slot (full-size)
- Watchdog Timer, Digital I/O, fTPM, mSATA, 12V only DC-in



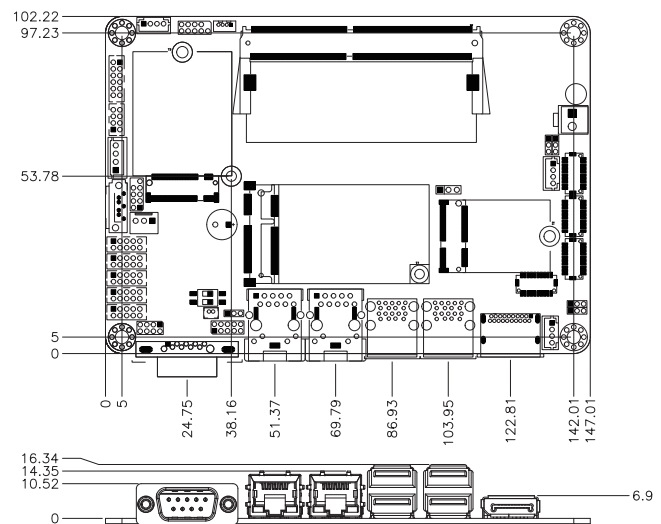
## Specifications

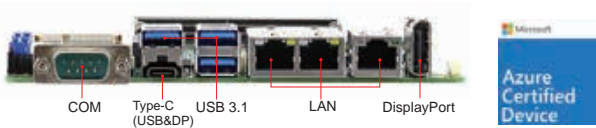
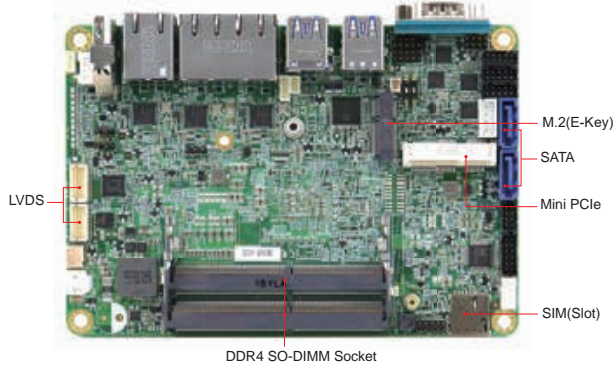
CPU	Intel® Celeron® QC J6412 (2.0GHz/2.6GHz) Intel® Celeron® DC N6210 (1.2GHz/2.6GHz)
PCH	N/A
Memory	1x DDR4-3200 SO-DIMM, Max. 16GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA 1x M.2 B3042
Mini PCIe Slots	Mini PCIe [for PCIe (x1) + USB 2.0 + SATA] 1x M.2 (B-Key, type:3042, SATA) 1x M.2 (E-Key, type:2230, PCIe x1 + USB 2.0)
Graphics Controller	Intel® SoC integrated Gen11 Graphics
Video Output	1x DisplayPort, 2x 24-bit dual-channel LVDS
Ethernet	2x Intel® I226V PCIe Gigabit LAN
I/O Chipset	Fintek F81966D-I
Serial Port	1x RS232/422/485 (Jumperless selection) & 5x RS232
USB 2.0	2x USB 2.0 (pin-header)
USB 3.X	4x USB 3.1 (Type A)
Serial ATA	1x SATA III (shared with M.2 B-Key)
Audio	Built-in HD with Realtek ALC888S + amplifier
TPM	fTPM
Others	Digital I/O (4-in/4-out), +12V DC-in
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® Celeron® J6412 2.00GHz w/ 8GB DDR4-3200 +12V:1.57A
Operating Temperature	0°C~60°C (32°F ~140°F)
Storage Temperature	-20°C~80°C (-4°F ~176°F)
Relative Humidity	95% (non-condensing @60°C)

## Ordering Information

IB837F-J6412	Intel® Celeron® J6412 (2GHz~2.6GHz) onboard 3.5-inch SBC, w/ 2x 2.5GbE LAN, 1x DisplayPort, 2x LVDS (24-bit LVDS dual channel), mSATA, M.2, 12V DC-in
IB837F-N6210	Intel® Celeron® N6210 (1.2GHz~2.6GHz) onboard 3.5-inch SBC, w/ 2x 2.5GbE LAN, 1x DisplayPort, 2x LVDS (24-bit LVDS dual channel), mSATA, M.2, 12V DC-in
HSIB837-A	Heatsink for IB837
HSIB837-1	Heat spreader for IB837

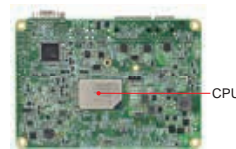
## Dimensions and Drawings





## Features

- Onboard Intel® Atom® x6000 Series processor
- 2x DDR4-3200 SO-DIMM, Max.32GB, Supports IB ECC
- Supports 2x DisplayPort (DP and Type-C), eDP or 24-bit dual-channel LVDS
- 3x Intel® 2.5G LAN
- 2x USB 2.0, 4x USB 3.1, 2x SATA III
- 1x M.2 sockets (E-Key), 1x Mini PCIe slot (full-size)
- Watchdog Timer, Digital I/O, TPM (2.0), mSATA (Share with SATA port)
- **Wide-range operating temperature from -40°C to 70°C**



IB836 with heatsink

IB836 with Heat spreader

## Specifications

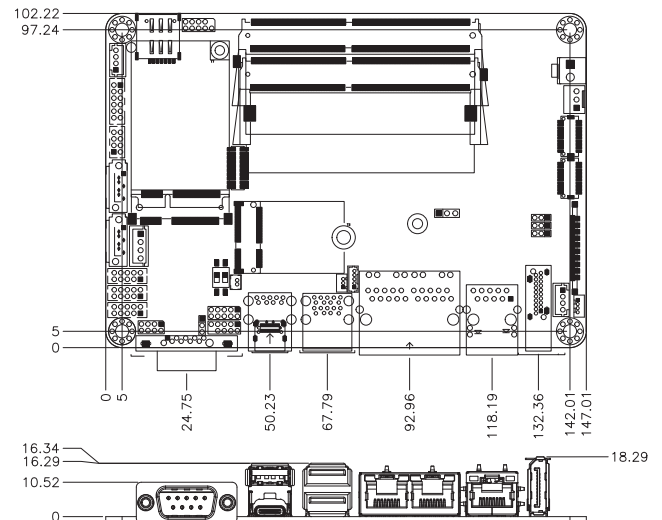
CPU	Intel® Atom® QC x6425E (1.8GHz~3.0GHz) Intel® Atom® QC x6413E (1.5GHz/3.0GHz)
PCH	Integrated in Intel® SoC
Memory	DDR4-3200 SO-DIMM, Max. 32GB, (supports IB ECC based on CPU)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA (Shared with SATA port)
Mini PCIe Slots	1x M.2 (E-Key, type:2230) 1x Mini PCIe (full-size)
Graphics Controller	Intel® SoC integrated Gen11 Graphics
Video Output	2x DisplayPort (DP connector & Type-C) eDP or 24-bit dual-channel LVDS
Ethernet	3x Intel® I226IT 2.5G LAN for Atom® (x6000)
I/O Chipset	Fintek F81964D-I
Serial Port	1x RS232/422/485 (Jumperless selection) 3x RS232
USB 2.0	2x USB 2.0 (pin-header)
USB 3.X	3x USB 3.1 (Type-A) 1x USB (Type-C)
Serial ATA	2x SATA III
Audio	Built-in HD with Realtek ALC888S w/ class-D amplifier
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out), EuP/ErP, <b>+9V~+36V DC-in</b>
Dimensions (L x W)	102mm x 147mm (4" x 5.8")
Power Consumption	Intel® Atom® x6413E 1.5GHz w/ 2x DD4 3200 16GB +12V: 1.87A
Operating Temperature	Atom® x6000: <b>-40°C~70°C(-40°F~158°F)</b>
Storage Temperature	-40°C~85°C (-40°F ~185°F)
Relative Humidity	90% (non-condensing @60°C)

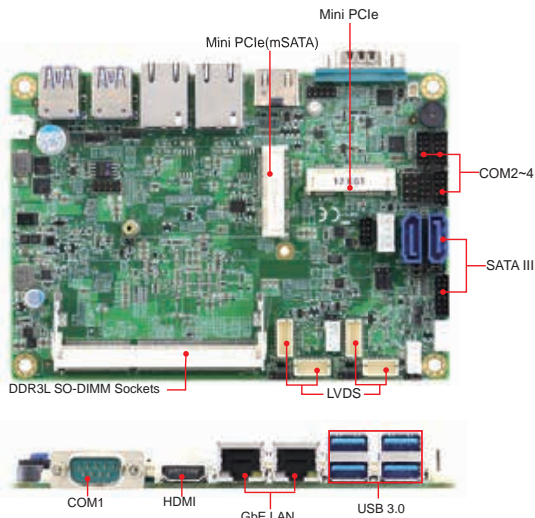
## Ordering Information

IB836F/FE-6425E	Intel® Atom® x6425E (1.8GHz~3.0GHz) 3.5" SBC w/ 3x 2.5G LAN, 2x DisplayPort (DP connector & Type-C), eDP or LVDS, mSATA, M.2, EuP/ErP <b>+9V~+36V DC-in</b> , wide-temperature support
IB836F/FE-6413E	Intel® Atom® x6413E (1.5GHz~3.0GHz) 3.5" SBC w/ 3x 2.5G LAN, 2x DisplayPort (DP connector & Type-C), eDP or LVDS, mSATA, M.2, EuP/ErP <b>+9V~+36V DC-in</b> , wide-temperature support
HSIB836-X-B	Heatsink for IB836F/FE
HSIB836-X-2	Heat spreader for IB836F/FE

\*model name with "F" is LVDS, "FE" is eDP

## Dimensions and Drawings





### Features

- Onboard Intel® Atom® x7 -E3950/ x5 -E3940/ x5 -E3930 Processor [i-Temp support]
- Onboard Intel® Pentium® N4200/ Celeron® N3350/ J3455
- 1x DDR3L-1866 SO-DIMM, Max. 8GB
- Supports HDMI 1.4b, **Dual LVDS (18/24bit)**
- Dual Intel® Gigabit LAN
- 4x USB 3.0, 2x USB 2.0, 4x COM, 2x SATA III
- 1x Mini PCIe slot (full-size), 1x Mini PCIe slot (half-size)
- Watchdog Timer, Digital I/O, mSATA, EuP/ErP
- Wide-range operating temperature in certain models



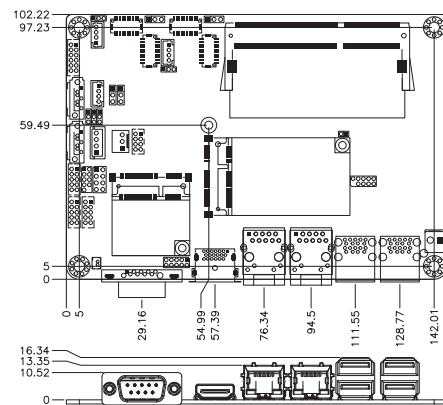
### Specifications

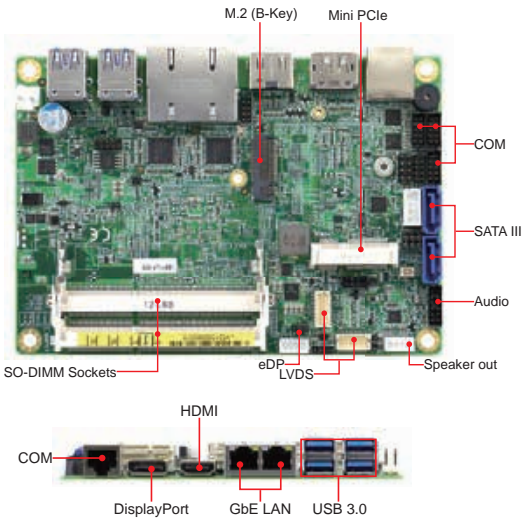
CPU	Intel Atom® x7-E3950 Processor (1.6GHz~2.0GHz) Intel Atom® x5-E3940 Processor (1.6GHz~1.8GHz) Intel Atom® x5-E3930 Processor (1.3GHz~1.8GHz) Intel® Pentium® Processor N4200 (1.1GHz~2.5GHz) Intel® Celeron® Processor N3350 (1.1GHz~2.4GHz) Intel® Celeron® Processor J3455(1.5GHz~2.3GHz)
PCH	Integrated in Intel® SoC
Memory	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 PCIe)
Mini PCIe Slots	2x Mini PCIe (1x full-size, 1x half-size)
Graphic Controller	Intel® SoC integrated Gen9 18EUs graphics
Video Output	Supports HDMI(1.4b), Dual LVDS (18/24bit)
Ethernet	IB818F-I50 2x Intel® I210IT Gigabit LAN IB818F-420/335: 2x Intel® I211AT or I210AT Gigabit LAN
I/O Chipset	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.X	4x USB 3.0 on board
Serial ATA	2x SATA III
Audio	Intel® Atom® SoC built-in HD audio controller + Realtek ALC888S Codec w/ class-D speaker amplifier
TPM	TPM (2.0)
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/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

IB818F-I50	Intel® Atom®x7-E3950 (1.6GHz~2.0GHz) 3.5" SBC w/ dual GbE LAN, HDMI, 2x LVDS (18/24-bit dual-channel LVDS), EuP/ErP, 12V~24V DC-in, wide-temp support
IB818F-I40	Intel® Atom®x5-E3940 (1.6GHz~1.8GHz) 3.5" SBC w/ dual GbE LAN, HDMI, 2x LVDS (18/24-bit dual-channel LVDS), EuP/ErP, 12V~24V DC-in, wide-temp support
IB818F-I30	Intel® Atom®x5-E3930 (1.3GHz~1.8GHz) 3.5" SBC w/ dual GbE LAN, HDMI, 2x LVDS (18/24-bit dual-channel LVDS), EuP/ErP, 12V~24V DC-in, wide-temp support
IB818F-420	Intel® Pentium® N4200 (1.1GHz~2.5GHz) 3.5" SBC w/ dual GbE LAN, HDMI, 2x LVDS (18/24-bit dual-channel LVDS), EuP/ErP, 12V~24V DC-in
IB818F-335	Intel® Celeron® N3350 (1.1GHz~2.4GHz) 3.5" SBC w/ dual GbE LAN, HDMI, 2x LVDS (18/24-bit dual-channel LVDS), EuP/ErP, 12V~24V DC-in
IB818F-J3455	Intel® Celeron® J3455 (1.5GHz/2.3GHz) 3.5" SBC w/ dual GbE LAN, HDMI, 2x LVDS (18/24-bit dual channel), EuP/ErP, 12V~24V DC-in
HSIB818-I	Heatsink for IB818-I50/I40/I30
HSIB818	Heatsink for IB818-420/335/J3455
HSIB818-I-1	Heat Spreader for IB818-I50/I40/I30
HSIB818-1	Heat Spreader for IB818-420/335/J3455
IB76A-1	Cable kit w/ USB, COM, Power, SATA+Power

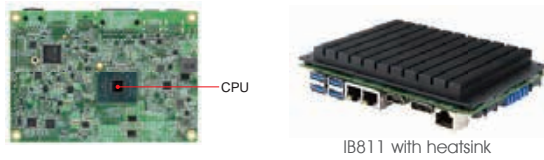
### Dimensions and Drawings





## Features

- Onboard Intel® Atom® x7 -E3950/ x5 -E3940/ x5 -E3930 Processor [i-Temp support]
- Onboard Intel® Pentium® N4200/ Celeron® N3350
- 2x DDR3L-1866/1600 SO-DIMM, Max. 8GB
- Supports HDMI(1.4b), DisplayPort 24 bit dual-channel LVDS
- Dual Intel® Gigabit LAN
- 4x USB 3.0, 2x USB 2.0, 4x COM, 2x SATA III
- 1x Mini PCIe slot (full-size), 1x M.2 (B-Key)
- Watchdog Timer, Digital I/O, mSATA, EuP/ErP
- Wide-range operating temperature in certain models



1 Single Board Computers

2 CPU Modules

3 Motherboards

4 CPU Cards

5 COM-HPC Module

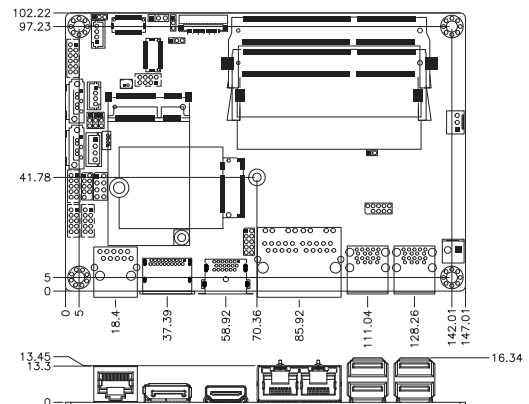
## Specifications

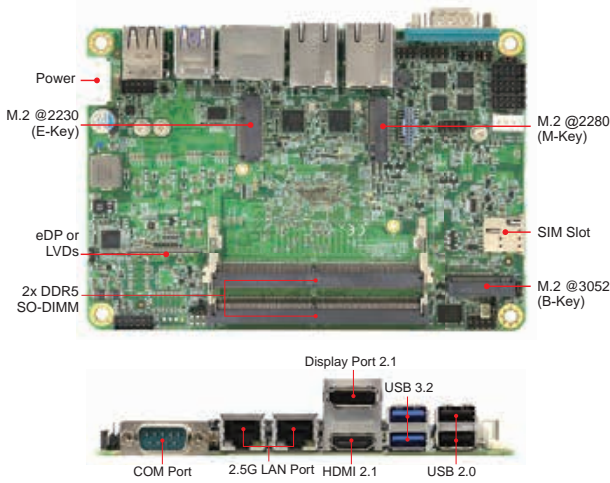
CPU	Intel Atom® x7-E3950 Processor (1.6GHz~2.0GHz) Intel Atom® x5-E3940 Processor (1.6GHz~1.8GHz) Intel Atom® x5-E3930 Processor (1.3GHz~1.8GHz) Intel® Pentium® Processor N4200 (1.1GHz~ 2.5GHz) Intel® Celeron® Processor N3350 (1.1GHz~ 2.4GHz)
PCH	Integrated in Intel® SoC
Memory	2x DDR3L SO-DIMM, Max. 8GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x mSATA
Mini PCIe Slots	1x Mini PCIe (full-size), 1x M.2 (B-Key, type:3042)
Graphics Controller	Intel® SoC integrated Gen9 18EUs graphics
Video Output	Supports HDMI (1.4b), DP (1.2), 24-bit dual-channel LVDS
Ethernet	IB811F-150/140/130: 2x Intel® I210IT Gigabit LAN IB811F-420/335: 2x Intel® I211AT or I210AT Gigabit LAN
I/O Chipset	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.X	4x USB 3.0 on board
Serial ATA	2x SATA III
Audio	Intel® Atom® SoC built-in HD audio controller + Realtek ALC888SHD 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

IB811LF-150	Intel® Atom® x7-E3950 (1.6GHz~2.0GHz) 3.5" SBC w/ dual GbE LAN, HDMI, DisplayPort & LVDS (24-bit dual-channel LVDS), mSATA, M.2, EuP/ErP, 9V~36V DC-in, wide-temp. support
IB811LF-140	Intel® Atom® x5-E3940 (1.6GHz~1.8GHz) 3.5" SBC w/ dual GbE LAN, HDMI, DisplayPort & LVDS (24-bit dual-channel LVDS), mSATA, M.2, EuP/ErP, 9V~36V DC-in, wide-temp. support
IB811LF-130	Intel® Atom® x5-E3930 (1.3~1.8GHz) 3.5" SBC w/ dual GbE LAN, HDMI, DisplayPort & LVDS (24-bit dual-channel LVDS), mSATA, M.2, EuP/ErP, 9V~36V DC-in, wide-temp. support
IB811LF-420	Intel® Pentium® N4200 (1.1~2.5GHz) 3.5" SBC w/ dual GbE LAN, HDMI, DisplayPort & LVDS (24-bit dual-channel LVDS), mSATA, M.2, EuP/ErP, 9V~36V DC-in
IB811LF-335	Intel® Celeron® N3350 (1.1~2.4GHz) 3.5" SBC w/ dual GbE LAN, HDMI, DisplayPort & LVDS (24-bit dual-channel LVDS), mSATA, M.2, EuP/ErP, 9V~36V DC-in
HSIB811-B	Heatsink for IB811F-420/ 335
HSIB811-I-A	Heatsink for IB811F-150/ 140/ 130
HSIB811-1	Heat spreader for IB811F-420/ 335
HSIB811-I-1A	Heat spreader for IB811F-150/ 140/ 130
IB76A-2	Cable kit w/ USB, COM, Power, SATA + Power

## Dimensions and Drawings





## Features

- AMD Ryzen™ Embedded 8000 Series APU on board, up to 8 cores/16 threads
- Dual-channel SO-DIMM, DDR5 5600, Max. 128GB (per DIMM), Total capacity: 256GB
- 1x eDP or 1x LVDs, 1x DP 2.1, 1x HDMI 2.1
- 2x Intel® I226-V 2.5 Gigabit LAN, 2x USB3.2, 4x USB 2.0
- 1x M.2 B-Key for 5G or LTE options
- 1x M.2 E-Key for Wi-Fi, Bluetooth
- 1x M.2 M-Key, type 2280 for storage
- Supports 2x RS232/422/485 ports, 2x RS232 ports



## Specifications

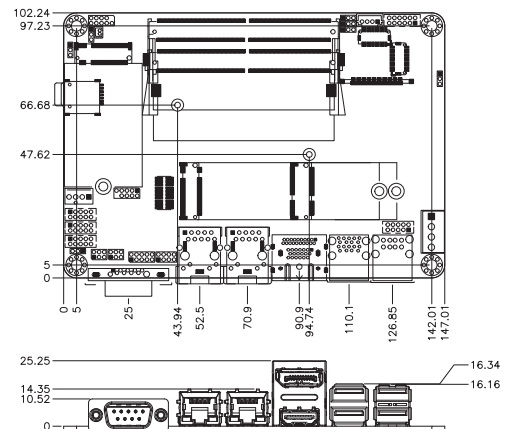
CPU	AMD Ryzen™ Embedded 8000 series APU
PCH	N/A
Memory	Dual-Channel SO-DIMM, DDR5 5600, Max. 128GB (per DIMM), Total capacity: 256GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x PIC-E Gen4 x4 (M.2 NVMe) M-Key Type 2280
Mini PCIe Slots	1x M.2 (E-Key, Type:2230, supports CNVi) 1x M.2 (B-Key, Type:3052, supports 5G/LTE) 1x SIM socket (Nano SIM)
Graphics Controller	RDNA3 graphics with up to 6 WGP (Work Group Processors)
Video Output	1x DP 2.1, max resolution: 8K@60Hz (Up to DP 2.1 / UHBR10 (10Gbps)) 1x HDMI 2.1, max resolution: 4K@120Hz 10bpc, 8K60A 10bpc (4:2:0) (Up to HDMI 2.1 FRL and 10G with Re-driver (Windows) / 2.0b (Linux)) 1x eDP 1.5 [original eDP, DP0], max resolution: 4K@60Hz or 1x LVDS [original DP, DP1] max resolution: Dual-Channel 18/24bit, up to 1920x1080 @ 60Hz
Ethernet	2x Intel® I226-V 2.5 Gigabit LAN
I/O Chipset	Fintek F81956D-I
Serial Port	2x RS232/422/485 COM port (configurable) 2x RS232 COM port
USB 2.0	4x USB 2.0 (2 for Type-A, 2 for Pin Header)
USB 3.X	2x USB 3.2 Gen2 (10Gbps)
Serial ATA	N/A
Audio	Realtek audio codec ALC888S-VD2-GR audio header x1 (for Line-in/Line-out/MIC)
TPM	fTPM as default (dTPM option: SLB9672)
Others	Digital I/O(4-in/ 4-out)
Dimensions (L x W)	147 mm x 102 mm (5.7" x 4")
Power Consumption	AMD Ryzen™ Embedded Ryzen w/ DDR5 5600 16GB x2 5 PRO 8645HS+12V:7.63A 7 PRO 8840U+12V:5.99A 7 PRO 8640U+12V:5.91A 7 PRO 8845HS+12V:7.49A
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

IB301-8845	3.5" AMD Ryzen™ Embedded 8000 series (Hawk Point 8845HS, CPU Freq. 3.8GHz up to 5.1GHz, 8 Cores, 16 Threads, TDP 35-54W) /3.5" SBC, 2x I226-V, 2x USB 3.2, 4x USB 2.0, 4x COM, 12V – 24V DC-in, w/ LVDS
IB301-E-8845	3.5" AMD Ryzen™ Embedded 8000 series (Hawk Point 8845HS, CPU Freq. 3.8GHz up to 5.1GHz, 8 Cores, 16 Threads, TDP 35-54W) /3.5" SBC, 2x I226-V, 2x USB 3.2, 4x USB 2.0, 4x COM, 12V – 24V DC-in, w/ eDP
IB301-8840	3.5" AMD Ryzen™ Embedded 8000 series (Hawk Point 8840U, CPU Freq. 3.3GHz up to 5.1GHz, 8 Cores, 16 Threads, TDP 15-30W) /3.5" SBC, 2x I226-V, 2x USB 3.2, 4x USB 2.0, 4x COM, 12V – 24V DC-in, w/ LVDS
IB301-E-8840	3.5" AMD Ryzen™ Embedded 8000 series (Hawk Point 8840U, CPU Freq. 3.3GHz up to 5.1GHz, 8 Cores, 16 Threads, TDP 15-30W) /3.5" SBC, 2x I226-V, 2x USB 3.2, 4x USB 2.0, 4x COM, 12V – 24V DC-in, w/ eDP
IB301-8645	3.5" AMD Ryzen™ Embedded 8000 series (Hawk Point 8645HS, CPU Freq. 4.3GHz up to 5.0GHz, 6 Cores, 12 Threads, TDP 35-54W) /3.5" SBC, 2x I226-V, 2x USB 3.2, 4x USB 2.0, 4x COM, 12V – 24V DC-in, w/ LVDS
IB301-E-8645	3.5" AMD Ryzen™ Embedded 8000 series (Hawk Point 8645HS, CPU Freq. 4.3GHz up to 5.0GHz, 6 Cores, 12 Threads, TDP 35-54W) /3.5" SBC, 2x I226-V, 2x USB 3.2, 4x USB 2.0, 4x COM, 12V – 24V DC-in, w/ eDP
IB301-8640	3.5" AMD Ryzen™ Embedded 8000 series (Hawk Point 8640U, CPU Freq. 3.5GHz up to 4.9GHz, 6 Cores, 12 Threads, TDP 15-30W) /3.5" SBC, 2x I226-V, 2x USB 3.2, 4x USB 2.0, 4x COM, 12V – 24V DC-in, w/ LVDS
IB301-E-8640	3.5" AMD Ryzen™ Embedded 8000 series (Hawk Point 8640U, CPU Freq. 3.5GHz up to 4.9GHz, 6 Cores, 12 Threads, TDP 15-30W) /3.5" SBC, 2x I226-V, 2x USB 3.2, 4x USB 2.0, 4x COM, 12V – 24V DC-in, w/ eDP
HSIB301-B	COOLER; HSIB301-B V-A, H052HSIB301B0000AP
PW595	Power CABLE; PW595 2-HD 4C Length 22cm, C501PW59504222000P

\*Specifications are subject to change without prior notice

## Dimensions and Drawings



# Comparison Table

## 2.5"/PICO ITX Single Board Computer

Models	PI900	PI805	PI800	IB200
<b>Form Factor</b>	PICO ITX (2.5")	PICO ITX (2.5")	PICO ITX (2.5")	2.5" SBC
<b>CPU Socket</b>	CPU on board	CPU on board	CPU on board	APU on board
<b>CPU</b>	Intel® Core™ Ultra 100U Intel® Core™ Ultra 7 155U Intel® Core™ Ultra 5 125U	Intel® Core™ series 3 SoC	Intel® Atom® Processor 7835RE/ 7433RE	AMD Ryzen™ Embedded R2514 AMD Ryzen™ Embedded R2314 AMD Ryzen™ Embedded R2312
<b>CPU Max. Frequency</b>	Up to 1.3GHz/ 1.7GHz/ 4.8GHz	Up to 1.3GHz/ 1.7GHz/ 4.8GHz	Up to 3.4GHz	Up to 2.7GHz
<b>PCH</b>	N/A	N/A	N/A	N/A
<b>Memory</b>	1x DDR5 SO-DIMM	1x DDR5 SO-DIMM	1x DDR5 SO-DIMM	Onboard Memory, DDR4
<b>Max. Memory Size</b>	48GB	16GB	16GB	8GB
<b>BIOS</b>	AMI	AMI	AMI	AMI
<b>Graphics Controller</b>	Intel® Ultra 100U series SoC integrated Iris Xe graphics, up to 128 EUs	Intel® Core™ series 3 SoC integrated Iris Xe graphics, up to 128 EUs	Intel® Graphics (New Gen) up to 32 EUs	Radeon™ Graphics
<b>Video Output</b>	1x HDMI (2.0) 1x DisplayPort (1.4a) via Type C 1x LVDS	1x HDMI (2.0) 1x LVDS 2x DisplayPort 1.4a via Type-C	1x HDMI (2.0b) 1x DisplayPort 1.2a (DP++)	24bits dual-channel LVDS (LVDS: 1920 x 1200 1080 at 60 Hz) 2x HDMI 2.0b
<b>Ethernet</b>	1x Realtek 8125BG-CG PCIe 2.5GbE LAN	1x Intel® I226V 2.5GbE	2x Realtek RTL-8125BI PCIe 2.5GbE LAN	2x Intel® I226IT 2.5 Gigabit
<b>Audio</b>	Realtek Codec ALC888S-VD2-GR	Realtek Codec ALC888S-VD2-GR	N/A	Built-in ALC888S HD audio codec
<b>SATA</b>	via M.2 M-key socket	N/A	1x SATA 3.0	1x SATA III port
<b>I/O Chipset</b>	Fintek F81804U-I	Fintek F81804U-I	Fintek F81804U-I	F81966AB-I
<b>Serial Port</b>	1x RS232/422/485 (Jumperless selection)	1x RS232/422/485 (Jumperless selection)	2x RS232/422/485 (Jumperless selection)	COM 1 & 2 : RS-232/422/485 configurable via BIOS Default is RS-232 COM 3 & 4 : RS232
<b>USB 2.0</b>	2x USB 2.0 via pin header 3x USB 3.2 via edge I/O 1x USB 3.2 via Type-C	2x USB 2.0 via pin header	2x USB 2.0 via pin header	2x USB 2.0 via pin header
<b>USB 3.X</b>	3x USB 3.2 via edge I/O	2x USB 3.2 via Type-C 2x USB 3.2 via Type-A	4x USB 3.2 via rear I/O	2x USB 3.2 Gen2
<b>Hardware Monitor</b>	N/A	Yes	N/A	Yes
<b>TPM</b>	dTPM	fTPM (2.0)	fTPM (2.0)	2.0
<b>Storage Device Interface</b>	1x M.2 (M2242 w/ NVMe & SATA)	1x M.2 (M2242 w/ PCIe & SATA)	1x M.2 (M2242 w/ PCIe(x1) & SATA)	1x M.2 (M-Key, type:2280, supports PCIe Gen.3)
<b>Watchdog Timer</b>	256 levels	256 levels	256 levels	256 levels
<b>Digital I/O</b>	4-in / 4-out	4-in / 4-out	4-in / 4-out	4-in/4-out
<b>Mini Type Slots</b>	1x M.2 (M-Key), 1x M.2 (E-Key)	1x M.2 (M-Key), 1x M.2 (E-Key)	1x M.2 (M-Key), 1x M.2 (E-Key)	1x M.2 (E-Key, type: 2230, 1x PCIe x1, USB 2.0
<b>Power input</b>	+12V DC-in	+12V DC-in	+12V DC-in	DC-in 12V
<b>Power Consumption</b>	Intel® Core® Ultra 7 155U / up to 4.80GHz w/ 1x 32GB DDR5 – 5600 +12V :5.93A Intel® Core® Ultra 5 125U / up to 4.30GHz w/ 1x 32GB DDR5 – 5600 DIMM +12V :5.91A	TBD	Intel® Atom® x7835RE 1.3GHz w/ 1x Transcend DDR5 5600 16GB +12V:3.22	AMD Ryzen™ Embedded R2514 3.35GHz w/ 1x 8GB DDR4-3200 (Onboard) +12V: ~2.9A AMD Ryzen™ Embedded R2312 2.1GHz w/ 1x 8GB DDR4-3200 (Onboard) +12V: ~1.8A
<b>Dimensions (L x W)</b>	100mm x 72mm	100mm x 72mm	100mm x 72mm	100mm x 72mm
<b>Extra Features</b>	LAN Wakeup, PDPC	LAN Wakeup, PDPC	LAN Wakeup, PDPC	LAN Wakeup, Eup / Erp
<b>Page No.</b>	P.1-26	P.1-27	P.1-28	P.1-29 ~ P.1-30

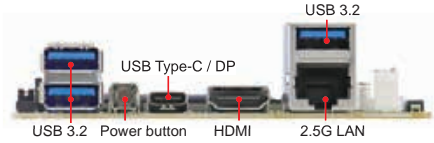
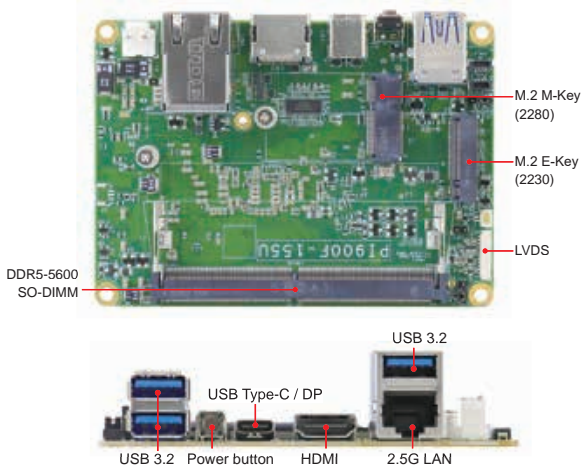
1 Single Board Computers

2 CPU Modules

3 Motherboards

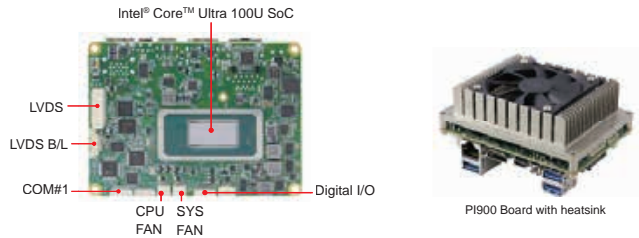
4 CPU Cards

5 COM-HPC Module



## Features

- Intel® Core™ Ultra 100U Series Processors (15W TDP)
- 1x DDR5-5600 SO-DIMM, Max. 48GB
- Supports DisplayPort (1.4a), HDMI (2.0), LVDS
- 3x USB 3.2 (Type-A), 2x USB 2.0 (pin-header), 1x USB 3.2 (Type-C)
- 1x RTL-8125BG-CG PCIe 2.5G LAN, 1x COM
- 2x M.2 slots (M2280+E2230)
- Watchdog Timer, Digital I/O, TPM (2.0), +12V DC input only



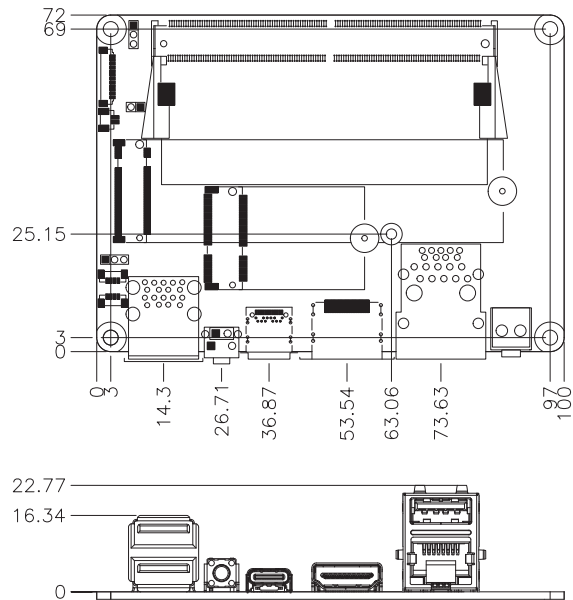
## Specifications

CPU	Intel® Core™ Ultra 100U Series
PCH	N/A
Memory	1x DDR5-5600 SO-DIMM, Max. 48GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	NVMe
Expansion Slots	1x M.2 (M2280), 1x M.2 (E2230)
Mini Type Slots	1x M.2 (M2280, supports NVMe & SATA) 1x M.2 (E2230, supports CNVi)+WiFi / BT
Graphics Controller	Intel® SoC integrated graphics
Video Output	1x HDMI (2.0) 1x DisplayPort (1.4a) via Type-C 1x LVDS
Ethernet	1x Realtek 8125BG-CG PCIe 2.5GbE LAN port
I/O Chipset	Fintek F81804U-I
Serial Port	1x RS232/422/485
USB 2.0	2x USB 2.0 thru onboard connectors
USB 3.X	3x USB 3.2 @ edge I/O, 1x USB 3.2 (Type-C)
Serial ATA	via M.2 M-key socket
Audio	Realtek Codec ALC888S-VD2-GR
TPM	dTPM
Others	Digital I/O (4-in/4-out), +12V DC input
Dimensions (L x W)	100mm x 72mm (3.94" x 2.84")
Power Consumption	Intel® Core® Ultra 7 155U / up to 4.80GHz w/ 1x 32GB DDR5 – 5600 +12V :5.93A Intel® Core® Ultra 5 125U / up to 4.30GHz w/ 1x 32GB DDR5 – 5600 DIMM +12V :5.91A
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

PI900AF-125U	PICO-ITX, Intel® Core™ Ultra 7-125U SoC onboard, w/ LVDS, DisplayPort, HDMI, 2.5GbE LAN, 1x COM, 1xSATA III, 2xM.2, dTPM, +12V DC-in, Optional Heatsink & cable kit (RoHS2)
PI900AF-155U	PICO-ITX, Intel® Core™ Ultra 7-155U SoC onboard, w/ LVDS, DisplayPort, HDMI, 2.5GbE LAN, 1x COM, 1xSATA III, 2xM.2, dTPM, +12V DC-in, Optional Heatsink & cable kit (RoHS2)

## Dimensions and Drawings



**NEW**

*Preliminary*

### Features

- Intel® Core™ Series 3 Processors
- 1x DDR5 SO-DIMM, Max. 16GB
- Supports HDMI (2.0), 2x DisplayPort 1.4a (via Type-C), LVDS
- 1x Intel® I226 2.5GbE LAN
- 2x USB 3.2 (Type-C), 2x USB 3.2 (Type-A), 2x USB 2.0, 1x COM (RS232/422/485)
- 2x M.2 sockets (M2242 [NVMe] + E2230 [PCIe x1 + USB 2.0])
- Watchdog Timer, Digital I/O (4-in/4-out), fTPM, +12V DC input only

### Specifications

CPU	Intel® Core™ Series 3 Processor
PCH	Integrated in SoC
Memory	1x DDR5 SO-DIMM socket, Max. 16GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	NVMe
Expansion Slots	1x M.2(M2242), 1x M.2 (E2230)
Mini Type Slots	1x M.2 2242 (M-Key, PCIe Gen 4 NVMe) 1x M.2 2230 (E-Key, PCIe x1 & USB 2.0)
Graphics Controller	Intel® integrated Iris Xe Graphics (up to 128EUs)
Video Output	1x HDMI (2.0) + 1x LVDS + 2x DisplayPort (1.4a) via Type-C
Ethernet	1x Intel® I226 2.5GbE
I/O Chipset	Fintek F81804U-I
Serial Port	1x RS232/422/485
USB 2.0	2x USB 2.0 via pin header
USB 3.X	2x USB 3.2 (Type-C), 2x USB 3.2 (Type-A)
Serial ATA	N/A
Audio	Realtek ALC888S-VD2-GR codec
TPM	fTPM
Others	Digital I/O (4-in/4-out)
Dimensions (L x W)	100mm x 72mm (3.94" x 2.84")
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	10%~ 95% (non-condensing @60°C)

### Ordering Information

PI805F-350

Intel® Core™ Series 3 Processor w/ 1x 2.5GbE, HDMI + LVDS + 2x DP, 1x COM, 2x M.2, fTPM, single +12V DC-in

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Single Board Computers

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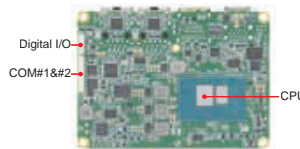
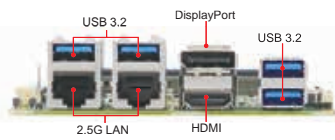
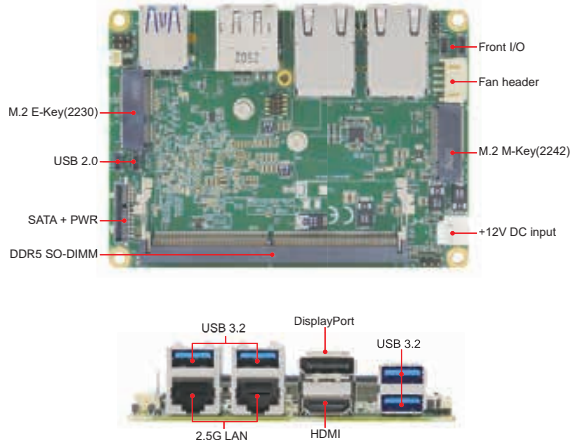
Motherboards

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CPU Cards

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COM-HPC Module



## Features

- Onboard Intel® Atom® x7000RE Series Processors
- 1x DDR5-4800 SO-DIMM, Max. 16GB
- Supports HDMI (2.0b) and DisplayPort (1.2a)
- 2x RTL-8125BI PCIe 2.5G LAN, 2x COM (RS232/422/485)
- 4x USB 3.2 (Type-A), 2x USB 2.0, 1x SATA III
- 2x M.2 sockets (M2242 [SATA + PCIe] + E2230 [USB + PCIe])
- Watchdog Timer, Digital I/O, TPM (2.0), +12V DC input only
- PCB dimensions: 100mm x 72mm
- **Wide-range operating temperature from -40°C to +70°C**

## Specifications

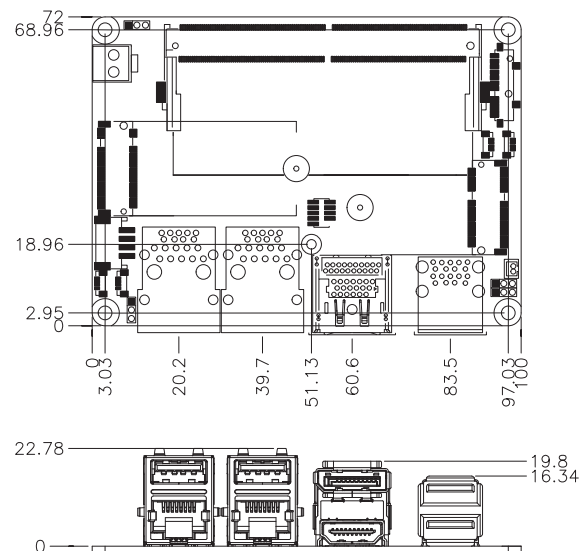
CPU	Intel® Atom® 8-Core x7835RE SoC
PCH	N/A
Memory	1x DDR5-4800 MHz, Max. 16GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x M.2 M-Key 2242 (SATA)
Expansion Slots	1x M.2 (M2242), 1x M.2 (E2230)
Mini Type Slots	1x M.2 (M-Key, type:2242, supports SATA & PCIe(x1) signal) 1x M.2 (E-Key, type: 2230, supports USB 2.0 & PCIe(x1) signal)
Graphics Controller	Intel® SoC integrated graphics
Video Output	1x HDMI (2.0b) 1x DisplayPort 1.2a (DP++)
Ethernet	2x Realtek RTL-8125BI PCIe 2.5GbE LAN ports
I/O Chipset	Fintek F81804U-I
Serial Port	2x RS232/422/485
USB 2.0	2x USB 2.0 via pin header
USB 3.X	4x USB 3.2
Serial ATA	1x SATA 3.0
Audio	N/A
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out)
Dimensions (L x W)	100mm x 72mm (3.94" x 2.84")
Power Consumption	Intel® Atom x7835RE 3.6GHz w/ 1x16GB DDR5 5600 SODIMM Transcend TS2GSA64V6E-I + 12V:3.22A
Operating Temperature	-40°C~+70°C (-40°F~+158°F)

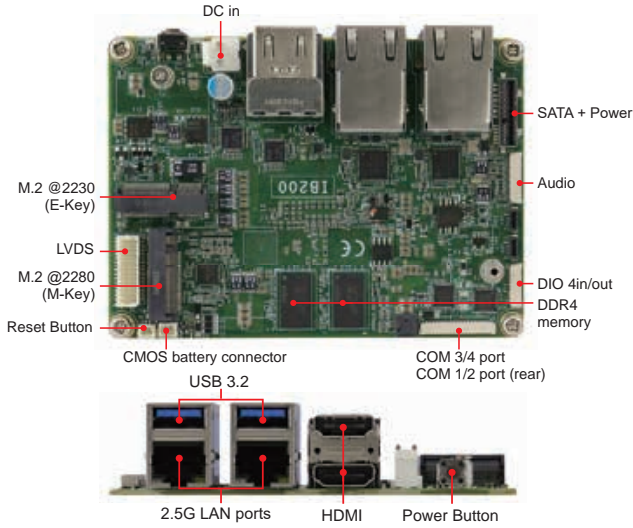
Storage Temperature	-40°C~+70°C (-4°F~+158°F)
Relative Humidity	95% (non-condensing @60°C)

## Ordering Information

PI800F-7835	Intel® Atom® x7835RE SoC onboard PICO-ITX board, w/ dual 2.5Gb, HDMI + DP, 2x COM, 2x M.2, dTPM, single +12V DC-in
PI800F-7433	Intel® Atom® x7433RE SoC onboard PICO-ITX board, w/ dual 2.5Gb, HDMI + DP, 2x COM, 2x M.2, dTPM, single +12V DC-in
HSPi800-A	Heatsink with fan for PI800

## Dimensions and Drawings





## Features

- AMD Ryzen™ Embedded R2000 series APU on board, up to 4 cores/8 threads
- Onboard DDR4 memory, Max. 8GB
- 2x HDMI 2.0b & LVDS: 5V/3.3V, 24 bit, dual channel (LVDS: 1920x1080 @60 Hz)
- 2.5 GbE LAN, 4x COM, 2x USB 3.2 Gen2 (10Gbps) [with PDPC support], 2x USB 2.0 via pin headers
- Supports 1x M.2 (M-Key, type 2280) & 1x M.2 (E-Key, type 2230)
- Supports 4x COM - COM1/COM2: RS-232/422/485, COM3/COM4: RS232 (Default: RS-232, adjustable in BIOS)
- Energy-efficient 12W-25W thermal design

## Specifications

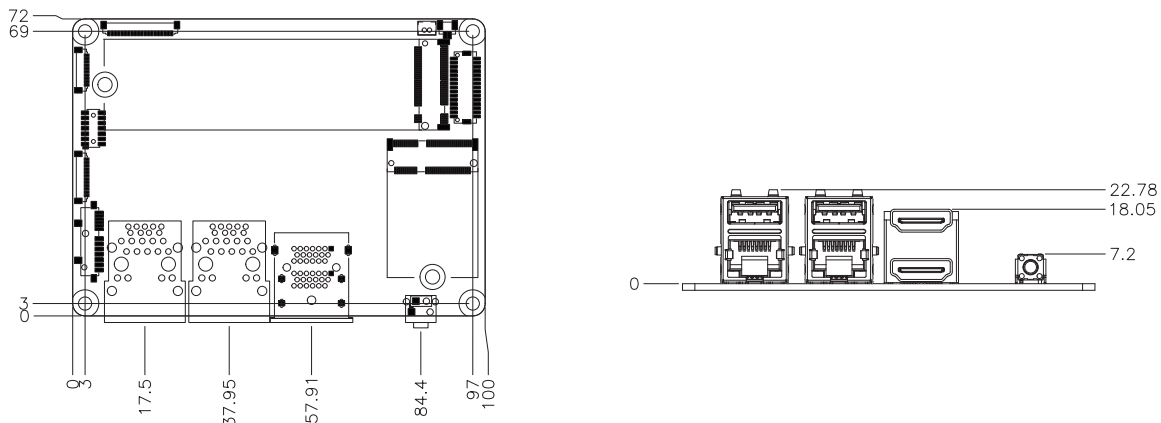
CPU	AMD Ryzen™ Embedded R2000 Series on board	Audio	Built-in audio w/ Realtek audio codec ALC888S-VD2-GR
PCH	N/A	TPM	2.0
Memory	Onboard DDR4 memory, Max. 8GB	Others	Digital I/O(4-in/ 4-out), Watchdog Timer
BIOS	AMI	Dimensions (L x W)	100mm x 72mm
Watchdog Timer	256 levels	Power Consumption	AMD Ryzen™ Embedded R2514 3.35GHz w/ 1x 8GB DDR4-3200 (Onboard) +12V: ~2.9A AMD Ryzen™ Embedded R2312 2.1GHz w/ 1x 8GB DDR4-3200 (Onboard) +12V: ~1.8A
H/W Monitor	Yes	Operating Temperature	0°C~60°C (32°F~140°F)
Storage Device Interface	1x SATA III 1x M.2 (M-Key, type 2280)	Storage Temperature	-20°C~80°C (-4°F~176°F)
Mini Type Slots	1x M.2 (E-Key, type 2230)	Relative Humidity	90% (non-condensing @60°C)
Graphics Controller	AMD Radeon™ Vega integrated		
Video Output	2x HDMI (2.0b), 1x 24-bit dual channel LVDS		
Ethernet	2x Intel® I226IT 2.5 Gigabit LAN		
I/O Chipset	Fintek F81966AB-I		
Serial Port	COM1 / COM2 : RS-232/422/485 (configurable) COM3 / COM4 : RS232		
USB 2.0	2x USB 2.0 (pin header)		
USB 3.X	2x USB 3.2 Gen2 (10Gbps)		
Serial ATA	1x SATA III		

## Ordering Information

IB200-R2312	AMD Ryzen™ R2312 APU (2.7GHz~3.5GHz) on board 2.5-inch Disk-Size w/ dual LAN, 2x HDMI, LVDS (24-bit dual-channel), 12V DC-in, Onboard DDR4 memory, Max. 8GB
IB200-R2514	2.5" AMD Ryzen™ Embedded R2000 series (APU R2514, CPU Freq. 2.1GHz up to 3.7GHz, 4 Cores, 8 Threads, TDP 12-35W) on board, 2.5"SBC w/ dual LAN, 2x HDMI, 3.3V LVDS (24-bit dual-channel), EuP/ErP, 12V DC-in
IB200-R2514-T	2.5" AMD Ryzen™ Embedded R2000 series (APU R2514, CPU Freq. 2.1GHz up to 3.7GHz, 4 Cores, 8 Threads, TDP 12-35W) on board, 2.5"SBC w/ dual LAN, 2x HDMI, 3.3V LVDS (24-bit dual-channel), EuP/ErP, 12V DC-in, TPM
IB200-R2514-5	2.5" AMD Ryzen™ Embedded R2000 series (APU R2514, CPU Freq. 2.1GHz up to 3.7GHz, 4 Cores, 8 Threads, TDP 12-35W) on board, 2.5"SBC w/ dual LAN, 2x HDMI, 5V LVDS (24-bit dual-channel), EuP/ErP, 12V DC-in
IB200-R2514-5T	2.5" AMD Ryzen™ Embedded R2000 series (APU R2514, CPU Freq. 2.1GHz up to 3.7GHz, 4 Cores, 8 Threads, TDP 12-35W) on board, 2.5"SBC w/ dual LAN, 2x HDMI, 5V LVDS (24-bit dual-channel), EuP/ErP, 12V DC-in, TPM
IB200-R2314	2.5" AMD Ryzen™ Embedded R2000 series (APU R2314, CPU Freq. 2.1GHz up to 3.5GHz, 4 Cores, 4 Threads, TDP 12-35W) on board, 2.5"SBC w/ dual LAN, 2x HDMI, 3.3V LVDS (24-bit dual-channel), EuP/ErP, 12V DC-in
IB200-R2314-T	2.5" AMD Ryzen™ Embedded R2000 series (APU R2314, CPU Freq. 2.1GHz up to 3.5GHz, 4 Cores, 4 Threads, TDP 12-35W) on board, 2.5"SBC w/ dual LAN, 2x HDMI, 3.3V LVDS (24-bit dual-channel), EuP/ErP, 12V DC-in, TPM
IB200-R2314-5	2.5" AMD Ryzen™ Embedded R2000 series (APU R2314, CPU Freq. 2.1GHz up to 3.5GHz, 4 Cores, 4 Threads, TDP 12-35W) on board, 2.5"SBC w/ dual LAN, 2x HDMI, 5V LVDS (24-bit dual-channel), EuP/ErP, 12V DC-in
IB200-R2314-5T	2.5" AMD Ryzen™ Embedded R2000 series (APU R2314, CPU Freq. 2.1GHz up to 3.5GHz, 4 Cores, 4 Threads, TDP 12-35W) on board, 2.5"SBC w/ dual LAN, 2x HDMI, 5V LVDS (24-bit dual-channel), EuP/ErP, 12V DC-in, TPM
IB200-R2312	2.5" AMD Ryzen™ Embedded R2000 series (APU R2312, CPU Freq. 2.7GHz up to 3.5GHz, 2 Cores, 4 Threads, TDP 12-25W) on board, 2.5"SBC w/ dual LAN, 2x HDMI, 3.3V LVDS (24-bit dual-channel), EuP/ErP, 12V DC-in
IB200-R2312-T	2.5" AMD Ryzen™ Embedded R2000 series (APU R2312, CPU Freq. 2.7GHz up to 3.5GHz, 2 Cores, 4 Threads, TDP 12-25W) on board, 2.5"SBC w/ dual LAN, 2x HDMI, 3.3V LVDS (24-bit dual-channel), EuP/ErP, 12V DC-in, TPM
IB200-R2312-5	2.5" AMD Ryzen™ Embedded R2000 series (APU R2312, CPU Freq. 2.7GHz up to 3.5GHz, 2 Cores, 4 Threads, TDP 12-25W) on board, 2.5"SBC w/ dual LAN, 2x HDMI, 5V LVDS (24-bit dual-channel), EuP/ErP, 12V DC-in
IB200-R2312-5T	2.5" AMD Ryzen™ Embedded R2000 series (APU R2312, CPU Freq. 2.7GHz up to 3.5GHz, 2 Cores, 4 Threads, TDP 12-25W) on board, 2.5"SBC w/ dual LAN, 2x HDMI, 5V LVDS (24-bit dual-channel), EuP/ErP, 12V DC-in, TPM

\*Specifications are subject to change without prior notice

## Dimensions and Drawings



# Comparison Table

## CPU Module

Models	ET985	ET982	ET981	ET980	ET978
<b>Form Factor</b>	COM Express Type 6 (R3.1)	COM Express Type 6 (R3.1)	COM Express Type-6 (R3.0)	COM Express Type-6 (R3.0)	COM Express Type-6 (R3.0)
<b>CPU Socket</b>	BGA2540 SoC on board	BGA1744 SoC on board	BGA1744 on board	BGA1744 on board	FP8 on board
<b>CPU</b>	Intel® Core™ Ultra 9/7/5 mobile processors	13th Gen Intel® Core™ i7/i5/i3 mobile processors	13th Gen Intel® Core™ i7/i5/i3	12th Gen Intel® Core™ i7/i5/i3	AMD Ryzen™ 8000 series Hawk Point APUs
<b>CPU Max. Frequency</b>	Up to 5.0GHz	Up to 4.9GHz	Up to 4.8GHz	Up to 4.7GHz	Up to 5.2GHz
<b>PCH</b>	N/A	N/A	N/A	N/A	N/A
<b>Memory</b>	2x DDR5 SO-DIMM	2x DDR5 O-DIMM	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM	2x DDR5 SO-DIMM
<b>Max. Memory Size</b>	128GB	64GB	64GB	64GB	64GB
<b>BIOS</b>	AMI	AMI	AMI	AMI	AMI
<b>Graphics Controller</b>	Intel® Core™ Ultra Series 3 processors integrated graphics	13th Gen Intel® Core™ processors integrated graphics	Intel® Core™ i integrated graphics	Intel® Core™ i integrated graphics	AMD Radeon™ 780M
<b>Video Output</b>	HDMI, DisplayPort, VGA, LVDS or eDP (on carrier board)	HDMI, DisplayPort, VGA, LVDS or eDP (on carrier board)	24-bit dual-channel LVDS (on carrier board)	24-bit dual-channel LVDS (on carrier board)	24-bit dual-channel LVDS (on carrier board)
<b>Ethernet</b>	1x Intel® I226LM 2.5GbE RJ45 on carrier board	1x Intel® I226LM 2.5GbE RJ45 on carrier board	Intel® I226LM 2.5 Gigabit LAN	Intel® I226LM 2.5 Gigabit LAN	Intel® I225V 2.5 Gigabit LAN
<b>Audio</b>	Built-in HD Audio controller	Built-in HD Audio controller	Built-in HD Audio controller	Built-in HD Audio controller	Realtek ALC662 or ALC888S HD audio codec (on carrier board)
<b>SATA</b>	N/A	2x SATA III via carrier board	2x SATA III (on carrier board)	2x SATA III ports (on carrier board)	2x SATA III ports (on carrier board)
<b>I/O Chipset</b>	Fintek F81804U-I (on board)	Fintek F81804U-I (on board)	F81804U-I (on board)	F81804U-I (on board)	F81804U-I (on board)
<b>Parallel Port</b>	N/A	N/A	N/A	N/A	N/A
<b>Serial Port</b>	2x COM ports (Tx/Rx only)	2x COM ports (Tx/Rx only)	2x COM ports (Tx/Rx only)	2x COM ports (Tx/Rx only)	2x RS-232 COM ports (Tx/Rx only)
<b>USB 2.0</b>	8x USB 2.0 via carrier board	8 x USB 2.0 via carrier board	8x USB 2.0 ports (via Carrier Board)	8x USB 2.0 ports (via carrier board)	8x USB 2.0 ports (via carrier board)
<b>USB 3.X</b>	4x USB3.2 via carrier board	4x USB3.2 (10Gbps) via carrier board	4x USB 3.1 Gen2 (via carrier board)	4x USB 3.1 Gen2 (via carrier board)	4x USB 3.1 Gen2 (via carrier board)
<b>TPM</b>	2.0	2.0	2.0	2.0	2.0
<b>KB / MS</b>	N/A	N/A	N/A	N/A	N/A
<b>Hardware Monitor</b>	Yes	Yes	Yes	Yes	Yes
<b>Storage Device Interface</b>	N/A	N/A	N/A	N/A	N/A
<b>Watchdog Timer</b>	256 levels	256 levels	256 levels	256 levels	256 levels
<b>Expansion slots</b>	1x PCIe(x8), 1x PCIe(x4), 4x PCIe(x1) to carrier board	1x PCIe(x16), 1x PCIe(x4), 4x PCIe(x1) to carrier board	1x PCIe(x16), 1x PCIe(x4), 4x PCIe(x1)	1x PCIe(x16), 1x PCIe(x4), 4x PCIe(x1)	1x PCIe(x16), 1x PCIe(x4), 4x PCIe(x1)
<b>Digital I/O</b>	4-in/4-out	4-in/4-out	4-in / 4-out on carrier board (IP414)	4-in / 4-out on carrier board (IP414)	4-in / 4-out on carrier board
<b>Power Input</b>	On carrier board	On carrier board	On Carrier Board	On carrier board	On carrier board
<b>Power Consumption</b>	TBD	TBD	13th Gen Intel® Core™ i7-1370PRE 1.90GHz w/ 2x DDR4 2400 4GB Innodisk M4SS-4GSSN50J-EA35 + 12V:7.57A	Intel® Core™ i5-1250PE 1.50GHz w/ 2x 16GB DDR4-3200 + 12V:2.6A	AMD Ryzen™ 8040 Hawk Point APUs series
<b>Dimensions (L x W)</b>	95mm x 125mm	95mm x 125mm	125mm x 95mm	125mm x 95mm	125mm x 95mm
<b>Extra Features</b>	Two 220-pin COM Express Type-6 interface connectors to carrier board (for USB, expansion slots, SATA, LVDS/eDP, DisplayPort, LAN, HD Audio, LPC, GPIO)	Two 220-pin COM Express Type 6 interface connectors to Carrier Board (for USB, expansion slots, SATA, LVDS/eDP, VGA, 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/eDP, VGA, 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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COM-HPC Module

# Comparison Table

## CPU Module

ET977	ET976	ET885	ET880	ET876
COM Express Type-6 (R3.0)	COM Express Type-6	COM Express Type 6 (R3.1)	COM Express Type-6 (R3.0)	COM Express Type-10 (R3.0)
BGA1140 on board	BGA1140 on board	FCBGA1264 SoC on board	FCBGA1296 SoC on board	FCBGA1296 SoC on board
AMD Ryzen™ V1000 / R1000 series Embedded APU	AMD Ryzen™ V1000 series embedded APU	Intel® Atom® x7433RE	Intel® Atom® QC x6425E Intel® Atom® DC x6211E	Intel® Atom® Processor E3950/E3940/ E3930
Up to 3.8GHz	Up to 3.8GHz	Up to 3.4GHz	Up to 3.0GHz	Up to 2.5GHz
N/A	N/A	N/A	N/A	N/A
2x DDR4 SO-DIMM	DDR4 Memory on board	1x DDR5 SO-DIMM	DDR4 8GB memory onboard + 1x DDR4 SO-DIMM	Onboard DDR3L memory
32GB	8GB	16GB	24GB	4GB
AMI	AMI	AMI	AMI	AMI
AMD Radeon™ Vega GPU integrated	AMD Radeon™ Vega GPU integrated	Intel® SoC integrated Gen12 UHD Graphics	Intel® SoC integrated Gen11 graphics	Intel® SoC integrated Gen9-LP graphics
24-bit dual-channel LVDS or eDP (on carrier board)	24-bit dual-channel LVDS or eDP (on carrier board)	2x DDI, 1x eDP or 1x LVDS (on carrier board)	24-bit dual-channel 2x DDI, LVDS or eDP (on carrier board)	24-bit dual-channel LVDS or eDP (on carrier board)
Intel® I210AT Gigabit LAN	Intel® I211AT or I210AT Gigabit LAN	1x Intel I226IT 2.5GbE via interface on carrier board	Intel I226IT Gigabit LAN	Intel® I210IT Gigabit LAN
AMD Ryzen™ built-in HD audio controller	AMD V1000 series APU built-in HD interface	Intel® Atom® SoC built-in HD Audio	Intel® Atom® SoC built-in HD audio controller	Intel® Atom® SoC built-in HD audio controller
2x SATA III (on carrier board)	2x SATA III ports (on carrier board)	2x SATA III via carrier board	2x SATA III (on carrier board)	2x SATA III (on carrier board)
Fintek F81804U-I	F81804U-I (on board)	Fintek F81804U-I (on board)	F81804U-I (on board)	F81804U-I (on board)
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)	1 SPP/EPP/ECP port (on carrier board)
2x UART (Tx/Rx only) (on carrier board)	2x RS-232 COM ports (on carrier board)	2x SATA III	2x UART (Tx/Rx only) (on carrier board)	2x UART (Tx/Rx only) (on carrier board)
8x USB 2.0 ports (via carrier board)	8x USB 2.0 (via carrier board)	8x USB 2.0 (via Carrier Board)	4x USB 2.0 (via Carrier Board)	8x USB 2.0 (via carrier board)
1x USB 3.1(10G), 3x USB 3.1 (via carrier board)	4x USB 3.1 (via carrier board)	4x USB 3.2 (10Gbps)	2x USB 3.1 (via Carrier Board)	2x USB 3.0 (via carrier board)
2.0	2.0	2.0	2.0	2.0
N/A	N/A	N/A	N/A	N/A
Yes	Yes	No	Yes	Yes
N/A	N/A	2x SATA III via carrier board	N/A	eMMC 5.0 up to 32GB (option)
256 levels	256 levels	256 levels	256 levels	256 levels
V1000: 1x PEG(8x), 4x PCIe(1x)(Gen3), 2x PCIe(1x)(Gen2) R1000: 1x PEG(4x), 3x PCIe(1x)(Gen3), 1x PCIe(1x), 3x PCIe(1x)(Gen2)	8x PCIe(x1)	4x PCIe(x1) via carrier board	5x PCIe(x1)	4x PCIe(x1)
4-in / 4-out on carrier board (IP418)	4-in / 4-out on carrier board (IP418)	4-in / 4-out	4-in/ 4-out on carrier board (IP419)	4-in/ 4-out on carrier board (IP417)
On carrier board	On carrier board	On carrier board	On Carrier Board	On carrier board
AMD V1605B w/ 2x 8GB DDR4-2133, +12V: 3.28A AMD R1606G w/ 2x 8GB DDR4-2133, +12V: 3.43A	Intel® i7-7600U, 2.8GHz w/ 8GB DDR4-2133 +12V: 3.47A; +5V: 1.4A +3.3V: 0.33, +5VBS: 0.10A	TBD	Intel® Atom® x6425E Processor 2.00GHz w/ 8GB DDR4-3200 +12V: 1.93A	Intel® Atom® E3950 1.6GHz w/ 4GB LDDR3L 1600 +12V: 1.42A
125mm x 95mm	125mm x 95mm	95mm x 95mm	95mm x 95mm	84mm x 55mm
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, eDP/LVDS, DDI, LAN, audio, LPC, GPIO, TPM (2.0))	Two 220-pin COM Express Type-6 interface connectors to Carrier Board (for USB, expansion slots, SATA, LVDS, DVI, DisplayPort, LAN, audio, LPC, GPIO), Boot on LAN	One 220-pin COM Express Type-10 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 Single Board Computers
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# Comparison Table

## CPU Module

Models	ET875	ET870	ET860	IBQ800	ET839
<b>Form Factor</b>	COM Express Type-10 (R3.0)	COM Express Type-6 (R3.0)	COM Express Type-6 (R3.0)	QSeven (R2.1)	ETX (3.0)
<b>CPU Socket</b>	FCBGA1296 SoC on board	FCBGA1296 SoC on board	BGA1170 SoC on board	FCBGA1296 SoC on board	BGA1170 SoC on board
<b>CPU</b>	Intel® Atom® Processor E3950/ E3940/E3930 Intel® Pentium® QC N4200 Intel® Celeron® DC N3350	Intel® Atom® Processor E3950/ E3940/ E3930 Intel® Pentium® QC N4200 Intel® Celeron® DC N3350	Intel® Atom® Processor E3845/ E3827	Intel® Atom® Processor E3950/ E3940/ E3930	Intel® Atom® Processor E3845
<b>CPU Max. Frequency</b>	Up to 2.5GHz	Up to 2.5GHz	Up to 1.91GHz	Up to 2.5GHz	1.91GHz
<b>PCH</b>	N/A	N/A	N/A	N/A	N/A
<b>Memory</b>	LPDDR4 Onboard Memory	2x DDR3L SO-DIMM	2x DDR3L SO-DIMM	LPDDR4 on board Memory	1x DDR3L SO-DIMM
<b>Max. Memory Size</b>	8GB	16GB	16GB	8GB	8GB
<b>BIOS</b>	AMI	AMI	AMI	AMI	AMI
<b>Graphics Controller</b>	Intel® Gen9-LP w/ 18 EUs graphics	Intel® Gen9-LP w/ 18 EUs graphics	Intel® Gen7 graphics	Intel® Gen9-LP w/ 18 EUs graphics	Intel® Gen7 graphics
<b>Video Output</b>	24-bit dual-channel LVDS (on carrier board)	24-bit dual-channel LVDS (on carrier board)	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)
<b>Ethernet</b>	Intel® I210IT Gigabit LAN	Intel® I210IT Gigabit LAN	Intel® I210IT Gigabit LAN	Intel® I210IT Gigabit LAN	Realtek RTL8106E 10/100M LAN
<b>Audio</b>	Realtek ALC662 or ALC888S HD audio codec (on carrier board)	Realtek ALC662 or ALC888S HD audio codec (on carrier board)	Realtek ALC662 or ALC888S HD audio codec (on carrier board)	Realtek ALC662 or ALC888S HD audio codec (on carrier board)	Realtek ALC662 or ALC888S HD audio codec (on carrier board)
<b>SATA</b>	2x SATA III ports (on carrier board)	2x SATA III ports (on carrier board)	2x SATA III ports (on carrier board)	2x SATA III ports (on carrier board)	1x SATA II port (on carrier board)
<b>I/O Chipset</b>	F81804U-I (on board)	F81804U-I (on board)	NCT5523D (on board)	F81804U-I (on board)	NCT6102D (on board)
<b>Parallel Port</b>	1 SPP/EPP/ECP port (on carrier board)	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)
<b>Serial Port</b>	2x UART (Tx/Rx only) (on carrier board)	2x UART (Tx/Rx only) (on carrier board)	2x UART (Tx/Rx only) (on carrier board)	1x UART (TX/RX) (on carrier board)	2x RS232 COM ports, TTL Level (on carrier board)
<b>USB 2.0</b>	4x USB 2.0 (via carrier board)	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)
<b>USB 3.X</b>	2x USB 3.0 (via carrier board)	3x USB 3.0 (via carrier board)	1x USB 3.0 (via carrier board)	3x USB 3.0 (via carrier board)	N/A
<b>TPM</b>	2.0	2.0	N/A	2.0	N/A
<b>KB / MS</b>	N/A	N/A	On carrier board	N/A	On carrier board
<b>Hardware Monitor</b>	Yes	Yes	Yes	Yes	Yes
<b>Storage Device Interface</b>	eMMC5.0 (option)	N/A	MicroSD	eMMC5.0 (option)	N/A
<b>Watchdog Timer</b>	256 levels	256 levels	256 levels	256 levels	256 levels
<b>Expansion slots</b>	4x PCIe(x1)	4x PCIe(x1)	1x PCIe (x1) on carrier board (IP411)	4x PCIe(x1)	3x PCI + 1x ISA on carrier board (IP412)
<b>Digital I/O</b>	4-in / 4out on carrier board (IP417)	4-in / 4out on carrier board (IP419)	4-in / 4-out on carrier board (IP411)	4-in / 4out on carrier board (IP416)	4-in / 4-out on carrier board (IP412)
<b>Power Input</b>	On carrier board	On carrier board	On carrier board	On carrier board	On carrier board
<b>Power Consumption</b>	Intel® Atom® Processor E3950 1.60GHz w/ Onboard LPDDR4 2400MHz 8GB +12V: 1.587A	Intel® Atom® E3950 1.6GHz w/ 2x 8GB DDR3L-1600 +12V: 2.18A	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/ 8GB LDDR4 1600 +12V: 1.7121A	Intel® Atom® E3845 1.91GHz w/ 2x 4GB DDR3L-1600 +5V: 1.92A
<b>Dimensions (L x W)</b>	84mm x 55mm	95mm x 95mm	95mm x 95mm	70mm x 70mm	95mm x 114mm
<b>Extra Features</b>	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	Two 220-pin COM Express T 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	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
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1 Single Board Computers

2 CPU Modules

3 Motherboards

4 CPU Cards

5 COM-HPC Module



### Features

- Onboard Intel® Core™ Ultra 9/7/5 processors
- 2x DDR5-5600 SO-DIMM sockets, Max. 128GB
- Supports 3x independent displays from HDMI / DP / VGA / LVDS or eDP
- 1x 2.5 GbE LAN
- 4x USB 3.2, 8x USB 2.0, 2x COM
- 1x PCIe (x8), 1x PCIe (x4), 4x PCIe (x1) signals to carrier board
- Watchdog Timer, Digital I/O, TPM (2.0)

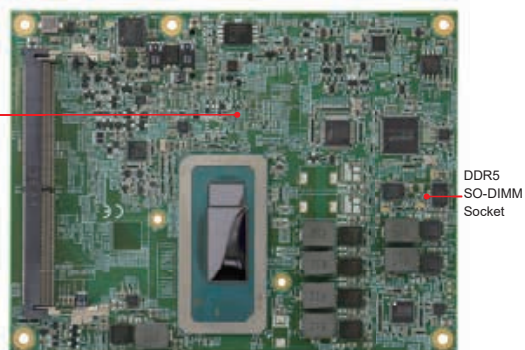
### Specifications

CPU	BGA2540 for Intel® Core™ Ultra 9/7/5 mobile processors (SoC)
PCH	Integrated in SoC
Memory	2x DDR5-5600 SO-DIMM sockets, Max. 128GB, Non-ECC
BIOS	AMI
Watchdog Timer	256 level programmable Watchdog Timer
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	1x PCIe (x8), 1x PCIe (x4), 4x PCIe (x1) signals to carrier board
Graphics Controller	Intel® Core™ Ultra Series 3 processors integrated graphics
Video Output	HDMI, DisplayPort, VGA, LVDS or eDP on carrier board
Ethernet	1x Intel® I226LM 2.5GbE (RJ45 via carrier board)
I/O Chipset	Fintek F81804U-I
Serial Port	2x COM ports (Tx/Rx only)
USB 2.0	8x USB 2.0 via carrier board
USB 3.X	4x USB 3.2 (10 Gbps) via carrier board
Serial ATA	N/A
Audio	Integrated HD Audio controller
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	TBD
Operating Temperature	0°C ~ 60°C ( 32°F ~ 140°F)
Storage Temperature	-20°C ~ 80°C (-4°F ~ 176°F)
Relative Humidity	90% RH (non-condensing @60°C)

### Ordering Information

ET985-335	COM Express (Type 6) module w/ Intel® Core® Ultra 5 335H onboard, supports eDP
ET985LV-335	COM Express (Type 6) module w/ Intel® Core® Ultra 5 335H onboard, supports LVDS





13th Gen Intel® Core™ processor

DDR5 SO-DIMM Socket

## Features

- Onboard 13th Gen Intel® Core™ i7/i5/i3 processors
- 2x DDR5-5600 SO-DIMM sockets, Max. 64GB
- Supports 3x independent displays from HDMI / DP / VGA / LVDS or eDP
- 1x onboard 2.5 GbE LAN
- 4x USB 3.2, 8x USB 2.0, 2x SATA III, 2x COM
- 1x PCIe (x16), 1x PCIe (x4), 4x PCIe (x1) signals to carrier board
- Watchdog Timer, Digital I/O, TPM (2.0)
- Supports wide-range operating temperature from **-40°C to 85°C (Only ET982LV-I7PRE)**



DDR5 SO-DIMM Socket

LAN chip

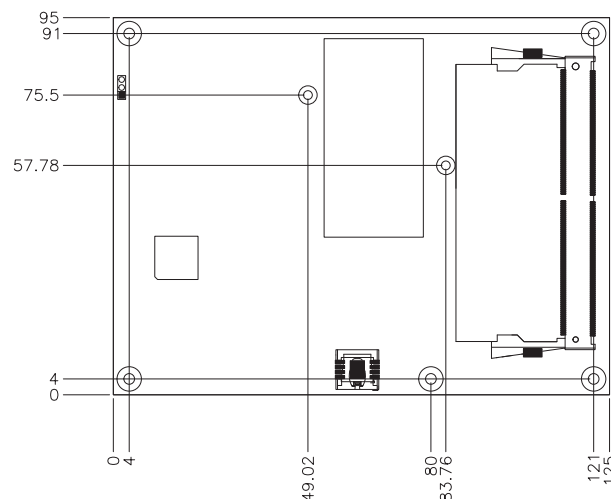
## Specifications

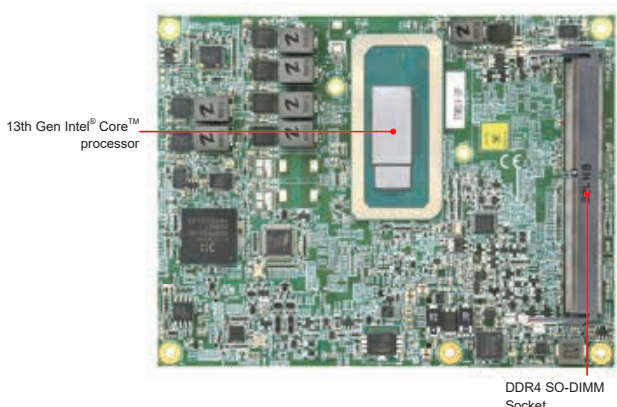
CPU	BGA1744 for 13th Gen Intel® Core i7/i5/i3 mobile processors (SoC)
PCH	Integrated in SoC
Memory	2x DDR5-5600 SO-DIMM sockets, Max. 64GB, ECC compatible
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	1x PCIe (x16), 1x PCIe (x4), 4x PCIe (x1) signals to carrier board
Graphics Controller	13th Gen Intel® Core processors integrated graphics
Video Output	HDMI, DisplayPort, VGA, LVDS or eDP on carrier board
Ethernet	1x Intel® I226LM 2.5GbE (RJ45 via carrier board)
I/O Chipset	Fintek F81804U-I onboard
Serial Port	2x COM ports (Tx/Rx only) via carrier board
USB 2.0	8x USB 2.0 via carrier board
USB 3.X	4x USB 3.2 (10 Gbps) via carrier board
Serial ATA	2x SATA III via carrier board
Audio	Integrated HD Audio controller
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out), Watchdog Timer
Dimensions (L X W)	95mm x 125mm (3.74" x 4.92")
Power Consumption	TBD
Operating Temperature	<b>-40°C~85°C (-40°F~185°F) for ET982LV-I7PRE</b> 0°C~60°C (32°F~140°F)
Storage Temperature	-20°C ~ 80°C (-4°F ~ 176°F)
Relative Humidity	90% RH (non-condensing @60°C)

## Ordering Information

ET982LV-I7PRE	COM Express (Type 6) module w/ Intel® i7-1370PRE onboard, supports LVDS
ET982LV-I7P	COM Express (Type 6) module w/ Intel® i7-1370PE onboard, supports LVDS
ET982-I7U	COM Express (Type 6) module w/ Intel® i7-1365UE onboard, supports eDP
IP414	ATX COM Express Type-6 carrier board, supports ATX
IP414-DC	ATX COM Express Type-6 carrier board, supports DC-in
HSET981-A	Heatsink with fan for ET981/ET982
HSET980-3	Heat spreader for ET981/ET982

## Dimensions and Drawing





13th Gen Intel® Core™ processor

DDR4 SO-DIMM Socket



DDR4 SO-DIMM Socket

LAN chip

## Specifications

CPU	BGA1744 for 13th Gen Intel® Core™ i Mobile Processors
PCH	N/A
Memory	2x DDR4-3200 SO-DIMM socket, Max. 64GB, ECC compatible
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	1x PCIe(x16), 1x PCIe(x4), 4x PCIe(x1) to carrier board
Graphics Controller	13th Intel® Gen P-series Core™ processors integrated graphics
Video Output	HDMI, DisplayPort, VGA, LVDS or eDP on carrier board
Ethernet	Intel® I226LM 2.5 GbE RJ45 on carrier board I226IT 2.5 GbE for ET981LV-I7PRE only
I/O Chipset	Fintek F81804U-I on board
Serial Port	2x COM ports (Tx/Rx only)
USB 2.0	8x USB 2.0 via carrier board
USB 3.X	4x USB 3.2 (1Gbps-10Gbps) via carrier board
Serial ATA	2x SATA III via carrier board
Audio	Built-in HD audio controller
TPM	TPM (2.0)
Others	Power: +12 V and +5 VSB for ATX, +12V for AT, Digital I/O (4-in/4-out), Watchdog Timer
Dimensions (L X W)	95mm x 125mm (3.74" x 4.92")
Power Consumption	13th Gen Intel® Core™ i7-1370PRE 1.90GHz w/ 2x DDR4 2400 4GB Innodisk M4SS-4GSSN50J-EA35 +12V:7.57A
Operating Temperature	-40°C~85°C (-40°F~185°F) for ET981LV-I7PRE 0°C~60°C (32°F~140°F)
Storage Temperature	-40°C~80°C (-40°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

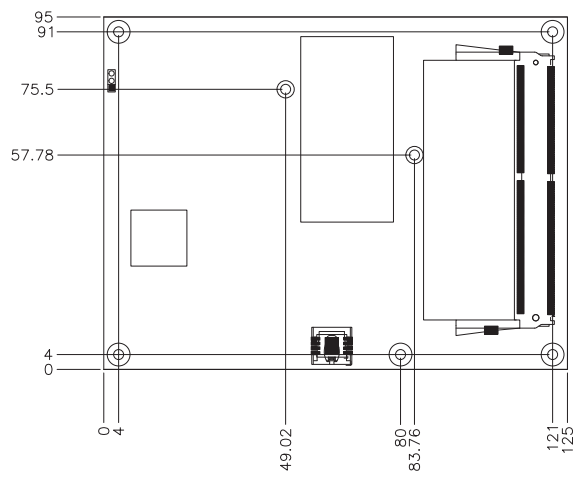
## Features

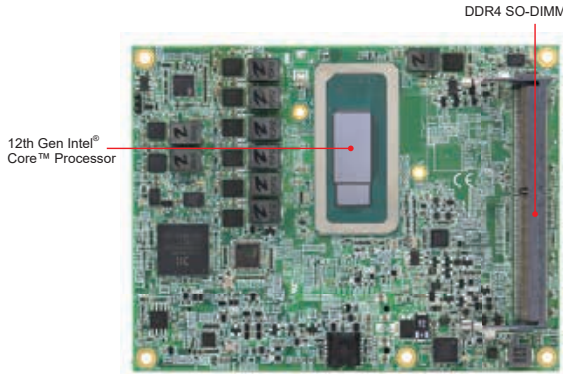
- Onboard 13th Gen Intel® Core™ i Mobile Processors COM Express (Type 6 & R3.1) Module
- 2x DDR4-3200 SO-DIMM sockets, Max. 64GB
- 1x 2.5 GbE
- 4x USB 3.2, 8x USB 2.0, 2x SATA III, 2x COM
- Supports 3x independent displays from HDMI / DP / VGA / LVDS or eDP
- 1x PCIe(x16), 1x PCIe(x4), 4x PCIe(x1) signals to carrier board
- Digital I/O, TPM (2.0), Watchdog Timer
- Supports wide-range operating temperature from -40°C to 85°C (Only ET981LV-I7PRE)

## Ordering Information

ET981LV-I7P	COM Express (Type 6) module w/ Intel® i7-1370PE onboard, LVDS support
ET981LV-I7PRE	COM Express (Type 6) Module w/ Intel® Core™ i7-1370PRE onboard, LVDS support (wide-temperature)
ET981LV-I5U	COM Express (Type 6) module w/ Intel® i5-1335UE onboard, LVDS support
ET981-I5U	COM Express (Type 6) module w/ Intel® i5-1335UE onboard, eDP support
ET981LV-I5P	COM Express (Type 6) module w/ Intel® i5-1340PE onboard, LVDS support
ET981LV-I3P	COM Express (Type 6) module w/ Intel® i3-1320PE onboard, LVDS support
IP414	ATX COM Express Type-6 carrier board, supports ATX
IP414-DC	ATX COM Express Type-6 carrier board, supports DC-in (+8V ~ +20V)
HSET981-A	Heatsink with fan for ET981/ET980
HSET980-3	Heat spreader for ET981/ET982

## Dimensions and Drawing





## Features

- Onboard 12th Gen Intel® Core™ i7/i5/i3 processors
- 2x DDR4-3200 SO-DIMM sockets, Max. 64GB
- Onboard 2.5 GbE
- Supports 3x independent displays from HDMI / DP / VGA / LVDS or eDP
- 4x USB 3.2, 8x USB 2.0, 2x SATA III, 2x COM
- 1x PCIe(x16), 1x PCIe(x4), 4x PCIe(x1) to carrier board
- Digital I/O, TPM (2.0), Watchdog Timer

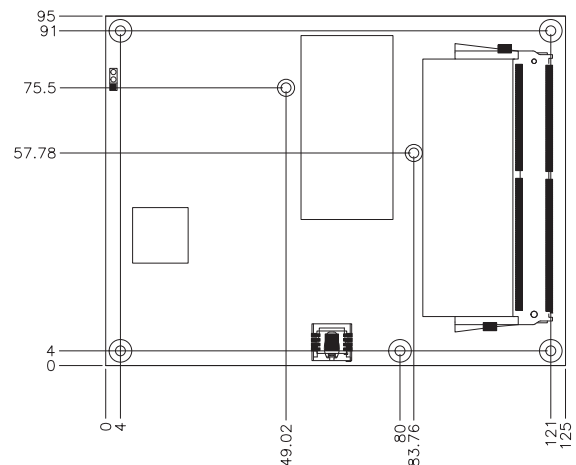
## Specifications

CPU	BGA1744 for 12th Gen Intel® Core™ i7/i5/i3 processors
PCH	N/A
Memory	2x DDR4-3200 SO-DIMM sockets, Max. 64GB, ECC compatible
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	1x PCIe(x16), 1x PCIe(x4), 4x PCIe(x1) to carrier board
Graphics Controller	12th Gen Intel® Core™ P-series processor integrated graphics
Video Output	HDMI, DisplayPort, VGA, LVDS or eDP on carrier board
Ethernet	Intel® I226LM 2.5 GbE RJ45 on carrier board
I/O Chipset	Fintek F81804U-I onboard
Serial Port	2x COM ports (Tx/Rx only)
USB 2.0	8x USB 2.0 via carrier board
USB 3.X	4x USB 3.2 (10Gbps) via carrier board
Serial ATA	2x SATA III via carrier board
Audio	Built-in HD audio controller
TPM	TPM (2.0)
Others	Power: +12V and +5VSB for ATX, +12V for AT Digital I/O (4-in/4-out), Watchdog Timer
Dimensions (L X W)	125mm x 95mm (4.92" x 3.74")
Power Consumption	Intel® Core™ i5-1250PE 1.50GHz w/ 2x 16GB DDR4-3200 +12V:2.6A
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

ET980LV-I7U	COM Express (Type 6) CPU Module w/ Intel® Core™ i7-1265UE onboard, LVDS support
ET980LV-I7P	COM Express (Type 6) CPU Module w/ Intel® Core™ i7-1270PE onboard, LVDS support
ET980LV-I5U	COM Express (Type 6) CPU Module w/ Intel® Core™ i5-1245UE onboard, LVDS support
ET980-I5U	COM Express (Type 6) CPU Module w/ Intel® Core™ i5-1245UE onboard, eDP support
ET980LV-I5P	COM Express (Type 6) CPU Module w/ Intel® Core™ i5-1250PE onboard, LVDS support
ET980-I3P	COM Express (Type 6) CPU Module w/ Intel® Core™ i3-1220PE onboard, eDP support
ET980LV-I3P	COM Express (Type 6) CPU Module w/ Intel® Core™ i3-1220PE onboard, LVDS support
IP414	ATX COM Express Type-6 carrier board, supports ATX
IP414-DC	ATX COM Express Type-6 carrier board, supports DC-in (+8V ~ +20V)
HSET980-B	Heatsink with fan for ET980
HSET980-2	Heat spreader for ET980

## Dimensions and Drawing





### Features

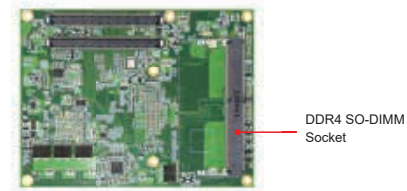
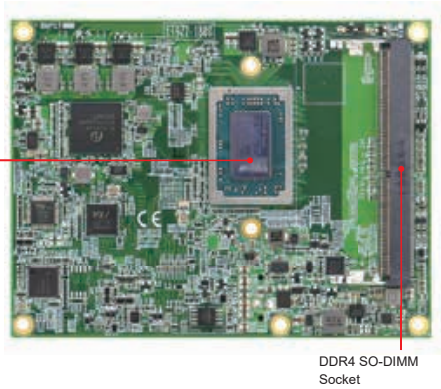
- Onboard AMD Ryzen™ 8000 series (Hawk Point APUs)
- Onboard DDR5 memory, Max. 8GB
- Supports 3x independent displays, HDMI/DVI/DisplayPort & LVDS or eDP via carrier board
- 4x USB 3.1, 8x USB 2.0, 2x SATA III
- Supports TPM (2.0)

### Specifications

CPU	AMD Ryzen™ Embedded 8000 series (Hawk Point APUs)
PCH	N/A
Memory	Onboard memory, DDR5, Max. 8GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	1x PEG (x8) 8x PCIe (x1)
Graphics Controller	AMD Radeon™ Vega GPU integrated
Video Output	2x DDI 1x LVDS or 1x eDP (option)
Ethernet	Intel® I226IT PCIe Gigabit LAN
I/O Chipset	Fintek F81804U-I
Serial Port	2x UART (Tx/Rx only)
USB 2.0	8x USB 2.0 via carrier board
USB 3.X	4x USB 3.2 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	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)

- 1 Single Board Computers
- 2 CPU Modules
- 3 Motherboards
- 4 CPU Cards
- 5 COM-HPC Module



## Features

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

## Specifications

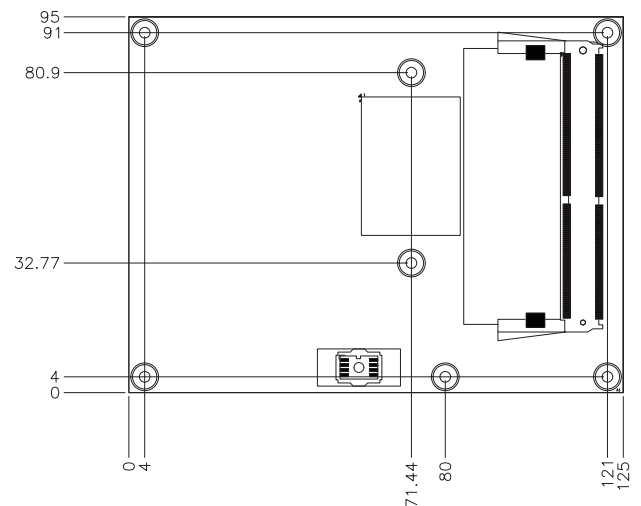
CPU	AMD Ryzen™ Embedded V1000 / R1000 series
PCH	N/A
Memory	2x DDR4 SO-DIMM, Max. 32GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	V1000 Series: 1x PEG(8x)(Gen3), 4x PCIe(1x)(Gen3), 2x PCIe(1x) R1000 Series: 1x PEG(4x)(Gen3), 3x PCIe(1x)(Gen3), 3x PCIe(1x)
Graphics Controller	AMD Radeon™ Vega GPU integrated
Video Output	V1000 Series: 3x DDI R1000 Series: 2x DDI 1x LVDS or 1x eDP (By option)
Ethernet	Intel® I211AT or I210AT Gigabit LAN
I/O Chipset	Fintek F81804U-I
Serial Port	2x UART (Tx/Rx only)
USB 2.0	8x USB 2.0 Port [USB 2.0 Hub x 3 ports, (VL822-Q7)]
USB 3.X	1x USB 3.1 port (10G), 3x USB 3.1 ports (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	AMD V1605B w/ 2x 8GB DDR4-2133, +12V: 3.28A AMD R1606G w/ 2x 8GB DDR4-2133, +12V: 3.43A
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

ET977-1605LV	COM Express (Type-6) CPU Module with AMD Ryzen™ V1605B QC APU (2.0GHz~3.6GHz), DDR4 dual-channel memory, LVDS support
ET977-1606LV	COM Express (Type-6) CPU Module with AMD Ryzen™ R1606G DC APU (2.6GHz~3.5GHz), DDR4 dual-channel memory, LVDS support
ET977-1505LV	COM Express (Type-6) CPU Module with AMD Ryzen™ R1505G DC APU (2.4GHz~3.5GHz), DDR4 dual-channel memory, LVDS support
HSET977-A	Heatsink with fan for ET977
HSET977-1	Heat spreader for ET977

\*Specifications are subject to change without prior notice

## Dimensions and Drawing



1

Single Board Computers

2

CPU Modules

3

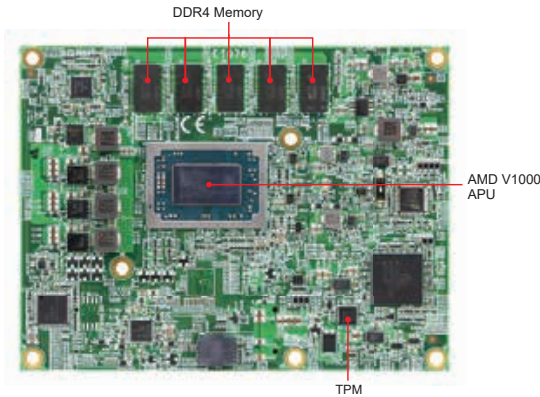
Motherboards

4

CPU Cards

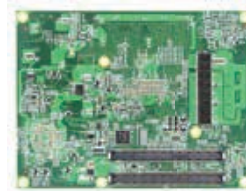
5

COM-HPC Module



## Features

- Onboard AMD Ryzen™ Embedded V1000 Series
- 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
- TPM (2.0)



## Specifications

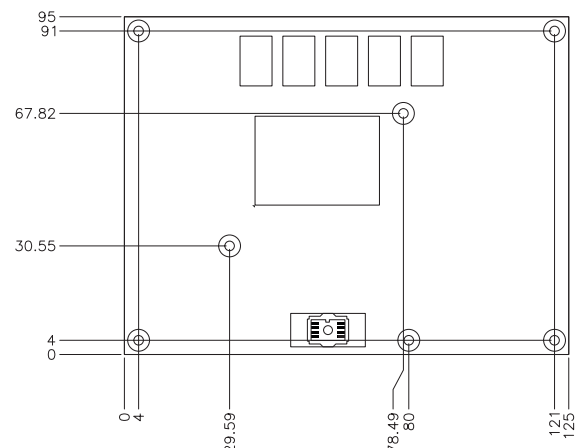
CPU	Onboard AMD Ryzen™ Embedded V1000 Series
PCH	N/A
Memory	Onboard Memory 4GB/8GB DDR4
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	1x PEG(x8) 8x PCIe(x1)
Graphics Controller	AMD Radeon™ Vega GPU integrated
Video Output	2x DDI 1x LVDS or 1x eDP (option)
Ethernet	Intel® I211AT or I210AT Gigabit LAN
I/O Chipset	Fintek F81804U-I
Serial Port	2x UART (Tx/Rx only)
USB 2.0	8x USB 2.0 via carrier board
USB 3.X	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°C)

## 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 fan for ET976
HSET976-1	Heat spreader for ET976

\*Specifications are subject to change without prior notice

## Dimensions and Drawing





## Features

- Onboard Intel® Atom® x7000RE series processors
- 1x DDR5 SO-DIMM socket, Max. memory up to 16GB
- 1x I226IT 2.5G LAN
- 4x USB 3.2 [Gen 2.0](10Gbps), 8x USB 2.0, 2x COM (Tx/Rx only), 2x SATA III
- Supports 3x independent displays (2x DDI + eDP or LVDS via carrier board)
- Watchdog Timer, Digital I/O (4-in/4-out), TPM (2.0)
- **Wide-range operating temperature from -40°C to +85°C**

## Specifications

CPU	Intel® Atom® x7433RE onboard
PCH	Integrated in Intel® SoC
Memory	1x DDR5 SO-DIMM socket, Max. 16GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	2x SATA III via carrier board
Expansion Slots	4x PCIe (x1) via carrier board
Graphics Controller	Intel® Gen12 UHD graphics
Video Output	2x DDI, 1x eDP or 1x LVDS via carrier board
Ethernet	1x Intel I226IT 2.5GbE via carrier board interface
I/O Chipset	Fintek F81804U-I
Serial Port	2x COM ports (Tx/Rx only)
USB 2.0	8x USB 2.0 via carrier board
USB 3.X	4x USB 3.2 (10Gbps)
Serial ATA	2x SATA III
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 (3.74" x 3.74")
Power Consumption	TBD
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 @60°C)

## Ordering Information

ET885-7433R	COM Express (Type-6) module w/ Intel® Atom® x7433RE SoC on board, supports eDP
ET885-7433RLV	COM Express (Type-6) module w/ Intel® Atom® x7433RE SoC on board, supports LVDS
HSET885-A	Heatsink for ET885 with Intel Atom® x7433 series SoC
HSET885-1	Heat spreader for ET885 with Intel Atom® x7433 series SoC

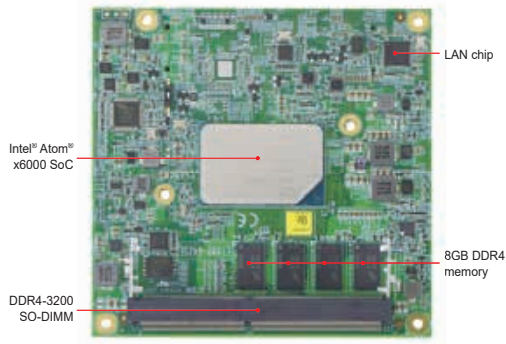
1 Single Board Computers

2 CPU Modules

3 Motherboards

4 CPU Cards

5 COM-HPC Module



## Features

- Onboard Intel® Atom® x6000 series processors
- Onboard 8GB DDR4 memory + 1x DDR4 SO-DIMM, IB ECC compatible
- 1x I226IT PCIe 2.5G LAN
- 2x USB 3.1, 4x USB 2.0, 2x SATA III, 2x UART (Tx/Rx only)
- 3x independent displays, DisplayPort / DVI-D / LVDS or eDP via carrier board (IP419)
- **Wide-range operating temperature from -40°C to +85°C**



ET880 with Heat spreader



ET880 with heatsink

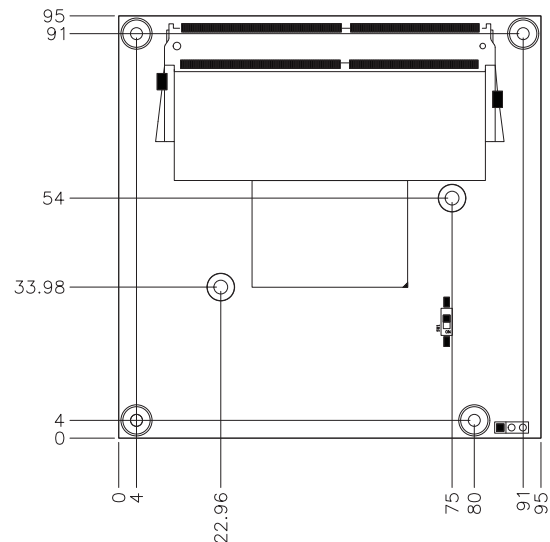
## Specifications

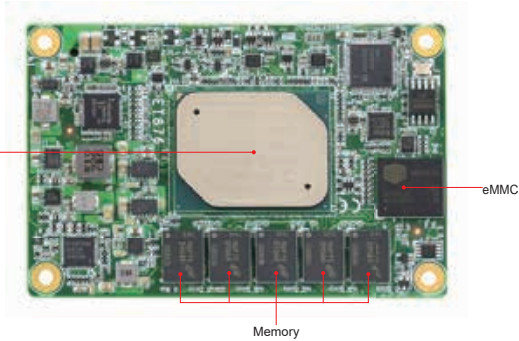
CPU	Intel® Atom® QC x6425E (1.8Ghz/3.0Ghz) Intel® Atom® DC x6211E (1.2Ghz/3.0Ghz)
PCH	Integrated in Intel® SoC
Memory	Onboard 8GB DDR4 & 1x DDR4 SO-DIMM, Max. support 24GB, IB ECC compatible
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	5x PCIe(x1) to carrier board
Graphics Controller	Intel® Gen11 integrated graphics
Video Output	2x DDI, LVDS or eDP on carrier board
Ethernet	1x Intel I226IT 2.5GbE RJ45 on carrier board
I/O Chipset	Fintek F81804U-I
Serial Port	2x COM ports (Tx/Rx only)
USB 2.0	4x USB 2.0 via carrier board
USB 3.X	2x USB 3.1 (5Gbps) via carrier board
Serial ATA	2x SATA III via carrier board
Audio	Built-in HD audio controller
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out)
Dimensions (L X W)	95mm x 95mm (3.74" x 3.74")
Power Consumption	Intel® Atom® x6425E Processor 2.00GHz w/ 8GB DDR4-3200 + 12V:1.93A
Operating Temperature	-40°C~+85°C (-40°F~+185°F) ; exclude SO-DIMM memory module
Storage Temperature	-40°C~90°C (-40°F~+194°F)
Relative Humidity	90% (non-condensing @60°C)

## Ordering Information

ET880-6425E	COM Express (Type-6) module w/ Intel® Atom® x6425E SoC on board, supports eDP
ET880-6425ELV	COM Express (Type-6) module w/ Intel® Atom® x6425E SoC on board, supports LVDS
ET880-6211E	COM Express (Type-6) module w/ Intel® Atom® x6211E SoC on board, supports eDP
ET880-6211ELV	COM Express (Type-6) module w/ Intel® Atom® x6211E SoC on board, supports LVDS
IP419	Mini-ITX COM Express Type-6 (R3.0) carrier board
HSET880-A	Heatsink with fan for ET880 with Atom® x6000 series SoC
HSET880-1	Heat spreader for ET880 with Atom® x6000 series SoC

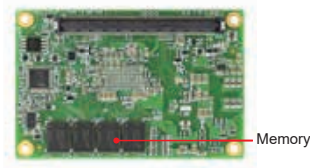
## Dimensions and Drawing





## Features

- Onboard Intel® Atom® x7-E3950/ x5-E3940/ x5-E3930 Processor [i-Temp support]
- Onboard DDR3L memory with ECC support
- 1x Intel® I210IT Gigabit LAN
- TPM (2.0), eMMC5.0 (option)
- **Wide-range operating temperature from -40°C to 85°C**



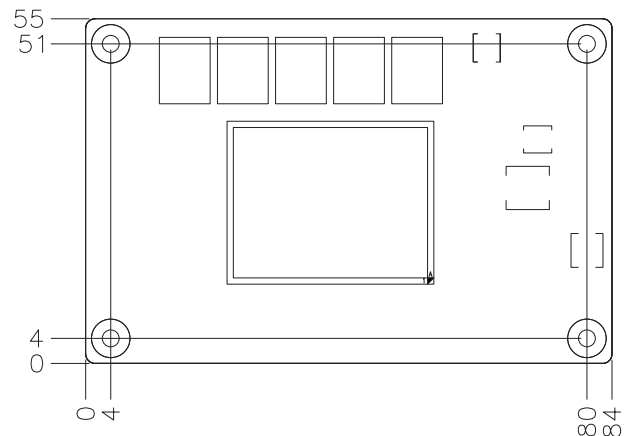
## Specifications

CPU	Intel Atom® x7-E3950 Processor (1.6GHz~2.0GHz) Intel Atom® x5-E3940 Processor (1.6GHz~1.8GHz) Intel Atom® x5-E3930 Processor (1.3GHz~1.8GHz)
PCH	Integrated in Intel® SoC
Memory	Onboard 4GB memory, DDR3L 1600MHz with ECC
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	eMMC 5.0 up to 32GB (option)
Expansion Slots	4x PCIe(x1)
Graphics Controller	Intel® SoC integrated Gen9-LP graphics
Video Output	1x DDI 1x LVDS or 1x eDP (option)
Ethernet	Intel® I210IT Gigabit LAN
I/O Chipset	F81804U-I
Serial Port	2x UART (Tx/Rx only)
USB 2.0	8x USB 2.0 via carrier board
USB 3.X	2x USB 3.0 via carrier board
Serial ATA	2x SATA III
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® E3950 1.6GHz w/ 4GB LDDR3L 1600 + 12V: 1.42A
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

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
IP417	Mini-ITX COM Express Type-10 (R3.0) carrier board
HSET876-1	Heat spreader for ET876-420/ 335
HSET876-X-1	Heat spreader for ET876-X7/ X5Q/ X5
HSET876-A	Heatsink w/ fan for ET876-420/ 335
HSET876-X-A	Heatsink w/ fan for ET876-X7/ X5Q/ X5
HSET876-X-B	Heatsink w/o Fan for ET876-X5 (only temp -40°C ~80°C)

## Dimensions and Drawing



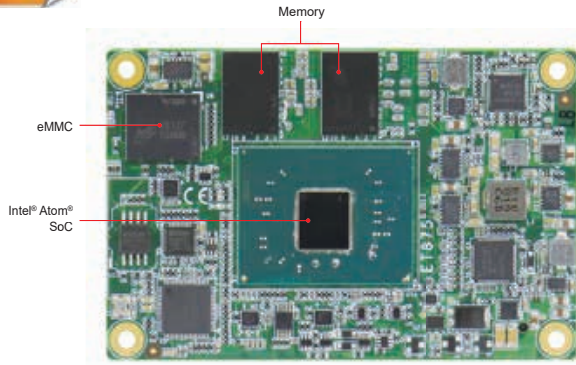
1 Single Board Computers

2 CPU Modules

3 Motherboards

4 CPU Cards

5 COM-HPC Module



### Features

- Onboard Intel® Atom® x7-E3950/ x5-E3940/ x5-E3930 Processor [i-Temp support]
- Onboard Intel® Pentium® N4200/ Celeron® N3350
- Onboard LPDDR4 memory
- 1x Intel I210IT Gigabit LAN
- Supports TPM (2.0), eMMC5.0 (option)
- Wide-range operating temperature in certain models



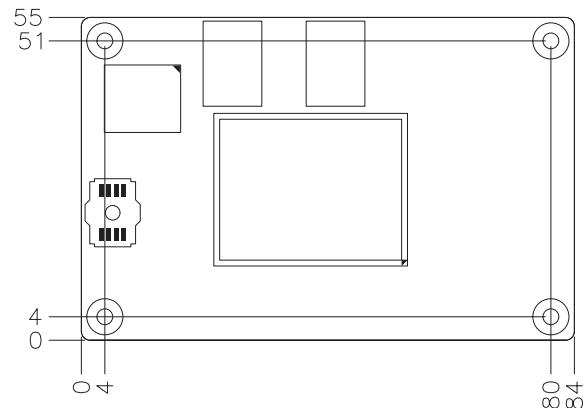
### Specifications

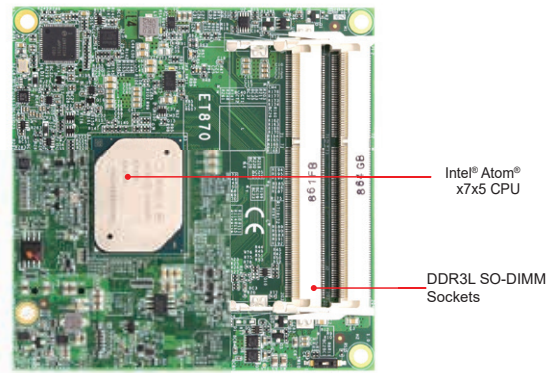
CPU	Intel Atom® x7-E3950 Processor (1.6GHz~2.0GHz) Intel Atom® x5-E3940 Processor (1.6GHz~1.8GHz) Intel Atom® x5-E3930 Processor (1.3GHz~1.8GHz) Intel® Pentium® Processor N4200 (1.1GHz~ 2.5GHz) Intel® Celeron® Processor N3350 (1.1GHz~ 2.4GHz)
PCH	Integrated in Intel® SoC
Memory	Onboard memory, LPDDR4, Max. 8GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	eMMC 5.0 up to 32GB (option)
Expansion Slots	4x PCIe(x1)
Graphics Controller	Intel® SoC integrated Gen9-LP graphics
Video Output	1x DDI 1x LVDS or 1x eDP (option)
Ethernet	Intel® I210IT Gigabit LAN
I/O Chipset	Fintek F81804U-I
Serial Port	2x UART (Tx/Rx only)
USB 2.0	8x USB 2.0 via carrier board
USB 3.X	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	N4200/N3350: -20°C ~ 60°C (-4°F~176°F)(ET875-420/ ET875-335) E3950/E3940/E3930: -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)

### 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, wide-temp support
ET875F1-X5Q	COM Express (Type-10) CPU Module with Intel® Atom® x5-E3940 (1.8GHz) on board, eDP, 4GB LPDDR4 memory on board, wide-temp support
ET875F1-X5QLV	COM Express (Type-10) CPU Module with Intel® Atom® x5-E3940 (1.8GHz) on board, LVDS, 4GB LPDDR4 memory on board, wide-temp support
ET875F1-X5	COM Express (Type-10) CPU Module with Intel® Atom® x5-E3930 (1.8GHz) on board, eDP, 4GB LPDDR4 memory on board, wide-temp support
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
IP417	Mini-ITX COM Express Type-10 (R3.0) carrier board
HSET875-A	Heatsink with Fan for ET875-420/ 335
HSET875-X-B	Heatsink with Fan for ET875-X7/ X5
HSET875-1	Heat spreader for ET875-420/335
HSET875-X-1	Heat spreader for ET875-X7/ X5

### Dimensions and Drawing





## Features

- Onboard Intel® Atom® x7-E3950/ x5-E3940/ x5-E3930 Processor [i-Temp support]
- 2x DDR3L-1866 SO-DIMM sockets, Max. 16GB
- 2x independent displays, DisplayPort/ DVI-D/ LVDS or eDP via carrier board (IP419)
- HD audio via carrier board (IP419)
- **Wide-range operating temperature from -40°C to 85°C**



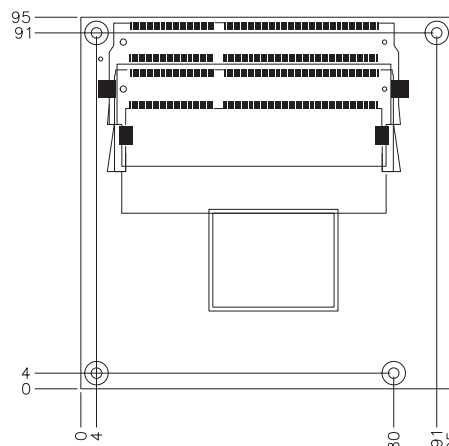
## Specifications

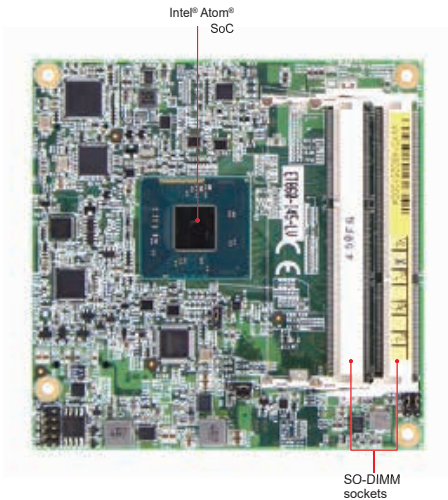
CPU	Intel Atom® x7-E3950 Processor (1.6GHz~2.0GHz) Intel Atom® x5-E3940 Processor (1.6GHz~1.8GHz) Intel Atom® x5-E3930 Processor (1.3GHz~1.8GHz)
PCH	Integrated in Intel® SoC
Memory	2x DDR3L-1866 SO-DIMM sockets, Max. 16GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	4x PCIe(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 Gigabit LAN
I/O Chipset	Fintek F81804U-I
Serial Port	2x COM ports (Tx/Rx only))
USB 2.0	4x USB 2.0 via carrier board
USB 3.X	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), DDR3L dual-channel memory, eDP support
ET870-I50LV	COM Express (Type-6) CPU Module with Intel® Atom® x7-E3950 (2.0GHz), DDR3L dual-channel memory, LVDS support
ET870-I40	COM Express (Type-6) CPU Module with Intel® Atom® x5-E3940 (1.8GHz), DDR3L dual-channel memory, eDP support
ET870-I40LV	COM Express (Type-6) CPU Module with Intel® Atom® x5-E3940 (1.8GHz), DDR3L dual-channel memory, LVDS support
ET870-I30	COM Express (Type-6) CPU Module with Intel® Atom® x5-E3930 (1.8GHz), DDR3L dual-channel memory, eDP support
ET870-I30LV	COM Express (Type-6) CPU Module with Intel® Atom® x5-E3930 (1.8GHz), DDR3L dual-channel memory, LVDS support
IP419	Mini-ITX COM Express Type-6 (R3.0) carrier board
HSET870-A	Heatsink with fan for ET870
HSET870-1	Heat Spreader for ET870

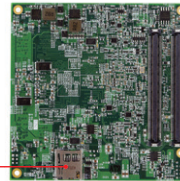
## Dimensions and Drawing





## Features

- Onboard Intel® Atom® Processor E3845/E3827
- 2x DDR3L SO-DIMM, Max. 8GB
- Single Gigabit LAN via carrier board (IP419)
- 2x SATA II, 1x USB 3.0, 8x USB 2.0, 2x COM via carrier board (IP419)
- Supports 2x independent displays, DisplayPort/CRT/LVDS via carrier board (IP419)
- Supports HD audio via carrier board (IP419)
- **Wide-range operating temperature from -40°C to 85°C**



MicroSD

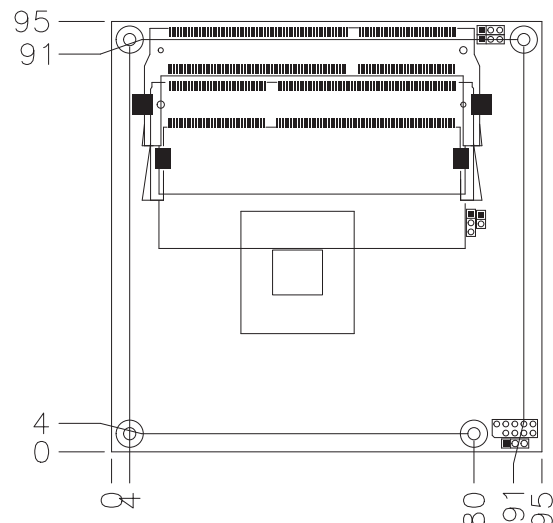
## Specifications

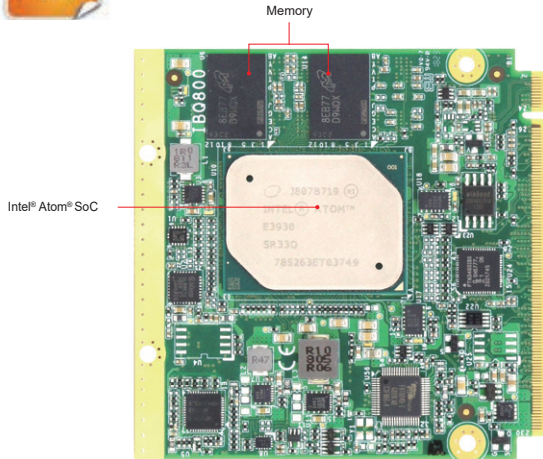
CPU	Intel® Atom® Processor E3845/E3827
PCH	Integrated in Intel® Atom® SoC
Memory	2x DDR3L@1.35V SO-DIMM, Max. 8GB (Non-ECC)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device interface	N/A
Expansion Slots	1x PCIe(x1)
Graphics Controller	Intel® Atom® E3845/E3827 SoC integrated graphics supports CRT, DisplayPort & LVDS
Video Output	24-bit single-channel LVDS on carrier board (IP419)
Ethernet	1x Intel® I210IT Gigabit LAN
I/O Chipset	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.X	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 or ALC888S 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	<b>-40°C~85°C (-40°F~185°F)</b>
Storage Temperature	<b>-40°C~90°C (-40°F~194°F)</b>
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 support
ET860-I27-LV	COM Express (Type-6) CPU Module w/ Intel® Atom® Processor E3827 (1.75GHz) SoC, DDR3L dual-channel memory, LVDS support
IP419	Mini-ITX COM Express Type-6 (R3.0) carrier board
HSET860-BGA-A	Heatsink with fan 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 Gigabit LAN
- TPM (2.0), eMMC5.0 (option)
- Wide-range operating temperature from -40°C to 85°C

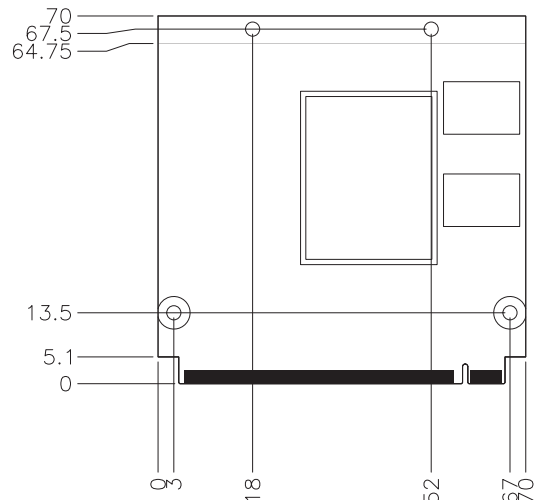
## Specifications

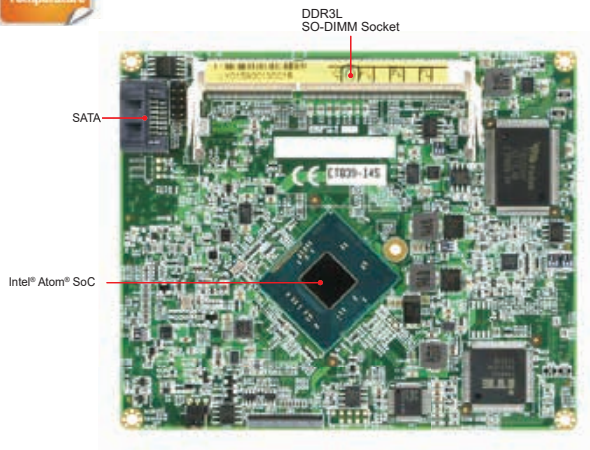
CPU	Intel® Atom® QC x5/ E3930 (1.3GHz~1.8GHz) Intel® Atom® QC x5/ E3940 (1.6GHz~1.8GHz) Intel® Atom® QC x7/ E3950 (1.6GHz~2.0GHz)
PCH	Integrated in Intel® SoC
Memory	Onboard memory, LPDDR4, Max. 8GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	eMMC 5.0 up to 32GB (option)
Expansion Slots	4x PCIe(x1)
Graphics Controller	Intel® SoC integrated Gen9-LP graphics
Video Output	Supports 1x DDI port, 1x eDP or 1x dual-channel LVDS (option)
Ethernet	1x Intel® I210IT Gigabit LAN
I/O Chipset	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.X	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
HSIBQ800-1	Heat spreader for IBQ800
HSIBQ800-A	Heatsink with fan for IBQ800

## Dimensions and Drawing





## 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 from -20°C to 70°C



ET839 with heat spreader

## Specifications

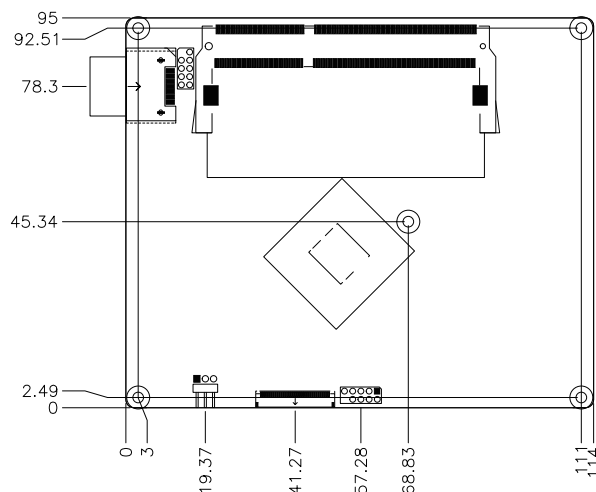
CPU	Intel® Atom® Processor E3845 SoC, 1.91GHz
PCH	Integrated in Intel® Atom® SoC
Memory	1x DDR3L SO-DIMM, Max. 8GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	N/A
Expansion Slots	4x ETX connectors for PCI bus, USB, audio, CRT, LVDS, LAN, COM ports, LPT, IDE, PS/2 keyboard/mouse 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 Chipset	Nuvoton NCT6102D 1x keyboard, 1x mouse, 1x printer
Serial Port	2x RS232
USB 2.0	4x USB 2.0 via carrier board
USB 3.X	N/A
Serial ATA	1x SATA 2.0 port on board (3.0Gb/sec)
Audio	Intel® Atom® SoC built-in HD Audio w/ Realtek ALC888S 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	-20°C~70°C (-68°F~158°F)
Storage Temperature	-20°C~80°C (-68°F~176°F)
Relative Humidity	10%~90% (non-condensing)

## Ordering Information

ET839D1S-I45	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

\*(S) means with Realtek ALC888S codec

## Dimensions and Drawing



Models	IP419	IP418	IP417
<b>Form Factor</b>	Mini-ITX form factor	ATX form factor	Mini-ITX form factor
<b>Module Interface</b>	COM Express Type-6 (R3.0)	COM Express Type-6 (R3.0)	COM Express Type-10 (R3.0)
<b>Video Output</b>	18/24-bit dual-channel LVDS DVI-D / DisplayPort on board	18/24-bit single-channel LVDS eDP DVI-D / HDMI / DisplayPort on board	18/24-bit single-channel LVDS DisplayPort on board
<b>Ethernet</b>	2x RJ45 connector	2x RJ-45 connector	2x RJ45 connector
<b>Audio</b>	Built-in ALC662 or ALC888S HD audio codec	Built-in ALC662 or ALC888S HD audio codec	Built-in ALC662 or ALC888S HD audio codec
<b>SATA</b>	2x SATA III	2x SATA III	2x SATA III
<b>I/O Chipset</b>	Fintek F81964D-I	Fintek F81964D-I	Fintek F81964D-I
<b>Parallel Port</b>	1x Parallel port	1x Parallel port	N/A
<b>Serial Port</b>	4x COM ports	2x COM ports	4x COM ports (4 ports via rear I/O, 2-ports via pin header)
<b>USB 2.0</b>	4x USB 2.0 (2 ports via rear I/O, 2x ports via onboard pin header, 1x port share with micro USB)	4x USB 2.0	4x USB 2.0 (4 ports via rear I/O)
<b>USB 3.X</b>	2x USB 3.0 via rear I/O	4x USB 3.0 via rear I/O	2x USB 3.0 via rear I/O
<b>KB / MS</b>	N/A	N/A	1x KB/MS connector
<b>Hardware Monitor</b>	Yes	Yes	Yes
<b>Watchdog Timer</b>	256 levels	256 levels	256 levels
<b>Expansion slots</b>	1x PCIe(x1) slot 1x M.2 (B Key) socket	1x PCIe16 slot 5x PCIe1 slots 2x Mini PCIe sockets	1x PCIe(x1) slot 2x Mini PCIe sockets (full-size & half-size)
<b>Digital I/O</b>	4-in/4-out	4-in/4-out	4-in/4-out
<b>Power Connector</b>	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
<b>Dimensions (L x W)</b>	170mm x 170mm (6.7"x6.7")	305mm x 244mm (12"x 9.6")	170mm x 170mm (6.7"x6.7")
<b>Extra Features</b>	Compatible with ET870/ET880/ET885	Compatible with ET976 / ET977	Compatible with ET875/ET876
<b>Page No.</b>	P.2-21	P.2-22	P.2-23

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Single Board Computers

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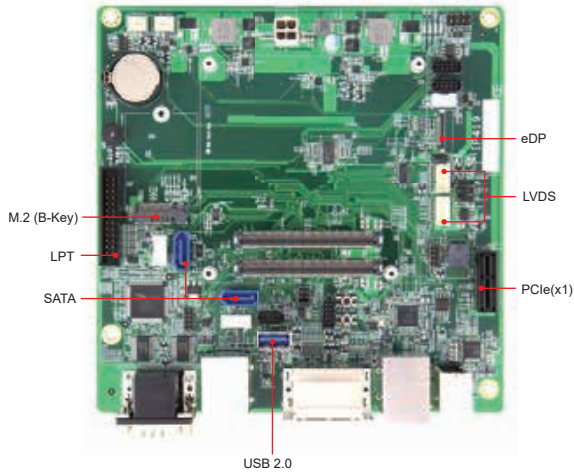
COM-HPIC Module

# Comparison Table

## Carrier Board

Models	IP416	IP414	IP412
<b>Form Factor</b>	Micro ATX form factor Qseven	ATX form factor	Micro ATX form factor
<b>Module Interface</b>	Qseven CPU Module (R2.1)	COM Express Type-6 (R3.0)	ETX (R3.0)
<b>Video Output</b>	18/24-bit dual-channel LVDS DisplayPort on board	18/24-bit dual-channel LVDS VGA / eDP / DisplayPort on board	18/24-bit dual-channel LVDS Analog CRT
<b>Ethernet</b>	1x RJ45 connector	1x RJ45 connector	1x RJ45 connector
<b>Audio</b>	Built-in ALC662 or ALC888S HD audio codec	Built-in ALC888S HD audio codec	N/A
<b>SATA</b>	2x SATA III	4x SATA III	N/A
<b>I/O Chipset</b>	Fintek F81846D-I	Fintek F81946D-I	N/A
<b>Parallel Port</b>	N/A	N/A	1x Parallel port
<b>Serial Port</b>	5x COM ports (4 ports via rear I/O, 1-port via pin header)	2x COM ports via onboard box-headers (RS232 only) 2x COM ports 2x COM ports (from CPU module, Tx/Rx only)	2x COM ports (1 port via rear I/O, 1-port via pin header)
<b>USB 2.0</b>	2x USB 3.0 via rear I/O 2x USB 2.0 (2 ports via onboard vertical, 1x port share with micro USB)	3x USB 2.0	2x USB 2.0 via rear I/O
<b>USB 3.X</b>	2x USB 3.0 via rear I/O	3x USB 3.2	N/A
<b>KB / MS</b>	N/A	1x KB/MS connector	1x PS/2 KB/MS connector
<b>Hardware Monitor</b>	Yes	Yes	Yes
<b>Watchdog Timer</b>	256 levels	256 levels	256 levels
<b>Expansion slots</b>	4x PCIe(x1) slots 1x Mini PCIe sockets (full-size)	1x PCIe(x16) slot [up to Gen.5] 2x PCIe(x4) slot 2x PCIe(x1) slot	3x PCI slots 1x ISA slot
<b>Digital I/O</b>	4-in/4-out	4-in/4-out	4-in/4-out
<b>Power Connector</b>	2x 2-pin connector for DC-in 12V only	20+ 4-pin connector for ATX (IP414) 2x 2-pin connector for DC power-in (IP414-DC only)	20+ 4-pin connector for ATX
<b>Dimensions (L x W)</b>	244mm x 244mm (9.6"x9.6")	305mm x 244mm (12" x 9.6")	244mm x 244mm (9.6"x 9.6")
<b>Extra Features</b>	Compatible with IBQ800	Compatible with ET980/ET981	Compatible with ET839
<b>Page No.</b>	P.2-24	P.2-25	P.2-26

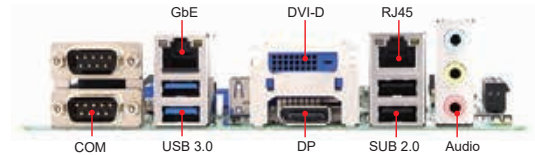
- 1  
Single Board Computers
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CPU Modules
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Motherboards
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CPU Cards
- 5  
COM-HPC Module



## Features

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

## I/O View



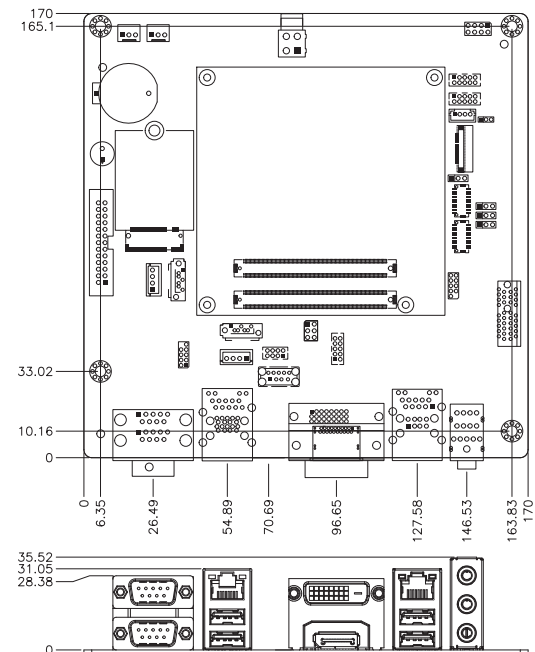
## Specifications

Form Factor	Mini-ITX
Module Interface	COM Express Type-6 (R3.0)
Expansions slots	1x PCIe(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 (option)
Ethernet	LAN1: Derived from COM Express CPU module LAN2: 1x Intel® I210IT
I/O Chipset	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.X	2x USB 3.0
Serial ATA	Derived from COM Express module 2x SATA III
Audio	Built-in ALC888S HD audio codec
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



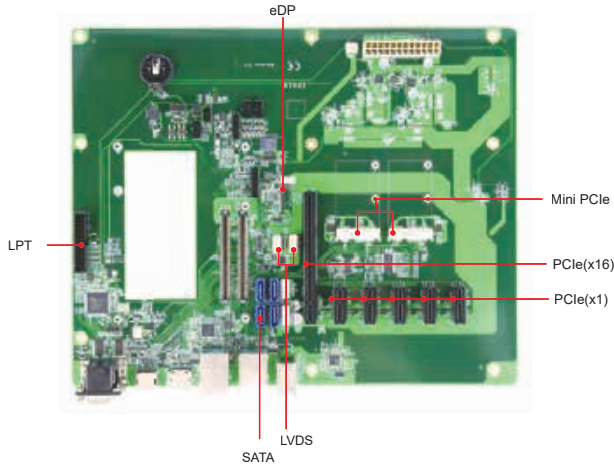
1 Single Board Computers

2 CPU Modules

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4 CPU Cards

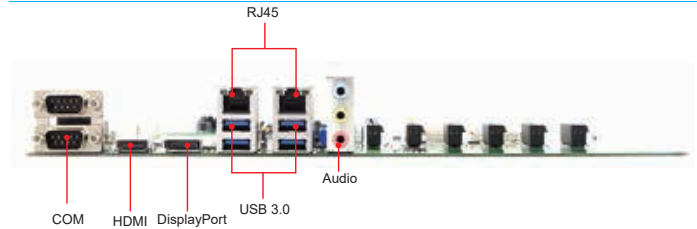
5 COM-HPC Module



## Features

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

## I/O View



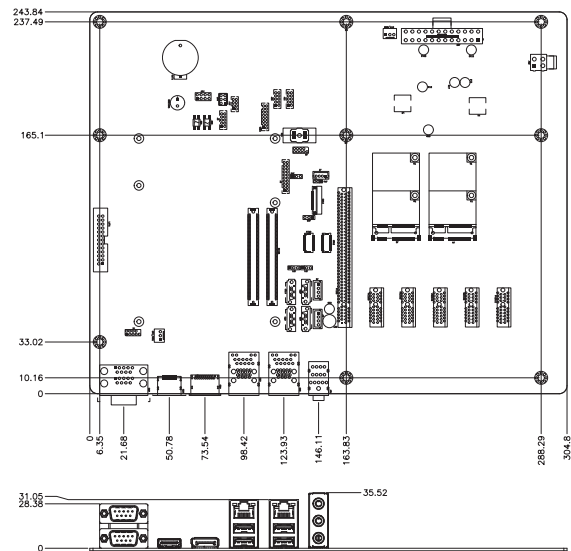
## Specifications

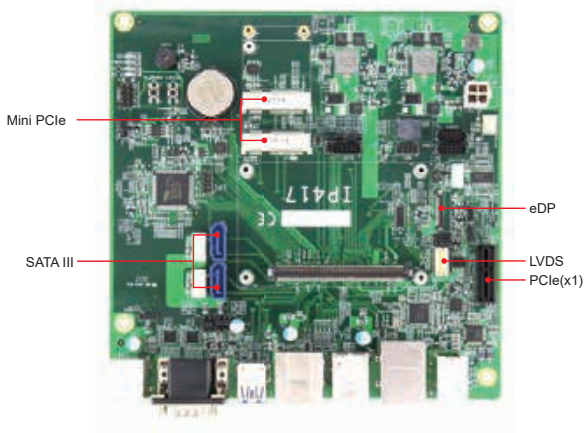
Form Factor	ATX
Module Interface	COM Express Type-6 (R3.0)
Expansions slots	1x PCIe(16x) slot 5x PCIe(1x) slot
Mini Type Slots	2x MiniPCIe socket
Video Output	1x VGA 3x DDI (1x DisplayPort, 1x HDMI, 1x DVI-D) 1x dual channel LVDS or 1x eDP (Depends on CPU module)
Ethernet	LAN1: Derived from COM Express CPU module LAN2: 1x Intel® I210IT
I/O Chipset	Fintek F81964D-I
Serial Port	2x COM ports (RS232)
USB 2.0	4x USB 2.0
USB 3.X	4x USB 3.0
Serial ATA	Derived from COM Express CPU module 4x SATA III
Audio	Built-in ALC888S HD audio codec
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

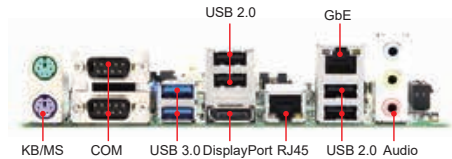




## Features

- 1x PCIe (x1), 2x Mini PCIe sockets (full-size & half-size)
- 8x USB 2.0, 2x USB 3.0
- Supports 1x eDP or 1x LVDS (based on COMe module), 1x DisplayPort
- 2x LAN connectors

## I/O View



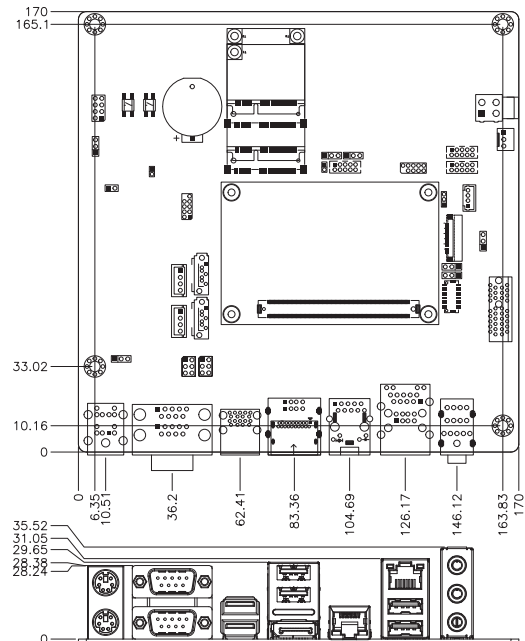
## Specifications

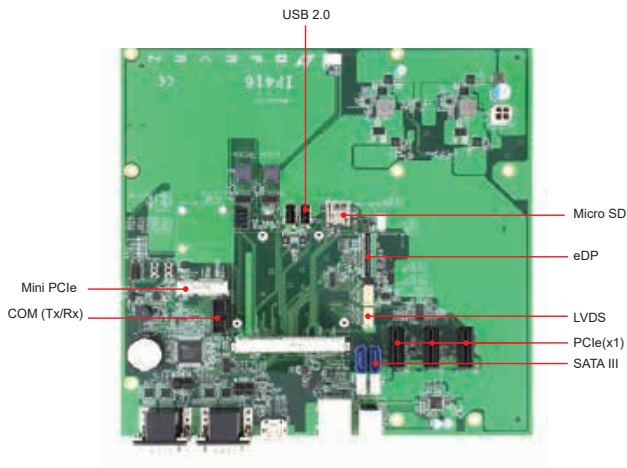
Form Factor	Mini ITX
Module Interface	COM Express Type-10 (R3.0)
Expansions slots	1x PCIe(x1) slot
Mini Type Slots	1x MiniPCIe socket (full-size) 1x MiniPCIe socket (half-size)
Video Output	1x DisplayPort 1x LVDS or 1 x eDP (option)
Ethernet	LAN1: Derived from COM Express CPU module LAN2: 1x Intel I210IT
I/O Chipset	Fintek F81846D-1
Serial Port	2x COM ports (RS232)
USB 2.0	8x USB 2.0
USB 3.X	2x USB 3.0
Serial ATA	2x SATA III
Audio	Built-in ALC888S HD audio codec
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

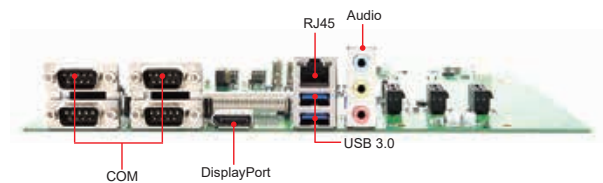




## Features

- 2x USB 2.0, 2x USB 3.0
- 3x PCIe(x1) slots, 1x MiniPCIe socket (full-size)
- 1x eDP or 1x LVDS, 1x DisplayPort
- 1x LAN, 1x Micro SD

## I/O View



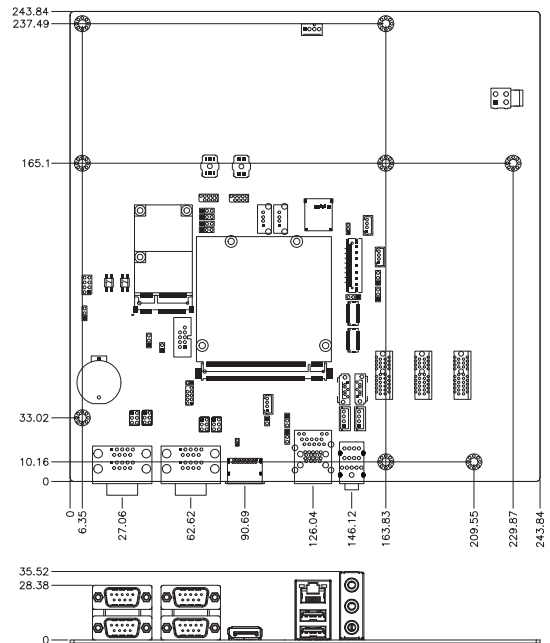
## Specifications

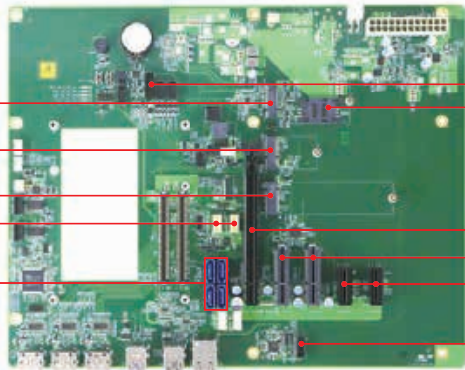
Form Factor	Micro ATX
Module Interface	Qseven CPU Module (R2.1)
Expansion Slots	3x PCIe(x1) slot
Mini Type Slots	1x MiniPCIe socket (full-size, reserved one hole for half-size)
Video Output	1x DisplayPort, 1x LVDS or 1x eDP (option)
Ethernet	LAN: Derived from Qseven CPU module
I/O Chipset	Fintek F81846D-I
Serial Port	4x COM RS232 & 1x COM (Tx/Rx only) from Qseven module
USB 2.0	2x USB 2.0
USB 3.X	2x USB 3.0
Serial ATA	2x SATA III
Audio	Built-in ALC888S 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
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## Dimensions and Drawing





## Features

- 1x PCIe(x16), 2x PCIe(x4), 2x PCIe(x1) expansion slots
- 1x RJ45, 3x DP, 3x dual USB 2.0 (1x M.2 E-Key, 1x Type-A, 1x via box header), 3x dual USB 3.2
- 2x COM via onboard box-headers (RS232 only)
- ATX power connector / DC-in (+8V ~ +20V)

## I/O View



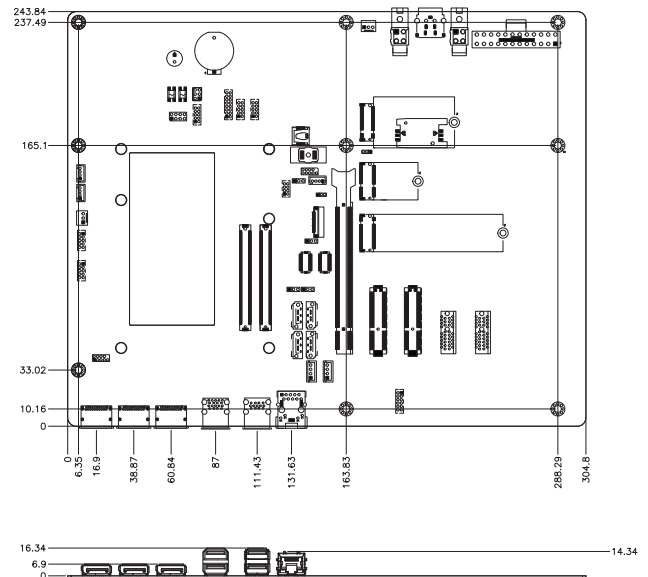
## Specifications

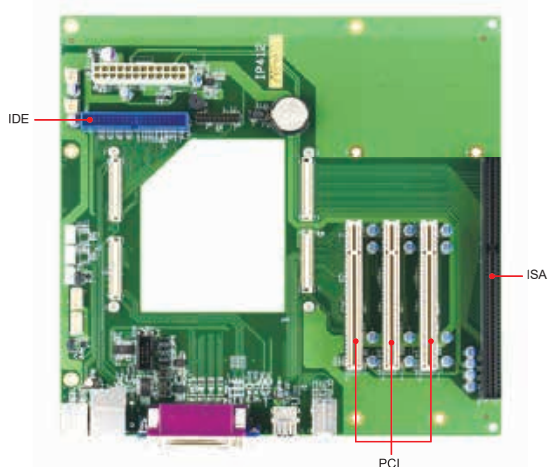
Form Factor	ATX
Module Interface	COM Express Type-6
Expansion Slots	1x PCIe(x16) slot [up to Gen.5] 2x PCIe(x4) slot 2x PCIe(x1) slot
Mini Type Slots	1x M.2 (B3052) 1x M.2 (M2080) 1x M.2 (E2230)
Video Output	3x DisplayPort 1x VGA 1x 24-bit dual-channel LVDS 1x eDP
Ethernet	Derived from COM Express CPU module
I/O Chipset	Fintek F81964D-I
Serial Port	COM ports x2 via onboard box-headers (RS232 only) - 2x COM ports (from onboard Super I/O) - 2x COM ports (from CPU module, Tx/Rx only)
USB 2.0	Derived from COM Express module 3x USB 2.0 (1 for Type-A, 2x via box headers)
USB 3.X	3x USB 3.2 Type-A connectors @edge I/O
Serial ATA	Derived from COM Express CPU module 4x SATA III
Audio	Built-in ALC888-S HD audio codec
Digital I/O	4-in/4-out
Watchdog	256 levels
KB/MS	Yes
Parallel	N/A
Dimensions (L X W)	305mm x 244mm (12" x 9.6")
Power	20+4-pin connector for ATX (IP414) 2x 2-pin connector for DC power-in (IP414-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

IP414	ATX COM Express Type-6 carrier board, supports ATX
IP414-DC	ATX COM Express Type-6 carrier board, supports DC-in (+8V ~ +20V)

## Dimensions and Drawing





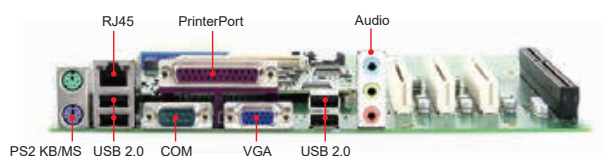
## Specifications

Form Factor	Micro ATX
Module Interface	ETX (3.0)
Expansion 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 Chipset	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.X	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

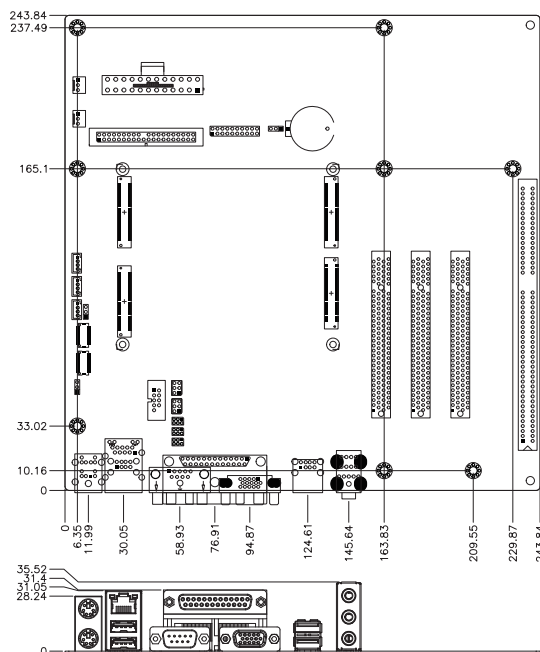
## I/O View



## Ordering Information

IP412	Mico ATX ETX (3.0) carrier board
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## Dimensions and Drawing



# Comparison Table

## ATX Motherboard

Models	MBB1005	MBB1004	MBB1002
<b>Form Factor</b>	ATX	ATX	eATX
<b>CPU Socket</b>	LGA1851	LGA1700	AMD SP6
<b>CPU</b>	Intel® Core™ Ultra 200S series DT CPU	Intel® Core™ 200E / 200PE & 14th/13th/12th Core i Processors	EPYC embedded 8004 series
<b>CPU Max. Frequency</b>	Up to 5.6GHz	Up to 4.7GHz	Up to 3.15GHz
<b>PCH</b>	Intel® Q870 PCH	Intel® Q670E,R680E PCH	N/A
<b>Memory</b>	4x DDR5 DIMM	4x DDR5 U-DIMM	6x DDR5 DIMM
<b>Max. Memory Size</b>	192GB	192GB	96 GB
<b>BIOS</b>	AMI	AMI	AMI
<b>Graphics Controller</b>	Intel® Core™ Ultra 200S series DT processors integrated	12th Gen Intel® Core™ i9/i7/i5/i3 processors integrated	N/A
<b>Video Output</b>	HDMI (2.0b)/ 3x DisplayPort (1.4) on board	2x DisplayPort /DP++ (1.4a) 1x HDMI (2.0)/ 1x DVI-D	N/A
<b>Ethernet</b>	Intel® I226LM 2.5G LAN Intel® I226V 2.5G LAN	Intel® I226LM 2.5G LAN Intel® I226V 2.5G LAN	2x Intel® X710-AT2 (Dual 10GbE port)
<b>Audio</b>	Built-in ALC888S HD audio codec	Built-in HD Audio controller + Realtek ALC888S-VD2-GR w/ 7.1 channels	N/A
<b>SATA</b>	4x SATA III ports	4x SATA III ports	4x SATA III ports
<b>I/O Chipset</b>	F81964D-I	Fintek F81964D-I	TBD
<b>Parallel Port</b>	N/A	N/A	N/A
<b>Serial Port</b>	2x RS232 2x RS232/422/485 (Jumperless selection)	4x COM ports: 2x RS232/422/485 + 2x RS232	1x External serial port (RS232)
<b>USB 2.0</b>	2x USB 2.0	2x USB 2.0 via pin-header	2x USB 2.0 via pin header
<b>USB 3.X</b>	3x USB 3.2 (10Gbps) 2x USB 3.1 (5Gbps)	2x USB 3.1 Gen1 (5 Gbps) via rear panel 4x USB 3.2 (10 Gbps) via rear panel 3x USB 3.2 via onboard box headers & vertical connector	2x (USB 3.2 Gen1) with PDPC
<b>TPM</b>	2.0	2.0	2.0
<b>KB / MS</b>	N/A	N/A	N/A
<b>Hardware Monitor</b>	Yes	Yes	Yes
<b>Storage Device Interface</b>	SATA III & NVMe	SATA III & NVMe	NVMe: 1x 2280 (by PCIe Gen.5 interface) NVMe: 2x M.2 x4 (Test by Gen.5 SSD)
<b>Watchdog Timer</b>	256 levels	256 levels	256 levels
<b>Digital I/O</b>	4-in/4-out	4-in/4-out	4-in/4-out
<b>Expansion Slots</b>	1x PCIe (x16)(Gen5.0), 2x PCIe (x4) (Gen4.0), 1x PCIe(x1)(Gen3.0), 2x PCI	2x PCIe (x16) [Gen.5.0] 2x PCIe (x4) [Gen.4.0] 2x PCIe (x1) [Gen.3.0]	1x PCIe (x16)_SLOT1 (Gen5) 1x PCIe (x16)_SLOT3 (Gen5) 1x PCIe (x16)_SLOT5 (Gen5), CXL support 1x PCIe (x16)_SLOT6 (Gen5), CXL support 1x PCIe (x16)_SLOT7 (Gen5), CXL support
<b>Mini Type Slots</b>	4x M.2 (B-Key, E-Key/2x M-Key)	4x M.2 (B-Key, E-Key/ 2x M-Key)	1x M.2 2280
<b>Power input</b>	ATX type	ATX type	ATX type
<b>Power Consumption</b>	Intel® Core™ Ultra 9 285 / up to 5.60GHz w/ 4x 48GB DDR5 – 5600 DIMM +12V :19.33A +5V :2.36A +5VSB :0.067A +3.3V :0.88A	Intel® Core™ 9 273PQE (125W) w/ 4x 32GB DDR5 5600 Up to 5.9GHz Innodisk M5U0-BGH2KCZQ-A35 +12V:22.85 +5V:1.39 +3.3V:1.64	AMD EPYC Embedded 8124P w/ 6x 32GB DDR5-5600 RDIMM +12V:~11.51A
<b>Dimensions (L x W)</b>	305mm x 244mm	305mm x 244mm	305 x 330 mm
<b>Extra Features</b>	Built-in iAMT (19.0), iSMART(4.0), LAN Wakeup, RAID, PDPC	Built-in iAMT (16.1), iSMART(4.0), LAN Wakeup, RAID, PDPC	LAN Wakeup PDPC
<b>Page No.</b>	P.3-4	P.3-5	P.3-6

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# Comparison Table

## ATX Motherboard

MBB1001	MBB-1000	MB997	MB995
ATX	ATX	ATX	ATX
AMD AM5	LGA1700	LGA1151	LGA1151
Ryzen™ embedded 7000 series	14th/13th/12th Gen Intel® Core™ i9/i7/i5/i3/ Pentium® Gold/ Celeron® DT CPU	9th/8th Gen Intel® Core™ i7/i5/i3/ Pentium® / Celeron® DT CPU	8th Gen Intel® Xeon® E/ Core™ i7/i5/i3 DT processors
Up to 3.8GHz	Up to 5.6GHz	Up to 4.7GHz	Up to 4.7GHz
AMD B665	Intel® R680E / Q670E PCH	Intel® C246 / Q370 / H310 PCH	Intel® C246 / Q370 PCH
4x DDR5 DIMM	4x DDR4 DIMM	4x DDR4 DIMM	4x DDR4 DIMM
128GB	128GB	64GB	64GB
AMI	AMI	AMI	AMI
Navi2 Integrated Graphics	13th Gen Intel® Core™ i9/i7/i5/i3 processors integrated	9th Gen Intel® Xeon® E/ Core™ i7/i5/i3 processors integrated	8th Gen Intel® Xeon® E/ Core™ i7/i5/i3 processors integrated
1x HDMI 2.1/1x DP 2.0/ 1x DVI-D on board	HDMI (2.0b)/ DisplayPort (1.4a)/ DVI-D on board	HDMI (2.0a)/ DisplayPort/ DVI-D on board	HDMI(2.0a)/ DisplayPort/ DVI-D on board
2x Intel I226-V	Intel® I225LM 2.5G LAN Intel® I225V 2.5G LAN	LAN 1: Intel® I219V GbE PHY for MB997EF; Intel® I219LM GbE PHY for MB997AF/ MB997AF-10G LAN 2: Intel® I210AT GbE	Intel® I219LM GbE PHY Intel® I210AT GbE as 2nd LAN
Built-in ALC888S HD audio codec	Built-in ALC888S HD audio codec	Built-in ALC888S HD audio codec	Built-in ALC888S HD audio codec
4x SATA III ports	4x SATA III ports	4x SATA III ports	6x SATA III ports (MB995VF-C246) 4x SATA III ports (MB995VF)
F81956D-I	F81966D-I	NC T6686D-I	F81966D-I
N/A	N/A	N/A	N/A
1x Dual DB9 stack connector for COM #1 (RS232/422/485) (Jumperless selection) COM #2 (RS232) 4x COM Port Header (RS232)	2x RS232 2x RS232/422/485 (Jumperless selection)	4x RS232 2x RS232/422/485 (Jumperless selection)	4x RS232 2x RS232/422/485 (Jumperless selection)
2x USB 2.0 via pin header 2x USB 2.0 Type-A vertical connector)	2x USB 2.0	N/A	N/A
4x USB 3.2 Gen 2 2x USB 3.2 Gen1 (with PDPC support)	4x USB 3.1 Gen2 (10Gbps) 4x USB 3.1 Gen1 (5Gbps)	4x USB 3.1 Gen2 (10Gbps) 5x USB 3.1 Gen1 (5Gbps)	4x USB 3.1 5x USB 3.0
2.0	2.0	2.0	2.0
N/A	N/A	N/A	box header
Yes	Yes	Yes	Yes
SATA III & NVMe	SATA III & NVMe	SATA III & NVMe	NVMe
256 levels	256 levels	256 levels	256 levels
4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out
1x PCIe (x16) (Gen5) 1x PCIe (x4) (Gen5) 1x PCIe (x4) (Gen4) 1x PCIe (x1) (Gen3) 1x PCI	1x PCIe (x16)(Gen5.0), 2x PCIe (x4), 1x PCIe(x1)(Gen3.0), 2x PCI	1x PCIe (x16), 1x PCIe (x4), 1x PCIe (x1), 2x PCI	1x PCIe (x16), 1x PCIe (x4), 1x PCIe (x1), 3x PCI
2x M.2 2280 (PCIe x2 gen 4, supports NVMe) supports RAID 0, 1 / UEFI and Windows 10 x64 Only (9.2 based driver)	4x M.2 (B-Key, E-Key/ 2x M-Key)	1x MiniPCIe, 2x M.2 (E/ M-Key)	1x MiniPCIe, 2x M.2 (E/ M-Key)
ATX type	ATX type	ATX type	ATX type
MBB1001-7645 / 7745 / 7945: AMD Ryzen™ 5 PRO 7645 3.8GHz AMD Ryzen™ 7 PRO 7745 3.8GHz AMD Ryzen™ 9 PRO 7945 3.7GHz w/ 1x 8GB DDR5-5200 UDIMM +12V: ~6.5A / +12V: ~7.0A / +12V: ~7.5A	Intel® Core™ i7-13700 2.10GHz w/ 4x 16GB DDR4 3200 DIMM Innodisk M4U0-AGS1KCEM-A35 +12V:20.26A	Intel® Core™ i7-9700K, 3.6GHz w/ 4x 4GB DDR4-2400 +12V: 12.64A +5V: 1.19A +5VSB: 0.132A +3.3V: 0.88A	Intel® Core™ i7-8700 3.4GHz w/ 4x 4GB DDR4-2400 +12V: 5.56A +5V: 1.65A +5VSB: 0.25A +3.3V: 0.65A
305mm x 244mm	305mm x 244mm	305mm x 244mm	305mm x 244mm
LAN Wakeup, RAID	Built-in iAMT (1.6), LAN Wakeup, RAID	Built-in iAMT (1.1.6), LAN Wakeup, iSMART, TPM (2.0), RAID	Built-in iAMT (1.1.6), LAN Wakeup, iSMART, TPM (2.0), vPro, RAID
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- 1 Single Board Computers
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# Comparison Table

## Micro ATX Motherboard

Models	MBB1006	MB998
<b>Form Factor</b>	Micro ATX	Micro ATX
<b>CPU Socket</b>	LGA1954	LGA1700
<b>CPU</b>	Intel® Core™ Ultra 300S series DT processors	14th/13th/12th Gen Intel® Core™ i9/i7/i5/i3/ Pentium® Gold/ Celeron® DT CPU
<b>CPU Max. Frequency</b>	TBD	Up to 5.6GHz
<b>PCH</b>	Intel® Q970	Intel® R680E / Q670E / W680 PCH
<b>Memory</b>	2x DDR5-CUDIMM	2x DDR5 UDIMM
<b>Max. Memory Size</b>	128GB	64GB
<b>BIOS</b>	AMI	AMI
<b>Graphics Controller</b>	Intel® Core™ Ultra 300S Series DT processor integrated graphics	Intel® Core™ i9/i7/i5/i3 processor integrated
<b>Video Output</b>	1x HDMI (2.1) + 2x DisplayPort (1.4a) + 1x DisplayPort/DP++ (DP1.4)	1x HDMI (2.0b) + 2x DisplayPort (1.4b) (DP++) + DVI-D
<b>Ethernet</b>	LAN 1&2 : Intel® I226V, supports 2.5G LAN 3: Intel® I219LM, Supports 1GbE	Intel® I226LM, supports 2.5G and iAMT Intel® I226V, supports 2.5G only
<b>Audio</b>	Realtek ALC888S-VD2-GR HD Audio codec w/ 7.1 channels and TI TPA2012D2 amplifier	Built-in ALC888S HD audio codec
<b>SATA</b>	4x SATA III	4x SATA III ports
<b>I/O Chipset</b>	F81964D-I	F81964D-I
<b>Parallel Port</b>	N/A	N/A
<b>Serial Port</b>	2x RS232/422/485 2x RS232	2x RS232 2x RS232/422/485 (jumperless selection)
<b>USB 2.0</b>	2x USB 2.0	2x USB 2.0
<b>USB 3.X</b>	4x USB3.2 (10Gbps), 2x USB3.2 (5bps)	4x USB 3.2(10Gbps) 2x USB 3.1(5Gbps)
<b>TPM</b>	2.0	2.0
<b>KB / MS</b>	N/A	N/A
<b>Hardware Monitor</b>	Yes	Yes
<b>Storage Device Interface</b>	SATA III & NVMe	SATA III & NVMe
<b>Watchdog Timer</b>	256 levels	256 levels
<b>Digital I/O</b>	4-in/4-out	4-in/4-out
<b>Expansion Slots</b>	1x PCIe (x16) [Gen5] 1x PCIe (x16) [x8 signal] [Gen 5] 1x PCIe (x4) [Gen5] 1x PCIe (x4) [Gen4]	1x PCIe (x16) [Gen.5.0], 1x PCIe (x4) [Gen.4.0], 1x PCIe (x4) [Gen.3.0]
<b>Mini Type Slots</b>	1x M.2 (M-Key,2280) 1x M.2 (E-Key,2230)	2x M.2 (M-Key,2280) 1x M.2 (E-Key, 2230) 1x M.2 (B-Key, 3052)
<b>Power input</b>		ATX type
<b>Power Consumption</b>	TBD	Intel® Core™ i7-13700 2.10GHz w/ 2x 32GB DDR5 5600 +12V:20.09A +5V:8.76A +3.3V:4.73A +5VSB:0.78A
<b>Dimensions (L x W)</b>	244mm x 244mm	244mm x 244mm
<b>Extra Features</b>	Built-in iAMT (22.0), LAN Wakeup, iSMART, TPM (2.0), RAID	Built-in iAMT (16.1), LAN Wakeup, RAID
<b>Page No.</b>	P3-11	P3-12

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Single Board Computers

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CPU Modules

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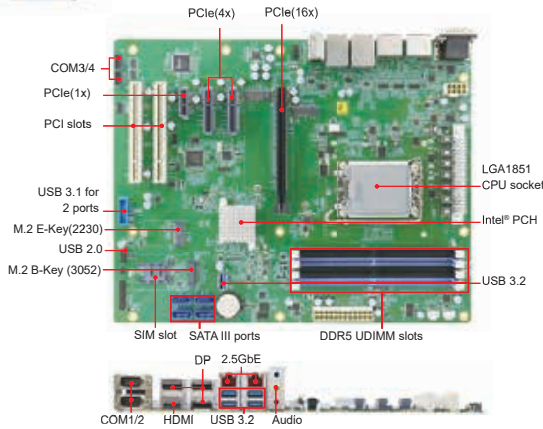
Motherboards

4

CPU Cards

5

COM-HPC Module



### Features

- Intel® LGA1851 Core™ Ultra 9/7/5 200S Series Processors, up to 65W
- 4x DDR5 U-DIMM sockets, Max. 192GB
- Intel® Core™ Ultra 200S processor integrated graphic Supports HDMI (2.0b) and 3x DisplayPort (1.4a) (DP++)
- LAN 1: Intel® I226LM, Supports 2.5G and iAMT
- LAN 2: Intel® I226V, Supports 2.5G only
- 5x USB3.2 [Gen 2.0], 2x USB3.2 [Gen 1.0], 2x USB 2.0, 4x COM, 4x SATA III
- 1x PCIe (x16) [Gen 5.0]; 2x PCIe(x4) [Gen 4.0] ; 1x PCIe(x1) [Gen 4.0]; 2x PCI
- 4x M.2, including E-Key (2230), B-Key (3052) and 2x M-Key (2280)
- Watchdog Timer, Digital I/O, iAMT (19.0), TPM (2.0)

### Specifications

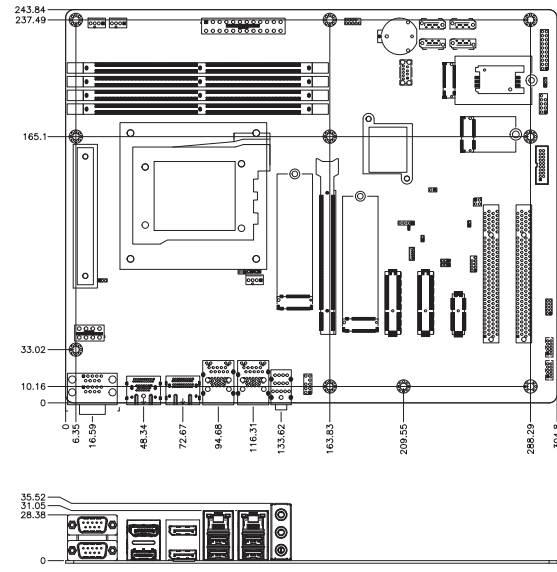
CPU Socket	LGA1851
CPU	Intel® LGA1851 Core™ Ultra 200S Series DT Processors (Arrow Lake-S)
PCH	Q870
Memory	4x DDR5 U-DIMM sockets, Up to DDR5 -5600, Max. 192GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	SATA III & NVMe
Expansion Slots	1x PCIe (x16) [Gen 5.0] 2x PCIe(x4) 1x PCIe(x1) 2x PCI
Mini Type Slots	2x M.2 (M-Key, type:2280, PCIe(4x)) 1x M.2 (E-Key, type:2230, USB 2.0 + PCIe(1x)) 1x M.2 (B-Key, type:3052, USB 3.2 + PCIe(1x))
Graphics Controller	Intel® LGA1851 Core™ Ultra 200S Series DT processor integrated graphics
Video Output	1x HDMI (2.0b) + 3x DisplayPort (1.4a) (DP++)
Ethernet	LAN 1: Intel® I226LM, Support 2.5G and iAMT LAN 2: Intel® I226V, support 2.5G only
I/O Chipset	Fintek F81964D-I
Serial Port	4x COM ports: 2x RS232/422/485 + 2x RS232
USB 2.0	2x USB 2.0 via pin-headers
USB 3.X	4x USB3.2 (10G bps) @edge connector 2x USB3.2 (5G bps) @onboard box-header 1x USB3.2 (10G bps) @onboard Type-A connector
Serial ATA	4x SATA III
Audio	Built-in HD Audio controller + Realtek ALC888S w/ 5.1 channels
TPM	Support dTPM (2.0) & fTPM (optional)
Others	Digital I/O (4-in/4-out), Watchdog Timer PDPC, iSMART(4.0)
Dimensions (L x W)	305mm x 244mm (12"x 9.6")

Power Consumption	Intel® Core™ Ultra 9 285 / up to 5.60GHz w/ 4x 48GB DDR5 – 5600 DIMM +12V :19.33A +5V :2.36A +5VSB :0.067A +3.3V :0.88A
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)

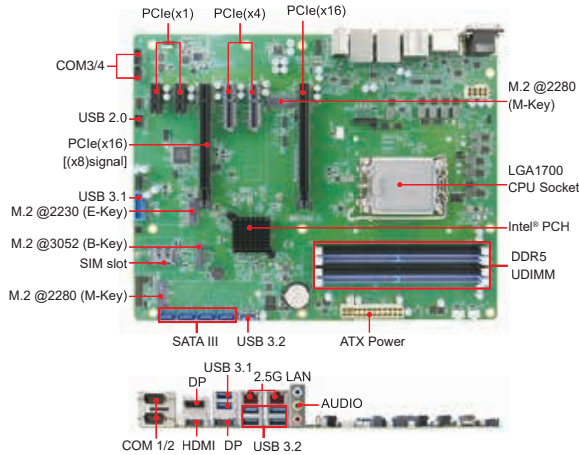
### Ordering Information

MBB1005AF-Q	LGA1851 Q870 ATX Motherboard w/ HDMI, 3x DisplayPort, 2x 2.5GbE, 4x SATA, RAID, iAMT (19.0), dTPM (2.0), iSMART(4.0)
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### Dimensions and Drawing



Remarks: 1. Specifications are subject to change without prior notice. 2. ODM/OEM is available. 3. For user's manual & datasheet download, visit [www.ibase.com.tw](http://www.ibase.com.tw).



## Features

- Intel® Core™ 200E / 200PE & 14th/13th/12th Core i LGA1700 Processors with Intel R680E/Q670E PCH
- 4x DDR5 U-DIMM sockets, Max. 192GB
- Supports 2x DisplayPort (1.4a), HDMI (2.0b), DVI-D
- LAN 1: Intel® I226LM, Supports iAMT
- LAN 2: Intel® I226V, Supports 2.5G only
- 4x USB 3.2 (Type-A), 3x USB 3.2, 2x USB 2.0, 4x SATA III
- 2x COM (RS232) +2x COM (RS232/422/485)
- 2x PCIe(x16) [Gen5.0], 2x PCIe(x4) [Gen4.0], 2x PCIe(x1) [Gen3.0]
- 4x M.2: E-Key (2230), B-Key (3052) and 2x M-Key (2280)
- Watchdog Timer, Digital I/O, iSMART (4.0), iAMT (16.1), dTPM (2.0)

## Specifications

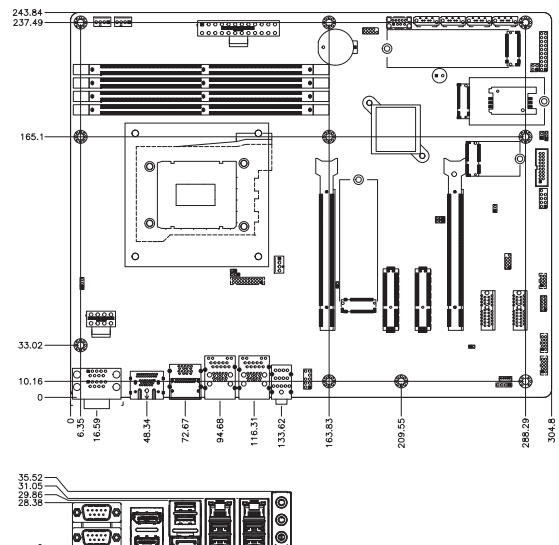
CPU Socket	LGA1700
CPU	Intel® Core™ 200E / 200PE & 14th/13th/12th Core i LGA1700 Processors
PCH	Q670E, R680E
Memory	4x DDR5 U-DIMM sockets, Max. 192GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	SATA III & NVMe
Expansion Slots	2x PCIe (x16) [Gen.5.0]; 2x PCIe (x4) [Gen.4.0] ; 2x PCIe (x1) [Gen.3.0]
Mini Type Slots	2x M.2 (M2280, supports NVMe (Gen4) 1x M.2 (E2230, supports CNV) 1x M.2 (B3052, supports 5G module)
Graphics Controller	12th Gen Intel® Core™ i9/i7/i5/i3 processors integrated
Video Output	2x DisplayPort /DP++ (1.4a) 1x HDMI (2.0) 1x DVI-D
Ethernet	LAN 1: Intel® I226LM, supports iAMT LAN 2: Intel® I226V, supports 2.5G only
I/O Chipset	Fintek F81964D-I
Serial Port	4x COM ports: 2x RS232/422/485 + 2x RS232
USB 2.0	2x USB 2.0 via pin-header
USB 3.X	4x USB 3.2(10 Gbps) @ rear panel 2x USB 3.1 Gen1(5 Gbps) support Type-A @ rear panel 2x USB 3.2 @ onboard box headers 1x USB 3.2 @ onboard vertical connector
Serial ATA	4x SATA III
Audio	Built-in HD Audio controller + Realtek ALC888S-VD2-GR w/ 7.1 channels
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out), iSMART (4.0), iAMT (16.1), dTPM (2.0), RAID
Dimensions (L x W)	305mm x 244mm (12"x 9.6")
Power Consumption	Intel® Core 9 273PQE (125W) w/ 4 x 32GB DDR5 5600 Up to 5.9GHz Innodisk M5U0-BGH2KCZQ-A35 +12V:22.85 +5V:1.39 +3.3V:1.64

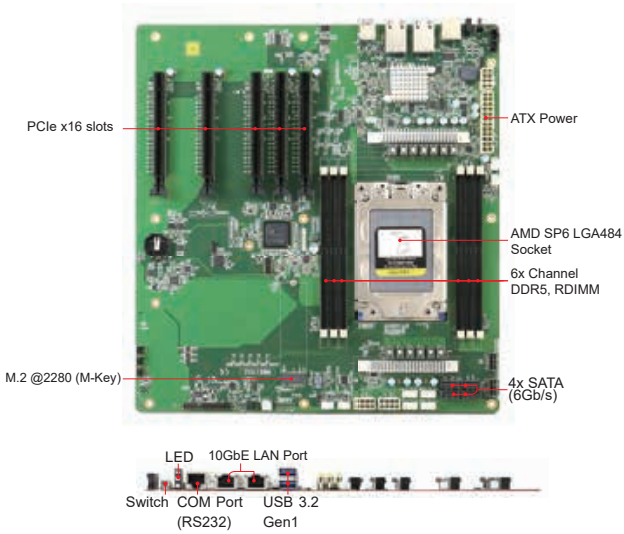
Operating Temperature	0°C~60°C ( 32°F~140°F)
Storage Temperature	-20°C~-80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

## Ordering Information

MBB1004AF-R	LGA1700 R680E ATX Motherboard w/ HDMI, DisplayPort, DVI-D, Dual 2.5G LAN, RAID, iAMT (16.1), dTPM (2.0), iSMART(4.0), supports ECC
MBB1004AF-Q	LGA1700 Q670E ATX Motherboard w/ HDMI, DisplayPort, DVI-D, Dual 2.5G LAN, RAID, iAMT (16.1), dTPM (2.0), iSMART(4.0)

## Dimensions and Drawing





## Features

- AMD EPYC Embedded 8004 series CPU
- 6x DDR5 4800 up to 576GB ECC support
- 5x PCIe x16 slots
- 2x (USB 3.2 Gen1) with PDPC Support
- 4x SATA 6Gb/s
- 1x PCIe Gen5 2280, 2x MCIO x4
- 2x Intel® X710-AT2 (Dual 10GbE port)

## Specifications

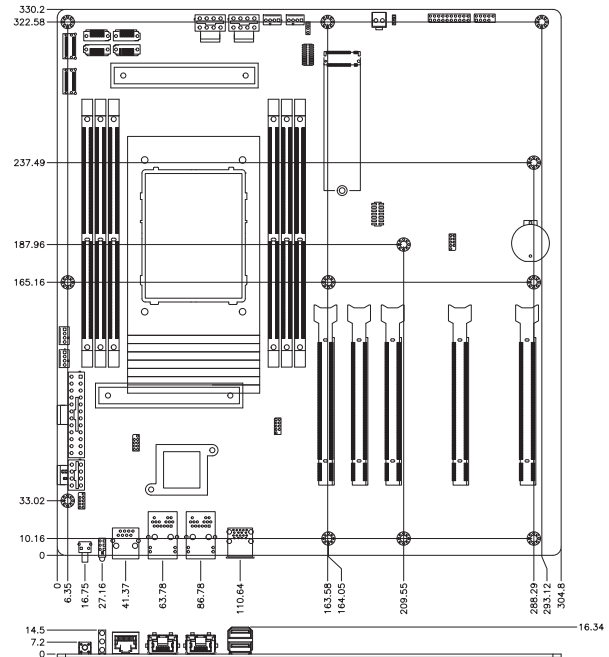
CPU Socket	AMD SP6 LGA 4844 (EPYC SP6 processors)
CPU	AMD EPYC Embedded 8004 series
PCH	N/A
Memory	Six-Channel DDR5 4800, 6 slots RDIMM, Max. 576GB, supports ECC 3600/4000/4400/4800MHz, 16GB, 32GB, 64GB, 96GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	4x SATA(6Gb/s) NVMe: 1x 2280 (by PCIe Gen.5 interface) NVMe: 2x MCIO x4 (Test by Gen.5 SSD)
Expansion Slots	5x PCIe(x16) (Gen5.0)
Mini Type Slots	N/A
Graphics Controller	N/A
Video Output	N/A
Ethernet	2x Intel® X710-AT2 (Dual 10GbE port)
I/O Chipset	N/A
Serial Port	1x External serial port (RS232)
USB 2.0	2x USB 2.0 PIN Header
USB 3.X	2x (USB 3.2 Gen1) with PDPC
Serial ATA	4x SATA (6Gb/s)
Audio	N/A
TPM	TPM (2.0)
Others	1x 24-pin SSI power connector 3x 8-pin SSI 12V power connector 4x Fan header 4-pin (3 for system + 1 for CPU) 1x SMBus 3x LED (Power+HDD+Status refer to Genoa) 1x RTC battery on board
Dimensions (L x W)	330mm x 304mm (12.9" x 12")
Power Consumption	AMD EPYC Embedded 8124P w/ 6x 32GB DDR5-5600 RDIMM +12V: ~11.51A
Operating Temperature	0°C~60°C ( 32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	0%~90% (non-condensing @60°C)

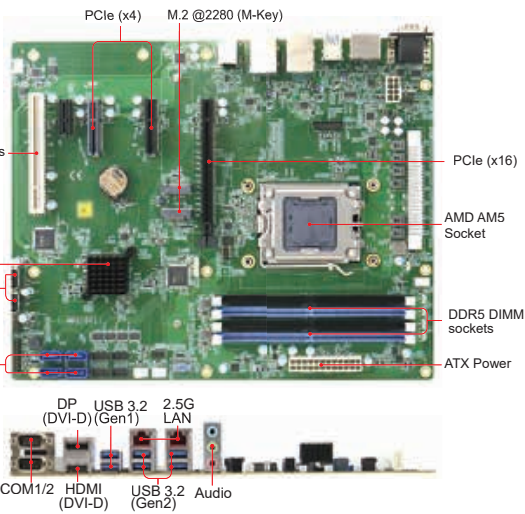
## Ordering Information

MBB1002	AMD EPYC Embedded 8004 series eATX Motherboard w/o CPU, memory, storage, supports EEC
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\*Specifications are subject to change without prior notice

## Dimensions and Drawing





## Features

- AMD Ryzen™ Embedded 7000 Processors with B650 chipset
- Dual-channel DDR5-5200 UDIMM (4 slots), up to 128GB, ECC supported
- Triple independent display outputs: DP / HDMI / DVI-D
- Dual 2.5 GbE LAN for high-speed networking
- Flexible expansion: 1x PCIe (x16) [Gen 5.0], 1x PCIe (x4) [Gen 5.0], 1x PCIe (x4) [Gen 4.0], 1x PCIe (x1) [Gen 3.0], 1x PCI slot
- 2x M.2 2280 (PCIe x2 Gen4, NVMe), Supports RAID 0, 1

## Specifications

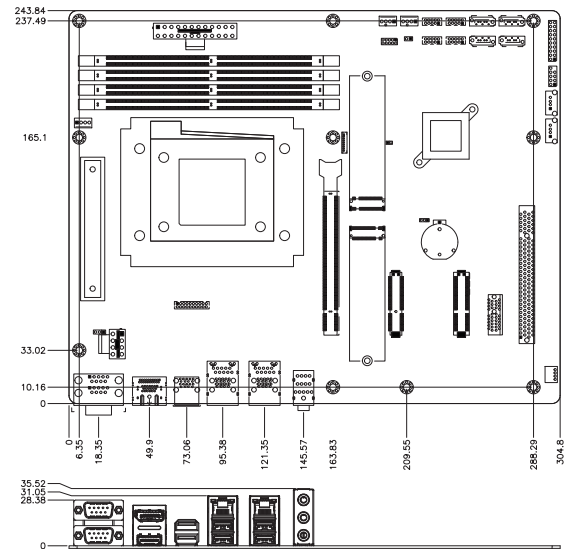
CPU Socket	LGA1718
CPU	AMD Ryzen™ Embedded 7000 series with B650
PCH	N/A
Memory	Dual-Channel DDR5 5200, UDIMM 4 slots, Max. 128GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	NVMe
Expansion Slots	1x PCIe x16 (Gen5) / 1x PCIe x4 (Gen5) 1x PCIe x4 (Gen4) / 1x PCIe x1 (Gen3) / 1x PCI
Display Interface	1x HDMI 2.1 1x DP 2.0 1x DVI-D
Mini Type Slots	N/A
Graphics Controller	N/A
Video Output	N/A
Ethernet	2.5 Gigabit LAN / Intel I226-V
Serial Port	1x Dual DB9 stack connector for - COM #1 (RS232/422/485) (jumperless selection) - COM #2 (RS232) 4x COM Port Header (RS232)
USB 2.0	2x USB 2.0 via pin header, 2x USB 2.0 Type-A vertical connector
USB 3.X	4x USB 3.2 Gen 2, + 2x USB 3.2 Gen1 With PDPC support
Serial ATA	4x SATA 6Gb/s SUPPORT RAID 0, 1, 10 / UEFI and Windows 10 x64 Only (9.2 based driver)
Audio	1x Triplet type jack 3 x 1 for HD audio port [Line-in / Line-out / Mic-in] Realtek ALC888S for 5.1 channel.
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out)
Dimensions (L x W)	305mm x 244mm (12" x 9.6")
Power Consumption	MBB1001-7645 / 7745 / 7945: AMD Ryzen™ 5 PRO 7645 3.8GHz AMD Ryzen™ 7 PRO 7745 3.8GHz AMD Ryzen™ 9 PRO 7945 3.7GHz w/ 1x 8GB DDR5-5200 UDIMM +12V: ~6.5A / +12V: ~7.0A / +12V: ~7.5A
Operating Temperature	0°C~60°C ( 32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	95% (non-condensing @60°C)

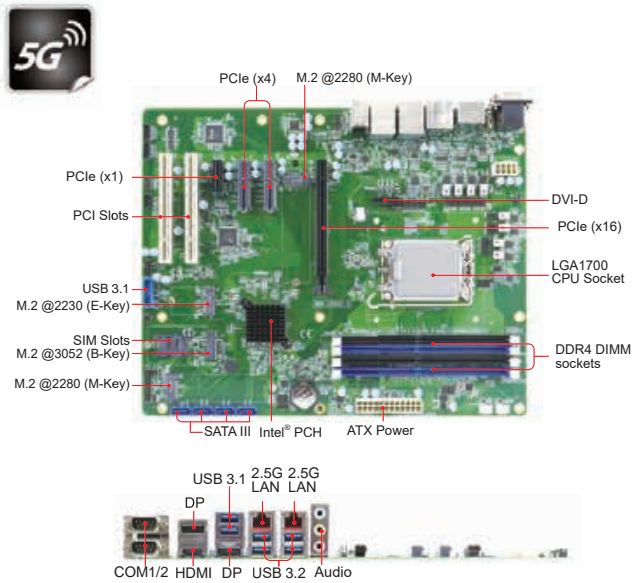
## Ordering Information

MBB1001	AMD Ryzen™ Embedded 7000 series ATX Motherboard w/ HDMI, DisplayPort, DVI-D, Dual Giga-LAN, RAID, TPM (2.0), supports ECC
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\*Specifications are subject to change without prior notice

## Dimensions and Drawing





### Features

- Intel® Core™ 200E / 200PE & 14th/13th/12th Core i LGA1700 Processors
- 4x DDR4 DIMM, Max. 128GB
- Intel® processor integrated graphics Supports HDMI (2.0b), DVI-D, and DisplayPort (1.4) (DP++)
- Dual Intel® 2.5G LAN
- 8x USB 3.1, 2x USB 2.0, 4x SATA 3.0, 4x COM
- 1x PCIe(x16) [Gen 5.0], 2x PCIe(x4) [Gen 4.0], 1x PCIe(x1) [Gen 3.0], 2x PCI
- 4x M.2 (B-Key, E-Key/ 2x M-Key)
- Watchdog Timer, Digital I/O, iAMT (16.1), TPM (2.0)

### Specifications

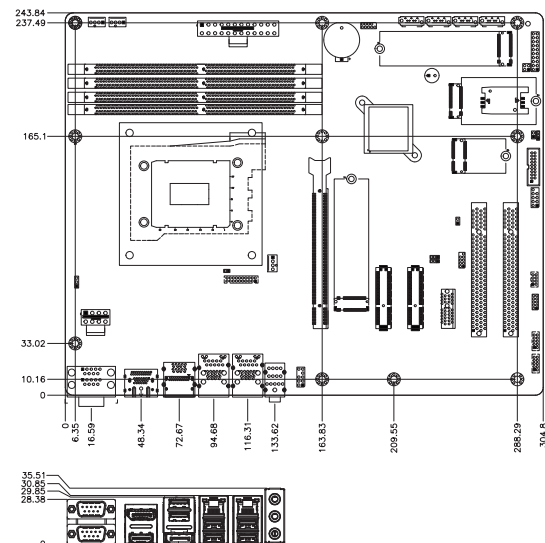
CPU Socket	LGA1700
CPU	Intel® Core™ 200E / 200PE & 14th/13th/12th Core i LGA1700 Processors
PCH	MBB-1000AF-R: Intel® R680E PCH MBB-1000AF-Q: Intel® Q670E PCH
Memory	4x DDR4-3200 MHz, Max. 128GB (Supports ECC by CPU SKUs + PCH R680E)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	NVMe
Expansion Slots	1x PCIe(x16) (Gen5.0), 2x PCIe(x4) (Gen4.0), 1x PCIe(x1) (Gen3.0), 2x PCI
Mini Type Slots	1x M.2 (M-Key, type:2280, supports NVMe with PCIe(x4) signal only) 1x M.2 (M-Key, type:2280) 1x M.2 (E-Key, type: 2230, supports CNV) 1x M.2 (B-Key, type:3052, supports 4G/5G/LTE)
Graphics Controller	12th Gen Intel® Core™ i9/i7/i5/i3 processors integrated
Video Output	1x HDMI (2.0b), 1x DVI-D, 2x DisplayPort (1.4a) (DP++)
Ethernet	Intel® I226LM 2.5GbE Intel® I226V 2.5GbE
I/O Chipset	Fintek F81964D-I
Serial Port	2x RS232, 2x RS232/422/485
USB 2.0	2x USB 2.0 via pin header
USB 3.0	4x USB 3.1 Gen2 (10Gbps), 2x USB 3.1 Gen1 (5Gbps), 2x USB 3.1 Gen1 (via box-header)
Serial ATA	4x SATA 3.0
Audio	Intel® R680E/ Q670E PCH-H built-in HD audio + Realtek ALC888S codec
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out), iAMT (16.1), RAID
Dimensions (L x W)	305mm x 244mm (12" x 9.6")
Power Consumption	Intel® Core™ i7-13700 2.10GHz w/ 4x 16GB DDR4 3200 DIMM Innodisk M4U0-AGS1KCEM-A35 + 12V:20.26A

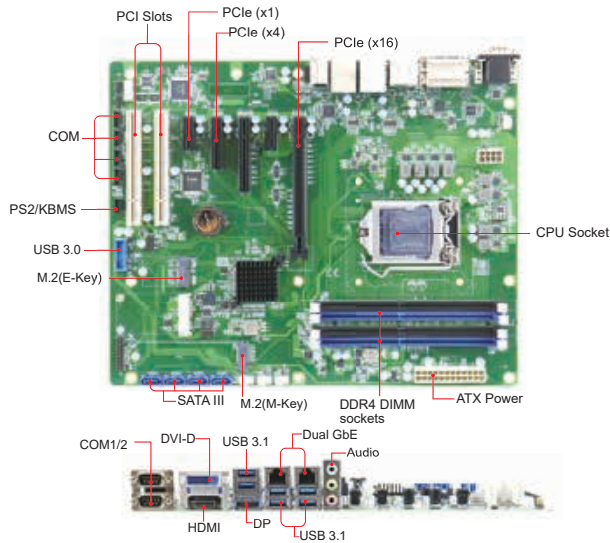
Operating Temperature	0°C~60°C ( 32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	95% (non-condensing @60°C)

### Ordering Information

MBB-1000AF-R	LGA1700 R680E ATX Motherboard w/ HDMI, DisplayPort, DVI-D, Dual 2.5G LAN, RAID, iAMT (16.0), TPM (2.0), supports ECC
MBB-1000AF-Q	LGA1700 Q670E ATX Motherboard w/ HDMI, DisplayPort, DVI-D, Dual 2.5G LAN, RAID, iAMT (16.0), TPM (2.0)

### Dimensions and Drawing





## Features

- 9th Gen Intel® Xeon® E/ Core™ i7/i5/i3 processors
- 4x DDR4 DIMM, Max.128GB
- Intel® processor integrated graphics Supports HDMI(2.0a), DVI-D, and DisplayPort
- Dual Intel® Gigabit LAN
- 6x USB 3.1, 2x USB 2.0, 4x SATA 3.0, 6x COM
- 1x PCIe(x16), 1x PCIe(x8) [Gen 3.0], 1x PCIe(x4), 2x PCIe(x1), 2x PCI
- Watchdog Timer, Digital I/O, iAMT (11.6), TPM (2.0), iSMART (4.0)

## Specifications

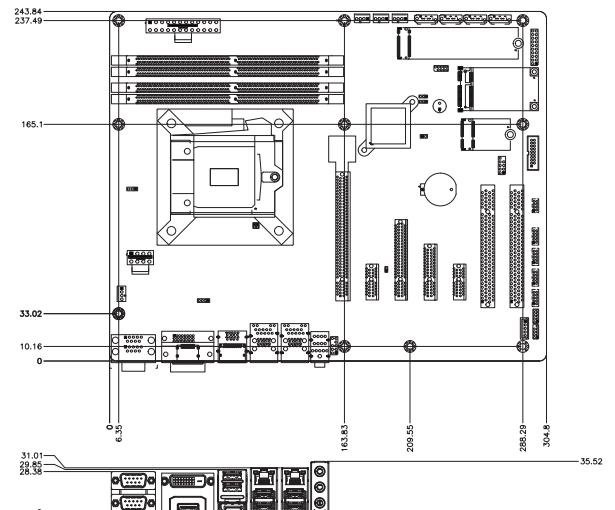
CPU Socket	LGA1151
CPU	9th Gen Intel® Xeon® E/ Core™ i7/i5/i3 HC/QC/DC processors, up to 5.0GHz
PCH	MB997AF-C246: Intel® C246 PCH MB997AF: Intel® Q370 PCH MB997EF: Intel® H310 PCH
Memory	4x DDR4-2666 / 2400 MHz, Max. 128GB (Supports ECC by CPU SKUs)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	NVMe
Expansion Slots	MB997AFS-C246/ MB997AFS: 1x PCIe (x16), 1x PCIe(x8), 1x PCIe(x4), 2x PCIe (x1), 2x PCI MB997EFS: 1x PCIe (x16), 2x PCIe (x1), 2x PCI
Mini Type Slots	1x MiniPCIe, 1x M.2 (M-Key, type:M2280), 1x M.2 (E-Key, type: E2230)
Graphics Controller	9th Gen Intel® Core™ i7/i5/i3 processors integrated
Video Output	1x HDMI2.0a, 1x DVI-D, 1x DisplayPort (1.2)(DP+ +)
Ethernet	LAN 1: MB997AF-C246/MB997AF: Intel® I219LM GbE PHY MB997EF: Intel® I219V GbE PHY LAN 2: MB997AF-C246: Intel® I210AT GbE MB997AF/ EF: Intel® I211AT or I210AT GbE
I/O Chipset	Nuvoton NC T6686D-T
Serial Port	4x RS232, 2x RS232/422/485
USB 2.0	2x USB 2.0 via pin header
USB 3.X	MB997AF-C246/MB997AF: 4x USB 3.1 Gen2 (10Gbps), 2x USB 3.1 Gen1 (5Gbps), 2x USB 3.1 Gen1 (5Gbps) via box-header MB997EF: 4x USB 3.1 Gen2 (10Gbps)
Serial ATA	4x SATA 3.0
Audio	Intel® CNL PCH-H built-in HD audio + Realtek ALC888S codec
TPM	TPM (2.0)
Others	Digital I/O(4-in/4-out), iAMT (11.6), RAID, iSMART (4.0), EuP/ErP

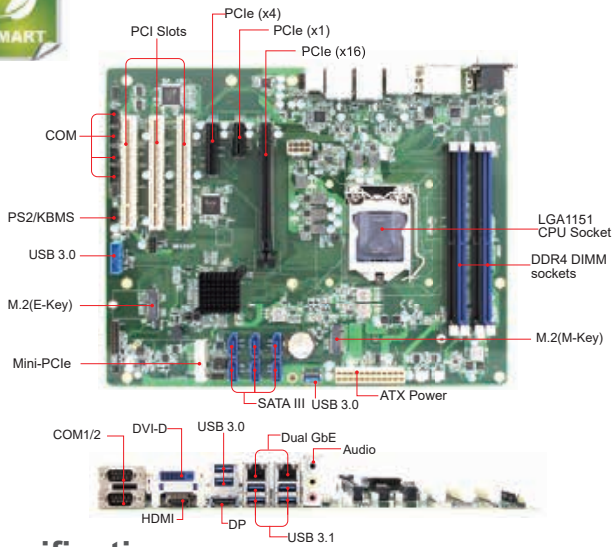
Dimensions (L x W)	305mm x 244mm (12" x 9.6")
Power Consumption	Intel® Core™ i7-9700K, 3.6GHz w/ 4x 4GB DDR4-2400 +12V: 12.64A +5V: 1.19A +5VSB: 0.132A +3.3V: 0.88A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	95% (non-condensing @60°C)

## Ordering Information

MB997AFS-C246	LGA1151 C246 ATX Motherboard w/ HDMI, DisplayPort, DVI-D, dual Gigabit LAN, RAID, iAMT (11.6), TPM (2.0), iSMART (4.0)
MB997AFS	LGA1151 Q370 ATX Motherboard w/ HDMI, DisplayPort, DVI-D, dual Gigabit LAN, RAID, iAMT (11.6), TPM (2.0), iSMART (4.0)
MB997EFS	LGA1151 H310 ATX Motherboard w/ HDMI, DisplayPort, DVI-D, dual Gigabit LAN, TPM (2.0), EuP/ErP

## Dimensions and Drawing





## 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	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 PCIe (x16), 1x PCIe (x4), 1x PCIe (x1)
Mini Type Slots	3x PCI, 1x MiniPCIe, 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)(DP++), 1x DVI-D
Ethernet	LAN 1: Intel® I219LM GbE PHY LAN 2: MB995VF-C246: Intel® I210AT GbE MB995VF: Intel® I211AT or I210AT GbE
I/O Chipset	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.X	4x USB 3.1 on board 5x USB 3.0: 2x ports on board, 2 ports via box-headers 1x 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 + Realtek ALC888S codec
TPM	TPM (2.0)

## Features

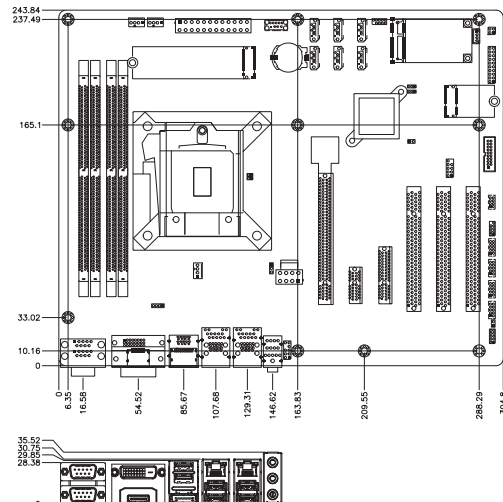
- 8th Gen Intel® Xeon® E / Core™ i7/i5/i3 HC/QC/DC processors, up to 4.7GHz
- 4x DDR4 DIMM, Max. 64GB
- Intel® processor integrated graphics Supports DVI-D, HDMI (2.0a) and DisplayPort
- Dual Intel® Gigabit LAN
- 4x USB 3.1, 5x USB 3.0, 6x COM, 6x SATA III
- 1x PCIe (x16), 1x PCIe (x4), 1x PCIe (x1),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

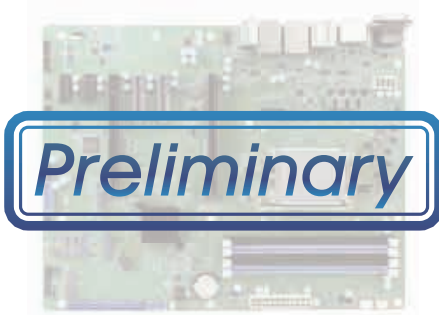
Others	Digital I/O (4-in/4-out), iAMT (11.6), RAID, iSMART (3.5), EuP/ErP
Dimensions (L x W)	305mm x 244mm (12" x 9.6")
Power Consumption	Intel® Core™ i7-8700 3.4GHz w/ 4x 4GB DDR4-2400 +12V: 5.56A +5V: 1.65A +5VSB: 0.25A +3.3V: 0.65A
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-20°C~80°C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





Preliminary

## Features

- Intel® Core™ Ultra 300S series desktop processors
- 2x DDR5-CUDIMM sockets, Max. 128GB
- Supports HDMI (2.1), DisplayPort (1.4a), DisplayPort/DP++ (DP1.4)
- LAN 1 & 2: Intel® I226V, Supports 2.5GbE only  
LAN 3: Intel® I219LM, Supports 1GbE with iAMT 22.0
- 4x USB 3.2 (10Gbps), 2x USB 3.2 (5Gbps), 2x USB 2.0, 4x COM, 4x SATA III
- 2x PCIe (x16) [Gen 5.0], 1x PCIe (x4) [Gen 4.0], 1x PCIe (x4) [Gen 3.0]
- 2x M.2 slots: 1x 2280 (M-Key, NVMe SSD) + 1x 2230 (E-Key, WiFi/BT module)
- Watchdog Timer, Digital I/O, iSMART(4.0), iAMT(22.0), TPM (2.0)

## Specifications

CPU Socket	LGA1954
CPU	Intel® Core™ Ultra 300S series DT processors
PCH	Q970
Memory	2x DDR5-CUDIMM sockets, Max. 128GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	SATA III & NVMe
Expansion Slots	1x PCIe x16 (Gen 5) 1x PCIe x16 (x8 signal, Gen 5) 1x PCIe x4 (Gen 5) 1x PCIe x4 (Gen 4)
Mini Type Slots	1x M.2 (M2280, NVMe) 1x M.2 (E2230, supports WiFi/BT, CNVi)
Graphics Controller	Intel® Core™ Ultra 300S Series DT processor integrated graphics
Video Output	1x HDMI (2.1) + 2x DisplayPort (via Type-C, DP1.4a) + 1x DisplayPort/DP++ (DP1.4)
Ethernet	LAN 1: Intel® I226V, supports 2.5G LAN 2: Intel® I226V, supports 2.5G LAN 3: Intel® I219LM, supports 1GbE
I/O Chipset	Fintek F81964D-I
Serial Post	4x COM ports: 2x RS232/422/485 + 2x RS232
USB 2.0	2x USB 2.0 (10Gbps)
USB 3.X	4x USB 3.2, 2x USB 3.2 (5 Gbps)
Serial ATA	4x SATA III
Audio	Realtek ALC888S-VD2-GR HD Audio codec w/ 7.1 channels and TI TPA2012D2 amplifier
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out), Watchdog Timer, iSMART (4.0), iAMT (22.0), TPM (2.0)
Dimensions (L x W)	244mm x 244mm (9.6" 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% RH (non-condensing @60°C)

## Ordering Information

MBB1006AF-Q	LGA1954 Q970 MicroATX Motherboard with 1x HDMI, 3x DisplayPort, 1x GbE, Dual 2.5GbE, 4x SATA, RAID, iAMT (22.0), TPM(2.0)
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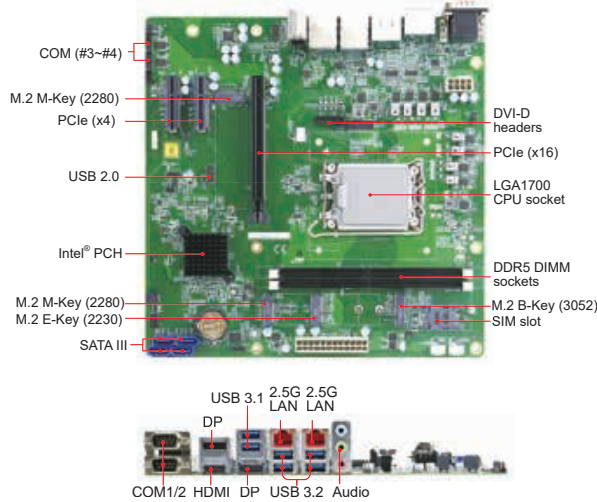
1 Single Board Computers

2 CPU Modules

3 Motherboards

4 CPU Cards

5 COM-HPC Module



## Features

- Intel® Core™ 200E / 200PE & 14th/13th/12th Core i LGA1700 processors
- 2x **DDR5** DIMM sockets, Max. 64GB
- Intel® processor integrated graphics Supports HDMI (2.0b), DVI-D and 2x DisplayPort (1.4) (DP++)
- Dual Intel 2.5G LAN
- 4x USB 3.2, 2x USB 3.1, 2x USB 2.0, 4x COM, 4x SATA III
- 1x PCIe (x16) [Gen 5.0], 1x PCIe (x4) [Gen 4.0], 1x PCIe (x4) [Gen 3.0]
- 4x M.2 (B-Key, E-Key and 2x M-Key)
- Watchdog Timer, Digital I/O, iAMT(16.1), TPM(2.0)

## Specifications

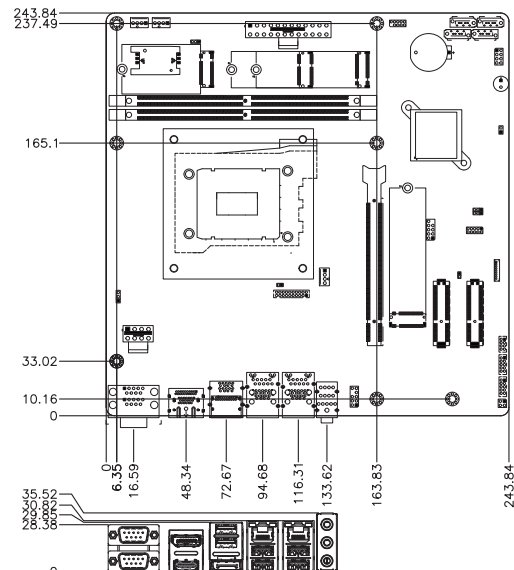
CPU Socket	LGA1700
CPU	Intel® Core™ 200E / 200PE & 14th/13th/12th Core i processors
PCH	MB998AF-R : Intel® R680E PCH (support ECC) MB998AF-Q : Intel® Q670E PCH
Memory	2x <b>DDR5</b> DIMM sockets, supports DDR5-4800/5600 memory module, Max. 64GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	SATA III & NVMe
Expansion Slots	1x PCIe (x16) [Gen.5.0], 1x PCIe (x4) [Gen.4.0], 1x PCIe (x4) [Gen.3.0]
Mini Type Slots	2x M.2 (M-Key, type:2280, PCIe) 1x M.2 (E-Key, type:2230, USB 2.0 + PCIe) 1x M.2 (B-Key, type:3052, USB 3.1 + PCIe)
Graphics Controller	13th Gen Intel® Core™ i7/i5/i3 processor integrated
Video Output	1x HDMI (2.0b) + 2x DisplayPort (1.4b) (DP++) + DVI-D
Ethernet	LAN 1: Intel® I226LM, supports 2.5G and iAMT LAN 2: Intel® I226V, supports 2.5G only
I/O Chipset	Fintek F81964D-I
Serial Post	4x COM port : 2x RS232/422/485 + 2x RS232
USB 2.0	2x USB 2.0 via pin-header
USB 3.X	4x USB 3.2 (10Gbps), 2x USB 3.1(5Gbps) @edge connector
Serial ATA	4x SATA III
Audio	Built-in HD Audio controller + Realtek ALC888S with 7.1 channels
TPM	TPM(2.0)
Others	Digital I/O (4-in/4-out), Watchdog Timer, SIM slot
Dimensions (L x W)	244mm x 244mm (9.6" x 9.6")
Power Consumption	Intel® Core™ i7-13700 2.10GHz w/2x 32GB DDR5 5600 +12V:20.09A +5V:8.76A +3.3V:4.73A +5VSB:0.78A

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

MB998AF-R	LGA1700 R680E (support ECC) MicroATX Motherboard with 1x HDMI, 2x DisplayPort, 1x DVI-D, dual 2.5GbE, 4x SATA, RAID, iAMT (16.1), fTPM
MB998AF-Q	LGA1700 Q670E MicroATX Motherboard with 1x HDMI, 2x DisplayPort, 1x DVI-D, dual 2.5GbE, 4x SATA, RAID, iAMT (16.1), fTPM

## Dimensions and Drawing



# Comparison Table

## Mini-ITX Motherboard

Models	MI1005	MI1002	MI1001	MI1000
<b>Form Factor</b>	Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX
<b>CPU Socket</b>	FCBGA2049	LGA1851	LGA1700	LGA1700
<b>CPU</b>	Intel® Core™ Ultra 200U/H MB processors	14th Gen Intel® Core™ Ultra DT processors	14th/13th/12th Gen Intel® Core™ DT processors	14th/13th/12th Gen Intel® Core™ DT processors
<b>CPU Max. Frequency</b>	Up to 5.4GHz	Up to 4.2GHz	Up to 5.8GHz	Up to 5.8GHz
<b>PCH</b>	N/A	N/A	Intel® Q670E	Intel® R680E
<b>Memory</b>	2x DDR5 SO-DIMM	2x DDR5 SO-DIMM	2x DDR5 SO-DIMM	2x DDR5 SO-DIMM
<b>Max. Memory Size</b>	96GB	64GB	64GB	64GB
<b>BIOS</b>	AMI	AMI	AMI	AMI
<b>Graphics Controller</b>	Intel® Core™ Ultra 200U/H MB processors	Intel® Core™ Ultra DT processor integrated Iris® 8Xe graphics	Intel® RPL-S Refresh DT processor integrated Xe graphics	Intel® RPL-S Refresh DT processor integrated Xe graphics
<b>Video Output</b>	DisplayPort, HDMI 2x Type-C	DisplayPort, HDMI 2x USB3.2 Type-C	eDP or 24-bit dual-channel ,LVDS 1x DisplayPort, HDMI	eDP or 24-bit dual-channel ,LVDS 2x DisplayPort
<b>Ethernet</b>	Intel® I226LM 2.5 Gigabit LAN 2x Intel® I226V 2.5 Gigabit LAN	Intel® I226LM 2.5 Gigabit LAN 2x Intel® I226V 2.5 Gigabit LAN	Intel® I226LM 2.5 Gigabit LAN Intel® I226V 2.5 Gigabit LAN 2x Intel® X550-AT2 10G LAN	Intel® I226LM 2.5 Gigabit LAN Intel® I226V 2.5 Gigabit LAN
<b>Audio</b>	Built-in ALC888S HD audio codec	Built-in ALC888S HD audio codec	NA	Built-in ALC888S HD audio codec
<b>SATA</b>	2x SATA III ports	2x SATA III ports	2x SATA III ports	4x SATA III ports
<b>I/O Chipset</b>	F8196AB-I	F81964D-I	F81964AB-I	F81964AD-I
<b>Parallel Port</b>	N/A	N/A	N/A	N/A
<b>Serial Port</b>	2x RS232/422/485 (Jumperless selection) 2x RS232	2x RS232/422/485 (Jumperless selection) 2x RS232	2x RS232/422/485 (Jumperless selection)	2x RS232/422/485 (Jumperless selection) 2x RS232
<b>USB 2.0</b>	4x USB 2.0 (via pin header)	4x USB 2.0 (via pin header)	2x USB 2.0 (via pin header)	4x USB 2.0 (via pin header)
<b>USB 3.0/3.1</b>	4x USB 3.2 via rear I/O	4x USB 3.2 via rear I/O	4x USB 3.2 via rear I/O	6x USB 3.2 via rear I/O
<b>TPM</b>	2.0	2.0	2.0	2.0
<b>KB / MS</b>	N/A	N/A	N/A	N/A
<b>Hardware Monitor</b>	Yes	Yes	Yes	Yes
<b>Storage Device Interface</b>	SATA III & NVMe	1x M.2 (E-Key) 1x M.2 (M-Key) 1x M.2 (B-Key)	1x M.2 (E-Key) 1x M.2 (M-Key)	1x M.2 (E-Key) 1x M.2 (M-Key)
<b>Watchdog Timer</b>	256 levels	256 levels	256 levels	256 levels
<b>Digital I/O</b>	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out
<b>Expansion Slots</b>	1x PCIe (x4)	1x PCIe (x4)	1x PCIe (x16)	1x PCIe (x16)
<b>Mini Type Slots</b>	1x M.2 (E-Key, type:2230) 1x M.2 (M-Key, type:2280) 1x M.2 (M-Key, type:2242)	1x M.2 (E-Key, type:2230) 1x M.2 (M-Key, type:2280) 1x M.2 (B-Key, type:3052)	1x M.2 (E-Key, type:2230) 2x M.2 (M-Key, type:2280)	1x M.2 (E-Key, type:2230) 2x M.2 (M-Key, type:2280)
<b>Power input</b>	ATX type	DC-in (+12V~+24V)	DC-in (Single 24V only)	ATX type
<b>Power Consumption</b>	Intel® Core™ Ultra 9 285H processor Up to 5.40GHz w/ 2x DDR5 5600 32GB Transcend TS4GSA64V6E +12V:11.33 +5V:0.89 +3.3V:0.66	Intel® Core™ Ultra 7 165HL w/ 2x DDR5 5600 16GB +24V : 6.98A	Intel® Core™ i9-14900 processor Up to 5.80GHz w/ 2x 32G DDR5-5600 +24V: 7.15A	14th Gen Intel® Core™ i9-14900 w/ 2x DDR5 32GB 5600 +12V:23.17A
<b>Dimensions (L x W)</b>	170mm x 170mm	170mm x 170mm	170mm x 170mm	170mm x 170mm
<b>Extra Features</b>	LAN Wakeup, iAMT(19.0), RAID, PDPC	N/A	N/A	N/A
<b>Page No.</b>	P.3-16	P.3-17	P.3-18	P.3-19

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# Comparison Table

# Mini-ITX Motherboard

MI999	MI998	MI997	MI996	MI995	MI993
Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX
LGA1200	LGA1151	LGA1700	FCBGA1440	FCBGA1440	FCBGA1440
10th Gen Intel® Xeon®-E / Core™ / Pentium® / Celeron® processors	9th /8th Gen Intel® Xeon®-E / Core™ / Pentium® / Celeron® processors	12th Gen Intel® Core™ i7/i5/i3 and Celeron® socket SoC Processors	9th Gen Intel® Xeon® E / Core™ i7/i5/i3 Celeron® processors	8th Gen Intel® Xeon® / Core™ i7/i5/i3 processors	AMD Embedded Zen Core processors
Up to 4.7GHz	Up to 4.9GHz	Up to 5.8GHz	Up to 4.2GHz	Up to 4.2GHz	Up to 2.7GHz
Intel® W480E, Q470E, H470E	Intel® C246, Q370, H310	TBD	Intel® CM246 PCH: MI996VF-X28/26 Intel® QM370 PCH: MI996VF-9850/ 9400 Intel® HM370 PCH: MI996EF-9100/ 4930	Intel® CM246 PCH Intel® QM370 PCH	N/A
2x DDR4 SO-DIMM	2x DDR4 SO-DIMM	2x DDR5 SO-DIMM	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM
64GB	32GB	32GB	32GB	32GB	32GB
AMI	AMI	AMI	AMI	AMI	AMI
10th Gen Intel® Core™ DT processor integrated HD Gfx eDP or 24-bit dual-channel LVDS DVI-D, HDMI1.4, DisplayPort	9th /8th Gen Intel® Core™ DT processor integrated HD Gfx eDP or 24-bit dual-channel LVDS DVI-D, HDMI1.4, DisplayPort	12th Gen Intel® Core™ i7/i5/i3 and Celeron® Processors	9th Gen Intel® Xeon®/ Core™ i7/i5/i3 integrated graphics	Intel® Core™ i integrated graphics	AMD R-series APU built-in GPU
Intel® I219LM GbE PHY Intel® I219V GbE PHY Intel® I210AT	Intel® I219LM GbE PHY Intel® I219V GbE PHY Intel® I210AT	LAN 1: Intel® I226LM, supports 2.5G and iAMT LAN 2: Intel® I226V, supports 2.5G only	Intel® I219LM/V Gigabit LAN PHY Intel® I210AT Gigabit LAN	Intel® I219LM/V Gigabit LAN PHY Intel® I210AT Gigabit LAN	Intel® I225V 2.5 Gigabit LAN Intel® I225V 2.5 Gigabit LAN
Built-in ALC888S HD audio codec	Built-in ALC888S HD audio codec	Built-in HD Audio controller + Realtek ALC888S w/ 7.1 channels	Built-in ALC888S HD audio codec	Built-in ALC888S HD audio codec	Built-in ALC888S HD audio codec
4x SATA III ports	4x SATA III ports	2x SATA III ports	MI996VF-X26/28: 4x SATA III MI996VF-9850 MI996EF-9100: 2x SATA III	MI995VF-X27: 4x SATA III MI995VF-8850/8400, MI995EF-8100: 2x SATA III	1x SATA III port
F81964D-I	F81964D-I	F81964D-I	F81964D-I	F81964D-I	NCT6116D
N/A	N/A	N/A	N/A	N/A	N/A
2x RS232/422/485 (Jumperless selection) 2x RS232	2x RS232/422/485 (Jumperless selection) 2x RS232	2x RS232/422/485 (Jumperless selection) 2x RS232	2x RS232/422/485 (Jumperless selection) 2x RS232	2x RS232 2x RS232/422/485 (Jumperless selection)	2x RS232 2x RS232/422/485 (Jumperless selection)
4x USB 2.0 (via pin header)	2x USB 2.0 (via pin header)	2x USB 2.0 (via pin header)	4x USB 2.0 (via pin header)	4x USB 2.0 (via pin header)	2x USB 2.0 (via pin header)
6x USB 3.2 (Gen1)	6x USB 3.0 (MI998AF) 4x USB 3.0 (MI998EF)	6x USB 3.2 (10 Gbps)	6x USB 3.1 (via real I/O)	6x USB 3.1 (on board)	2x USB 3.1 via rear I/O
2.0	2.0	2.0	2.0	2.0	2.0
N/A	N/A	N/A	N/A	N/A	N/A
Yes	Yes	Yes	Yes	Yes	Yes
1x M.2 (E-Key@2230), supports CNVi 1x M.2 (M-Key@2280), supports NVMe (for MI999AF-W/ MI999AF-Q Series only)	1x M.2 (E-Key) 1x M.2 (M-Key)	1x M.2 (E-Key) 2x M.2 (M-Key) 1x M.2 (B-Key)	mSATA 1x M.2 (E-Key) 1x M.2 (M-Key)	mSATA, M.2	M.2 (M-Key)
256 levels	256 levels	256 levels	256 levels	256 levels	256 levels
4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out
1x PCIe (x16)	1x PCIe (x16)	1x PCIe (x16)	1x PCIe (x16)	1x PCIe (x16)	1x PCIe (x8)
2x M.2	1x M.2 (E-Key, type:2230) 1x M.2 (M-Key, type:2280)	1x M.2 (E-Key, type:2230) 2x M.2 (M-Key, type:2280) 1x M.2 (B-Key, type:3052)	1x Mini PCIe 1x M.2 (M-Key, type:2280, NVMe) 1x M.2 (E-Key, type:2230, CNVi)	1x Mini PCIe 2x M.2	1x M.2 (B-Key, type:3052) 1x M.2 (M-Key, type:2280) 1x M.2 (E-Key, type:2230)
ATX type	ATX type	ATX type	ATX type	ATX type	DC-in
Intel® Core™ i5-10500E 3.0GHz w/ 2x DDR4 2133 4GB +12V:6.08A, +5Vsb:0.11A, +5V:1.19A, +3.3V:0.90A	Intel® i7-8700, w/ DDR4-2400 8GB +12V: 6.36A; +5V:1.46A; +5VSB: 0.07A; +3.3V: 0.37A	Intel® Core™ i7-12700HL w/ 2x 32GB DDR5-4800 +12V:13.21A	Intel® Xeon E-2176G, 3.7GHz w/ 8GB DDR4-2400 +12V: 7.73A +5V: 1.59A +5VBS: 0.17A +3.3V: 0.32A	Intel® Core™ i5-8400H, 2.50GHz, w/ 2x 16GB DDR4-2133 +12V: 3.01A +5V: 1.43A +5VSB: 0.15A +3.3V: 0.32A	AMD Ryzen™ Embedded R2514 3.35GHz / R2314 2.1GHz / R2312 2.1GHz w/ 1x 8GB DDR4-2666 +12V: ~2.9A +12V: ~2.2A +12V: ~1.9A
170mm x 170mm	170mm x 170mm	170mm x 170mm	170mm x 170mm	170mm x 170mm	170mm x 170mm
iAMT (14.0), LAN Wakeup, EuP/ErP	iAMT (11.6), LAN Wakeup, EuP/ErP	iAMT (16.0)	iAMT (11.6), LAN Wakeup, iSMART, EuP/ ErP, RAID, vPro (MI996VF)	iAMT (11.6)/ vPro(MI995VF), LAN Wakeup, iSMART, RAID, EuP/ErP (MI995EF)	LAN wakeup
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Remarks: 1. Specifications are subject to change without prior notice. 2. ODM/OEM is available. 3. For user's manual & datasheet download, visit [www.ibase.com.tw](http://www.ibase.com.tw).

# Comparison Table

## Mini-ITX Motherboard

Models	MI989	MI988	MI836	MI808	MI805
<b>Form Factor</b>	Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX
<b>CPU Socket</b>	BGA1140 APU on board	BGA1140 APU on board	FCBGA1493	FCBGA1170	FCBGA1170
<b>CPU</b>	AMD Embedded Zen Core processors	AMD Embedded Zen Core CPU	Intel® Atom® QC x6425E Intel® Atom® QC x6413E Intel® Atom® DC x6211E	Intel® Pentium® N3710 / Celeron® N3010 SoC	Intel® Celeron® QC J1900 SoC
<b>CPU Max. Frequency</b>	Up to 4.15GHz	Up to 3.8GHz	TBD	Up to 2.56GHz/ 2.24GHz	2.0GHz
<b>PCH</b>	N/A	N/A	Intel® Atom® SoC	N/A	N/A
<b>Memory</b>	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM	2x DDR4 SO-DIMM	2x DDR3L SO-DIMM	2x DDR3L SO-DIMM
<b>Max. Memory Size</b>	64GB	32GB	32GB	8GB	16GB
<b>BIOS</b>	AMI	AMI	AMI	AMI	AMI
<b>Graphics Controller</b>	AMD V-series APU built-in GPU	AMD V-series APU built-in GPU	Intel® Atom® SoC integrated	Intel® Gen8 w/ 16 EUs graphics	Intel® Gen7 w/ 4EUs graphics
<b>Video Output</b>	4x DisplayPort	HDMI(2.0)/ DP on board	1x HDMI (2.0b) + 1x VGA + LVDS or eDP	VGA, DVI-D on board	DVI-D on board
<b>Ethernet</b>	Intel® I210AT Gigabit LAN	Intel® I210AT Gigabit LAN	LAN 1: Intel® I226IT LAN 2: Intel® I226IT	2x Intel® I210AT Gigabit LAN	2x Intel® I210AT Gigabit LAN
<b>Audio</b>	Built-in ALC888S HD audio codec	Built-in ALC888S HD audio codec	Built-in HD audio controller + Realtek ALC888S with class-D amplifier	Built-in ALC269 audio codec w/ 2W amplifier	Built-in ALC269 audio codec w/ 2.3W amplifier
<b>SATA</b>	1x SATA III port	1x SATA III port	1x SATA III port	2x SATA III ports	2x SATA II ports
<b>I/O Chipset</b>	F81966D-I	NCT6116D	F81964D-I	F81866AD-I	NCT6106D
<b>Parallel Port</b>	N/A	N/A	N/A	N/A	N/A
<b>Serial Port</b>	2x RS232/422/485 (jumperless selection) 2x RS232	2x RS232/422/485 (jumperless selection) 4x RS232	4 COM ports: 2x RS232/422/485 2x RS232	3x RS232 1x RS232/422/485 (jumperless selection)	5x RS232 1x RS232/422/485 (jumperless selection)
<b>USB 2.0</b>	2x USB 2.0 via rear I/O	N/A	4x USB 2.0 via pin-header	2x USB 2.0 via pin header	2x USB 2.0 on rear I/O 2x USB 2.0 via pin header
<b>USB 3.X</b>	2x USB 3.1 (Gen.2) via rear I/O	4x USB 3.1 rear I/O	3x USB 3.1 (5Gbps)	4x USB 3.0 on rear I/O	1x USB 3.0 on rear I/O
<b>TPM</b>	N/A	N/A	2.0	2.0 (option)	N/A
<b>KB / MS</b>	N/A	N/A	N/A	PS/2	N/A
<b>Hardware Monitor</b>	Yes	Yes	Yes	Yes	Yes
<b>Storage Device Interface</b>	mSATA, M.2	mSATA, M.2	mSATA, M.2	mSATA or CFast	mSATA
<b>Watchdog Timer</b>	256 levels	256 levels	256 levels	256 levels	256 levels
<b>Digital I/O</b>	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out	4-in/4-out
<b>Expansion Slots</b>	1x PCIe (x16)	1x PCIe (x8)	1x PCIe (x1)	1x PCIe (x1)	1x PCIe (x1)
<b>Mini Type Slots</b>	3x M.2	1x Mini PCIe 1x M.2	1x Mini PCIe (x1) 1x SATA III	1x Mini PCIe (x1)	1x Mini PCIe (x1)
<b>Power input</b>	ATX type	ATX type/ DC-in (12V~24V)	+12V ~+24V DC-in	DC In 12V or DC in 18V~ 24V	DC In 12V ~ 24V
<b>Power Consumption</b>	AMD Ryzen™ Embedded V2748 2.9GHz w/ 1x 8GB DDR4-3200 (Onboard or SO-DIMM) +12V: ~3.5A AMD Ryzen™ Embedded V2718 1.7GHz w/ 1x 8GB DDR4-3200 (Onboard or SO-DIMM) +12V: ~2.7A	AMD Ryzen™ Embedded V1807B 3.35GHz w/ 2x 8GB DDR4-2133 +24V: 2.55A	Intel® Atom® x6425E 2.00GHz Transcend TS1GSH64V4B-I w/ 2x DDR4-2400 8GB [SEC Chipset] +12V : 1.74A	Intel® Pentium® N3700 1.6GHz w/ 2x 4GB DDR3L-1600 +19V: 1.01A	Intel® Celeron® J1900 2GHz 8GB DDR3L-1600 +12V: 1.28A
<b>Dimensions (L x W)</b>	170mm x 170mm	170mm x 170mm	170mm x 170mm	170mm x 170mm	170mm x 170mm
<b>Extra Features</b>	LAN wakeup, EuP/ErP	LAN wakeup iSMART	LAN wakeup	LAN Wakeup, SIM card slot iSMART(3.1)	iSMART(3.0). LAN Wakeup
<b>Page No.</b>	P.3-26	P.3-27	P.3-28	P.3-29	P. 3-30

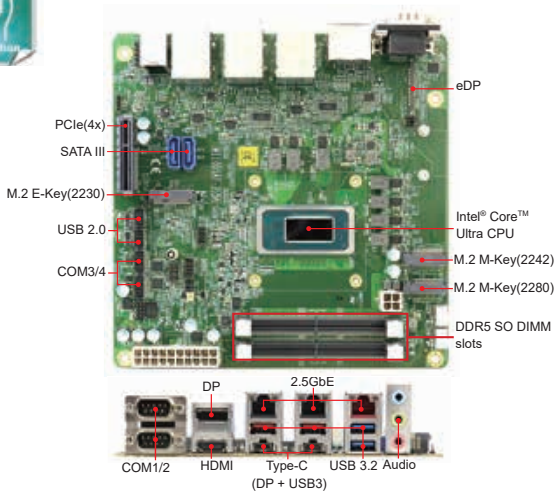
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Specifications

CPU Socket	BGA2049 CPU onboard
CPU	Intel® Core™ Ultra 9/7/5 200 U/H Mobile Processors (Arrow Lake – U/H)
PCH	N/A
Memory	2x DDR5 SO-DIMM sockets, Up to <b>DDR5-6400 cSO-DIMM</b> memory module, Max. 96GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	SATA III & NVMe
Expansion Slots	1x PCIe (x4) [Gen 4]
Mini Type Slots	2x M.2 (M-Key, type:2280 + 2242, PCIe(4x) Gen.4) 1x M.2 (E-Key, type:2230, USB 2.0 + PCIe(1x) Gen.4)
Graphics Controller	Intel® Core™ Ultra 9/7/5 200 U/H Mobile Processors integrated graphics
Video Output	1x eDP + HDMI + 1x DisplayPort (1.4a) (DP++) + 2x Type-C
Ethernet	LAN 1 : Intel® I226LM, Support 2.5G and iAMT LAN 2 / LAN 3: Intel® I226V, supports 2.5G only
I/O Chipset	Fintek F81966AB-I
Serial Port	4x COM ports: 2x RS232/422/485 + 2x RS232
USB 2.0	4x USB 2.0 via pin-header
USB 3.X	4x USB3.2 Type-A (10Gbps)+ 2x USB Type-C (10 bps) @ edge connector
Serial ATA	2x SATA III
Audio	Built-in HD Audio controller + Realtek ALC888S w/ 7.1 channels
TPM	Supports fTPM
Others	Digital I/O (4-in/4-out), Watchdog Timer, PDPC, CPU cooler
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Core™ Ultra 9 285H processor Up to 5.40GHz w/ 2x DDR5 5600 32GB Transcend TS4GSA64V6E +12V:11.33 +5V:0.89 +3.3V:0.66
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)

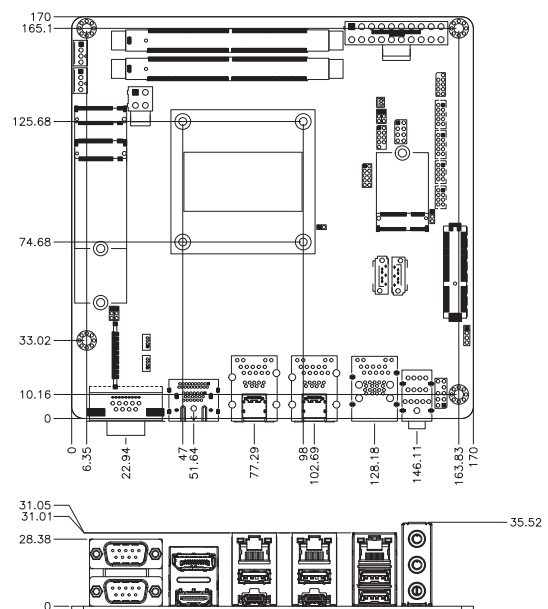
Features

- Intel® BGA2049 Core™ Ultra 9/7/5 200 U/H series mobile onboard processors, up to 65W
- 2x DDR5-6400 cSO-DIMM, Max. 96GB, Non-ECC
- Supports eDP(1.4b), 2x Type-C, HDMI (2.1) and DisplayPort(1.4a) (DP++)
- LAN 1: Intel® I226LM, Supports 2.5G and iAMT, LAN 2 / LAN 3: Intel® I226V, Supports 2.5G only
- 4x USB 3.2 (Type-A), 2x USB (Type-C), 4x USB 2.0, 4x COM, 2x SATA III
- 1x PCIe (x4) [Gen 4.0]; 3x M.2 (E-Key @2230 and 2x M-Key @2280 & 2242)
- Watchdog Timer, Digital I/O, iAMT(19.0) , fTPM (2.0)

Ordering Information

MI1005AF-285H	Intel® Core™ Ultra 9 285H CPU onboard MiniITX board w/ eDP, HDMI, 2x DisplayPort, 2x Type-C (for DP & USB 3.2), 3x 2.5GbE, 2x SATA, iAMT (19.0), fTPM (2.0)
MI1005AF-255H	Intel® Core™ Ultra 7 255H CPU onboard MiniITX board w/ eDP, HDMI, 2x DisplayPort, 2x Type-C (for DP & USB 3.2), 3x 2.5GbE, 2x SATA, iAMT (19.0), fTPM (2.0)
MI1005AF-225H	Intel® Core™ Ultra 5 225H CPU onboard MiniITX board w/ eDP, HDMI, 2x DisplayPort, 2x Type-C (for DP & USB 3.2), 3x 2.5GbE, 2x SATA, iAMT (19.0), fTPM (2.0)

Dimensions and Drawing



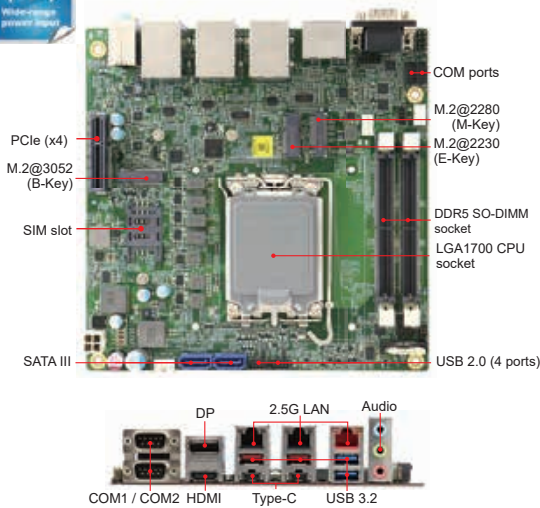
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## Features

- Intel® Core Ultra 100HL/100UL series DT processors (Meteor Lake-PS)
- 2x DDR5 SO-DIMM, Max. 64GB
- Supports HDMI, DisplayPort(DP++), 2x Type-C
- 1x Intel® I226LM 2.5G LAN, 2x Intel® I226V 2.5G LAN
- 4x USB 3.2, 2x USB Type-C, 4x USB 2.0, 4x COM, 2x SATA III
- 1x PCIe (x4), 3x M.2 (M-Key + E-Key + B-Key)
- Supports 5G & Watchdog Timer, Digital I/O, iAMT (18.0), TPM (2.0)
- 12V~24V DC input

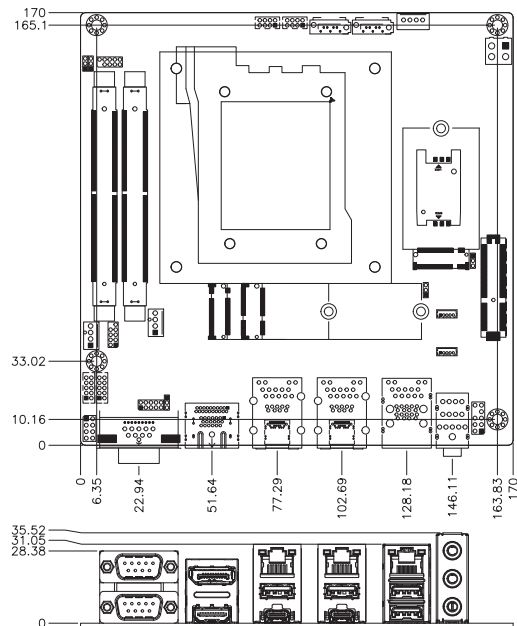
## Specifications

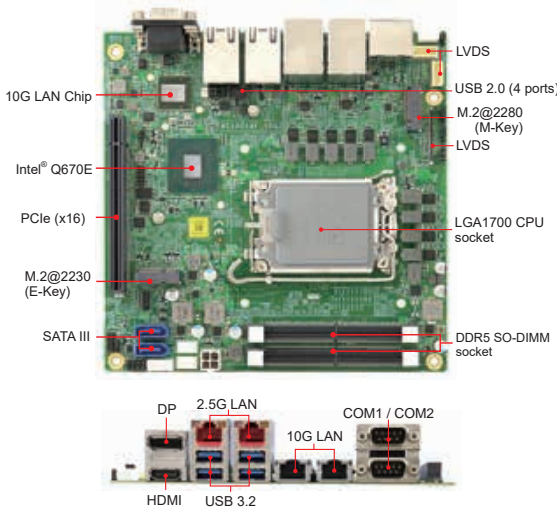
CPU Socket	LGA1851
CPU	Intel® Core Ultra 100HL/100UL series DT processors
PCH	N/A
Memory	2x DDR5 SO-DIMM, Max. 64GB, Non-ECC
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	M.2 SSD (M2280 for NVMe)
Expansion Slots	1x PCIe (x4)
Mini Type Slots	1x M.2 (M-Key, Type:2280, supports NVMe) 1x M.2 (E-Key, Type:2230, supports CNVi) 1x M.2 (B-Key, Type:3052, supports 5G/LTE)
Graphics Controller	14th Gen Intel® Core™ Ultra Processor integrated Iris® Xe graphics
Video Output	HDMI, DisplayPort, 2x Type-C
Ethernet	Intel® I226LM as 1st LAN, I226V as 2nd and 3rd LAN
I/O Chipset	Fintek F81964D-I on board
Serial Port	COM1/COM2 (RS232/422/485); COM3/COM4 (RS232 only)
USB 2.0	4x USB 2.0 via pin-header
USB 3.X	6x USB 3.2 (4x Type-A+ 2x Type-C)
Serial ATA	2x SATA III
Audio	HDA controller + Realtek codec ALC888S-VD2
TPM	dTPM, fTPM is option
Others	Digital I/O (4-in/4-out); RAID, iAMT(18.0), +12V~+24V DC-in
Dimensions (L x W)	170mm x 170mm
Power Consumption	Intel® Core™ Ultra 7 165HL w/ 2x DDR5 5600 16GB +24V : 6.98A
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

MI1002AF	LGA1851 MiniITX Motherboard w/ HDMI, DisplayPort, 2x Type-C, 3x 2.5GbE, 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230/B3052), supports iAMT(18.0) & dTPM (2.0), DC-in (12V~24V)
MI1002AF-1	LGA1851 MiniITX Motherboard w/ HDMI, DisplayPort, 2x Type-C, 3x 2.5GbE, 2x SATA III, 2x COM, 3x M.2 (M2280/ E2230/B3052), supports iAMT(18.0) & fTPM (2.0), DC-in (12V~24V)

## Dimensions and Drawing





## Features

- 14th/13th/12th Gen Intel® Core i9/i7/i5/i3 DT processors (RPL-S Refresh)
- 2x DDR5 SO-DIMM sockets, Max. 64GB
- Intel processor integrated graphic Supports eDP, LVDS and 1x DisplayPort(1.4a) (DP++), HDMI(2.0)
- 2x Intel® 2.5G LAN & 2x Intel® 10G LAN
- 4x USB 3.2, 2x USB 2.0, 2x COM, 2x SATA III
- 1x PCIe (x16) [Gen 5.0]; 2x M.2 (E-Key and M-Key)
- Supports Watchdog Timer, Digital I/O, iAMT(16.1), TPM (2.0), **+24V only DC input**



MI1001AF-10G Board with heatsink

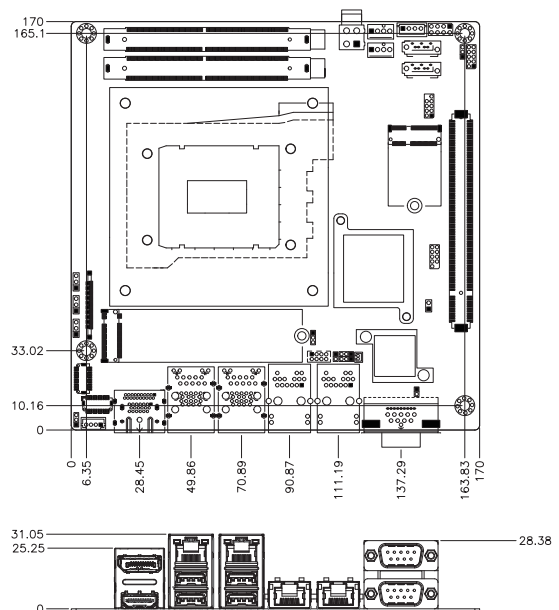
## Specifications

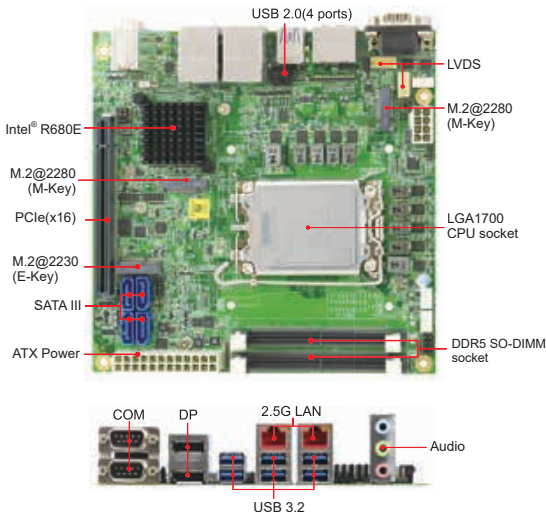
CPU Socket	LGA1700
CPU	14th/13th/12th Gen Intel® RPL-S Refresh Core i /DT processors
PCH	Q670E
Memory	2x DDR5 SO-DIMM sockets, supports DDR5 -5600, Max. 64GB *DDR5-5600 only by Core i9/i7 Processor & 1R memory module*
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	SATA III & NVMe
Expansion Slots	1x PCIe (x16) [Gen 5.0]
Mini Type Slots	1x M.2 (M-Key, type:2280, PCIe(4x) Gen.4) 1x M.2 (E-Key, type:2230, USB 2.0 + PCIe 3.0)
Graphics Controller	14th Gen Intel® RPL-S Refresh DT processor integrated Xe graphics architecture
Video Output	1x eDP + 1x DisplayPort (1.4a) (DP++) + LVDS + 1x HDMI (2.0)
Ethernet	LAN 1: Intel® I226LM, supports 2.5G and iAMT LAN 2: Intel® I226V, supports 2.5G only LAN 3&4: Intel® X550-AT2, supports 10G (For MI1001AF-10G only)
I/O Chipset	Fintek F81966AB-I
Serial Port	2x COM ports: 1x RS232/422/485 + 1x RS232
USB 2.0	2x USB 2.0 via pin-header
USB 3.X	4x USB 3.2 (10Gbps) @ edge connector
Serial ATA	2x SATA III
Audio	N/A
TPM	TPM(2.0)
Others	Digital I/O (4-in/4-out), Watchdog Timer
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Core™ i9-14900 processor, Up to 5.80GHz w/ 2x 32G DDR5-5600 +24V: 7.15A
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

MI1001AF-10G	LGA1700 MiniITX Motherboard, Q670E PCH, w/ Dual 10GbE, Dual 2.5GbE, HDMI + DisplayPort + eDP + LVDS, 2x SATA III, 2x COM, 2x M.2 (M2280/ E2230), supports iAMT(16.1) & dTPM (2.0), DC-in (24V only)
MI1001AF-Q	LGA1700 MiniITX Motherboard, Q670E PCH, w/ Dual 2.5GbE, HDMI + DisplayPort + eDP + LVDS, 2x SATA III, 2x COM, 2x M.2 (M2280/E2230), supports iAMT(16.1) & dTPM (2.0), DC-in (24V only)

## Dimensions and Drawing





## Specifications

CPU Socket	LGA1700
CPU	Intel® Core™ 200E / 200PE & 14th/13th/12th Gen Intel® Core™ i DT processor
PCH	R680E
Memory	2x DDR5 SO-DIMM sockets, supports DDR5 -5600 memory module , Max. 64GB *DDR5-5600 only by Core i7 Processor & 1R memory module*
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	SATA III & NVMe
Expansion Slots	1x PCIe (x16) [Gen 5.0]
Mini Type Slots	2x M.2 (M-Key, type:2280, PCIe(4x) Gen.4) 1x M.2 (E-Key, type:2230, USB 2.0 + PCIe 3.0)
Graphics Controller	14th Gen Intel® RPL-S Refresh DT processor integrated Xe graphics architecture
Video Output	1x eDP + 2x DisplayPort (1.4a) (DP++) + LVDS
Ethernet	LAN 1: Intel® I226LM , supports 2.5G and iAMT LAN 2: Intel® I226V, supports 2.5G only
I/O Chipset	Fintek F81964D-I
Serial Port	2x COM ports: 1x RS232/422/485 + 1x RS232
USB 2.0	4x USB 2.0 via pin-headers
USB 3.X	2x USB 3.2 (10Gbps)+ 4x USB 3.2 (5Gbps) @edge connector
Serial ATA	4x SATA III
Audio	Built-in HD audio controller + Realtek ALC888S w/ 7.1 channels
TPM	TPM(2.0)
Others	Digital I/O (4-in/4-out), Watchdog Timer, PDPC
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	14th Gen Intel® Core™ i9-14900 w/ 2x DDR5 32GB 5600 +12V:23.17A
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)

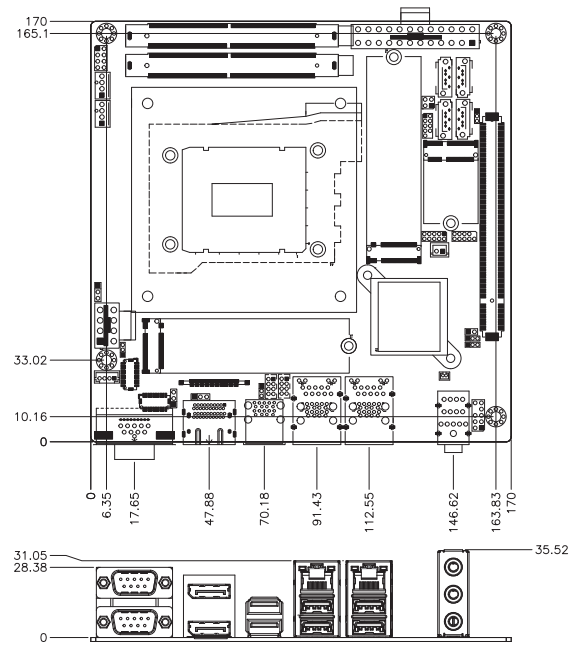
## Features

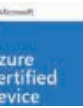
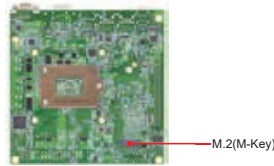
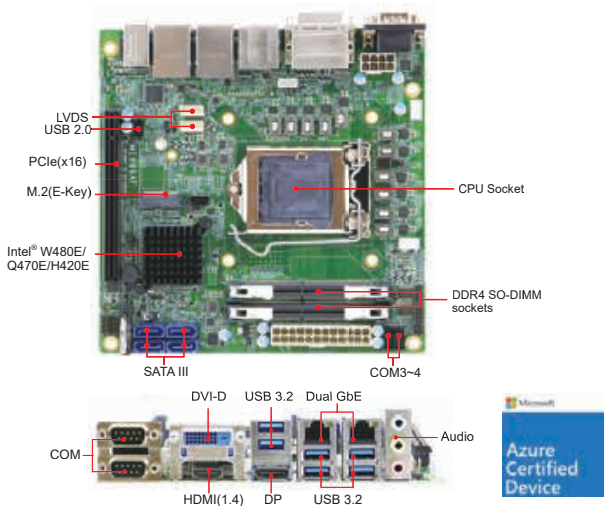
- Intel® Core™ 200E / 200PE & 14th/13th/12th Gen Intel® Core™ DT Processors with Intel® R680E PCH
- 2x DDR5 SO-DIMM sockets, Max. 64GB, support ECC
- Intel® processor integrated graphic Supports eDP, LVDS and 2x DisplayPort (1.4a) (DP++)
- 1x LAN 1: Intel® I226LM, Supports 2.5G and iAMT  
1x LAN 2: Intel® I226V, Supports 2.5G
- 6x USB 3.2, 4x USB 2.0, 2x COM, 4x SATA III
- 1x PCIe (x16) [Gen 5.0]; 3x M.2 (1x E-Key for WiFi/BT and 2x M-Key for NVMe)
- Supports Watchdog Timer, Digital I/O, iAMT (16.1), TPM (2.0)

## Ordering Information

MI1000AF-R	LGA1700 Mini-ITX Motherboard w /eDP, LVDS, 2x DisplayPort, 2x Dual 2.5GbE, 4x SATA, RAID, iAMT (16.1), dTPM
MI1000AF-R-1	LGA1700 Mini-ITX Motherboard w /eDP, LVDS, 2x DisplayPort, 2x Dual 2.5GbE, 4x SATA, RAID, iAMT (16.1), fTPM (2.0)

## Dimensions and Drawing





## Specifications

CPU Socket	LGA1200
CPU	10th Gen Intel® Xeon® W / Core™ / Pentium® / Celeron® processors, up to 4.8GHz
PCH	MI999AF-W: W480E MI999AF-Q: Q470E MI999EF-H: H420E
Memory	2x DDR4 SO-DIMM socket, Max. 64GB (supports ECC with CPU SKU)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x M.2 (M2280) NVMe
Expansion Slots	1x PCIe (X16)
Mini Type Slots	1x M.2(E-Key@2230), supports CNVI 1x M.2(M-Key@2280), supports NVMe (for MI999AF-W/MI999AF-Q Series only)
Graphics Controller	Intel® UHD Graphics 630
Video Output	Supports, DVI-D, HDMI (1.4b), DisplayPort (1.2), and eDP or 24-bit dual channel LVDS
Ethernet	1st LAN MI999AF-W/ MI999AF-Q: Intel® I219LM MI999EF-H: Intel® I219V 2nd LAN MI999AF-W: Intel® I210AT MI999AF-Q/ MI999EF-H: Intel® I211AT or I210AT
I/O Chipset	Fintek F81964D-I
Serial Port	MI999AF-W/ MI999AF-Q: COM1 ~ COM2 (RS232/422/485) MI999EF-H: COM1 ~ COM2 (RS232) COM3 ~ COM4: RS232
USB 2.0	4x USB 2.0 onboard
USB 3.X	6x USB 3.2 (Gen1, 5Gbps)
Serial ATA	4x SATA III
Audio	Built-in HD audio + Realtek® ALC888S codec
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out), RAID, iAMT (14) or Eup/ErP
Dimensions (L x W)	170mm x 170mm
Power Consumption	Intel® Core™ i5-10500E, 3.00GHz, with 2x 4GB DDR4 2133 +12V: 6.08A +5V: 1.19A +5Vsb: 0.11A +3.3V: 0.90A

## Features

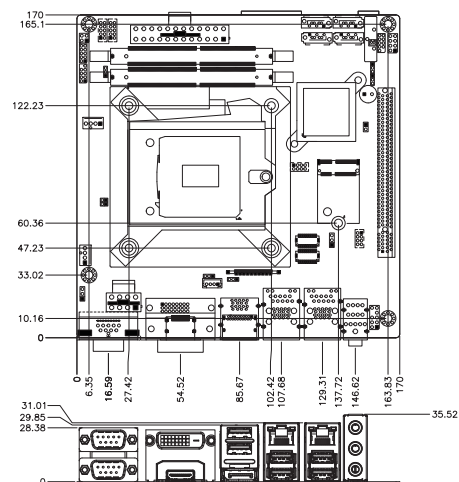
- 10th Gen Intel® Xeon® W / Core™ / Pentium® / Celeron® processors, up to 4.8GHz
- 2x DDR4 SO-DIMM, Max. 64GB, ECC compatible
- Intel® Processor integrated graphics, Supports DVI-D, HDMI, DisplayPort and 24-bit dual-channel LVDS or eDP
- Dual Intel® Gigabit LAN
- 6x USB 3.2, 4x USB 2.0, 4x COM, 4x SATA III
- 1x PCIe (x16), 2x M.2 (E-Key, M-Key)
- Watchdog Timer, Digital I/O, iAMT (14), TPM (2.0)

Operating Temperature	0°C ~ 60°C (32°F~140°F)
Storage Temperature	-20°C ~ 80°C (-4°F ~ 176°F)
Relative Humidity	95% (non-condensing @60°C)

## Ordering Information

MI999AF-W	LGA1200 W480E Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, LVDS, Dual Gigabit LAN, RAID, iAMT(14), TPM (2.0)
MI999AFE-W	LGA1200 W480E Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, eDP, Dual Gigabit LAN, RAID, iAMT(14), TPM (2.0)
MI999AF-Q	LGA1200 Q470E Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, LVDS, Dual Gigabit LAN, RAID, iAMT(14), TPM (2.0)
MI999AFE-Q	LGA1200 Q470E Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, eDP, Dual Gigabit LAN, RAID, iAMT(14), TPM (2.0)
MI999EF-H	LGA1200 H420E Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, LVDS, Dual Gigabit LAN, EuP/ErP, TPM (2.0)
MI999EFE-H	LGA1200 H420E Mini-ITX motherboard w/ DVI-D, HDMI, DisplayPort, eDP, Dual Gigabit LAN, EuP/ErP, TPM (2.0)

## Dimensions and Drawing



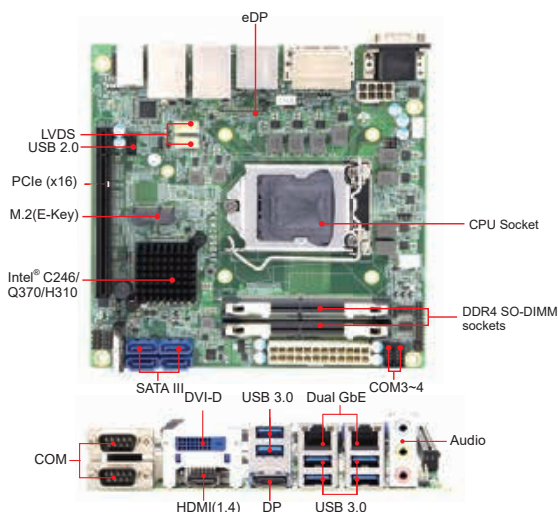
1 Single Board Computers

2 CPU Modules

3 Motherboards

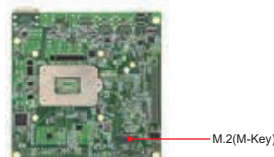
4 CPU Cards

5 COM-HPIC Module



### 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 USB 3.0, 2x USB 2.0, 4x COM, 4x SATA III
- 1x PCIe (x16), 2x M.2
- Watchdog Timer, Digital I/O, iAMT (11.6), TPM (2.0)



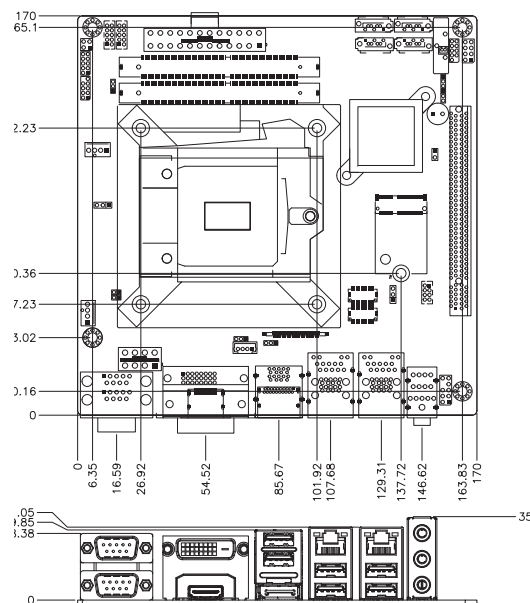
### Specifications

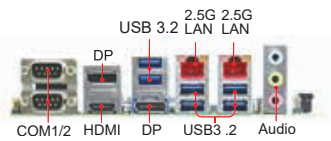
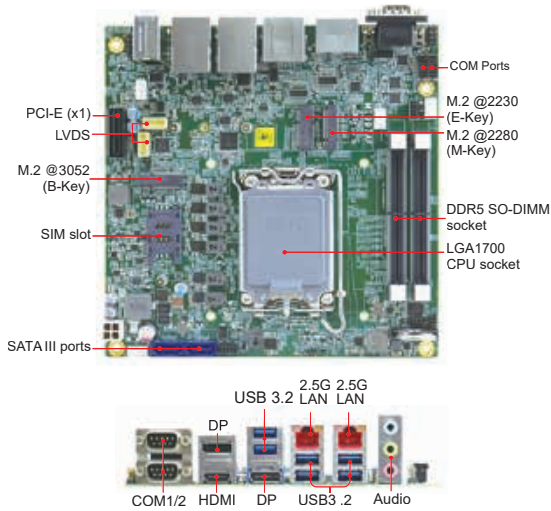
CPU Socket	LGA1151
CPU	9th/8th Gen Intel® Xeon® E / Core™ / Pentium® / Celeron® processors, up to 4.7GHz
PCH	MI998AF(E)-C246: Intel® C246 PCH MI998AF(E): Intel® Q370 PCH MI998EF(E): Intel® H310 PCH
Memory	2x DDR4 SO-DIMM, Max. 32GB (supports ECC by CPU SKU)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	NVMe
Expansion Slots	1x PCIe (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 or I210AT
I/O Chipset	Fintek F81964D-I
Serial Port	MI998AF(E)-C246: COM1 ~ COM2 (RS232/422/485) MI998AF(E): COM1 ~ COM2 (RS232/422/485) (Jumper-less selection) MI998EF(E): COM1 ~ COM2 (RS232) COM3 ~ COM4: RS232
USB 2.0	MI998AF-C246 / MI998AF: 2x USB 2.0 MI998EF: 2x USB 2.0
USB 3.X	MI998AF-C246 / MI998AF: 6x USB 3.0 MI998EF: 4x USB 3.0
SATA	4x SATA III
Audio	Intel® C246/ Q370/ H310 PCH-H built-in HD audio + Realtek ALC888S codec
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)

### 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)

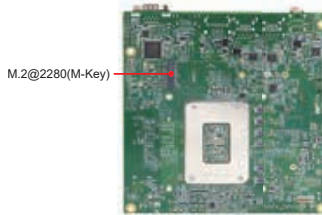
### Dimensions and Drawing





## Features

- 13th/12th Gen Intel® Core i7/i5/i3 and Celeron® DT Processors
- 2x **DDR5** SO-DIMM sockets, Max. 64GB
- Intel® processor integrated graphics Supports HDMI (2.0a), LVDS and 2x DisplayPort (1.4a) (DP++)
- Dual Intel® 2.5G LAN
- 4x USB 3.2, 2x USB 3.1, 2x USB 2.0, 4x COM, 2x SATA III
- 1x PCIe (x1) [Gen 3.0]; 4x M.2 (B-Key, E-Key and 2x M-Key)
- Watchdog Timer, Digital I/O, iAMT(16.0), fTPM
- 12V~24V DC input



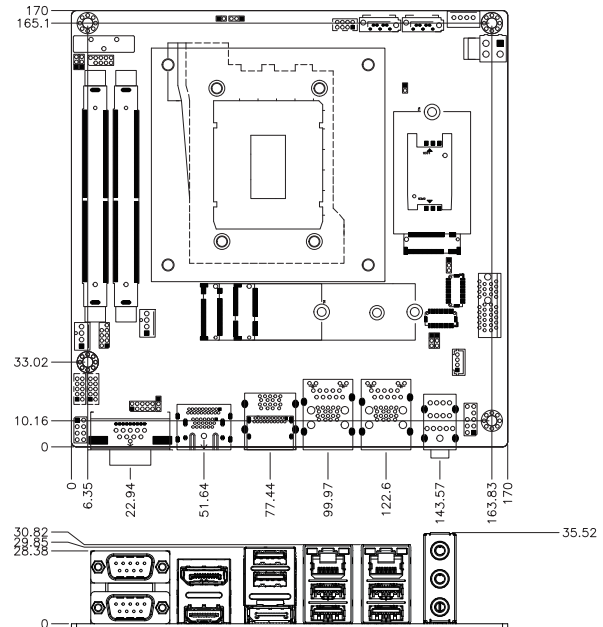
## Specifications

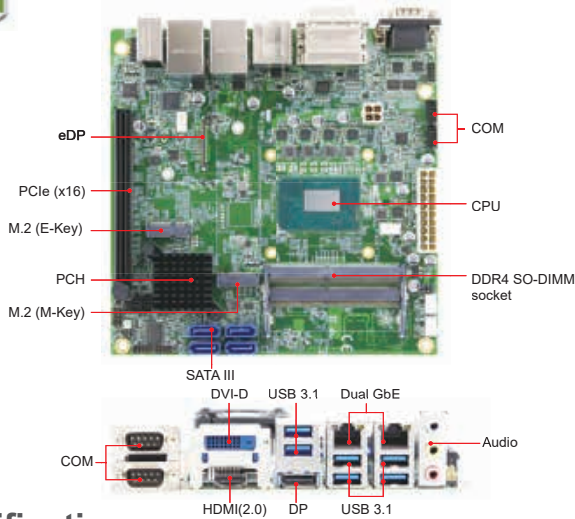
CPU Socket	LGA1700
CPU	13th/12th Gen Intel® Core™ i7/i5/i3 and Celeron® socket SoC Processors
PCH	N/A
Memory	2x <b>DDR5</b> SO-DIMM sockets, supports DDR5-4800 memory module, Max. 64GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	SATA III & NVMe
Expansion Slots	1x PCIe (x1) [Gen.3.0]
Mini Type Slots	2x M.2 (M-Key, type:2280, PCIe(4x) Gen.4) 1x M.2 (E-Key, type:2230, USB 2.0 + PCIe(1x)) 1x M.2 (B-Key, type:3052, USB 3.2 + PCIe(1x))
Graphics Controller	12th Gen Intel® Core™ i7/i5/i3 and Celeron® Processors
Video Output	1x HDMI (2.0a) + 2x DisplayPort (1.4a) (DP++) + LVDS
Ethernet	LAN 1: Intel® I226LM, supports 2.5G and iAMT LAN 2: Intel® I226V, supports 2.5G only
I/O Chipset	Fintek F81964D-I
Serial Port	4 COM ports : 2x RS232/422/485 + 2x RS232
USB 2.0	2x USB 2.0 via pin-header
USB 3.X	6x USB 3.2 (10 Gbps) @ edge connector
Serial ATA	2x SATA III
Audio	Built-in HD Audio controller + Realtek ALC888S w/ 7.1 channels
TPM	Supports fTPM
Others	Digital I/O (4-in/4-out), Watchdog Timer, SIM socket, 12V~24V DC-in
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Core™ i7-12700HL w/ 2x 32GB DDR5-4800 +12V:13.21A
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

MI997AF	LGA1700 Mini-ITX Motherboard w/ HDMI, LVDS, 2x DisplayPort, Dual 2.5GbE, 2x SATA, iAMT (16.0), TPM (2.0)
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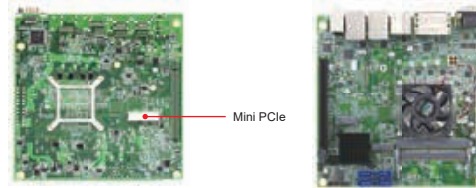
## Dimensions and Drawing





## Features

- Onboard 9th Gen Intel® Xeon® E / Core™ i7/i5/i3/ Celeron® processors
- 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 PCIe (x16), 1x Mini PCIe, 2x M.2
- Watchdog Timer, Digital I/O, iAMT (11.6), TPM (2.0), iSMART, vPRO (MI996VF series)



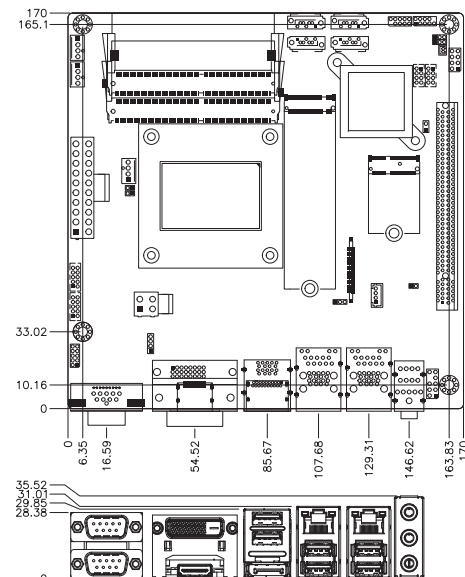
## Specifications

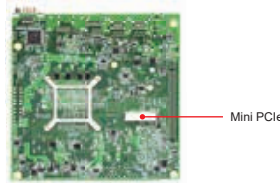
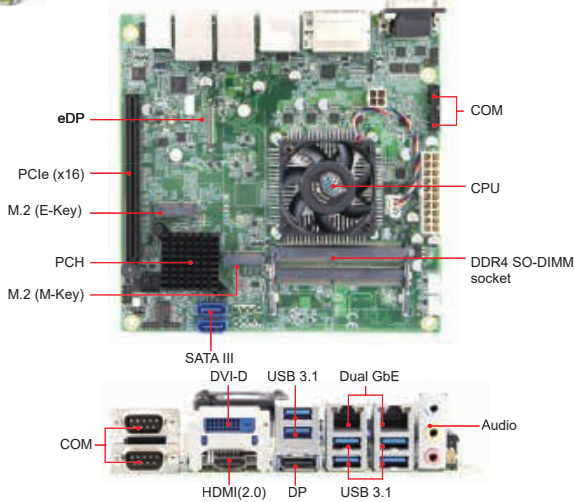
CPU Socket	FCBGA1440
CPU	9th Gen Intel® Xeon® E / Core™ i7/i5/i3 / Celeron® processors
PCH	MI996VF-X28/26: Intel® CM246 PCH MI996VF-9850: Intel® QM370 PCH MI996EF-9100/ 4930: Intel® HM370 PCH
Memory	2x DDR4-2666 SO-DIMM socket, Max. 32GB (supports ECC by CPU SKUs)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	mSATA, M.2
Expansion Slots	1x PCIe (x16)
Mini Type Slots	1x Mini PCIe 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 or I210AT Gigabit LAN
I/O Chipset	Fintek F81964D-I
Serial Port	2x RS232/422/485, 2x RS232
USB 2.0	4x USB 2.0 via pin header
USB 3.X	6x USB 3.1 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 + Realtek ALC888S codec
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® Xeon E-2176G, 3.7GHz w/ 8GB DDR4-2400 +12V: 7.73A, +5V: 1.59A, +5VBS: 0.17A, +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

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
MI996EF-9100	FCBGA1440 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	FCBGA1440 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





## 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 PCIe (x16), 1x Mini PCIe, 2x M.2
- Watchdog Timer, Digital I/O, iAMT (11.6), TPM (2.0), iSMART, vPRO (MI995VF series)

## Specifications

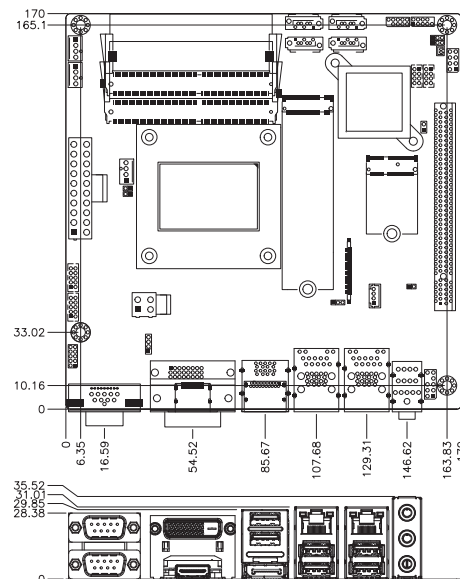
CPU Socket	FCBGA1440
CPU	8th Gen Intel® Xeon® E / Core™ i7/i5/i3 processors
PCH	MI995VF-X27: Intel® CM246 PCH MI995VF-8850/8400: Intel® QM370 PCH MI995EF-8100: Intel® HM370 PCH
Memory	2x DDR4-2666 SO-DIMM socket, Max. 32GB (supports ECC by CPU SKUs)
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	mSATA, M.2
Expansion Slots	1x PCIe (x16)
Mini Type Slots	1x Mini PCIe 1x M.2 (M-Key, type:2280, NVMe) 1x M.2 (E-Key, type:2230, CNVi)
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 or I210AT Gigabit LAN
I/O Chipset	Fintek F81964D-I
Serial Port	2x RS232/422/485, 2x RS232
USB 2.0	4x USB 2.0 via pin header
USB 3.X	6x USB 3.1 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 + Realtek ALC888S codec
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/ 2x 16GB DDR4-2133 +12V: 3.01A +5V: 1.43A +5VSB: 0.15A +3.3V: 0.32A

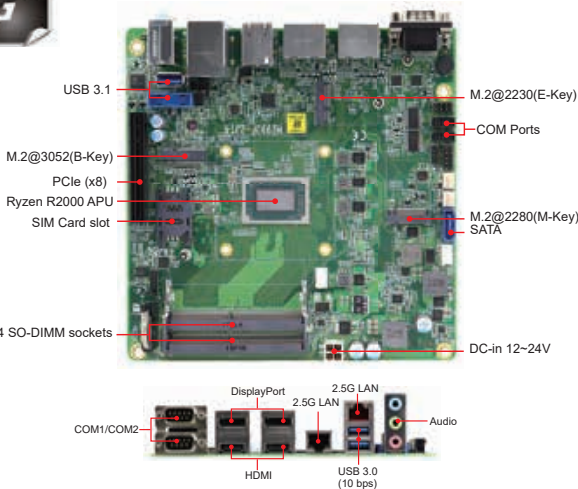
Operating Temperature	0°C~60°C ( 32°F~140°F)
Storage Temperature	-20°C~80°C (-4°F~176°F)
Relative Humidity	90% (non-condensing @60°C)

## 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	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





## Features

- AMD Ryzen™ Embedded R2000 series APU on board
- 2x DDR4 SO-DIMM sockets, Max. 32GB
- Dual Intel® 2.5G LAN
- 2x HDMI + 2x DisplayPort
- 5x USB 3.1, 2x USB 2.0, 4x COM, 1x SATA III
- 1x PCIe (x8), 3x M.2 (B-Key, E-Key and M-Key)
- Watchdog Timer, Digital I/O, TPM (2.0)

## Specifications

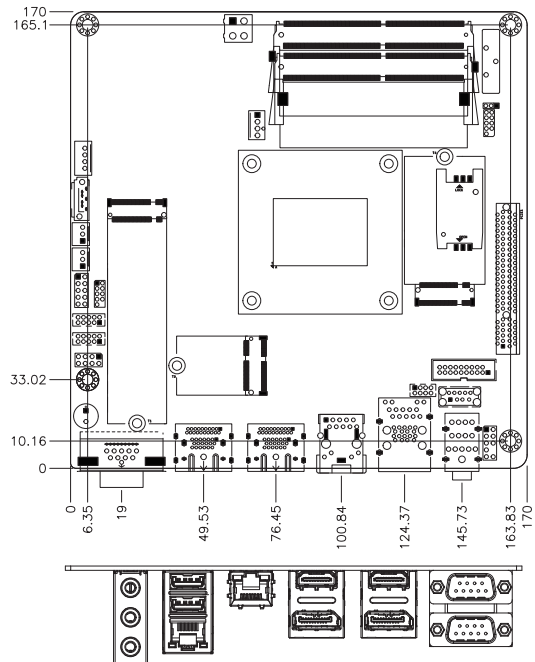
CPU Socket	BGA1440
CPU	AMD Ryzen™ Embedded R2514 / R2314 / R2312
PCH	N/A
Memory	2x DDR4-2666/2400 SO-DIMM socket, Max. 32GB, ECC compatible
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	M.2 (M-Key)
Expansion Slots	1x PCIe (x8) [R2514 & R2314] or 1x PCIe(x4) [R2312]
Mini Type Slots	1x M.2 (M-Key, type:2280, SATA + PCIe) 1x M.2 (E-Key, type:2230, USB 2.0 + PCIe) 1x M.2 (B-Key, type:3052, USB 3.1 + PCIe + SMBus) [R2514 & R2314]
Graphics Controller	AMD Radeon™ Graphics
Video Output	2x HDMI + 2x DP (R2514 & R2314) 2x HDMI + 1x DP (R2312)
Ethernet	LAN 1: Intel® I226V LAN 2: Intel® I226V (R2514 & R2314)
I/O Chipset	Nuvoton NCT6116D
Serial Port	4x COM ports: 2x RS232/422/485, 2x RS232
USB 2.0	2x USB 2.0 via pin header
USB 3.X	2x USB 3.2 (10Gbps)@ edge connector; 2x USB 3.1 (5Gbps) via onboard box-header 1x USB 3.1 (5Gbps) via onboard connector (R2514 & R2314)
Serial ATA	1x SATA III
Audio	Built-in HD Audio controller + Realtek ALC888S w/ 5.1 channels
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out), Watchdog Timer, SIM
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	AMD Ryzen™ Embedded R2514 3.35GHz / R2314 2.1GHz / R2312 2.1GHz w/ 1x 8GB DDR4-2666 +12V: ~2.9A +12V: ~2.2A +12V: ~1.9A
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)

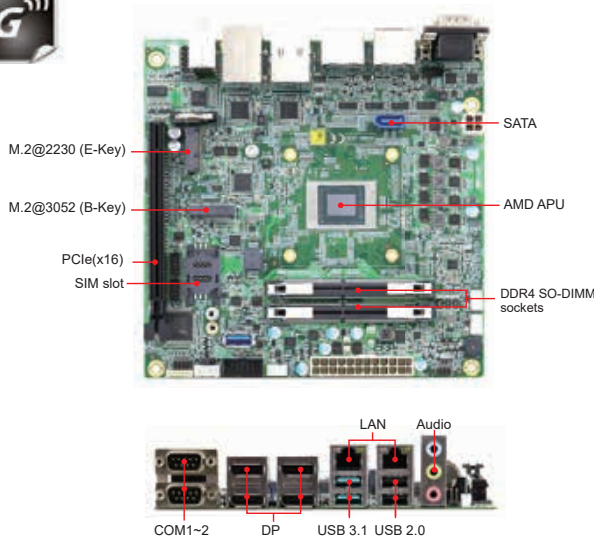
## Ordering Information

MI993F-2514	AMD Ryzen™ R2514 (2.1GHz~3.7GHz) APU onboard, 2x HDMI, 2x DisplayPort, 1x SATA, 2x 2.5G LAN, TPM (2.0), CPU cooler on board
MI993F-2314	AMD Ryzen™ R2314 (2.1GHz~3.5GHz) APU onboard, 2x HDMI, 2x DisplayPort, 1x SATA, 2x 2.5G LAN, TPM (2.0), CPU cooler on board
MI993F-2312	AMD Ryzen™ R2312 (2.7GHz~3.5GHz) APU onboard, 2x HDMI, 1x DisplayPort, 1x SATA, 1x 2.5G LAN, TPM (2.0), CPU cooler on board

\*Specifications are subject to change without prior notice

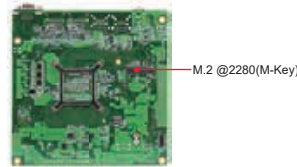
## Dimensions and Drawing





## Features

- AMD Ryzen™ Embedded V2000 Series on board
- 2x DDR4 SO-DIMM, Max. 64GB, ECC compatible
- Dual Intel® Gigabit LAN
- 4x DisplayPort 1.4
- 3x USB 3.1, 2x USB 2.0, 4x COM, 1x SATA III
- 1x PCIe(x16), 3x M.2 (B-Key, E-Key and M-Key)
- Watchdog Timer, Digital I/O, TPM (2.0)



## Specifications

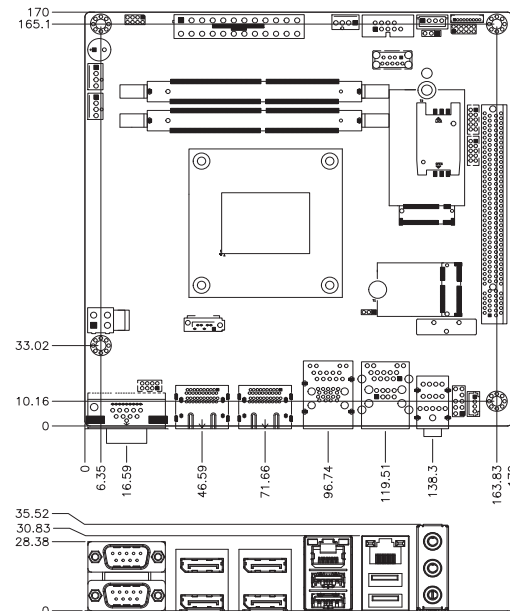
CPU Socket	BGA1140
CPU	AMD V2000 series APU on board
PCH	N/A
Memory	2x DDR4-3200 SO-DIMM socket, Max. 64GB, ECC compatible
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	2x M.2 (B-Key/ M-Key)
Expansion Slots	1x PCIe (x16)
Mini Type Slots	1x M.2 (E-Key, type:2230) 1x M.2 (B-Key, type:3052) 1x M.2 (M-Key, type:2280, NVMe)
Graphics Controller	AMD Radeon™ Graphics
Video Output	4x DisplayPort 1.4
Ethernet	2x Intel® I211AT or I210AT Gigabit LAN
I/O Chipset	F81966D-I
Serial Port	4x COM port
USB 2.0	2x USB 2.0
USB 3.X	3x USB 3.1 (10Gbps)
Serial ATA	1x SATA 3.0
Audio	Built-in HD audio + Realtek ALC888S codec
TPM	2.0
Others	Digital I/O, SIM socket
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	AMD Ryzen™ Embedded V2748 2.9GHz w/ 1x 8GB DDR4-3200 (Onboard or SO-DIMM) +12V: ~3.5A AMD Ryzen™ Embedded V2718 1.7GHz w/ 1x 8GB DDR4-3200 (Onboard or SO-DIMM) +12V: ~2.7A
Operating Temperature	0°C ~ 60°C (32°F ~ 140°F)
Storage Temperature	-20°C ~ 80°C (-4°F ~ 176°F)
Relative Humidity	95% (non-condensing @60°C)

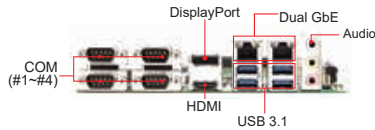
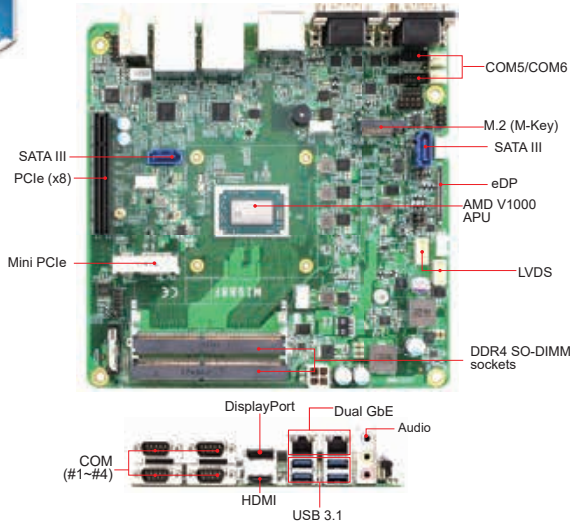
## Ordering Information

MI989F-2718	AMD Ryzen™ V2718 APU (1.7GHz~4.15GHz) on board Mini-ITX motherboard, with 4x DisplayPort, dual Gigabit LAN, TPM (2.0), EuP/ErP, CPU cooler on board
MI989F-2748	AMD Ryzen™ V2748 APU (2.9GHz~4.15GHz) on board Mini-ITX motherboard, with 4x DisplayPort, dual Gigabit LAN, TPM (2.0), EuP/ErP, CPU cooler on board

\*Specifications are subject to change without prior notice

## Dimensions and Drawing





## Features

- AMD Ryzen™ Embedded R2000/V1000 Series on board
- 2x DDR4 SO-DIMM, Max. 32GB
- 2x Gigabit LAN
- 1x HDMI(2.0a), 1x DisplayPort (1.2), 1x eDP or 1x 24-bit dual-channel LVDS
- 4x USB 3.1, 2x SATA III, 6x COM
- 1x PCIe (x8), 1x Mini PCIe socket, 1x M.2 (M-Key)

## Specifications

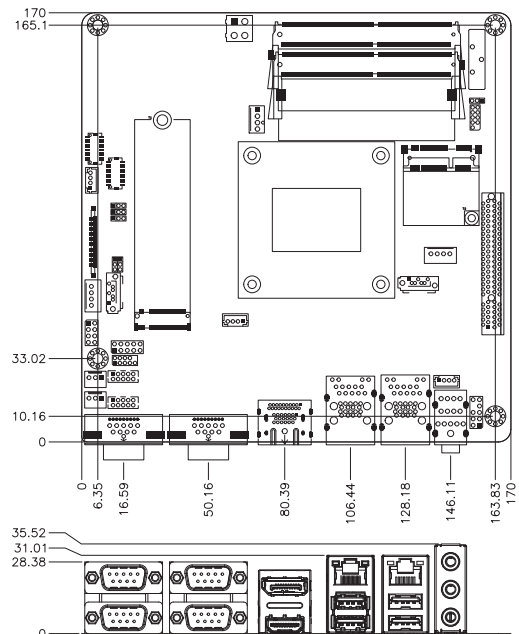
CPU Socket	BGA 1140 APU on board
CPU	AMD Ryzen™ Embedded R2000/V1000 Series on board
PCH	N/A
Memory	DDR4 SO-DIMM, supports ECC 2x DDR4-2666, Max. 32GB
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x M.2 (supports NVMe)
Expansion Slots	1x PCIe (x8), 1x M.2 (M-Key, type: 2280)
Mini Type Slots	1x Mini PCIe
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 or I210AT Gigabit LAN
I/O Chipset	Nuvoton NCT6116D
Serial Port	2x RS232/422/485 (jumperless selection) 4x RS232
USB 2.0	N/A
USB 3.X	4x USB 3.1 on board
Serial ATA	2x SATA III
Audio	Built-in HD audio + Realtek ALC888S codec
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)

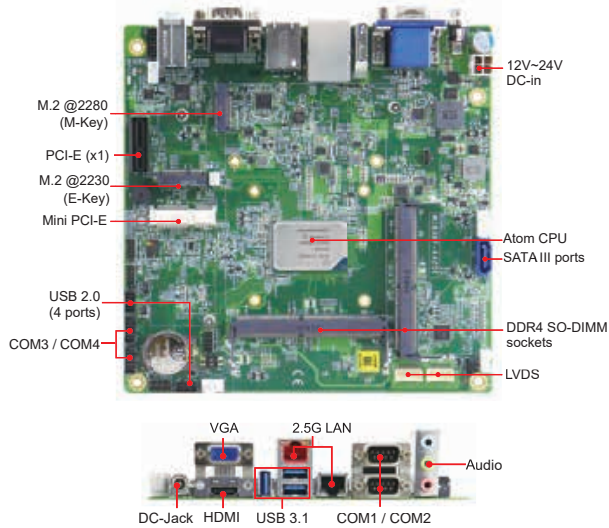
## Ordering Information

MI988FS-2514	AMD Ryzen™ R2514 (2.1GHz~3.7GHz) APU on board Mini-ITX motherboard, with HDMI (2.0), DP, eDP or LVDS, dual Gigabit LAN, iSMART, +12V~+24V DC-in
MI988FS-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, iSMART, +12V~+24V DC-in
MI988FS-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, iSMART, +12V~+24V DC-in
MI988FS-1605	AMD Ryzen™ V1605B QC APU (2.0GHz~3.6GHz) on board Mini-ITX, with HDMI(2.0), DP, eDP or LVDS, dual Gigabit LAN, iSMART, +12V~+24V DC-in
MI988FS-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

\*Specifications are subject to change without prior notice

## Dimensions and Drawing





## Features

- Onboard Intel® Atom® x6000 series processors
- 2x DDR4-3200 SO-DIMM sockets, Max. 32GB, Supports IBEC
- Intel® Atom® processor integrated graphics HDMI (2.0b), VGA and LVDS or eDP
- Dual Intel® 2.5G LAN (I226IT)
- 3x USB 3.1, 4x USB 2.0, 4x COM, 1x SATA III
- 1x PCIe (x1) [Gen 3.0], 1x mPCIe, 2x M.2 sockets (M-Key & E-Key)
- Watchdog Timer, Digital I/O, fTPM
- **Wide-range operating temperature from -40°C to +70°C**



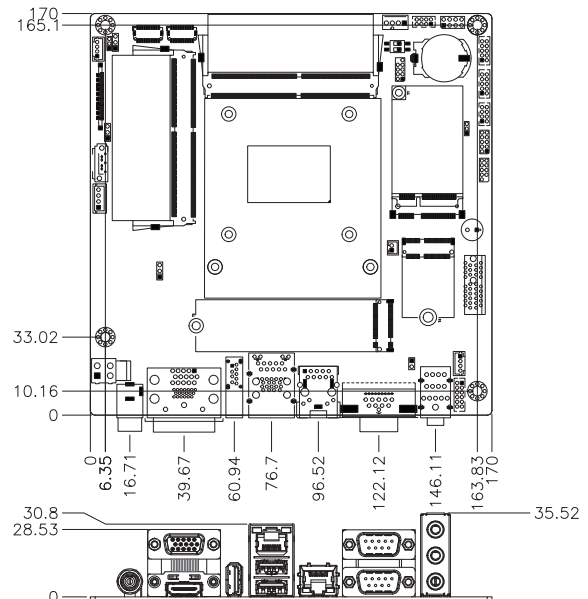
## Specifications

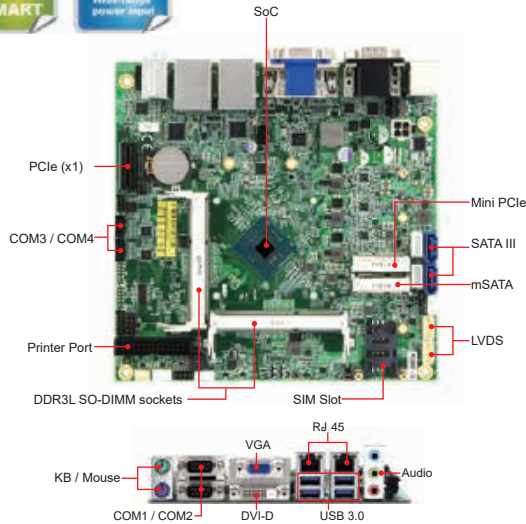
CPU	Intel® Atom® QC x6425E (2.0GHz / 3.0GHz) Intel® Atom® QC x6413E (1.5GHz / 3.0GHz) Intel® Atom® DC x6211E (1.3GHz / 3.0GHz)
PCH	Integrated in Intel® Atom® SoC
Memory	2x DDR4-3200 SO-DIMM, Max. 32GB
BIOS	AMI
Watchdog Timer	256 levels
Storage Device Interface	1x SATA III (shared with M.2)
H/W Monitor	Yes
Mini Type Slots	1x M.2 (M-Key, type:2280, SATA III) 1x M.2 (E-Key, type:2230, USB 2.0 + PCIe) 1x MiniPCIe (full-size, USB 2.0 + PCIe)
Expansion Slots	1x PCIe (x1) [Gen.3.0]
Graphics Controller	Intel® Atom® SoC integrated
Video Output	1x HDMI (2.0b) + 1x VGA + LVDS or eDP
Ethernet	LAN 1: Intel® I226IT LAN 2: Intel® I226IT
I/O Chipset	Fintek F81964D-I
Serial Port	4 COM ports: 2x RS232/422/485 + 2x RS232
USB 2.0	4x USB 2.0 via pin-header
USB 3.X	3x USB 3.1 (5Gbps) @ edge connector
Serial ATA	1x SATA III
Audio	Built-in HD audio controller + Realtek ALC888S with class-D amplifier
TPM	Supports fTPM
Others	Digital I/O (4-in/4-out), Watchdog Timer, +12V ~+24V DC-in, with fanless heatsink
Dimensions (L x W)	170mm x 170mm (6.7" x 6.7")
Power Consumption	Intel® Atom® x6425E 2.0GHz w/ 2x DDR4-2400 8GB [SEC Chipset] +12V : 1.74A
Operating Temperature	<b>-40°C ~ +70°C (-40°F ~ 158°F)</b>
Storage Temperature	-40°C ~ +80°C (-40°F ~ 176°F)
Relative Humidity	90% (non-condensing @60°C)

## Ordering Information

MI836F-6425E	Intel Atom® x6425E (2.0GHz~3.0GHz) + fanless heatsink onboard MiniITX, w/ Intel I226IT LAN x2, HDMI, VGA, LVDS, 12~24V DC-in, wide-temperature support
MI836FE-6425E	Intel Atom® x6425E (2.0GHz~3.0GHz) + fanless heatsink onboard MiniITX, w/ Intel I226IT LAN x2, HDMI, VGA, eDP, 12~24V DC-in, wide-temperature support
MI836F-6413E	Intel Atom® x6413E (1.5GHz~3.0GHz) + fanless heatsink onboard MiniITX, w/ Intel I226IT LAN x2, HDMI, VGA, LVDS, 12~24V DC-in, wide-temperature support
MI836FE-6211E	Intel Atom® x6211E (1.3GHz~3.0GHz) + fanless heatsink onboard MiniITX, w/ Intel I226IT LAN x2, HDMI, VGA, eDP, 12~24V DC-in, wide-temperature support

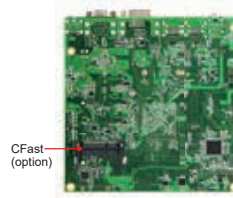
## Dimensions and Drawing





## 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
- Dual Intel® 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 PCIe (x1), 1x Mini PCIe, 1x mSATA, 1x CFAST



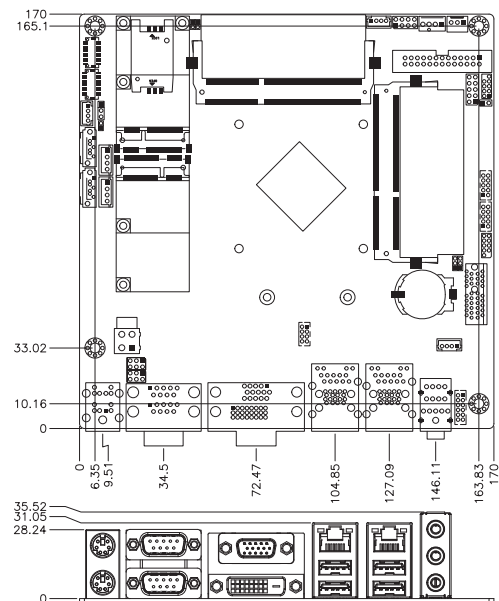
## Specifications

CPU Socket	FCBGA1170
CPU	Intel® Pentium® N3710, up to 2.4GHz or Celeron® N3010, up to 2.24GHz
PCH	N/A
Memory	2x DDR3L-1600 SO-DIMM socket, Max. 8GB
BIOS	AMI
Watchdog Timer	256 levels
Storage Device Interface	1x mSATA, 1x CFAST (option)
H/W Monitor	Yes
Expansion Slots	1x PCIe (x1)
Mini Type Slots	1x Mini PCIe
Graphics Controller	Intel® Pentium® SoC integrated Intel® Gen-8 graphics
Video Output	Supports DVI-D, CRT 24-bit dual-channel LVDS
Ethernet	Intel® I211AT or I210AT Gigabit LAN
I/O Chipset	Fintek F81846AD-I
Serial Port	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.X	4x USB 3.0 on board
Serial ATA	2x SATA III
Audio	Intel® Pentium SoC built-in HD audio + Realtek ALC269 codec
TPM	TPM (2.0)
Others	Digital I/O (4-in/4-out); 12V DC-in or 18V~24V DC-in; iSMART; TPM (2.0); SIM card slot, CFAST (option)
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) Mini-ITX motherboard with heatsink, DVI-D, VGA & LVDS, 2x Gigabit LAN, iSMART 3.2, TPM (2.0), DC-in 12V only
MI808FW-371	Intel® Pentium® N3710 (2.56GHz) Mini-ITX motherboard with heatsink, DVI-D, VGA & LVDS, 2x Gigabit LAN, iSMART 3.2, TPM (2.0), <b>18V~24V DC-in</b>
MI808F-301 (w/ MOQ)	Intel® Celeron® N3010 (2.24GHz) Mini-ITX motherboard with heatsink, DVI-D, VGA & LVDS, 2x Gigabit LAN, iSMART 3.2, TPM (2.0), DC-in 12V only
MI808FW-301 (w/ MOQ)	Intel® Celeron® N3010 (2.24GHz) Mini-ITX motherboard with heatsink, DVI-D, VGA & LVDS, 2x Gigabit LAN, iSMART 3.2, TPM (2.0), <b>18V~24V DC-in</b>

## Dimensions and Drawing



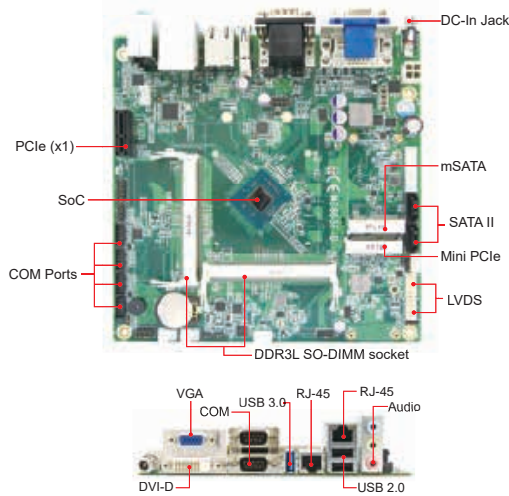
1 Single Board Computers

2 CPU Modules

3 Motherboards

4 CPU Cards

5 COM-HPC Module



## 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 Gigabit LAN
- Watchdog Timer, Digital I/O, iSMART
- 1x USB 3.0, 4x USB 2.0, 6x COM, 2x SATA II
- 1x PCIe (x1), 1x Mini PCIe, 1x mSATA



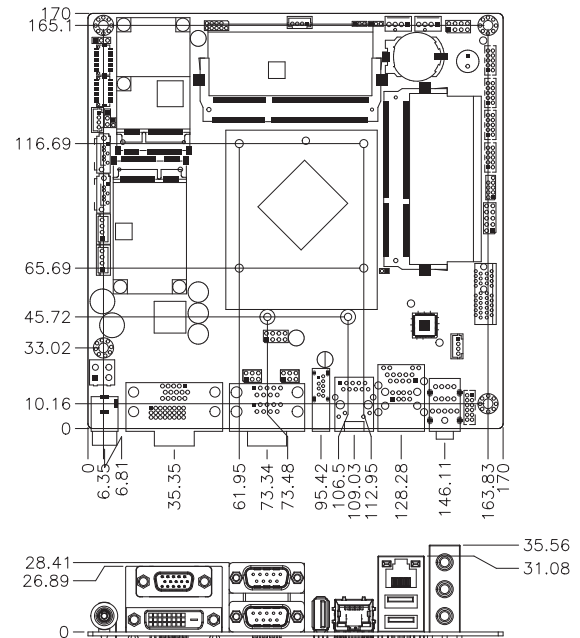
## Specifications

CPU Socket	FCBGA1170
CPU	Intel® Celeron® J1900 SoC (2.0GHz, 2MB cache)
PCH	N/A
Memory	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 PCIe (x1)
Mini Type Slots	1x Mini PCIe
Graphics Controller	Intel® Celeron® J1900 integrated Gen7 graphics
Video Output	Supports DVI-D, CRT 24-bit dual-channel LVDS
Ethernet	Intel® I211AT or I210AT Gigabit LAN
I/O Chipset	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.X	1x USB 3.0 on board
Serial ATA	2x SATA III
Audio	Intel® Celeron® J1900 built-in audio + 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 2.0GHz SoC Mini-ITX motherboard w/ DVI-D, VGA & LVDS, 2x Gigabit LAN, iSMART, with heatsink
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## Dimensions and Drawing



# Comparison Table

## Full-Size CPU Card

Models	IB996	IB995
<b>Form Factor</b>	Full-Size CPU Card (PICMG® 1.3)	Full-Size CPU Card (PICMG® 1.3)
<b>CPU Socket</b>	LGA1700	LGA1151
<b>CPU</b>	14th/13th/12th Gen Intel® Core™ i DT processors	9th/8th Gen Intel® Xeon® E / Core™ i7/i5/i3 / Pentium® / Celeron® DT processors
<b>CPU Max. Frequency</b>	Up to 5.8GHz	Up to 4.7GHz
<b>PCH</b>	Intel® R680E/Q670E	IB995AF-C246: Intel® C246 IB995AF: Intel® Q370 IB995EF: Intel® H310
<b>Memory</b>	2x DDR5 DIMM	2x DDR4 DIMM
<b>Max. Memory Size</b>	64GB	32GB
<b>BIOS</b>	AMI	AMI
<b>Graphics Controller</b>	Intel® DT processor integrated Xe graphics	Intel UHD Graphics P630
<b>Video Output</b>	24-bit dual-channel LVDS CRT DVI-D	24-bit dual-channel LVDS DVI-D and DVI-I on board
<b>Ethernet</b>	Intel® I226LM 2.5 Gigabit LAN Intel® I226V 2.5 Gigabit LAN	LAN 1: Intel® I219LM Gigabit LAN PHY (IB995AF-C246/IB995AF) Intel® I219V Gigabit LAN PHY (IB995EF) LAN2: Intel® I210AT Gigabit LAN
<b>Audio</b>	Built-in ALC888S HD audio codec	Built-in ALC888S HD audio codec
<b>SATA</b>	5x SATA III ports	5x SATA III ports (IB995AF-C246) 3x SATA III ports (IB995AF) 2x SATA III ports (IB995EF)
<b>I/O Chipset</b>	F81966AB-I	F81964D-I
<b>Parallel Port</b>	1x SPP/EPP/ECP port	1x SPP/EPP/ECP port
<b>Serial Port</b>	1x RS232/422/485 (jumperless selection) 3x RS232	3x RS232 1x RS232/422/485
<b>USB 2.0</b>	N/A	6x USB 2.0 (via pin header for IB995AF-C246/IB995AF, 1x via M.2, 1x via onboard Vertical type-A)
<b>USB 3.0/3.1</b>	7x USB 3.2 via rear I/O (4x via onboard pin header, 2x via rear I/O vertical type-A, 1x via onboard vertical type-A)	5x USB 3.0 (1x via rear panel, 4x via box-header for IB995AF-C246/IB995AF, 2x via box header for IB995EF)
<b>KB / MS</b>	NA	Combo PS/2
<b>Hardware Monitor</b>	Yes	Yes
<b>Storage Device Interface</b>	2x M.2	2x M.2
<b>Watchdog Timer</b>	256 levels	256 levels
<b>Digital I/O</b>	4-in/4-out	4-in/4-out
<b>Expansion Slots</b>	4x PCI, 4x PCIe (x1) or 1x PCIe (x4), 1x PCIe (x16) from backplane	4x PCI, 4x PCIe (x1) or 1x PCIe (x4), 1x PCIe (x16) from backplane
<b>Mini Type Slots</b>	1x M.2 (M-Key, type:2280, supports CNVI) 1x M.2 (E-Key, type:2230, supports NVMe)	1x M.2 (M-Key, type:2280, supports CNVI) 1x M.2 (E-Key, type:2230, supports NVMe)
<b>TPM</b>	1x M.2 (E-Key, type:2230) 2x M.2 (M-Key, type:2280)	2.0
<b>Power Input</b>	ATX type	ATX type
<b>Power Consumption</b>	Intel® Core™ i9-14900 Processor, Up to 5.80GHz ATLA AD5LHC16PBA1-CCA w/ 2x DDR5 5600 16GB +3.3V : 1.24A +5V : 0.35A +5VSB : 0.08A +12V : 23.45A	Intel® Core™ i7-9700K 3.60GHz Innodisk M4U0-BGS2KCIK-A35 w/ 2x DDR4-2666 32G +3.3V : 0.76A +5V : 0.93A +5VSB : 0.08A +12V : 12.08A
<b>Dimensions (L x W)</b>	338mm x 126mm	338mm x 126mm
<b>Extra Features</b>	iAMT (1.6), RAID(0&1, 5), LAN Wakeup	iAMT (1.6), RAID(0&1, 5), LAN Wakeup
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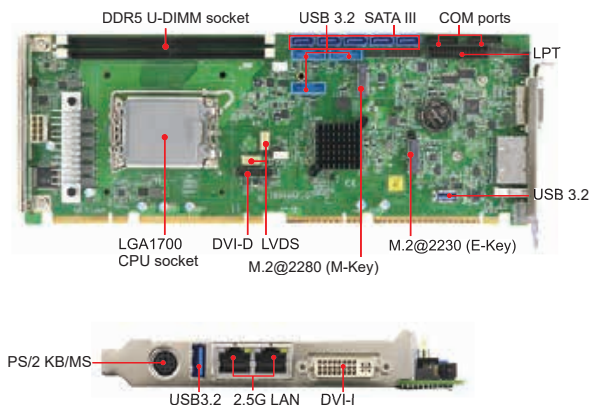
Motherboards

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CPU Cards

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COM-HPC Module



## Specifications

CPU Socket	LGA1700
CPU	14th/13th/12th Gen Intel® Core™ i9/i7/i5/i3 processors
PCH	Intel® R680E/Q670E PCH
Memorys	2x DDR5-5600MHz DIMM, Max. 64GB, Non-ECC
BIOS	AMI
Watchdog Timer	256 levels
H/W Monitor	Yes
Storage Device Interface	1x M.2 (supports NVMe)
Expansion Slots	4x PCI, 4x PCIe (x1) or 1x PCIe (x4) 1x PCIe (x16) from backplane
Mini Type Slots	1x M.2 (M-Key, type:2280, supports NVMe) 1x M.2 (E-Key, type:2230, supports CNV)
Graphics Controller	Intel® DT processor integrated Xe graphics
Video Output	Supports DVI-I, DVI-D, 24-bit dual channel LVDS
Ethernet	Intel® I226LM 2.5G LAN Intel® I226V 2.5G LAN (as 2nd LAN)
I/O Chipset	Fintek F81966AB-I
Serial Port	1x RS232/422/485 (jumperless selection), 3x RS232
USB 2.0	1x USB 2.0 via M.2 (E-Key)
USB 3.X	6x USB 3.2 on board 1x USB 3.2 on edge IO 1x USB 3.2 Type-A on board (vertical type)
Serial ATA	5x SATA III
Audio	Intel® PCH built-in HD audio controller + Realtek ALC888S codec
TPM	dTPM (2.0)
Others	Printer port, Digital I/O (4-in/ 4-out), RAID, iAMT (16.1)
Dimensions (L x W)	338mm x 126mm (13.3" x 4.96")
Max. Power Requirement	Intel® Core™ i9-14900 Processor, Up to 5.80GHz ATLA AD5LHC16PBA1-CCA w/ 2x DDR5 5600 16GB +3.3V : 1.24A +5V : 0.35A +5VSB : 0.08A +12V : 23.45A
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)

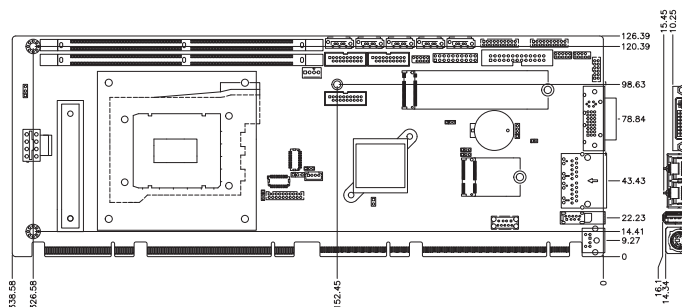
## Features

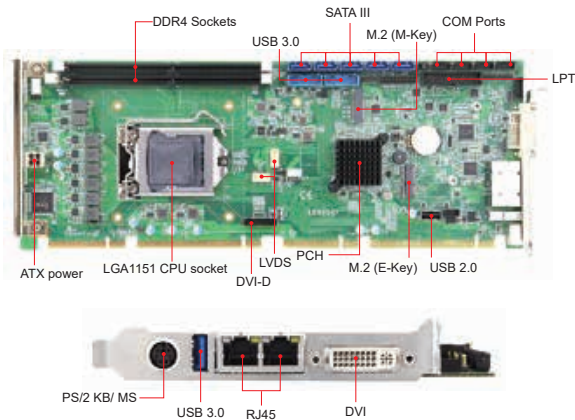
- 14th/13th/12th Gen Intel® Core™ i9/i7/i5/i3 Desktop Processors
- 2x DDR5 DIMM, Max. 64GB
- 2x Intel® 2.5G LAN
- Intel® processor integrated Xe graphics, Supports DVI-I & LVDS & DVI-D
- 8x USB 3.2, 5x SATA III, 4x COM, 1x PS/2 for KB/MS
- 2x M.2 socket (M-Key/E-Key)
- Supports dTPM (2.0) & iAMT(16.1)

## Ordering Information

IB996AF-Q	LGA1700 R680E/Q670E PICMG1.3 Full-Size CPU Card w/ DVI-I, LVDS, DVI-D, 2.5G LAN, iAMT (16.1), 5x SATA III
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## Dimensions and Drawing





## 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 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-Key/E-Key)

## 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
Memorys	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 PCIe (x1) or 1x PCIe (x4) 1x PCIe (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 or I210AT Gigabit LAN (as 2nd LAN) IB995AF-C246: Intel® I210AT Gigabit LAN (as 2nd LAN)
I/O Chipset	Fintek F81964D-I
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.X	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 ALC888S codec
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")

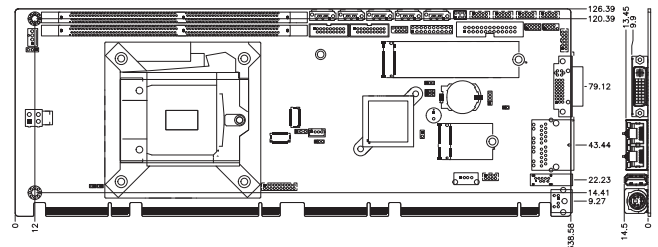
Power Consumption	Intel® Core™ i7-9700K 3.60GHz Innodisk M4U0-BGS2KCIK-A35 w/ 2x DDR4-2666 32G +3.3V : 0.76A +5V : 0.93A +5VSB : 0.08A +12V : 12.08A
Operating Temperature	0°C ~ 60°C(32°F ~ 140°F)
Storage Temperature	-20°C ~ 80°C(-4°F ~ 140°F)
Relative Humidity	90%(non-condensing @60°C)

## Ordering Information

IB995AFS-C246	LGA1151 C246 PICMG1.3 Full-Size CPU Card w/ DVI-I, DVI-D, LVDS, Dual Gigabit LAN, iAMT (11.6), 5x SATA III
IB995AFS	LGA1151 Q370 PICMG1.3 Full-Size CPU Card w/ DVI-I, DVI-D, LVDS, Dual Gigabit LAN, iAMT (11.6), 3x SATA III
IB995EFS	LGA1151 H310 PICMG1.3 Full-Size CPU Card w/ DVI-I, DVI-D, LVDS, Dual Gigabit LAN, 2x SATA III

\*(S) means with Realtek ALC888S codec

## Dimensions and Drawing



1 Single Board Computers

2 CPU Modules

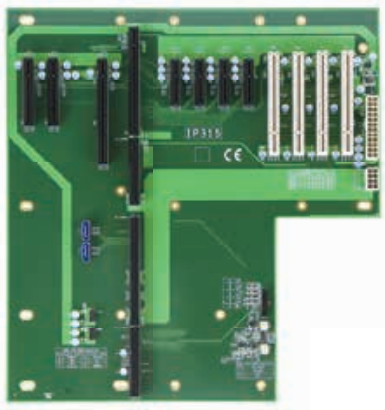
3 Motherboards

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5 COM-HPC Module

## IP315

### PICMG 1.3 12-Slot Backplane



#### Features

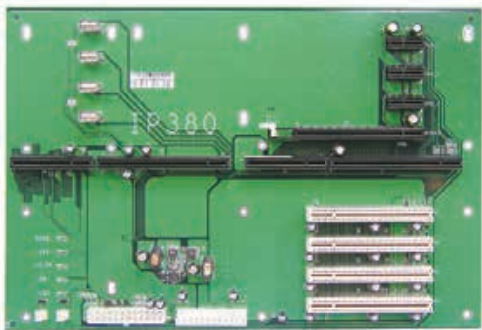
- 4-layer PCB
- AT / ATX power connector, ATX power outlet
- 4x CPI, 1x PCIe(x16), 2x PCIe(x8), 4x PCIe(x4)
- Size: 310mm x 327 mm (12.2" x 12.9")

#### Ordering Information

IP315	PICMG 1.3 12-slot Backplane W/ 1x PCIe(16x), 2x (PCIex8), 4x PCIe(x4), 4x PCI slot
-------	--

## IP380(L)

### PICMG 1.3 8-Slot Backplane



#### Features

- 4-layer PCB
- AT / ATX power connector
- 1x PCIe 16-lane slot, 3x PCIe 1-lane slots
- PICMG 1.3 connector(A: PCIe x16, B: PCIe x8, C: PCIe x16, D: PCIe 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 PCIe 16-lane and 3x PCIe 1-lane, 4x PCI
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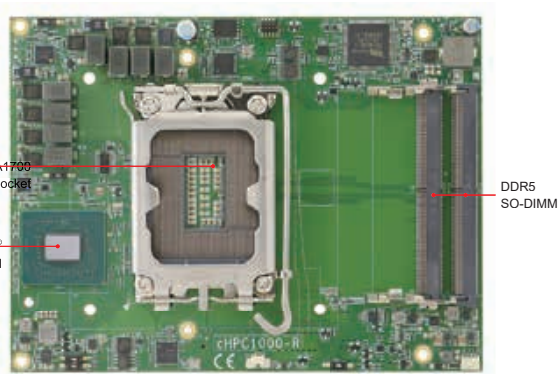
CPU Cards

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COM-HPC Module



Preliminary



## Features

- Intel® Core™ Series 200E & 14th/13th/12th Gen Core™ i Desktop processors
- 4x DDR5 SO-DIMM, Max. 128GB
- 3x DDI& 1x eDP on carrier board
- Dual 2.5GbE LAN
- 1x PCIe x16 [Gen 5.0], 3x PCIe x4 [Gen 4.0], 1x PCIe x4 [Gen 3.0], 1x PCIe x1 [Gen 3.0] to carrier board
- 8x USB 3.2 [Gen 2.0] (10Gbps), 8x USB 2.0, 2x SATA III, 2x UART
- Digital I/O, TPM (2.0), Watchdog Timer, Hardware Monitor



CHPC1000 with heatsink

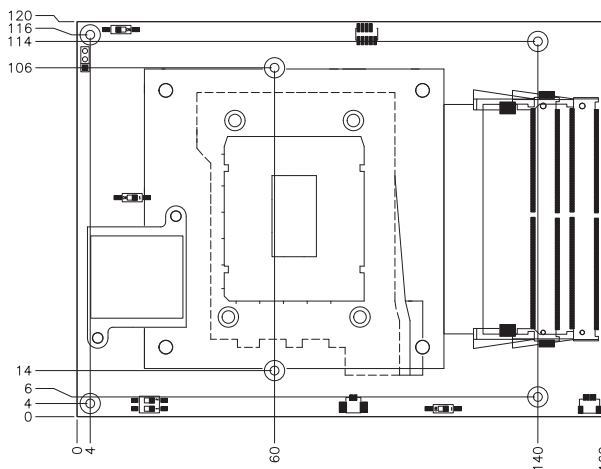
## Specifications

Form Factor	COM-HPC Client module (Size C)
Module Interface	COM-HPC Client Module (R1.2)
Expansions slots	1x PCIe x16 [Gen 5], 3x PCIe x4 [Gen 4], 1x PCIe x4 [Gen 3], 1x PCIe x1 [Gen 3] to carrier board
Mini Type Slots	N/A
Video Output	3x DDI& 1x eDP on carrier board
Ethernet	LAN1: 1x Intel® I226LM 2.5G LAN LAN2: 1x Intel® I226V 2.5G LAN
I/O Chipset	Fintek F81964D-I
Serial Port	2x UART
USB 2.0	8x USB 2.0 via carrier board
USB 3.X	8x USB 3.2 Gen 2 (10Gbps) via carrier board
Serial ATA	2x SATA III via carrier board
Audio	Integrated HD Audio controller
Digital I/O	6-in/6-out
Watchdog	256 level programmable Watchdog Timer
KB/MS	N/A
Parallel	N/A
Dimensions (L X W)	160mm x 120mm (6.3" x 4.7")
Power	TBD
Operating Temperature	0°C ~ 60°C ( 32°F ~ 140°F)
Storage Temperature	-20°C ~ 80°C (-4°F ~ 176°F)
Relative Humidity	90% RH (non-condensing @60°C)

## Ordering Information

CHPC1000	LGA1700 R680E COM-HPC Client module (Size C), w/ 4x DDR5 SO-DIMM, Dual 2.5G LAN, TPM (2.0) onboard
----------	--

## Dimensions and Drawing



1 Single Board Computers

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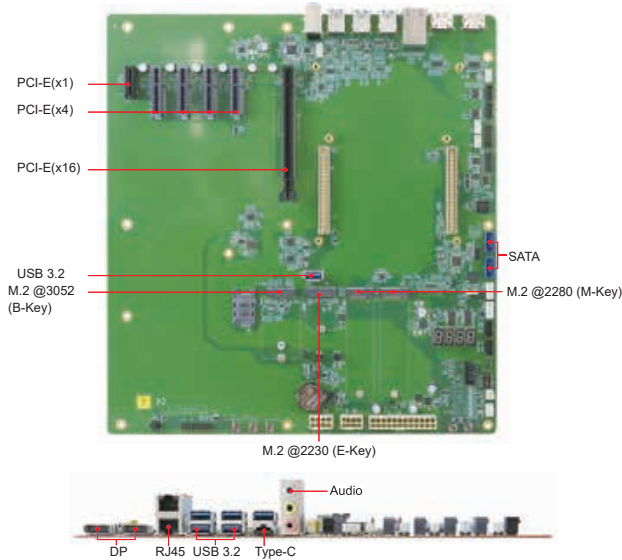
4 CPU Cards

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# IP460-HPC-C



Preliminary



## Features

- Supports COM-HPC® Client Module (Size A/B/C)
- Supports 1x eDP (x4), 3x DisplayPort
- Dual 2.5GbE LAN ports derived from COM-HPC Client module
- Supports 8x USB 3.2, 8x USB 2.0
- Supports 1x PCIe (x16)[Gen 5.0], 3x PCIe(x4) [Gen 4.0], 1x PCIe(x4)[Gen 3.0], 1x PCIe(x1) [Gen 3.0]
- Supports 4x M.2 slots (M-Key / E-Key / B-Key)

## Specifications

Form Factor	Extended ATX for COM-HPC Client modules
Module Interface	COM-HPC (Client) Carrier board [Rev 2.2]
Expansions slots	1x PCIe x16 (Gen 5) slot 3x PCIe x4 (Gen 4) slots 1x PCIe x4 (Gen 3) slot 1x PCIe x1 (Gen 3) slot
Mini Type Slots	1x M.2 2280 (M-Key, PCIe Gen 4 NVMe) 1x M.2 2280 (M-Key, PCIe Gen 3 NVMe) 1x M.2 2230 (E-Key, PCIe x1 / USB 2.0) 1x M.2 3052 (B-Key, PCIe / USB)
Video Output	1x eDP (x4), 3x DisplayPort (2x DP connector s+ 1x Type-C)
Ethernet	2x 2.5GbE (derived from COM-HPC Client module)
I/O Chipset	N/A
Serial Port	2x COM ports via onboard box headers
USB 2.0	8x USB 2.0 via COM-HPC Client module (5x Type A + 1x Type-C & 2x M.2)
USB 3.X	8x USB 3.2 Gen 2 (6x Type-A+ 1x Type-C & 2x M.2)
Serial ATA	2x SATA III
Audio	Realtek ALC888S-VD2-GR w/ TI TPA2012D2 amplifier
Digital I/O	6-in/6-out
Watchdog	256-level Watchdog Timer (module dependent)
KB/MS	N/A
Parallel	N/A
Dimensions (L X W)	305mm x 330mm (12" x 13")
Power	24-pin + 8-pin ATX power connectors
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

IP460	E-ATX COM-HPC Carrier Board, support COM-HPC Client modules
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# Mini PCIe Cards

IBD182



**Features:**

- PCIe to 2x RS232
- XR17V352 chipset
- 50.95mm x 30mm

IBD184



**Features:**

- PCIe to 4x RS232
- XR17V354 chipset
- 50.95mm x 30mm

IBD190



**Features:**

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

IBD192



**Features:**

- PCIe to 2x GbE LAN
- 2x Intel® I210-AT chipset
- 50.95mm x 30mm

IBD195



**Features:**

- PCIe to 2x CAN Bus
- dual-channel isolation
- 50.95mm x 30mm

IBD196



**Features:**

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

# M.2 Cards

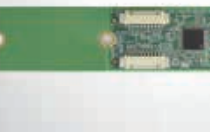
IMD101



**Features:**

- M.2 B-M to 2x 2.5GbE LAN
- 2x Intel® I226-IT chipset
- 22mm x 80 mm

IMD102



**Features:**

- M.2 B-M to 2x RS232
- F81504U chipset
- 22mm x 80 mm

IMD103



**Features:**

- M.2 B-M to 1x CAN bus
- F81601AN Chipset
- 22mm x 42 mm

# Embedded Function Cards

## Riser Cards



### IP405

#### Features

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



### IP116-R

#### Features

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



### IP118

#### Features

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



### IP119

#### Features

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

## Daughter Boards



### ID107

#### Features

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



### ID600

#### Features

- 90 mm x 70mm
- +19V ~+24V DC to DC converter
- 300W ATX power board



### ID452

#### Features

- 90 mm x 45mm
- +12V ~+24V DC to DC converter
- 120W ATX power board



### ID450-R

#### Features

- 90 mm x 45mm
- +12V only DC to DC converter
- 120W ATX power board

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## HEADQUARTERS

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## DOWNLOAD

EMBEDDED COMPUTING CATALOG



## WORLDWIDE OFFICES

### European Headquarters

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