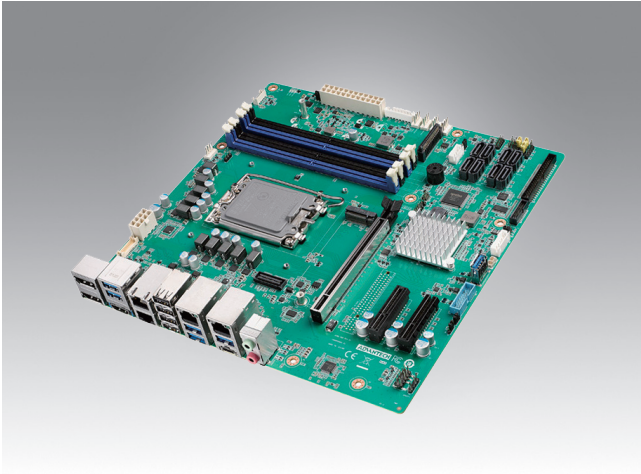


AIMB-588 B1

Intel® 12th/13th/14th Gen Core™ Processor MicroATX Motherboard with 2 DP/HDMI/eDP, 4 LAN up to 2.5GbE LAN (Alder Lake-S/Raptor Lake-S/Raptor Lake-S Refresh)



Features

- Intel® 12/13/14th Gen Core™ i9/i7/i5/i3 processors with Q670E/ R680E/ H610E chipsets
- 3 2.5GbE LAN and 1 GbE LAN for digital devices
- Up to 192GB DDR5 UDIMMs for data transfer
- High speed expansions: PCIe x16 Gen5, 8 USB3.2, 1 USB3.2 Type C
- 1 internal USB3.2 type A to support USB keylock functions
- Quad displays by 2 DPs, HDMI, and eDP
- WISE-DeviceOn and Embedded Software APIs

Software APIs:



Utilities:



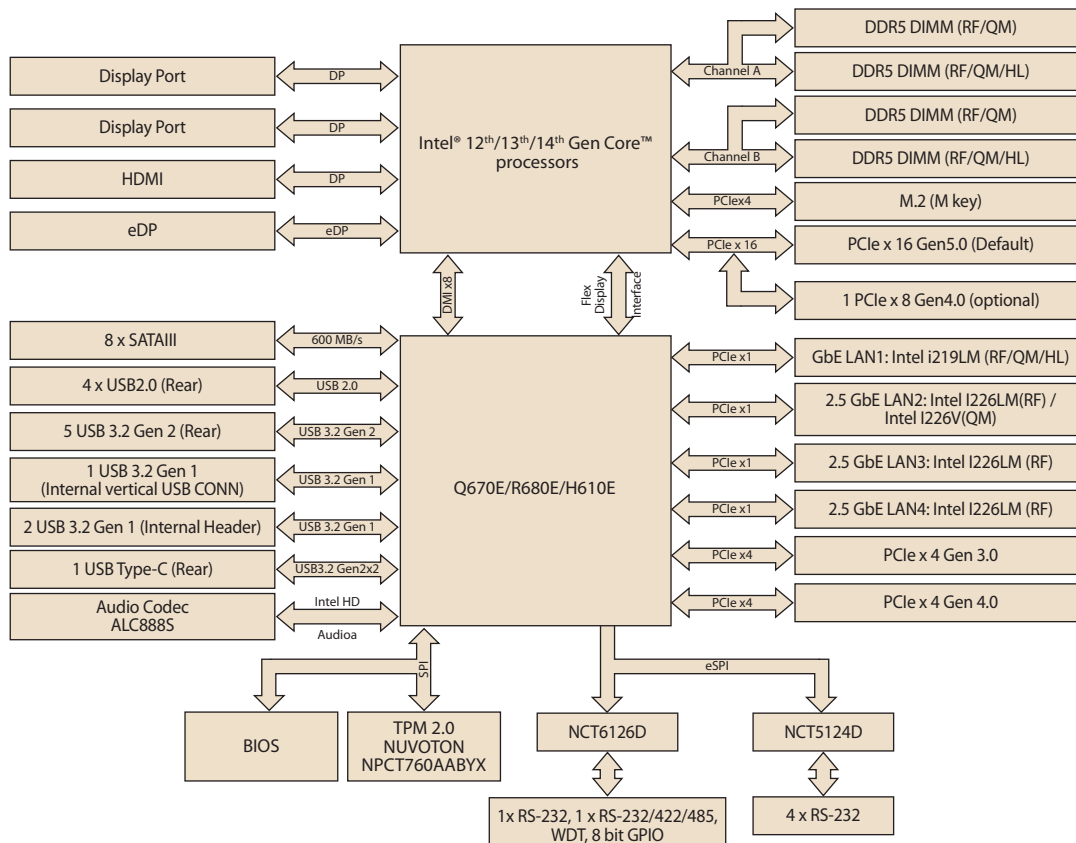
Specifications

14th Processor System	CPU	i9-14900/ i9-14900T	i7-14700/ i7-14700T	i5-14500/ i5-14500T	i5-14400/ i5-14400T	i3-14100/ i3-14100T	Intel® Processor 300	Intel® Processor 300T				
	Core Number (Performance and Efficient core)	8P+16E	8P+12E	6P+8E	6P+4E	4P	2P	2P				
	Max. Speed	5.8/ 5.5GHz	5.4/ 5.2GHz	5.0GHz/ 4.8GHz	4.7GHz/ 4.5GHz	4.7GHz/ 4.4GHz	3.9GHz	3.4GHz				
	Smart cache	36M	33M	24M	20M	12M	6M	6M				
	TDP	65W/35W	65W/35W	65W/35W	65W/35W	60W/35W	46W	35W				
	ECC memory support (with chipset R680E)	Yes	Yes	Yes	No	No	Yes	Yes				
13th Processor System	CPU	i9-13900E/ i9-13900TE	i7-13700E/ i7-13700TE	i5-13500E/ i5-13500TE	i3-13100E/ i3-13100TE	i9-13900	i7-13700	i5-13500	i5-13400	i3-13100		
	Core Number (Performance and Efficient core)	8P+16E	8P+8E	6P+8E	4P+0E	8P+16E	8P+8E	6P+8E	6P+4E	4P+0E		
	Max. Speed	5.20GHz/ 5.00GHz	5.10 GHz/ 4.80 GHz	4.60 GHz/ 4.50 GHz	4.40 GHz/ 4.10 GHz	5.60 GHz	5.20 GHz	4.80 GHz	4.80 GHz	4.50 GHz		
	Intel Smart Cache	36MB/36MB	30MB/30MB	24MB/24MB	12MB/12MB	36MB	30MB	24MB	20MB	12MB		
	TDP (W)	65W/35W	65W/35W	65W/35W	60W/35W	35W	35W	65W	65W	60W		
	ECC memory support (with chipset R680E)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No		
12th Processor System	CPU	i9-12900E/ i9-12900TE	i7-12700E/ i7-12700TE	i5-12500E/ i5-12500TE	i3-12100E/ i3-12100TE	G7400E/ G7400TE	G6900E/ G6900TE	i9-12900	i7-12700	i5-12500	i5-12400	i3-12100
	Core Number (Performance and Efficient core)	8P+8E	8P+4E	6P+0E	4P+0E	2P+0E	2P+0E	8P+8E	8P+4E	6P+0E	6P+0E	4P+0E
	Max. Speed	5.0GHz/ 4.8GHz	4.8GHz/ 4.7GHz	4.5GHz/ 4.3GHz	4.2GHz/ 4.0GHz	3.6GHz/ 3.0GHz	3.0GHz/ 2.4GHz	5.10GHz	4.9GHz	4.6GHz	4.4GHz	4.3GHz
	Intel Smart Cache	30MB/30MB	25MB/25MB	18MB/18MB	12MB/12MB	6MB/6MB	4MB/4MB	30MB	25MB	18MB	18MB	12MB
	TDP (W)	65W/35W	65W/35W	65W/35W	60W/35W	46W/35W	46W/35W	65W	65W	65W	65W	60W
	ECC memory support (with chipset R680E)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Chipset	Q670E/R680E/H610E											
BIOS	AMI BIOS UEFI 256 Mbits SPI											
Expansion Slot	PCIe x16 (Gen5)	1 slot										
	PCIe x8 (Gen4)	(1 slot, optional)										
	PCIe x4 (Gen3)	1 slot										
	PCIe x4 (Gen4)	1 slot										
Memory	Technology	Dual Channel DDR5 up to 5600 MT/s, ECC memory supported by all CPU only with Chipset R680E										
	Max. Capacity	192GB (48 GB per DIMM)										
	Frequency	5600MT/s (1DPC - 1DIMM 1R), 4400MT/s (2DPC - 1DIMM 1R&2R), 4000MT/s (2DPC - 2DIMM 1R), 3600MT/s (2DPC - 2DIMM 2R)										
	Socket	588RF/588QM: Four 288-pin DDR5 UDIMM sockets(Dual Channel, Two DIMMs per channel) 588HL: Two 288-pin DDR5 UDIMM sockets, (Dual Channel, One DIMM per channel)										
Graphics	Controller	Intel UHD Graphics 770 Supports DirectX12, OpenGL 4.5										
	HDMI	1, up to resolution 4096 x 2160 @ 60Hz. Supports HDR										
	eDP	1, up to resolution 3840 x 2160 @ 60 Hz (Internal pin header)										
	Display Port	2, up to 4096 x 2304 @ 60Hz										
Multi-Display	Up to 4 independent displays (4 with R680E/Q670E)											
Ethernet	Controller	LAN1: 1GbE Intel I219-LM (AIMB-588RF/AIMB-588QM/AIMB-588HL) LAN2: 2.5GbE Intel I226LM (AIMB-588RF): 2.5GbE Intel I226V (AIMB-588QM) LAN3: 2.5GbE Intel I226LM (AIMB-588RF) LAN4: 2.5GbE Intel I226LM (AIMB-588RF)										
	Connector	RJ45 x2 (588QM) / RJ45 x4 (588RF) / RJ45 x1 (588HL)										

Specifications (Cont.)

SATA	Max Data Transfer Rate	600 MB/s Max. (SATA 3.0)			
	Q'ty	RJ45 x2 (588QM) / RJ45 x4 (588RF) / RJ45 x1 (588HL)			
Rear I/O	Display Port	2			
	HDMI	1			
	Ethernet	2 (AIMB-588QM); 4 (AIMB-588RF); 1(AIMB-588HL)			
	USB	AIMB-588QM: 4 USB 3.2 Gen2 type A; 1 USB 3.2 Gen1 type A; 1 USB3.2 Gen2 Type C; 4 USB 2.0 type A AIMB-588RF: 5 USB 3.2 Gen2 type A; 1 USB 3.2 Gen2 Type C; 4 USB 2.0 type A AIMB-588HL: 2 USB 3.2 Gen2 type A; 4 USB 2.0			
	Audio	2 (Mic-in/ Line-out)			
Internal Connector	USB 3.2	AIMB-588QM: 3 USB 3.2 Gen1 AIMB-588RF: 3 USB 3.2 Gen1 AIMB-588HL: 2 USB 3.2 Gen1			
	USB 2.0	0			
	Serial	6 (5 x RS-232, 1 x RS-232/422/485 with auto flow control)			
	SATA 3.0	8			
	Extended Display Port (eDP)	1			
	M.2 (M key)	1 2280 NVMe PCIe4 (AIMB-588QM/AIMB-588RF)			
Watchdog Timer	GPIO	8-bit GPIO			
	Output Interval	System reset Programmable 1 ~ 255 sec/min			
Power Requirements	Power On	+5 V	3.3 V	12 V	12V_8P 5 Vsb
		19.6A	24.04A	19A	18.5A 2.5A
Environment	Temperature	Operating 0 ~ 60 °C (32 ~ 140 °F), depends on CPU speed and cooler solution			Non-Operating -40 ~ 85 °C (-40 ~ 185 °F)
	Dimensions	244 mm x 244 mm (9.6" x 9.6")			
Physical Characteristics	Input Mode	ATX input			

Block Diagram



Ordering Information

P/N	Chipset	USB 3.2 Gen 2	USB 3.2 Gen 1	USB Typc-C Gen 2x2	USB 2.0	PCIe x16* Gen5	PCIe x8* Gen4	PCIe x4 Gen3	PCIe x4 Gen4	GbE LAN	2.5GbE LAN	DP	HDMI	eDP	SATA III	COM	M.2 M-key	TPM
AIMB-588QM-0AB1	Q670E	4	4	1	4	1	0	1	1	1	1**	2	1	1	8	6	1	1
AIMB-588RF-0AB1	R680E	5	3	1	4	1*	0 (1)*	1	1	1	3***	2	1	1	8	6	1	1
AIMB-588HL-0AB1	H610E	2	2	0	4	1	0	1	0	1	0	2	1	1	4	6	0	1

() means BOM option

* BOM option support: PCIe x8 Gen5 signals at PCIe16 slot and PCIe x8 Gen4 signals at PCIe8 slot

** LAN2: 2.5GbE Intel I226V

*** LAN2: 2.5GbE Intel I226LM; LAN3: 2.5GbE Intel I226LM; LAN4: 2.5GbE Intel I226LM

Packing List

Part Number	Description	Quantity
1700003194	SATA HDD cable	2
19Z0002619T000	I/O port bracket	1
1930006770-01	M.2 device screw	2
2046058811	AIMB-588 B1 Startup Manual	1

Optional Accessories

Part Number	Description
1700020277-01	Dual port USB 3.0 cable 30cm with IO bracketDual port USB 2.0 cable 27cm with bracket
1700034131-01	F Cable IDE#2 20P-1.27/D-SUB 9P(M)x2 60CM shield
1700000447	1-to-4 serial ports cable kit, 45cm
1701400181	1-to-4 serial ports cable kit, 18cm
1970005349T001	LGA1700 CPU Cooler (for CPU TDP <= 65W), H: 56.5mm
1970005672T001	LGA1700 CPU Cooler (for CPU TDP <= 35W), H: 32mm

Note: screws P/N: 1933030500 for ACP-1010MB, 1930004607 for HPC-7120S

I/O View



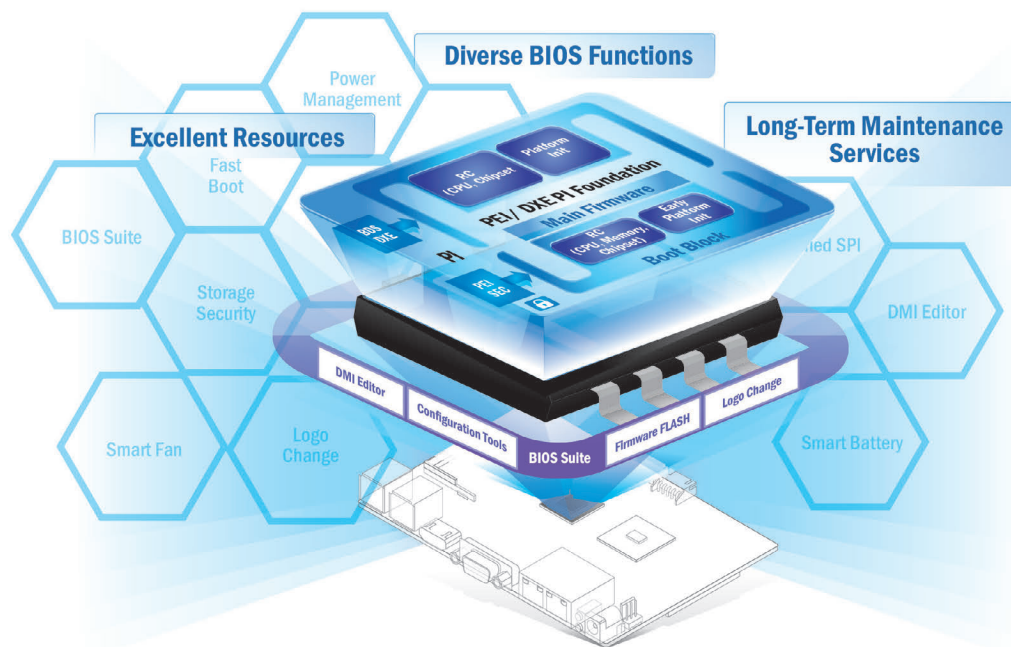
Embedded OS/API

OS/API	Part No.	Description
win10 IoT Ent	20706WX1HS0017	img W10 21HL (Eng)
	20706WX1VS0017	img W10 21VL (Eng)
	20706WX1ES0017	img W10 21EL (Eng)

Reliable Embedded BIOS Solutions

Custom BIOS services with long-term support

Advantech's high-quality embedded BIOS solutions deliver rapid execution and feature expert BIOS team support. These solutions feature multi-functional designs that ensure security and enable power/boot management. Advantech further provides 10+ years of BIOS version management, internal management, and longevity support for both hardware and BIOS — enhancing application efficiency, diversifying functionality, and optimizing performance.



Embedded BIOS Solution Advantages

Sufficient Sources

- Strong partnership with BIOS vendors
- 50+ engineers with extensive industrial BIOS experience

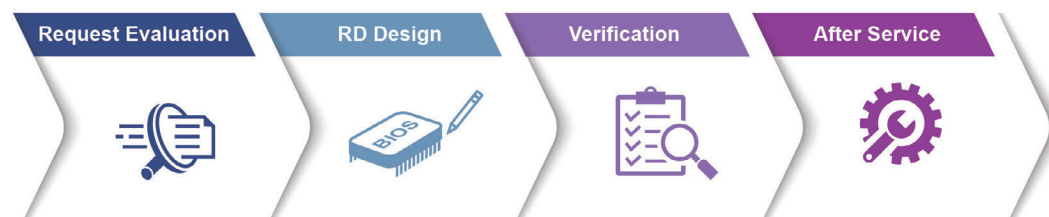
Diverse BIOS Functions

- Multi-layer security
- 3 second fast boot
- Power management
- BIOS suite utility

Long-Term Maintenance Services

- Platform longevity support
- 10-year BIOS version control
- BIOS remote backup

Value-Added Customization Process



WISE-DeviceOn

Massive IoT Device Management Utility

IoT deployment and management typically involves numerous disparate devices installed on multiple sites. These devices require effective monitoring, managing, and tracking. Advantech's easy-to-use WISE-DeviceOn interface enables users to remotely monitor device health, troubleshoot problems, and send software/firmware updates over-the-air (OTA). In sum, DeviceOn empowers quick real-time responsiveness to emerging problems.



Features

Comprehensive Management	Remote Access	Efficient Operations
<ul style="list-style-type: none"> • Devices status • Peripherals/firmware • Open for extension 	<ul style="list-style-type: none"> • Real-time monitoring • Remote controls • Troubleshooting 	<ul style="list-style-type: none"> • Zero-touch on-boarding • OTA updates • Batch control

Product Highlights



SOM-6883

High-performance 11th Gen Intel[®] COMe Type 6 Module



MIO-5375

Compact 11th Gen Intel[®] Outdoor Focused 3.5" SBC



EPC-B5587

10th Gen Intel[®] Xeon[®] based Edge server



EPC-R3220

Arm based IoT Edge Gateway

Edge AI Suite

AI development for diverse application at the Edge

Increasing demand for AI inference/analytic capabilities at the Edge make AI training models, software development environments, and hardware configuration key factors in successful solution deployment. Advantech's Edge AI Suite helps users build AI demo devices quickly and choose optimal hardware solutions easily.



5x Performance Boost	All-in-one Installation	One Click AI Experience	Plug-and-play Environment	Discover Cost-effective Hardware
<ul style="list-style-type: none"> Integrated Intel® OpenVINO™ technology Boost AI using Advantech hardware 	<ul style="list-style-type: none"> Build AI environment in under 5 minutes Ready-to-use configuration 	<ul style="list-style-type: none"> User friendly configuration guidance One-click Benchmark acquisition 	<ul style="list-style-type: none"> Easy access to 100+ AI inference extensions Software development package available 	<ul style="list-style-type: none"> Diverse CPU/RAM options Find hardware solutions for AI development

Embedded Linux Support and Design-in Services

Hardware Certified Ubuntu and Yocto with Eco Partner Services

Linux is the most popular embedded OS for transportation, outdoor services, factory automation, and mission critical applications. Its open source and kernel reliability features ease security updates, and make it particularly adaptable to new AI and Edge computing technology. Advantech has cooperated with Canonical and other software partners to provide hardware certified Ubuntu image and Yocto BSP as Linux offerings. The Advantech, Embedded Linux, and Android Alliance (ELAA) delivers local software services and consultation.



Features

Certified OS and BSP	Licensed Services	Numerous AI and Edge Resources	Local Partner Alliance
<ul style="list-style-type: none"> Platform compatibility tests Preloaded functional driver and software stacks 	<ul style="list-style-type: none"> License authorized Canonical delivers 10-years of bug fixes and security updates In-house bundled service 	<ul style="list-style-type: none"> Containerized technology for service provision and deployment AI resources from Caffe, TensorFlow, and mxnet 	<ul style="list-style-type: none"> Embedded Linux and Android Alliance (ELAA)