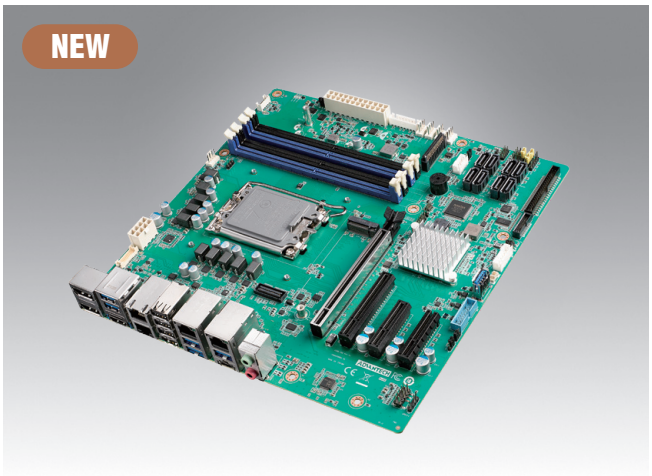
AIMB-588

Intel® 12th Gen Core™ processors (Alder Lake-S) i9/i7/i5/i3 LGA1700, MicroATX with 2 DP++/HDMI/eDP, 1 GbE LAN, 3 2.5GbE LANs, 8 USB 3.2, 1 USB 3.2 Type-C, 6 COM



Windows 10 ubuntu **WISE-DeviceOn** CE FC RoHS

Features

- Supports Intel® 12th Gen Core™ processors (Alder Lake-S) with Q670E/ R680E/ H610E chipset
- Four displays. (x2 DP++, HDMI, eDP)
- Intel AMT and Intel vPro Technology
- PCIe x16 slot Gen5, PCIe x4 slot Gen4, PCIe x4 slot Gen3
- Max up to x8 USB 3.2, x1 USB 3.2 Gen2 Type C, x4 USB 2.0, x8 SATAIII, x1 GbE LAN, x3 2.5GbE LANs, x1 M.2 M-Key
- Software RAID 0, 1, 5, 10, TPM 2.0
- WISE-DeviceOn and Embedded Software APIs

Software APIs: SMBus, H/W Monitor, Watchdog, GPIO

Utilities: BIOS flash, Monitoring

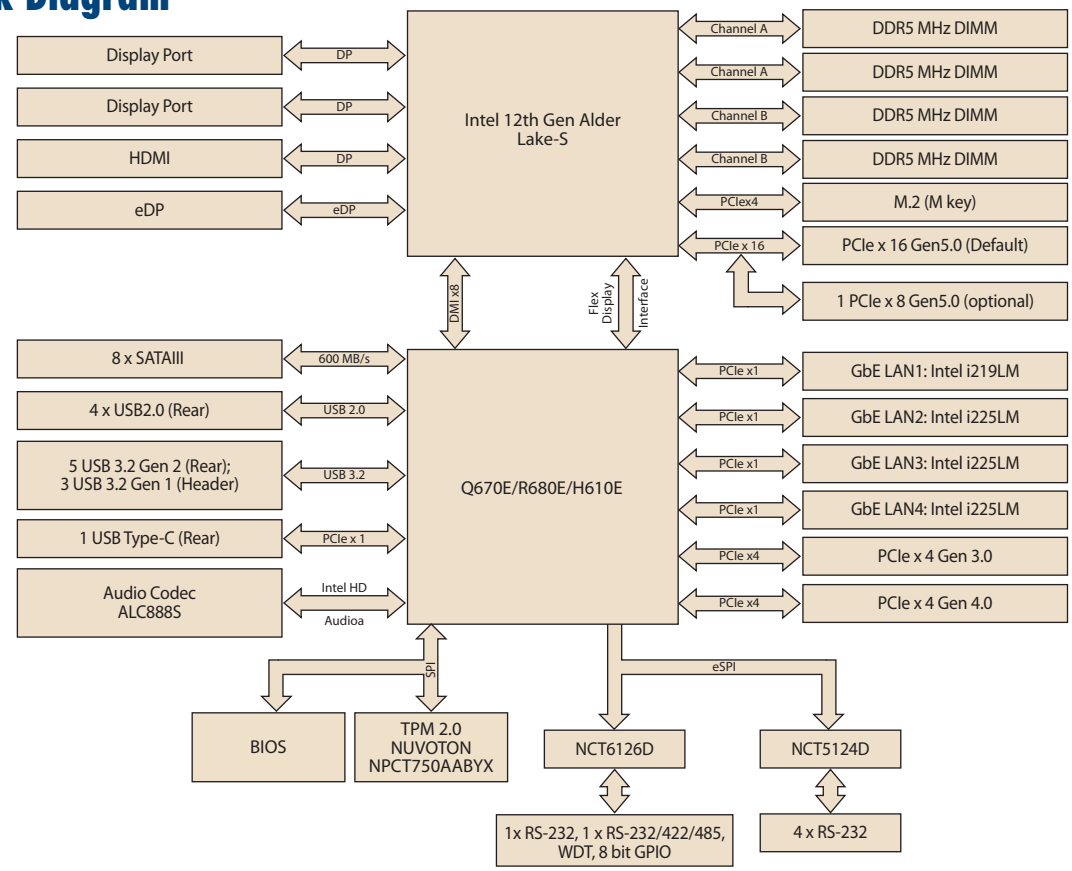
Specifications

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	16/16	12/12	6/6	4/4	2/2	2/2	16	12	6	6	4
	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
	Supports Model	AIMB-588Q, AIMB-588R, AIMB-588H										
	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 4400, ECC memory supported by CPU with Chipset R680E										
	Max. Capacity	128GB (32 GB per DIMM)										
	Socket	Four 288-pin DDR5 UDIMM sockets, Dual Channel, Two DIMMs per channel										
Graphics	Controller	Intel UHD Graphics 770 Supports DirectX12, OpenGL 4.5										
	HDMI	1, up to resolution 4096*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										
	Four Display	DP + DP + HDMI + eDP										
	Triple Display	DP + DP + HDMI, DP + DP + eDP, DP + HDMI + eDP										
	Dual Display	DP + HDMI, DP + DP, DP + eDP, HDMI + eDP										
Ethernet	Controller	LAN1: 1GbE Intel I219-LM (AIMB-588Q/AIMB-588R/AIMB-588H) LAN2: 2.5GbE Intel I225-LM (AIMB-588Q/AIMB-588R) LAN3: 2.5GbE Intel I225-LM (AIMB-588R) LAN4: 2.5GbE Intel I225-LM (AIMB-588R)										
	Connector	RJ45 x2 (588Q) / RJ45 x4 (588R) / RJ45 x1(588H)										
SATA	Max Data Transfer Rate	600 MB/s Max. (SATA 3.0)										
	Q'ty	8 (AIMB-588Q); 8 (AIMB-588R), 4 (AIMB-588H)										
Rear I/O	Display Port	2										
	HDMI	1										
	Ethernet	2 (AIMB-588Q); 4 (AIMB-588R);1(AIMB-588H)										
	USB	AIMB-588Q: 5 USB 3.2 Gen2 type A; 1 USB3.2 Gen2 Type C; 4 USB 2.0 type A AIMB-588R: 5 USB 3.2 Gen2 type A; 1 USB 3.2 Gen2 Type C; 4 USB 2.0 type A AIMB-588H: 2 USB 3.2 Gen2 type A; 4 USB 2.0										
	Audio	2 (Mic-in/ Line-out)										
Internal Connector	USB 3.2	AIMB-588Q: 3 USB 3.2 Gen1 AIMB-588R: 3 USB 3.2 Gen1 AIMB-588H: 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 PCIex4 (AIMB-588Q/AIMB-588R)										
	GPIO	8-bit GPIO										
Watchdog Timer	Output	System reset										
	Interval	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		Operating				Non-Operating						
	Temperature	0 ~ 60° C (14 ~ 158° F), depends on CPU speed and cooler solution				-40 ~ 85° C (-40 ~ 185° F)						
Physical Characteristics	Dimensions	244 mm x 244 mm (9.6" x 9.6")										
Power	Input Mode	ATX input										

All product specifications are subject to change without notice.

Last updated: 29-Jul-2022

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-588Q-00A1	Q670E	4	4	1	4	1	0	1	1	1	1	2	1	1	8	6	1	1
AIMB-588R-00A1	R680E	5	3	1	4	1*	0 (1)*	1	1	1	3	2	1	1	8	6	1	1
AIMB-588H-00A1	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 PCIEX16 slot and PCIe x8 Gen4 signals at PCIEX8 slot

Riser Card

Part Number	Description
AIMB-RF10F-01A1E	1U riser card with 1 PCIex16 expansion

Packing List

Part Number	Description	Quantity
1700003194	SATA HDD cable	2
19Z0002619T000	I/O port braket	1
1930001071	M.2 device screw	2

I/O View

AIMB-588R AIMB-588Q AIMB-588H

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
1700022363-01	1-to-1 serial port cable kit, 17cm
1700030647-01	1-to-1 serial port cable kit, 30cm
1700000447	1-to-4 serial ports cable kit, 45cm
1701400181	1-to-4 serial ports cable kit, 18cm
1970005349T000	LGA1700 CPU cooler for 2U chassis, for CPU TDP ≦ 65W, 78.0(W) x 78(L) x 55.4 (H)

Note: Purchasing AIMB-588's proprietary CPU cooler from Advantech is a must, other CPU cooler might be not compatible with AIMB-588. Note: screws P/N: 1933030500 for ACP-1010MB, 1930004607 for HPC-7120S

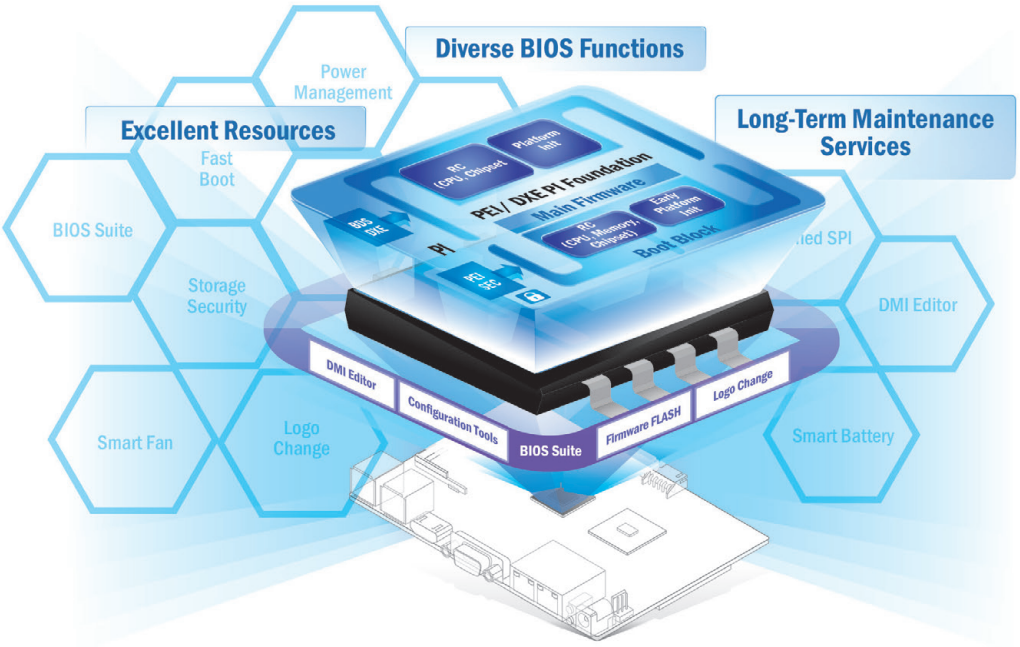
Embedded OS/API

OS/API	Part No.	Description
win10 IoT Ent	TBD	TBD

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

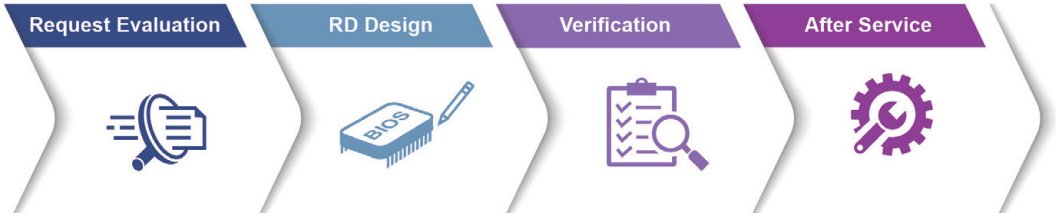
Diverse BIOS Functions

- 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
• Devices status • Peripherals/firmware • Open for extension	• Real-time monitoring • Remote controls • Troubleshooting	• 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
• Integrated Intel® OpenVINO™ technology • Boost AI using Advantech hardware	• Build AI environment in under 5 minutes • Ready-to-use configuration	• User friendly configuration guidance • One-click Benchmark acquisition	• Easy access to 100+ AI inference extensions • Software development package available	• 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
• Platform compatibility tests • Preloaded functional driver and software stacks	• License authorized Canonical delivers 10-years of bug fixes and security updates • In-house bundled service	• Containerized technology for service provision and deployment • AI resources from Caffe, TensorFlow, and mxnet	• Embedded Linux and Android Alliance (ELAA)