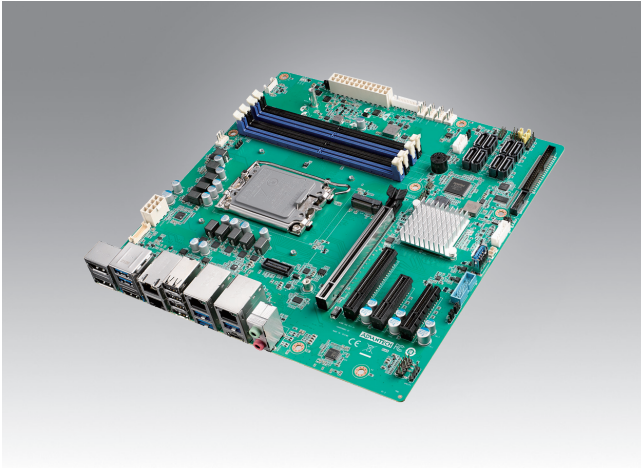


# AIMB-588 B1

## Micro-ATX Motherboard 12/13/14th Gen Intel® Core™ & Core 200S Processor (codename: Alder Lake-S/Raptor Lake-S/ Raptor Lake-S Refresh/Bartlett Lake-S)



### 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:



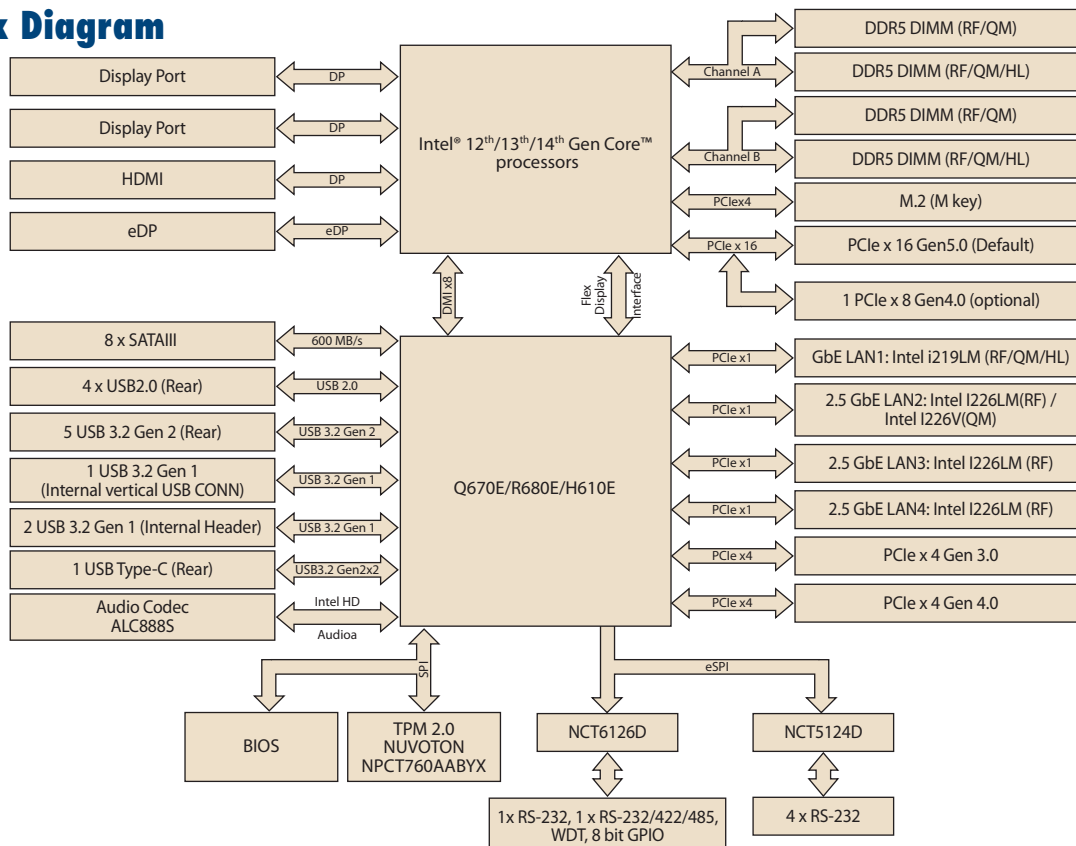
#### Utilities:



### Specifications

Processor System	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 MT/s, ECC memory supported by all CPU only with Chipset R680E		
	Max. Capacity	192GB (48 GB per DIMM)		
	Frequency	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)		
SATA	Max Data Transfer Rate	600 MB/s Max. (SATA 3.0)		
	Q'ty	AIMB-588RF/AIMB-588QM: 8 AIMB-588HL: 4		
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		
	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	System reset		
Power Requirements	Interval	Programmable 1 ~ 255 sec/min		
	Operation	+5V	3.3V	12V 12V_8P
	Configuration: Intel® Core™ i9-14900 24-Core Processor 2.00GHz with UDIMM DDR5 4800 48GB*4pcs	1.316A	0.856A	0.192A 24.29910A
	Standby (5Vsb)	3A		
Environment	Operating			Non-Operating
	Temperature	0 ~ 60 °C (32 ~ 140 °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		

### Block Diagram



### Ordering Information

P/N	Chipset	USB 3.2 Gen 2	USB 3.2 Gen1	USB Typc-C Gen 2x2	USB 2.0	PCIe x16 (Gen 5)	PCIe x8 (Gen 4)	PCIe x4 (Gen 3)	PCIe x4 (Gen 4)	1GbE LAN	2.5 GbE LAN	DP	HDMI	eDP	SATA III	COM	M.2 M-key	TPM
AIMB-588RF-0AB1	R680E	5	3	1	4	1	0	1	1	1	3***	2	1	1	8	6	1	1
AIMB-588RF-1AB1	R680E	5	3	1	4	1*	1	1	1	1	3***	2	1	1	8	6	1	1
AIMB-588QM-0AB1	Q670E	4	4	1	4	1	0	1	1	1	1**	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
AIMB-588RF-1AB1U	R680E	5	3	1	4	1*	1	1	1	1	3***	2	1	1	8	6	1	1
AIMB-588QM-0AB1U	Q670E	4	4	1	4	1	0	1	1	1	1**	2	1	1	8	6	1	1

\* PCIe x8 lanes at 1 PCIe x16 physical slot  
 \*\* LAN2: 2.5GbE Intel I226V  
 \*\*\* LAN2: 2.5GbE Intel I226LM; LAN3: 2.5GbE Intel I226LM; LAN4: 2.5GbE Intel I226LM  
 Note: Series 2 Processors (Bartlett Lake) are under development

### Packing List

Part Number	Description	Quantity
1700003194	SATA HDD cable	2
1920002619T000	I/O port bracket	1
1930006770-01	M.2 device screw	2
2040658811	AIMB-588 B1 Startup Manual	1

### Optional Accessories

Part Number	Description
17000020277-01	Dual port USB 3.0 cable 30cm with IO bracket
1700034131-01	1-to-2 serial ports cable, 60cm (for COM1/2)
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: 193030500 for ACP-1010MB, 1930004607 for HPC-7120S

### I/O View



Note: The current OS only support 12/13/14th Processors. OS for Series 2 Processors (Bartlett Lake) are under development.

### Embedded OS/API

OS/API	Part No.	Description
Windows 10	20706WX1HS0148	img W10 21HL 64b 21H2 ENU
	20706WX1VS0148	img W10 21VL 64b 21H2 ENU
	20706WX1ES0148	img W10 21EL 64b 21H2 ENU
Windows 11	20706WLE1S0012	img W11 24EL 64b 24H2 ENU
	20706WLH1S0012	img W11 24HL 64b 24H2 ENU
	20706WLW1S0012	img W11 24VL 64b 24H2 ENU
Ubuntu	20706U22DS0009	img UbuntuD 64b 22.04 ENU

## CPU List

Intel® Core™ Processors (Series 2, Hybrid)	Processor	Core7 251E	Core7 251TE	Core5 221E	Core5 221TE	Core5 211E	Core5 211TE	Core3 201E	Core3 201TE	300	300T		
	Cores	24	24	14	14	10	10	4	4	2	2		
	Base frequency (GHz)	2.1 / 1.6	1.4 / 1.0	2.7 / 2.1	1.8 / 1.3	2.7 / 2.0	1.7 / 1.3	3.6 / NA	2.9 / NA	3.9 / NA	3.4 / NA		
	Max frequency (GHz)	5.6 / 4.4	5.4 / 3.9	5.2 / 3.9	5.0 / 3.6	4.9 / 3.7	4.8 / 3.4	4.8 / NA	4.6 / NA	3.9 / NA	3.4 / NA		
	Smart cache (MB)	36	36	24	24	20	20	12	12	6	6		
	TDP (W)	65	45	65	45	65	45	60	45	46	35		
Intel® Core™ Processors (Series 2, P-core only)	Processor	Core9 273PQE	Core9 273PE	Core9 273PTE	Core7 253PQE	Core7 253PE	Core7 253PTE	Core5 223PQE	Core5 223PE	Core5 223PTE	Core5 213PE	Core5 213PTE	
	Cores	12	12	12	10	10	10	8	8	8	8	8	
	Base frequency (GHz)	3.4	2.3	1.4	3.5	2.5	1.8	4	2.9	2.3	2.7	2.1	
	Max frequency (GHz)	5.9	5.7	5.5	5.7	5.5	5.4	5.5	5.4	5.4	5.2	5.2	
	Smart cache (MB)	36	36	36	33	33	33	24	24	24	24	24	
	TDP (W)	125	65	45	125	65	45	125	65	45	65	45	
Intel® Core™ Processors (14th gen)	Processor	i9-14900	i9-14900T	i7-14700	i7-14700T	i5-14500	i5-14500T	i5-14400	i5-14400T	i3-14100	i3-14100T		
	Cores	24	24	20	20	14	14	10	10	4	4		
	Base frequency (GHz)	2.0 / 1.5	1.1 / 0.8	2.1 / 1.5	1.3 / 0.9	2.6 / 1.9	1.7 / 1.2	2.5 / 1.8	1.5 / 1.1	3.5 / NA	2.7 / NA		
	Max frequency (GHz)	5.8 / 4.3	5.5 / 4.0	5.4 / 4.2	5.2 / 3.7	5.0 / 3.7	4.8 / 3.4	4.7 / 3.5	4.5 / 3.2	4.7 / NA	4.4 / NA		
	Smart cache (MB)	36	36	33	33	24	24	20	20	12	12		
	TDP (W)	65	35	65	35	65	35	65	35	60	35		
Intel® Core™ Processors (13th gen)	Processor	i9-13900E / i9-13900	i9-13900TE	i7-13700E / i7-13700	i7-13700TE	i5-13500E / i5-13500	i5-13500TE	i5-13400E / i5-13400	i3-13100E / i3-13100	i3-13100TE			
	Cores	24	24	16	16	14	14	10	4	4			
	Base frequency (GHz)	1.8 / 2.0	1	1.9 / 2.1	0.8	2.4 / 2.6	1.3	2.4 / 2.5	3.3 / 3.4	2.4			
	Max frequency (GHz)	5.2 / 5.6	5	5.1 / 5.2	4.8	4.6 / 4.8	4.5	4.6	4.4 / 4.5	4.1			
	Smart cache (MB)	36	36	30	30	24	24	20	12	12			
	TDP (W)	65	35	65	35	65	35	65	60	35			
Intel® Core™ Processors (12th gen)	Processor	i9-12900E / i9-12900	i9-12900TE	i7-12700E / i7-12700	i7-12700TE	i5-12500E / i5-12500/12400	i5-12500TE	i3-12100E / i3-12100	i3-12100TE	G7400E	G7400TE	G6900E	G6900TE
	Cores	16	16	12	12	6	6	4	4	2	2	2	2
	Base frequency (GHz)	2.3 / 2.4	1.1	2.1	1.4	2.9/3.0/2.5	1.9	3.2	2.1	3.6	3	3	2.4
	Max frequency (GHz)	5	4.8	4.8	4.7	4.5/4.6/4.4	4.3	4.2/4.3	4	NA	NA	NA	NA
	Smart cache (MB)	30	30	25	25	18	18	12	12	6	6	4	4
	TDP (W)	65	35	65	35	65	35	60	35	46	35	46	35