

AIMB-289 A1 / A2

Mini-ITX 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

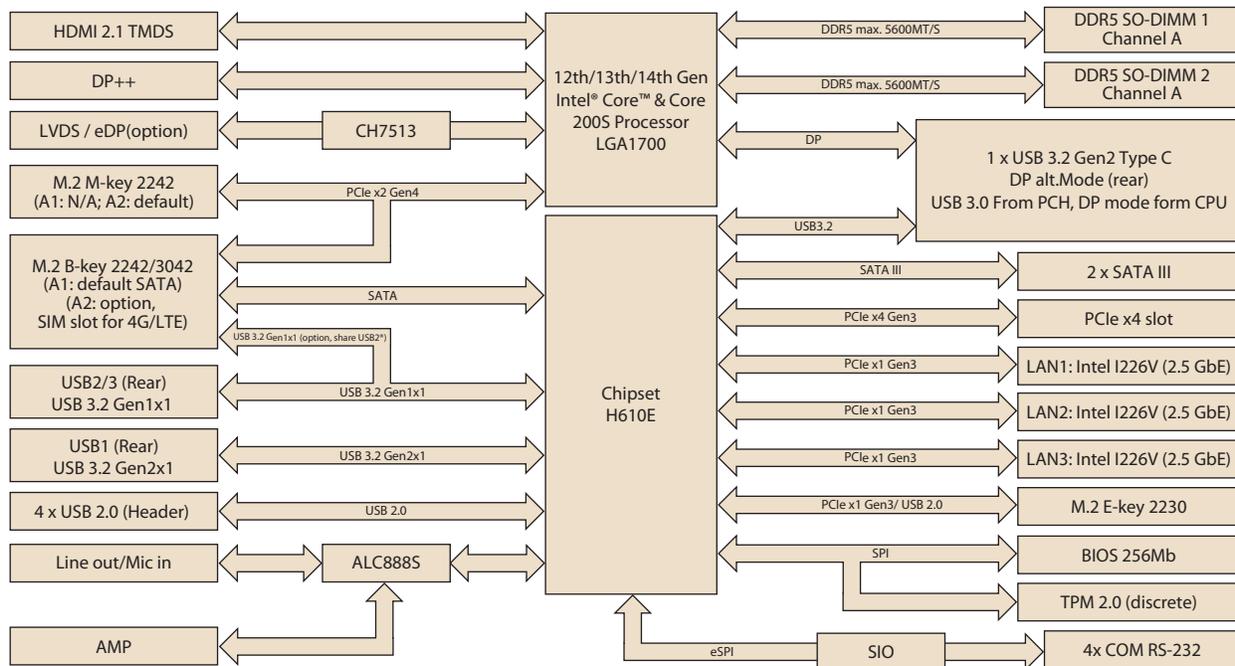
- 12th/13th/14th Gen Intel® Core™ & Core 200S Processor, Up to 24Core, support H610E chipset
- Up to 96GB DDR5 5600 MT/s with two SO-DIMM
- Super Speed I/O: PCIe x4 Gen3, USB3.2 Gen2 (10Gbps), 2.5GbE
- Triple independent 4K displays with 1 DP, 1 HDMI, 1 LVDS (or eDP)
- TPM2.0 support
- SUSI API, WISE-DeviceOn and Embedded Software



Specifications

Platform	CPU	12/13/14th Gen Intel® Core™ & Core 200S
Processor System	Chipset	H610E
	BIOS	AMI EFI 256 Mbit SPI
Expansion Slot	M.2	A1: 1 x B-Key(2242/3042, for SSD & 4G) + 1 x E-Key(2230, for Wifi/BT) A2: 1 x M-Key(2242/3042, for SSD & 4G) or 1 x B-Key by option + 1 x E-Key(2230, for Wifi/BT)
	PCIe x4	1 x PCIe x4 Gen3
Memory	Technology	Dual Channel DDR5, up to 5600 MT/s (non-ECC)
	Max. Capacity	96GB (up to 48GB per DIMM)
	Socket	2 x 262 pin DDR5 SO-DIMM
Graphics	Controller	Intel® UHD Graphics 770
	HDMI	1 x HDMI 2.1 TMDS, up to 4096 x 2160 @ 60 Hz
	DP	1 x DP1.4b, up to 4096 x 2160 @ 60 Hz
	eDP	1 (by Option) up to 4096 x 2160 @ 60 Hz (colay with LVDS)
	LVDS	1 (by default) up to 1920 x 1200 @ 60 Hz
	Multi Displays	Triple independent display. DP + HDMI + LVDS (or eDP)
Network	ETHERNET	10/100/1000/2500 Mbps
	Controller	LAN1: 2.5 GbE Intel I226-V LAN 2: 2.5 GbE Intel I226-V LAN 3: 2.5 GbE Intel I226-V
	Connector	3 x RJ45
Audio	Codec	Realtek ALC888S, High Definition Audio (HD), Line-Out (default)
	Amplifier	Yes (Option, 3.0W)
SATA	Max data transfer rate	6.0 Gb/s
	Channel	2 (SATA III)
Rear I/O	DP	1
	HDMI	1
	Ethernet	3
	USB	2 x USB 3.2 Gen1x1 + 1 x USB 3.2 Gen2x1 + 1 x USB 3.2 Gen2 Type-C (Full SKU)
	Audio	1 (Line out/Mic in)
Internal Connector	USB	4 x USB2.0
	LVDS/eDP	1 (LVDS colay with eDP)
	Serial	4 (COM1 RS-232, supports 5V/12V by jumper selection, COM2 & 3 RS232/422/485, COM4 RS-232)
	SATA	2
	M.2	A1: 1 x B-Key(2242/3042, for SSD & 4G) + 1 x E-Key(2230, for Wifi/BT) A2: 1 x M-Key(2242/3042, for SSD & 4G) or 1 x B-Key by option + 1 x E-Key(2230, for Wifi/BT)
Watchdog Timer	GPIO	8-bit
	Output	System reset
Power Requirements	Interval	Programmable 1 ~ 255 (second or minute)
	Input voltage	12-24V DC-in
	Connector	DC Jack
Physical Characteristics	Power consumption	Configuration Max. 133W Typical 96W
	Dimensions	170 mm x 170 mm (6.69" x 6.69")
Environment	Temperature	Operating: 0 ~ 60 °C (32 ~ 140 °F)
	Storage	Non-Operating: -40 ~ 85 °C (-40 ~ 185 °F)

Block Diagram



Ordering Information

A1

P/N	Chipset	HDMI	LVDS/eDP	DP	2.5GbE	COM	SATA III	USB Type-C	USB 3.2	USB 2.0	M.2 E Key	M.2 M Key	M.2 B Key	PCIe x4	TPM	AMP
AIMB-289HF-LDA1	H610E	1	1/(1)	1	3	4	2	1	2 x USB3.2 Gen1x1 1 x USB3.2 Gen2x1	4	1	-	1	1	1	(1)
AIMB-289HL-EDA1	H610E	1	(1)/1	1	2	2/(2)	2	-	2 x USB3.2 Gen1x1 1 x USB3.2 Gen2x1	4	1	-	1	1	(1)	(1)
AIMB-289HF-LDA1U	H610E	1	1/(1)	1	3	4	2	1	2 x USB3.2 Gen1x1 1 x USB3.2 Gen2x1	4	1	-	1	1	1	(1)

A2

Part Number	Chipset	HDMI	LVDS/eDP	DP	2.5GbE	COM	SATAIII	USB Type-C	USB3.2	USB2.0	M.2 E key	M.2 M key/B key	PCIex4	TPM	AMP
AIMB-289HF-LDA2	H610E	1	1/(1)	1	3	4	2	1	2 x USB3.2 Gen1x1* 1 x USB3.2 Gen2x1	4	1	1/(1)**	1	1	(1)

(*) Supports by BOM options

*M.2 B key USB 3.2 signal (option) co-design with one USB 3.2 in rear side.

** M.2 M key and B key is co-design.

Packing List

Part Number	Description	Quantity
19350304A0	Screw M3x4L	2
1700018785	SATA power cable	1
1700034404-02	1-to-1 serial port cable, 50cm	1
1700003194	SATA HDD cable	1
1960116395T001	I/O port bracket	1
1700023082-11	ATX 2*10P to 1*3P-2.0 15cm cable	1

Optional Chassis

Part Number	Description
EPC-B2000-AC00	Mini-ITX Chassis

I/O View



Embedded OS/API

OS/API	Part Number	968 P/N	Description
Win 11	20706WLE1S0022	968QW1124ELOXE	img W11 24EL AIMB-289 64b 24H2 ENU
Win 11	20706WLH1S0022	968QW1124HLOXE	img W11 24HL AIMB-289 64b 24H2 ENU
Win 11	20706WL1S0022	968QW1124VLOXE	img W11 24VL AIMB-289 64b 24H2 ENU
Win 10	20706WX1ES0120	968QW21ELE	img W10 21EL AIMB-289 64b 21H2 ENU
Win 10	20706WX1HS0120	968QW21HLE	img W10 21HL AIMB-289 64b 21H2 ENU
Win 10	20706WX1VS0120	968QW21VLE	img W10 21VL AIMB-289 64b 21H2 ENU
Ubuntu 22.04	20706U22DS0060	968MOU204D	img UbuntuD AIMB-289 64b 22.04 ENU
Ubuntu 24.04	20706U24DS0004	968MOU204D	img UbuntuD AIMB-289 64b 24.04 ENU

Optional Accessory

Part Number	Description
1700034405-01	1-to-2 USB 2.0 cable, 50cm
1970005349T001	LGA1700 CPU Cooler H: 55.4mm (for TDP 65W)
1970005672T001	LGA1700 CPU Cooler H: 32mm (for TDP 35W)
1970005672T011	LGA1700 CPU Cooler H:31.6mm (for TDP 65W)

CPU List

Intel® Core Processors (Series 2)	Processor	Intel® Core7 251E	Intel® Core7 251TE	Intel® Core5 221E	Intel® Core5 221TE	Intel® Core5 211E	Intel® Core5 211TE	Intel® Core3 201E	Intel® Core3 201TE	Intel® 300 300	Intel® 300T 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 (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		
	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			
	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
	TDP (W)	65	35	65	35	65	35	60	35	46	35	46	35