

AIMB-278 B1

Mini-ITX Motherboard 12th/13th Gen Intel® Core™ Processor LGA1700



Features

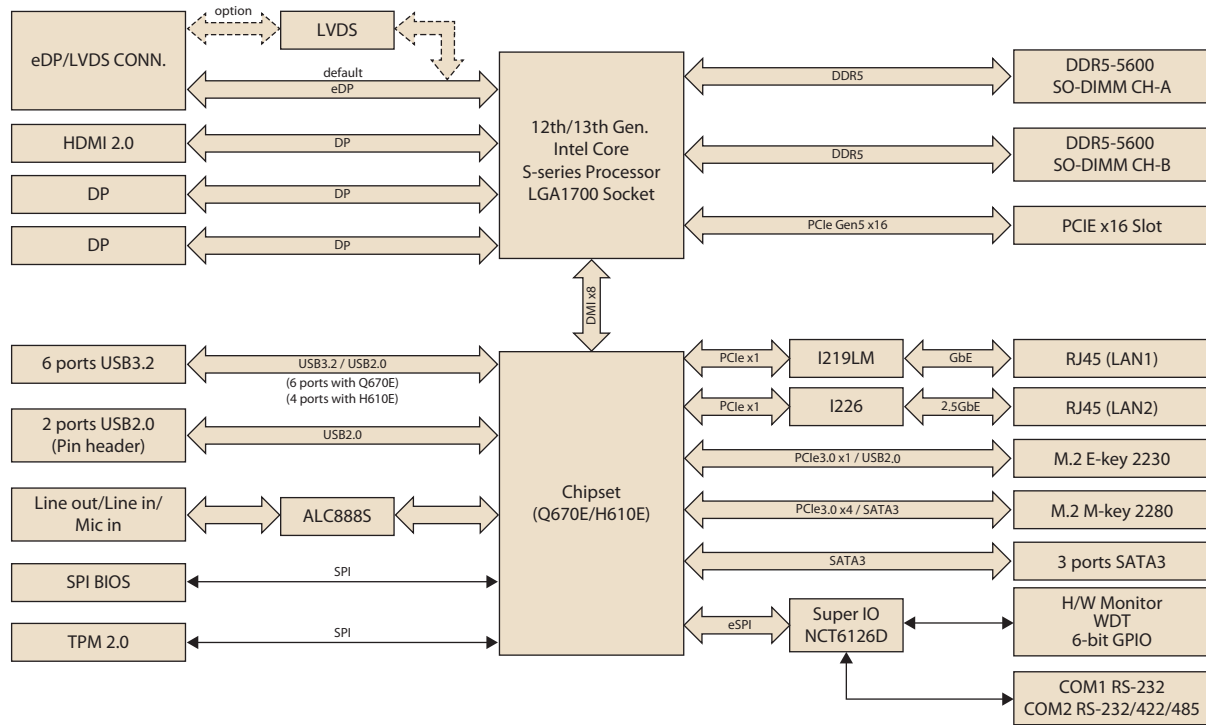
- 12th/13th Gen Intel® Core™ Desktop Processors, Up to 24Core, support Q670E/H610E chipset
- Dual channel DDR5 5600MHz, max. 96GB with two SODIMMs
- Super Speed I/O: PCIe x16 Gen5 (32GT/s), USB3.2 Gen2 (10Gbps), 2.5GbE
- Quad independent 4K displays with 2 DP, 1 HDMI, 1eDP
- Rich expansion: M.2 M key for NVMe SSD, M.2 E key for wireless, 3 SATA(RAID 0,1,5)
- TPM2.0 support
- SUSI API, WISE-DeviceOn and Embedded Software



Specifications

| | CPU | 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 | | | | |
|----------------------------|--|--|------------|----------------------|------------|----------------------------|------------|----------------------|----------------------|------------|---------|--------|---------|--|
| 13th Generation Processors | Core Number | 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 Speed (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 | | | | |
| 12th Generation Processors | CPU | 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 | |
| | Core Number | 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 Speed (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 | |
| Processor System | Chipset | Q670E / H610E | | | | | | | | | | | | |
| | BIOS | AMI EFI 256Mb SPI | | | | | | | | | | | | |
| Expansion Slot | M.2 | 1 M-Key for SSD, 1 E-Key for Wireless connection | | | | | | | | | | | | |
| | PCIe x16 | PCIe x16 Gen5(32GT/s) for discrete GPU card and storage devices | | | | | | | | | | | | |
| Memory | Technology | Dual Channel DDR5, up to 5600 MHz (non-ECC) | | | | | | | | | | | | |
| | Max. Capacity | 96GB (up to 48GB per SODIMM) | | | | | | | | | | | | |
| | Socket | 2 x 262pin SODIMM | | | | | | | | | | | | |
| Graphics | Controller | up to Intel® UHD Graphics 770 | | | | | | | | | | | | |
| | HDMI | HDMI2.0b, supports max. resolution 4096 x 2160 @ 60 Hz | | | | | | | | | | | | |
| | DP | DP1.4a, supports max. resolution 4096 x 2304 @ 60 Hz | | | | | | | | | | | | |
| | eDP | By Default, with internal pin header, supports max. resolution 4096 x 2304 @ 60 Hz | | | | | | | | | | | | |
| | LVDS | By Option, internal pin header, supports single/dual channel 18/24-bit with maximum resolution up to 1920 x 1200 @ 60 Hz (eDP colay with LVDS) | | | | | | | | | | | | |
| Multi Displays | up to 4 independent displays (combination of 2DP, 1HDMI, 1eDP) | | | | | | | | | | | | | |
| Network | ETHERNET | up to 2500 Mb/s | | | | | | | | | | | | |
| | Controller | Intel I219LM and Intel i226 | | | | | | | | | | | | |
| | Connector | 2 x RJ45 | | | | | | | | | | | | |
| SATA | Max data transfer rate | 600 MB/s | | | | | | | | | | | | |
| | Channel | 3 x SATAIII | | | | | | | | | | | | |
| Rear I/O | DP | 2 | | | | | | | | | | | | |
| | HDMI | 1 | | | | | | | | | | | | |
| | Ethernet | 2 | | | | | | | | | | | | |
| | USB | Up to 6 USB3.2 (Q670E: 6 USB3.2 Gen2; H610E: 2 USB3.2 Gen1 (optional 2 USB3.2 Gen1) & 2 USB2.0) | | | | | | | | | | | | |
| | Audio | 1 (Line in/Line out/Mic in) | | | | | | | | | | | | |
| Internal Connector | USB | 2 USB2.0 | | | | | | | | | | | | |
| | eDP/LVDS | 1 eDP (LVDS colay with eDP) | | | | | | | | | | | | |
| | Serial | 2 (COM1 RS-232, COM2 RS232/422/485) | | | | | | | | | | | | |
| | SATA | 3 | | | | | | | | | | | | |
| | M.2 | 1 M-key (dimension: 2280) 1 E-key (dimension: 2230) | | | | | | | | | | | | |
| | GPIO | 6-bit | | | | | | | | | | | | |
| Watchdog Timer | Output | System reset | | | | | | | | | | | | |
| | Interval | Programmable 1 – 255 sec/min | | | | | | | | | | | | |
| Power Requirements | Boost | 92.7W | | | | | | | | | | | | |
| | Typical | 68.9W | | | | | | | | | | | | |
| Environment | Temperature | Operating: 0 – 60° C (32 – 140° F), depends on CPU speed and cooler solution | | | | | | | | | | | | |
| | Storage | Non-Operating: -40 – 85° C (-40 – 185° F) | | | | | | | | | | | | |
| Physical Characteristics | Dimensions | 170 mm x 170 mm (6.69" x 6.69") | | | | | | | | | | | | |

Block Diagram



Ordering Information

| P/N | Chipset | HDMI | LVDS/eDP | DP | GbE | 2.5GbE | COM | SATAIII | USB3.2 | USB2.0 | M.2 M key | M.2 E key | PCIex16 | TPM | AMP |
|----------------|---------|------|----------|----|-----|--------|-----|---------|--------|--------|-----------|-----------|---------|-----|-----|
| AIMB-278Q-EAB1 | Q670E | 1 | (1)/1 | 2 | 1 | 1 | 2 | 3 | 6 | 2 | 1 | 1 | 1 | 1 | 1 |
| AIMB-278Q-LAB1 | Q670E | 1 | 1/(1) | 2 | 1 | 1 | 2 | 3 | 6 | 2 | 1 | 1 | 1 | 1 | 1 |
| AIMB-278H-EAB1 | H610E | (1) | (1)/1 | 2 | 1 | (1) | 2 | 2 | 2/(2) | 4 | 1 | 1 | 1 | (1) | (1) |

(1) Supports by BOM options

Packing List

| Part Number | Description | Quantity |
|----------------|--------------------------------|----------|
| 1700003194 | SATA HDD cable | 1 |
| 1700031130-01 | 1-to-2 serial port cable, 20cm | 1 |
| 1960109548T001 | I/O port bracket | 1 |
| 2046027800 | Startup manual for AIMB-278 | 1 |

Optional Accessory

| Part Number | Description |
|----------------|---|
| 1970005349T001 | ADL-S LGA1700 CPU Cooler (for CPU TDP <= 65W) |

I/O View



Embedded OS/API

| OS/API | Part No. | 968 P/N | Description |
|-------------|----------------|------------|------------------------------------|
| Windows 10 | 20706WX1ES0015 | 968QW21ELE | img W10 21EL AIMB-278 64b 21H2 ENU |
| Windows 10 | 20706WX1HS0015 | 968QW21HLE | img W10 21HL AIMB-278 64b 21H2 ENU |
| Windows 10 | 20706WX1VS0015 | 968QW21VLE | img W10 21VL AIMB-278 64b 21H2 ENU |
| Ubuntu22.04 | 20706U22DS0017 | 968MOU204D | img Ubuntu AIMB-278 64b 22.04 ENU |

Optional Chassis

| Part Number | Description |
|----------------|---|
| EPC-B2000-A030 | Mini-ITX Chassis with 350W ATX power supply |