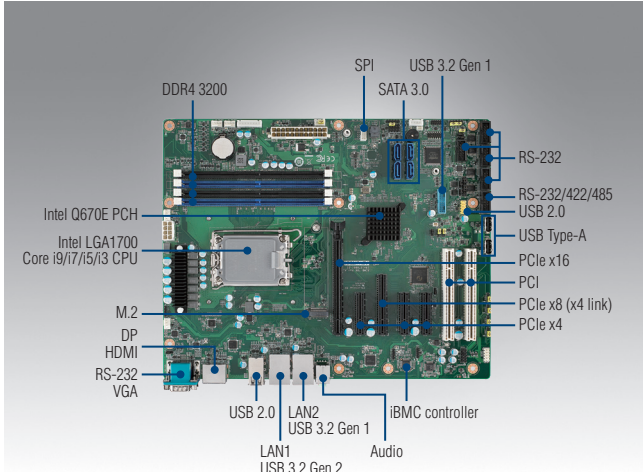


# AIMB-788

## LGA1700 ATX Motherboard Supporting 12/13/14th Gen & Intel® Core™ Processor Series 2, with DP/HDMI/VGA, DDR4, USB 3.2, M.2



### Features

- Intel® 12th/13th/14th generation Core™ i9/i7/i5/i3 processor & Intel® Core™ Processor Series 2 with Q670E chipset
- Four DIMM sockets up to 128 GB DDR4 3200
- Triple display DP/HDMI/VGA and dual GbE LAN
- M.2, SATA RAID 0, 1, 5, 10, USB 3.2 Gen 2
- Advantech iBMC remote out-of-band power management solution on DeviceOn
- AWS (Amazon Web Service) IoT Greengrass qualified

Note 1: Legacy platform is not supported.

Note 2: dTPM 2.0 module is required to enable Intel vPro and TPM technologies.

Note 3: Intel® Platform Trust Technology (Intel® PTT) ready for Windows 11.

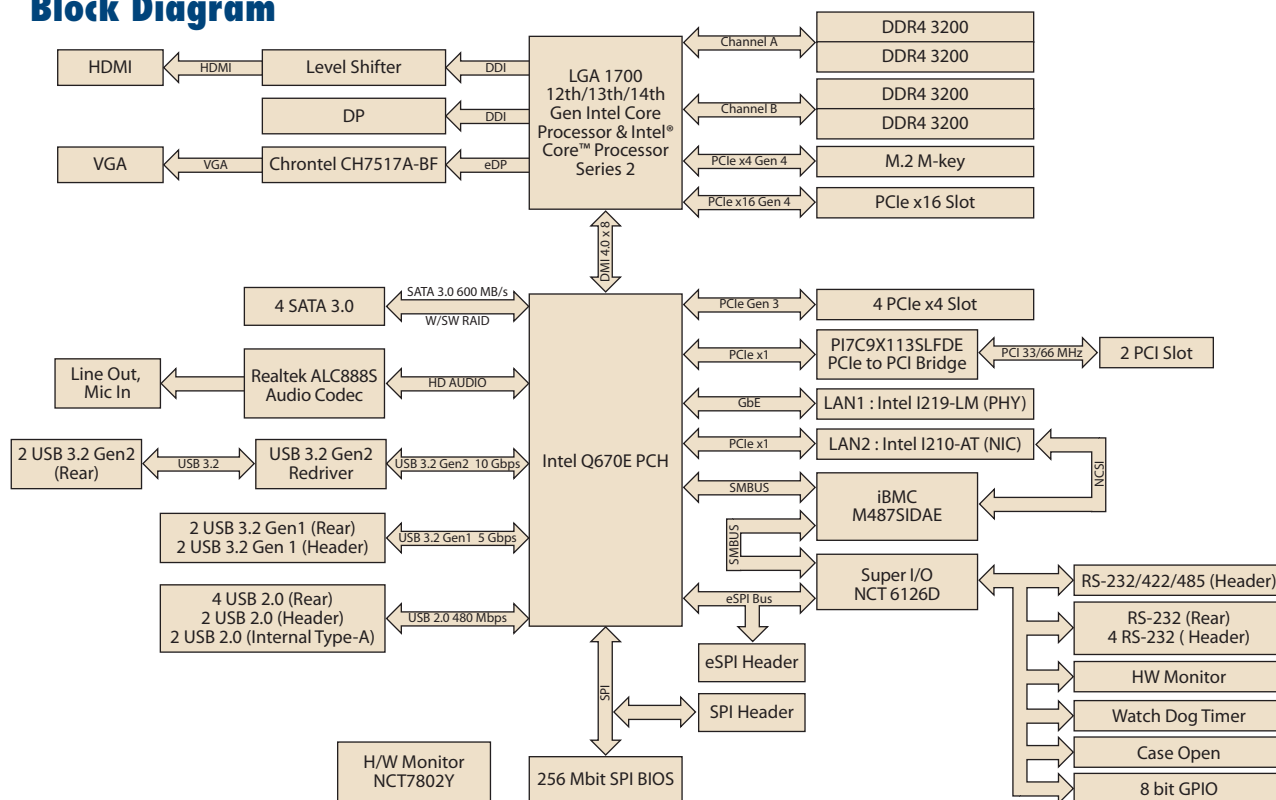
### Quiet Specifications



|                                                    |                         |                                                                                                |            |             |              |             |              |             |             |              |                |                 |                |                 |
|----------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------|------------|-------------|--------------|-------------|--------------|-------------|-------------|--------------|----------------|-----------------|----------------|-----------------|
| Intel® Core™ Processors Series 2 (Bartlett Lake-S) | CPU                     | 251E                                                                                           | 251TE      | 221E        | 221TE        | 211E        | 211TE        | 211EF       | 201E        | 201TE        | 300            | 300T            |                |                 |
|                                                    | P-core Base Frequency   | 2.1 GHz                                                                                        | 1.4 GHz    | 2.7 GHz     | 1.8 GHz      | 2.7 GHz     | 1.7 GHz      | 2.7 GHz     | 3.6 GHz     | 2.9 GHz      | 3.9 GHz        | 3.4 GHz         |                |                 |
|                                                    | L3 Cache                | 36 MB                                                                                          | 36 MB      | 24 MB       | 24 MB        | 20 MB       | 20 MB        | 20 MB       | 12 MB       | 12 MB        | 6 MB           | 6 MB            |                |                 |
|                                                    | Cores                   | 24                                                                                             | 24         | 14          | 14           | 10          | 10           | 10          | 4           | 4            | 2              | 2               |                |                 |
|                                                    | Processor Base Power    | 65W                                                                                            | 45W        | 65W         | 45W          | 65W         | 45W          | 65W         | 60W         | 45W          | 46W            | 35W             |                |                 |
| 14th Generation Processors                         | CPU                     | i9-14900                                                                                       | i9-14900T  | i7-14700    | i7-14700T    | i5-14500    | i5-14500T    | i5-14400    | i5-14400T   | i5-14400F    | i3-14100       | i3-14100T       | 300            | 300T            |
|                                                    | P-core Base Frequency   | 2.0 GHz                                                                                        | 1.1 GHz    | 2.1 GHz     | 1.3GHz       | 2.6 GHz     | 1.7 GHz      | 2.5 GHz     | 1.5 GHz     | 2.5 GHz      | 3.5 GHz        | 2.7 GHz         | 3.9 GHz        | 3.4 GHz         |
|                                                    | L3 Cache                | 36 MB                                                                                          | 36 MB      | 33 MB       | 33 MB        | 24 MB       | 24 MB        | 20 MB       | 20 MB       | 20 MB        | 12 MB          | 12 MB           | 6 MB           | 6 MB            |
|                                                    | Cores                   | 24                                                                                             | 24         | 20          | 20           | 14          | 14           | 10          | 10          | 10           | 4              | 4               | 2              | 2               |
|                                                    | Processor Base Power    | 65 W                                                                                           | 35 W       | 65 W        | 35 W         | 65 W        | 35 W         | 65 W        | 35 W        | 65 W         | 60 W           | 35 W            | 46 W           | 35 W            |
| 13th Generation Processors                         | CPU                     | i9-13900(E)                                                                                    | i9-13900TE | i7-13700(E) | i7-13700T(E) | i5-13500(E) | i5-13500T(E) | i5-13400(E) | i3-13100(E) | i3-13100T(E) |                |                 |                |                 |
|                                                    | P-core Base Frequency   | 2.0 GHz                                                                                        | 1.1 GHz    | 2.1 GHz     | 1.4 GHz      | 2.5 GHz     | 1.6 GHz      | 2.5 GHz     | 3.4 GHz     | 2.5 GHz      |                |                 |                |                 |
|                                                    | L3 Cache                | 36 MB                                                                                          | 36 MB      | 30 MB       | 30 MB        | 24 MB       | 24 MB        | 20MB        | 12 MB       | 12 MB        |                |                 |                |                 |
|                                                    | Cores                   | 24                                                                                             | 24         | 16          | 16           | 14          | 14           | 10          | 4           | 4            |                |                 |                |                 |
|                                                    | Processor Base Power    | 65 W                                                                                           | 35 W       | 65 W        | 35 W         | 65 W        | 35 W         | 65W         | 60 W        | 35 W         |                |                 |                |                 |
| 12th Generation Processors                         | CPU                     | i9-12900(E)                                                                                    | i9-12900TE | i7-12700(E) | i7-12700TE   | i5-12500(E) | i5-12400     | i5-12500TE  | i3-12100(E) | i3-12100TE   | Pentium G7400E | Pentium G7400TE | Celeron G6900E | Celeron G6900TE |
|                                                    | P-core Base Frequency   | 2.4 GHz                                                                                        | 1.1 GHz    | 2.1 GHz     | 1.4 GHz      | 3.0 GHz     | 2.5 GHz      | 1.9 GHz     | 3.3 GHz     | 2.1 GHz      | 3.6 GHz        | 3.0 GHz         | 3.0 GHz        | 2.4 GHz         |
|                                                    | L3 Cache                | 30 MB                                                                                          | 30 MB      | 25 MB       | 25 MB        | 18 MB       | 18 MB        | 18 MB       | 12 MB       | 12 MB        | 6 MB           | 6 MB            | 4 MB           | 4 MB            |
|                                                    | Cores                   | 16                                                                                             | 16         | 12          | 12           | 6           | 6            | 6           | 4           | 4            | 2              | 2               | 2              | 2               |
|                                                    | Processor Base Power    | 65 W                                                                                           | 35 W       | 65 W        | 35 W         | 65 W        | 65 W         | 35 W        | 60 W        | 35 W         | 46 W           | 35 W            | 46 W           | 35 W            |
| Processor System                                   | Socket                  | LGA 1700                                                                                       |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Chipset                 | Q670E                                                                                          |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | BIOS                    | AMI 256Mbit SPI Flash                                                                          |            |             |              |             |              |             |             |              |                |                 |                |                 |
| Expansion Slot                                     | PCI                     | 2                                                                                              |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | PCIe x4 (Gen 3)         | 3                                                                                              |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | PCIe x8 (Gen 3)         | 1 (x4 link)                                                                                    |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | PCIe x16 (Gen 4)*       | 1                                                                                              |            |             |              |             |              |             |             |              |                |                 |                |                 |
| Memory                                             | Technology              | Dual Channel DDR4 3200 Non-ECC UDIMM                                                           |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Max Capacity            | 128 GB                                                                                         |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Sockets                 | 4 x 288-pin DIMM                                                                               |            |             |              |             |              |             |             |              |                |                 |                |                 |
| Graphics                                           | Controller              | Chipset integrated Intel UHD Graphics                                                          |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | VRAM                    | Shares system memory is subjected to OS                                                        |            |             |              |             |              |             |             |              |                |                 |                |                 |
| Ethernet                                           | Interface               | 10/100/1000 Mbps                                                                               |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Controller              | GbE LAN1: Intel I219-LM (PHY); GbE LAN2: Intel I210-AT                                         |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Connector               | 2 x RJ-45                                                                                      |            |             |              |             |              |             |             |              |                |                 |                |                 |
| SATA                                               | Max. Data Transfer Rate | 600 MB/s                                                                                       |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Channel                 | 4                                                                                              |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | RAID                    | 0, 1, 5, 10                                                                                    |            |             |              |             |              |             |             |              |                |                 |                |                 |
| Rear I/O                                           | VGA                     | 1 (Resolution up to 1920 x 1200 @ 60Hz)                                                        |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | HDMI                    | 1 (Resolution up to 3840 x 2160 @ 60Hz)                                                        |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | DisplayPort             | 1 (Resolution up to 4096 x 2304 @ 60Hz)                                                        |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Ethernet                | 2                                                                                              |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | USB                     | 8 (2 x USB 3.2 Gen 2, 2 x USB 3.2 Gen 1, 4 x USB 2.0)                                          |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Audio                   | 2 (Line-out, Mic-in)                                                                           |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Serial                  | 1 (RS-232)                                                                                     |            |             |              |             |              |             |             |              |                |                 |                |                 |
| Watchdog Timer                                     | Output                  | System reset                                                                                   |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Interval                | Programmable 1 – 255 sec                                                                       |            |             |              |             |              |             |             |              |                |                 |                |                 |
| Power Requirement                                  | Power On                | Intel Core i 65W , DDR4 32 GB x 4                                                              |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Voltage                 | +3.3 V                                                                                         |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Current                 | 1.41 A                                                                                         |            |             |              |             |              |             |             |              |                |                 |                |                 |
| Internal Connectors                                | USB                     | 6 (2 x USB 3.2 Gen 1 via pin header, 2 x USB 2.0 via pin header, 2 x USB 2.0 type A connector) |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Serial                  | 5 (4 x RS-232, 1 x RS-232/422/485)                                                             |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | SATA                    | 4                                                                                              |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | M.2                     | 1 (PCIex4 Gen 4 M-key 2280 type)                                                               |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | SPI                     | 1 (Optional dTPM 2.0 module available)                                                         |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | GPIO                    | 8-bit                                                                                          |            |             |              |             |              |             |             |              |                |                 |                |                 |
| Environment                                        | Operating               | Non-Operating                                                                                  |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Temperature             | 0 – 60 °C (32 – 140 °F), depends on CPU loading and system thermal solution                    |            |             |              |             |              |             |             |              |                |                 |                |                 |
|                                                    | Humidity                | 95% @ 40 °C, non-condensing                                                                    |            |             |              |             |              |             |             |              |                |                 |                |                 |
| Physical Characteristics                           | Dimension (L x H)       | 304.8 x 244 mm (12" x 9.6")                                                                    |            |             |              |             |              |             |             |              |                |                 |                |                 |

\* The PCIe x16 slot, from CPU, can only support graphic cards and storage cards according to the specification recommended by Intel. Other types of add-on cards might not work properly. For the compatible device list validated on the PCIe x16 slot, please refer to the user manual.

## Block Diagram



## Ordering Information

| Part number      | Chipset | Memory                               | Display         | USB 3.2 Gen 2 | USB 3.2 Gen 1 | USB 2.0 | COM | GbE LAN | AMT | M.2 | SATA 3.0 | SW RAID | iBMC |
|------------------|---------|--------------------------------------|-----------------|---------------|---------------|---------|-----|---------|-----|-----|----------|---------|------|
| AIMB-788G2-00A1  | Q670E   | Non-ECC UDIMM DDR4 3200 up to 128 GB | VGA + HDMI + DP | 2             | 4             | 8       | 6   | 2       | Yes | 1   | 4        | Yes     | Yes  |
| AIMB-788G2-00A1U | Q670E   | Non-ECC UDIMM DDR4 3200 up to 128 GB | VGA + HDMI + DP | 2             | 4             | 8       | 6   | 2       | Yes | 1   | 4        | Yes     | Yes  |

## Packing List

| Part Number    | Description                                 | Qty |
|----------------|---------------------------------------------|-----|
| 1700003194     | SATA data cable                             | 2   |
| 1960104181T001 | I/O port bracket (for 2U chassis or higher) | 1   |
| 2041078800     | Startup manual                              | 1   |

Note: Driver CD is not provided. Please visit Advantech support website for driver download.

## Embedded OS

| Part Number    | Description                        |
|----------------|------------------------------------|
| 20706WX1HS0038 | img W10 21HL AIMB-788 64b 21H2 ENU |
| 20706WX1VS0038 | img W10 21VL AIMB-788 64b 21H2 ENU |
| 20706WX1ES0038 | img W10 21EL AIMB-788 64b 21H2 ENU |
| 20706WLH1S0035 | img W11 24HL AIMB-788 64b 24H2 ENU |
| 20706WL1S0035  | img W11 24VL AIMB-788 64b 24H2 ENU |
| 20706WLE1S0035 | img W11 24EL AIMB-788 64b 24H2 ENU |
| 20706U22DS0011 | img UbuntuD AIMB-788 64b 22.04 ENU |

## I/O View



AIMB-788G2-00A1  
AIMB-788G2-00A1U

## Optional Accessories

| Part number                                       | Description                                                              |
|---------------------------------------------------|--------------------------------------------------------------------------|
| 1700002204                                        | 2-port USB 2.0 cable w/ BKT(27 cm)                                       |
| 1700028292-01                                     | 2-port USB 3.0 cable w/ BKT(30 cm)                                       |
| 1970005349T000                                    | CPU cooler for 2U, 4U, and wallmount chassis (for CPU Base Power=35~65W) |
| 1970005436T001                                    | CPU cooler for 2U, 4U, and wallmount chassis (for CPU Base Power=125W)   |
| 1701090401                                        | Single COM port cable(40 cm)                                             |
| 1701092300                                        | Dual COM port cable(28.5 cm)                                             |
| 1700022749-11/<br>1700022749-12/<br>1700022749-13 | SATA power cable                                                         |
| PCA-TPMSPI-00A1                                   | dTPM 2.0 SPI module to enable TPM and vPro technologies                  |

## Riser Card

| Part Number      | Description                                     |
|------------------|-------------------------------------------------|
| AIMB-R430P-03A2E | 2U riser card with 3 PCI expansion              |
| AIMB-R431F-21A1E | 2U riser card with 1 PCIe16 & 1 PCIe1 expansion |
| AIMB-R43PF-21A1E | 2U riser card with 1 PCIe16 & 2 PCI expansion   |
| AIMB-R4301-03A2E | 2U riser card with 1 PCIe1 expansion            |

Note: AIMB-788 is not compatible with 1U chassis.