AIMB-787 LGA1200 Intel® Core™ i9/i7/i5/i3 ATX with Triple Display, Dual GbE LAN, M.2, USB 3.2, DDR4 Startup Manual

Packing List

Before you begin installing your card, please make sure that the following items have been shipped:

- 1 AIMB-787 motherboard
- 1 AIMB-787 Startup Manual
- 2 Serial ATA HDD data cables
- 1 I/O port bracket

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

Specifications

Standard Functions

- **CPU:** LGA1200 socket supporting 10th Gen Intel® Core™ i9/i7/i5/i3 and Pentium®/Celeron® processors
- **BIOS:** AMI 256 Mbit SPI BIOS
- **Chipset:** Intel® Q470E PCH

Note: Legacy platforms are not supported.

- **System memory:** Up to 128 GB in four 288-pin DIMM sockets, supporting dual-channel DDR4 2400/2666/2933 SDRAM. AIMB-787 supports non-ECC unbuffered DIMMs and does not support any memory configuration that mixes non-ECC with ECC unbuffered DIMMs.
- **M.2 socket:** One M.2 socket supports up to PCIe x4 M-Key 2280 type storage devices.

For more information on this and other Advantech products, please visit our website at:

http://www.advantech.com

For technical support and service, please visit our support website for AIMB-787 at:

http://advt.ch/aimb787spt

Register your products on our website and get 2 months extra warranty for free at:

http://www.register.advantech.com

This manual is for the AIMB-787 series Rev. A1.

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Specifications (Cont.)

- **SATA interface:** Four on-board Serial ATA 3.0 connectors support data transmission rates of up to 600 MB/s. All four SATA 3.0 ports support Advanced Host Controller Interface (AHCI) technology.
- **PCIe and PCI slots:** 1 PCIe x16 expansion slot, 4 PCIe x4 expansion slots (three x4 link, one x1 link), 2 PCI slots 32-bit / 33 MHz PCI 2.2 compliant
- **USB 3.2/2.0:** 2 USB 3.2 Gen 2 ports on rear with up to 10 Gb/s data rate, 4 USB 3.2 Gen 1 ports (2 rear, 2 via header), 8 USB 2.0 ports (4 rear, 2 via header, 2 internal Type-A)
- **LPC interface:** Advantech-designed LPC connector supports dTPM module
- **Serial ports:** Six serial ports: COM1, COM2 and COM4 ~ 6 are RS-232; COM3 is RS-232/422/485 with jumper and BIOS menu options.
- **Keyboard/mouse connector:** The motherboard is not equipped with rear PS/2 connector for keyboard/mouse. A 6-pin onboard header is supported for an optional PS/2 keyboard/mouse cable.
- **Watchdog timer:** 255 sec timer intervals

Graphics Interface

- **Chipset:** CPU integrated graphics controller
- **Display memory:** 1 GB maximum shared memory with 2 GB and above system memory installed
- **DisplayPort:** Resolution up to 4096 x 2304 @ 60 Hz refresh rate
- **DVI-D:** Resolution up to 1920 x 1200 @ 60 Hz refresh rate
- **VGA:** Resolution up to 1920 x 1200 @ 60 Hz refresh rate

Ethernet Interface

- **Interface:** 10/100/1000 Mbps
- **Controller:** LAN1: Intel® I219-LM; LAN2: Intel® I210-AT.

Mechanical and Environmental

- **Dimensions (L x W):** 304.8 x 244 mm (12” x 9.6”)
- **Power supply voltage:** +3.3 V, +5 V, ±12 V, +5 Vsb
- **Power consumption:**
  Intel® Core™ i5-10500E; DDR4 16 GB x 4
  Maximum: +3.3 V at 5.56 A, +5 V at 4.02 A, +12 V at 6.28 A, +5 Vsb at 0.16 A, -12 V at 0.1 A
- **Operating temperature:** 0 ~ 60 °C (depending on CPU)
- **Weight of board:** 0.7 kg (1.54 lb)

Jumpers and Connectors

The board has a number of jumpers that allow you to configure your system to suit your application. The table below lists the function of each jumper and connector.

Connector / Jumper List	
Label	**Function**
LAN1 ~ LAN2	GbE LAN
USB3C1	USB 3.2 Gen 2 port *2
USB3C2	USB 3.2 Gen 1 port *2
USB3H1	USB 3.2 Gen 1 port *2 (20-pin header)
USB2C1	USB 2.0 port *4
USB2A1 ~ USB2A2	USB 2.0 port (internal Type-A)
USB2H2	USB 2.0 port *2 (10-pin header)
VGA1+DVI1	VGA connector / DVI-D connector
COM1+DP1	Serial port: RS-232 (DB-9 connector) / DP connector
COM2, COM4 ~ COM6	Serial port: RS-232 (9-pin header)
COM3	Serial port: RS-232/422/485 (9-pin header)
KBMS1	External keyboard/mouse connector (6-pin header)
CPUFAN1	CPU fan connector (4-pin)
SYSFAN1 ~ SYSFAN3	System fan connector (4-pin)
JFP3	Keyboard lock and power LED Suspend: fast flash (ATX/AT) System on: ON (ATX/AT) System off: OFF (ATX/AT)
JFP2	External speaker / HDD LED connector / SMBus connector
JFP1	Power switch / reset connector
AUDIO1+AUDIO2	Audio connector (Line-Out, Mic-In)
VOLT1	Alarm board power connector
JCASE1	Case open connector
LANLED1	Front panel LAN indicator connector
NVME1	M.2 2280 M-Key socket
SATA1 ~ SATA4	Serial ATA 3.0 port
PCI1 ~ PCI2	PCI slot
PCIE1	PCIe x16 slot (Gen 3 x16 link)
PCIE2 , PCIE4 ~ PCIE5	PCIe x4 slot (Gen 3 x4 link)
PCIE3	PCIe x4 slot (Gen 3 x1 link)
DIMMA1	Channel A DIMM1

Jumpers and Connectors (Cont.)

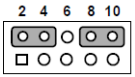
DIMMA2	Channel A DIMM2
DIMMB1	Channel B DIMM1
DIMMB2	Channel B DIMM2
ATX12V1	ATX 12 V auxiliary power connector (for CPU)
EATXPWR1	ATX 24-pin main power connector (for system)
SPDIF_OUT1	SPDIF audio out pin header
GPIO1	8-bit GPIO from super I/O
SMBUS1	SMBus connector from PCH
FPAUD1	Front panel audio connector
LPC1	Low pin count connector for Advantech dTPM 2.0 and RS232 module..

JCMOS1: Clear CMOS JME1: Intel® ME update	
Closed Pins	**Result**
1-2	*Keep CMOS data *Enable ME update
2-3	Clear CMOS data Disable ME update
* Default	

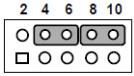
*Keep CMOS data
*Enable ME update

Clear CMOS data
Disable ME update

JWDT1+JOBS1: Watchdog Timer Output and OBS Alarm	
Closed Pins	**Result**
2-4, 8-10	Watchdog timer disable (2-4) OBS beep (8-10)
4-6, 8-10	*Watchdog timer reset (4-6) OBS beep (8-10)
* Default	



Watchdog timer disable (2-4)
OBS beep (8-10)



*Watchdog timer reset (4-6)
OBS beep (8-10)

PSON1: ATX/AT Mode Selection	
Closed Pins	**Result**
1-2	AT mode
2-3	*ATX mode
* Default	

AT mode

*ATX mode

JUSB_1 (Rear USB), JUSB_2 (Onboard USB): USB Power Source Switch Between +5V and +5V_DUAL	
Closed Pins	**Result**
1-2	*USB +5V_DUAL power
2-3	USB +5V power
* Default	

*USB +5 V_DUAL power

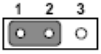
USB +5 V power

JPCICLK1: PCI Clock Selection	
Closed Pins	**Result**
1-2	*33/66 MHz autodetected
2-3	33 MHz
* Default	

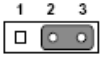
*33/66 MHz autodetected

33 MHz

SMB1 (Clock), SMB2 (Data): PCIe SMBus Connection Setting	
Closed Pins	**Result**
1-2	*Enable PCIe SMBus connection
2-3	Disable PCIe SMBus connection
* Default	



*Enable PCIe SMBus connection

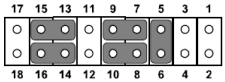


Disable PCIe SMBus connection

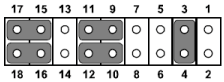
Note! Both SMB1 and SMB2 jumpers should be switched to the same setting, either 1-2 closed or 2-3 closed.

Jumpers and Connectors (Cont.)

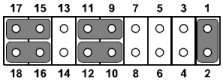
JSETCOM3: COM3 RS-232/422/485 Jumper Settings	
Closed Pins	**Result**
5-6, 7-9, 8-10, 13-15, 14-16	*RS-232
3-4, 9-11, 10-12, 15-17, 16-18	RS-422
1-2, 9-11, 10-12, 15-17, 16-18	RS-485
* Default	



*RS-232



RS-422

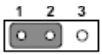


RS-485

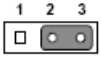
Note!

A BIOS setting change is necessary if RS-422 or RS-485 is selected. Please refer to Chapter 3 of the user manual for additional settings.

JT1(TX Signal), JR1(RX Signal): COM3 RS-422/485 Termination Resistor	
Closed Pins	**Result**
1-2	Disable termination
2-3	*Enable termination
* Default	



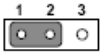
Disable termination



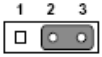
*Enable termination

Jumpers and Connectors (Cont.)

JFV1: VGA Dummy Load Setting	
Closed Pins	**Result**
1-2	Enable VGA dummy load
2-3	*Disable VGA dummy load
* Default	



Enable VGA dummy load



*Disable VGA dummy load

Note! It is recommended to leave this function disabled if you use DVI/DP as your main display.

Declaration of Conformity

Caution! The computer is supplied with a battery-powered realtime clock circuit. There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

This device complies with the requirements in Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Board Layout

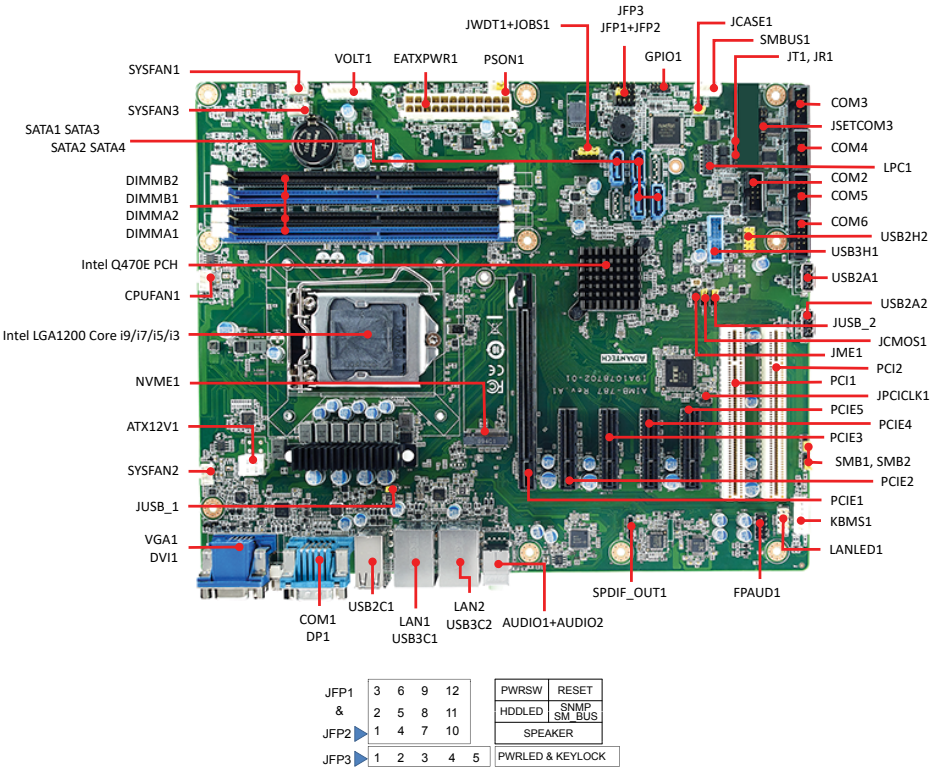


Figure 1: Board Layout: Jumper and Connector Locations