

AIMB-786 LGA1151 Intel® Core™ i7/i5/i3 ATX with Triple Display, Dual GbE LAN, SATA 3.0, USB 3.1, DDR4 Startup Manual

Packing List

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

- 1 AIMB-786 motherboard
- 1 AIMB-786 Startup Manual
- 2 Serial ATA HDD data cables
- 2 Serial ATA HDD power cables
- 1 I/O port bracket

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

Note: Acrobat Reader is required to view any PDF file. Acrobat Reader can be downloaded at: www.adobe.com/Products/acrobat/readstep2.html (Acrobat is a trademark of Adobe)

Specifications

Standard Functions

- **CPU:** LGA1151 socket supporting 8/9th Gen Intel® Core™ i7/i5/i3 and Pentium®/Celeron® processors
- **BIOS:** AMI 256 Mbit SPI BIOS
- **Chipset:** Intel® Q370 PCH
- **System memory:** Up to 64 GB in four 288-pin DIMM sockets, supporting dual-channel DDR4 2400/2666 SDRAM. AIMB-786 supports non-ECC unbuffered DIMMs and does not support any memory configuration that mixes non-ECC with ECC unbuffered DIMMs.

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-786 at:

<http://adv.t.ch/aimb786spt>



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-786 series Rev. A1.

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Specifications (Cont.)

Note: Due to the inherent limitations of PC architecture, the system may not fully detect 64 GB RAM when 64 GB RAM is installed.

- **SATA interface:** Five onboard Serial ATA 3.0 connectors support data transmission rates of up to 600 MB/s. All five 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, 2 PCI slots 32-bit/33 MHz PCI 2.2 compliant
- **LPC interface:** Advantech-designed LPC connector supports dTPM 2.0 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:** An external keyboard and mouse connector on the motherboard is supported. No PS/2 keyboard/mouse connector is supported in the rear I/O.
- **Watchdog timer:** 255 sec timer intervals
- **USB 3.1/2.0:** 2 USB 3.1 (Gen 2) ports on rear with up to 10 Gb/s data rate, 4 USB 3.1 Gen 1 ports (2 rear, 2 via header), 7 USB 2.0 ports (4 rear, 2 via header, 1 internal Type-A)

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™ i7-8700 3.2 GHz; DDR4 16 GB x 4
Maximum: +3.3 V at 2.8 A, +5 V at 1.77 A, +12 V at 3.77 A, +5 Vsb at 0.1 A, -5 V at 0.06 A, -12 V at 0.04 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	LAN1, LAN2
USB3C1	USB 3.1 Gen 2 port 1, 2
USB3C2	USB 3.1 Gen 1 port 1, 2
USB3H1	USB 3.1 Gen 1 port 1, 2 (20-pin header)
USB2C1	USB 2.0 port 1, 2, 3, 4
USB2A1	USB 2.0 port (internal Type-A)
USB2H2	USB 2.0 port 1, 2 (10-pin header)
VGA1+DVI1	VGA connector / DVI-D connector
COM1+DP1	Serial port: RS-232 (DB-9 connector) / DP connector
DP2	Connector for optional DP/DVI/ HDMI cable
COM2, COM4 ~ COM6	Serial port: RS-232 (9-pin header)
COM3	Serial port: RS-232/422/485 (9-pin header)
KBMS1	External keyboard and 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 (AT/ATX)
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
SATA1 ~ SATA5	Serial ATA 3.0 port
PCI1	PCI slot
PCI2	PCI slot
PCIE1	PCIe x16 slot
PCIE2	PCIe x4 slot
PCIE3	PCIe x4 slot

Jumpers and Connectors (Cont.)

PCIE4	PCIe x4 slot
PCIE5	PCIe x4 slot
DIMMA1	Channel A DIMM1
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)
SPI_CN1	Update BIOS pin header
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 modules.
JCMOS1	Clear CMOS
JME1	Intel® ME update
JWDT1	Watchdog timer reset
JOBS1	Hardware monitor alarm
PSON1	AT/ATX mode selection
JUSB_1	USB power source switch between +5 V and +5 V_ DUAL for rear USB ports
JUSB_2	USB power source switch between +5 V and +5 V_ DUAL for onboard USB ports
JPCCLK1	PCI clock selection
JSETCOM3	COM3 RS-232/422/485 jumper setting
JT1, JR1	COM3 RS-422/485 termination resistor
JFV1	VGA dummy load setting

PSON1: ATX/AT Mode Selection

Closed Pins	Result
1-2	AT mode
2-3	*ATX mode
* Default	



AT mode

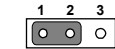


*ATX mode

Jumpers and Connectors (Cont.)

JCMOS1: Clear CMOS JME1: Clear ME

Pins	Result
1-2	*Keep CMOS data *Enable ME update
2-3	Clear CMOS data Disable ME update
* Default	



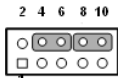
*Keep CMOS data
*Enable ME update



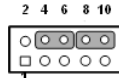
Clear CMOS data
Disable ME update

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)

JUSB1 (Rear USB), JUSB2 (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 +5V_DUAL power



USB +5V power

JPCICLK1: PCI Clock Selection

Closed Pins	Result
1-2	*33/66 MHz autodetected
2-3	33 MHz
* Default	



*33/66 MHz autodetected

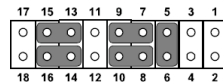


33 MHz

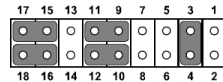
Jumpers and Connectors (Cont.)

JSETCOM3: COM3 RS-232/422/485 Jumper Settings

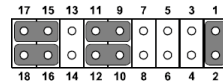
Closed Pins	Result
5-6, 7-9, 8-10, 13-15, 14-16	*RS-232
3-4, 9-11, 10-12, 15-17, 16-18	RS-422
1-2, 9-11, 10-12, 15-17, 16-18	RS-485
* Default	



*RS-232



RS-422



RS-485

Note!

If RS-485 is selected, it is necessary to change device mode to RS-485 for further choice of auto flow control under BIOS menu. Please refer to Chapter 3.2.2.10 of 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.

Jumpers and Connectors (Cont.)



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

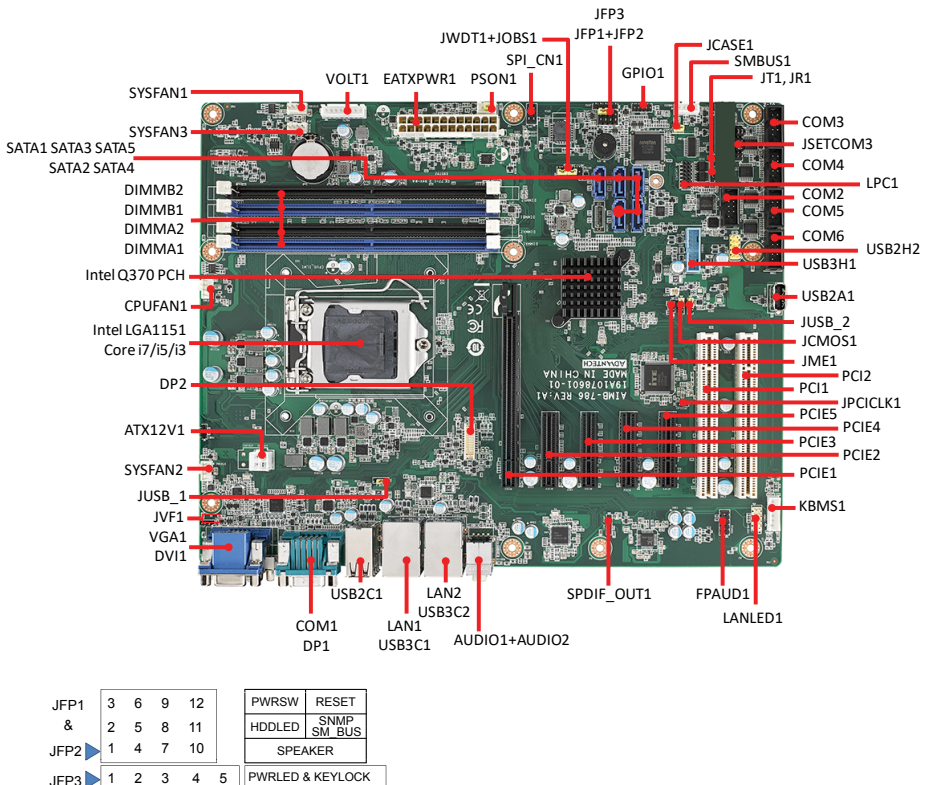


Figure 1: Board Layout: Jumper and Connector Locations