AIMB-789 LGA1851 Intel® Core™ Ultra (Series 2) ATX Motherboard with DP/HDMI/VGA, DDR5, USB 3.2, M.2 Startup Manual

Packing List

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

- 1 x AIMB-789 motherboard
- 1 x AIMB-789 startup manual
- 2 x Serial ATA HDD data cables
- 1 x 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:** LGA1851 socket supporting Intel® Core™ Ultra (Series 2) Desktop Processors.
- **BIOS:** AMI 256 Mbit SPI BIOS
- **Chipset:** Intel® Q870 PCH

Note: Legacy platforms are not supported.

- **System memory:** Up to 192 GB in four 288-pin DIMM sockets, supporting dual-channel DDR5 4400 SDRAM. AIMB-789 supports non-ECC unbuffered DIMMs
- **M.2 socket:** M.2 socket supports up to PCIe x4 Gen 5 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-789 at:

https://advt.ch/aimb789espt

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-789 series Rev. A1, and all specifications are subject to the datasheet on the official website. The information in this manual is subject to change without notice.

Part No. 2041078900 1st Edition
Printed in China Feb 2025

Specifications (Cont.)

- **SATA interface:** Four on-board Serial ATA 3.0 connectors support data transmission rates up to 600 MB/s. All four SATA 3.0 ports support Advanced Host Controller Interface (AHCI) technology.
- **PCIe and PCI slots:** One PCIe x16 Gen 5 expansion slot, one PCIe x8 expansion slot (Gen 4 x4 link), three PCIe x4 (Gen 4) expansion slots (Gen 4 x4 link), one PCIe x1 Gen4 expansion slot, and one PCI slot.
- **USB 3.2/2.0:** 6 USB 3.2 Gen 1 ports (4 rear, 2 via header), 7 USB 2.0 ports (4 rear, 2 via header, 1 internal Type-A).
- **Serial port:** Six serial ports: COM1, COM2 and COM4 ~ 6 are RS-232; COM3 is RS-232/422/485 with BIOS menu options.
- **SPI interface:** Advantech-designed SPI connector supports optional dTPM 2.0 module.
- **Watchdog timer:** 255 timer level intervals.

Graphics Interface

- **Chipset:** CPU integrated graphics controller.
- **DisplayPort:** Resolution up to 4096 x 2304 @ 60 Hz refresh rate.
- **HDMI:** Resolution up to 3840 x 2160 @ 30 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 consumption:** Intel® Core™ Ultra 65W; DDR5 32 GB x 4
  Maximum: +3.3 V at 7.35 A, +5 V at 3.45 A, +12 V at 0.21 A, +5 Vsb at 0.23 A, -12 V at 0.06 A
- **Operating temperature:** 0 ~ 60°C (depending on CPU loading and thermal solution)
- **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 1 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)
USB2H1	USB 2.0 port *2 (10-pin header)
VGA1	VGA connector
COM1	Serial port: RS-232 (DB-9 connector)
HDMI1	HDMI connector
DP1	DP connector
COM2, COM4 ~ COM6	Serial port: RS-232 (9-pin header)
COM3	Serial port: RS-232/422/485 (9-pin header)
CPUFAN1	CPU fan connector (4-pin)
SYSFAN1 ~ SYSFAN3	System fan connector (4-pin)
JFP1 + JFP2	Front panel 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
NVME2	M.2 2280 M-Key socket (Only on the AIMB-789-1 version)
SATA4 ~ SATA7	Serial ATA 3.0 port
PCIE1	PCIe x16 slot (Gen 5)
PCIE2	PCIe x4 slot (Gen 4)
PCIE3	PCI slot
PCIE4	PCIe x1 slot (Gen 4)
PCIE5	PCIe x4 slot (Gen 4)
PCIE6	PCIe x8 slot (x4 Gen 4 link)
PCIE7	PCIe x4 slot (Gen 4 link)
DIMMA1	Channel A DIMM1
DIMMA2	Channel A DIMM2
DIMMB1	Channel B DIMM1

Jumpers and Connectors (Cont.)

DIMMB2	Channel B DIMM2
ATX12V1+ ATX12V2	ATX 12 V auxiliary power connector (for CPU)
EATXPWR1	ATX 24-pin main power connector (for system)
GPIO1	8-bit GPIO from super I/O
SMBUS1	SMBus connector from PCH
SPI_TPM1	SPI (Serial Peripheral Interface) connector for Advantech dTPM 2.0 module.

Note: The PCIE1&PCIE2 slots can only support graphics cards and storage cards according to the specification recommended by Intel. Other types of add-on cards might not work properly.

JCMOS1: CMOS clear data 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

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.)

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

SMB1 (clock), SMB2 (data): PCIe SMBus connection setting for PCIE3~PCIE6 slots SMB3 (clock), SMB4 (data): PCIe SMBus connection setting for PCIE1 &PCIE2 slots	
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: SMB1+SMB2 or SMB3+SMB4 jumpers should be switched to the same setting, either 1-2 closed or 2-3 closed.

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.

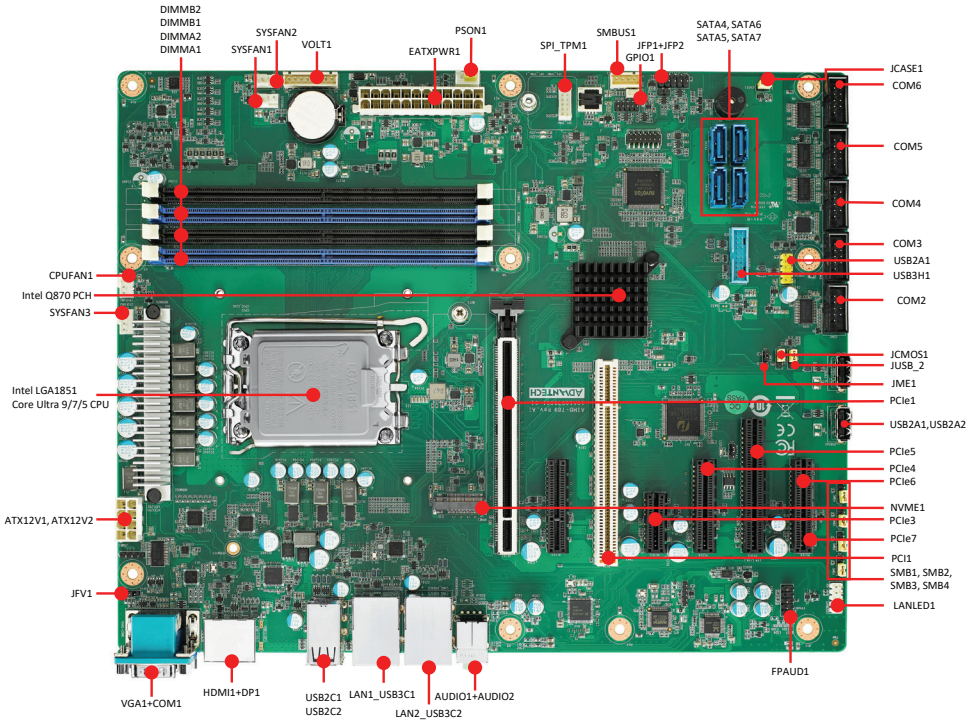
Declaration of Conformity

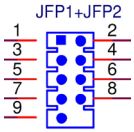
Caution: The computer is supplied with a battery-powered realtime clock circuit. There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

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





Front Panel Connector (JFP1+JFP2)

Pin	Signal	Pin	Signal
1	HDD_LED+	2	PANSWIN#
3	HDD_LED-	4	GND
5	POWER_LED+	6	SYSTEM RESET#
7	POWER_LED-	8	GND
9	POWER_LED-		

Figure 1: Board Layout: Jumper and Connector Locations