ADVANTECH

AIMB-709 LGA1851 Intel® Core™ Ultra (Series 2) ATX Motherboard with HDMI/VGA, DDR5, USB 3.2 Startup Manual

Packing List

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

- 1 x AIMB-709 motherboard
- 1 x AIMB-709 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® H810 PCH

Note: Legacy platforms are not supported.

- **System memory:** Up to 96 GB in two 288-pin DIMM sockets, supporting dual-channel DDR5 6400 SDRAM. AIMB-709 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-709 at:

https://reurl.cc/rEp4E4

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-709 series Rev. A1, and all specifications are subject to the data-sheet on the official website. The information in this manual is subject to change without notice.

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:** 1 PCIe x16 Gen 5 expansion slot, 3 PCIe x4 expansion slots (x2 Gen 4 link), 3 PCI slots 32-bit/33 MHz
- **USB 3.2/2.0:**
  - G2 SKU: 4 USB 3.2 Gen 1 ports on the rear with up to 5 Gb/s data rate, 6 USB 2.0 ports (2 rear, 2 via header, 2 internal Type-A)
  - VG SKU: 2 USB 3.2 Gen 1 ports on the rear with up to 5 Gb/s data rate, 5 USB 2.0 ports (2 rear, 2 via header, 1 internal Type-A)
- **Serial port:** Up to 6 serial ports: COM1~2 and COM4 ~ 6 are RS-232; COM3 is RS-232/422/485 and 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*.
- **Display memory:** 1 GB maximum shared memory with 2 GB and above system memory installed.
- **HDMI (G2 SKU only):** Resolution up to 3840 x 2160 @ 30 Hz refresh rate.
- **VGA:** Resolution up to 1920 x 1200 @ 60 Hz refresh rate.

Ethernet Interface

- **Interface:**
  - LAN1: 10/100/1000 Mbps
  - LAN2: 10/100/1000/2500 Mbps (G2 SKU only)
- **Controller:**
  - LAN1: Intel® I219-V
  - LAN2: Intel® I226-V (G2 SKU only)

Mechanical and Environmental

- **Dimensions (L x W):** 304.8 x 244 mm (12" x 9.6")
- **Power consumption:** Intel Core Ultra 65W; DDR5 16 GB x 2, Maximum: +3.3V at 0.96A, +5V at 1.71A, +12V at 0.13A, +5Vsb at 0.07A, -12V at 0.01A, -5V at 0.01A
- **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.

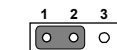| Connector/Jumper List	
Label	**Function**
ATX12V1+ATX12V2	ATX 12 V auxiliary power connector (for CPU)
AUDIO1+AUDIO2	Audio connector (Line Out, Mic In)
COM4 ~ COM6	Serial port: RS-232 (9-pin header, G2 SKU only)
COM3	Serial port: RS-232/422/485 (9-pin header, G2 SKU only)
COM12	Serial port: RS-232 (DB-9 connector) *2
CPUFAN1	CPU fan connector (4-pin)
DIMMA1	Channel A DIMM1
DIMMB1	Channel B DIMM1
EATXPWR1	ATX 24-pin main power connector (for system)
FPAUD1	Front panel audio connector
GPIO1	8-bit GPIO from super I/O
HDMI1	HDMI connector (G2 SKU only)
JCASE1	Case open connector
JCMOS1	CMOS clear data
JFP1	Power switch/reset connector
JFP2	External speaker/HDD LED connector/SMBus connector
JFV1	VGA dummy load setting
JME1	Intel® ME update
JPCICLK1	PCI clock selection
LAN1	GbE LAN
LAN2	GbE LAN (G2 SKU only)
LANLED1	Front panel LAN indicator connector
PCI1 ~ PCI3	PCI slot
PCIE1	PCIe x16 slot (x16 Gen 5 link)
PCIE2 ~ PCIE4	PCIe x4 slot (x2 Gen 4 link)
PSON1	ATX/AT mode selection
SATA4 ~ SATA7	Serial ATA 3.0 port
SMB1 ~ SMB2	PCIe SMBus connection setting for PCIE2 ~ PCIE4 slot
SMB3 ~ SMB4	PCIe SMBus connection setting for PCIE1 slot
SMBUS1	SMBus connector from PCH

Jumpers and Connectors (Cont.)

SPI_TPM1	SPI (Serial Peripheral Interface) connector for Advantech dTPM 2.0 module.
SYSFAN1 ~ SYSFAN3	System fan connector (4-pin)
USB2A1	USB 2.0 port (internal Type-A)
USB2A2	USB 2.0 port (internal Type-A, G2 SKU only)
USB2C1	USB 2.0 port *2
USB2H1	2 x USB 2.0 port (10-pin header)
USB3C1	USB 3.2 Gen 1 port *2 (G2 SKU only)
USB3C2	USB 3.2 Gen 1 port *2
VGA1	VGA connector
VOLT1	Alarm board power connector

Note: The PCIE1 slot 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. For the compatible device list validated on the PCIe x16 slot, please refer to the user manual.

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.)

JPCICLK1: PCI clock selection

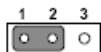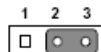| Closed Pins	Result
1-2	*33/66 MHz auto detected
2-3	33 MHz
* Default	

*33/66 MHz autodetected   33 MHz

SMB1 (clock), SMB2 (data): PCIe SMBus connection setting for PCIE2 ~ PCIE4 slots
SMB3 (clock), SMB4 (data): PCIe SMBus connection setting for PCIE1 slot

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.
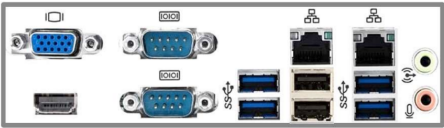
This device complies with the requirements in Part 15 of the FCC rules. Operation is subject to the following two conditions:
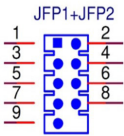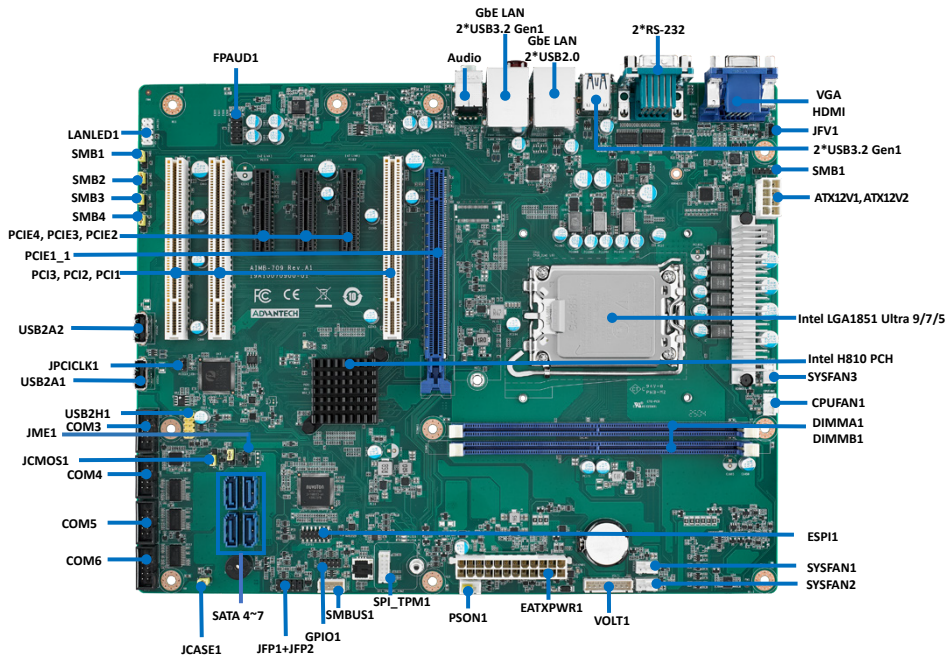
1. This device may not cause harmful interference.

2. This device must accept any interference received, including interference that may cause undesired operation.

Board Layout

Rear Panel

G2 SKU	VGA HDMI	COM1 COM2	USB3C2	LAN1 USB2C1	LAN2 USB3C1	Line-Out Mic-In
VG SKU	VGA ✕	COM1 COM2	USB3C2	LAN1 USB2C1	Line-Out Mic-In

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