

ASMB-981, LGA 6096 AMD® EPYC™ Embedded 9004/9005 Server Board with 16 x DDR5, 6 x PCIe x16, 4 x MCIO, 5 x USB 3.2 (Gen1), Dual 10GbE, and IPMI Startup Manual

Packing List

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

- 1 x Startup manual
- 2 x CPU power cable
- 2 x Screw for M.2 device x 2
- 1 x I/O Shield
- 1 x COM cable
- 1 x PCIe I/O support

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

Specifications

Standard M/B Functions

- **CPU:** LGA 6096 (Socket SP5) Dual AMD® EPYC™ Embedded 9004/9005 processor
- **BIOS:** Dual AMI 512 Mbit SPI BIOS
- **System Memory:** 16 x DDR5 6400 MT/s registered ECC DIMM, Max. capacity 4TB

Note: Due to the inherent limitations of older PC architectures, the system may not fully detect 4TB RAM when 4TB RAM is installed.

- **SATA Interface:** 16 x SATA 3.0 (via 2 x MCIO)

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This manual is for the ASMB-981 Series Rev. A1.

Part No. 2042098100

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1st Edition

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Specifications (Cont.)

- **Serial Ports:** Onboard header, only support RS-232 (inserted in rear I/O via COM cable connection)
- **Watchdog Timer:** 255-level timer intervals
- **USB Port:** Support up to 2 x USB3.2 Gen1 (2 ports in rear IO), 1 x USB3.2 Gen1 (from onboard 20-pin header) and 1 x Type-A (USB 3.2 Gen1)

VGA Interface

- **Chipset:** ASPEED AST2600
- **Display Memory:** 64 MB
- **Resolution:** Supports VGA, resolution up to 1920 x 1200 @60Hz refresh

Ethernet Interface

- **Interface:** 10/100/1000/2500 Mbps & 10GbE Base-T
- **Controller:** LAN1/2: Intel I226; LAN3/4: Intel X710

Mechanical and Environmental

- **Dimensions (L x W):** 380 x 352.5 mm (14.96 x 13.88")
- **Power Supply Voltage:** +3.3 V, +5 V, +12 V, +5 Vsb
- **Power Consumption (mainboard only, excluding I/O device):** Max. Load (400W CPU@3.65 GHz DDR5-4800, 16G*16)): +3.3V @ 2.51A, +5V @ 6.95A, +12V @ 76.64A, +SLOT12V @ 0.73A
- **Operating Temperature:** 0~40°C (depending on CPU)
- **Net Weight:** 2.03 kg

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 of the jumpers and connectors.

Connectors	
Label	Function
ATXPWR1	ATX 24-pin main power connector
ATX12V1, ATX12V2 ATX12V3, ATX12V4	Processor power connector (ATX12V1, ATX12V2 for CPU0, ATX12V3, ATX12V4 for CPU1)
BH2	For optional battery kit
BIOS_SKT1, BIOS_SKT2	BIOS SPI ROM
COM1	Serial port: RS-232
CPUFAN0, CPUFAN1	CPU FAN connector (CPUFAN0 for CPU0, CPUFAN1 for CPU1)

Jumpers and Connectors (Cont.)

C0_DIMM_A1, C0_DIMM_B1, C0_DIMM_C1, C0_DIMM_E1, C0_DIMM_G1, C0_DIMM_H1, C0_DIMM_I1, C0_DIMM_K1, C1_DIMM_M1, C1_DIMM_N1, C1_DIMM_O1, C1_DIMM_Q1, C1_DIMM_S1, C1_DIMM_T1, C1_DIMM_U1, C1_DIMM_W1	DDR5 slot
GPIO1	GPIO connector
LAN1_2, LAN3, LAN4	RJ-45 LAN connector LAN1, LNA2, LAN3, LAN4
BMC_LAN_USB3C1	IPMI dedicated LAN connector & USB 3.2 Gen1 port 1, 2
EX_THR1	Connector for external thermistor
M2_22110_1, M2_22110_2	M.2 connector (PCIe Gen5 x4)
PMBUS1	PMBUS connector to communicate with power supply
MCIO1, MCIO2, MCIO3, MCIO4	MCIO connector (MCIO1/2 support PCIe Gen5 x8/SATA, MCIO3/4 support PCIe Gen5 x8,)
PCIEX16_SLOT2	PCIe x16 slot (x16 link) (CPU0)
PCIEX16_SLOT4	PCIe x16 slot (x16 link) (CPU0)
PCIEX16_SLOT6	PCIe x16 slot (x16 link) (CPU1)
PCIEX16_SLOT8	PCIe x16 slot (x16 link) (CPU1)
PCIEX16_SLOT9	PCIe x16 slot (x16 link) (CPU0)
PCIEX16_SLOT10	PCIe x16 slot (x16 link) (CPU1)
SLOT12V1, SLOT12V2	For PCIe slot 12V input only
SMBUS1	SM Bus header
SPI_CN1, SPI_CN2	Connector for BIOS update tool
BMC_SPI1	BMC SPI ROM
SYSFAN0_A, SYSFAN0_B SYSFAN1_A, SYSFAN1_B SYSFAN2_A, SYSFAN2_B SYSFAN3_A, SYSFAN3_B SYSFAN4, SYS- FAN5, SYSFAN6	System FAN connector
USB3H1, USB3A1	USB 3.2 Gen1 (20-pin header) USB 3.2 Gen1 (Type-A)
SKY_SB1	SMBUS for SKY series HDD BP
VGA1	VGA connector
SGPIO1, SGPIO2	sSATA SGPIO header
SYS_LED1	System LED connector

Jumpers and Connectors (Cont.)

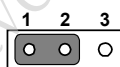
LANLED1	LAN LED connector
PEHP1	NVMe RAID LED control

Jumper list

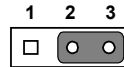
Label	Function
JCASE1	Chassis case open alarm
JCMOS1	CMOS clear
JFP1, JFP2	Front panel header
JWDT1	Watch Dog Reset
PSON1	AT(1-2)/ATX(2-3), default (2-3)
JSMB1	For RD debugging

JCMOS1: CMOS clear function

Closed pins	Result
1-2	Keep CMOS data update*
2-3	Clear CMOS data update
*: Default	



Keep CMOS data



Clear CMOS data

Declaration of Conformity

The 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.

Installation Notes

JFP1

2	4	6	8	-
1	3	5	7	9

PWRSW	RESET	
HDD LED	PWR LED	

JFP1	
Pin.2	#PWR_SW
Pin.4	GND
Pin.6	#RST_SW
Pin.8	GND
Pin.3, Pin.5	SATA_M2_LED, BMC_SUSLED

*The power button pin is located at Pins 2 & 4 of the front panel connector.

Installation Note (Cont.)

2.0 mm JFP2 connector on board

Description	Pin Number		Description
RST BTN	2	▼1	PWD BTN
PWD GND	4	3	PWD GND
LAN1_LED+	6	5	LAN2_LED+
LAN1_LED-	8	7	LAN2_LED-
X	10	9	SYS_LED+
GND	12	11	SYS_LED-
PWR LED+	14	13	HDD_LED+
PWR LED-	16	15	HDD_LED-

Installation Note (Cont.)

2.0 mm JFP2 connector to 2.54 mm pitch header

Description	Pin Number		Description
(Red) PWD BTN	▼1	2	RST BTN (White)
(Black) PWD GND	3	4	PWD GND (Black)
(Blue) LAN1_LED+	5	6	LAN2_LED+(Brown)
(Red) LAN1_LED-	7	8	LAN2_LED-(Black)
		Key	
(Orang) HDD_LED+	13	14	PWR LED+ (Red)
(Black) HDD_LED-	15		
	Key	16	PWR LED- (Black)

Board Layout

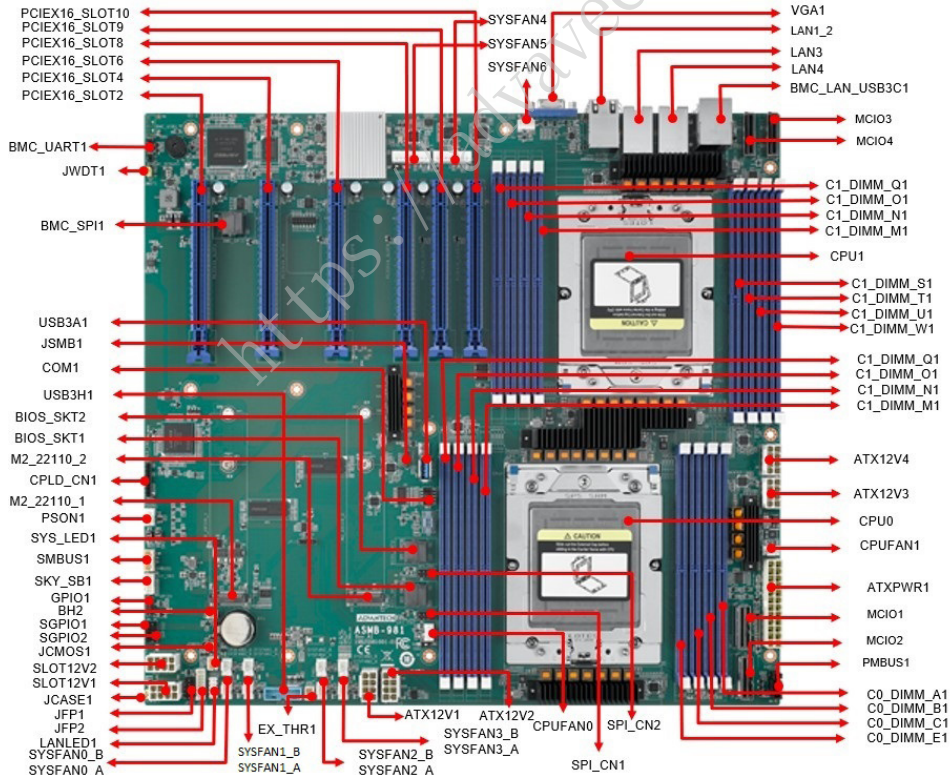


Figure 1: Board Layout: Jumper and Connector Locations