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Manual

ADVANTECH

ASMB-788

Industrial ATX Motherboard for Intel® 12th Gen. Core™ i9/i7/i5/i3 processors with W680
Chipset



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ASMB-788 LGA 1700 Intel® 12th Gen. Core™ ATX Server Board with 4 x DDR5, 5 x PCIe, 7 x USB 3.2, 4 x SATA3, Quad/Dual LANs, 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 Serial ATA HDD data cables
- 2 x Serial ATA HDD power cables
- 1 x COM cable (for connection to rear panel)
- 1 x I/O port bracket
- 1 x Warranty card
- 1 x Screw for M.2 device

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

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For technical support and service, please visit our support website for ASMB-788 at:

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This manual is for the ASMB-788 series Rev. A1.

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Specifications

Standard Functions

- **CPU:** LGA 1700 12th Gen Intel® Core™ i9/i7/i5/i3 processors
 - **BIOS:** AMI 256 Mb SPI BIOS
 - **Chipset:** Intel W680
 - **System memory:** Dual Channel DDR5 ECC/Non-ECC 4400/4000/3600 MHz unbuffered DIMM, Max. 128 GB
- Note:** Due to the inherent limitations of PC architecture, the system may not fully detect 128 GB RAM when 128 GB RAM is installed.
- **SATA3 interface:** 4 x SATA3 6Gb/s ports to support Intel Rapid Storage Technology with software RAID 0, 1, 10, & 5 (for Windows only)
 - **Serial ports:** Six serial ports onboard, only support RS-232 (1 x inserted in rear I/O via COM cable connection)
 - **Watchdog timer:** 255 level timer intervals (sec/min)
 - **USB 3.2:** Supports up to 7 x USB 3.2 ports, 4 x Gen2 ports in rear I/O, 2 x Gen1 ports from on-board pin header, and 1 x Gen1 port from on-board Type-A connector
 - **USB 2.0:** Supports up to 6 x USB 2.0 ports

Display Interface

- **Chipset:** CPU integrated Intel HD graphics controller
- **Display memory:** 1 GB maximum shared memory with 2 GB and above system memory installed (BIOS default is 256 MB)
- **Resolution:**
 - Supports VGA up to 1920x1200 resolution @60 Hz refresh rate
 - Supports DVI up to 1920x1200 resolution @60 Hz refresh rate
 - Supports HDMI 2.0 up to 2K/4K resolution @60 Hz refresh rate

Ethernet Interface

- **Interface:** 10/100/1000 Mbps
- **Controller:** LAN1: Intel® I219LM; LAN2 ~ LAN4: Intel® I210AT (LAN2 is BMC shared NIC; LAN3/4 is for G4 SKU only)

Mechanical and Environmental

- **Dimensions (L x W):** 244 x 304 mm (9.6 x 12 in)
- **Power supply voltage:** +3.3 V, +5 V, ±12 V, 5 V_{SB}
- **Power consumption:** Max. load: +3.3 V @ 2.05 A, +5 V @ 1.69 A, +12 V @ 0.36 A, +12 V (8P) @ 13 A, +5 V_{SB} @ 0.10 A
- **Operating temperature:** 0 ~ 60 °C; 32 ~ 140 °F (depends on CPU speed and cooler solution)
- **Weight:** 0.5 kg; 1.1 lb (weight of board)

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 list	
Label	Function
ATXPWR1	ATX 24-pin main power connector (for System)
ATX12V1	8-pin power connector (for CPU)
AUDIO2	Audio connector
BAT1	For RTC battery
BAT2	For optional battery kit
BIOS_SKT1	BIOS SPI ROM
BMC_DEBUG1	For RD debugging
BMC_UART1	BMC debug message
BMC_VGA1	BMC VGA connector
BMC_SPI1	BMC image ROM
COM1, COM2, COM3_4, COM5_6	Serial port: RS-232
CPUFAN0	CPU FAN connector
DIMMA0, DIMMA1, DIMMB0, DIMMB1	DDR5 288-pin slot
DVI1	DVI connector
ESPI1	For RD debugging
EX_THR1	For external thermistor cable kit
FPAUD1	Front panel audio header
GPIO1	8-bit GPIO header
HDMI1_VGA1	HDMI + VGA connector
JCASE1	Case open
JFP1	To support 1U chassis (Cable P/N: 1700031926-11) Power Switch/Power Reset/Power LED/LAN1LED/LAN2LED/HDD LED Power LED Behavior: <ul style="list-style-type: none"> • Suspend: Fast flash (ATX/AT) • System On: ON (ATX/AT) • System Off: OFF (ATX/AT)
JFP1+JFP2	Power Switch/ Power Reset/ External Speaker/ HDD LED/ SMBus connector
JFP3	Keyboard Lock and Power LED Suspend: Fast flash (ATX/ AT) System On: ON (ATX/ AT) System Off: OFF (ATX/AT)
LAN1_USB3C1, LAN2_USB3C2	LAN1/USB 3.2 Gen2 port 1, 2 stack connector LAN2/USB 3.2 Gen2 port 3, 4 stack connector

Jumpers and Connectors (Cont.)

Connector list	
LANLED1	LAN LED extension connector
LAN3_LAN4	LAN3 & LAN4 connector
M2_2280_1	M.2 2280 (PCIe)
PCI_SLOT1, PCI_SLOT2	PCI slot
PCIEX4_SLOT4	PCIe x4 slot (Gen3 x4 link)
PCIEX4_SLOT3, PCIEX4_SLOT5, PCIEX4_SLOT7	PCIe x4 slot (Gen4 x4 link)
PCIEX16_SLOT6	PCIe x16 slot (Gen5 x16 link)
PMBUS1	PMBUS connector to communicate with power supply
SATA0~3	SATA III (6 Gb/s)
SMBUS1	SMBus connector
SPDIF_OUT1	SPDIF audio output pin header
SPI_CN1	SPI flash card pin header
SPI_TPM1	SPI connector for Advantech TPM 2.0 module (P/N: PCA-TPMSPI-00A1)
SYS_LED1	System information LED connector
SYSFAN0, SYSFAN1, SYSFAN2, SYSFAN3	System FAN connector
USB2H1, USB2H2, USB2H3	USB 2.0 port (Header)
USB3A1	USB 3.2 Gen1 Port (USB Type A)
USB3H1	USB 3.2 Gen1 port (Header)
VOLT1	Voltage display

Jumper list	
Label	Function
JCMOS1	CMOS clear
JFV1	VGA is forced on
JME1	Intel ME Disable jumper for ME/ BIOS update
JWDT1	Watchdog reset
JUSB_1	Rear window USB 3.2 Gen2 port power source switch between +5 V _{sb} and +5 V

Jumpers and Connectors (Cont.)

Jumper list

JUSB_2	On board USB 2.0/3.2 Gen1 port power source switch between +5 V _{SB} and +5 V
JPEG1	x16 or x8x8 for slot-6
JPSMB1, JPSMB2	PCIe SLOT SMBUS connector: to PCH (1-2)/to BMC (2-3)
JPCICKL1	PCI slot 66MHz clock: Enable (1-2)/Disable (2-3)
JSMB1	For RD debugging
JTHR_SEL1	To select on board or external thermistor
PERSON1	AT (1-2)/ATX (2-3)

PCIEX16_Slot6 configuration (JPEG1)

Closed pins	Result
1-2	Slot6 PCIe x16*
2-3	Slot6 PCIe x8 + x8

*: Default



Slot6 PCIe x16



Slot6 PCIe x8 + x8

JCMOS1/JME1: CMOS clear/ME update function

Closed pins	Result
1-2	Keep CMOS data/Disable ME update*
2-3	Clear CMOS data/Enable ME update

*: Default



Keep CMOS data/
Disable ME update



Clear CMOS data/
Enable ME update

JWDT1: Watchdog timer output option

Closed Pins	Result
1-2	System reset*
2-3	Disabled

*: Default



System Reset 1-2 Closed



Disabled 2-3 Closed

Jumpers and Connectors (Cont.)

PERSON1: ATX, AT mode selector

Closed Pins	Result
1-2	AT Mode
2-3	ATX Mode*

*: Default



AT Mode 1-2 closed



ATX Mode 2-3 closed

JFP1, JFP2

Pin.3	#PWR_SW
Pin.6	GND
Pin.9	#RST_SW
Pin.12	GND

*Power button pin is located in Pin 3 & 6 of front panel connector

JFP1	3	6	9	12	PWRSW	RESET
&	2(+)	5(-)	8	11		
JFP2	1	4	7	10	SPEAKER	
JFP3	1	2	3	4	5	PWRLED & KEYLOCK
	(+)	(-)				

2.0 mm JFP1 connector on board

Description	Pin Number		Description
RST BTN	2	▼1	PWR BTN
RST GND	4	3	PWR GND
LAN1_LED+	5	6	LAN2_LED+
LAN1_LED-	8	7	LAN2_LED-
CRPS Detect (Reserved)	10	9	SYS_LED+ (Reserved)
GND	12	11	SYS_LED- (Reserved)
PWR_LED+	14	13	HDD_LED+
PWR_LED-	16	15	HDD_LED-

2.0 mm JFP1 connector to 2.54 mm Pitch Header

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

Jumpers and Connectors (Cont.)

SATA storage mapping table		
Connector Label	BIOS Menu	Intel Rapid Storage Technology
SATA0	SATA4	Internal empty port 4
SATA1	SATA5	Internal empty port 5
SATA2	SATA6	Internal empty port 6
SATA3	SATA7	Internal empty port 7

Declaration of Conformity

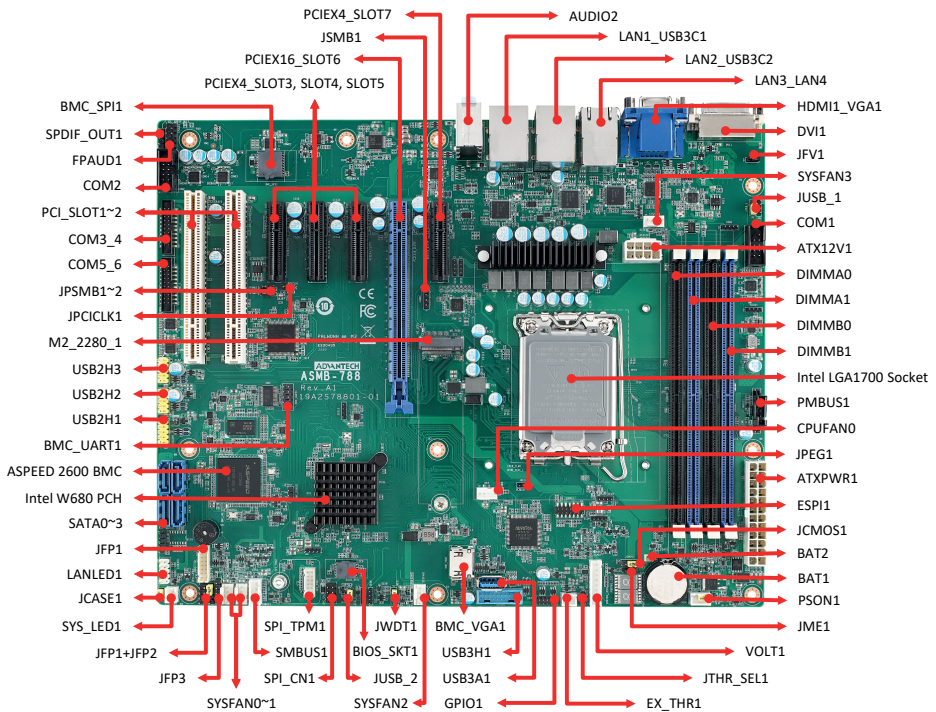
Caution! The computer is supplied with a battery-powered realtime clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.



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



Board Layout: Jumper and Connector Locations

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