



**MODEL:
IMBA-H420**

ATX motherboard supports 14nm LGA1200 Intel® 10th/ 11th Generation Core™ i9/i7/i5/i3, Celeron® and Pentium® processor, DDR4, triple displays, 2.5 GbE LAN, USB 3.2, SATA 6Gb/s, HD Audio and RoHS

User Manual

Revision

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Manual Conventions



WARNING

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.



CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.



NOTE

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.

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Chapter

1

Introduction

IMBA-H420 ATX Motherboard

1.1 Introduction

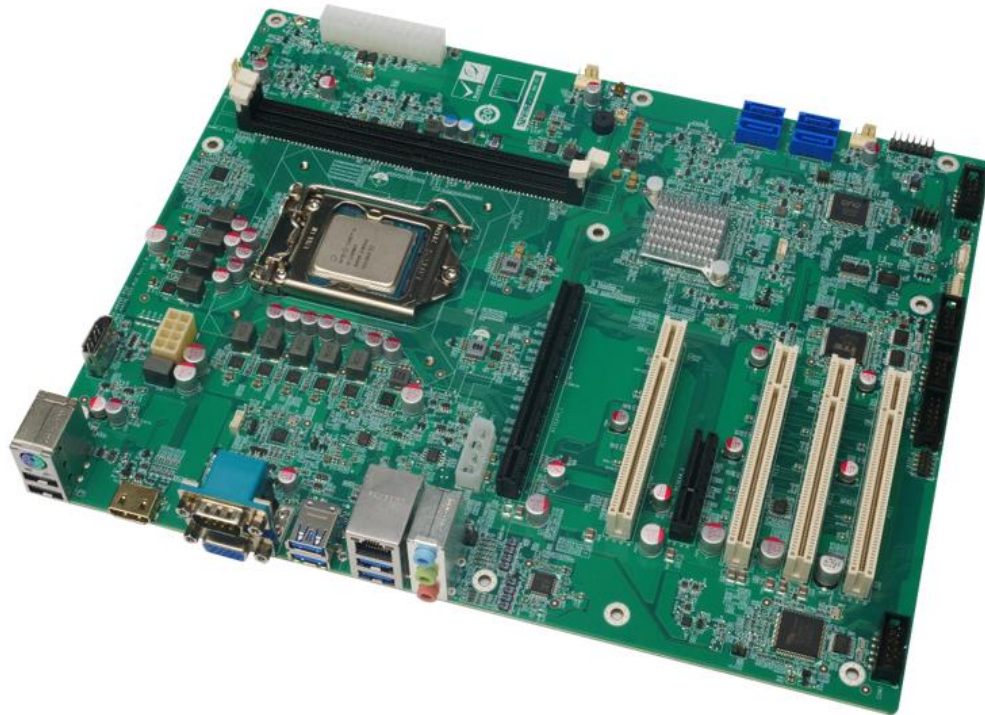


Figure 1-1: IMBA-H420

The IMBA-H420 is an ATX motherboard. It accepts a Socket LGA1200 10th/11th Generation Intel® Core™ i9/i7/i5/i3, Pentium® or Celeron® processor and supports two 288-pin 2933MHz dual-channel DDR4 SDRAM DIMM modules up to 64 GB. The integrated Intel® H420E chipset supports four SATA 6Gb/s drives. Moreover, the IMBA-H420 includes DP++, HDMI and VGA interfaces for triple displays.

The IMBA-H420 provides one 2.5GbE interfaces through the Intel® I225V controllers. Expansion and I/O include four PCI slots, one PCIe x16 slot, one PCIe x4 slot, one RS-232, four USB 3.2 Gen 1, two USB 2.0 on the rear panel.

1.2 Features

Some of the IMBA-H420 motherboard features are listed below:

- ATX form factor
- LGA1200 10th/11th Generation Intel® Core™ i9/i7/i5/i3, Pentium® or Celeron® processor supported
- Intel® H420E chipset
- Two 288-pin 2933MHz dual-channel DDR4 DIMMs support up to 128 GB
- One Intel® I225V 2.5GbE controller
- Supports PCI Express Generation 3.0
- Triple display by DP++, HDMI and VGA interfaces
- Four SATA 6Gb/s connectors (no RAID)
- Four USB 3.2 Gen 1 ports and four USB 2.0 ports
- One PCIe Gen3 x16 slot
- One PCIe Gen3 x4 slot
- Four PCI slots
- Six serial ports (one on rear panel; the others via internal pin header)
- The optional expansion cards provide more choices to meet user's demand
- TPM 2.0 security function supported by PTT (Platform Trust Technology), based on BIOS setting
- High Definition Audio
- RoHS compliant

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1.3 Connectors

The connectors on the IMBA-H420 are shown in the figure below.

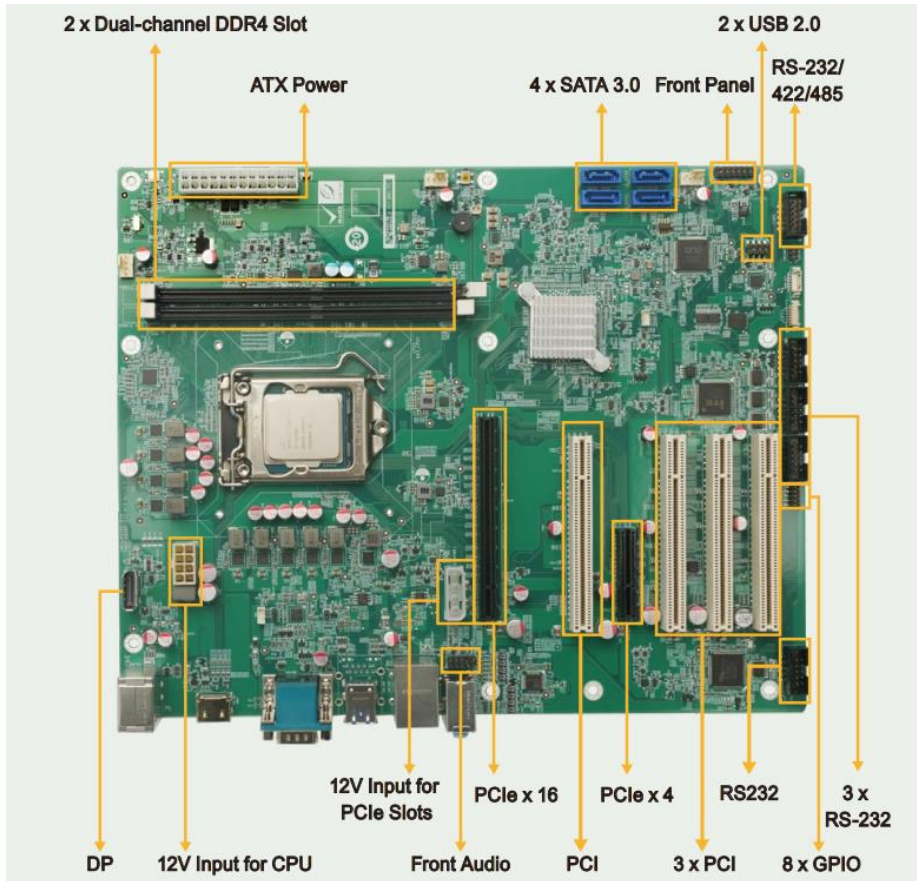


Figure 1-2: Connectors

1.4 Dimensions

The main dimensions of the IMBA-H420 are shown in the diagram below.

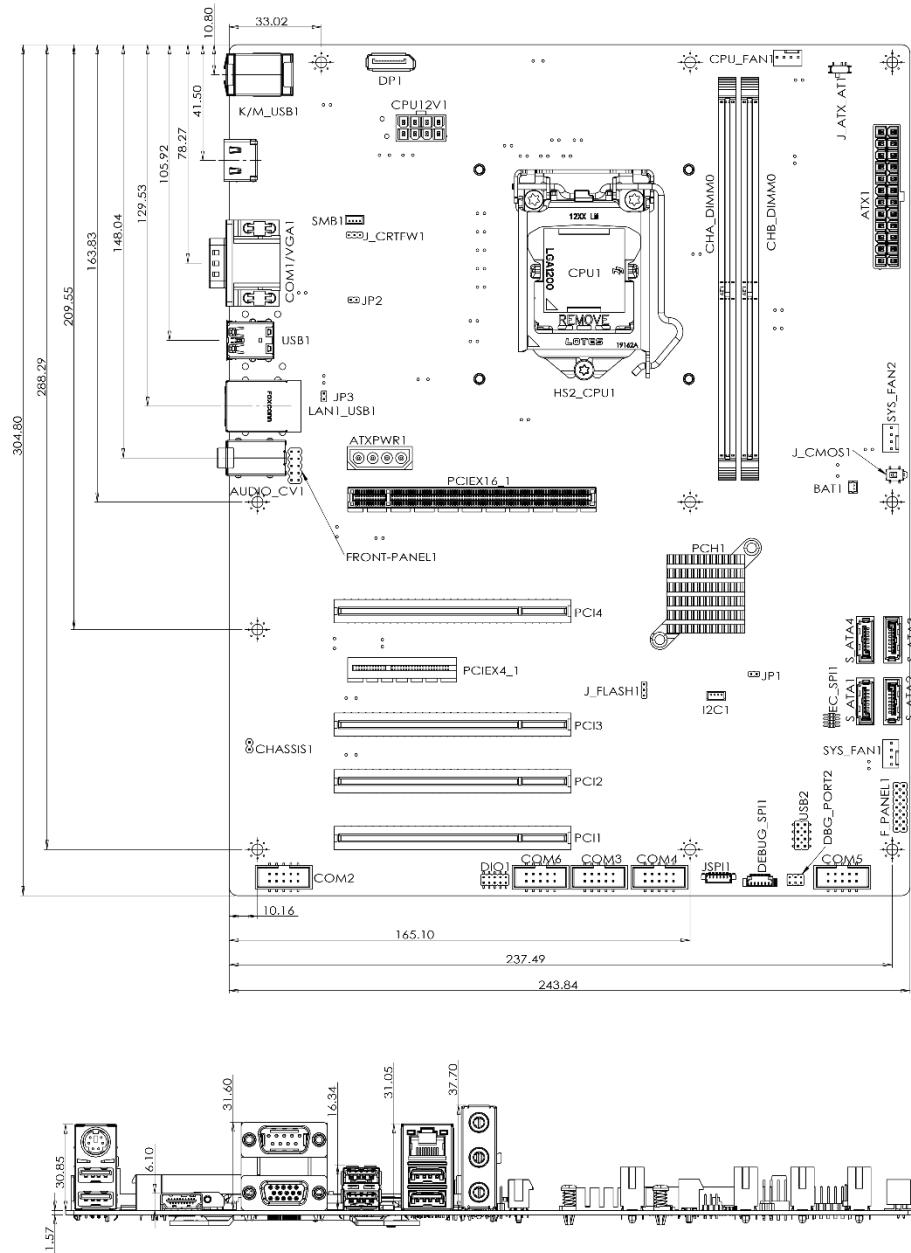


Figure 1-3: IMBA-H420 Dimensions (mm)

IMBA-H420 ATX Motherboard

1.5 Data Flow

Figure 1-4 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

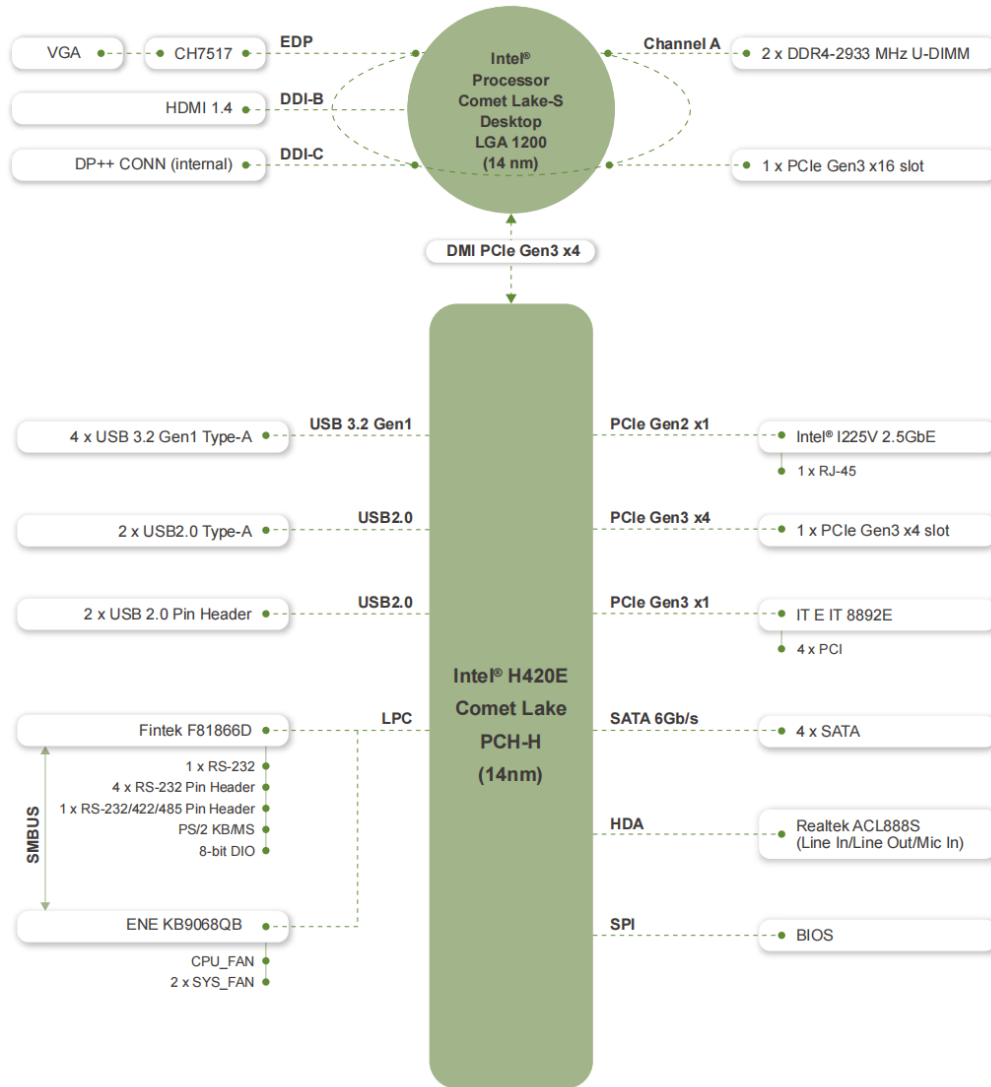


Figure 1-4: Data Flow Diagram

1.6 Technical Specifications

The IMBA-H420 technical specifications are listed below.

Specification/Model	IMBA-H420
Form Factor	ATX
CPU Supported	LGA1200 10th/11th Generation Intel® Core™ i9/i7/i5/i3, Pentium® or Celeron® CPU
Chipset	Intel® H420E
Memory	Two 288-pin 2933 MHz dual-channel unbuffered DDR4 SDRAM DIMMs supported (system max. 64 GB)
Graphics Engine	Up to Intel® UHD Graphics 630; Intel® HD Graphics Gen 9 Engines with 16 low-power execution units, supporting DX2015, OpenGL 5.x, OpenCL2.x and ES 2.0
Display Output	Triple display 1 x VGA (up to 1920 x 1200@60Hz) 1 x Internal DP++ (up to 4096 x 2304@60Hz) 1 x HDMI (up to 4096 x 2160@30Hz)
Audio	Realtek ALC888S HD codec 3 x Audio Jack (Line-in, Line-out, Mic-in)
BIOS	AMI UEFI BIOS
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Expansions	1 x PCIe Gen3 x16 1 x PCIe Gen3 x4 4 x PCI
I/O Interface Connectors	
Chassis Intrusion	One 2-pin header
Digital I/O	1 x 8-bit digital I/O (2x5 pin)
Ethernet	LAN1: Intel I225-V GbE controller (colay I225-LM)

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Fan	1 x CPU fan connector (1x4 pin) 2 x System fan connector (1x4 pin)
Front Panel	1 x Front Panel (2 x 7 pin, Power LED, HDD LED, Speaker, Power Button, Reset Button)
I²C	1 x I ² C (1x4 pin)
LAN LED	2 x LAN LED (1x2 pin)
Serial SATA	Four SATA 6Gb/s connectors
Serial Ports	1 x RS-232/422/485 (2x5 pin, P=2.54) 4 x RS-232 (2x5 pin, P=2.54)
SMBus	One 4-pin wafer connector
USB Ports	4 x USB 3.2 Gen 1 Type-A on the rear IO 2 x USB 2.0 Type-A on the rear IO 2 x USB 2.0 via pin header
Environmental and Power Specifications	
Power Supply	AT/ATX power supply
Power Consumption	3.3V@1.36A, 5V@14.16A, 12V@7.5A (Intel® Core™ i9-10900E CPU with four 32 GB 3200 MHz DDR4 memory)
Operating Temperature	0°C ~ 60°C
Storage Temperature	-30°C ~ 70°C
Operating Humidity	5% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	244 mm x 305 mm
Weight (GW/NW)	1200 g/700 g

Table 1-1: IMBA-H420 Specifications

Chapter

2

Packing List

IMBA-H420 ATX Motherboard

2.1 Anti-static Precautions



WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband:*** Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding:*** Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad:*** When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB:*** Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the IMBA-H420 is unpacked, please do the following:

- Follow the anti-static guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List



NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the IMBA-H420 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The IMBA-H420 is shipped with the following components:





Quantity	Item and Part Number	Image
1	IMBA-H420 single board computer	
3	SATA cable	
1	I/O shielding	
1	Quick installation guide	

Table 2-1: Packing List

IMBA-H420 ATX Motherboard

2.4 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	Image
Dual-port USB cable with bracket (P/N: 19800-003100-100-RS)	
FLAT CABLE; RS-232/422/485; RS-232 CABLE;2;230mm (P/N: 32205-000702-200-RS)	
SATA power cable (P/N: 32102-000100-200-RS)	
RS-232 cable,230mm , P=2.54 (P/N: 19800-020100-100-RS)	
High-performance LGA1155/LGA1156/1200 cooler kit (1U chassis compatible, 45W) (P/N: CF-1156C-R20)	
High-performance LGA1155/1156/1200 cooler kit, 1U chassis compatible 73W (P/N: CF-115XA-R10)	
High-performance LGA1155/LGA1156/1200 cooler kit (1U chassis compatible, 65W) (P/N: CF-1156D-R30)	
High-performance LGA1155/LGA1156/1200 cooler kit (95W) (P/N: CF-115XE-R10)	

Table 2-2: Optional Items

Chapter

3

Connectors

IMBA-H420 ATX Motherboard

3.1 Peripheral Interface Connectors

This chapter details all the peripheral interface connectors.

3.1.1 IMBA-H420 Layout

The figures below show all the peripheral interface connectors.

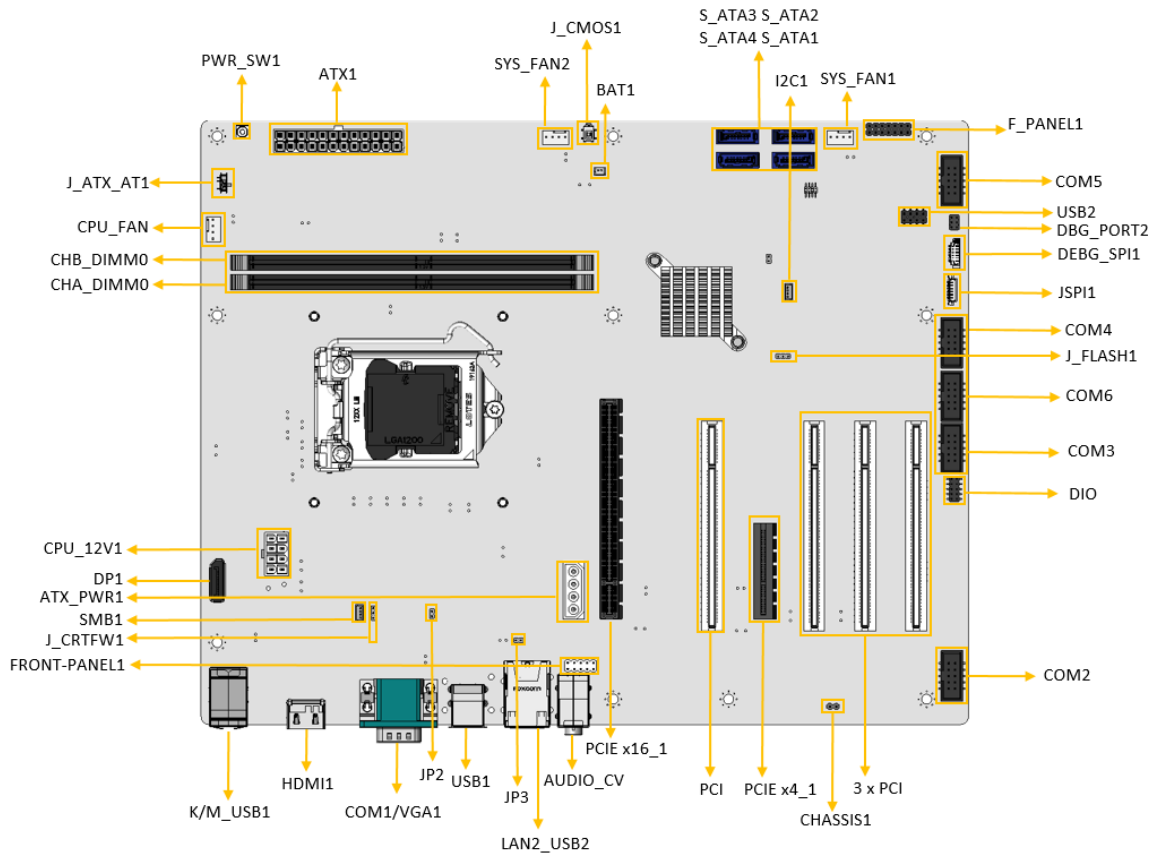


Figure 3-1: Peripheral Interface Connectors

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
ATX CPU 12V power connector	8-pin Molex power connector	CPU12V1
PCIe power connector	4-pin connector	ATXPWR1
Onboard power button	Push button	PWR_SW1
ATX power connector	24-pin connector	ATX1
AT/ATX power mode setting	3-pin switch	J_ATX_AT1
Chassis intrusion connector	2-pin header	CHASSIS1
Digital I/O connector	10-pin header	DIO1
EC debug connector	6-pin header	DEBUG_SPI1
Debug connector	6-pin header	DBG_PORT2
Flash descriptor security override jumper	3-pin header	J_FLASH1
Fan connector (CPU)	4-pin wafer	CPU_FAN1
Fan connectors (system)	4-pin wafer	SYS_FAN1, SYS_FAN2
Clear CMOS jumper	2-pin header	J_CMOS1
Internal audio connector	9-pin header	FRONT-PANEL1
Front panel connector	14-pin header	F_PANEL1
I ² C connector	4-pin wafer	I2C1
SMBUS connector	4-pin wafer	SMB1
VGA firmware refresh connector	3-pin wafer	J_CRTFW1
PCI slots	PCI slot	PCI1, PCI2, PCI3, PCI4
PCIe x4 slot	PCIe x4 slot	PCIEX4_1

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Connector	Type	Label
PCIe x16 slot	PCIe x16 slot	PCIEX16_1
DDR4 DIMM sockets	288-pin socket	CHA_DIMM0, CHB_DIMM0
SATA 6Gb/s connectors	SATA connector	S_ATA1, S_ATA2, S_ATA3, S_ATA4,
Serial ports, RS-232	10-pin box header	COM2, COM3, COM4, COM6
Serial ports, RS-232/422/485	10-pin box header	COM5
Flash SPI ROM connector	6-pin wafer	JSPI1
EC SPI Flash connector	8-pin header	EC_SPI1
Internal USB 2.0 connectors	8-pin header	USB2
LAN2 link LED connector	2-pin header	JP3
Internal DP++ connector	DP++	DP1
Battery connector	2-pin header	BAT1

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

The table below lists the connectors on the external I/O panel.

Connector	Type	Label
External HD Audio jack	Audio jacks	AUDIO_CV1
External keyboard/mouse and USB 2.0 combo connector	2 x USB 2.0 Type-A PS2	K/M_USB1
External HDMI connector	HDMI	HDMI_1
External 2.5GbE RJ-45 and dual USB 3.2 Gen 1 combo connector	RJ45 2 x USB 3.2 Gen 1	LAN2_USB2
External dual USB 3.2 Gen 1 connector	2 x USB 3.2 Gen 1	USB1
External RS-232 and VGA combo connector	DB-9 (9-pin male) VGA (15-pin female)	COM1/VGA1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the IMBA-H420.

3.2.1 CPU 12V Power Connector

- CN Label:** CPU12V1
- CN Type:** 8-pin Molex power connector. p=4.2 mm
- CN Location:** See Figure 3-2
- CN Pinouts:** See Table 3-3

This connector provides power to the CPU.

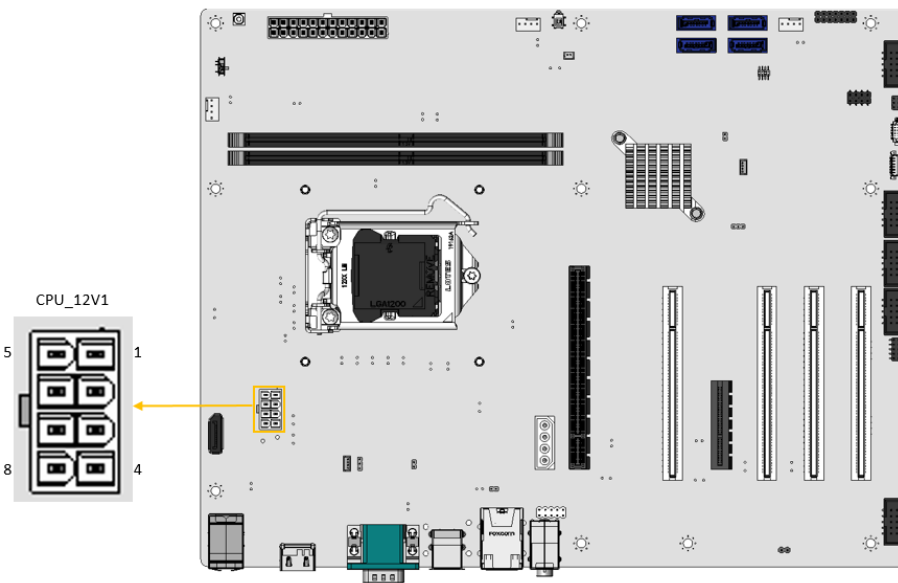


Figure 3-2: ATX CPU 12V Power Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	+12V
2	GND	6	+12V
3	GND	7	+12V
4	GND	8	+12V

Table 3-3: ATX CPU 12V Power Connector Pinouts

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3.2.2 PCIe Power Connector

- CN Label:** **ATXPWR1**
- CN Type:** 4-pin connector, p=5.08 mm
- CN Location:** See **Figure 3-3**
- CN Pinouts:** See **Table 3-4**

The additional power connector provides extra +12V and +5V power to the system.

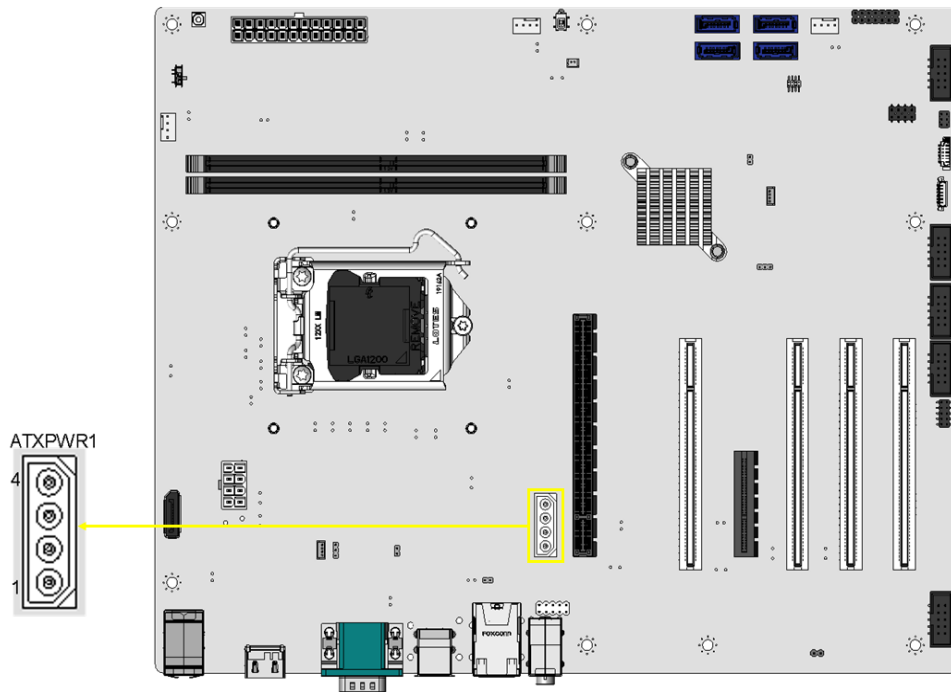


Figure 3-3: PCIe Power Connector Location

Pin	Description
1	+12V
2	GND
3	GND
4	+5V

Table 3-4: PCIe Power Connector Pinouts

3.2.3 ATX Power Connector

- CN Label:** ATX1
- CN Type:** 24-pin connector, p=4.2 mm
- CN Location:** See **Figure 3-4**
- CN Pinouts:** See **Table 3-5**

The ATX power connector connects to an ATX power supply.

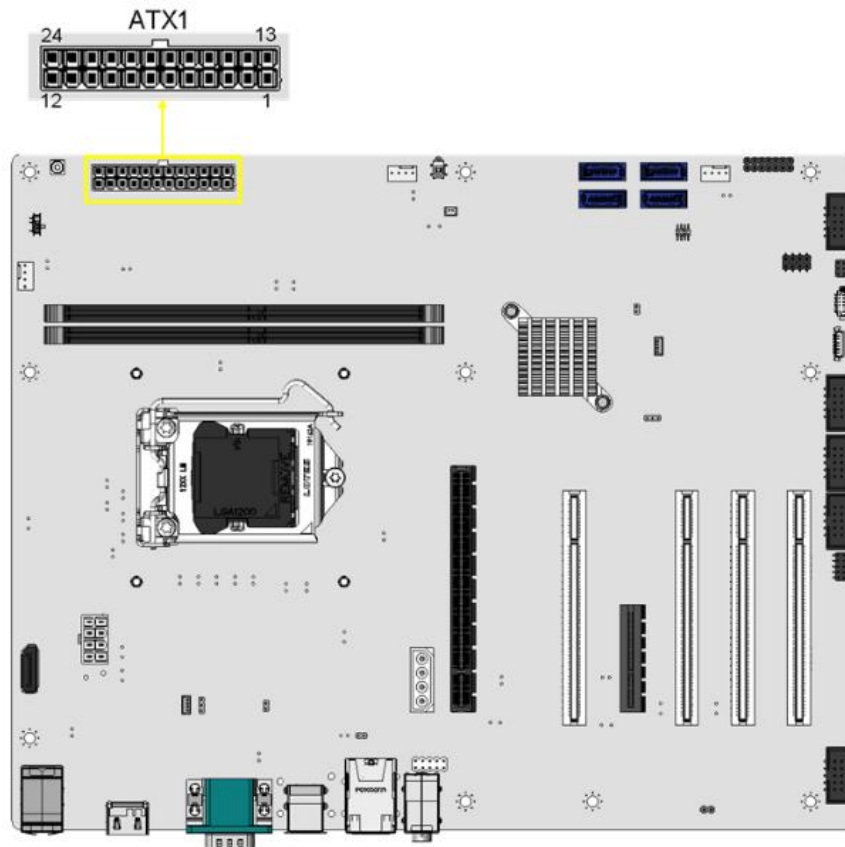


Figure 3-4: ATX Power Connector Location

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Pin	Description	Pin	Description
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power good	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

Table 3-5: ATX Power Connector Pinouts

3.2.4 Battery Connector



CAUTION:

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.



NOTE:

It is recommended to attach the RTC battery onto the system chassis in which the IMBA-H420 is installed.

- CN Label:** **BAT1**
- CN Type:** 2-pin header
- CN Location:** See **Figure 3-5**

A system battery is placed in the battery holder. The battery provides power to the system clock to retain the time when power is turned off.

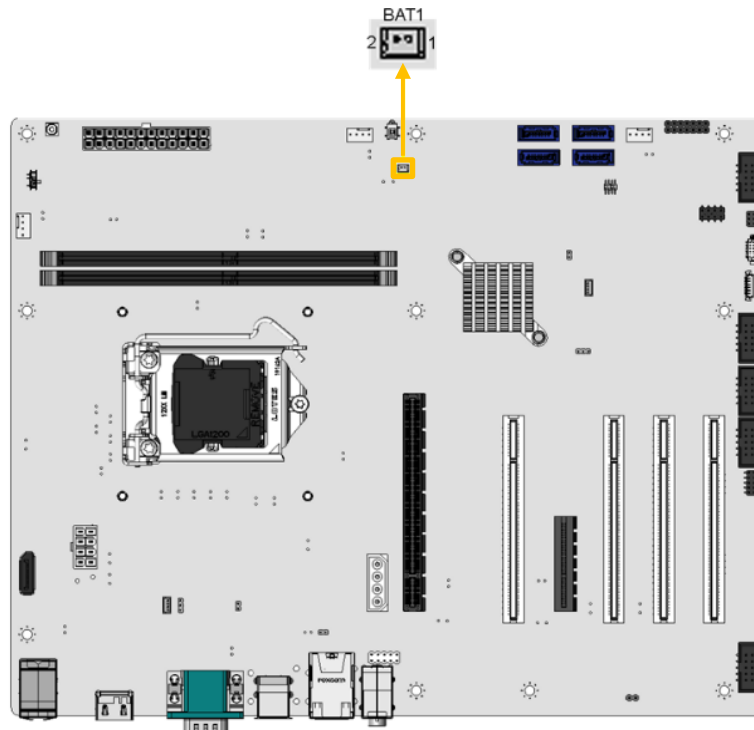


Figure 3-5: Battery Connector Location

3.2.5 Chassis Intrusion Connector

- CN Label:** **CHASSIS1**
- CN Type:** 2-pin header, p=2.54 mm
- CN Location:** See **Figure 3-6**
- CN Pinouts:** See **Table 3-6**

The chassis intrusion connector is for a chassis intrusion detection sensor or switch that detects if a chassis component is removed or replaced.

IMBA-H420 ATX Motherboard

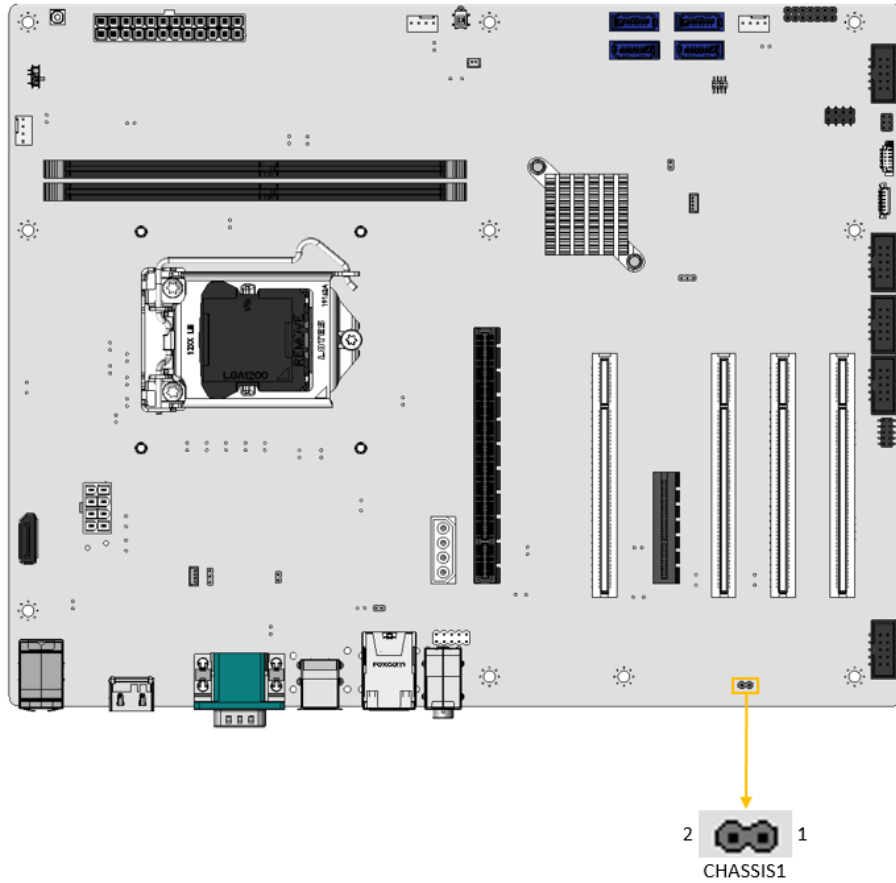


Figure 3-6: Chassis Intrusion Connector Location

Pin	Description
1	+VRTC
2	CHASSIS_OPEN

Table 3-6: Chassis Intrusion Connector Pinouts

3.2.6 Digital I/O Connector

- CN Label:** DIO1
- CN Type:** 10-pin header, p=2.0 mm
- CN Location:** See **Figure 3-7**
- CN Pinouts:** See **Table 3-7**

The Digital I/O connector provides programmable input and output for external devices.

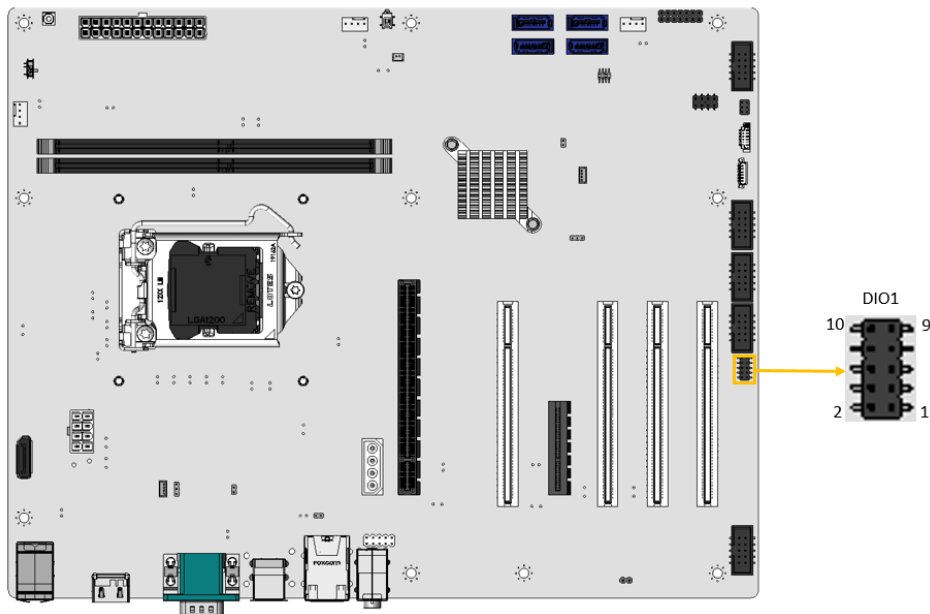


Figure 3-7: Digital I/O Connector Location

Pin	Description	Pin	Description
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 3-7: Digital I/O Connector Pinouts

IMBA-H420 ATX Motherboard

3.2.7 EC Debug Connector

- CN Label:** DEBUG_SPI1
- CN Type:** 6-pin header, p=1.25 mm
- CN Location:** See Figure 3-8
- CN Pinouts:** See Table 3-8

The DEBUG_SPI1 connector is used for EC debug (with SPI protocol).

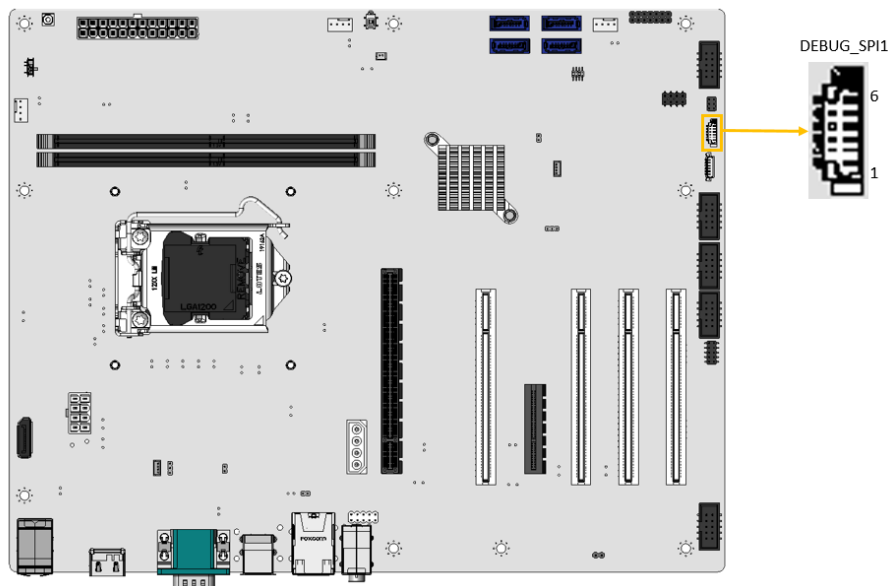


Figure 3-8: EC Debug Connector Location

Pin	Description	Pin	Description
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0

Table 3-8: Digital I/O Connector Pinouts

3.2.8 Debug Connector

- CN Label:** **DBG_PORT2**
- CN Type:** 6-pin header, p=2 mm
- CN Location:** See **Figure 3-9**
- CN Pinouts:** See **Table 3-9**

The DBG_PORT2 is used for monitoring the motherboard startup process with debug card .

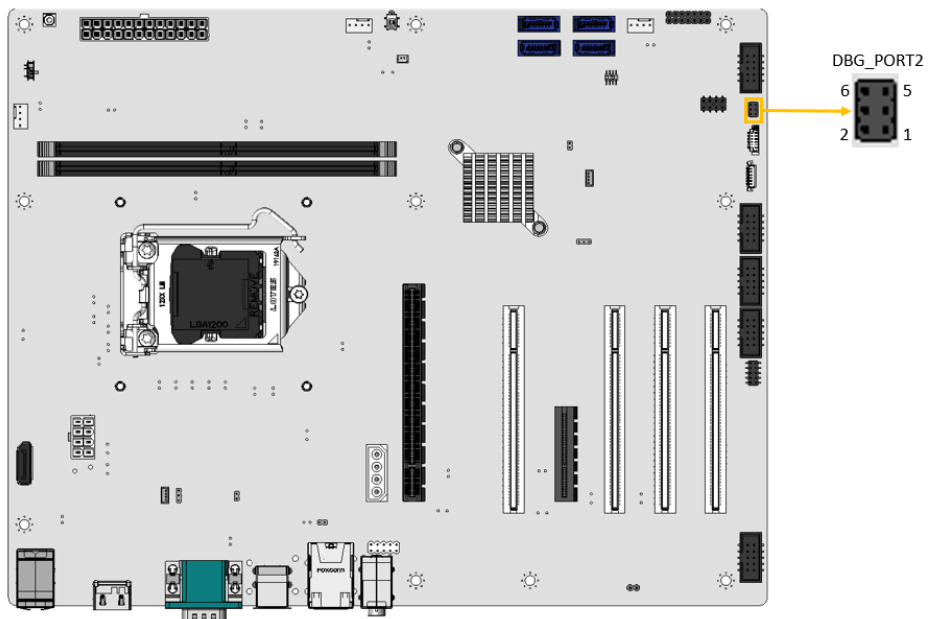


Figure 3-9: Debug Connector Location

Pin	Description	Pin	Description
1	+5V	2	SMCLK_EC
3	NC	4	SMDATA_EC
5	GND	6	PLTRST_N

Table 3-9: Debug Connector Pinouts

IMBA-H420 ATX Motherboard

3.2.9 Fan Connector (CPU)

- CN Label:** CPU_FAN1
- CN Type:** 4-pin wafer, p=2.54 mm
- CN Location:** See Figure 3-10
- CN Pinouts:** See Table 3-10

The fan connector attaches to a CPU cooling fan.

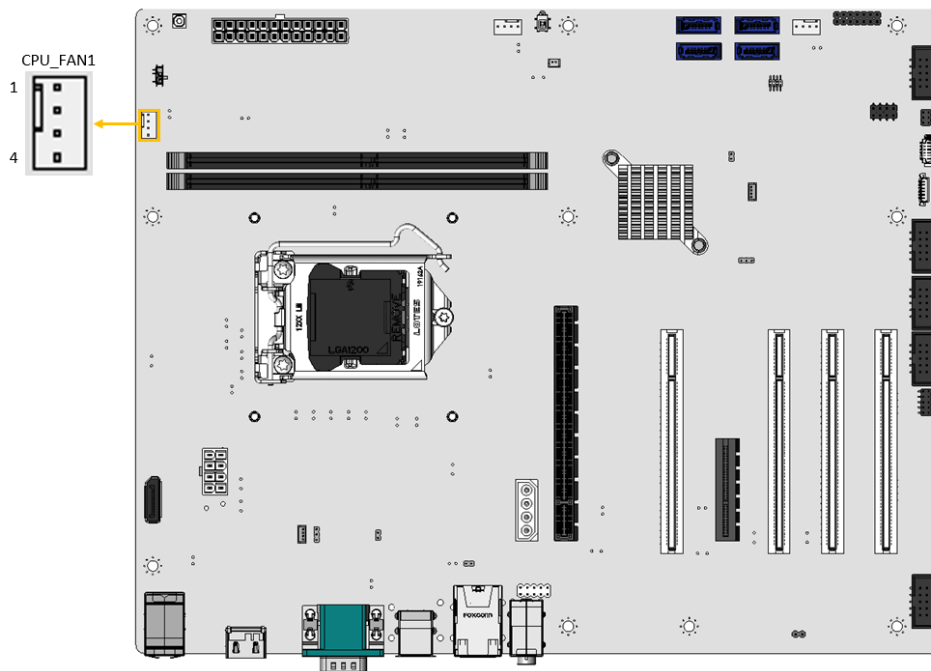


Figure 3-10: CPU Fan Connector Location

Pin	Description
1	GND
2	+12V
3	FANIO
4	+5V

Table 3-10: CPU Fan Connector Pinouts

3.2.10 Fan Connectors (System)

- CN Label:** **SYS_FAN1, SYS_FAN2**
- CN Type:** 4-pin wafer, p=2.54 mm
- CN Location:** See **Figure 3-11**
- CN Pinouts:** See **Table 3-11**

Each fan connector attaches to a system cooling fan. The SYS_FAN1 provides smart fan function.

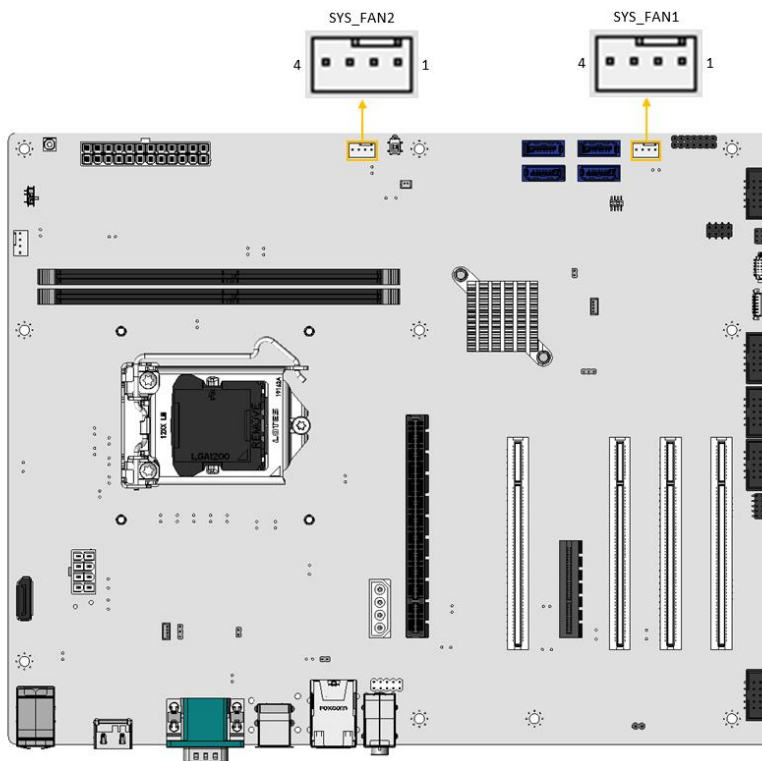


Figure 3-11: System Fan Connector Locations

Pin	Description
1	GND
2	+12V
3	FANIO
4	PWM

Table 3-11: System Fan Connector Pinouts

IMBA-H420 ATX Motherboard

3.2.11 Front Panel Connector

- CN Label:** F_PANEL1
- CN Type:** 14-pin header, p=2.54 mm
- CN Location:** See Figure 3-12
- CN Pinouts:** See Table 3-12

The front panel connector connects to the indicator LEDs and buttons on the computer's front panel.

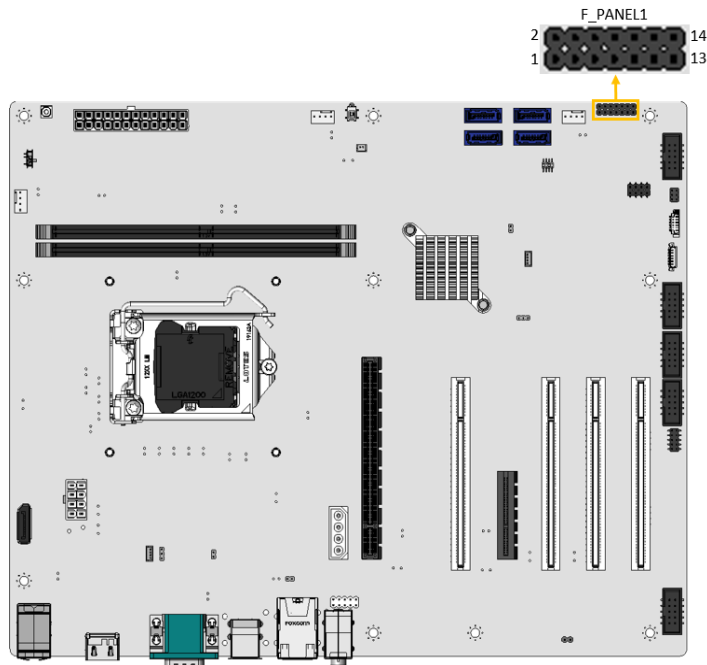


Figure 3-12: Front Panel Location

Pin	Description	Pin	Description
1	PWR_LED+	2	SPKR+
3	NC	4	NC
5	PWR_LED-	6	NC
7	PWR_BTN+	8	SPKR-
9	PWR_BTN-	10	NC
11	HDD_LED+	12	RESET+
13	HDD_LED-	14	RESET-

Table 3-12: Front Panel Pinouts

3.2.12 Internal Audio Connector

- CN Label:** FRONT-PANEL1
- CN Type:** 9-pin header, p=2.54 mm
- CN Location:** See Figure 3-13
- CN Pinouts:** See Table 3-13

This connector connects to speakers, a microphone and an audio input.

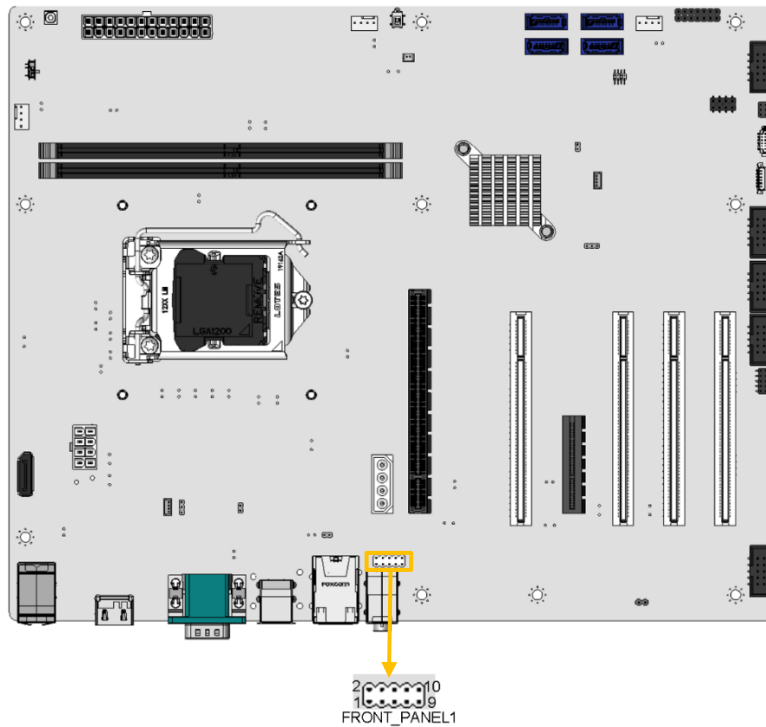


Figure 3-13: Internal Audio Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LMIC2-L	2	AUD_GND
3	LMIC2-R	4	PRESENCE#
5	LLINE2-R	6	MIC2-JD
7	FRONT-IO	8	NC
9	LLINE2-L	10	LINE2-JD

Table 3-13: Internal Audio Connector Pinouts

IMBA-H420 ATX Motherboard

3.2.13 I²C Connector

- CN Label:** I2C1
- CN Type:** 4-pin wafer, p=1.25 mm
- CN Location:** See Figure 3-14
- CN Pinouts:** See Table 3-14

The I²C connector is used to connect I²C-bus devices to the mainboard.

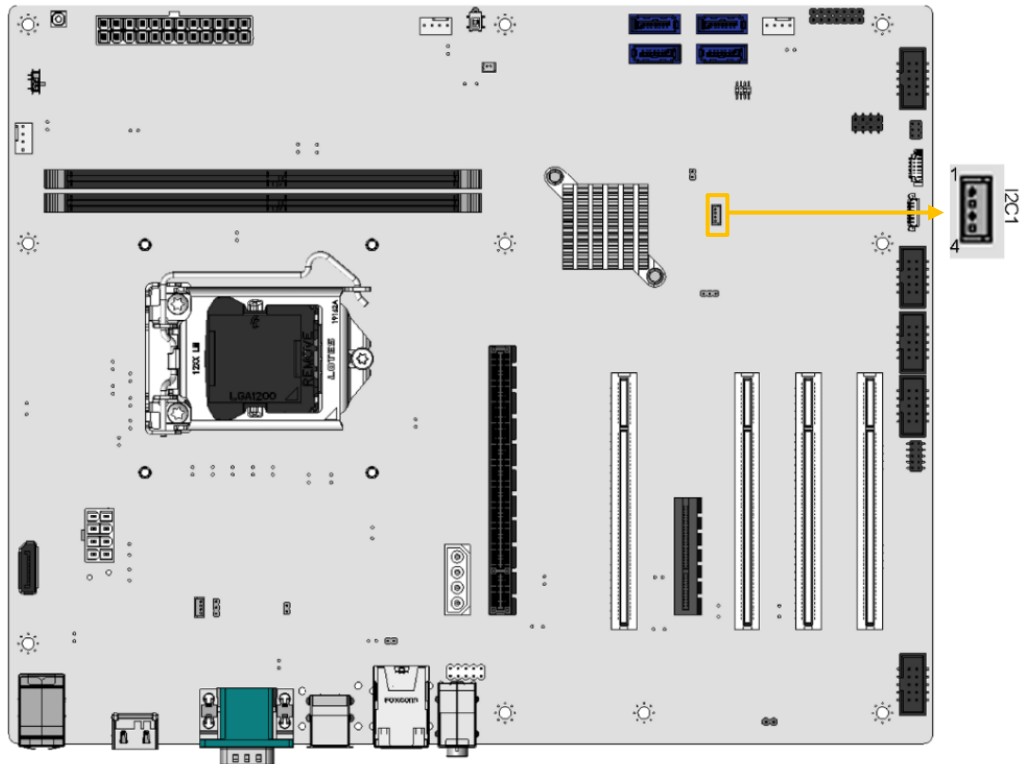


Figure 3-14: I²C Connector Location

Pin	Description
1	GND
2	I2C_DAT
3	I2C_CLK
4	+5V

Table 3-14: I2C Connector Pinouts

3.2.14 SMBus Connector

- CN Label:** SMB1
- CN Type:** 4-pin wafer, p=1.25 mm
- CN Location:** See **Figure 3-15**
- CN Pinouts:** See **Table 3-15**

The SMBus (System Management Bus) connector provides low-speed system management communications.

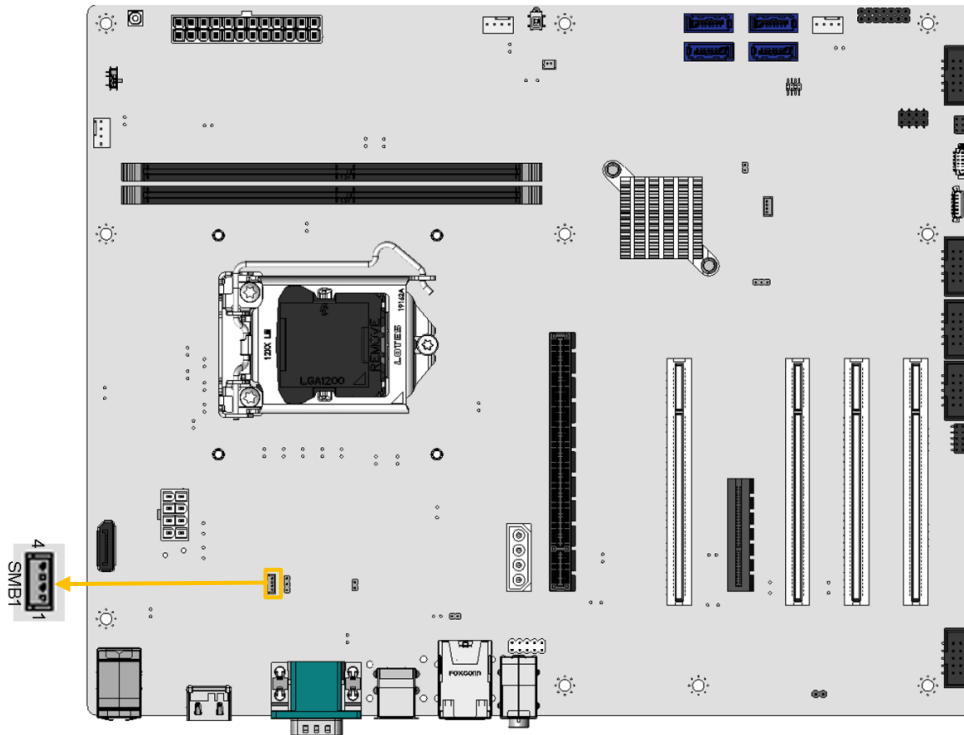


Figure 3-15: SMBus Connector Location

Pin	Description
1	GND
2	SMB_DATA
3	SMB_CLK
4	+5V

Table 3-15: SMBus Connector Pinouts

IMBA-H420 ATX Motherboard

3.2.15 LAN Link LED Connector

- CN Label:** JP2, JP3
- CN Type:** 2-pin header, p=2.00 mm
- CN Location:** See **Figure 3-16**
- CN Pinouts:** See **Table 3-16** and **Table 3-17**

The LAN LED connectors are used to connect to the LAN LED indicators on the chassis to indicate users the link activities of the LAN ports.

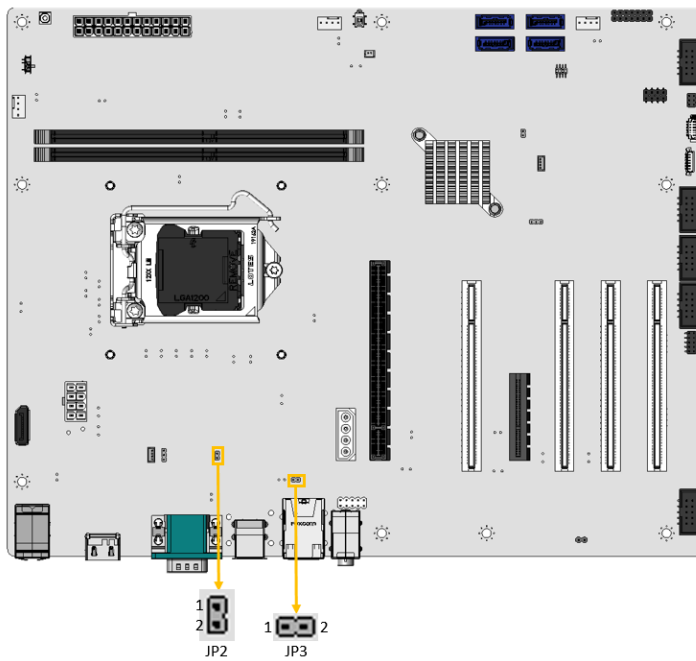


Figure 3-16: JP2, JP3 Connector Locations

Pin	Description
1	+3.3V
2	LAN2_I225_LINK_ACT

Table 3-16: JP2 Connector Pinouts

Pin	Description
1	+3.3V
2	LAN3_I225_LINK_ACT

Table 3-17: JP3 Connector Pinouts

3.2.16 PCI Slots

CN Label: PCI1, PCI2, PCI3, PCI4

CN Type: PCI Slot

CN Location: See **Figure 3-17**

The PCI slot enables a PCI expansion module to be connected to the board.

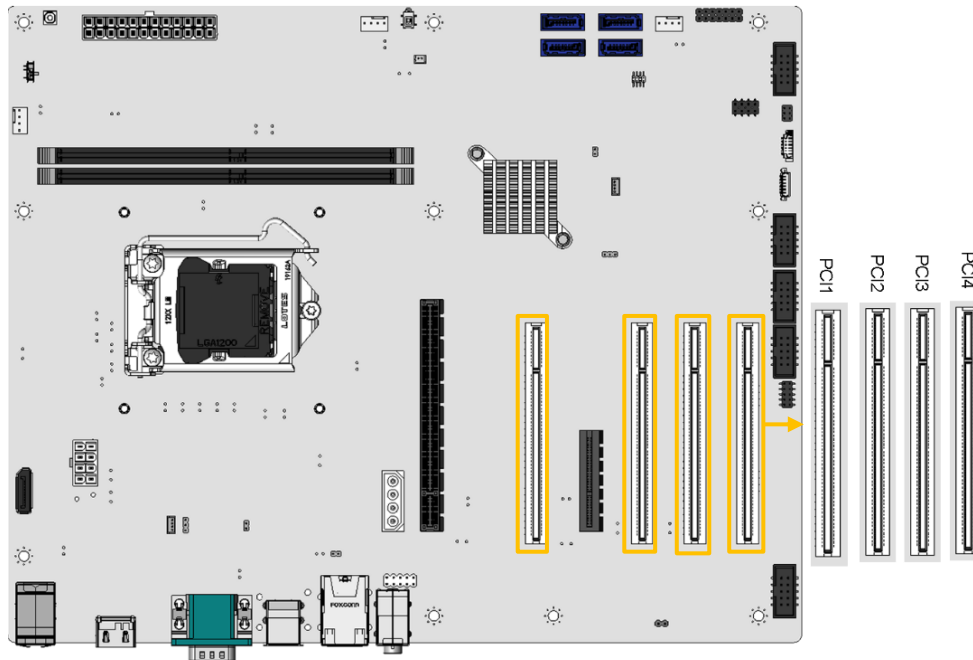


Figure 3-17: PCI Slot Locations

IMBA-H420 ATX Motherboard

3.2.17 PCIe x4 Slot

- CN Label:** PCIEX4_1
- CN Type:** PCIe x4 slot
- CN Location:** See **Figure 3-18**

The PCIe x4 expansion card slots are for PCIe x4 expansion cards.

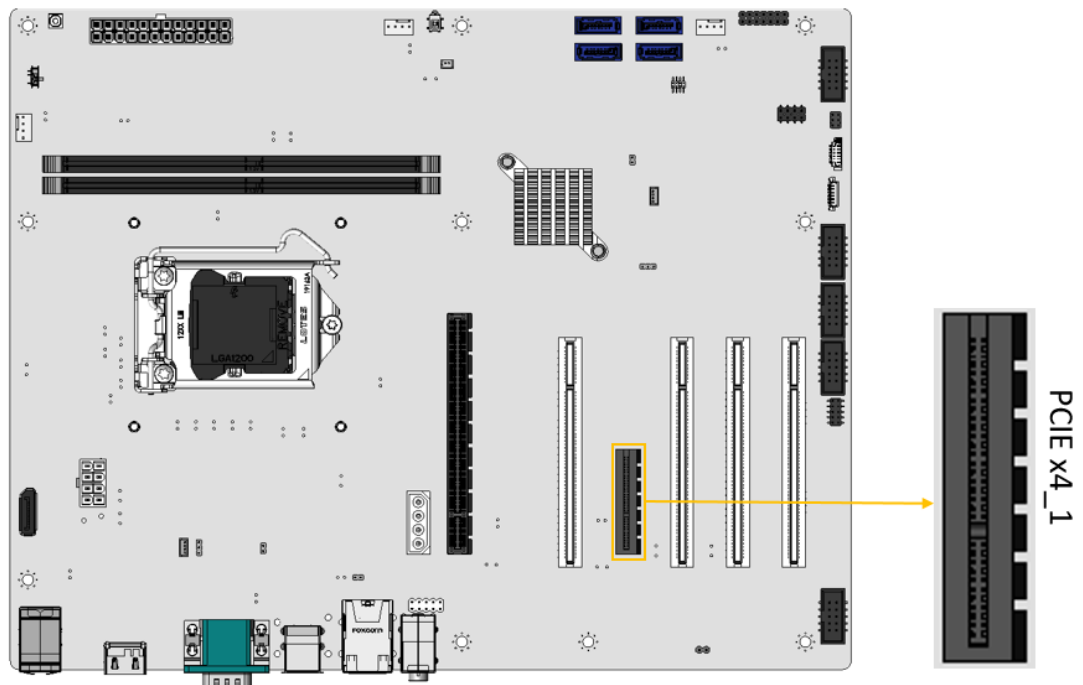


Figure 3-18: PCIe x4 Slot Locations

3.2.18 PCIe x16 Slot

- CN Label:** PCIEX16_1
- CN Type:** PCIe x16 slot
- CN Location:** See **Figure 3-19**

The PCIe x16 expansion card slots are for PCIe x16 expansion cards.

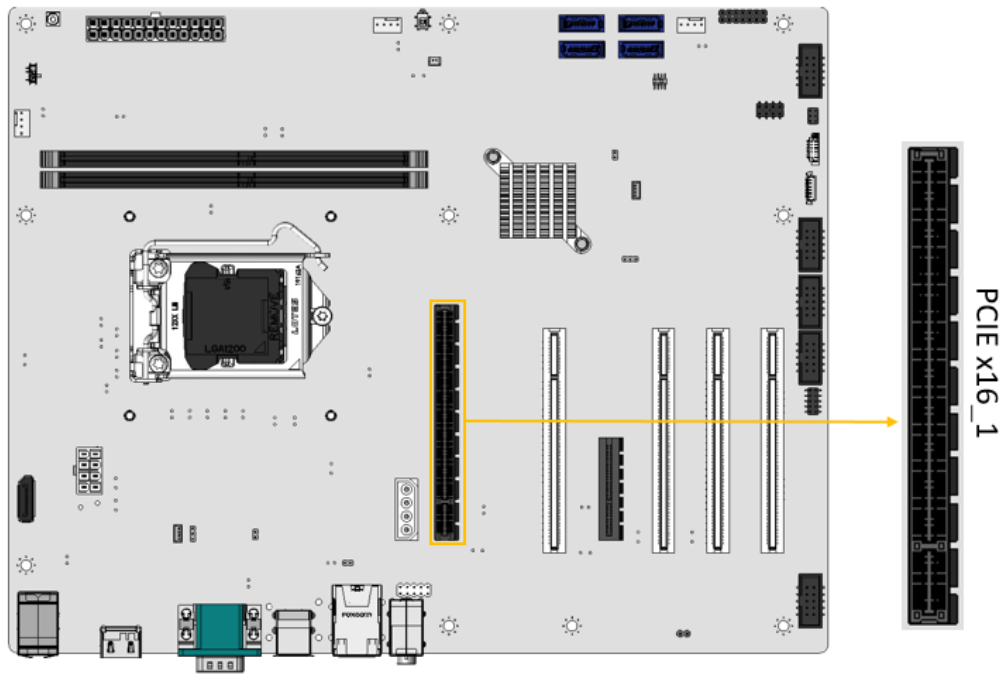


Figure 3-19: PCIe x16 Slot Locations

IMBA-H420 ATX Motherboard

3.2.19 Onboard Power Button

- CN Label:** PWR_SW1
- CN Type:** Push button
- CN Location:** See Figure 3-20

The on-board power button controls system power.

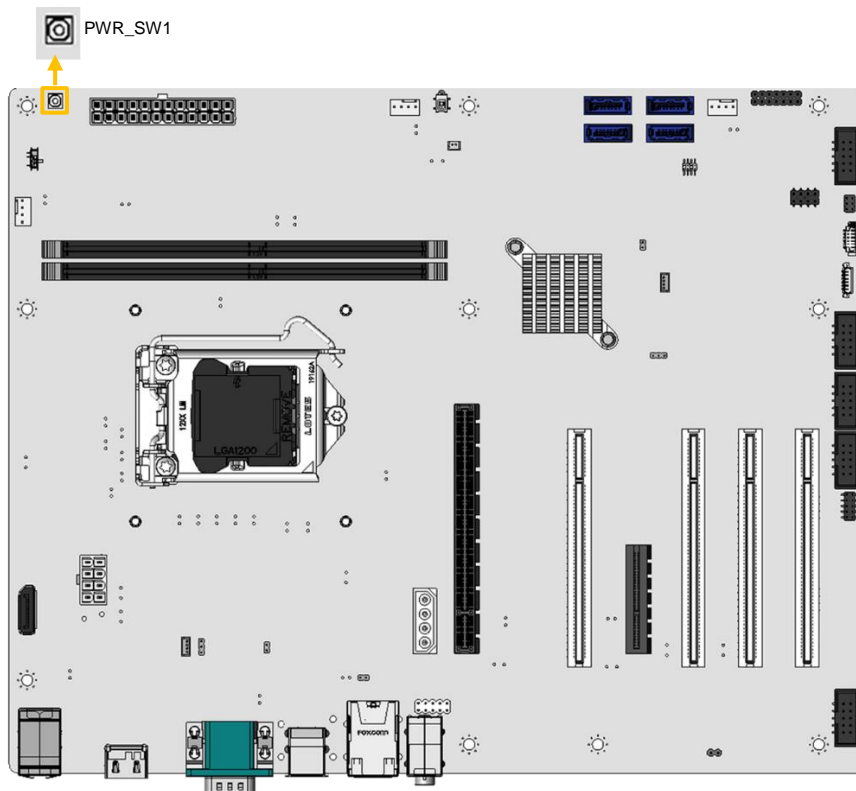


Figure 3-20: Power Button Location

3.2.20 DDR4 DIMM Sockets

CN Label: CHA_DIMM0, CHB_DIMM0,

CN Type: 288-pin socket

CN Location: See Figure 3-21

The DIMM slots are for DDR4 DIMM memory modules

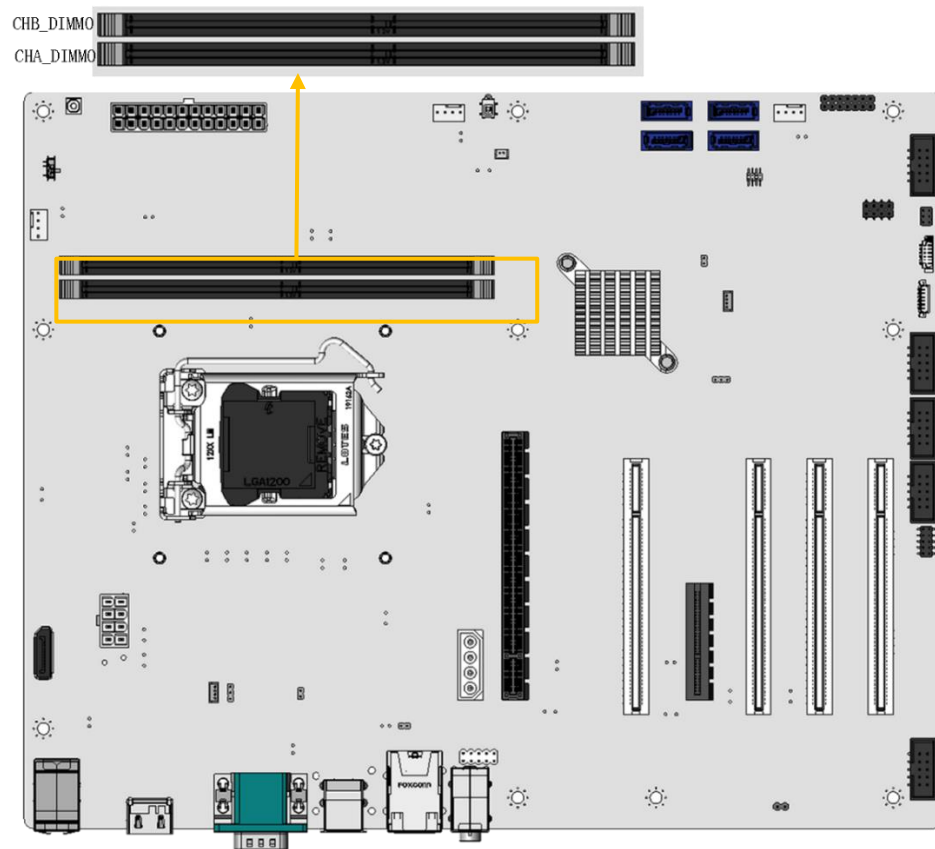


Figure 3-21: DDR4 DIMM Socket Location

IMBA-H420 ATX Motherboard

3.2.21 SATA 6Gb/s Connectors

CN Label: S_ATA1, S_ATA2, S_ATA3, S_ATA4

CN Type: 7-pin SATA connector

CN Location: See Figure 3-22

CN Pinouts: See Table 3-18

The SATA drive connectors can be connected to SATA drives and support up to 6Gb/s data transfer rate.

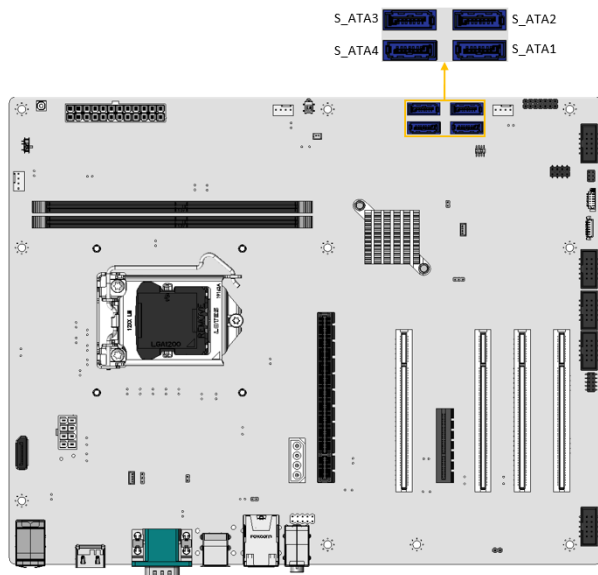


Figure 3-22: SATA 6Gb/s Connector Locations

Pin	Description
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA RX+
7	GND
8	N/C

Table 3-18: SATA 6Gb/s Connector Pinouts

3.2.22 Serial Port, RS-232

- CN Label:** COM2, COM3, COM4, COM6
- CN Type:** 10-pin box header, p=2.54 mm
- CN Location:** See Figure 3-23
- CN Pinouts:** See Table 3-19

Each of these connectors provides RS-232 connections.

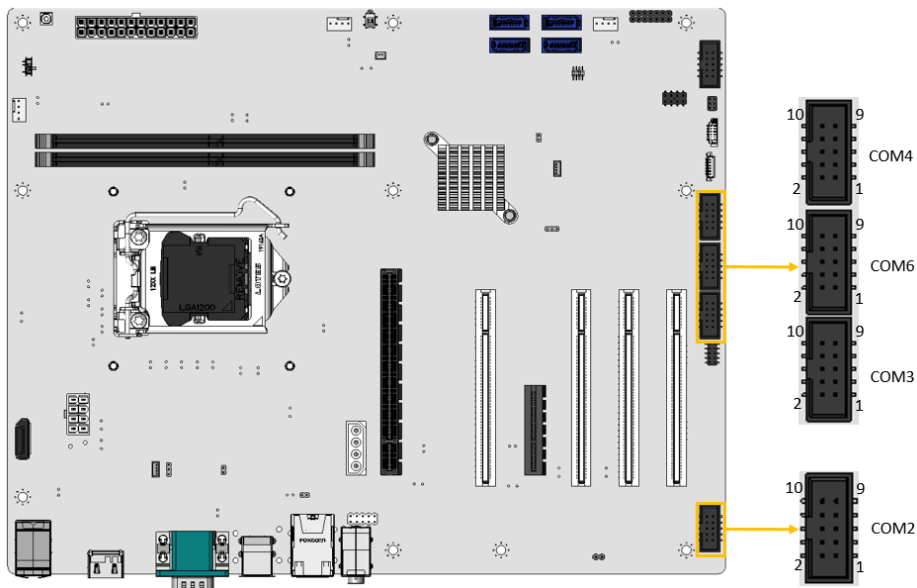


Figure 3-23: RS-232 Serial Port Connector Location

Pin	Description	Pin	Description
1	DCD	2	DSR
3	SIN	4	RTS
5	SOUT	6	CTS
7	DTR	8	RI
9	GND	10	GND

Table 3-19: RS-232 Serial Port Connector Pinouts

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3.2.23 Serial Port, RS-232/422/485

- CN Label:** COM5
- CN Type:** 10-pin box header, p=2.54 mm
- CN Location:** See **Figure 3-24**
- CN Pinouts:** See **Table 3-20** and **Table 3-21**

Each of these connectors provides RS-232, RS-422 or RS-485 communications.

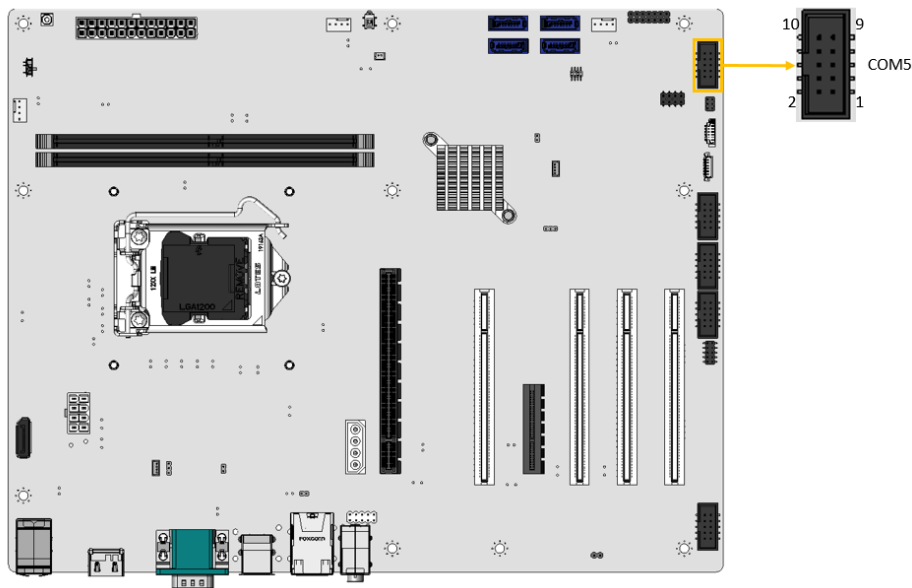


Figure 3-24: RS-232/422/485 Connector Location

Pin	Description	Pin	Description
1	DCD	2	DSR
3	SIN	4	RTS
5	SOUT	6	CTS
7	DTR	8	RI
9	GND	10	GND

Table 3-20: RS-232/422/485 Connector Pinouts

Use the optional RS-232/422/485 cable to connect to a serial device. The pinouts of the DB-9 connector are listed below.

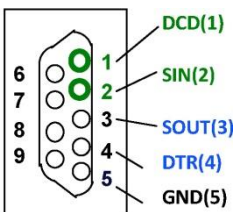
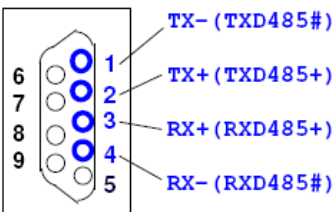
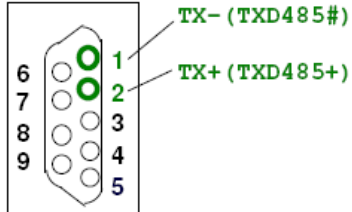
RS-232 Pinouts	RS-422 Pinouts	RS-485 Pinouts
 <p>DCD(1) SIN(2) SOUT(3) DTR(4) GND(5)</p> <p>DSR(6) RTS(7) CTS(8) RI(9)</p>	 <p>TX- (TXD485#) TX+ (TXD485+) RX+ (RXD485+) RX- (RXD485#)</p>	 <p>TX- (TXD485#) TX+ (TXD485+)</p>
D-SUB 9PIN MALE MODE 01	D-SUB 9PIN MALE MODE 00	D-SUB 9PIN MALE MODE 10/11

Table 3-21: DB-9 RS-232/422/485 Pinouts

3.2.24 Flash SPI ROM Connector

- CN Label:** JSPI1
- CN Type:** 6pin header, p=1.25 mm
- CN Location:** See Figure 3-25
- CN Pinouts:** See Table 3-22

The Flash SPI ROM connector is used to flash the SPI ROM.

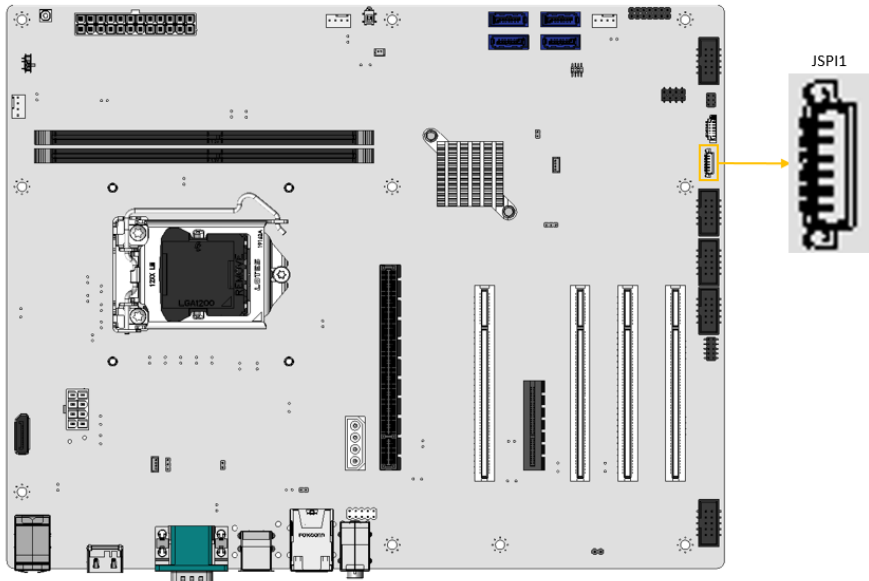


Figure 3-25: Flash SPI ROM Connector Location

IMBA-H420 ATX Motherboard

Pin	Description	Pin	Description
1	+3.3V	4	SPI_CLK
2	SPI_CS#	5	SPI_SI
3	SPI_SO	6	GND

Table 3-22: Flash SPI ROM Connector Pinouts

3.2.25 EC SPI Flash Connector

CN Label: EC_SPI1

CN Type: 8-pin header, p=1.27 mm

CN Location: See Figure 3-26

CN Pinouts: See Table 3-23

The EC SPI flash connector is used to flash the EC SPI ROM.

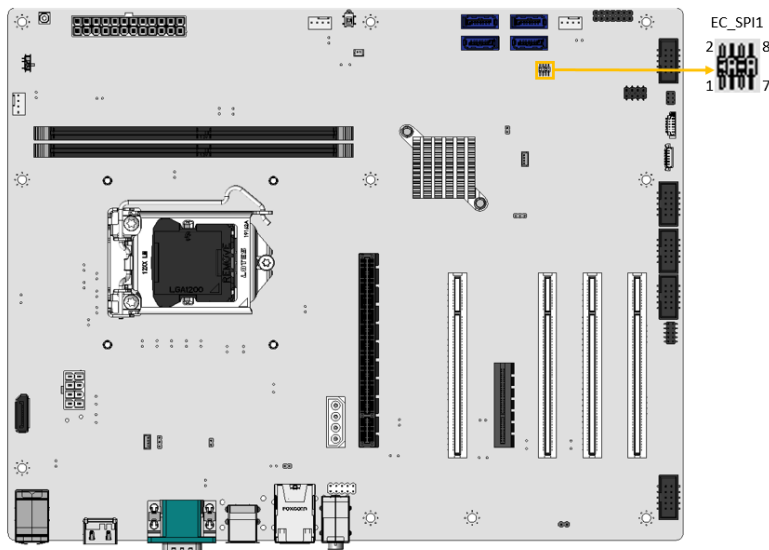


Figure 3-26: EC SPI Flash Connector Location

Pin	Description	Pin	Description
1	CS#_EC	2	+3.3V_EC_FLASH
3	SO_EC	4	HOLD#_EC
5	EC_GPG2	6	SCK_EC
7	GND	8	SIO_EC

Table 3-23: EC SPI Flash Connector Pinouts

3.2.26 Internal DP++ Connector

- CN Label:** DP1
- CN Type:** DisplayPort
- CN Location:** See **Figure 3-27**
- CN Pinouts:** See **Table 3-24**

The DP++ connector connects to a display device with DisplayPort interface.

Pin	Description	Pin	Description
1	DPC_OB_LANE0L_P	11	GND
2	GND	12	DPC_OB_LANE3L_N
3	DPC_OB_LANE0L_N	13	DPC_CONFIG1
4	DPC_OB_LANE1L_P	14	DPC_CONFIG2
5	GND	15	DPC_AUX_CTRL_P2
6	DPC_OB_LANE1L_N	16	GND
7	DPC_OB_LANE2L_P	17	DPC_AUX_CTRL_N2
8	GND	18	DPC_HPD#
9	DPC_OB_LANE2L_N	19	GND
10	DPC_OB_LANE3L_P	20	+V3P3_DP

Table 3-24: DP++ Connector Pinouts

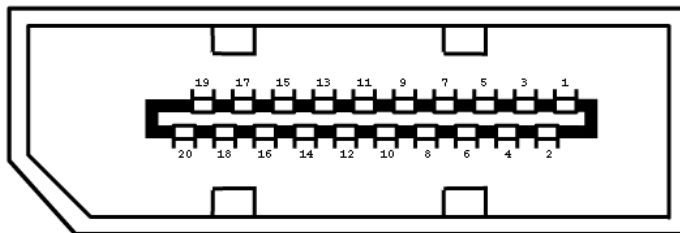


Figure 3-27: DP++ Connector Location

IMBA-H420 ATX Motherboard

3.2.27 Internal USB 2.0 Connectors

- CN Label:** USB2
- CN Type:** 8-pin header, p=2.54 mm
- CN Location:** See Figure 3-28
- CN Pinouts:** See Table 3-25

The Internal USB 2.0 connectors connect to USB 2.0 devices. Each pin header provides two USB 2.0 ports.

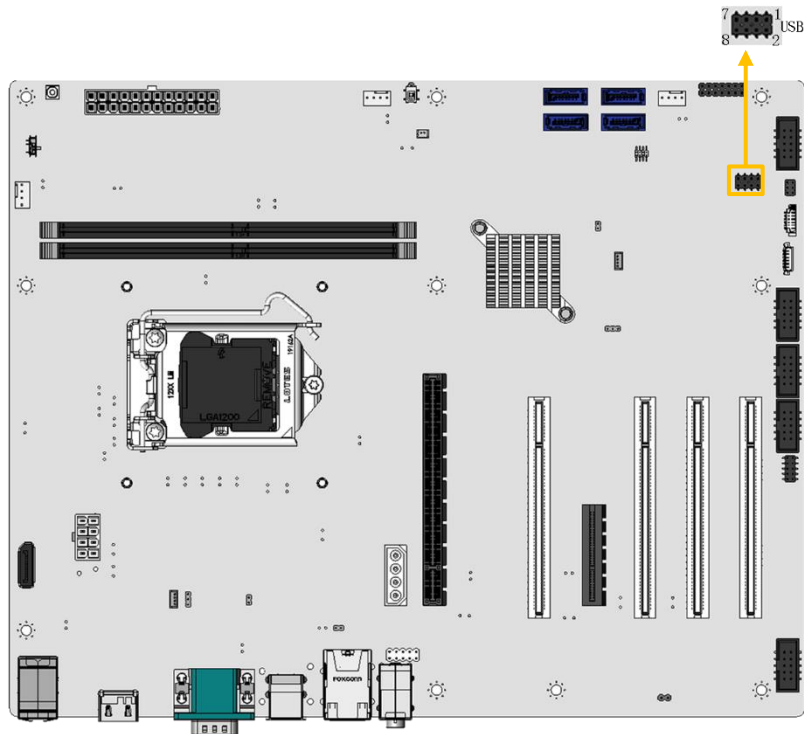


Figure 3-28: Internal USB 2.0 Connector Locations

Pin	Description	Pin	Description
1	VCC	2	GND
3	USB_DATA-	4	USB_DATA+
5	USB_DATA+	6	USB_DATA-
7	GND	8	VCC

Table 3-25: Internal USB 2.0 Connector Pinouts

3.2.28 VGA Firmware Refresh Connector

- CN Label:** J_CRTFW1
- CN Type:** 3-pin wafer
- CN Location:** See Figure 3-29
- CN Pinouts:** See Table 3-26

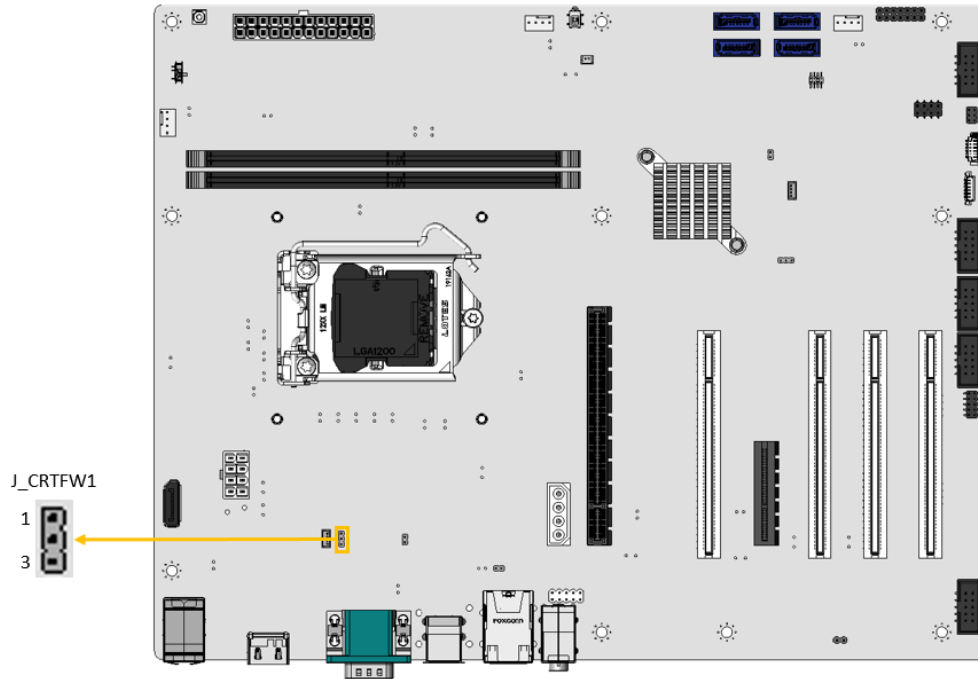


Figure 3-29: VGA Firmware Refresh Connector Location

Pin	Description	Pin	Description
1	SMB_CLK	2	GND
3	SMB_DATA		

Table 3-26: VGA Firmware Refresh Connector Pinouts

IMBA-H420 ATX Motherboard

3.3 External Peripheral Interface Connector Panel

The figure below shows the external peripheral interface connector (EPIC) panel. The EPIC panel consists of the following:

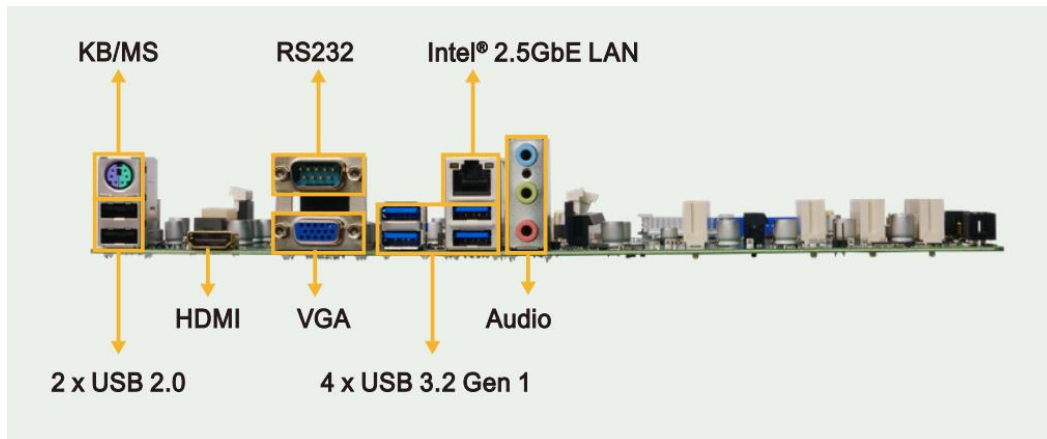


Figure 3-30: External Peripheral Interface Connector

3.3.1 External HD Audio Jack

- CN Label:** AUDIO_CV1
- CN Type:** Audio jacks
- CN Location:** See **Figure 3-31**

The audio jacks connect to external audio devices.

- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other audio devices.
- **Line Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (Pink):** Connects a microphone.

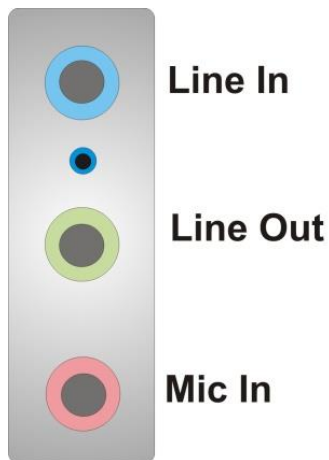


Figure 3-31: Audio Connector

IMBA-H420 ATX Motherboard

3.3.2 External Keyboard/Mouse and USB 2.0 Combo Connectors

- CN Label:** K/M_USB1
- CN Type:** PS2, 2 x USB 2.0 Type-A
- CN Location:** See **Figure 3-32**
- CN Pinouts:** See **Table 3-27** and **Table 3-28**

There are two external USB 2.0 connectors on the IMBA-H420. The USB 2.0 connector can be connected to a USB 2.0/1.1 device. PS2 is located on the mounting bracket for easy connection to a keyboard or a PS2 mouse.

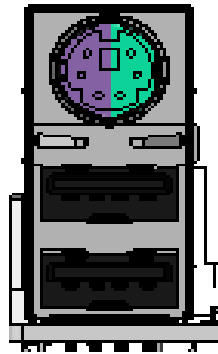


Figure 3-32: PS2, USB 2.0 Connector

USB			
Pin	Description	Pin	Description
1	GND	5	GND
2	USB_DATA+	6	USB_DATA+
3	USB_DATA-	7	USB_DATA-
4	VCC_USB3_56	8	VCC_USB3_56

Table 3-27: USB 2.0 Port Pinouts

Pin	Description	Pin	Description
9	GND	12	VCC
10	KEYBOARD DATA	13	KEYBOARD CLOCK
11	MOUSE DATA	14	MOUSE CLOCK

Table 3-28: PS2 Port Pinouts

3.3.3 External HDMI Combo Connector

- CN Label:** HDMI1
- CN Type:** HDMI, DisplayPort
- CN Location:** See **Figure 3-33**
- CN Pinouts:** See **Table 3-29**

The HDMI connector can connect to an HDMI device.

Pin	Description	Pin	Description
1	HDMI_DATA2-1_L	13	N/C
2	GND	14	N/C
3	HDMI_DATA2#-1_L	15	HDMI_SCL-1
4	HDMI_DATA1-1_L	16	HDMI_SDA-1
5	GND	17	GND
6	HDMI_DATA1#-1_L	18	HDMI_U5V-1
7	HDMI_DATA0-1_L	19	TMDS_B_HPD#
8	GND	20	HDMI_GND
9	HDMI_DATA0#-1_L	21	HDMI_GND
10	HDMI_CLK-1_L	22	HDMI_GND
11	GND	23	HDMI_GND
12	HDMI_CLK#-1_L		

Table 3-29: HDMI Connector Pinouts

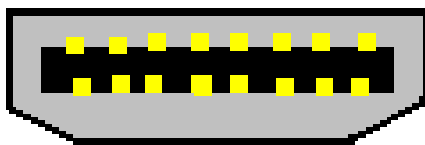


Figure 3-33: HDMI Connector

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3.3.4 External 2.5GbE RJ-45 and dual USB 3.2 Gen 1 Combo Connectors

CN Label: LAN2_USB2

CN Type: RJ45, 2 x USB 3.2 Gen 1

CN Location: See **Figure 3-34**

CN Pinouts: See **Table 3-30** and **Table 3-31**

The USB connectors support USB 3.2 Gen 1 (5Gb/s) connection. The LAN connector connects to a local network.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	10	VCC
2	USB_DATA-	11	USB_DATA-
3	USB_DATA+	12	USB_DATA+
4	GND	13	GND
5	USB3_RX-	14	USB3_RX-
6	USB3_RX+	15	USB3_RX+
7	GND	16	GND
8	USB3_TX-	17	USB3_TX-
9	USB3_TX+	18	USB3_TX+

Table 3-30: USB 3.2 Gen 1 Pinouts

RJ45			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
20	LAN2_I225_MDI0_P	24	LAN2_I225_MDI2_P
21	LAN2_I225_MDI0_N	25	LAN2_I225_MDI2_N
22	LAN2_I225_MDI1_P	26	LAN2_I225_MDI3_P
23	LAN2_I225_MDI1_N	27	LAN2_I225_MDI3_N

Table 3-31: RJ45 Pinouts



Figure 3-34: RJ45 & USB 3.2 Gen 1 Connector

3.3.5 External RS-232 and VGA Combo Connectors

- CN Label:** COM1/VGA1
- CN Type:** 15-pin VGA and 9-pin COM
- CN Location:** See **Figure 3-35** and **Figure 3-36**
- CN Pinouts:** See **Table 3-32** and **Table 3-33**

The COM connector (COM1) connects to a serial device that supports RS-232 communication.

Pin	Description	Pin	Description
C1	-NDCD1	C7	-NRTS1
C2	NSIN1	C8	-NCTS1
C3	NSOUT1	C9	-XRI1
C4	-NDTR1	C10	COM_VGA_GND
C5	GND	C11	COM_VGA_GND
C6	-NDSR1		

Table 3-32: COM1 Connector Pinouts

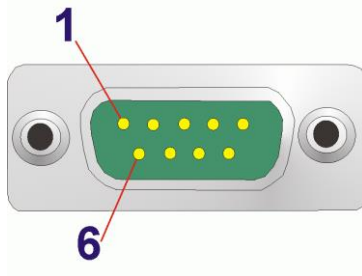


Figure 3-35: COM1 Serial Port Pinout Locations

IMBA-H420 ATX Motherboard

The 15-pin VGA connector connects to a monitor that accepts a standard VGA input.



NOTE:

The user has to connect the VGA connector to the monitor before system booting as the VGA output function is supported via the eDP to VGA converter.

Pin	Description	Pin	Description
V1	BR	V10	Display_GND
V2	BG	V11	N/C
V3	BB	V12	5VDDCDA
V4	N/C	V13	5HSYNC
V5	GND	V14	5VSYNC
V6	GND	V15	5VDDCLK
V7	GND	V16	GND
V8	GND	V17	GND
V9	+CRT_VCC		

Table 3-33: VGA Connector Pinouts

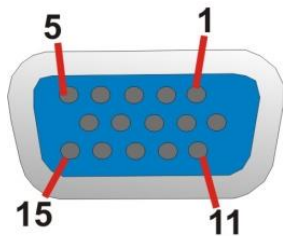


Figure 3-36: VGA Connector

3.3.6 External Dual USB 3.2 Gen 1 Connectors

- CN Label:** LAN1_USB1
- CN Type:** Dual USB 3.2 Gen 1
- CN Location:** See Figure 3-37
- CN Pinouts:** See Table 3-34

The USB connectors support USB 3.2 Gen 1 (5Gb/s) connection.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	10	VCC
2	USB_DATA-	11	USB_DATA-
3	USB_DATA+	12	USB_DATA+
4	GND	13	GND
5	USB3_RX-	14	USB3_RX-
6	USB3_RX+	15	USB3_RX+
7	GND	16	GND
8	USB3_TX-	17	USB3_TX-
9	USB3_TX+	18	USB3_TX+

Table 3-34: External USB 3.2 Gen 1 Connector Pinouts

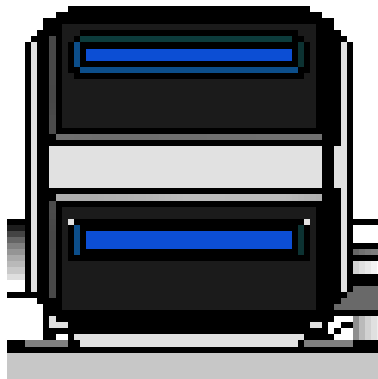


Figure 3-37: Dual USB 3.2 Gen 1

Chapter

4

Installation

4.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the IMBA-H420 may result in permanent damage to the IMBA-H420 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-H420. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-H420 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- **Wear an anti-static wristband:** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- **Self-grounding:**- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad:** When configuring the IMBA-H420, place it on an anti-static pad. This reduces the possibility of ESD damaging the IMBA-H420.
- **Only handle the edges of the PCB:-:** When handling the PCB, hold the PCB by the edges

4.2 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

IMBA-H420 ATX Motherboard



WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
 - The user manual provides a complete description of the IMBA-H420 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
 - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the IMBA-H420 on an anti-static pad:
 - When installing or configuring the motherboard, place it on an anti-static pad. This helps to prevent potential ESD damage.
- Turn all power to the IMBA-H420 off:
 - When working with the IMBA-H420, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the IMBA-H420, **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.3 Socket LGA1200 CPU Installation



WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

DO NOT touch the pins at the bottom of the CPU. When handling the CPU, only hold it on the sides.

To install the CPU, follow the steps below.

Step 1: Disengage the load lever by pressing the lever down and slightly outward to clear the retention tab. Fully open the lever. See **Figure 4-1**.

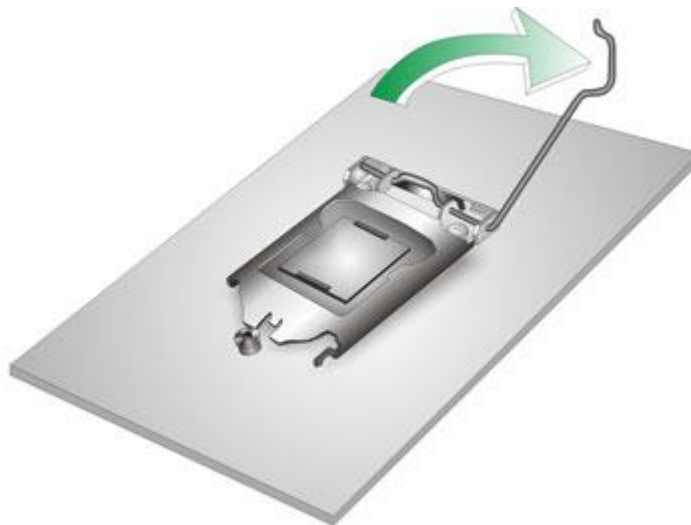


Figure 4-1: Disengage The CPU Socket Load Lever

Step 2: Open the socket and remove the protective cover. The black protective cover can be removed by pulling up on the tab labeled "Remove". See **Figure 4-2**.

IMBA-H420 ATX Motherboard

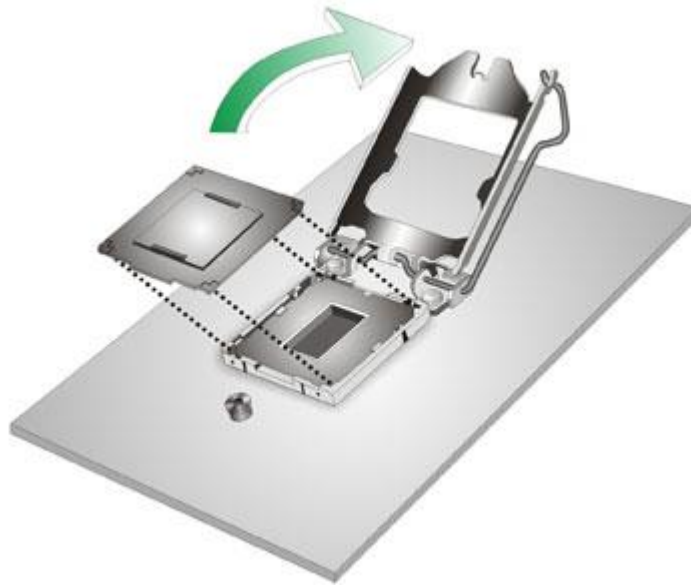


Figure 4-2: Remove Protective Cover

- Step 3: Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.
- Step 4: Orientate the CPU properly.** The contact array should be facing the CPU socket.



WARNING:

DO NOT touch the pins at the bottom of the CPU. When handling the CPU, only hold it on the sides.

-
- Step 5: Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket.
- Step 6: Align the CPU pins.** Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.

Step 7: Insert the CPU. Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See **Figure 4-3**.

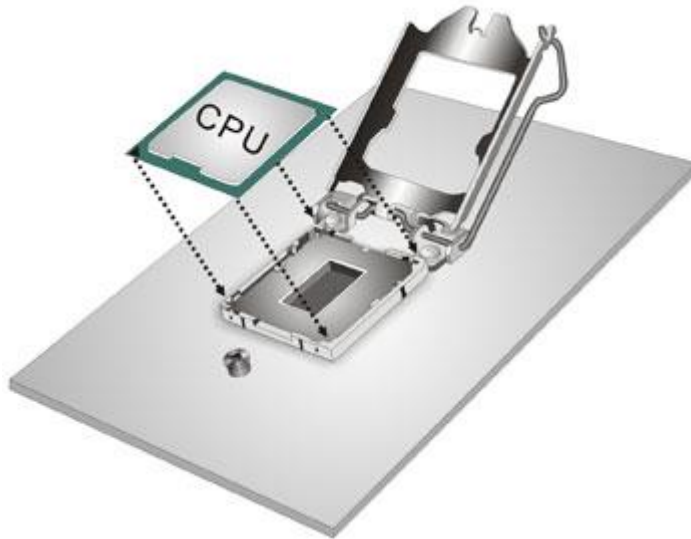


Figure 4-3: Insert The Socket LGA1200 CPU

Step 8: Close the CPU socket. Close the load plate and pull the load lever back a little to have the load plate be able to secure to the knob. Engage the load lever by pushing it back to its original position (**Figure 4-4**). There will be some resistance, but will not require extreme pressure.

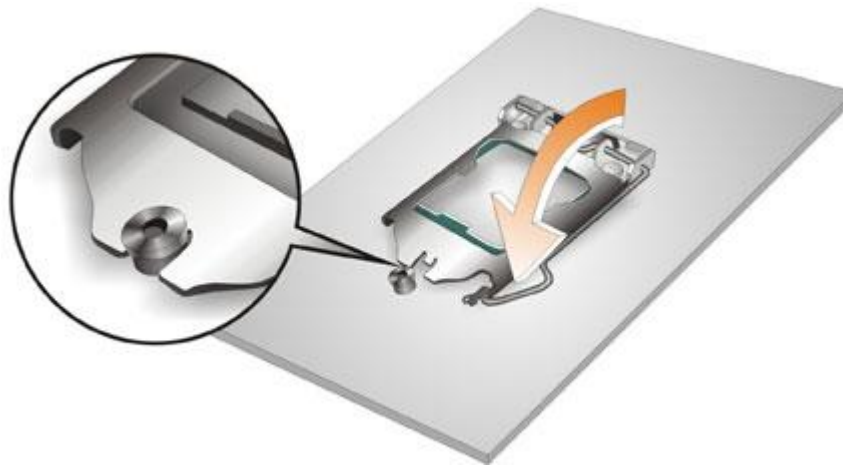


Figure 4-4: Close The Socket LGA1200

IMBA-H420 ATX Motherboard

Step 9: Connect the 12 V power to the board. Connect the 12 V power from the power supply to the board.

4.4 Socket LGA1200 Cooling Kit Installation



WARNING:

DO NOT attempt to install a push-pin cooling fan.

The pre-installed support bracket prevents the board from bending and is **ONLY** compatible with captive screw type cooling fans.

The cooling kit can be bought from IEI. The cooling kit has a heat sink and fan.



WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, follow the instructions below.

Step 1: A cooling kit bracket is pre-installed on the rear of the motherboard. See **Figure 4-5**.

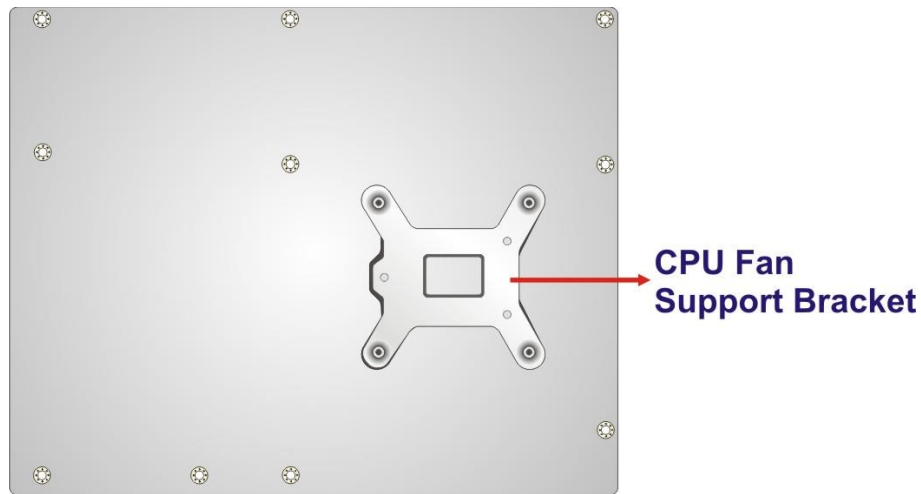


Figure 4-5: Cooling Kit Support Bracket

- Step 2:** Place the cooling kit onto the socket LGA1200 CPU. Make sure the CPU cable can be properly routed when the cooling kit is installed.
- Step 3:** Mount the cooling kit. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the holes of the cooling kit bracket.
- Step 4:** Tighten the screws. Use a screwdriver to tighten the four screws. In a diagonal pattern, tighten each screw a few turns then move to the next one, until they are all secured. Do not overtighten the screws.
- Step 5:** Connect the fan cable. Connect the cooling kit fan cable to the CPU fan connector on the IMBA-H420. Carefully route the cable and avoid heat generating chips and fan blades.

IMBA-H420 ATX Motherboard

4.5 DIMM Installation

To install a DIMM, please follow the steps below and refer to **Figure 4-6**.

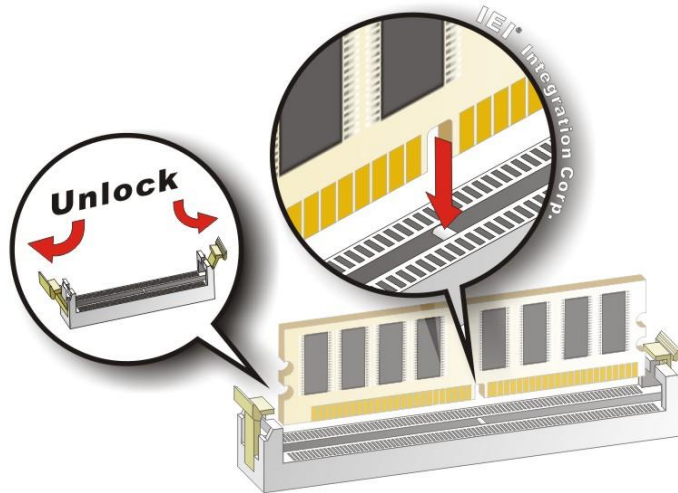


Figure 4-6: DIMM Installation

- Step 1: Open the DIMM socket handles.** Open the two handles outwards as far as they can. See **Figure 4-6**.
- Step 2: Align the DIMM with the socket.** Align the DIMM so the notch on the memory lines up with the notch on the memory socket. See **Figure 4-6**.
- Step 3: Insert the DIMM.** Once aligned, press down until the DIMM is properly seated. Clip the two handles into place. See **Figure 4-6**.
- Step 4: Removing a DIMM.** To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.



CAUTION:

For quad channel configuration, install four identical memory modules that feature the same capacity, timings, voltage, number of ranks and the same brand.

4.6 System Configuration

The system configuration is controlled by jumpers, buttons, switches and BIOS options. The system configuration must be performed before installation.

4.6.1 AT/ATX Power Mode Setting

The AT and ATX power mode selection is made through the AT/ATX power mode switch which is shown in **Figure 4-7**.

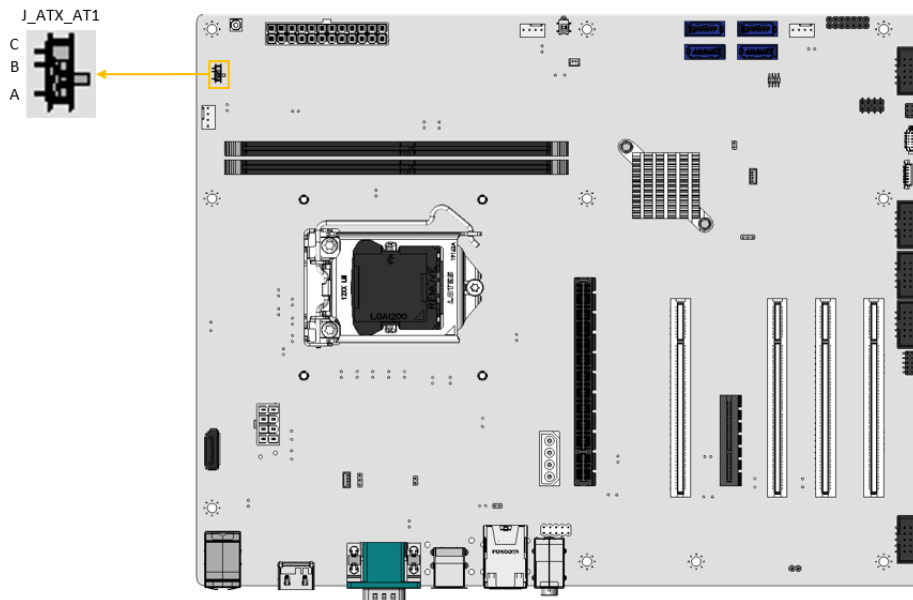


Figure 4-7: AT/ATX Power Mode Switch Location

Setting	Description
A-B	ATX power mode (default)
B-C	AT power mode

Table 4-1: AT/ATX Power Mode Switch Settings

IMBA-H420 ATX Motherboard

4.6.2 Clearing CMOS

To reset the BIOS, remove the on-board battery and short the **J_CMOS1** switch. The J_CMOS1 switch is shown in **Figure 4-8**

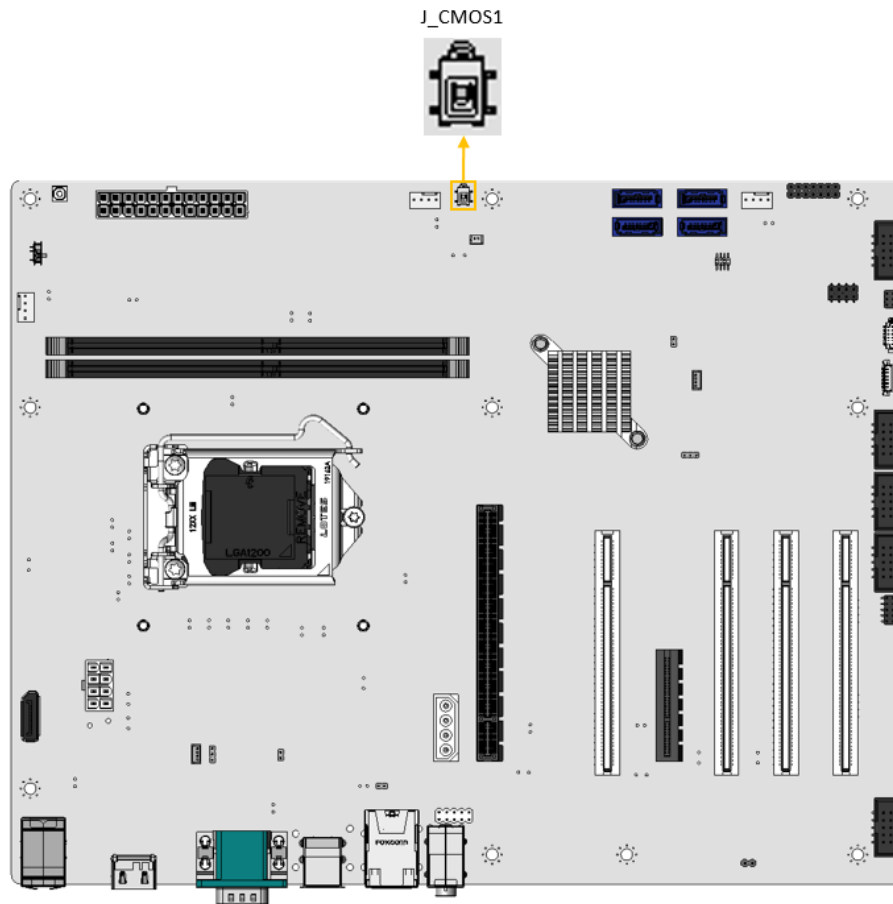


Figure 4-8: Clear CMOS Jumper Location

Pin	Description
NC	Keep CMOS Setup (Normal Operation)
Press button	Clear CMOS Setup

Table 4-2: Clear CMOS Jumper Pinouts

4.6.3 Flash Descriptor Security Override Jumper

The flash descriptor security override jumper (J_FLASH1) allows to enable or disable the ME firmware update. Refer to **Table 4-3** and **Figure 4-9** for the jumper location and settings.

Pin	Description
Short 1-2	Disabled (default)
Short 2-3	Enabled

Table 4-3: Flash Descriptor Security Override Jumper Pinouts

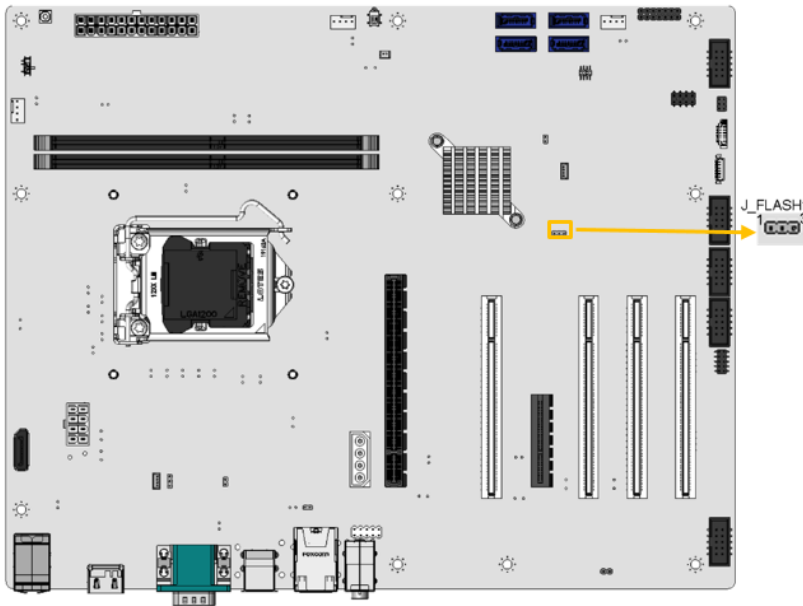


Figure 4-9: Flash Descriptor Security Override Jumper Location

To update the ME firmware, please follow the steps below.

- Step 1:** Before turning on the system power, short pin 2-3 of the flash descriptor security override jumper.
- Step 2:** Update the BIOS and ME firmware, and then turn off the system power.
- Step 3:** Remove the metal clip on the flash descriptor security override jumper or return to its default setting (short pin 1-2).
- Step 4:** Restart the system. The system will reboot 2 ~ 3 times to complete the ME firmware update.

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4.7 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the onboard connectors.

4.7.1 SATA Drive Connection

The IMBA-H420 is shipped with two SATA drive cables. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: Locate the connectors. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: Insert the cable connector. Insert the cable connector into the on-board SATA drive connector until it clips into place. See **Figure 4-10**.

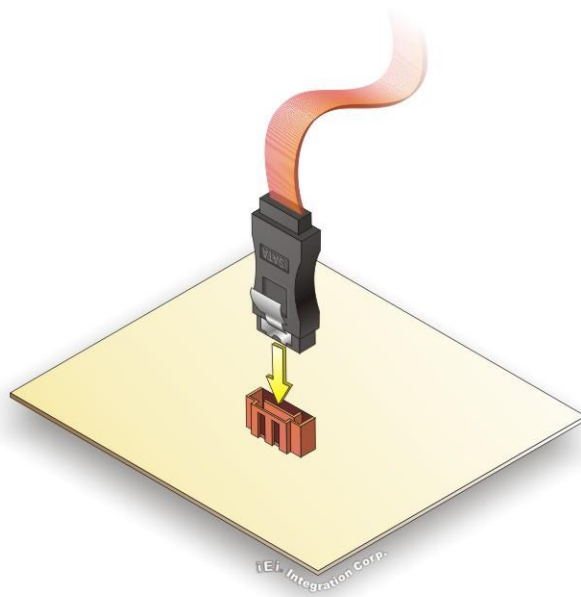


Figure 4-10: SATA Drive Cable Connection

Step 3: Connect the cable to the SATA disk. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-11**.

Step 4: Connect the SATA power cable. Connect the SATA power connector to the back of the SATA drive. See **Figure 4-11**.

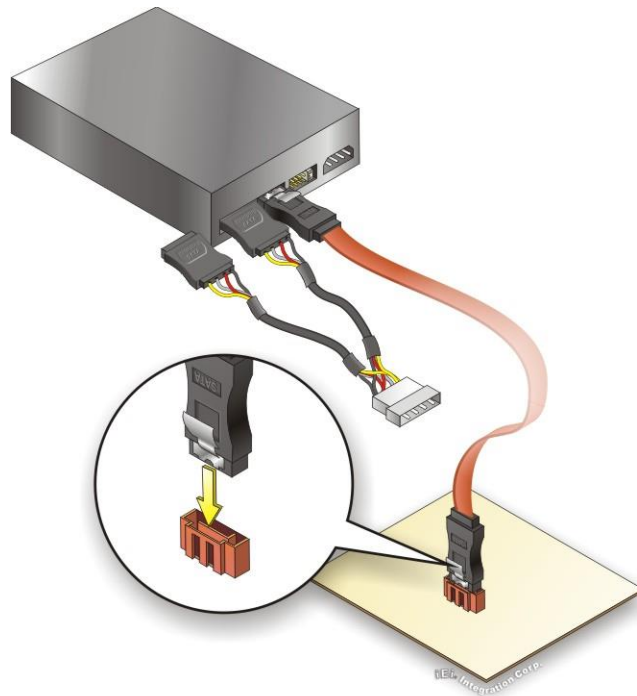


Figure 4-11: SATA Power Drive Connection

The SATA power cable can be bought from IEI. See Optional Items in Section 2.4.

IMBA-H420 ATX Motherboard

4.8 Software Installation

All the drivers for the IMBA-H420 are available on IEI Resource Download Center (<https://download.ieiworld.com>). Type IMBA-H420 and press Enter to find all the relevant software, utilities, and documentation.

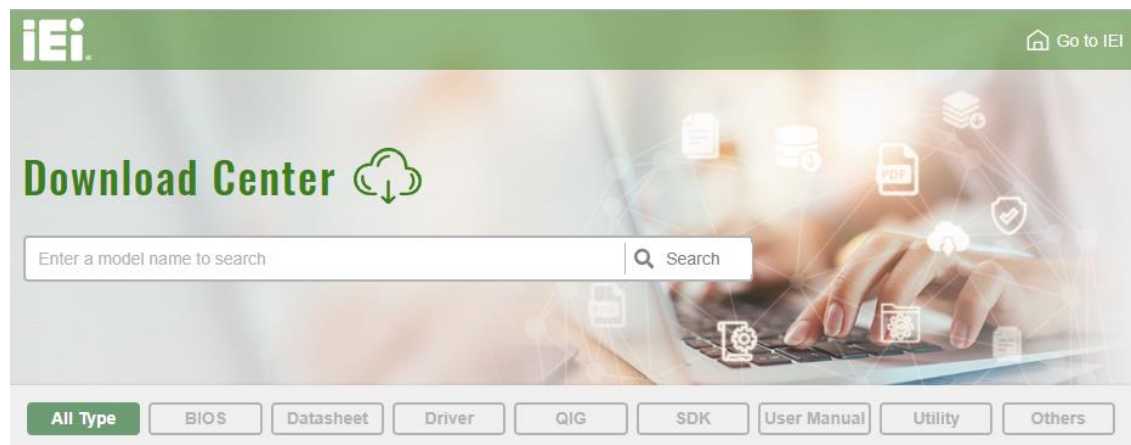
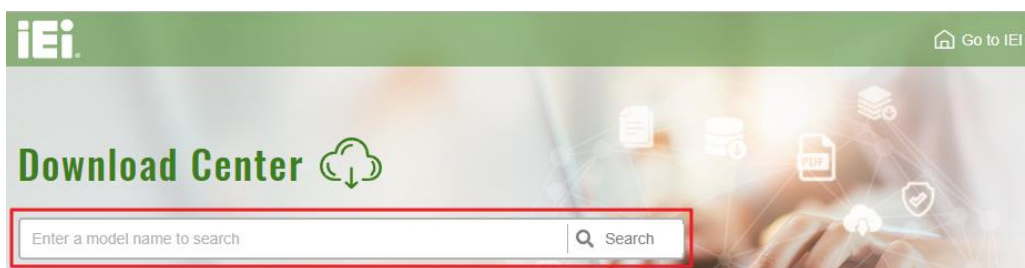


Figure 4-12: IEI Resource Download Center

4.9 Driver Download

To download drivers from IEI Resource Download Center, follow the steps below.

Step 1: Go to <https://download.ieiworld.com>. Type IMBA-H420 and press Enter.



Step 2: All product-related software, utilities, and documentation will be listed. You can choose **Driver** to filter the result.

[All Type](#)
[BIOS](#)
[Datasheet](#)
[Driver](#)
[QIG](#)
[SDK](#)
[User Manual](#)
[Utility](#)
[Others](#)

WAFER-BT-i1 Product Info ▶

Embedded Computer ▶ Single Board Computer ▶ Embedded Board
 3.5" SBC with Intel® 22nm Atom™/Celeron® on-board SoC

File Name	Published	Version	File Checksum
7B000-001033-RS V2.3.iso (2.23 GB)	2017/10/03	2.30	3B2DB1F792779A93A8F50DDBC3943E30

Step 3: Click the driver file name on the page and you will be prompted with the following window. You can download the entire ISO file (❶), or click the small arrow to find an individual driver and click the file name to download (❷).

7B000-001168-RS_V1.4.iso

❶ [Click here to download entire ISO file. \(2.99 GB\)](#)

* Download individual file *

- Docs
 - ❷ 1.Chipset
 - 10.1.1.12.zip (2.7 MB)
 - 2.VGA
 - 3.Audio
 - 4.Lan
 - 5.USB 3.0
 - 6.Serial IO
 - 7.TXE
 - 8.Manual



NOTE:

To install software from the downloaded ISO image file in Windows 8, 8.1 or 10, double-click the ISO file to mount it as a virtual drive to view its content. On Windows 7 system, an additional tool (such as Virtual CD-ROM Control Panel from Microsoft) is needed to mount the file.

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4.10 Intel® AMT Setup Procedure

The IMBA-H420 is featured with the Intel® Active Management Technology (AMT). To enable the Intel® AMT function, follow the steps below.

- Step 1:** Make sure at least one of the memory sockets is installed with a DDR4 DIMM.
- Step 2:** Connect an Ethernet cable to the RJ-45 connector labeled **JP1**
- Step 3:** The AMI BIOS options regarding the Intel® ME or Intel® AMT must be enabled,
- Step 4:** Properly install the Intel® Management Engine Components drivers from the iAMT Driver & Utility directory in the driver CD.
- Step 5:** Configure the Intel® Management Engine BIOS extension (MEBx). To get into the Intel® MEBx settings, press <Ctrl+P> after a single beep during boot-up process. Enter the Intel® current ME password as it requires (the Intel® default password is **admin**).

Appendix

A

Regulatory Compliance

IMBA-H420 ATX Motherboard

DECLARATION OF CONFORMITY



This equipment has been tested and found to comply with specifications for CE marking. If the user modifies and/or installs other devices in the equipment, the CE conformity declaration may no longer apply.

FCC WARNING



This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Appendix

B

Product Disposal

IMBA-H420 ATX Motherboard



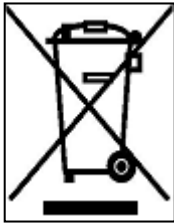
CAUTION:

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

Outside the European Union—If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.

Within the European Union—The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your device, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

Appendix

C

Error Beep Code

IMBA-H420 ATX Motherboard

C.1 PEI Beep Codes

Number of Beeps	Description
1	Memory not Installed
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXE IPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

C.2 DXE Beep Codes

Number of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met



NOTE:

If you have any question, please contact IEI for further assistance.

Appendix

D

Hazardous Materials Disclosure

IMBA-H420 ATX Motherboard

D.1 RoHS II Directive (2015/863/EU)

The details provided in this appendix are to ensure that the product is compliant with the RoHS II Directive (2015/863/EU). The table below acknowledges the presences of small quantities of certain substances in the product, and is applicable to RoHS II Directive (2015/863/EU).

Please refer to the following table.

Part Name	Toxic or Hazardous Substances and Elements									
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)	Bis(2-ethylhexyl) phthalate (DEHP)	Butyl benzyl phthalate (BBP)	Dibutyl phthalate (DBP)	Diisobutyl phthalate (DIBP)
Housing	O	O	O	O	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O	O	O	O	O
Battery	O	O	O	O	O	O	O	O	O	O
<p>O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in Directive (EU) 2015/863.</p> <p>X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in Directive (EU) 2015/863.</p>										

D.2 China RoHS

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	○	○	○	○	○	○
印刷电路板	○	○	○	○	○	○
金属螺帽	○	○	○	○	○	○
电缆组装	○	○	○	○	○	○
风扇组装	○	○	○	○	○	○
电力供应组装	○	○	○	○	○	○
电池	○	○	○	○	○	○

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11364-2014 與 GB/T26572-2011 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11364-2014 與 GB/T26572-2011 标准规定的限量要求。