



**MODEL:
PCIE-Q470**

Full-size PICMG 1.3 CPU Card supports LGA1200 10th/11th Generation Intel® Core™ i9/i7/i5/i3, Pentium®, Celeron® Processor with Intel® Q470/Q470E, DDR4, HDMI, Dual Intel® 2.5GbE, USB 3.2, SATA6Gb/s, M.2, iAUDIO and RoHS

User Manual

Revision

Date	Version	Changes
May 18, 2022	1.00	Initial release

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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

PCIE-Q470 Full-size PICMG 1.3 CPU Card

1.1 Introduction

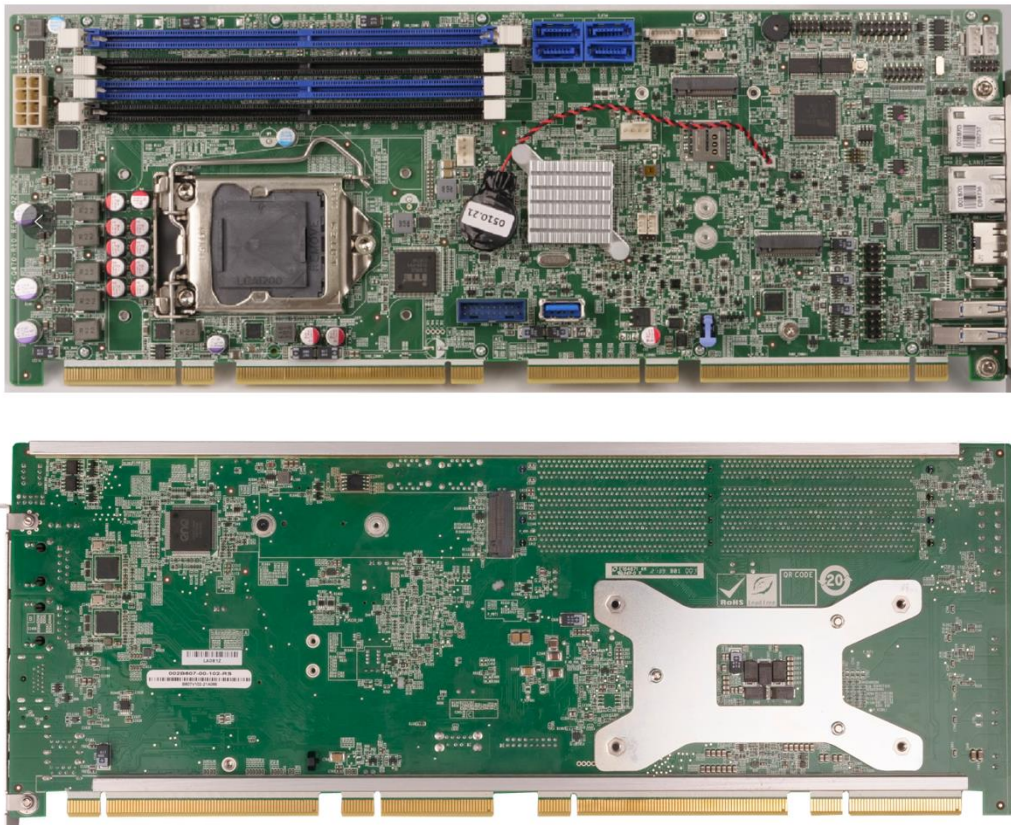


Figure 1-1: PCIE-Q470

The PCIE-Q470 is a full-size PICMG 1.3 CPU card. It accepts a Socket LGA1200 10th/11th Generation Intel® Core™ i9/i7/i5/i3, Pentium® or Celeron® processor and supports four 288-pin 2933MHz dual-channel DDR4 DIMMs up to 128 GB. The integrated Intel® Q470/Q470E chipset supports four SATA 6Gb/s drives with RAID 0/1/5/10 function.

The PCIE-Q470 provides two 2.5GbE interfaces through the Intel® I225V controllers. Expansion and I/O include three M.2 slots, two USB 3.2 Gen 1 ports and one USB 3.2 Gen 2 by USB Type-C port on the rear panel, six USB 2.0 via internal pin headers, two USB 3.2 Gen 1 via internal box headers, one USB 3.2 Gen 1 via internal Type-A connector and four COM ports via internal pin headers.

1.2 Features

The PCIE-Q470 motherboard features are listed below:

- Full-size PICMG 1.3 CPU card
- LGA1200 10th/11th Generation Intel® Core™ i9/i7/i5/i3, Pentium® or Celeron® processor supported
- Intel® Q470/Q470E chipset
- Four 288-pin 2933 MHz dual-channel unbuffered DDR4 SDRAM DIMMs supported up to 128 GB
- Two Intel® I225V 2.5GbE controller
- Supports PCI Express Generation 3.0
- One M.2 2280 M-key slot for storage
- Four SATA 6Gb/s connectors support RAID 0, 1, 5, 10 function
- Two USB 3.2 Gen 1 by USB Type-A ports on the rear I/O
- One USB 3.2 Gen 2 by USB Type-C port on the rear I/O
- Six USB 2.0 ports via internal pin headers
- Two USB 3.2 Gen1 ports via internal box headers
- One USB 3.2 Gen1 via internal Type-A connector
- Two RS-232 serial ports via internal pin headers
- Two RS-422/485 serial ports via internal pin headers
- TPM 2.0 security function supported by PTT (Platform Trust Technology), based on BIOS setting
- High Definition Audio
- RoHS compliant

PCIE-Q470 Full-size PICMG 1.3 CPU Card

1.3 Connectors

The connectors on the PCIE-Q470 are shown in the figure below.

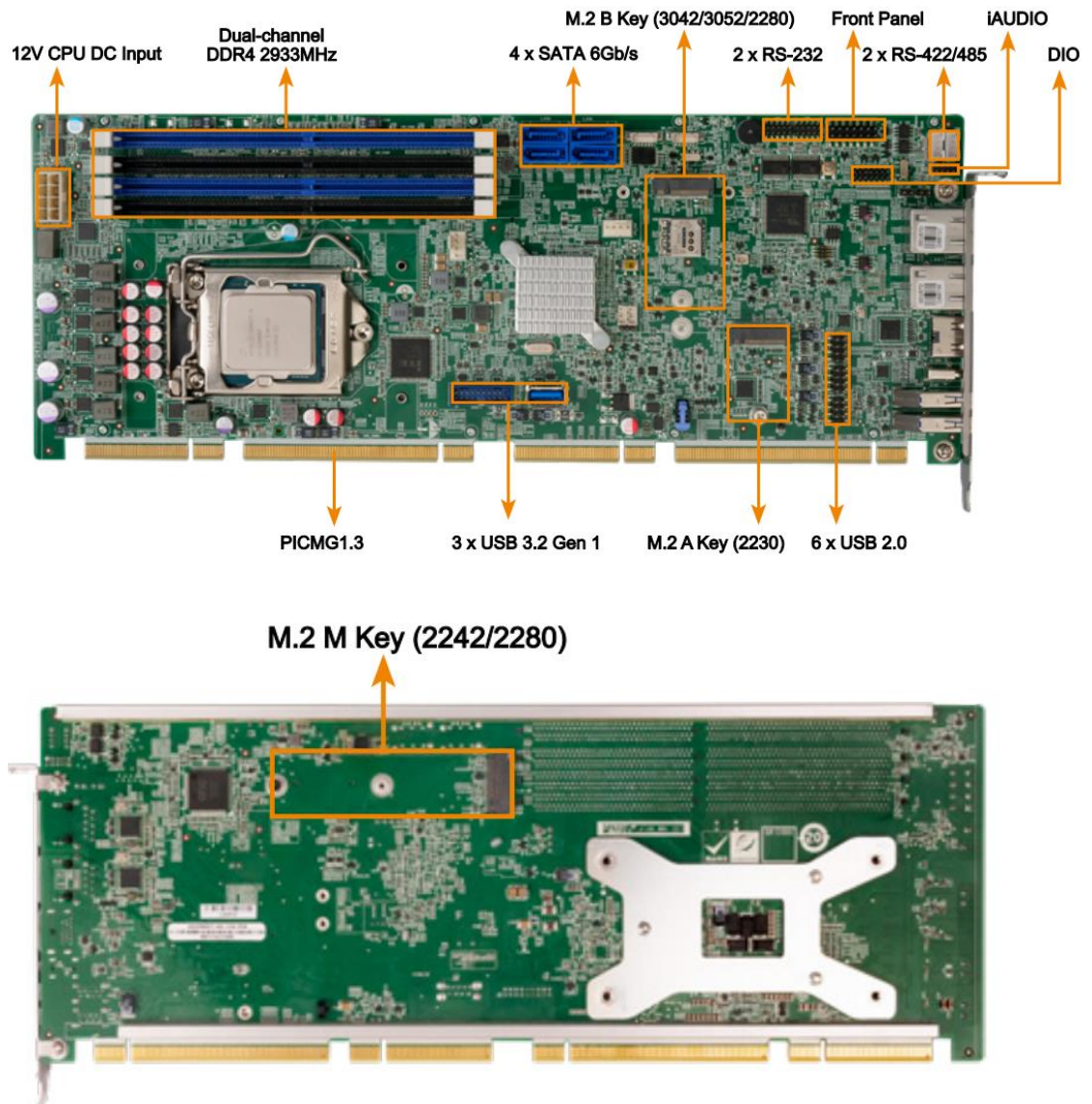


Figure 1-2: Connectors

1.4 Dimensions

The main dimensions of the PCIE-Q470 are shown in the diagram below.

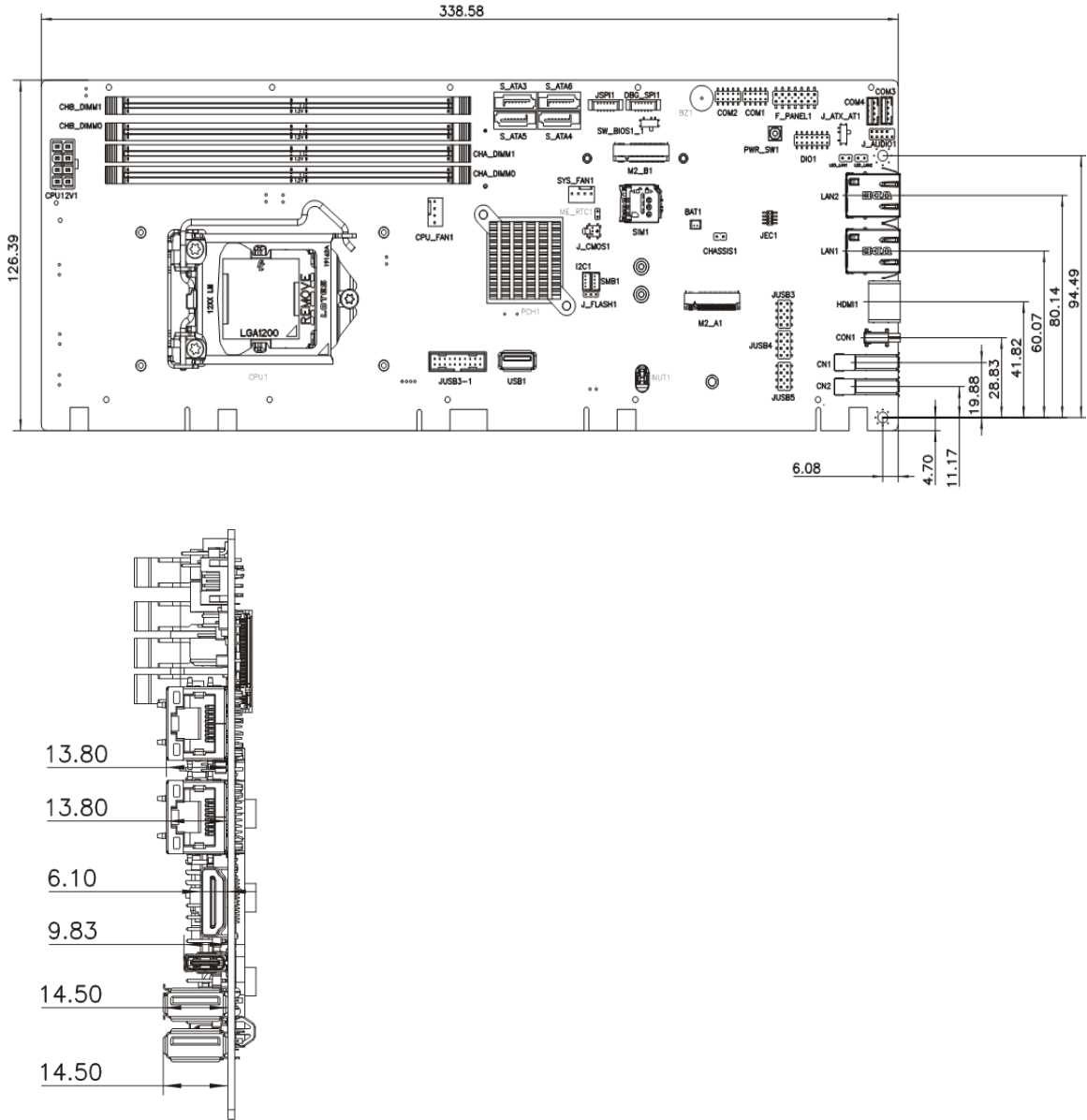


Figure 1-3: PCIE-Q470 Dimensions (mm)

PCIE-Q470 Full-size PICMG 1.3 CPU Card

1.5 Data Flow

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

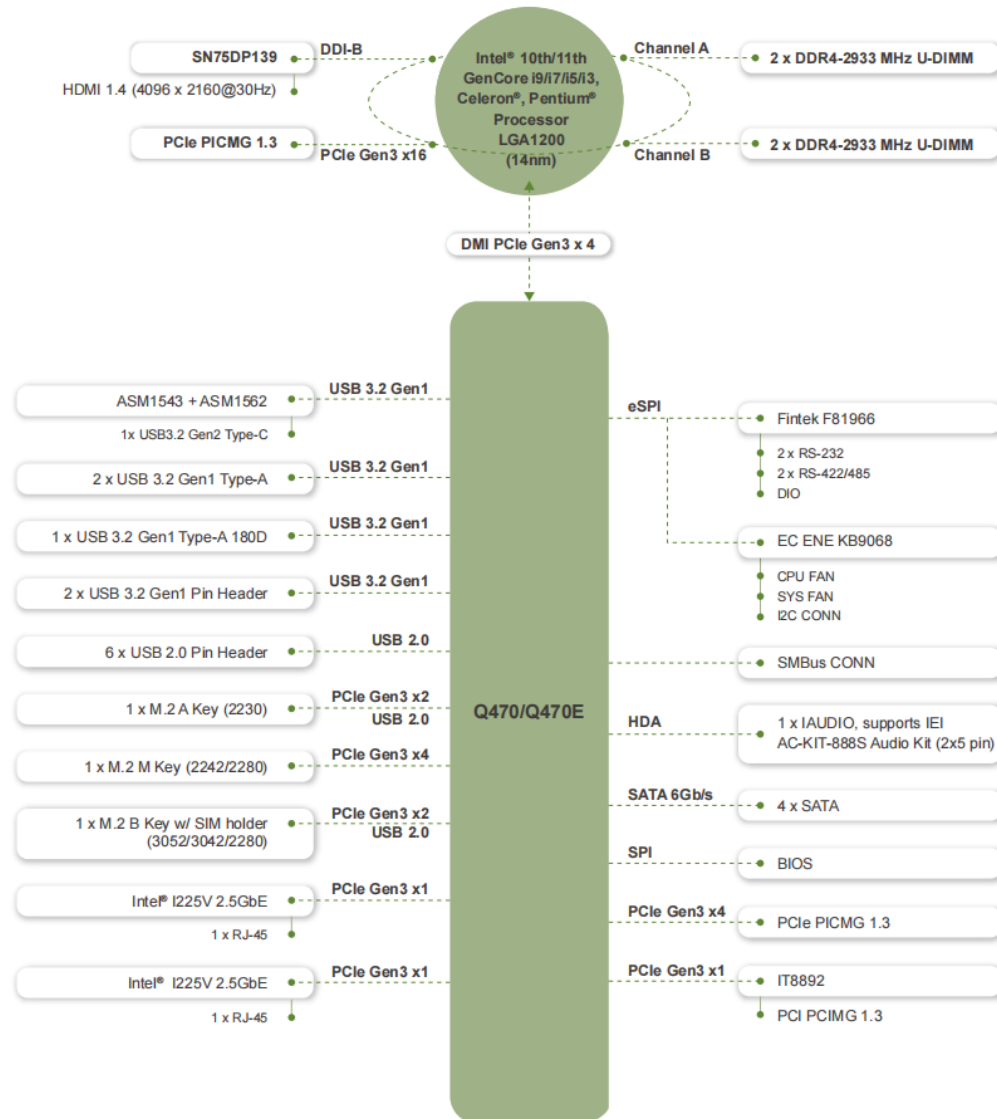


Figure 1-4: Data Flow Diagram

1.6 Technical Specifications

The PCIE-Q470 technical specifications are listed below.

Specification/Model	PCIE-Q470
Form Factor	Full-size PICMG 1.3 CPU Card
CPU Supported	LGA1200 10th/11th Generation Intel® Core™ i9/i7/i5/i3, Pentium® or Celeron® CPU
PCH	Intel® Q470/Q470E
Memory	Four 288-pin 2933 MHz dual-channel unbuffered DDR4 SDRAM DIMMs (system max. 128GB)
Graphics Engine	10th Generation CML-S up to Intel® UHD Graphics 630, Intel® HD 9th Generation Display Engine based on 16 low power execution units supporting DX2015, OpenGL 5.X and OpenCL2.x, ES 2.0 11th Generation RKL-SXe 12th Generation Graphics Architecture, Intel® UHD Graphics 750, supports 12-bit end-to-end, support AV1, VP9, HEVC 12b, HDR10, FP16
Display Output	1 x HDMI 1.4 (up to 4096 x 2160@30Hz)
Ethernet Controllers	LAN1: Intel® I225V 2.5GbE controller LAN2: Intel® I225V 2.5GbE controller
Audio	1 x iAUDIO, support IEI AC-KIT-888S Audio Module (2 x 5 pin)
BIOS	AMI UEFI BIOS
Expansions	1 x PCIe x16 signal via golden finger (Support x16, or x8 + x8, or x4 + x4 + x8) 4 x PCIe x1 signal from PCH via golden finger 4 x PCI signal via golden finger 1 x M.2 A Key (2230) with PCIe Gen3 x2/USB 2.0 1 x M.2 B Key (3042/3052/2280) with SIM holder (with PCIe Gen3 x2/USB 2.0) 1 x M.2 M Key (2280/2242) with PCIe Gen3 x4

PCIE-Q470 Full-size PICMG 1.3 CPU Card

Super I/O Controller	Fintek F81966D-I
Embedded Controller	ENE KB9068QB
Watchdog Timer	Software programmable supports 1~255 sec. system reset
I/O Interface Connectors	
Chassis Intrusion	1 x Chassis intrusion (1x2 pin)
Digital I/O	1 x 12-bit digital I/O (2x7 pin)
Ethernet	Two RJ-45 GbE ports
Fan	1 x CPU fan connector (1x4 pin) 1 x System fan connector (1x4 pin)
Front Panel	1 x Front panel connector (2x7 pin) Power LED, HDD LED, power button, reset button
I²C	One 4-pin wafer connector
Keyboard and Mouse	One internal keyboard and mouse connector (6-pin wafer)
LAN LED	Two 2-pin headers for LAN1 LED and LAN2 LED
Serial ATA	4 x SATA 6Gb/s connectors (support RAID 0, 1, 5, 10)
Serial Ports	2 x RS-232 (2x5 pin, P=2.0) 2 x RS-422/485 (1x4 pin, P=2.0) support AFC
SMBus	One 4-pin wafer connector
TPM	Intel® PTT (TPM 2.0)
USB Ports	2 x USB 3.2 Gen 1 by USB Type-A ports on rear panel 1 x USB 3.2 Gen 2 by USB Type-C port on rear panel 6 x USB 2.0 (2x4 pin) ports via internal pin header 2 x USB 3.2 Gen1 (2x10 pin) ports via internal box header 1 x USB 3.2 Gen1 port via internal Type-A connector

Environmental and Power Specifications	
Power Supply	AT/ATX power support
Power Consumption	3.3V@1.04A, 5V@8.61A, 12V@12.33A (Intel® Core™ i9-11900K CPU with 4 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	338 mm x 126 mm
Weight (GW/NW)	GW:1000g / NW:500g
Certification	CE/FCC compliant

Table 1-1: PCIE-Q470 Specifications

Chapter

2

Packing List

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 PCIE-Q470 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.

PCIE-Q470 Full-size PICMG 1.3 CPU Card

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 PCIE-Q470 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The PCIE-Q470 is shipped with the following components:





Quantity	Item and Part Number	Image
1	PCIE-Q470 CPU card	
1	SATA cable	
1	Mini jumper pack	
1	Quick installation guide	

Table 2-1: Packing List

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: CB-USB02-RS)	
SATA power cable (P/N: 32102-000100-200-RS)	
RS-232 cable, 200mm, P=2.0 (P/N: 32205-002700-200-RS)	
LGA1150/1151/1200 cooler kit (high-performance compatible, 95W) (P/N: CF-1150SA-R10)	
LGA1150/1151/1200 cooler kit (high-performance compatible, 65W) (P/N: CF-1150SB-R11)	
LGA1150/1151/1200 cooler kit (1U chassis compatible, 65W) (P/N: CF-1150SC-R20)	
LGA1150/1151/1200 cooler kit (high-performance compatible, 95W) (P/N: CF-1150SE-R11)	

Table 2-2: Optional Items

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

This chapter details all the peripheral interface connectors.

3.1.1 PCIE-Q470 Layout

The figure below shows all the peripheral interface connectors.

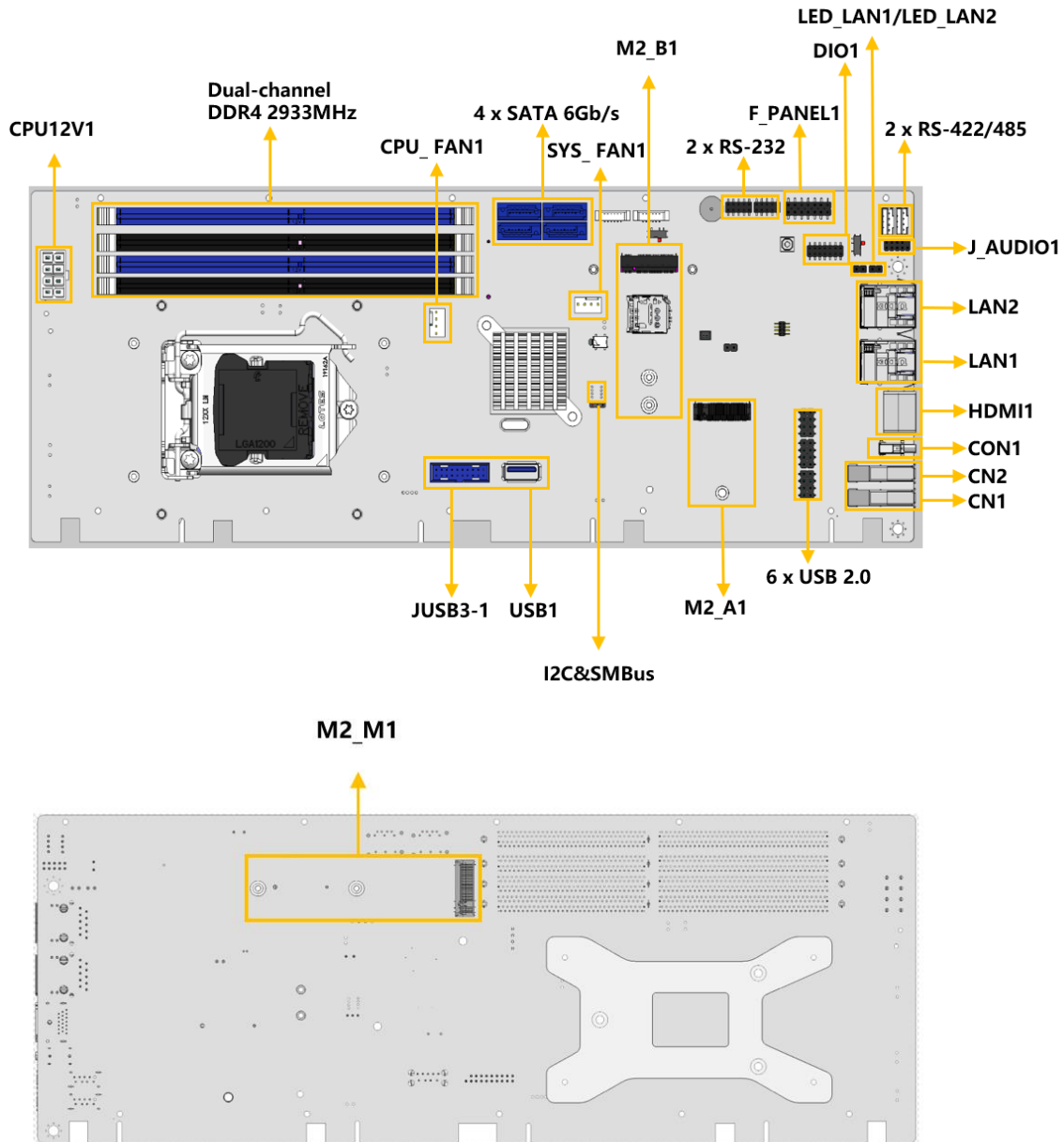


Figure 3-1: Peripheral Interface Connectors

PCIE-Q470 Full-size PICMG 1.3 CPU Card

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
Battery connector	2-pin wafer	BAT1
Chassis intrusion connector	2-pin header	CHASSIS1
AT/ATX power mode setting	3-pin switch	J_ATX_AT1
Digital I/O connector	14-pin header	DIO1
EC debug connector	6-pin wafer	DBG_SPI1
Clear CMOS jumper	Push button	J_CMOS1
Flash descriptor security override jumper	3-pin header	J_FLASH1
Fan connectors (CPU)	4-pin wafer	CPU_FAN1
Fan connectors (system)	4-pin wafer	SYS_FAN1
BIOS selection switch	3-pin switch	SW_BIOS1_1
Audio connector	10-pin header	J_AUDIO1
Front panel connector	14-pin header	F_PANEL1
I ² C connector	4-pin wafer	I2C1
SMBus connector	4-pin wafer	SMB1
LAN1 link LED connector	2-pin header	LED_LAN1
LAN2 link LED connector	2-pin header	LED_LAN2
M.2 A-key slot	M.2 A-key slot	M2_A1
M.2 B-key slot	M.2 B-key slot	M2_B1
M.2 M-key slot (on solder side)	M.2 M-key slot	M2_M1
On-board power switch	Push button	PWR_SW1

Connector	Type	Label
DDR4 DIMM slots	288-pin socket	CHA_DIMM0, CHA_DIMM1 CHB_DIMM0, CHB_DIMM1
SATA 6Gb/s connectors	7-pin SATA connector	S_ATA3, S_ATA4, S_ATA5, S_ATA6,
RS-232 serial port connectors	10-pin box header	COM1, COM2
RS-422/485 serial port connectors	4-pin wafer	COM3, COM4
Flash SPI ROM connector	6-pin wafer	JSPI1
Flash EC ROM connector	8-pin header	JEC1
SIM card slot	SIM slot	SIM1
Internal USB 2.0 connectors	8-pin header	JUSB3,JUSB4,JU SB5
Internal USB 3.2 Gen 1 connector (Type-A)	USB 3.2 Gen 1	USB1
Internal USB 3.2 Gen 2 connector (Type-C)	20-pin box header	JUSB3-1

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 2.5GbE RJ-45 connectors	Dual RJ-45	LAN1, LAN2
External HDMI connector	HDMI	HDMI1
External USB 3.2 Gen 1 connectors	2 x USB 3.2 Gen 1 by USB Type-A	CN1, CN2
External USB 3.2 Gen 2 connector	USB 3.2 Gen 2 by USB Type-C	CON1

Table 3-2: External Peripheral Connectors

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the PCIE-Q470.

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.

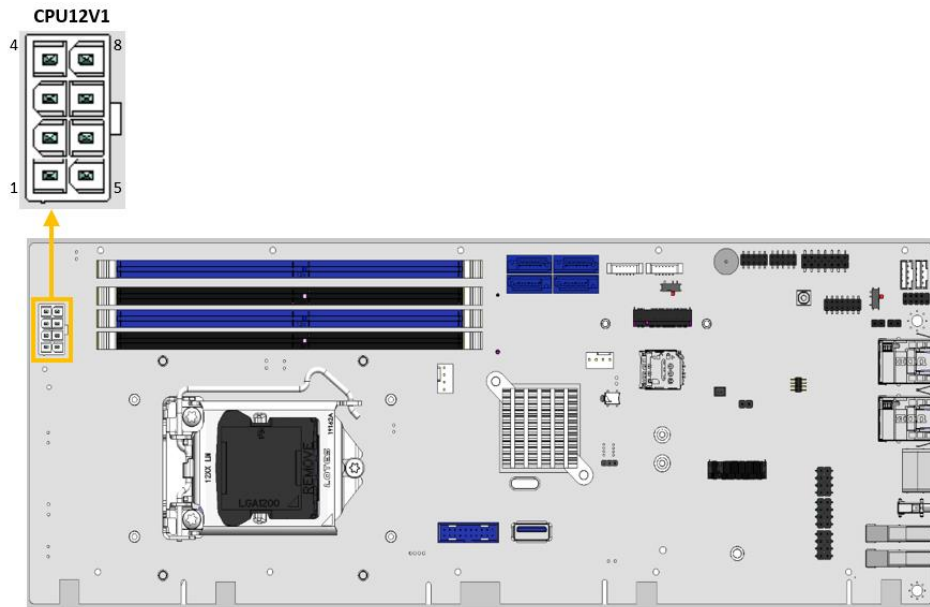


Figure 3-2: ATX CPU 12V Power Connector Location

Pin	Description	Pin	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

3.2.2 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 PCIE-Q470 is installed.

- CN Label:** **BAT1**
- CN Type:** 2-pin wafer, p=1.25 mm
- CN Location:** See **Figure 3-3**

This is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off.

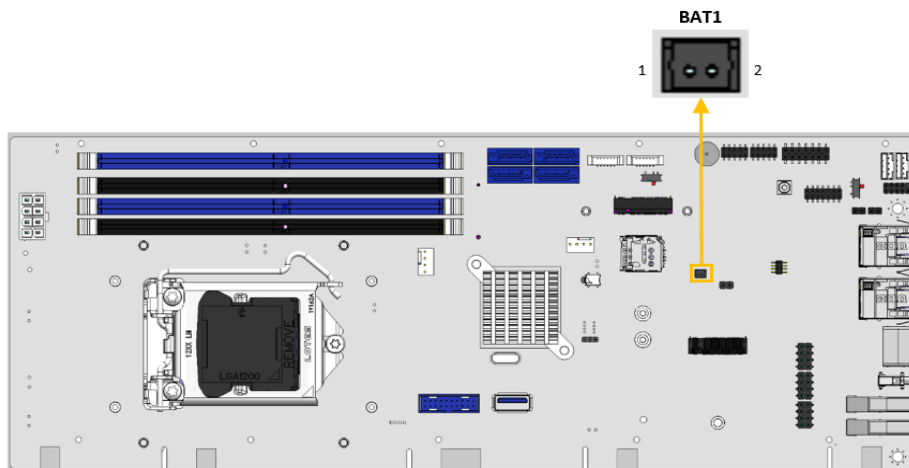


Figure 3-3: Battery Connector Location

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.2.3 Chassis Intrusion Connector

- CN Label:** CHASSIS1
- CN Type:** 2-pin header, p=2.54 mm
- CN Location:** See Figure 3-4
- CN Pinouts:** See Table 3-4

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

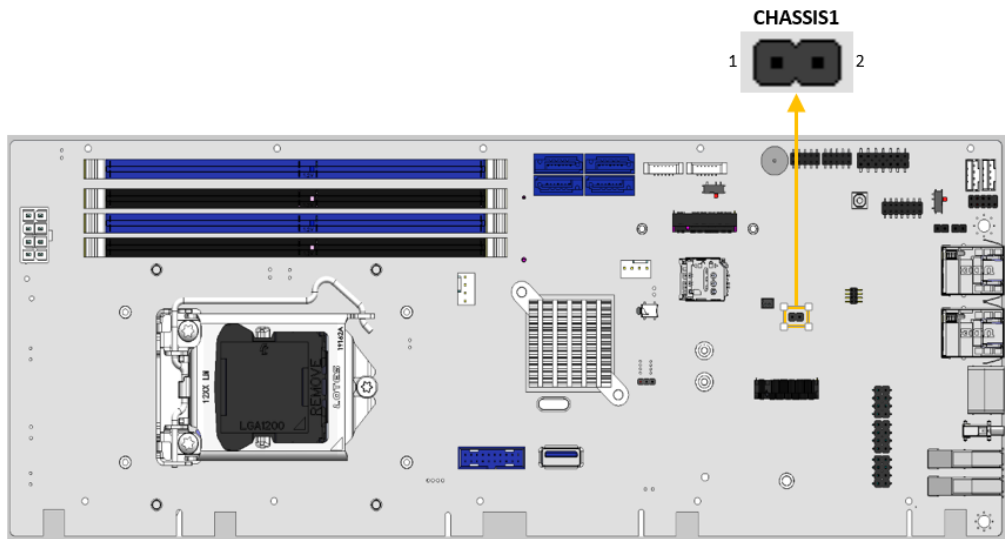


Figure 3-4: Chassis Intrusion Connector Location

Pin	Description
1	+3.3VSB
2	CHASSIS_OPEN

Table 3-4: Chassis Intrusion Connector Pinouts

3.2.4 Digital Input/Output Connector

- CN Label:** DIO1
- CN Type:** 14-pin header, p=2.00 mm
- CN Location:** See **Figure 3-5**
- CN Pinouts:** See **Table 3-5**

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

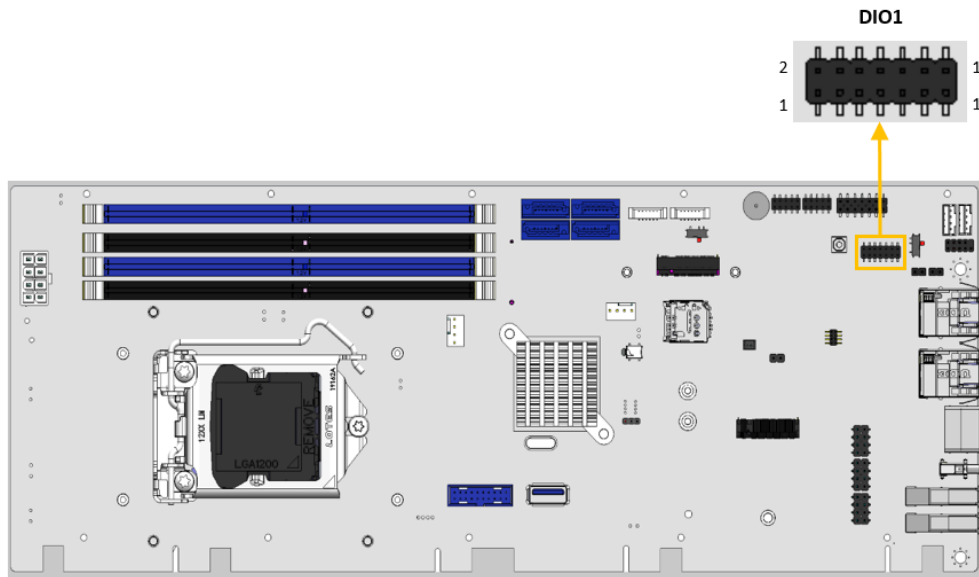


Figure 3-5: Digital I/O Connector Location

Pin	Description	Pin	Description
1	GND	2	VCC
3	Output 5	4	Output 4
5	Output 3	6	Output 2
7	Output 1	8	Output 0
9	Input 5	10	Input 4
11	Input 3	12	Input 2
13	Input 1	14	Input 0

Table 3-5: Digital I/O Connector Pinouts

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.2.5 EC Debug Connector

- CN Label:** **DBG_SPI1**
- CN Type:** 6-pin wafer, p=1.25 mm
- CN Location:** See **Figure 3-6**
- CN Pinouts:** See **Table 3-6**

The EC debug connector is used for EC debug.

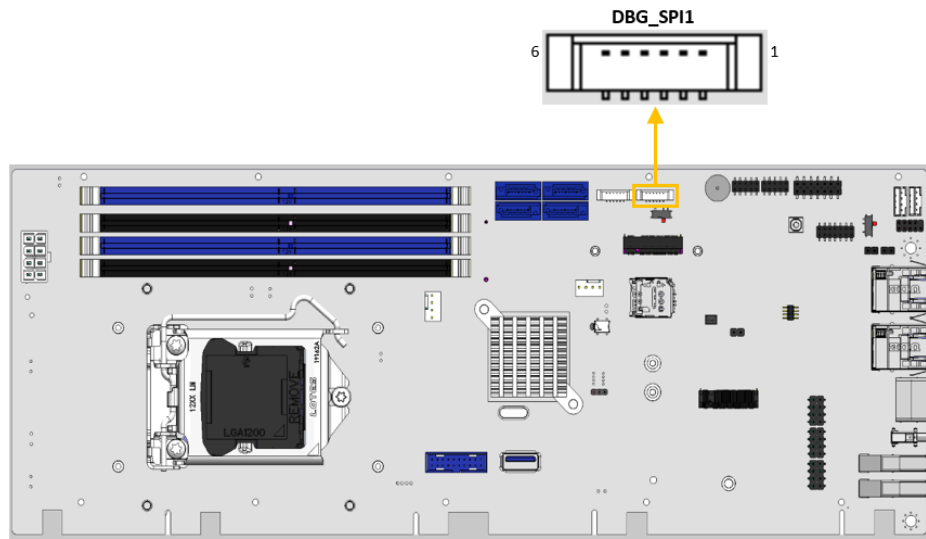


Figure 3-6: EC Debug Connector Location

Pin	Description	Pin	Description
1	NC	2	EDICLK
3	EDICS	4	EDIDI
5	EDIDO	6	GN

Table 3-6: EC Debug Connector Pinouts

3.2.6 Fan Connectors (CPU)

- CN Label:** CPU_FAN1
- CN Type:** 4-pin wafer, p=2.54 mm
- CN Location:** See Figure 3-7
- CN Pinouts:** See Table 3-7

The fan connector attaches to a CPU cooling fan.

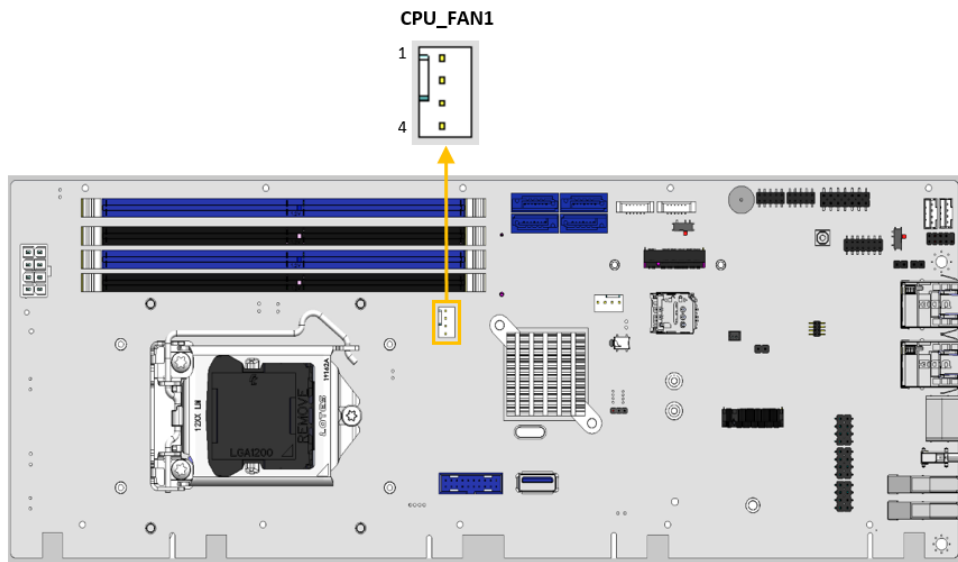


Figure 3-7: CPU Fan Connector Location

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

Table 3-7: CPU Fan Connector Pinouts

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.2.7 Fan Connectors (System)

- CN Label:** **SYS_FAN1**
- CN Type:** 4-pin wafer, p=2.54 mm
- CN Location:** See **Figure 3-8**
- CN Pinouts:** See **Table 3-8**

The fan connector attaches to a system cooling fan.

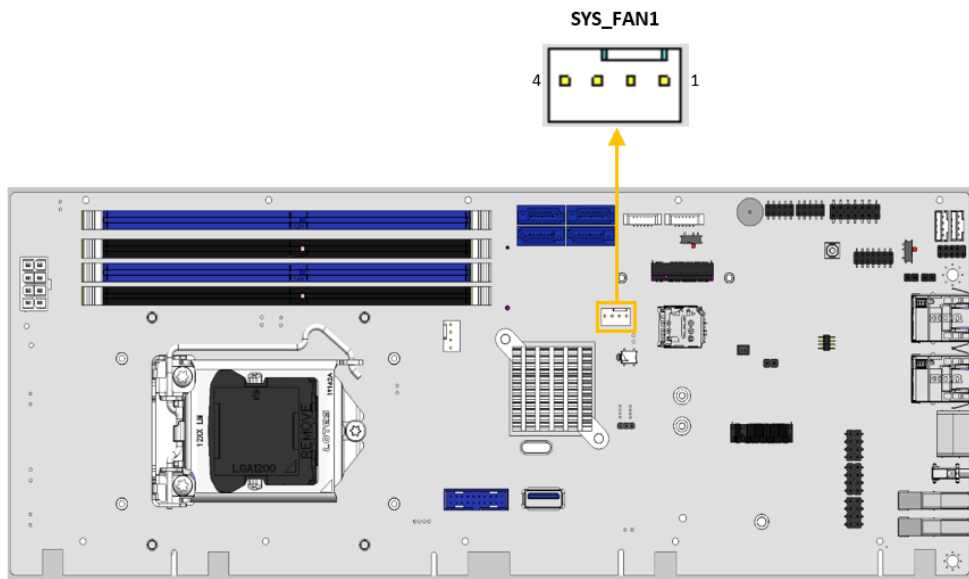


Figure 3-8: System Fan Connector Location

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

Table 3-8: System Fan (SYS_FAN1) Connector Pinouts

3.2.8 Audio Connector

- CN Label:** J_AUDIO1
- CN Type:** 10-pin header, p=2.00 mm
- CN Location:** See Figure 3-9
- CN Pinouts:** See Table 3-9

This connector allows connection to an external audio kit.

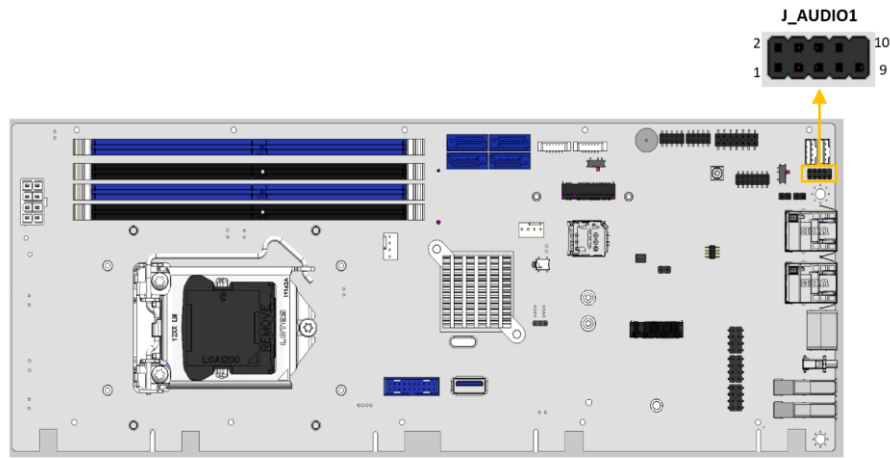


Figure 3-9: Audio Connector Location

Pin	Description	Pin	Description
1	HDA_SYNC	2	HDA_BIT_CLK
3	HDA_SDOUT	4	HDA_SPKR
5	HDA_SDIN	6	HDA_RST#
7	HDA_VCC	8	HDA_GND
9	HDA_+12V	10	HDA_GND

Table 3-9: Audio Connector Pinouts

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.2.9 Front Panel Connector

- CN Label:** F_PANEL1
- CN Type:** 14-pin header, p=2.54 mm
- CN Location:** See Figure 3-10
- CN Pinouts:** See Table 3-10

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

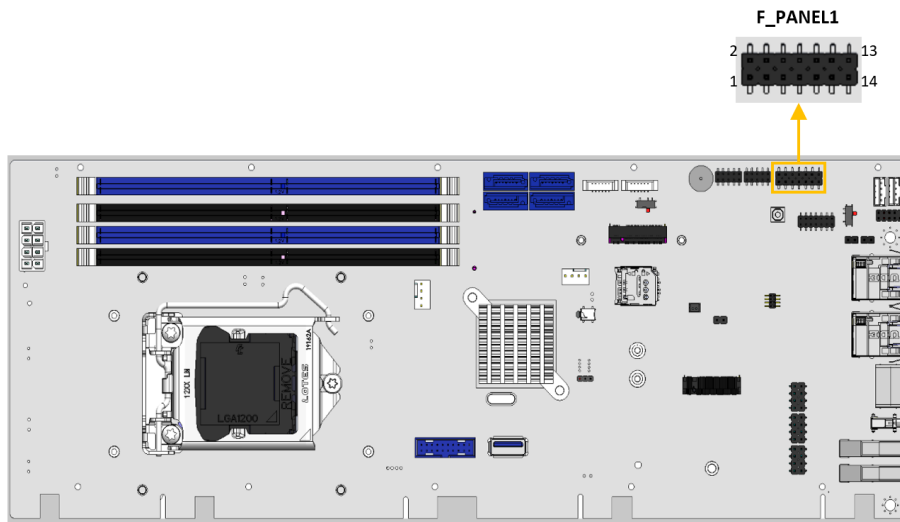


Figure 3-10: Front Panel Connector Location

Function	Pin	Description	Function	Pin	Description
PWR LED	1	PWR_LED+	SPKR	2	BEEP_PWR
	3	NC		4	NC
	5	PWR_LED-		6	NC
PWR BTN	7	PWR_BTN+		8	PC_BEEP
	9	PWR_BTN-		10	NC
HDD LED	11	HDD_LED+	RESET	12	Reset+
	13	HDD_LED-		14	Reset-

Table 3-10: Front Panel Connector Pinouts

3.2.10 I²C Connector

- CN Label:** I2C1
- CN Type:** 4-pin wafer, p=1.25 mm
- CN Location:** See **Figure 3-11**
- CN Pinouts:** See **Table 3-11**

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

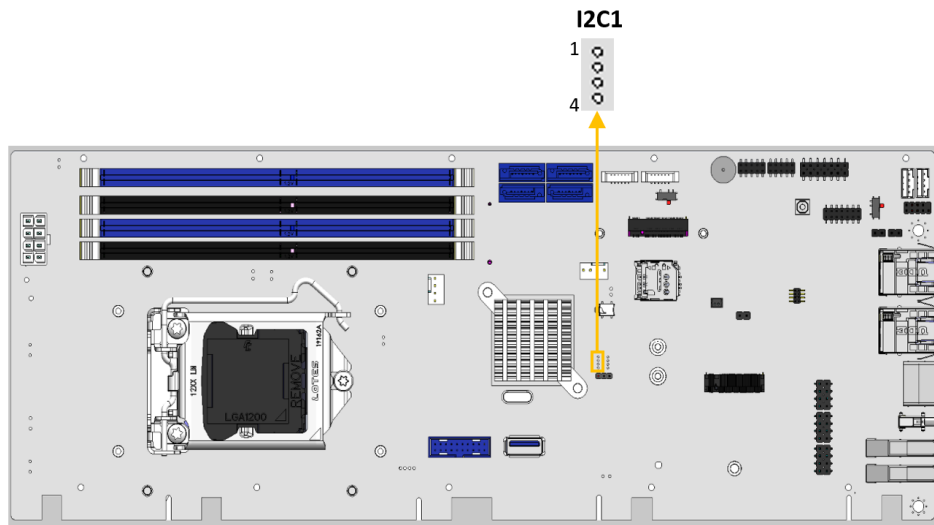


Figure 3-11: I²C Connector Location

Pin	Description
1	GND
2	I2C_DATA
3	I2C_CLK
4	+5V

Table 3-11: I²C Connector Pinouts

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.2.11 SMBus Connector

- CN Label:** SMB1
- CN Type:** 4-pin wafer, p=1.25 mm
- CN Location:** See Figure 3-12
- CN Pinouts:** See Table 3-12

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

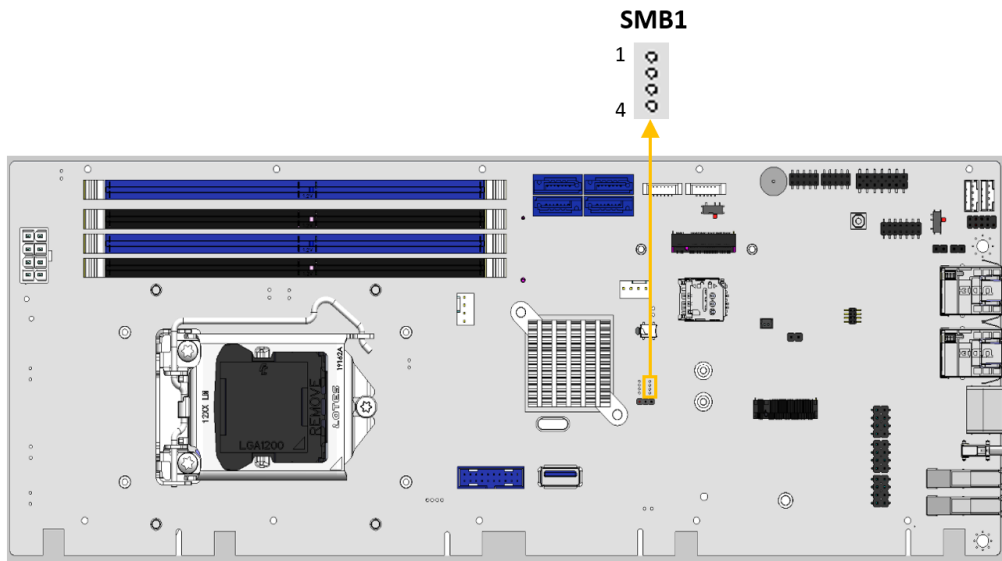


Figure 3-12: SMBus Connector Location

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

Table 3-12: SMBus Connector Pinouts

3.2.12 LAN Link LED Connector

- CN Label:** LED_LAN1, LED_LAN2
- CN Type:** 2-pin header, p=2.54 mm
- CN Location:** See **Figure 3-13**
- CN Pinouts:** See **Table 3-13**

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

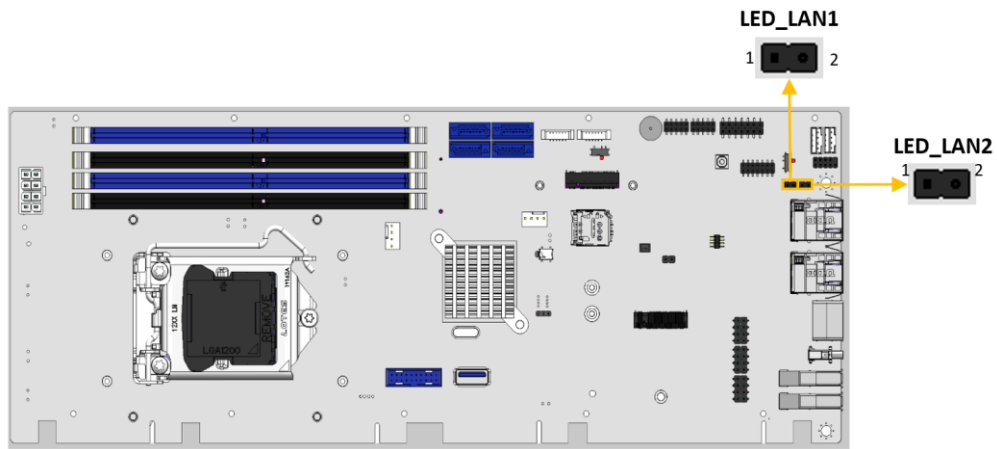


Figure 3-13: LAN LED Connector Locations

Pin	Description
1	+3.3V
2	LAN_LED_LINK#_ACT

Table 3-13: LAN LED Connector Pinouts

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.2.13 M.2 A-key slot

- CN Label:** M2_A1
- CN Type:** A-key slot
- CN Location:** See Figure 3-14
- CN Pinouts:** See Table 3-14

The M.2 2230 slot is keyed in the A position. The M.2 slot supports PCIe x1 and USB 2.0 interfaces.

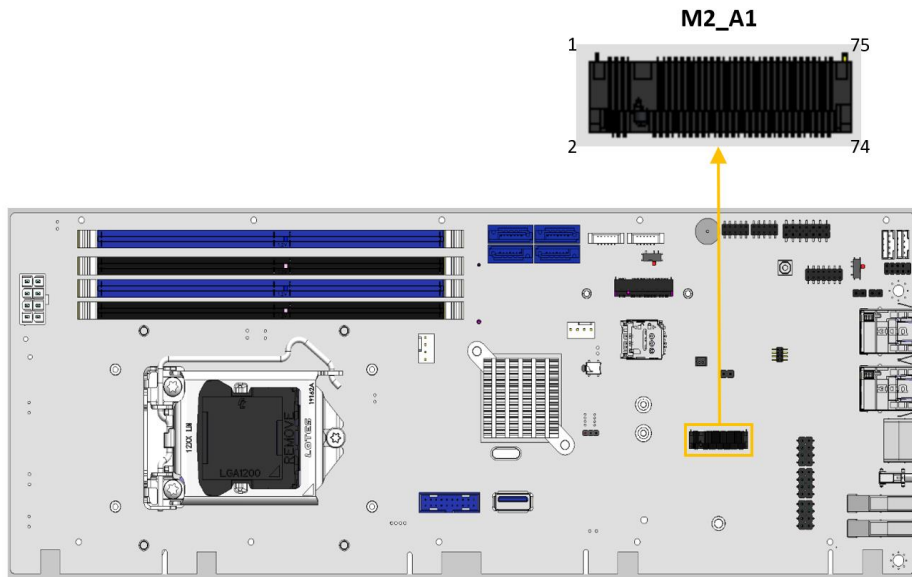


Figure 3-14: M.2 A-key (2230) Slot Location

Pin	Description	Pin	Description
1	GND	2	+3.3V
3	USB2_DP	4	+3.3V
5	USB2_DN	6	NC
7	GND	8	Module Key
9	Module Key	10	Module Key
11	Module Key	12	Module Key
13	Module Key	14	Module Key
15	Module Key	16	NC

Pin	Description	Pin	Description
17	NC	18	GND
19	NC	20	NC
21	NC	22	NC
23	GND	24	GND
25	NC	26	NC
27	NC	28	NC
29	GND	30	GND
31	NC	32	NC
33	GND	34	NC
35	PETP0	36	GND
37	PETN0	38	NC
39	GND	40	NC
41	PERP0	42	NC
43	PERN0	44	NC
45	GND	46	NC
47	PCIE_CLK+	48	NC
49	PCIE_CLK-	50	NC
51	GND	52	PLT_RST
53	CLKREQ0#	54	Pull up
55	PCIE_WAKE	56	W_DIS
57	GND	58	I2C_DAT
59	NC	60	I2C_CLK
61	NC	62	NC
63	GND	64	NC
65	NC	66	NC
67	NC	68	NC
69	GND	70	+3.3V
71	NC	72	+3.3V
73	NC	74	+3.3V
75	GND		

Table 3-14: M.2 A-key (2230) Slot Pinouts

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.2.14 M.2 B-key slot

- CN Label:** M2_B1
- CN Type:** B-key slot
- CN Location:** See Figure 3-15
- CN Pinouts:** See Table 3-15

The M.2 2230 slot is keyed in the A position. The M.2 slot supports PCIe x1 and USB 2.0 interfaces.

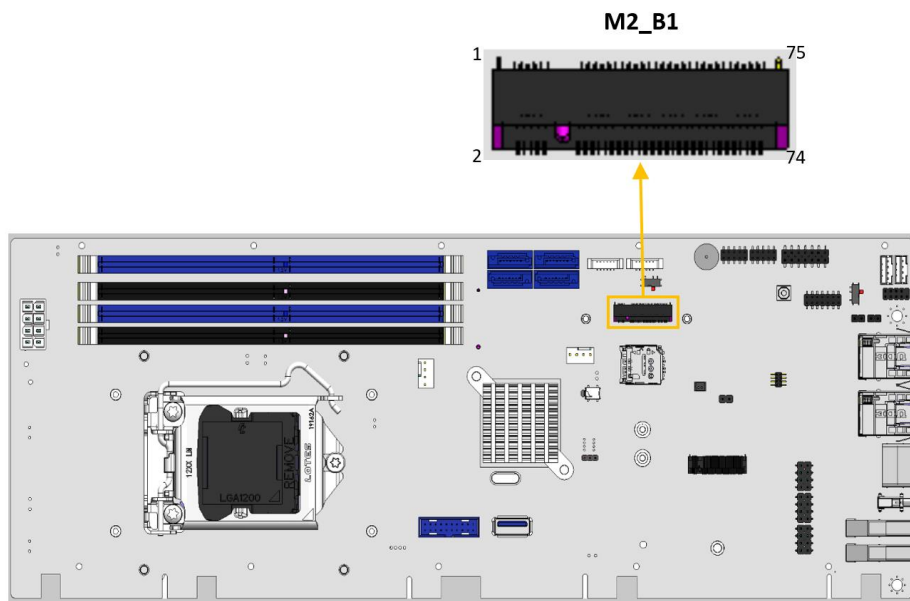


Figure 3-15: M.2 B-key (3042/3052/2242/2280) Slot Location

Pin	Description	Pin	Description
1	GND	2	+3.3V
3	USB2_DP	4	+3.3V
5	USB2_DN	6	NC
7	GND	8	Module Key
9	Module Key	10	Module Key
11	Module Key	12	Module Key
13	Module Key	14	Module Key
15	Module Key	16	NC

Pin	Description	Pin	Description
17	NC	18	GND
19	NC	20	NC
21	NC	22	NC
23	GND	24	GND
25	NC	26	NC
27	NC	28	NC
29	GND	30	GND
31	NC	32	NC
33	GND	34	NC
35	PETP0	36	GND
37	PETN0	38	NC
39	GND	40	NC
41	PERP0	42	NC
43	PERN0	44	NC
45	GND	46	NC
47	PCIE_CLK+	48	NC
49	PCIE_CLK-	50	NC
51	GND	52	PLT_RST
53	CLKREQ0#	54	Pull up
55	PCIE_WAKE	56	W_DIS
57	GND	58	I2C_DAT
59	NC	60	I2C_CLK
61	NC	62	NC
63	GND	64	NC
65	NC	66	NC
67	NC	68	NC
69	GND	70	+3.3V
71	NC	72	+3.3V
73	NC	74	+3.3V
75	GND		

Table 3-15: M.2 B-key (3042/3052/2242/2280) Slot Pinouts

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.2.15 M.2 M-key slot (on solder side)

- CN Label:** M2_M1
- CN Type:** M-key slot
- CN Location:** See Figure 3-16
- CN Pinouts:** See Table 3-16

The M.2 2280 slot is keyed in the B position. The M.2 slot supports PCIe x2 interfaces.

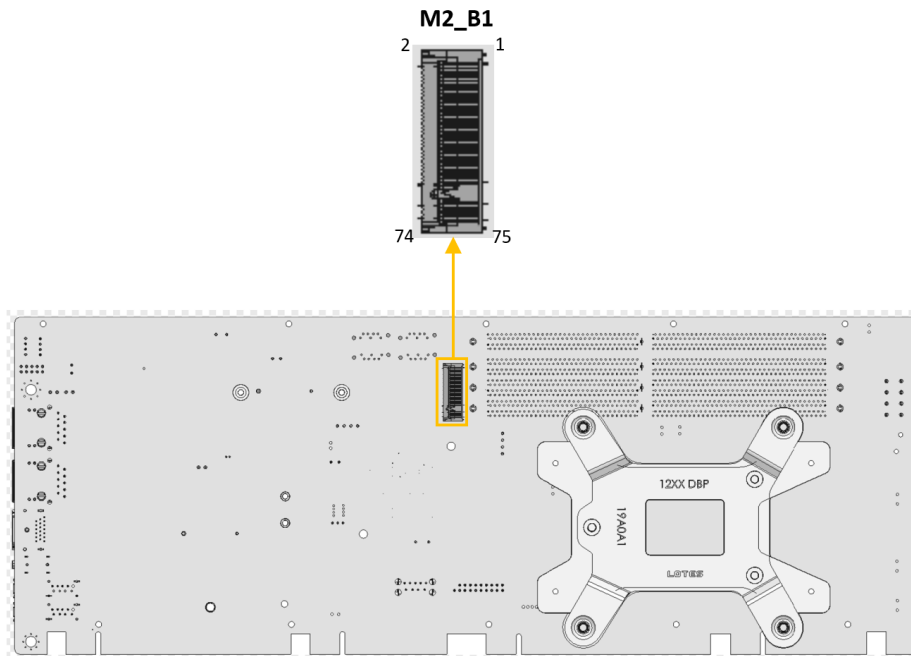


Figure 3-16: M.2 M-key (2242/2280) Slot Location

Pin	Description	Pin	Description
1	GND	2	+3.3V
3	GND	4	+3.3V
5	PERN0	6	NC
7	PERP0	8	NC
9	GND	10	DAS/DSS#
11	PETN0	12	+3.3V
13	PETP0	14	+3.3V
15	GND	16	+3.3V

Pin	Description	Pin	Description
17	PERN1	18	+3.3V
19	PERP1	20	NC
21	GND	22	NC
23	PETN1	24	NC
25	PETP1	26	NC
27	GND	28	NC
29	PERN2	30	NC
31	PERP2	32	NC
33	GND	34	NC
35	PETN2	36	NC
37	PETP2	38	DEVSLP
39	GND	40	NC
41	PERN3	42	NC
43	PERP3	44	NC
45	GND	46	NC
47	PETN3	48	NC
49	PETP3	50	PERST#
51	GND	52	CLKREQ
53	PCIECLKN	54	PEWAKE
55	PCIECLKP	56	NC
57	GND	58	NC
59	Module Key	60	Module Key
61	Module Key	62	Module Key
63	Module Key	64	Module Key
65	Module Key	66	Module Key
67	NC	68	NC
69	PEDET	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		

Table 3-16: M.2 M-key (2242/2280) Slot Pinouts

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.2.16 On-Board Power Switch

- CN Label:** PWR_SW1
- CN Type:** Push button
- CN Location:** See Figure 3-17

The on-board power button controls system power.

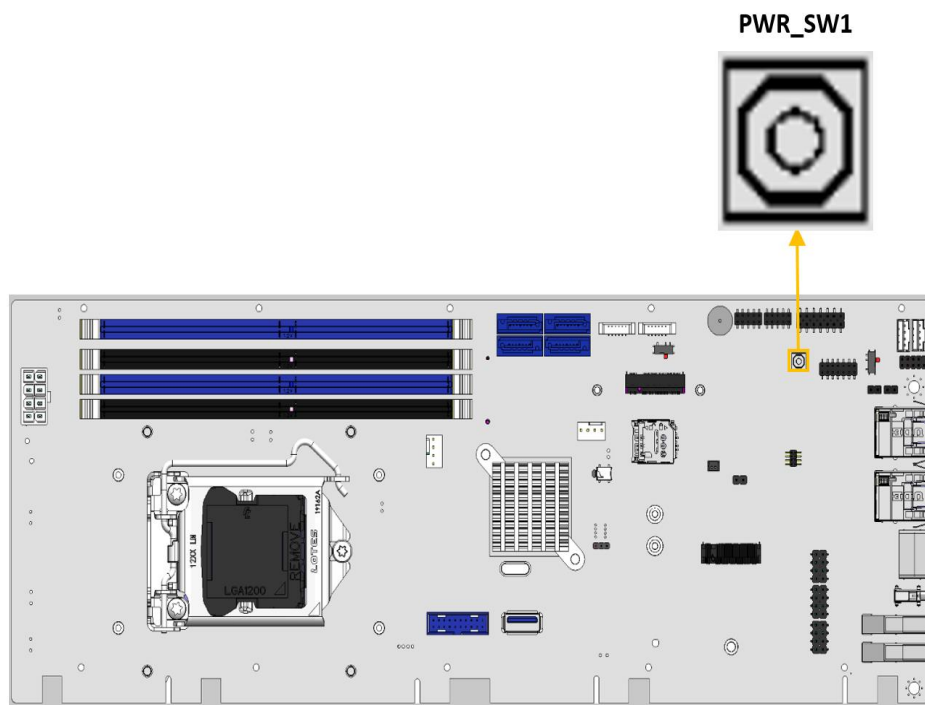


Figure 3-17: Power Button Location

3.2.17 DDR4 DIMM Slots

- CN Label:** CHA_DIMM0, CHA_DIMM1, CHB_DIMM0, CHB_DIMM1
- CN Type:** 288-pin DDR4 DIMM socket
- CN Location:** See Figure 3-18

The DIMM sockets are for DDR4 DIMM memory modules.

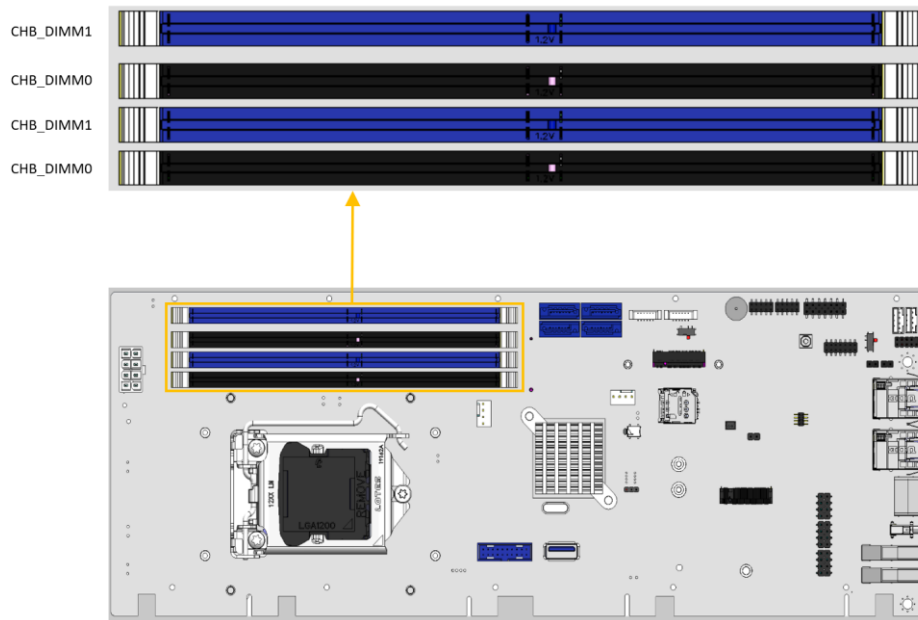


Figure 3-18: DDR4 DIMM Socket Locations

3.2.18 SATA 6Gb/s Connectors

- CN Label:** S_ATA3, S_ATA4, S_ATA5, S_ATA6
- CN Type:** 7-pin SATA connector
- CN Location:** See Figure 3-19
- CN Pinouts:** See Table 3-17

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

PCIE-Q470 Full-size PICMG 1.3 CPU Card

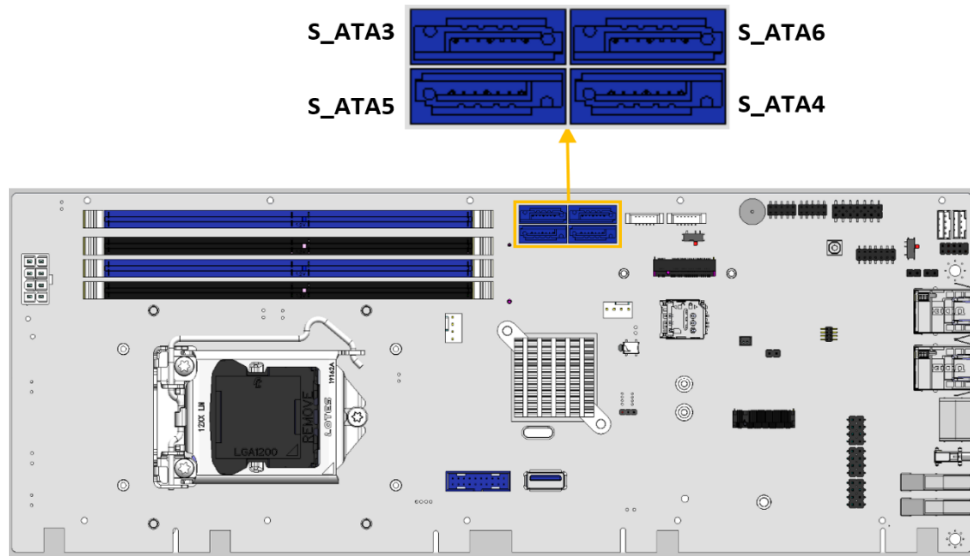


Figure 3-19: SATA 6Gb/s Connector Locations

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

Table 3-17: SATA 6Gb/s Connector Pinouts

3.2.19 RS-232 Serial Port Connectors

- CN Label:** COM1, COM2
- CN Type:** 10-pin box header, p=2.00 mm
- CN Location:** See Figure 3-20
- CN Pinouts:** See Table 3-18

Each of these connectors provides RS-232 connections.

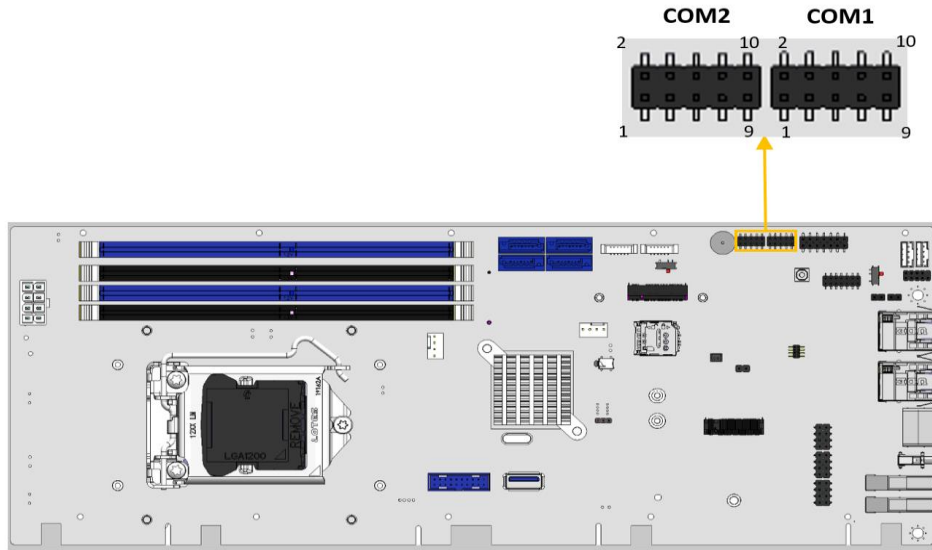


Figure 3-20: RS-232 Serial Port Connector Location

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

Table 3-18: RS-232 Serial Port Connector Pinouts

3.2.20 RS-422/485 Serial Port Connectors

- CN Label:** COM3, COM4
- CN Type:** 4-pin wafer, p=2.00 mm
- CN Location:** See **Figure 3-21**
- CN Pinouts:** See **Table 3-19** and **Table 3-20**

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

PCIE-Q470 Full-size PICMG 1.3 CPU Card

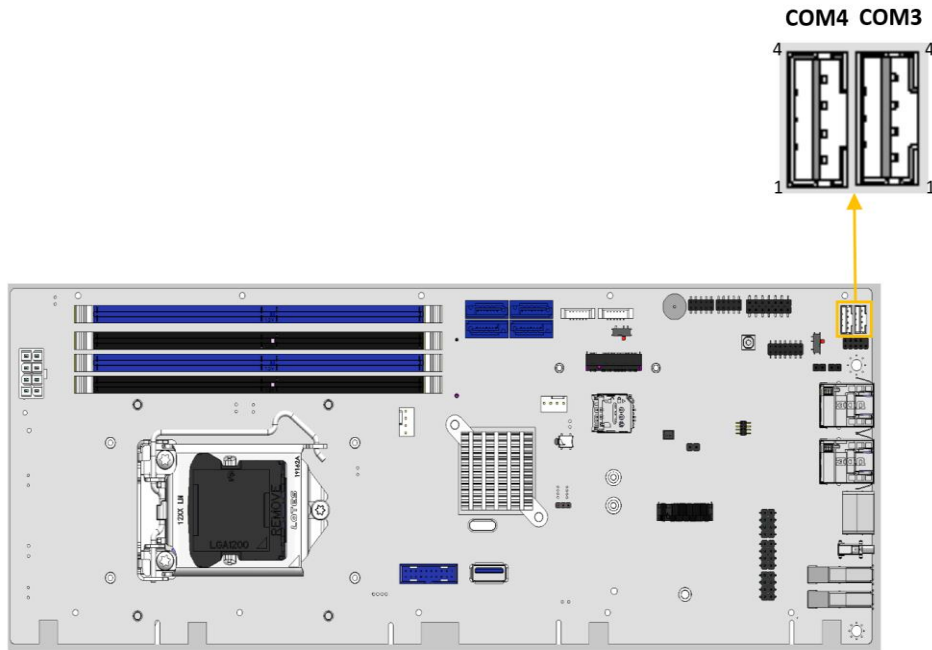


Figure 3-21: RS-422/485 Serial Port Connectors Location

Pin	Description	Pin	Description
1	RXD422-	3	TXD422+/TXD485+
2	RXD422+	4	TXD422-/TXD485-

Table 3-19: RS-422/485 Serial Port Connectors Pinouts

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

RS-422 Pinouts	RS-485 Pinouts
<p>RS-422</p> <p>D-SUB 9PIN MALE MODE 00</p> <p>D-SUB 9PIN MALE MODE 00</p>	<p>RS-485</p> <p>D-SUB 9PIN MALE MODE 10/11</p> <p>D-SUB 9PIN MALE MODE 10/11</p>

Table 3-20: DB-9 RS-422/485 Pinouts

3.2.21 Flash SPI ROM Connector

- CN Label:** JSPI1
- CN Type:** 6-pin wafer, p=1.25 mm
- CN Location:** See Figure 3-22
- CN Pinouts:** See Table 3-21

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

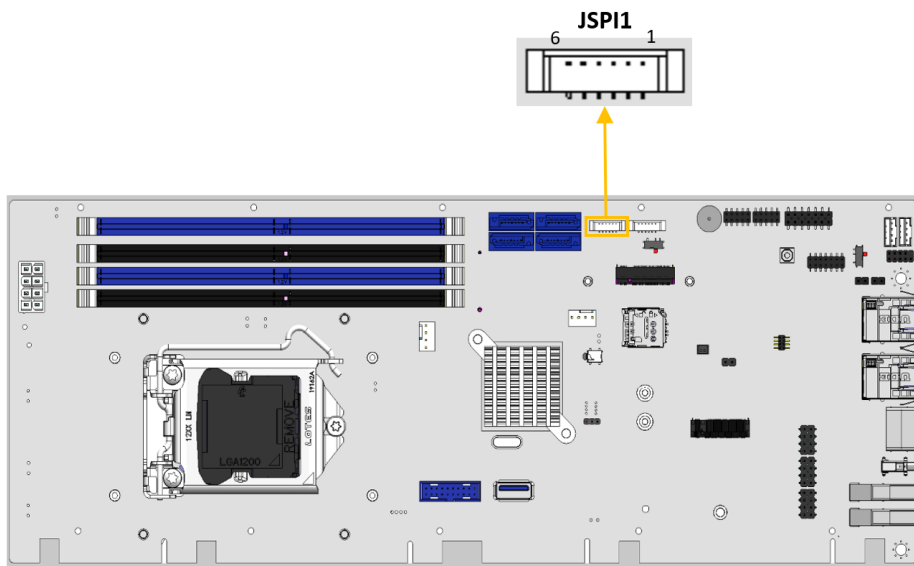


Figure 3-22: Flash SPI ROM Connector Location

Pin	Description	Pin	Description
1	+V3.3M_SPI_CON	4	SPI_CLK_SW
2	SPI_CS	5	SPI_SI_SW
3	SPI_SO_SW	6	GND

Table 3-21: Flash SPI ROM Connector Pinouts

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.2.22 Flash EC ROM Connector

- CN Label:** JEC1
- CN Type:** 8-pin header, p=1.27 mm
- CN Location:** See Figure 3-23
- CN Pinouts:** See Table 3-22

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

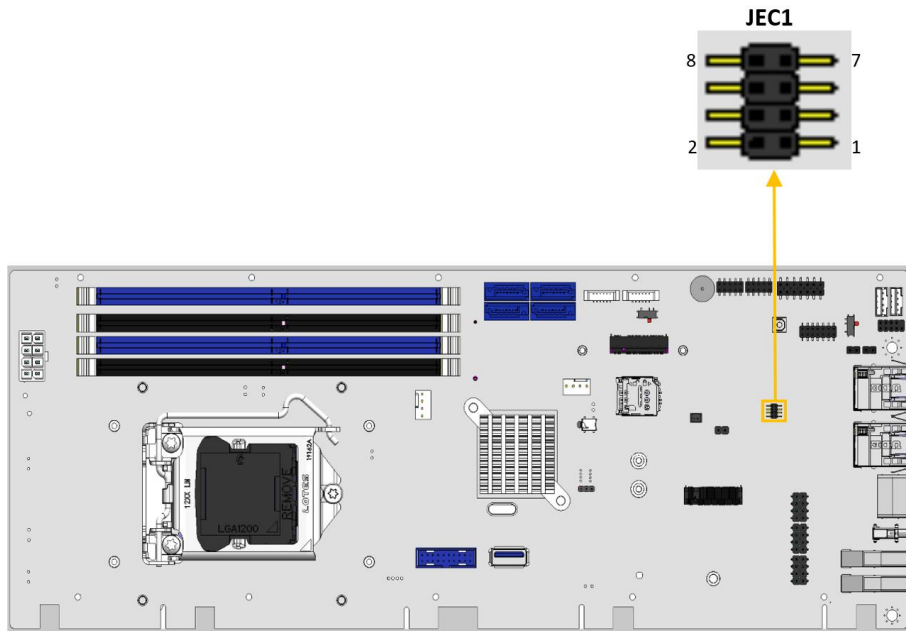


Figure 3-23: Flash EC ROM Connector Location

Pin	Description	Pin	Description
1	FSCE#	2	VCC
3	FMISO	4	NC
5	EC_DET_FLASH	6	FSDCK
7	GND	8	FMOSI

Table 3-22: Flash EC ROM Connector Pinouts

3.2.23 SIM Card Slot

- CN Label:** SIM1
- CN Type:** SIM slot
- CN Location:** See **Figure 3-24**
- CN Pinouts:** See **Table 3-23**

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

A WWAN module must be installed in the M.2 B-key slot (M2_B1) to provide WWAN communication.

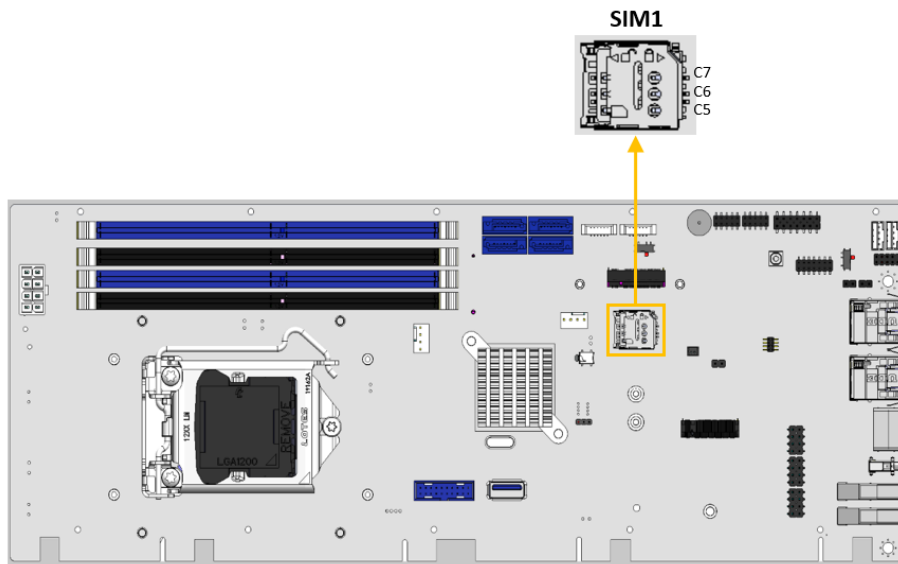


Figure 3-24: SIM Card Slot Connector Location

Pin	Description	Pin	Description
C1	SIM_VCC	C5	GND
C2	SIM_RST	C6	NC
C3	SIM_CLOCK	C7	SIM_IO

Table 3-23: SIM Card Slot Connector Pinouts

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.2.24 Internal USB 2.0 Connectors

CN Label: JUSB3, JUSB4, JUSB5

CN Type: 8-pin header, p=2.54 mm

CN Location: See Figure 3-25

CN Pinouts: See Table 3-24

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

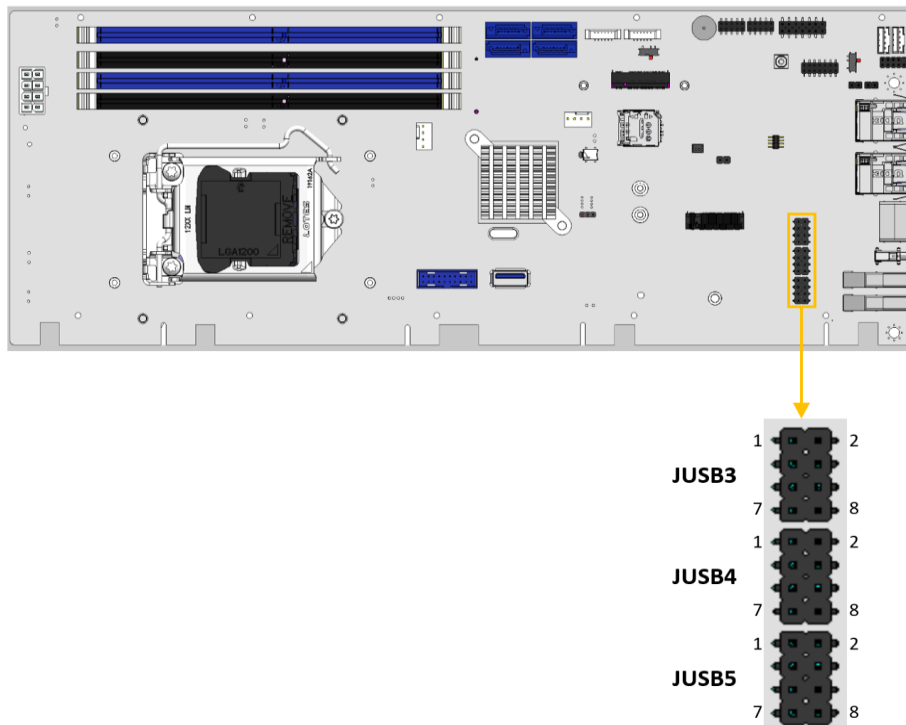


Figure 3-25: Internal USB 2.0 Connector Locations

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 3-24: Internal USB 2.0 Connector Pinouts

3.2.25 Internal USB 3.2 Gen 1 Connector (Type-A)

- CN Label:** USB1
- CN Type:** USB 3.2 Gen 1 Type-A Port
- CN Location:** See Figure 3-26
- CN Pinouts:** See Table 3-25

The Internal USB 3.2 Gen 1 connector connects to USB 3.2 devices. This connector provides USB 3.2 Gen 1 (5Gb/s) ports.

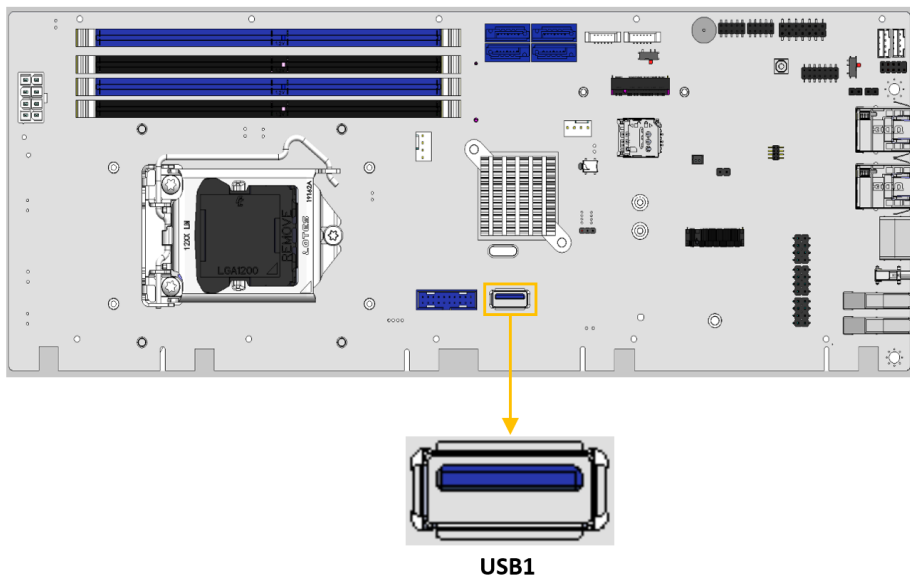


Figure 3-26: Internal USB 3.2 Gen 1 Connector Location

Pin	Description	Pin	Description
1	VCC	6	USB3_RX+
2	USB_DATA-	7	GND
3	USB_DATA+	8	USB3_TX-
4	GND	9	USB3_TX+
5	USB3_RX-		

Table 3-25: Internal USB 3.2 Gen 1 Connector Pinouts

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.2.26 Internal USB 3.2 Gen 1 Connector

- CN Label:** JUSB3-1
- CN Type:** 20-pin box header, p=2.00 mm
- CN Location:** See Figure 3-27
- CN Pinouts:** See Table 3-26

The Internal USB 3.2 Gen 1 connector connects to USB 3.2 devices.

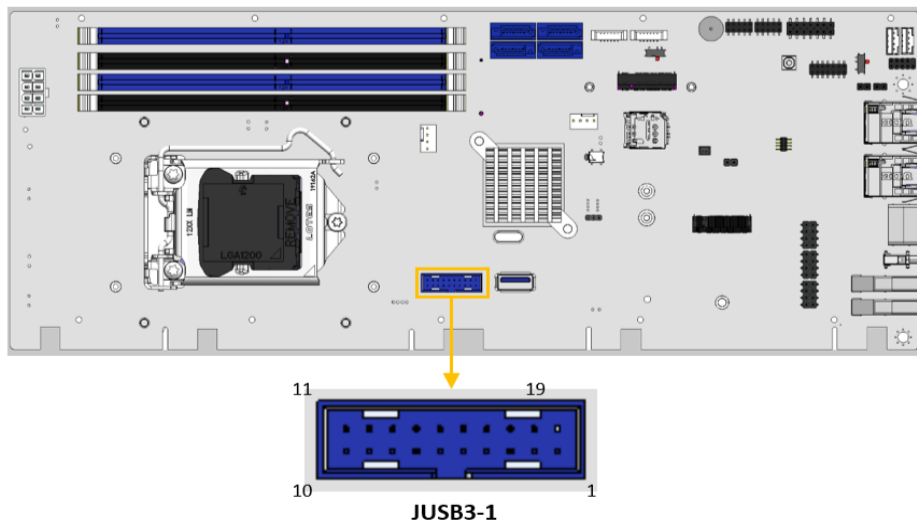


Figure 3-27: Internal USB 3.2 Gen 1 Connector Location

Pin	Description	Pin	Description
1	VCC	11	USB_DATA+
2	USB_RX-	12	USB_DATA-
3	USB_RX+	13	GND
4	GND	14	USB3_TX+
5	USB3_TX-	15	USB3_TX-
6	USB3_TX+	16	GND
7	GND	17	USB3_RX+
8	USB3_DATA-	18	USB3_RX-
9	USB3_DATA+	19	VCC
10	NC		

Table 3-26: Internal USB 3.2 Gen 1 Connector Pinouts

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:

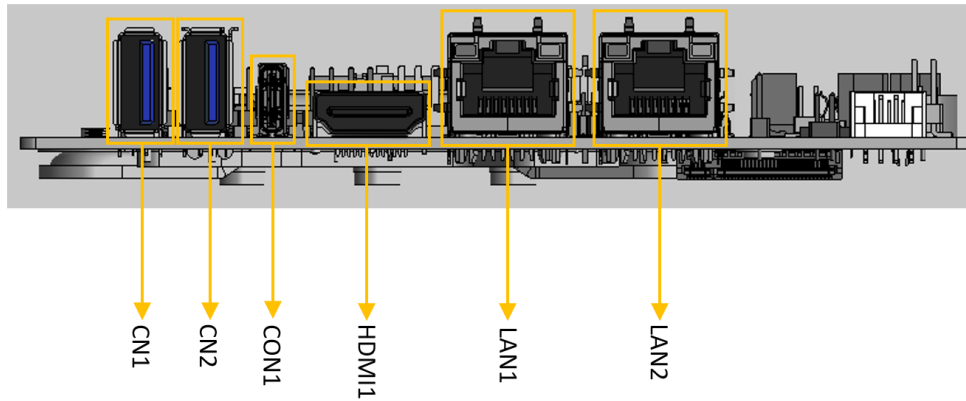


Figure 3-28: External Peripheral Interface Connector

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.3.1 External 2.5GbE RJ-45 connectors

- CN Label:** LAN1, LAN2
- CN Type:** RJ-45
- CN Location:** See Figure 3-29
- CN Pinouts:** See Table 3-27

Each LAN connector connects to a local network.

LAN LED location and pinouts see **Figure 3-30** and **Table 3-28**.

Pin	Description	Pin	Description
1	MDIA3-	5	MDIA1+
2	MDIA3+	6	MDIA2+
3	MDIA2-	7	MDIA0-
4	MDIA1-	8	MDIA0+

Table 3-27: LAN Pinouts

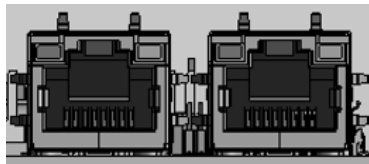


Figure 3-29: LAN Location

LED	Description	LED	Description
A	on: linked blinking: data is being sent/received-	B	off: 100 Mb/s orange: 1000 Mb/s green: 2500 Mb/s

Table 3-28: LAN LED Pinouts

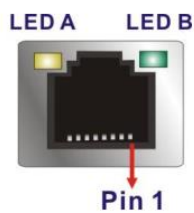


Figure 3-30: LAN LED Location

3.3.2 External HDMI connector

- CN Label:** HDMI1
- CN Type:** HDMI connector
- CN Location:** See **Figure 3-31**
- CN Pinouts:** See **Table 3-29**

The HDMI connector can connect to an HDMI device.

Pin	Description	Pin	Description
21	HDMI_DATA2	31	GND
22	GND	32	HDMI_CLK#
23	HDMI_DATA2#	33	N/C
24	HDMI_DATA1	34	N/C
25	GND	35	HDMI_SCL
26	HDMI_DATA1#	36	HDMI_SDA
27	HDMI_DATA0	37	GND
28	GND	38	+5V
29	HDMI_DATA0#	39	HDMI_HPD
30	HDMI_CLK		

Table 3-29: HDMI Connector Pinouts



Figure 3-31: HDMI Connector

PCIE-Q470 Full-size PICMG 1.3 CPU Card

3.3.3 External USB 3.2 Gen 1 Connectors (Type-A)

- CN Label:** CN1, CN2
- CN Type:** USB 3.2 Gen 1 Type A
- CN Location:** See **Figure 3-32**
- CN Pinouts:** See **Table 3-30**

There are two external USB 3.2 Gen 1 ports on the PCIE-Q470. The USB connector can be connected to a USB 2.0 or USB 3.2 device. The pinouts of USB 3.2 Gen 1 connectors are shown below.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	6	USB3_RX+
2	USB_DATA-	7	GND
3	USB_DATA+	8	USB3_TX-
4	GND	9	USB3_TX+
5	USB3_RX-		

Table 3-30: External USB 3.2 Gen 1 Connectors (Type-A) Pinouts

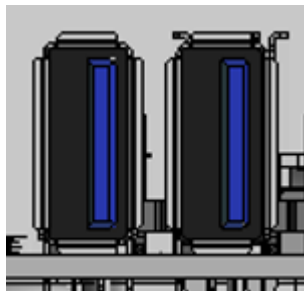


Figure 3-32: USB 3.2 Gen 1 Connectors (Type-A)

3.3.4 External USB 3.2 Gen 2 Connector (Type-C)

- CN Label:** CON1
- CN Type:** USB 3.2 Gen 2 Type-C
- CN Location:** See Figure 3-33
- CN Pinouts:** See Table 3-31

The USB 3.2 Gen 2 connector can be connected to a USB Type-C device.

Pin	Description	Pin	Description
A1	GND	B12	GND
A2	TX1+	B11	RX1+
A3	TX1-	B10	RX1-
A4	VBUS	B9	VBUS
A5	CC1	B8	SBU2
A6	D+	B7	NC
A7	D-	B6	NC
A8	SBU1	B5	VCONN
A9	VBUS	B4	VBUS
A10	RX2-	B3	TX2-
A11	RX2+	B2	TX2+
A12	GND	B1	GND

Table 3-31: USB 3.2 Gen 2 Type-C Port Pinouts

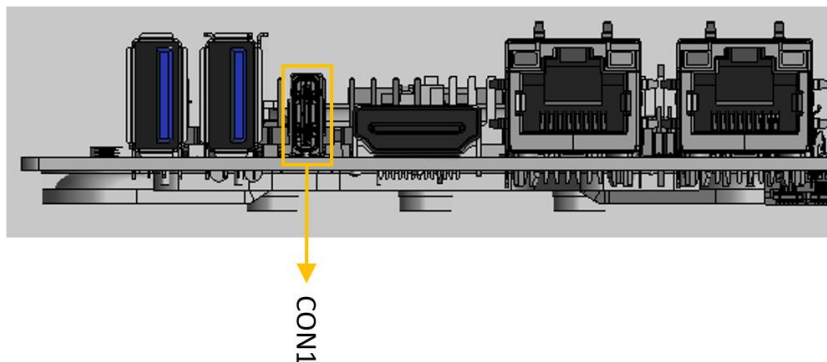


Figure 3-33: USB 3.2 Gen 2 Type-C Port Location

Chapter

4

Installation

4.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the PCIE-Q470 may result in permanent damage to the PCIE-Q470 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PCIE-Q470. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PCIE-Q470 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 PCIE-Q470, place it on an anti-static pad. This reduces the possibility of ESD damaging the PCIE-Q470.
- **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.

PCIE-Q470 Full-size PICMG 1.3 CPU Card



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 PCIE-Q470 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 PCIE-Q470 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 PCIE-Q470 off:
 - When working with the PCIE-Q470, 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 PCIE-Q470, **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**.

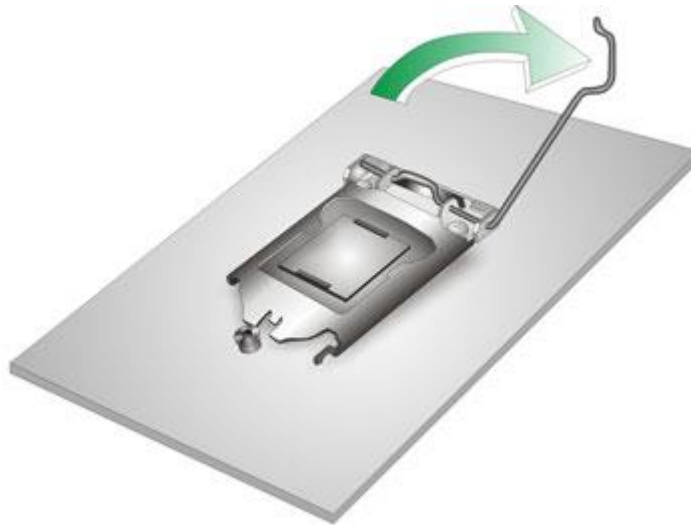


Figure 4-1: Disengage the CPU Socket Load Lever

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**.

PCIE-Q470 Full-size PICMG 1.3 CPU Card

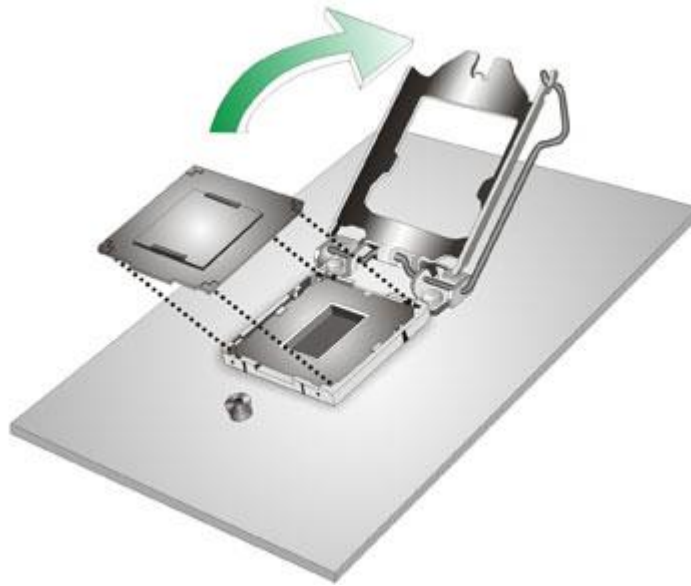


Figure 4-2: Remove Protective Cover

- 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**.

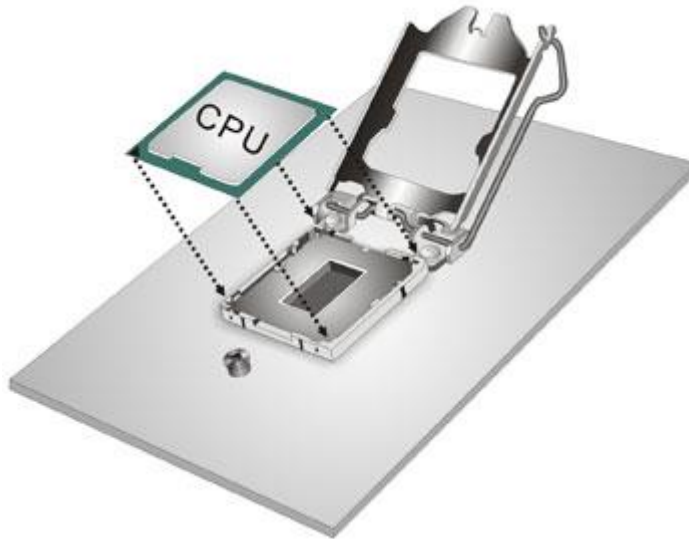


Figure 4-3: Insert the Socket LGA1200 CPU

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.

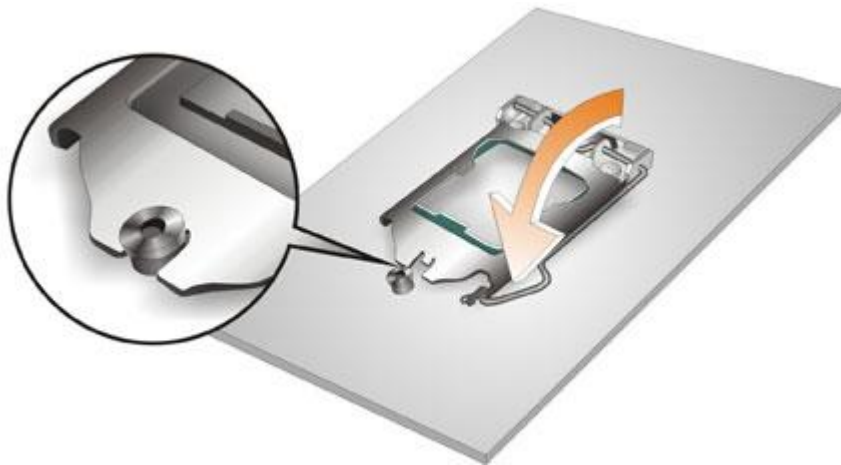


Figure 4-4: Close the Socket LGA1200

PCIE-Q470 Full-size PICMG 1.3 CPU Card

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**.

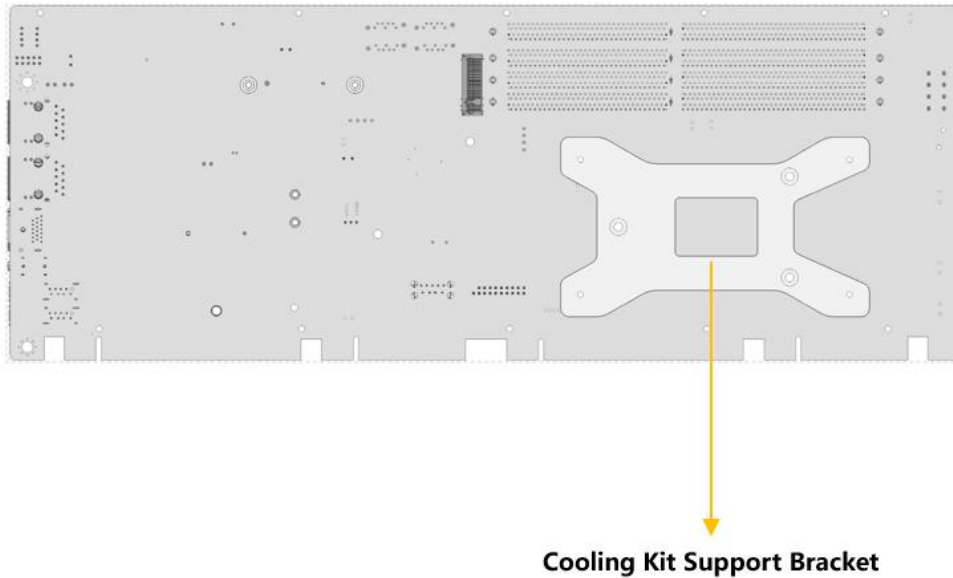


Figure 4-5: Cooling Kit Support Bracket

- 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 PCIE-Q470. Carefully route the cable and avoid heat generating chips and fan blades.

PCIE-Q470 Full-size PICMG 1.3 CPU Card

4.5 DIMM Installation

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

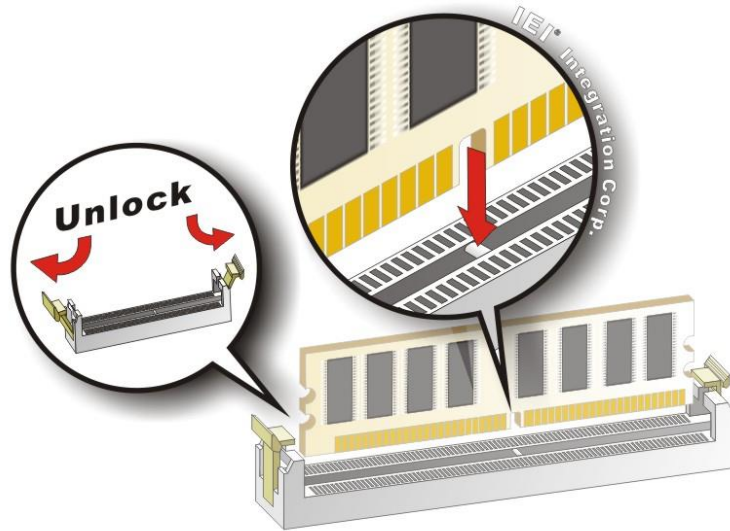


Figure 4-6: DIMM Installation

- 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 should 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**.

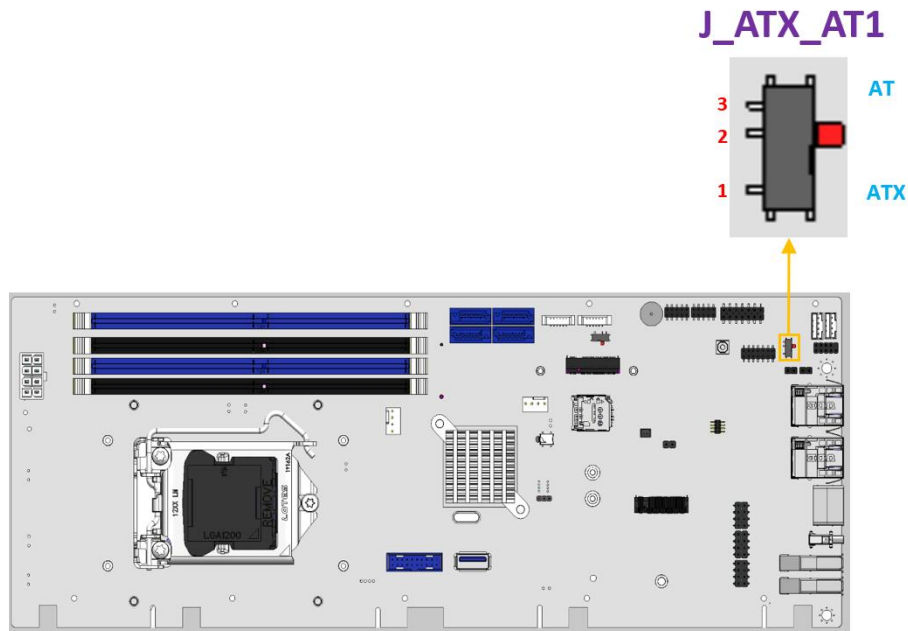


Figure 4-7: AT/ATX Power Mode Switch Location

Setting	Description
1-2 (right)	ATX power mode (default)
2-3 (left)	AT power mode

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

PCIE-Q470 Full-size PICMG 1.3 CPU Card

4.6.2 BIOS Selection Switch

The BIOS selection is made through the BIOS switch which is shown in **Figure 4-8**.

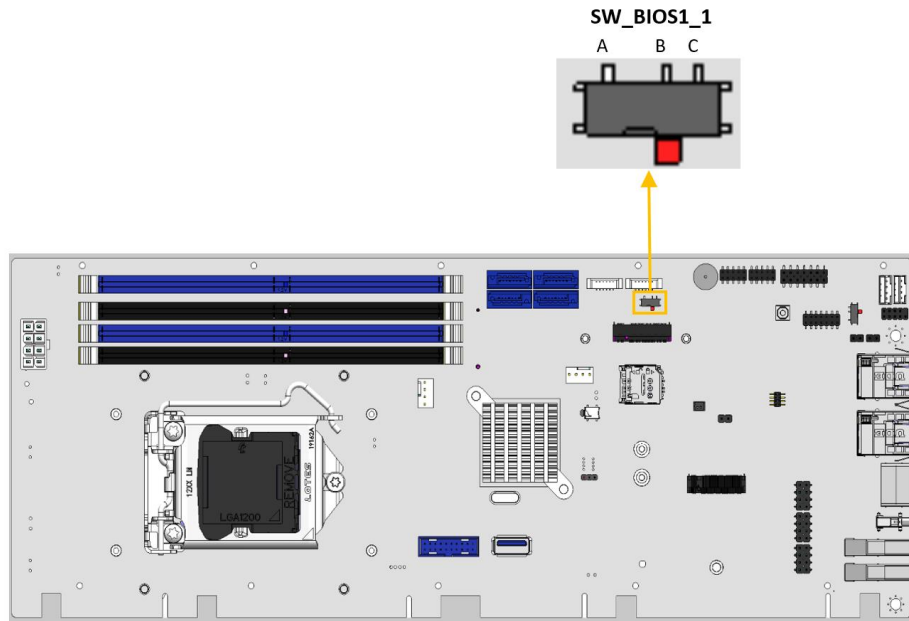


Figure 4-8: BIOS Switch Locations

Pin	Description	Pin	Description
Short A - B	BIOS1: four PCIe x1 slots (default)	Short B - C	BIOS2: one PCIe x4 slot

Table 4-2: BIOS Switch Settings

4.6.3 Clear CMOS Button

To reset the BIOS, remove the on-board battery and press the clear CMOS button for three seconds or more. The clear CMOS button location is shown in **Figure 4-9**.

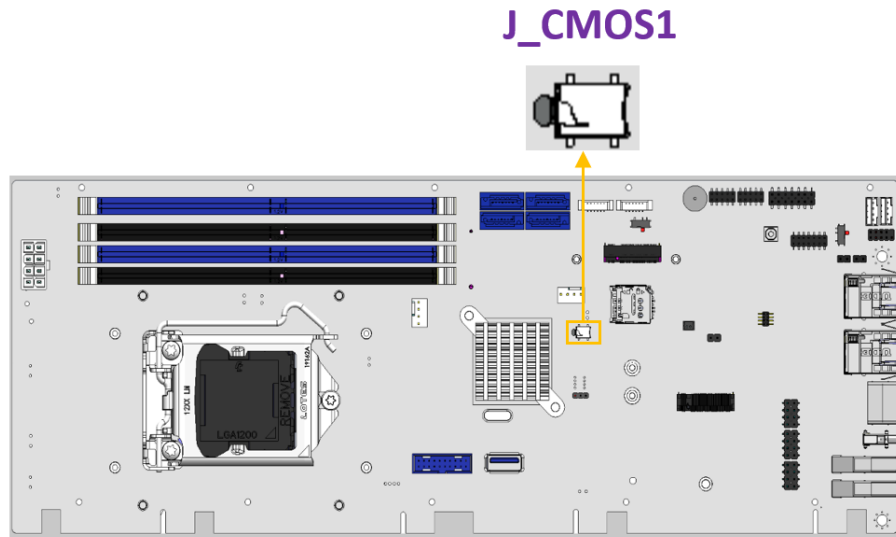


Figure 4-9: Clear CMOS Button Location

4.6.4 PCIe x16 Channel Mode Setup

The PCIe-Q470 supports one PCIe x16 interface on the backplane. The PCIe x16 channel mode setup is made through the BIOS menu in “Chipset → System Agent (SA) Configuration → PEG Port Configuration”. Use the **PEG Link Width Configuration** BIOS option to configure the PCIe x16 channel mode.

Options	Description
1x16	Sets the PCIe x16 link width as one PCIe x16 slot (default)
2x8	Sets the PCIe x16 link width as two PCIe x8 slots
1x8, 2x4	Sets the PCIe x16 link width as one PCIe x8 and two PCIe x4

Table 4-3: PCIe x16 Channel Mode Setup

PCIE-Q470 Full-size PICMG 1.3 CPU Card

4.6.5 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 4-4** and **Figure 4-10** for the jumper location and settings.

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

Table 4-4: Flash Descriptor Security Override Jumper Settings

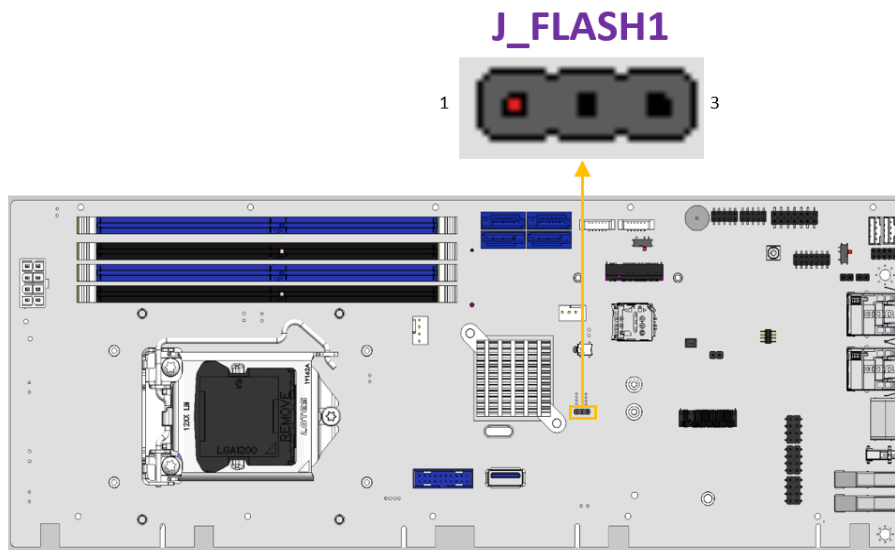


Figure 4-10: Flash Descriptor Security Override Jumper Location

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.

4.6.6 USB Power Selection

The USB power selection is made through the BIOS menu in “Chipset → PCH-IO Configuration”. Use the **USB Power SW1** and the **USB Power SW2** BIOS options to configure the correspondent USB ports (see **Table 4-5**) and refer to **Table 4-6** to select the USB power source.

BIOS Options	Configured USB Ports
USB Power SW1	USB3_1 (external USB 3.1 port) USB3_2 (external USB 3.1 port) USB3 (internal USB 2.0 port, Type A)
USB Power SW2	USB1 (internal USB 2.0 ports) USB2 (internal USB 2.0 ports) USB4 (internal USB 2.0 ports) USB3-1 (internal USB 3.1 ports)

Table 4-5: BIOS Options and Configured USB Ports

Options	Description
+5V DUAL	+5V dual (default)
+5V	+5V

Table 4-6: USB Power Source Setup

PCIE-Q470 Full-size PICMG 1.3 CPU Card

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 PCIE-Q470 is shipped with one 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 4-11**.

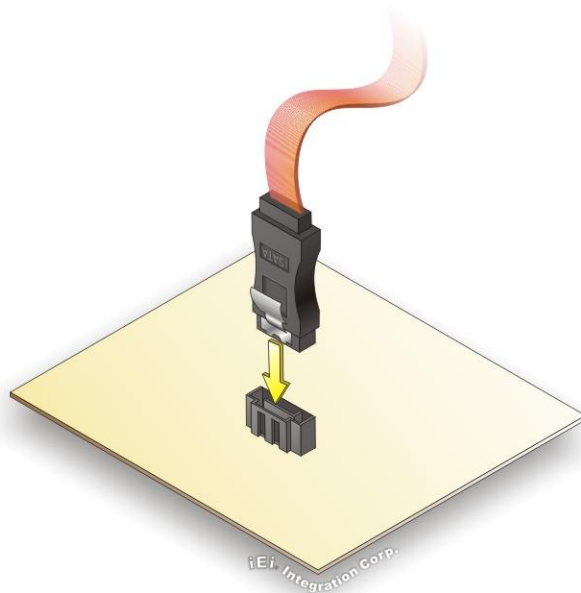


Figure 4-11: SATA Drive Cable Connection

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 4-12**.

Step 4: Connect the SATA power cable. Connect the SATA power connector to the back of the SATA drive. See **Figure 4-12**.

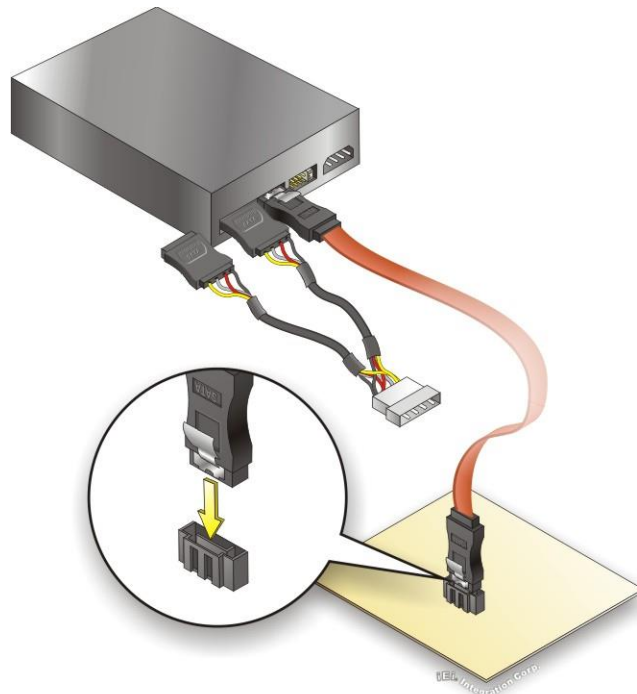


Figure 4-12: SATA Power Drive Connection

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

PCIE-Q470 Full-size PICMG 1.3 CPU Card

4.8 Software Installation

All the drivers for the PCIE-Q470 are available on IEI Resource Download Center (<https://download.ieiworld.com>). Type PCIE-Q470 and press Enter to find all the relevant software, utilities, and documentation.

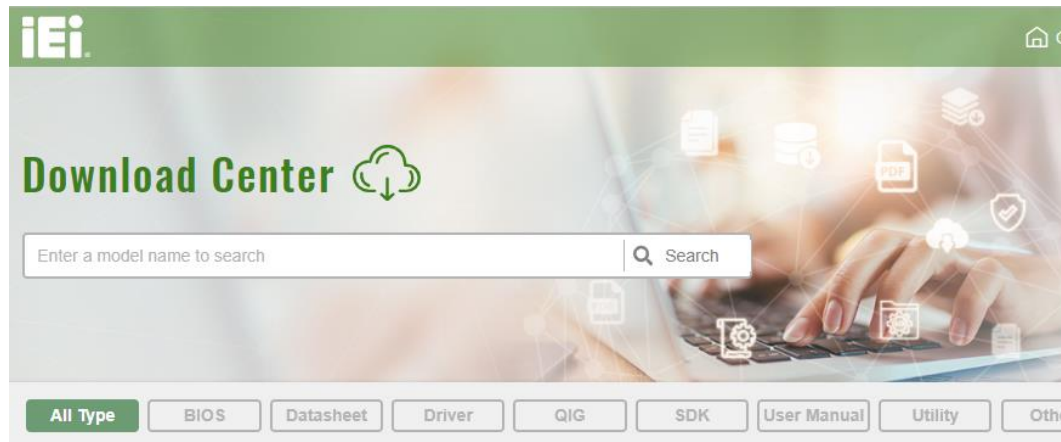
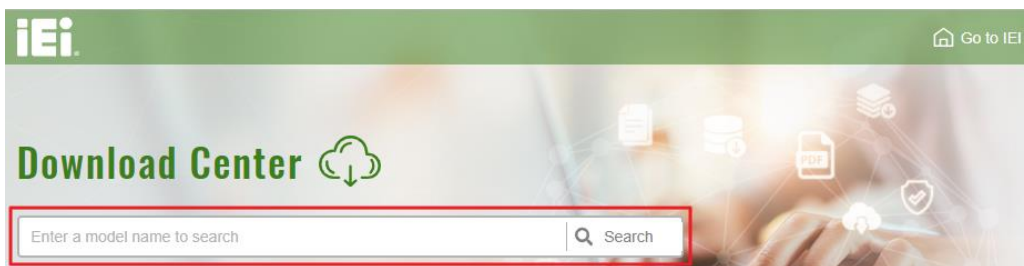


Figure 4-13: IEI Resource Download Center

4.8.1 Driver Download

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

Step 1: Go to <https://download.ieiworld.com>. Type PCIE-Q470 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](#)

Keyword: "PCIE-Q470", Searching Result : 12 Records.

HPCI-E-Q470 Product Info ▶

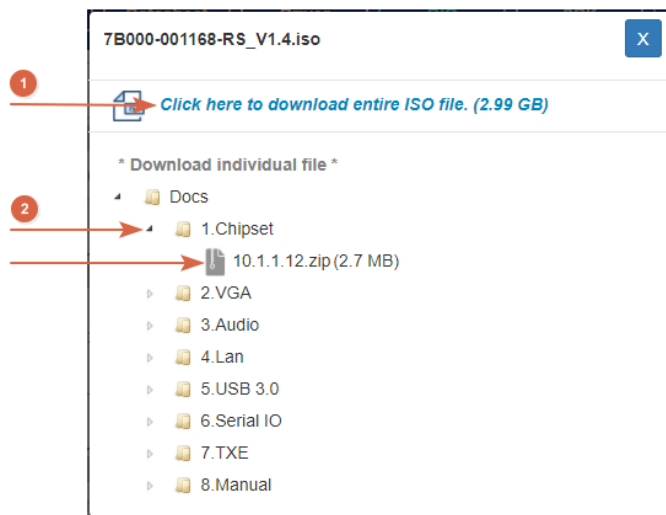
[Embedded Computer](#) ▶ [Single Board Computer](#) ▶ [Half Size Single Board Computer](#)

Half-size PICMG 1.3 CPU Card supports LGA1200 Intel® 10th/11th Gen. Core™ i9/i7/i5/i3, Pentium®, Celeron® CPU with Q470/Q470E, DDR4 SO-DIMM, HDMI, Dual Intel® 2.5GbE, USB 3.2 Gen2, SATA 6Gb/s, M.2, IAUDIO, and RoHs

Driver

File Name	Published	Version	File Checksum
HPCI-E-Q470-R10_V1.0.iso (2.03 GB)	2022/03/25	1.00	B5ABE21BB28ABBA8F27E8B212B580742

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).



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.

4.9 Intel® AMT Setup Procedure

The PCIE-Q470 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 **LAN1**.
- 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**).



NOTE:

To change the password, enter a new password following the strong password rule (containing at least one upper case letter, one lower case letter, one digit and one special character, and be at least eight characters).

Appendix

A

Regulatory Compliance

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

PCIE-Q470 Full-size PICMG 1.3 CPU Card

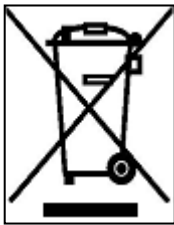


CAUTION:

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

PCIE-Q470 Full-size PICMG 1.3 CPU Card

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

PCIE-Q470 Full-size PICMG 1.3 CPU Card

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。