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MODEL:

HPCIE-Q470

Half-Size PICMG 1.3 CPU Card Supports LGA1200 10th Gen Intel® Core™ i9/i7/i5/i3 /Pentium® /Celeron® CPU with Intel® Q470/Q470E, DDR4 SO-DIMM, HDMI, USB-C, Dual Intel® 2.5GbE, USB 3.2, SATA 6Gb/s, M.2, HD Audio, Intel® AMT and RoHS

User Manual

Rev. 1.00 – May 12, 2022

RoHS Lead Free

Revision

Date	Version	Changes
May 12, 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.

HOT SURFACE

This symbol indicates a hot surface that should not be touched without taking care.

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Chapter

1

Introduction

1.1 Introduction

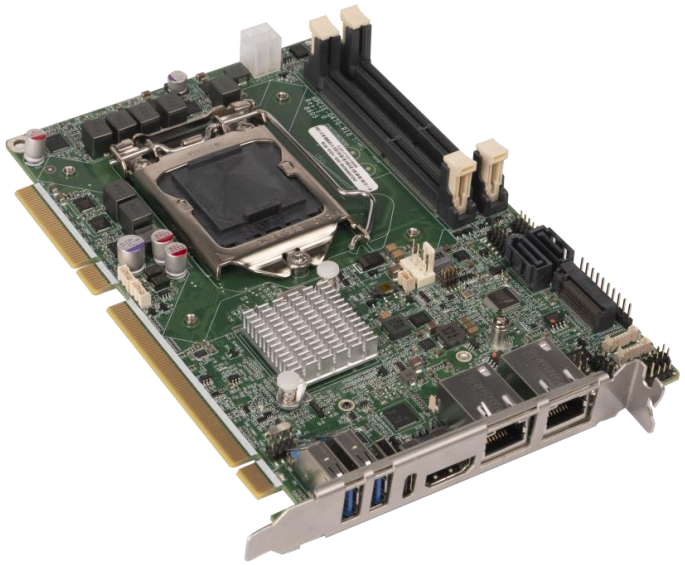


Figure 1-1: HPCIE-Q470

The HPCIE-Q470 is a half-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 two 260-pin 2933 MHz dual-channel DDR4 SO-DIMM, supporting up to 64G.

The HPCIE-Q470 provides dual 2.5GbE interfaces through the Intel® I225V. The integrated Intel® Q470/Q470E chipset supports two SATA 6Gb/s drives with RAID 0/1 function. In addition, the HPCIE-Q470 includes HDMI 1.4 interface for display.

The HPCIE-Q470 provides rich I/O interfaces, including two USB 3.2 Gen 1 (5Gb/s) and one USB3.2 Gen2 (10Gb/s) by USB Type-C on the rear panel, two USB 2.0 by pin headers and two RS-232/422/485 connectors. M.2 A Key (2230) with PCIe Gen3 x2/USB 2.0 and M.2 M Key (2280/2242) with PCIe Gen3 x4 provide flexible expansion options. High Definition Audio (HDA) support through IEI audio kit ensures HDA devices can be easily implemented on the HPCIE-Q470.

1.2 Features

Some of the HPCIE-Q470 motherboard features are listed below:

- Half-size PICMG 1.3 CPU card
- 10th/11th generation LGA1200 Intel® Core™ i9/i7/i5/i3, Pentium® or Celeron® processor supported
- Intel® Q470/Q470E chipset
- Two 260-pin 2933 MHz dual-channel DDR4 SO-DIMM, supporting up to 64GB
- Two Intel® PCIe 2.5GbE connectors
- One HDMI display connector
- One M.2 A key (2230) with PCIe Gen3 x2 and USB 2.0
- One M.2 M key (2280/2242) with PCIe Gen3 x4
- Two SATA 6Gb/s connectors support RAID 0/1 function
- Two USB 3.2 Gen 1 (5Gb/s) ports on the rear I/O
- Two USB 2.0 ports via internal pin headers
- Two RS-232/422/485 serial ports
- High Definition Audio through IEI audio kit
- RoHS compliant

1.3 Connectors

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

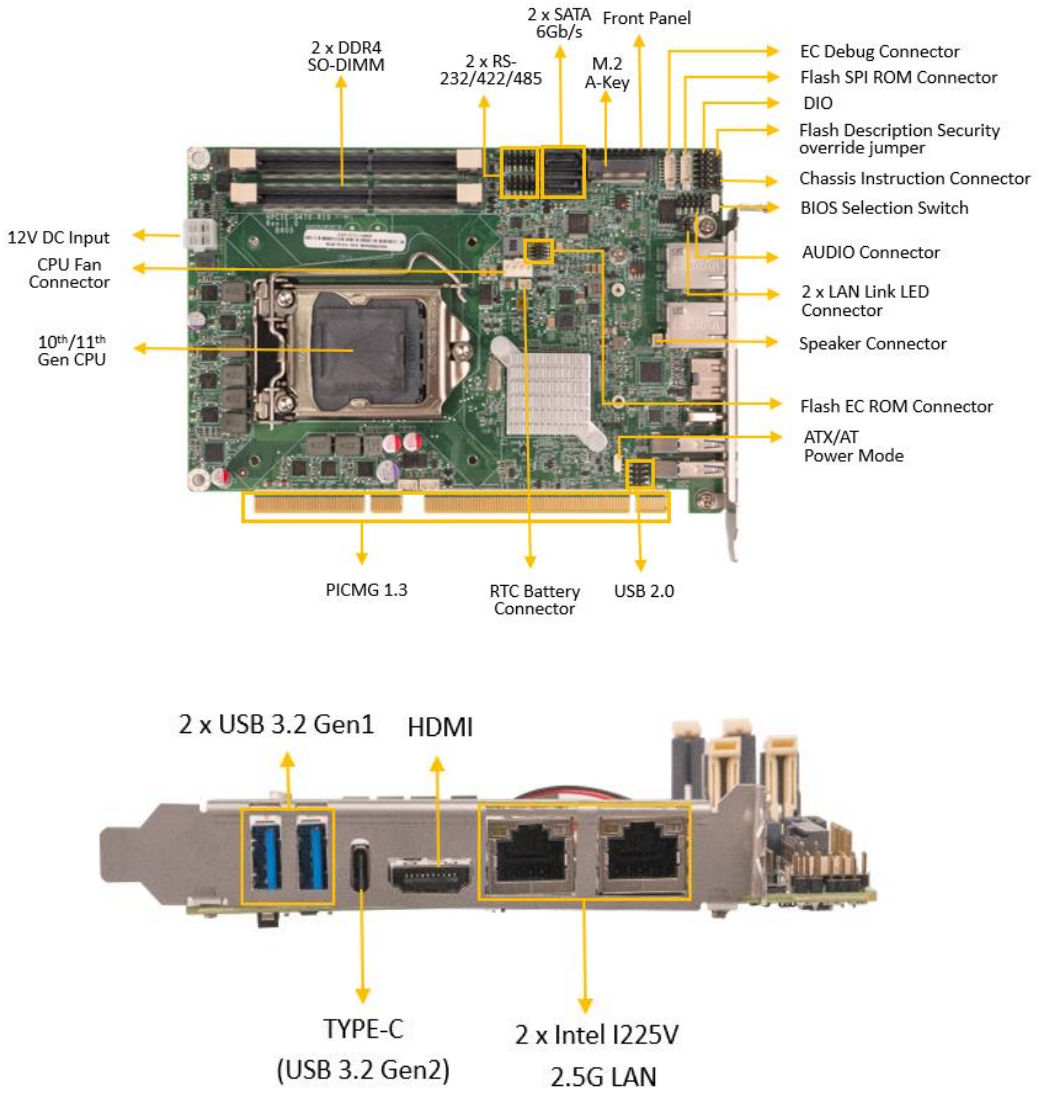


Figure 1-2: Connector

1.4 Dimensions

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

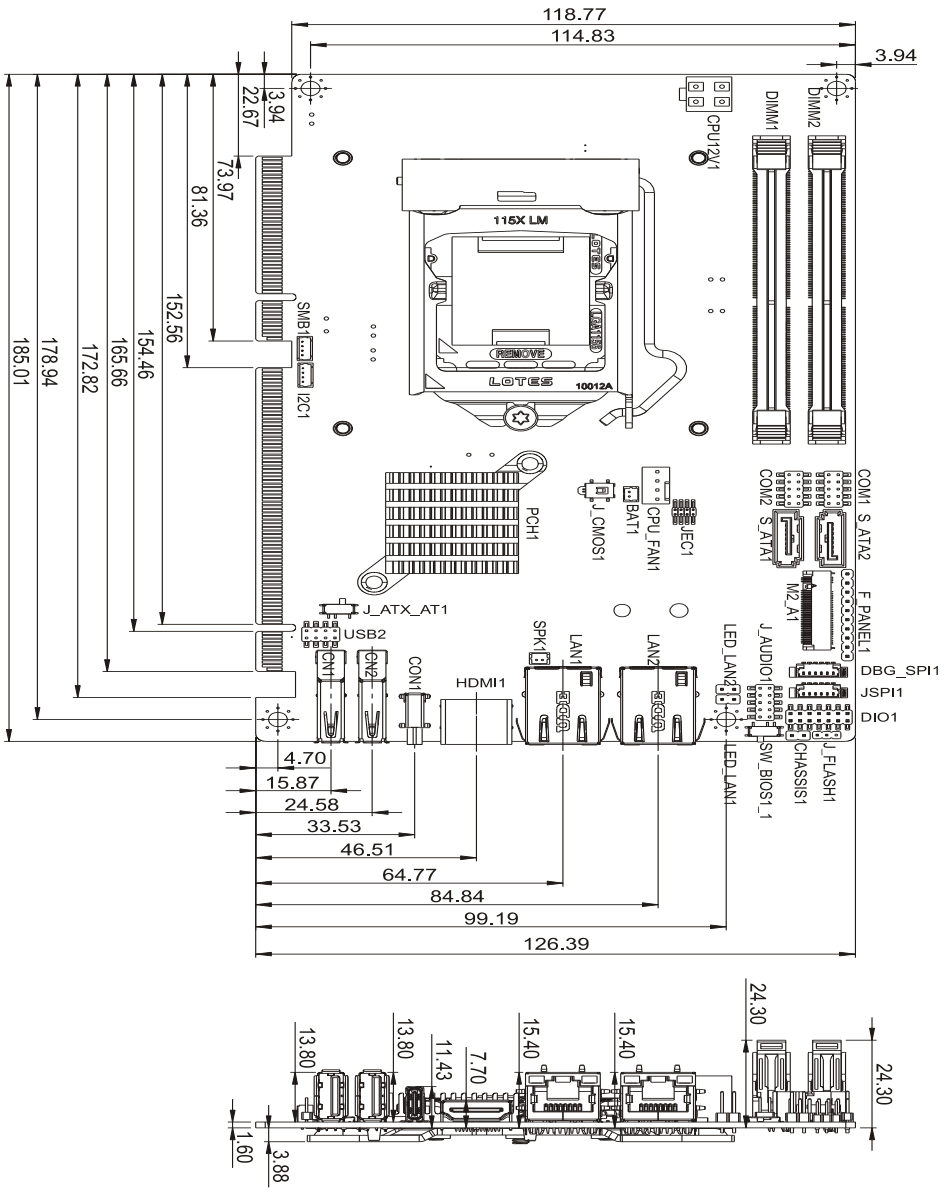


Figure 1-3: Dimension (Unit: mm)

1.5 Data Flow

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

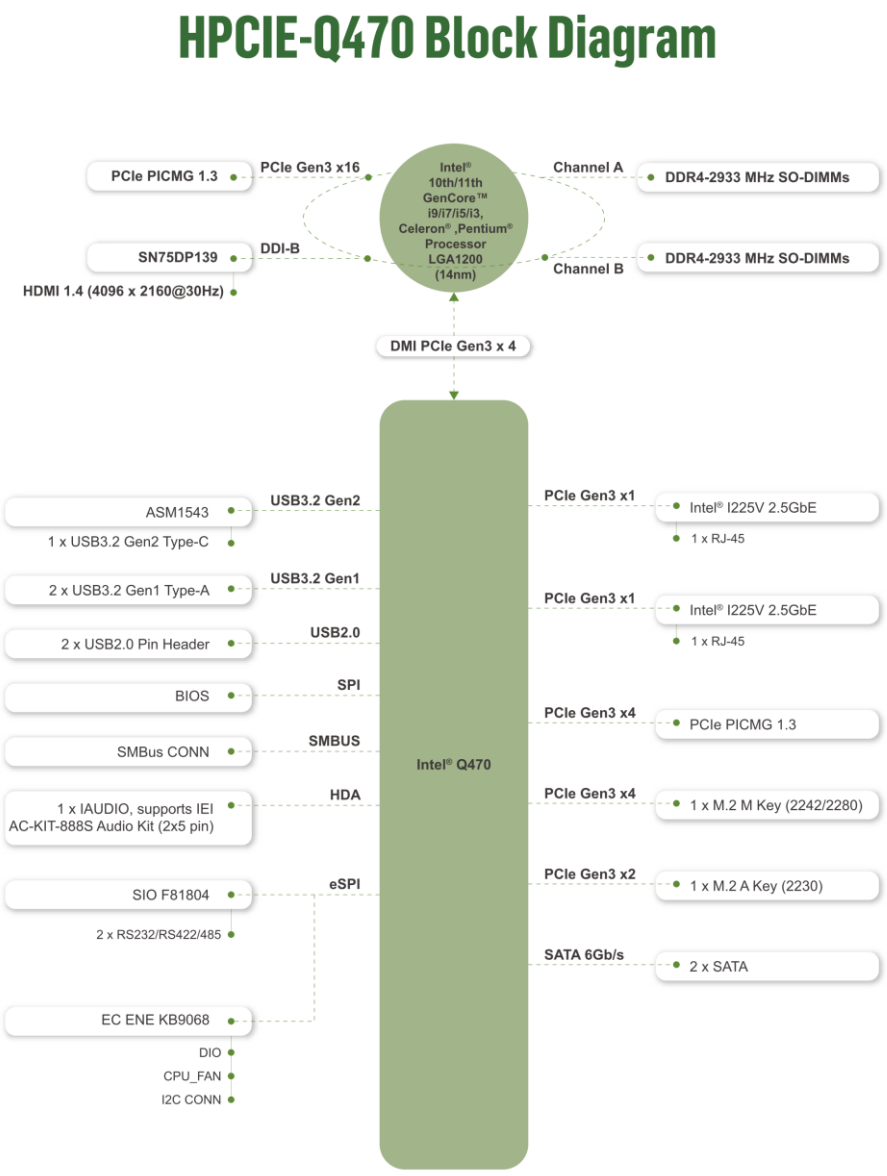


Figure 1-4: Block Diagram

1.6 Technical Specifications

The HPCIE-Q470 technical specifications are listed below.

HPCIE-Q470	Half-Size PICMG 1.3 CPU Card Supports LGA1200 10th/11th Gen Intel® Core™ i9/i7/i5/i3 /Pentium® /Celeron® CPU with Intel® Q470/Q470E, DDR4 SO-DIMM, HDMI, USB-C, Dual Intel® 2.5GbE, USB 3.2, SATA 6Gb/s, M.2, HD Audio, Intel® AMT and RoHS
CPU	LGA1200 10th/11th Gen Intel® Core™ i9/i7/i5/i3,Pentium® and Celeron® Processor (Support up to 65w)
Chipset	Intel® Q470/Q470E
BIOS	AMI UEFI BIOS
Memory	Two 260-pin 2933 MHz Dual-channel DDR4 SO-DIMM, supporting up to 64GB
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,and supports AV1, VP9,HEVC 12b, HDR10, FP16
Display Output	1 x HDMI 1.4(up to 4096 x 2160@30Hz)
Ethernet	LAN1: Intel® I225V 2.5GbE controller LAN2: Intel® I225V 2.5GbE controller
External I/O Interface	2 x USB3.2 Gen1 (5Gb/s) 1 x USB3.2 Gen2 (10Gb/s) by USB Type-C
Internal I/O Interface	2 x SATA 6Gb/s (Support RAID 0/1) 2 x USB 2.0 (2x4 pin, P=2.0) 2 x RS-232/422/485 (2x5 pin, P=2.0) (RS-485 support AFC)
SMBus/ I²C	1 x SMBus (1x4 pin)
I²C	1 x I²C (1x4 pin)
Audio	1 x IAUDIO, support IEI AC-KIT-888S Audio Module (2 x 5 pin)
Front Panel	1 x Front panel connector (1x10 pin) Power LED, HDD LED, Power Button, Reset Button
LAN LED	2 x LAN LED (1 x 2 pin)
Expansion	16-lane PCIe signal from CPU via golden finger (supports x16, or x8 + x8, or x4 + x4 + x8) 4-lane PCIe signal from PCH via golden finger (supports x4, or x1 + x1 + x1 + x1) 1 x M.2 A key (2230) with PCIe Gen3 x2/USB 2.0 1 x M.2 M key (2280/2242) with PCIe Gen3 x4
Digital I/O	1 x 12-bit digital I/O (2x7 pin)
TPM	Intel® PTT (TPM 2.0)
Fan Connector	1 x CPU fan connector (1x4 pin)

Chassis Open	1 x Chassis intrusion (1x2 pin)
Power Supply	5V/12V, ATX/AT power supply Support AT/ATX mode ErP/EuP compliant
Watchdog Timer	Software programmable, support 1~255 sec. system reset
Power Consumption	3.3V@0.11A, 5V@1.12A, 12V@13.31A, 5VSB@0.15A (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
Dimension	169 mm x 126 mm
Weight	GW:1000g / NW:420g

Table 1-1: Technical Specification

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 HPCIE-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.

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

The HPCIE-Q470 is shipped with the following components:

Quantity	Item and Part Number	Image
1	HPCIE-Q470 CPU card	
1	SATA cable	
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-USB02A-RS)	
SATA power cable (**P/N**: 32102-000100-200-RS)	
RS-232/422/485 cable (**P/N**: 32205-002700-200-RS)	
High-performance LGA1155/1156/1200 cooler kit (1U chassis compatible, 73W) (**P/N**: CF-115XA-R10)	
LGA1155/LGA1156/1200 cooler kit (1U chassis compatible, 45W) (**P/N**: CF-1156C-R20)	
LGA1155/LGA1156/1200 cooler kit (1U chassis compatible, 65W) (**P/N**: CF-1156D-R30)	

Table 2-2: Optional Items

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

This chapter details all the peripheral interface connectors.

3.1.1 HPCIE-Q470 Layout

The figure below shows all the peripheral interface connectors.

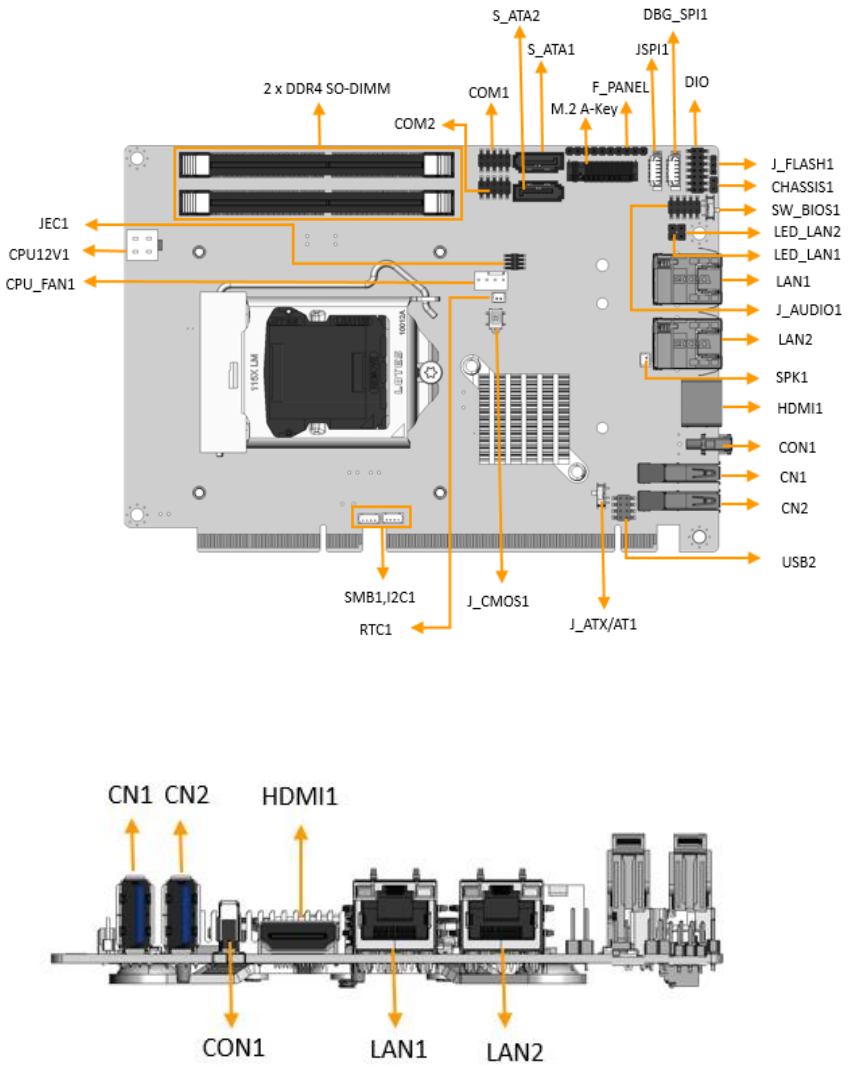


Figure 3-1: HPCIE-Q470 Layout

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

CONNECTOR	TYPE	LABEL
AT/ATX power mode setting	Electronic switch	J_ATX_AT1
BIOS selection switch	Electronic switch	SW_BIOS1_1
Clear CMOS jumper	Electronic switch	J_CMOS1
Flash descriptor security override jumper	3-pin header	J_FLASH1
ATX CPU 12V power connector	4-pin connector	CPU12V1
Audio connector	10-pin header	J_AUDIO1
RTC battery connector	2-pin wafer	BAT1
Chassis intrusion connector	2-pin header	CHASSIS1
DDR4 SO-DIMM slots	DDR4 SO-DIMM	DIMM1, DIMM2
Digital I/O connector	14-pin header	DIO1
EC debug connector	6-pin wafer	DBG_SPI1
Fan connector	4-pin wafer	CPU_FAN1
Flash SPI ROM connector	6-pin wafer	JSPI1
Flash EC ROM connector	8-pin header	JEC1
Front panel connector	10-pin header	F_PANEL1
I2C connector	4-pin wafer	I2C1
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	M2_A1
M.2 M-key slot (on solder side)	M.2 M-key	M2_M1
RS-232/422/485 serial port connectors	10-pin header	COM1, COM2
SATA 6Gb/s connectors	SATA	S_ATA1, S_ATA2,
SMBus connector	4-pin wafer	SMB1
Speaker connector	2-pin header	SPK1
Internal USB 2.0 connector	USB 2.0	USB2

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
Ethernet connector	RJ-45	LAN1, LAN2
External HDMI1 connector	HDMI	HDMI1
USB 3.2 GEN1 connectors	USB Type-A	CN1, CN2
USB 3.2 GEN2 connector	USB Type-C	CON1

Table 3-2: External Interface Panel Connectors

3.2 Internal Peripheral Connectors

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

3.2.1 ATX CPU 12V Power Connector

CN Label: **CPU12V1**

CN Type: 4-pin connector, P=4.2mm

CN Location: See **Figure 3-2**

CN Pinouts: See **Table 3-3**

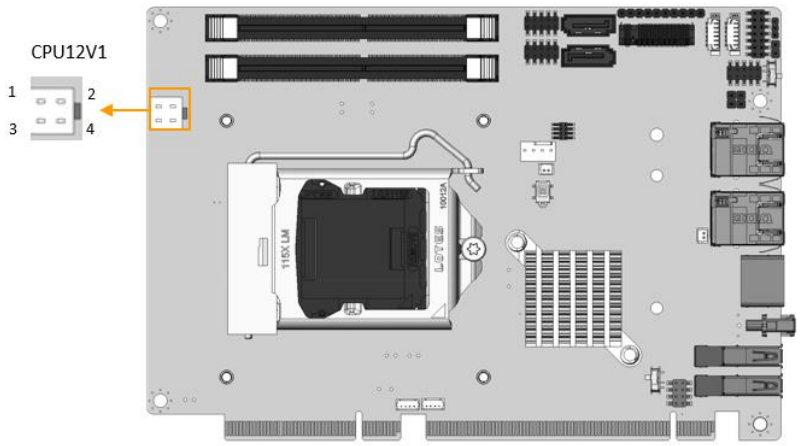


Figure 3-2: ATX CPU 12V Power Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	3	+12V
2	GND	4	+12V

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

3.2.2 Internal Audio Connector for IEI Audio Module

CN Label: **J_AUDIO1**

CN Type: 10-pin Header, P=2.00mm

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

CN Pinouts: See **Table 3-4**

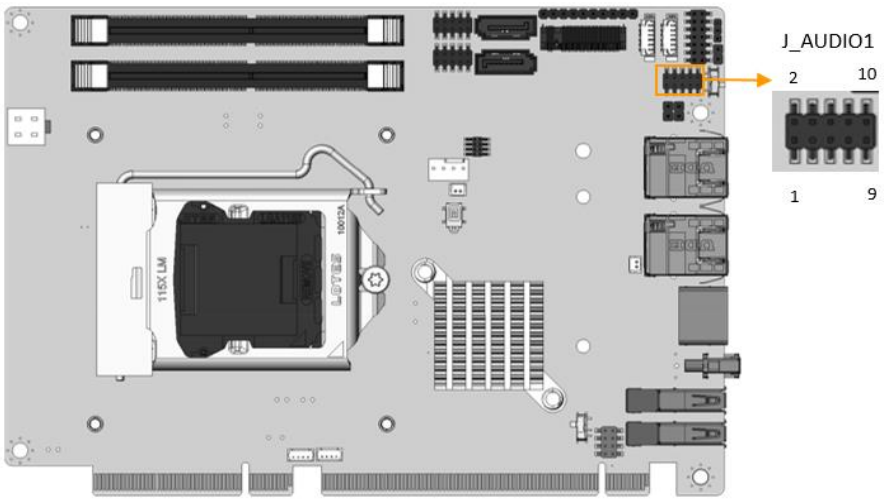


Figure 3-3: Internal Audio Connector Location

PIN NO.	DESCRIPTION	PIN NO.	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 3-4: Internal Audio Connector for IEI Audio Module Pinouts

3.2.3 RTC Battery Connector

CN Label: **BAT1**

CN Type: 2-pin Wafer, P=1.25mm

CN Location: See **Figure 3-4**

CN Pinouts: See **Table 3-5**

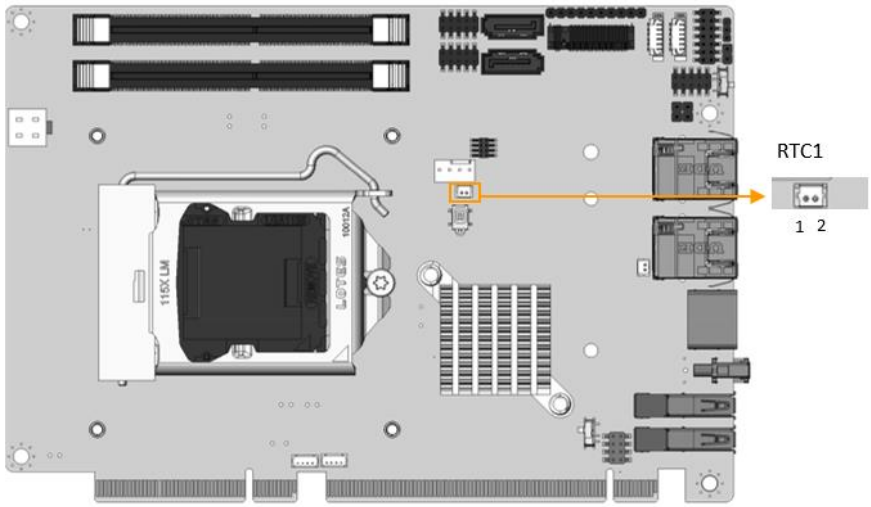


Figure 3-4: RTC Battery Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VBATT	2	GND

Table 3-5: RTC Battery Connector Pinouts

3.2.4 Chassis Instruction Connector

CN Label: **CHASSIS1**

CN Type: 2-pin Header, P=2.54mm

CN Location: See **Figure 3-5**

CN Pinouts: See **Table 3-6**

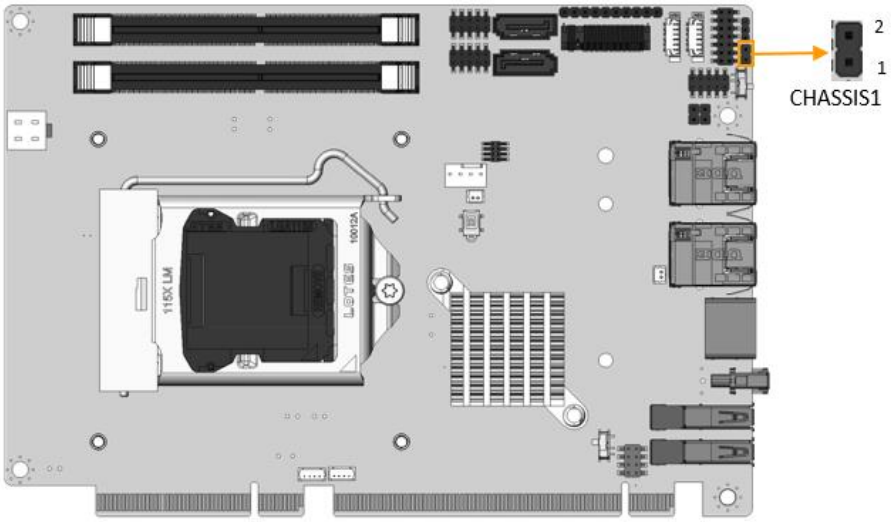


Figure 3-5: Chassis Instruction Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3VSB	2	CHASSIS_OPEN

Table 3-6: Chassis Instruction Connector Pinouts

3.2.5 Digital Input/Output Connector

CN Label: **DIO1**

CN Type: 14-pin Header, P=2.00mm

CN Location: See **Figure 3-6**

CN Pinouts: See **Table 3-7**

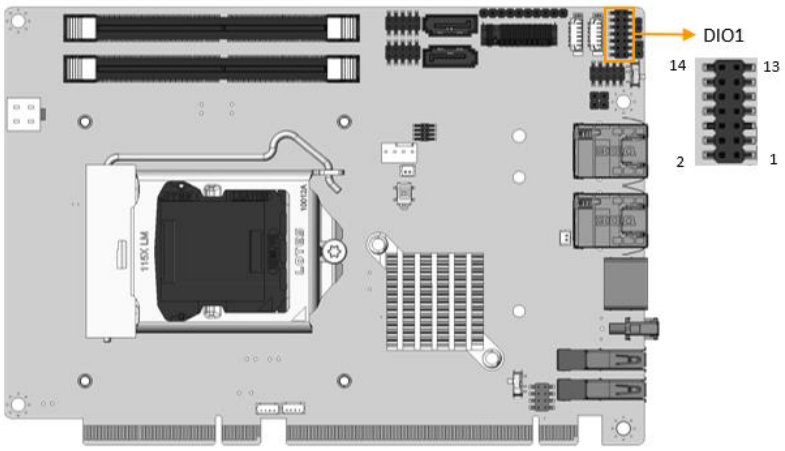


Figure 3-6: Digital Input/Output Connector Location

PIN NO.	DESCRIPTION	PIN NO.	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 3-7: Digital Input/Output Connector Pinouts

3.2.6 EC Debug Connector

CN Label: **DBG_SPI1**

CN Type: 6-pin Wafer, P=1.25mm

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-8**

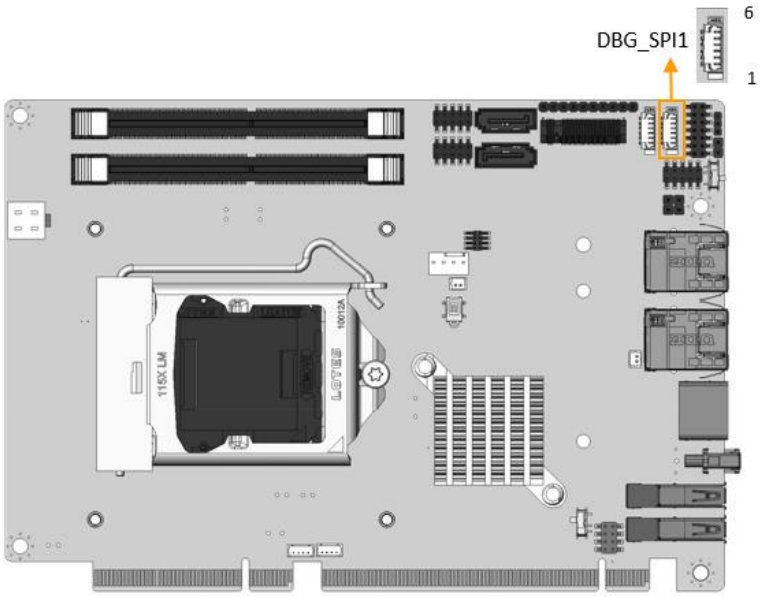


Figure 3-7: EC Debug Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	2	EDICS
3	EDIDO	4	EDICLK
5	EDIDI	6	GND

Table 3-8: EC Debug Connector Pinouts

3.2.7 CPU Fan Connector

CN Label: **CPU_FAN1**

CN Type: 4-pin Wafer, P=2.54mm

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-9**

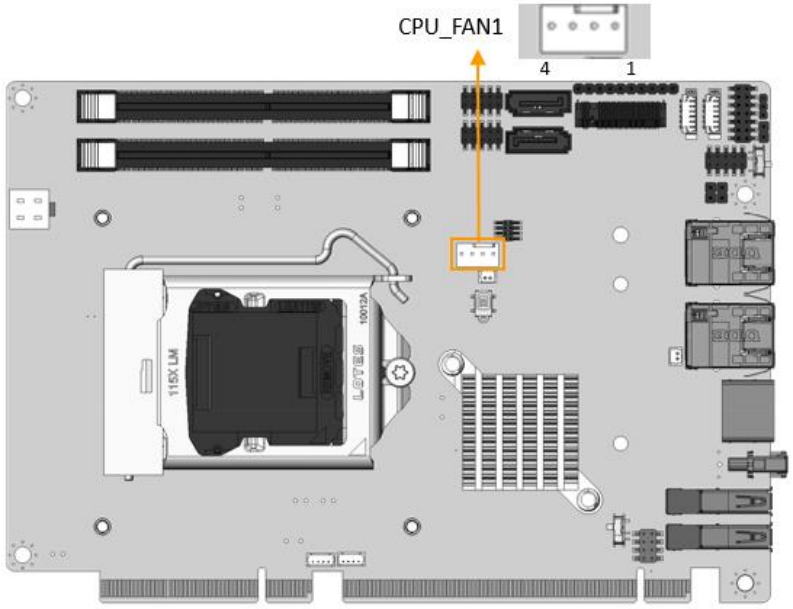


Figure 3-8: CPU Fan Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FANIO	4	PWM

Table 3-9: CPU Fan Connector Pinouts

3.2.8 Flash SPI ROM Connector

CN Label: **JSPI1**

CN Type: 6-pin Wafer, P=1.25mm

CN Location: See **Figure 3-9**

CN Pinouts: See **Table 3-10**

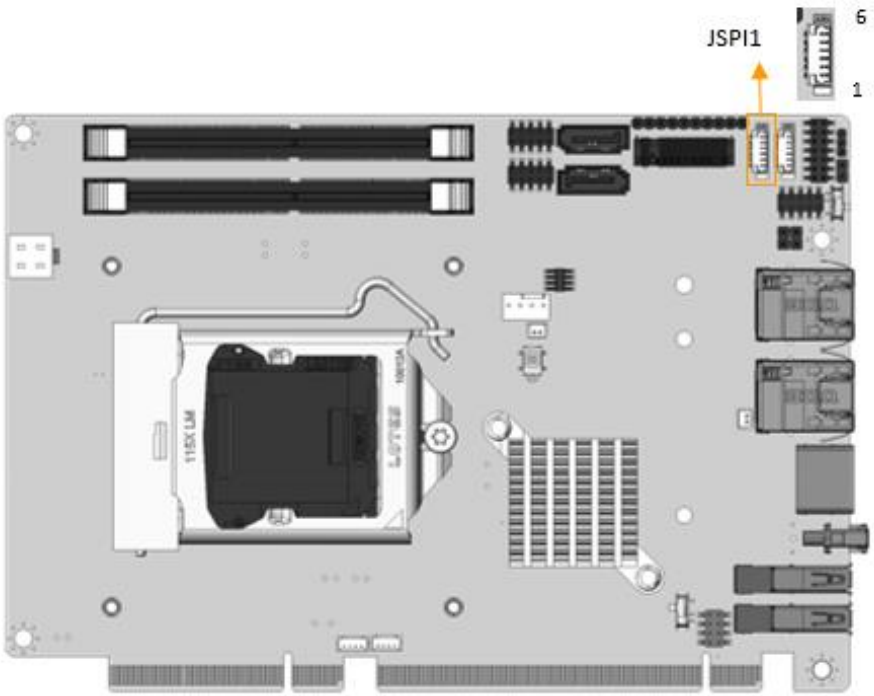


Figure 3-9: Flash SPI ROM Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	4	SPI_CLK
2	SPI_CS#	5	SPI_SI
3	SPI_SO	6	GND

Table 3-10: Flash SPI ROM Connector Pinouts

3.2.9 Flash EC ROM Connector

CN Label: **JEC1**

CN Type: 8-pin Header, P=1.27mm

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-11**

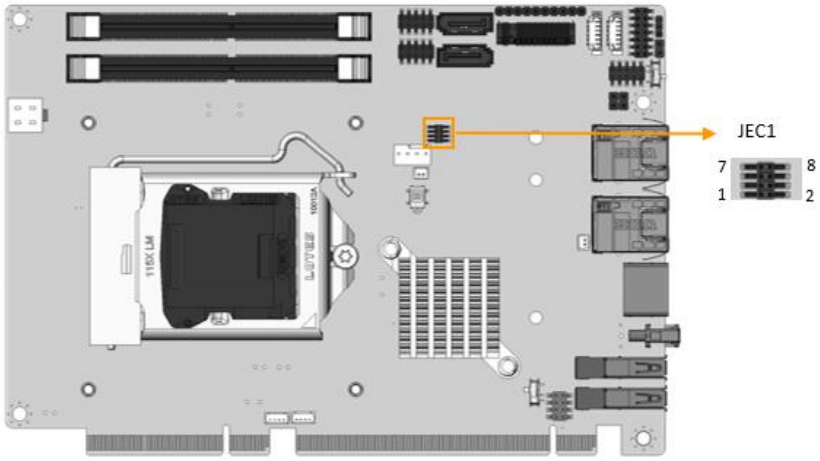


Figure 3-10: Flash EC ROM Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	FSCE#	2	VCC
3	FMISO	4	NC
5	EC_DET_FLASH	6	FSCK
7	GND	8	FMOSI

Table 3-11: Flash EC ROM Connector Pinouts

3.2.10 Front Panel Connector

CN Label: **F_PANEL1**

CN Type: 10-pin Header, P=2.54mm

CN Location: See **Figure 3-11**

CN Pinouts: See **Table 3-12**

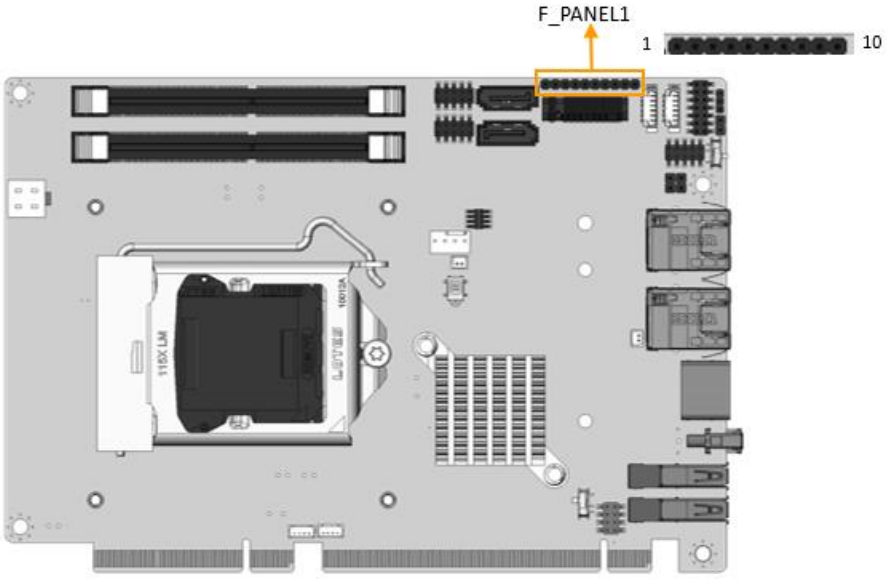


Figure 3-11: Front Panel Connector Location

	PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	
	1	NC	6	PWR_LED+	PWR LED
PWR BTN	2	PWR_BTN+	7	PWR_LED-	
	3	PWR_BTN-	8	GND	
HDD LED	4	HDD_LED+	9	Reset+	RESET
	5	HDD_LED-	10	Reset-	

Table 3-12: Front Panel Connector Pinouts

3.2.11 I²C Connector

CN Label: **I2C1**

CN Type: 4-pin Wafer, P=1.25mm

CN Location: See **Figure 3-12**

CN Pinouts: See **Table 3-13**

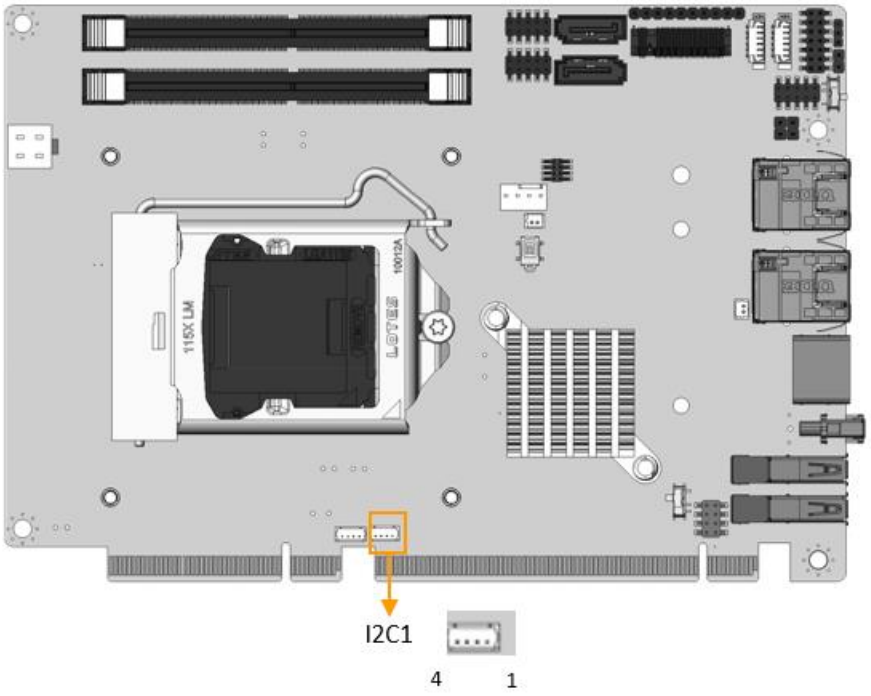


Figure 3-12: I²C Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	3	I2C_CLK
2	I2C_DATA	4	+5V

Table 3-13: I²C Connector Pinouts

3.2.12 LAN1 Link LED Connector

CN Label: **LED_LAN1**

CN Type: 2-pin Header, P=2.54mm

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-14**

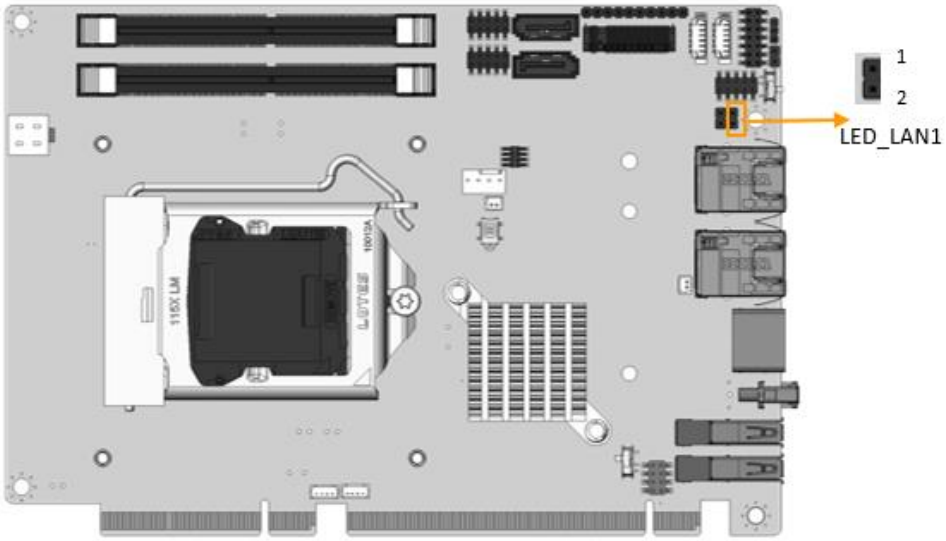


Figure 3-13: LAN1 Link LED Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	LAN1_LED_LNK#_ACT

Table 3-14: LAN1 Link LED Connector Pinouts

3.2.13 LAN2 Link LED Connector

CN Label: **LED_LAN2**

CN Type: 2-pin Header, P=2.54mm

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-15**

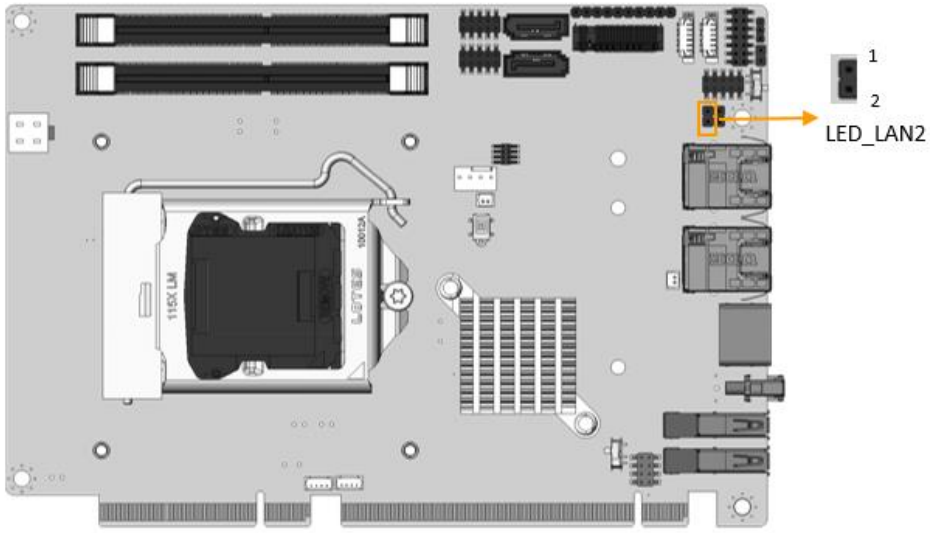


Figure 3-14: LAN2 Link LED Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	LAN2_LED_LNK#_ACT

Table 3-15: LAN2 Link LED Connector Pinouts

3.2.14 RS-232/422/485 Serial Port Connector

CN Label: **COM1,COM2**

CN Type: 10-pin Header, P=2.00mm

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-16**

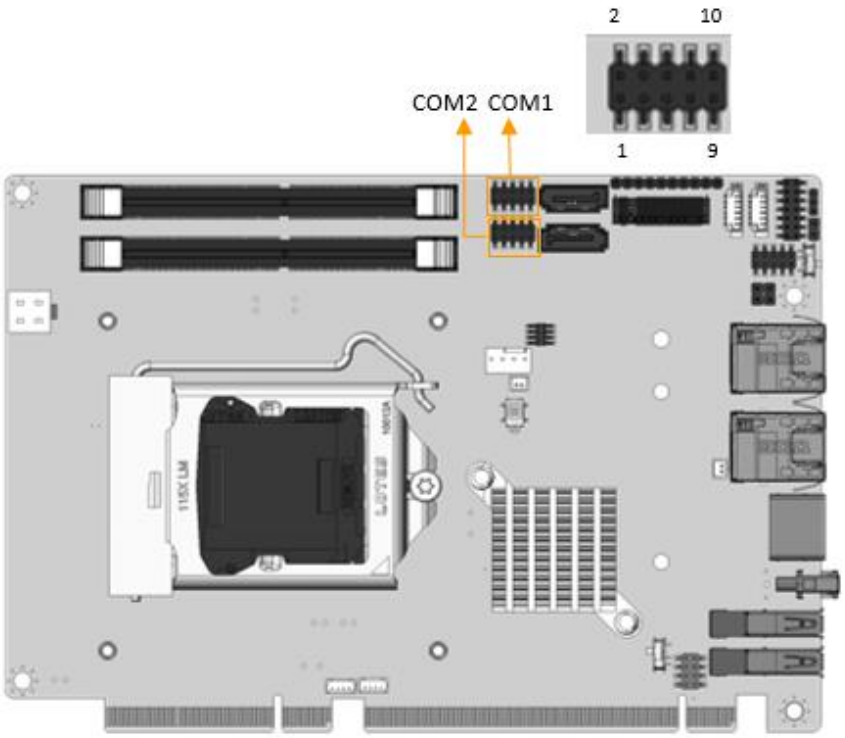


Figure 3-15: RS-232/422/485 Serial Port Connectors Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

Table 3-16: RS-232/422/485 Serial Port Connector Pinouts

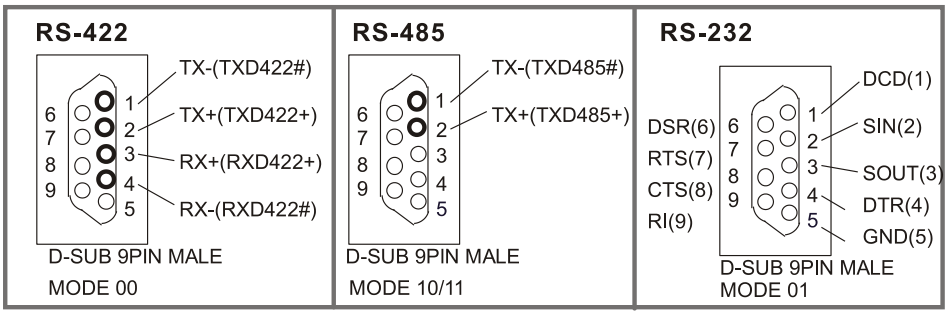


Figure 3-16: RS-232/422/485 Pinout

3.2.15 SATA 6Gb/s Connector

CN Label: **S_ATA1,S_ATA2**

CN Type: 7-pin SATA, P=1.27mm

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

CN Pinouts: See **Table 3-17**

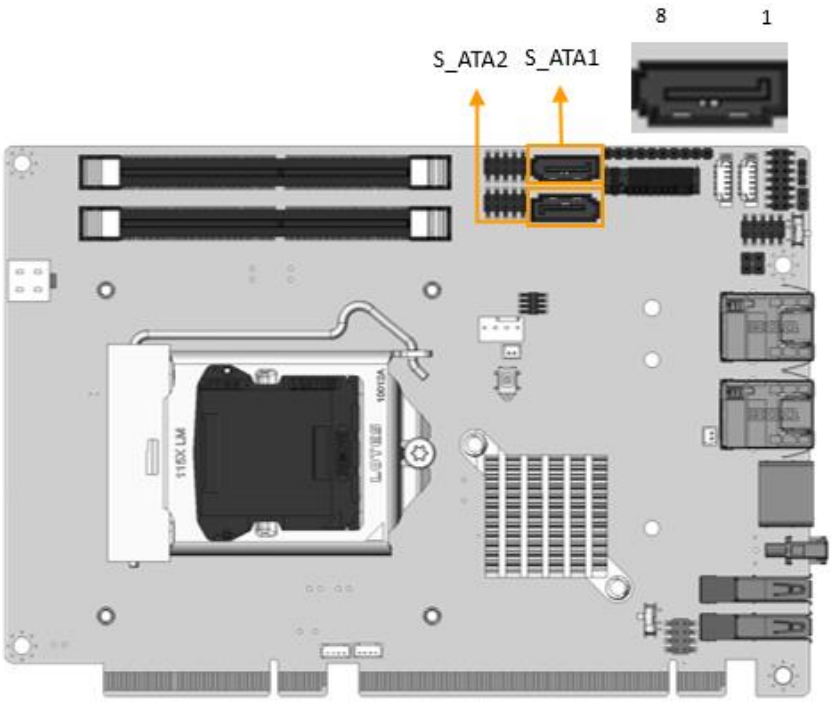


Figure 3-17: SATA 6Gb/s Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	SATA_RX-
2	SATA_TX+	6	SATA RX+
3	SATA_TX-	7	GND
4	GND	8	N/C

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

3.2.16 SMBus Connector

CN Label: **SMB1**

CN Type: 4-pin Wafer, P=1.25mm

CN Location: See **Figure 3-18**

CN Pinouts: See **Table 3-18**

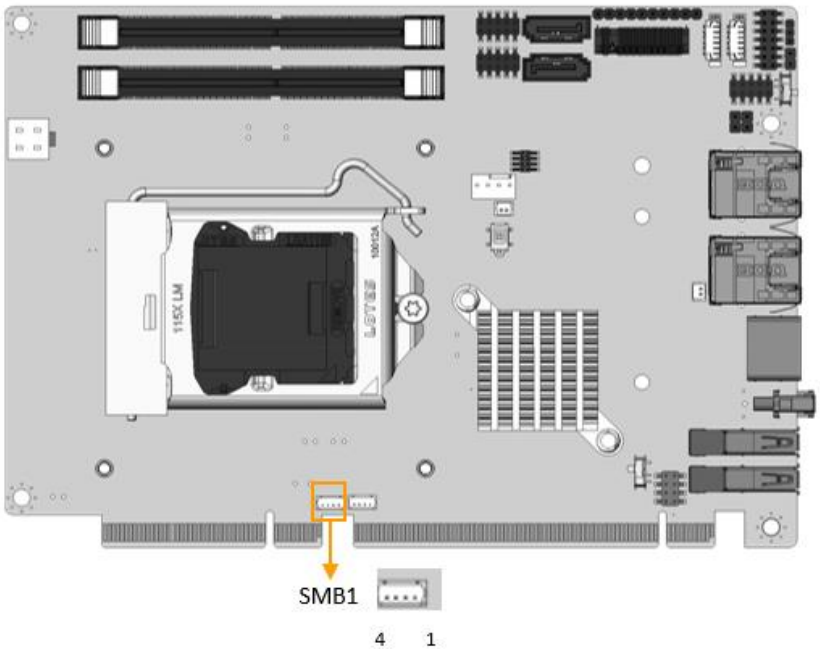


Figure 3-18: SMBus Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	3	SMB_CLK
2	SMB_DATA	4	+5V

Table 3-18: SMBus Connector Pinouts

3.2.17 Speaker Connector

CN Label: **SPK1**

CN Type: 2-pin Wafer, P=1.25mm

CN Location: See **Figure 3-19**

CN Pinouts: See **Table 3-19**

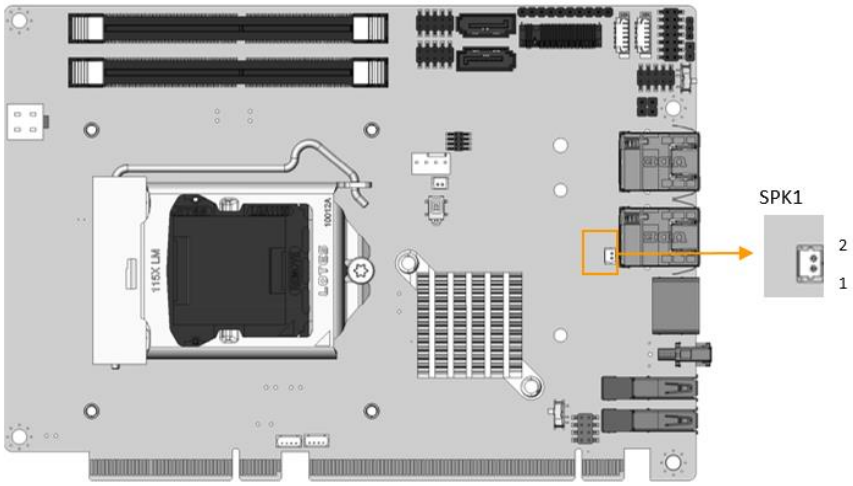


Figure 3-19: Speaker Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+V5S	2	PC_BEEP

Table 3-19: Speaker Connector Pinouts

3.2.18 Internal USB 2.0 Connector

CN Label: **USB2**

CN Type: 8-pin Header, P=2.00mm

CN Location: See **Figure 3-20**

CN Pinouts: See **Table 3-20**

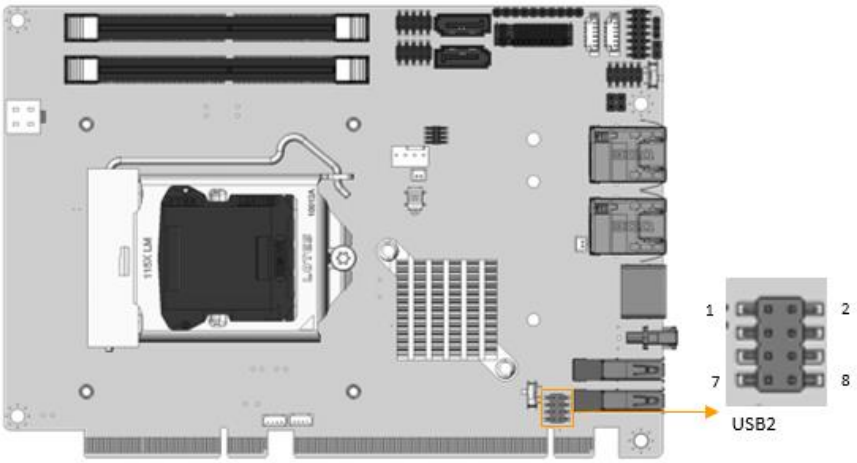


Figure 3-20: Internal USB 2.0 Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	USB_DATA-	4	USB_DATA+
5	USB_DATA+	6	USB_DATA-
7	GND	8	VCC

Table 3-20: Internal USB 2.0 Connector Pinouts

3.2.19 M.2 A-Key Slot

CN Label: **M2_A1**

CN Type: M.2 A-Key Slot

CN Location: See **Figure 3-21**

CN Pinouts: See **Table 3-21**

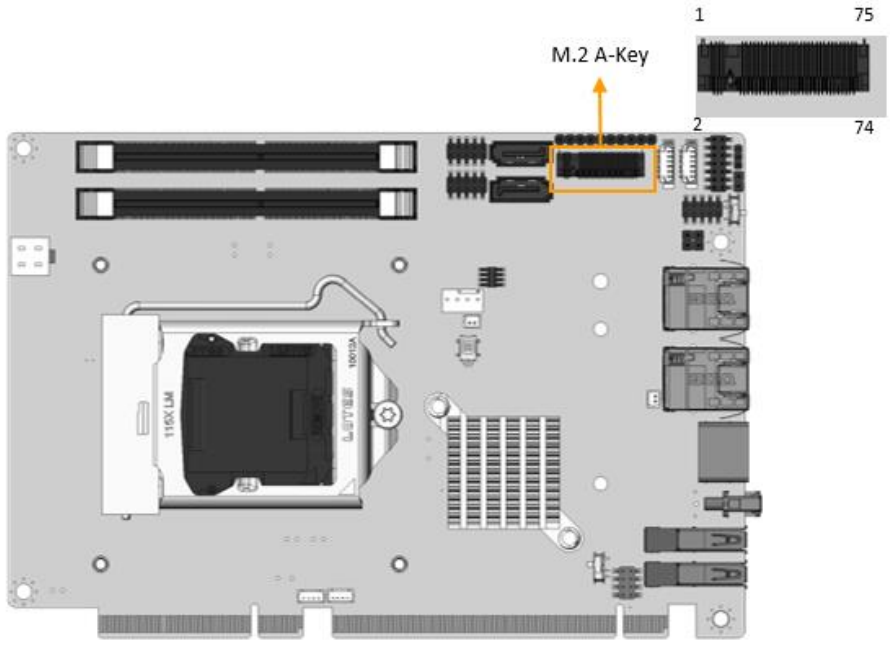


Figure 3-21: M.2 A-Key Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+3.3V
3	USB+	4	+3.3V
5	USB-	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
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	PCIE_TX1+	36	GND
37	PCIE_TX1-	38	NC
39	GND	40	NC
41	PCIE_RX1+	42	NC
43	PCIE_RX1-	44	NC
45	GND	46	NC
47	PCIE_CLK0+	48	NC
49	PCIE_CLK0-	50	NC
51	GND	52	PLT_RST
53	CLKREQ0#	54	Pull up +3.3V
55	PCIE_WAKE	56	Pull up +3.3V
57	GND	58	M2_DAT
59	PCIE_TX2+	60	M2_CLK
61	PCIE_TX2-	62	NC
63	GND	64	NC
65	PCIE_RX2+	66	M2_RST
67	PCIE_RX2-	68	CLKREQ0#
69	GND	70	PCIE_WAKE
71	PCIE_CLK1+	72	+3.3V
73	PCIE_CLK1-	74	+3.3V
75	GND		

Table 3-21: M.2 A-Key Slot Pinouts

3.2.20 M.2 M-Key Slot

CN Label: **M2_M1**

CN Type: M.2 M-Key Slot

CN Location: See **Figure 3-22**

CN Pinouts: See **Table 3-22**

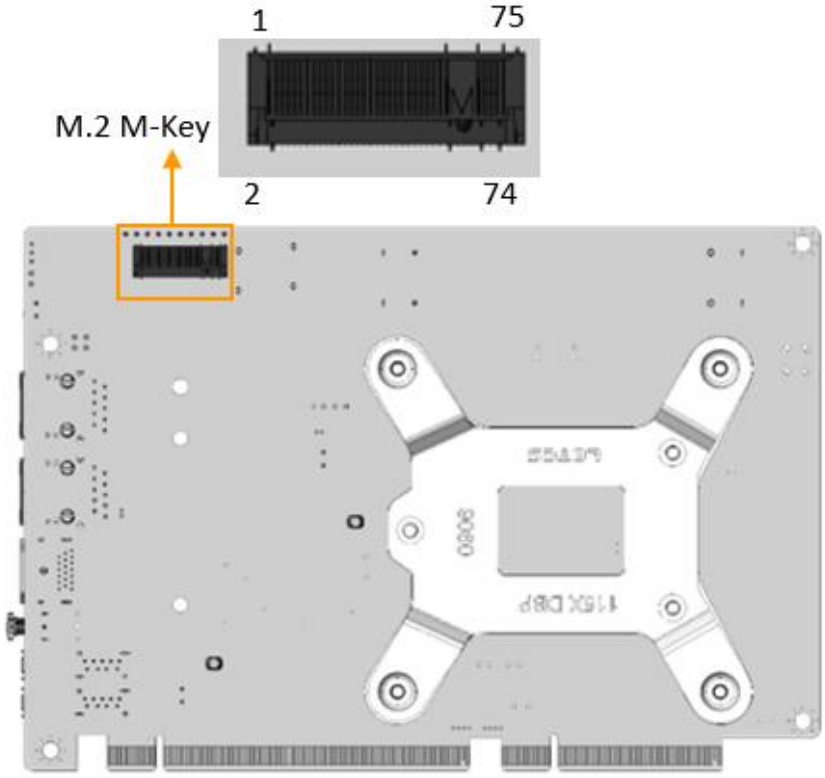


Figure 3-22: M.2 M-Key Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+3.3V
3	GND	4	+3.3V
5	PCIE_RX3+	6	NC
7	PCIE_RX3-	8	M2_SSD_PLN
9	GND	10	+3.3V
11	PCIE_TX3+	12	+3.3V

13	PCIE_TX3-	14	+3.3V
15	GND	16	+3.3V
17	PCIE_RX2+	18	+3.3V
19	PCIE_RX2-	20	NC
21	GND	22	NC
23	PCIE_TX2+	24	NC
25	PCIE_TX2-	26	NC
27	GND	28	NC
29	PCIE_RX1+	30	NC
31	PCIE_RX1-	32	NC
33	GND	34	NC
35	PCIE_TX1+	36	NC
37	PCIE_TX1-	38	SATA_SSD_SLP
39	GND	40	NC
41	PCIE_RX0+	42	NC
43	PCIE_RX0-	44	NC
45	GND	46	NC
47	PCIE_TX0+	48	NC
49	PCIE_TX0-	50	M2_RST
51	GND	52	CLKREQ0#
53	PCIECLK-	54	PCIE_WAKE
55	PCIECLK+	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 3-22: M.2 M-Key Slot 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:

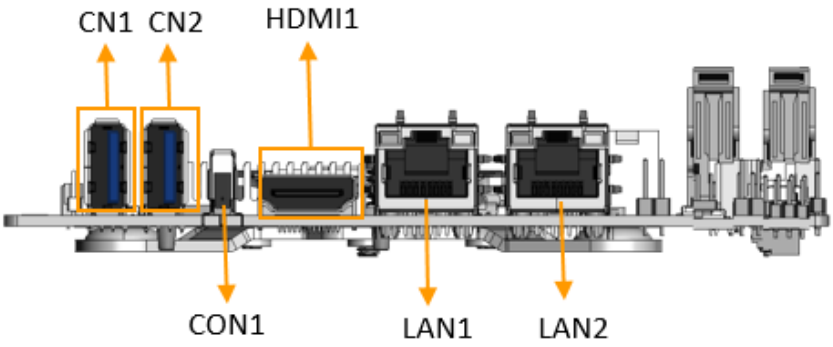


Figure 3-23: External Peripheral Interface Connector (EPIC) panel

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

CN Label:	**CN1, CN2**
CN Type:	USB Type-A
CN Location:	See **Figure 3-24**
CN Pinouts:	See **Table 3-23**

There are two external USB 3.2 Gen 1 connectors on the HPCIE-Q470.

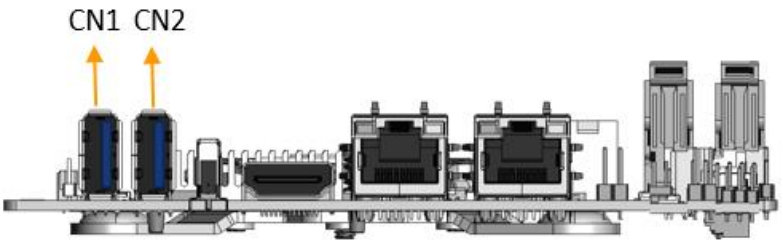


Figure 3-24: External USB 3.2 Gen 1 Connectors Location

PIN NO.	DESCRIPTION	PIN NO.	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 3-23: External USB 3.2 Gen1 Connector (Type-A) Pinouts

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

CN Label: **CON1**

CN Type: USB Type-C

CN Location: See **Figure 3-25**

CN Pinouts: See **Table 3-24**

There is one external USB 3.2 Gen 2 connector on the HPCIE-Q470.

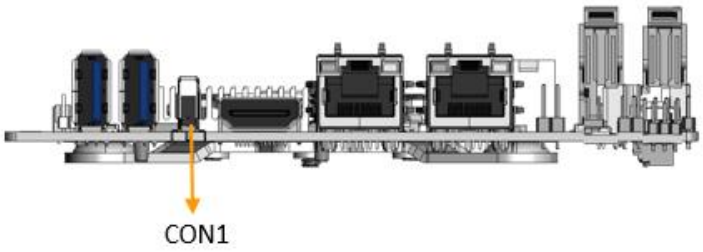


Figure 3-25: External USB 3.2 Gen 2 Connector Location

PIN NO.	DESCRIPTION	PIN NO.	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 3-24: External USB 3.2 Gen2 Connetor (Type-C) Pinouts

3.3.3 External HDMI Connector

CN Label: **HDMI1**

CN Type: External HDMI Connector

CN Location: See **Figure 3-26**

CN Pinouts: See **Table 3-25**

The 19-pin HDMI connector connects to a monitor that accepts a standard HDMI input.

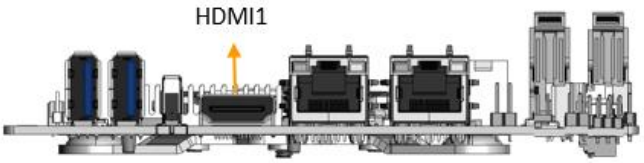


Figure 3-26: External HDMI Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HDMI_DATA2	11	GND
2	GND	12	HDMI_CLK#
3	HDMI_DATA2#	13	N/C
4	HDMI_DATA1	14	N/C
5	GND	15	HDMI_SCL
6	HDMI_DATA1#	16	HDMI_SDA
7	HDMI_DATA0	17	GND
8	GND	18	+5V
9	HDMI_DATA0#	19	HDMI_HPD
10	HDMI_CLK		

Table 3-25: External HDMI Connector Pinouts

3.3.4 Ethernet Connectors

CN Label: **LAN1, LAN2**

CN Type: RJ-45

CN Location: See **Figure 3-27**

CN Pinouts: See **Table 3-26**

Each LAN connector connects to a local network.

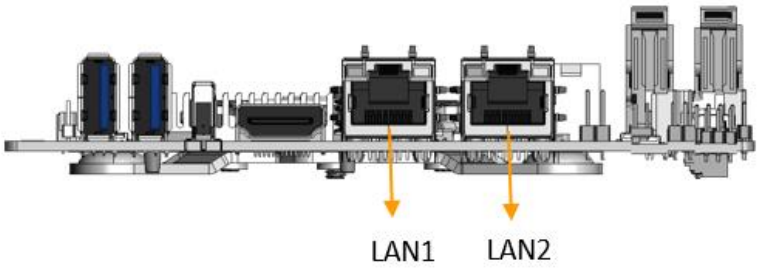


Figure 3-27: Ethernet Connectors Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MDIA3-	5	MDIA1+
2	MDIA3+	6	MDIA2+
3.	MDIA2-	7	MDIA0-
4.	MDIA1-	8	MDIA0+

Table 3-26: Ethernet Connector Pinouts

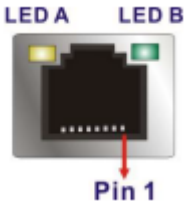


Figure 3-28: LAN LED Location

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 3-27: LAN LED Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

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

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

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 HPCIE-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 HPCIE-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 HPCIE-Q470 off:
  - When working with the HPCIE-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 HPCIE-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**.

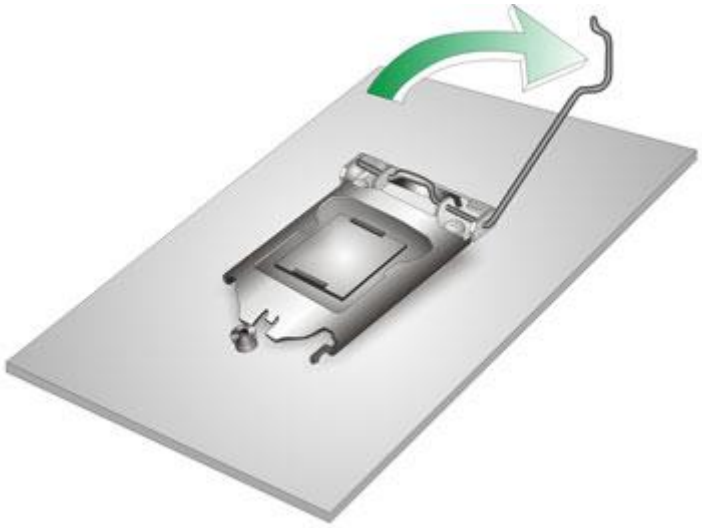


Figure 4-1: Disengage the CPU Socket Load Lever

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**.

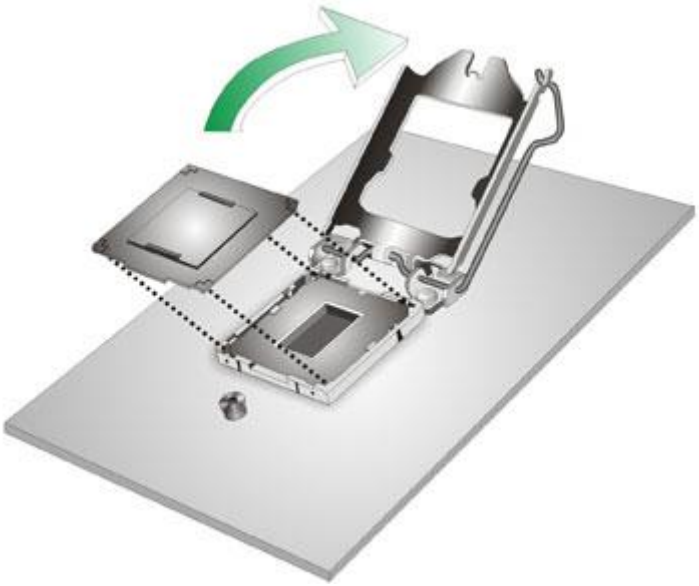


Figure 4-2: Remove Protective Cover

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**.

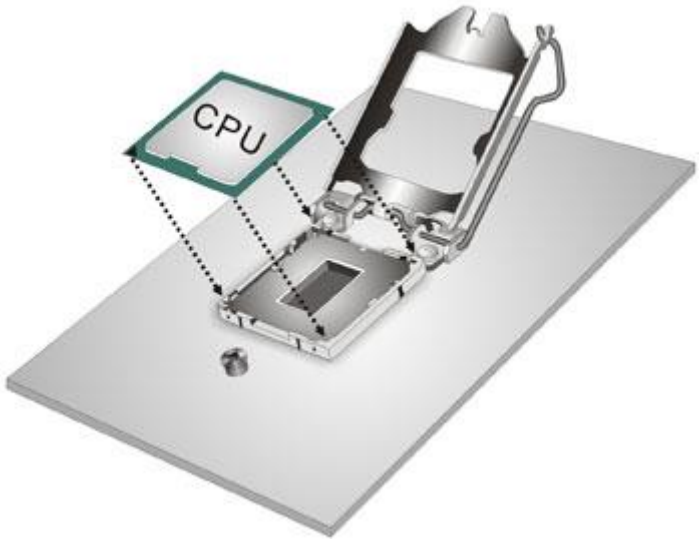


Figure 4-3: Insert the Socket LGA1200 CPU

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

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.**

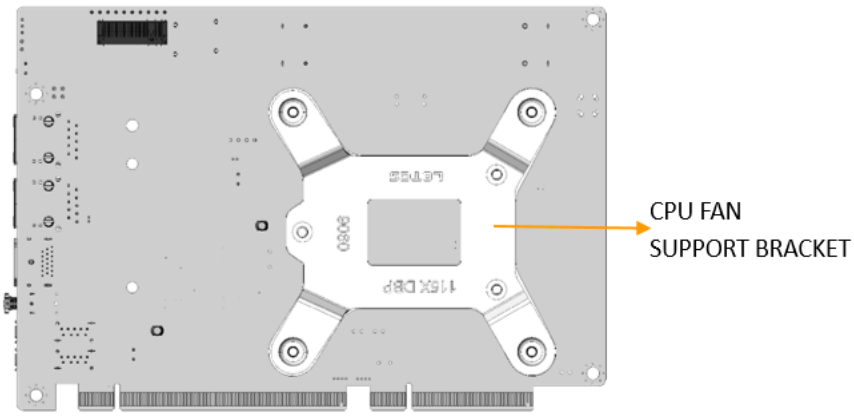


Figure 4-5: Cooling Kit Support Bracket

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

4.5 SO-DIMM Installation

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

CAUTION:

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

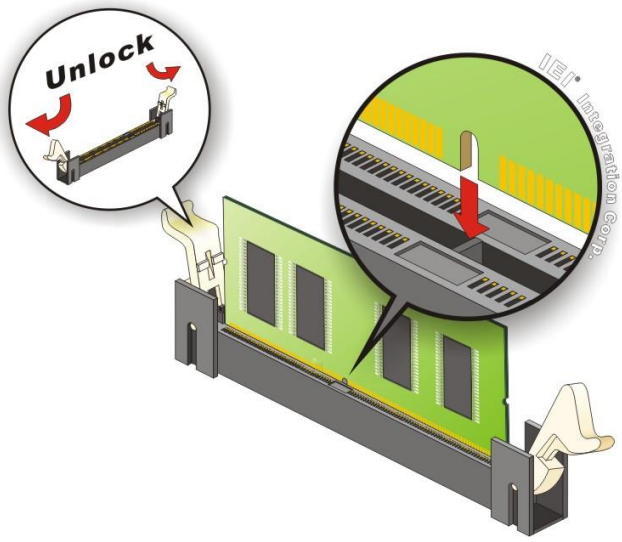


Figure 4-6: SO-DIMM Installation

Step 1: **Open the SO-DIMM socket handles**. Open the two handles outwards as far as they can.

Step 2: **Align the SO-DIMM with the socket**. Align the SO-DIMM so the notch on the memory lines up with the notch on the memory socket.

Step 3: **Insert the SO-DIMM**. Once aligned, press down until the SO-DIMM is properly seated. Clip the two handles into place.

Step 4: To remove a SO-DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

4.6 M.2 Card Installation

The M.2 A-Key card slot allows installation of M.2 A-Key card. To install a M.2 A-Key card, please follow the steps below.

Step 1: **Locate the M.2 A-Key card slot**. See **Chapter 3**.

Step 2: **Remove the retention screw**. Remove the retention screw.

Step 3: **Insert into the socket at an angle**. Line up the notch on the card with the notch on the slot. Slide the M.2 A-Key card into the socket at an angle of about 20º . (**Figure 4-7**)

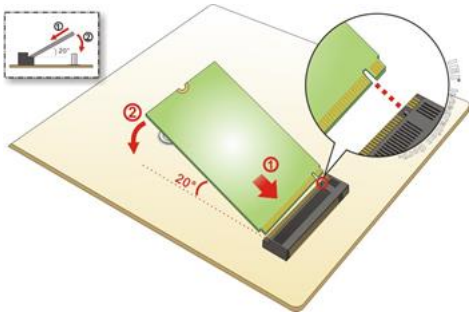


Figure 4-7: Inserting The M.2 Module Into The Slot At An Angle

Step 4: **Secure the M.2 A-Key card**. Secure the M.2 A-Key card with the retention screw previously removed (**Figure 4-8**).

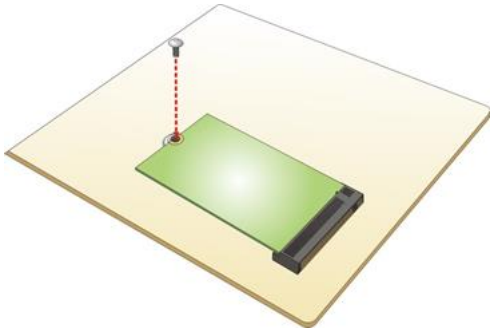


Figure 4-8: Securing The M.2 Module

4.7 System Configuration

The system configuration should be performed before installation.

4.7.1 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 4-9**.

CN Label: **J_ATX_AT1**

CN Type: Slide switch

CN Location: See **Figure 4-9**

CN Pinouts: See **Table 4-1**

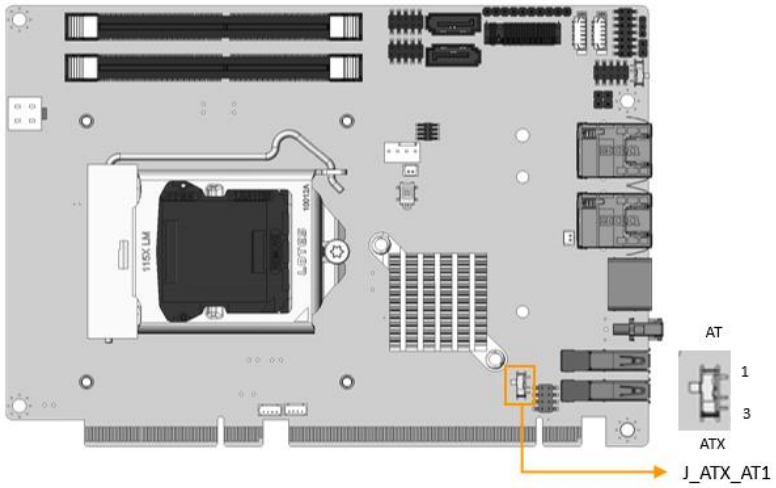


Figure 4-9: AT/ATX Power Mode Setting

PIN NO.	DESCRIPTION
Short 1 - 2	ATX Power Mode (default)
Short 2 - 3	AT Power Mode

Table 4-1: AT/ATX Power Mode Setting

4.7.2 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 4-10**.

CN Label: **J_CMOS1**

CN Type: Button

CN Location: See **Figure 4-10**

CN Pinouts: See **Table 4-2**

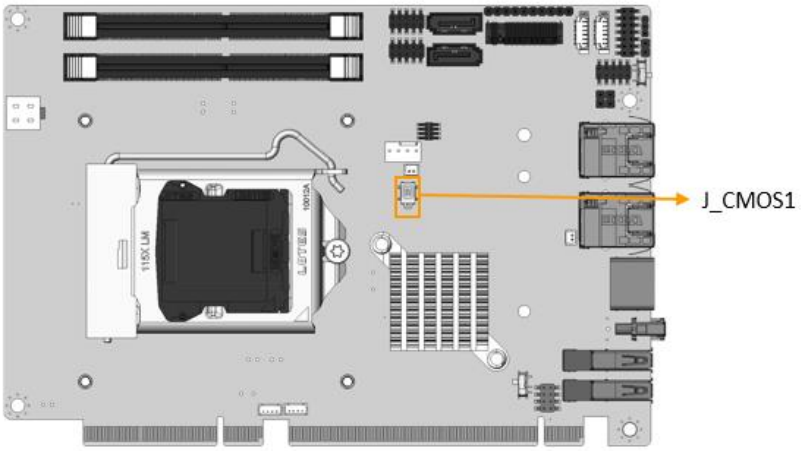


Figure 4-10: Clear CMOS Button Location

Status	DESCRIPTION
NC	Keep CMOS Setup (Normal Operation)
Press	Clear CMOS Setup

Table 4-2: Clear CMOS Button Jumper Setting

4.7.3 BOIS Selection Switch

The user can select to use either one PCIe x4 slot or four PCIe x1 slots on the backplane via the BIOS switch. Refer to below table for the BIOS switch settings.

To switch BIOS1 to BIOS2 or BIOS2 to BIOS1 successfully, please follow the steps below.

Step 1: Unplug the system power cord.

Step 2: Switch BIOS1 to BIOS2 or BIOS2 to BIOS1 by moving the BIOS switch to BIOS1 or BIOS2 position as shown in 错误!未找到引用源。.

Step 3: Remove the on-board battery, and then reinstall it.

Step 4: Clear CMOS by pressing the clear CMOS button for three seconds or more.

Step 5: Perform the system booting.

CN Label:	**SW_BIOS_1**
CN Type:	Slide switch
CN Location:	See **Figure 4-11**
CN Pinouts:	See **Table 4-3**

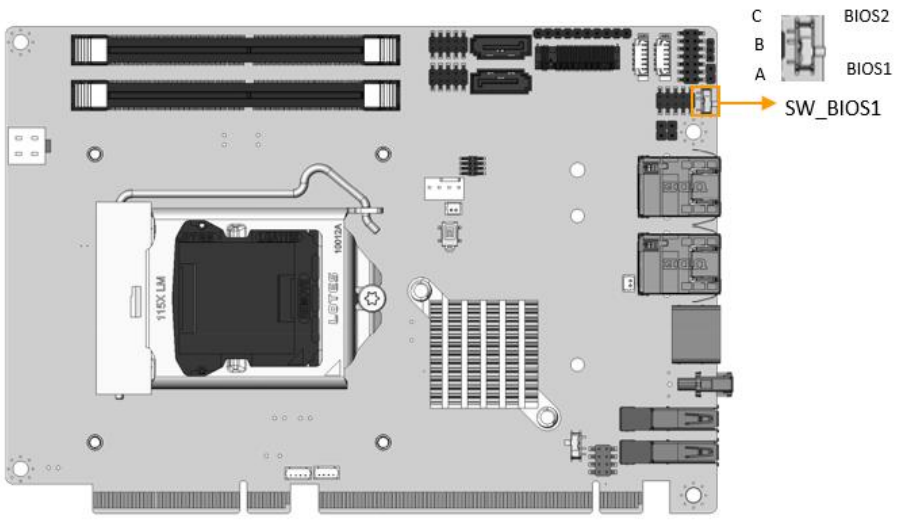


Figure 4-11: BIOS Selection Switch Location

PIN NO.	DESCRIPTION
Short A - B	BIOS1: four PCIe x1 slots (default)
Short B - C	BIOS2: one PCIe x4 slot

Table 4-3: BIOS Selection Switch

4.7.4 Flash Descriptor Security Override Jumper

The flash descriptor security override jumper (J_FLASH1) allows to enable or disable the ME firmware update. Refer to **Figure 4-12** for the jumper location and settings.

CN Label: **J_FLASH1**

CN Type: 3-pin header, P=2.00mm

CN Location: See **Figure 4-12**

CN Pinouts: See **Table 4-4**

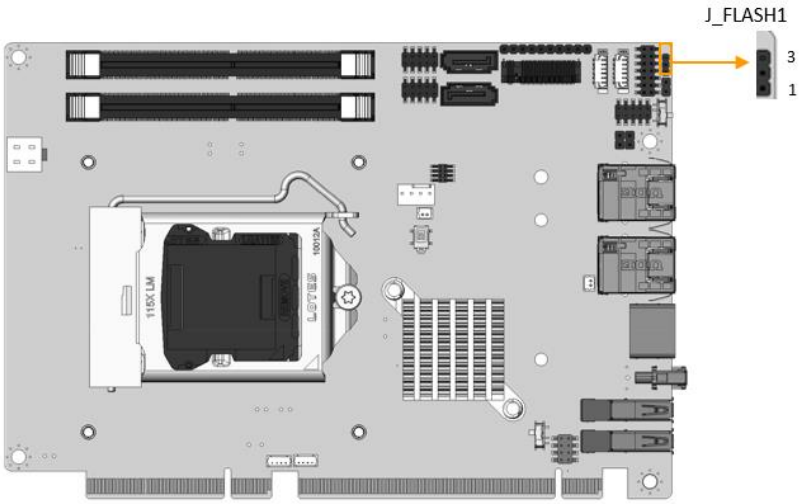


Figure 4-12: Flash Descriptor Security Override Jumper Location

PIN NO.	DESCRIPTION
Short 1-2	Disabled (default)
Short 2-3	Enabled

Table 4-4: Flash Description Security Override Jumper

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.

4.7.5 USB Power Selection

Use the USB Power SW BIOS options to configure whether to provide power to the corresponding USB connector(s) when the system is in S3/S4 sleep state. This option is valid only when the above Power Saving Function (ERP) BIOS option is disabled.

USB Power SW: USB Power Setting	
USB Power SW	**DESCRIPTION**
+5V DUAL	Power is provided in S3/S4 sleep state (default)
+5V	Power is not provided in S3/S4 sleep state
Use the **USB Power SW** BIOS options to configure whether to provide power to the corresponding USB connector(s) when the system is in S3/S4 sleep state. This option is valid only when the above **Power Saving Function (ERP)** BIOS option is disabled.	

Table 4-5: USB Power Setting

4.8 Internal Peripheral Device Connections

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

4.8.1 SATA Drive Connection

The HPCIE-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 4-13**.

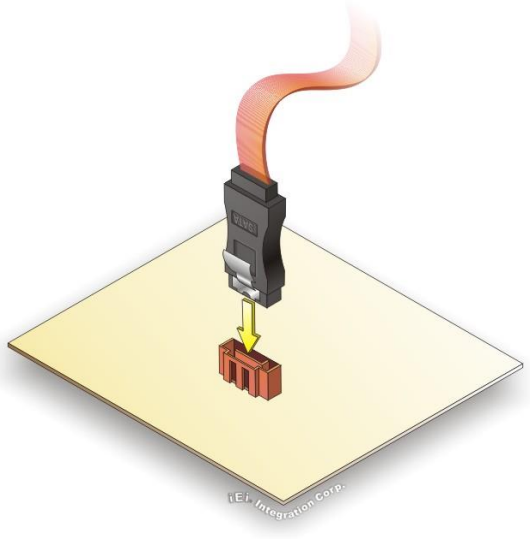


Figure 4-13: SATA Drive Cable Connection

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 4-14**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 4-14**.

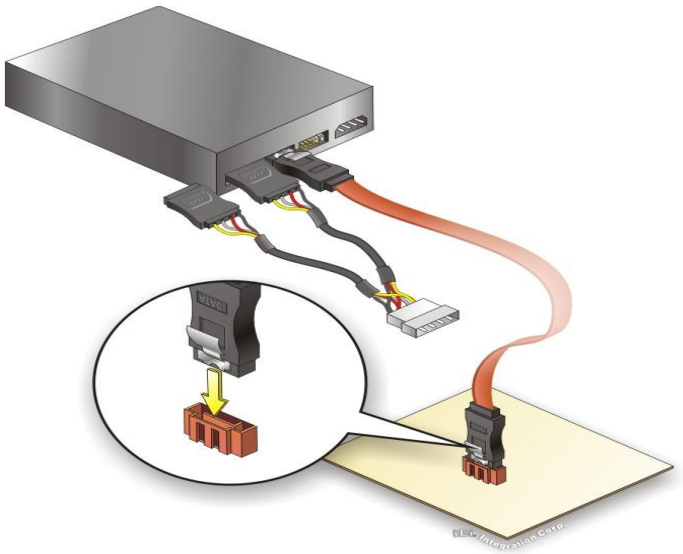


Figure 4-14: SATA Power Drive Connection

The SATA power cable can be bought from IEI. See Table 2-1: Packing List

Optional Items in Section 2.4.

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

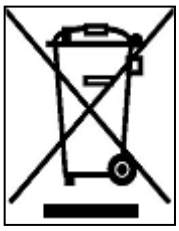
Product Disposal

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

Digital I/O Interface

C.1 Introduction

The DIO connector on the HPCIE-Q470 is interfaced to GPIO ports on the Super I/O chipset. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

NOTE:

For further information, please refer to the datasheet for the Super I/O chipset.

The BIOS interrupt call **INT 15H** controls the digital I/O.

INT 15H:

AH – 6FH
Sub-function:
AL – 8 :Set the digital port as INPUT
AL :Digital I/O input value

C.2 Assembly Language Sample 1

```
MOV     AX, 6F08H       ;setting the digital port as input
INT     15H             ;
```

AL low byte = value

AH – 6FH	
Sub-function:	
AL – 9	:Set the digital port as OUTPUT
BL	:Digital I/O input value

C.3 Assembly Language Sample 2

```
MOV     AX, 6F09H       ;setting the digital port as output
MOV     BL, 09H         ;digital value is 09H
INT     15H             ;
```

Digital Output is 1001b

Appendix

D

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. Contact IEI support or visit the IEI website for specific drivers for other operating systems.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

EXAMPLE PROGRAM:

```
; INITIAL TIMER PERIOD COUNTER

;
W_LOOP:
;

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT     15H

;
; ADD THE APPLICATION PROGRAM HERE
;

        CMP     EXIT_AP, 1      ;is the application over?
        JNE     W_LOOP          ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT     15H

;
; EXIT ;
```

Appendix

E

Error Beep Code

E.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	DXEIPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

E.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

F

Hazardous Materials Disclosure

F.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
Display	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

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.

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.

F.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	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O

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。