

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

HPCIE-Q470

Quick Installation Guide

Version 1.0

July 19, 2022

Package List

HPCIE-Q470 package includes the following items:

- 1 x HPCIE-Q470 single board computer
- 1 x SATA cable
- 1 x QIG



©2022 Copyright by IEI Integration Corp.
All rights reserved.

Specifications

- CPU:
10th/11th Generation LGA1200 Intel® Core™ i9/i7/i5/i3, Pentium® and Celeron® processors
- Chipset:
Intel® Q470
- Memory:
Two 260-pin 2933 MHz dual-channel DDR4 SO-DIMM slots supporting up to 64 GB memory
- BIOS:
AMI UEFI BIOS
- 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, supporting 12-bit end-to-end, AV1, VP9, HEVC 12b, HDR10, FP16
- Display Output:
1 x HDMI 1.4 (up to 4096 x 2160 @ 30 Hz)
- Ethernet:
LAN1: Intel® I225V 2.5GbE controller (colay with I225-LM)
LAN2: Intel® I225V 2.5GbE controller (colay with I225-LM)
- External I/O Interface:
2 x USB 3.2 Gen 1 (5Gb/s) (Type-A)
1 x USB 3.2 Gen 2 (10Gb/s) (Type-C)
- Internal I/O Interface:
2 x USB 2.0 (2x4 pin, p=2.0)
2 x RS-232/422/485 (2x5 pin, p=2.0) (support Auto Flow Control over RS-485)
2 x SATA 6Gb/s (RAID 0/1 supported)
- Audio:
1 x iAUDIO connector supporting IEI AC-KIT-888S audio module

- (2x5 pin, p=2.0)
- Front Panel:
1 x Front panel (1x10 pin, p=2.54; power LED, HDD LED, power button, reset button)
 - LAN LED:
2 x LAN LED (1x2 pin, p=2.54)
 - Expansions:
16-lane PCIe signal from CPU via golden finger
(supporting x16, or x8 + x8, or x4 + x4 + x8)
4-lane PCIe signal from PCH via golden finger
(supporting 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 (on solder side)
 - Digital I/O:
1 x 12-bit digital I/O (2x7 pin, p=2.0)
 - SMBus:
1 x SMBus (1x4 pin, p=1.25)
 - I²C:
1 x I²C (1x4 pin, p=1.25)
 - Fan Connector:
1 x CPU fan connector (1x4 pin)
 - Chassis Intrusion:
1 x Chassis intrusion connector (1x2 pin, p=2.54)
 - Power Supply:
5V/12V ATX/AT power supply
Support AT/ATX mode
ErP/EuP compliant
 - 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)
 - Watchdog Timer:
Software programmable support 1–255 sec. system reset

- Operation Temperature: 0°C – 60°C
- Storage Temperature: -30°C – 70°C
- Operation Humidity: 5% – 95%, non-condensing
- Dimensions: 185 mm x 126 mm
- Weight: GW:1000 g / NW:420 g
- Safety: CE/FCC compliant

All the drivers and utility for the HPCIIE-Q470 are available on IEI Resource Download Center. Type HPCIIE-Q470 and press Enter to find all the relevant software, utilities, and documentation. To install software from the downloaded ISO file, mount the file as a virtual drive to view its content.

IEI Resource Download Center

<https://download.ieiworld.com>



Ordering Information

- **HPCIE-Q470-R10:**
Half-size PICMG 1.3 CPU Card supports 10th/11th Gen. LGA1200 Intel® Core™ i9/i7/i5/i3, Pentium® and Celeron® processors, Intel® Q470, DDR4 SO-DIMM, HDMI, dual Intel® 2.5GbE, USB 3.2 Gen 2, SATA 6Gb/s, M.2, iAUDIO and RoHS
- **CB-USB02A-RS:**
Dual port USB cable with bracket, 300mm, p=2.0
- **32102-000100-200-RS:**
SATA power cable, MOLEX 8981-4M to SATA15P, 150mm
- **32205-002700-200-RS:**
RS-232/422/485 cable, 200mm, p=2.0
- **AC-KIT-888S-R10:**
Realtek ALC888S 7.1 Channel HD Audio peripheral board, RoHS
- **CF-115XA-R10:**
High performance LGA1155/1156 cooler kit, 1U chassis compatible, 73W
- **CF-1156C-R20:**
LGA1155/LGA1156 cooler kit, 1U chassis compatible, 45W
- **CF-1156D-R30:**
LGA1155/LGA1156 cooler kit, 1U chassis compatible, 65W

Jumpers Setting and Connectors

LABEL	FUNCTION
J_ATX_AT1	AT/ATX power mode setting
SW_BIOS1_1	BIOS selection switch
J_CMOS1	Clear CMOS jumper
J_FLASH1	Flash descriptor security override jumper
CPU12V1	ATX CPU 12V power connector
J_AUDIO1	Audio connector
BAT1	RTC battery connector
CHASSIS1	Chassis intrusion connector
DIMM1, DIMM2	DDR4 SO-DIMM slots
DIO1	Digital I/O connector
DBG_SPI1	EC debug connector
CPU_FAN1	Fan connector
JSPI1	Flash SPI ROM connector
JEC1	Flash EC ROM connector
F_PANEL1	Front panel connector
I2C1	I ² C connector
LED_LAN1	LAN1 link LED connector
LED_LAN2	LAN2 link LED connector
M2_A1	M.2 A-key slot
M2_M1	M.2 M-key slot (on solder side)
COM1, COM2	RS-232/422/485 serial port connectors
S_ATA1, S_ATA2,	SATA 6Gb/s connectors
SMB1	SMBus connector
SPK1	Speaker connector
USB2	Internal USB 2.0 connector
LAN1, LAN2	External 2.5GbE RJ-45 connectors
HDMI1	External HDMI connector
CN1, CN2	External USB 3.2 Gen 1 connectors
CON1	External USB 3.2 Gen 2 connector

J_ATX_AT1: AT/ATX Power Mode Setting	
PIN NO.	DESCRIPTION
Short 1 - 2	ATX Power Mode (default)
Short 2 - 3	AT Power Mode

SW_BIOS1_1: BIOS Selection Switch	
PIN NO.	DESCRIPTION
Short A - B	BIOS1: four PCIe x1 slots (default)
Short B - C	BIOS2: one PCIe x4 slot

J_CMOS1: Clear CMOS Jumper	
Status	DESCRIPTION
NC	Keep CMOS Setup (Normal Operation)
Press	Clear CMOS Setup

J_FLASH1: Flash Descriptor Security Override Jumper	
PIN NO.	DESCRIPTION
Short 1-2	Disabled (default)
Short 2-3	Enabled

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.

CPU12V1: ATX CPU 12V Power Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	3	+12V
2	GND	4	+12V

J_AUDIO1 : Internal Audio Connector for IEI Audio Module			
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

BAT1: RTC Battery Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VBATT	2	GND

CHASSIS1: Chassis Intrusion Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3VSB	2	CHASSIS_OPEN

DIO1 : Digital Input/Output Connector			
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

DBG_SPI1: EC Debug Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	2	EDICS
3	EDIDO	4	EDICLK
5	EDIDI	6	GND

CPU_FAN1: CPU Fan Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FANIO	4	PWM

JSPI1: Flash SPI ROM Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	4	SPI_CLK
2	SPI_CS#	5	SPI_SI
3	SPI_SO	6	GND

JEC1: Flash EC ROM Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	FSCE#	2	VCC
3	FMISO	4	NC
5	EC_DET_FLASH	6	FSCK
7	GND	8	FMOSI

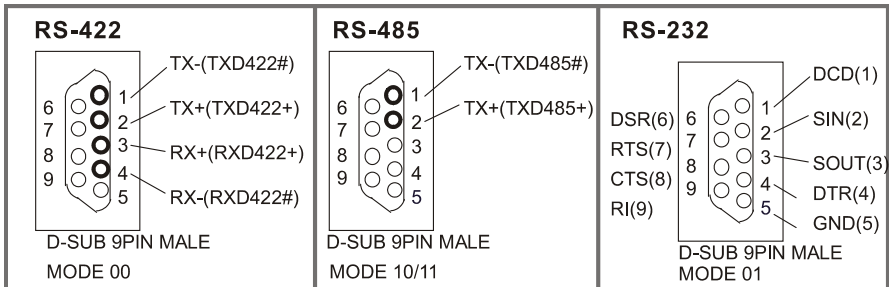
F_PANEL1: Front Panel Connector					
	PIN	DESCRIPTION	PIN	DESCRIPTION	
	1	NC	6	PWR_LED+	PWR LED
PWR BTN	2	PWR_BTN+	7	PWR_LED-	
	3	PWR_BTN-	8	GND	
HDD LED	4	HDD_LED+	9	Reset+	RESET
	5	HDD_LED-	10	Reset-	

I2C1: I²C Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	3	I2C_CLK
2	I2C_DATA	4	+5V

LED_LAN1: LAN1 Link LED Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+3.3V	2	LAN1_LED_LNK#_ACT

LED_LAN2: LAN2 Link LED Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+3.3V	2	LAN2_LED_LNK#_ACT

COM1, COM2: RS-232/422/485 Serial Port Connectors			
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



S_ATA1, S_ATA2: SATA 6Gb/s Connectors			
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

SMB1: SMBus Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	3	SMB_CLK
2	SMB_DATA	4	+5V

SPK1: Speaker Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+V5S	2	PC_BEEP

USB2: Internal USB 2.0 Connector			
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

M2_A1: M.2 A-key Slot			
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		

M2_M1: M.2 M-key Slot			
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		

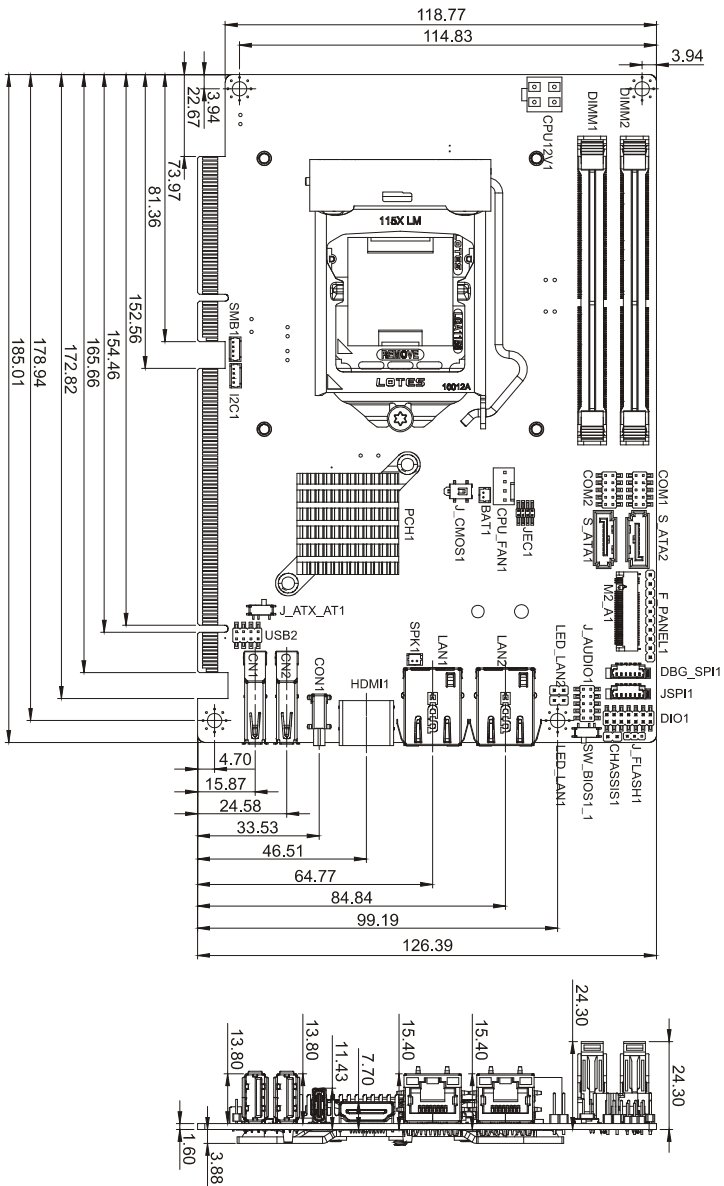
LAN1, LAN2: External 2.5GbE RJ-45 Connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MDIA3-	5	MDIA1+
2	MDIA3+	6	MDIA2+
3.	MDIA2-	7	MDIA0-
4.	MDIA1-	8	MDIA0+

HDMI1: External HDMI Connector			
PIN NO.	DESCRIPTION	PIN NO.	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		

CN1, CN2: External USB 3.2 Gen 1 Connectors (Type-A)			
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-		

CON1: External USB 3.2 Gen 2 Connector (Type-C)			
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

Board Layout: Jumper and Connector Locations



(Unit: mm)