

**Full-size PICMG 1.3 CPU Card supports LGA1151 Intel® Core™  
i7/i5/i3/Pentium®/Celeron® CPU per Intel® Q170, DDR4,  
VGA/IDP, Dual Intel® PCIe GbE, USB 3.0, SATA 6Gb/s,  
PCIe mini, mSATA, HD Audio, iAMT,  
iRIS-2400 and RoHS**

# **PCIE-Q170**

## **Quick Installation Guide**

**Version 1.0**

Jul 27, 2016.

### **Package List**

PCIE-Q170 package includes the following items:

- 1 x PCIE-Q170 single board computer
- 1 x SATA cable (P/N: 32000-0628000-RS)
- 1 x Mini jumper pack
- 1 x QIG (Quick Installation Guide)
- 1 x Utility CD



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## Specifications

- CPU:  
LGA1151 Intel® Core™ i7/i5/i3/Pentium®/Celeron® CPU
- PCH: Intel® Q170
- Memory:  
Four 288-pin 1867/2133MHz Dual-Channel DDR4 SDRAM unbuffered DIMM supported up to 64GB
- BIOS: UEFI BIOS
- Graphic Engine:  
Intel® HD Graphics Gen 9 supports DX11/12, OpenCL 2.x and OpenGL 4.3/4.4 Decode/Encode for HEVC, VP8, VP9, VDENC
- Ethernet:  
LAN1: Intel® I219LM Clarkville-V with Intel® iAMT 11.0 supported  
LAN2: Intel® I210 PCIe controller
- Super IO: Fintek F81866
- EC: IWDD
- External I/O:  
2 x USB 3.0  
2 x RJ-45  
1 x VGA
- Internal I/O:  
1 x 6-pin wafer for KB/MS  
1 x iDP  
1 x LPT  
6 x SATA3.0 (SATA0, SATA1, SATA2, SATA3) (Q170 supports RAID 0, 1, 5, 10)  
7 x USB 2.0 (1 type A 180°, 6 by pin header)  
2 x RS-232  
2 x RS-232/422/485  
2 x USB 3.0 (4 pin header)

- Front Panel: 1 x Front Panel (Power LED, HDD LED, Speaker, Power Button, Reset Button)
- LAN LED: 2 x 2 Pin for LAN1 LED, LAN2 LED (Active)
- Audio: Support 7.1 channel HD audio by IEI AC-KIT-892HD kit
- TPM: 1 x 20-pin (2x10) header
- SMBus: 1 x 4-pin (1x4) wafer
- I2C: 1 x 4-pin (1x4) wafer
- Infrared Interface: 1 x 5-pin (1x5) header
- iRIS Remote Management Module:
  - 1 x iRIS-2400 slot (optional)
- Expansion:
  - 16 lanes from CPU & 4 lanes from Q170 PCIe signal via golden finger
  - One PCIe Mini
  - Four PCI signal via golden finger
- Watchdog Timer:
  - Software programmable support 1~255 sec. system reset
- Digital I/O: 8-bit digital I/O (4-bit input, 4-bit output)
- FAN Connector:
  - 1 x 4-pin smart fan connector (CPU fan)
  - 1 x 4-pin smart fan connector (system fan)
- Power supply:
  - 5V/12V, AT/ATX support
- Power Consumption:
  - 5V@3.12A, 12V@6.85A, 3.3V@1.13A, 5VSB@0.15A
  - (Intel® Core™ i7-6700K 4.0GHz CPU with 64GB (16GB x 4) 2133 MHz DDR4 memory)
- Operation Temperature: -20°C ~ 60°C
- Operation Humidity: 10% ~ 95%, non-condensing
- Dimensions: 338mm x 126mm
- Weight GW/NW: 1000g / 420g

## Ordering Information

- **PCIE-Q170-R10:**  
Full-size PICMG 1.3 CPU Card supports LGA1151 Intel® Core™ i7/i5/i3/Pentium®/Celeron® CPU per Intel® Q170, DDR4, VGA/IDP, Dual Intel® PCIe GbE, USB 3.0, SATA 6Gb/s, PCIe mini, mSATA, HD Audio, iAMT and RoHS
- **PCIE-Q170-i2-R10:**  
Full-size PICMG 1.3 CPU Card supports LGA1151 Intel® Core™ i7/i5/i3/Pentium®/Celeron® CPU per Intel® Q170, DDR4, VGA/IDP, Dual Intel® PCIe GbE, USB 3.0, SATA 6Gb/s, PCIe mini, mSATA, HD Audio, iAMT, iRIS-2400 and RoHS
- **19800-000075-RS:** KB/MS cable with bracket
- **32102-000100-200-RS:** SATA power cable
- **32200-015100-RS:** LPT Cable
- **32200-074800-RS:** RS-422/485 cable, 200mm
- **AC-KIT-892HD-R10:**  
7.1 channel HD Audio kit with Realtek ALC892 support dual audio streams
- **CF-1150SA-R10:** Special cooler kit for LGA1150, High-performance compatible, 95W
- **CF-1150SB-R10:** Special cooler kit for LGA1150, High-performance compatible, 65W
- **CF-1150SC-R10:**  
Special cooler kit for LGA1150, 1U chassis compatible, 65W
- **CF-1150SE-R11:**  
Special cooler kit for LGA1150, 1U chassis compatible, 95W
- **CF-1150SF-R10:**  
Special cooler kit for LGA1150, 1U chassis compatible, 54W
- **DP-DP-R10:**  
DisplayPort to DisplayPort converter board (For iEi IDP connector)
- **DP-DVI-R10:**  
DisplayPort to DVI-D converter board (For iEi IDP connector)

- **DP-HDMI-R10:**  
DisplayPort to HDMI converter board (For iEi IDP connector)
- **DP-LVDS-R10:**  
DisplayPort to LVDS converter board (For iEi IDP connector)
- **DP-VGA-R10:**  
DisplayPort to VGA converter board (For iEi IDP connector)
- **SAIDE-KIT01-R10:**  
SATA to IDE/CF Converter board

## Jumpers setting and connectors

LABEL	FUNCTION
J_ATX_AT1	AT/ATX mode select switch
J_CMOS1	Clear CMOS button
PCIE x16 Power	PCIEX16 channel mode setting
USB SW1 Power USB SW2 Power	USB power setting
MSATA_SW1	M-SATA switch auto-detect
J_FLASH1	Flash descriptor security override
SW_BIOS1_2	Switch BIOS1 or BIOS2 (option function)
J_AUDIO1	Audio source connector
CHASSIS1	Chassis status connector (Rev1.02)
CPU_FAN1	CPU fan connector
CPU12V1	+12V power connector
CHA_DIMM0,CHA_DIMM1 CHB_DIMM0,CHB_DIMM1	DDR3 DIMM slots
DIO1	Digital I/O connector
DP1	Display port connector
CN1	EC debug connector
F_PANEL1	Front panel connector
IPMI1	Collocation IPMI module (iRIS-2400)
I2C1	I2C Connector
KB_MS1	Keyboard and mouse connector
LED_LAN1	LAN1 link LED connector
LED_LAN2	LAN2 link LED connector
LPT1	Internal Parallel port connector
MPCIE1	M-SATA card connector
COM1, COM2	RS-232 serial port connector
COM3, COM4	Internal RS-232/422/485 serial port connector
SATA1, SATA2, SATA3 SATA4, SATA5, SATA6	SATA 6Gb/s drive connectors
SMB1	SMBUS connector
JSPI1	Flash SPI ROM connector
JSPI2	Flash EC ROM connector
SYS_FAN1	System fan connector

TPM1	TPM connector
USB1, USB2, USB3	Internal USB 2.0 connectors
USB4	External USB2.0 type A Connector
USB3_1, USB3_2	USB 3.0 connector
USB3_34	Internal USB 3.0 connector
LAN1, LAN2	RJ45 LAN connectors
VGA1	VGA connector

#### J\_ATX\_AT1: AT/ATX mode select switch

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

#### J\_CMOS1: Clear CMOS button

PIN NO.	DESCRIPTION
NC (default)	Keep CMOS Setup (Normal Operation)
Press button	Clear CMOS Setup

#### PCIEX16 Power: PCIEX16 channel mode setting

PCIEX16	DESCRIPTION
1 x16 PCIE	1 x16 PCIE (default)
2 x8 PCIE	2 x8 PCIE
1 x8 , 2x4 PCIE	1 x8 , 2x4 PCIE

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

#### Chipset

Auto Power Button Status [Disabled(ATX)]

Restore AC Power Loss [Last State] -----

> PCI Express Configuration

> PCI Azalia Configuration

Power Saving Function(ERP) [Disabled]

PCIEX16 Power [1 x16 PCIE]

USB SW1 [+5V DUAL]

USB SW2 [+5V DUAL]

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<b>USB SW1, USB SW2: USB power setting</b>	
<b>PCIE x16</b>	<b>DESCRIPTION</b>
+5V DUAL	5V DUAL (default)
+5V	+5V

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Chipset

Auto Power Button Status	[Disabled(ATX)]	
Restore AC Power Loss	[Last State]	-----
> PCI Express Configuration		
> PCI Azalia Configuration		
Power Saving Function(ERP)	[Disabled]	
PCIEX16 Power	[1 x16 PCIE]	
USB SW1	[+5V DUAL]	
USB SW2	[+5V DUAL]	

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<b>MSATA_SW1: M-SATA switch auto-detect</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
Open	Auto Detect M-SATA (default)
Short	M-SATA Enable

<b>J_FLASH1: Flash descriptor security override</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
Short 1 - 2	Disabled (default)
Short 2 - 3	Enabled

<b>SW_BIOS1_2 : Switch BIOS1 or BIOS2 (option function)</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
Short 1 - 2	BIOS1 (default)
Short 2 - 3	BIOS2



<b>J_AUDIO1: Audio source connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
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

<b>CHASSIS1: Chassis status connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+3.3VSB	2	CHASSIS OPEN

<b>CPU_FAN1: CPU fan connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	+12V
3	FANIO	4	PWM

<b>CPU12V1: +12V power connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	GND
3	+12V	4	+12V

<b>DIO1: Digital I/O connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

<b>DP1: Display port connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+5V	11	AUXP
2	LANE1N	12	AUXN
3	LANE1P	13	GND
4	GND	14	LANE2P
5	LANE3N	15	LANE2N
6	LANE3P	16	GND
7	GND	17	LANE0P
8	AUX_CTRL_DET_D	18	LANE0N
9	GND	19	+3.3V
10	HPD		

<b>CN1: EC debug connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	EC_EPP_STB#	2	EC_EPP_AFD#
3	EC_EPP_PD0	4	NC
5	EC_EPP_PD1	6	EC_EPP_INIT#
7	EC_EPP_PD2	8	EC_EPP_SLIN#
9	EC_EPP_PD3	10	GND
11	EC_EPP_PD4	12	NC
13	EC_EPP_PD5	14	EC_EPP_BUSY
15	EC_EPP_PD6	16	EC_EPP_KSI5
17	EC_EPP_PD7	18	EC_EPP_KSI4

<b>F_PANEL1: Front panel connector</b>					
	<b>PIN</b>	<b>DESCRIPTION</b>	<b>PIN</b>	<b>DESCRIPTION</b>	
PWR LED	1	+5V	2	BEEP_PWR	SPKR
	3	NC	4	IPMI ID_LED+	IPMI LED
	5	GND	6	IPMI ID_LED-	
PWR BTN	7	PWRBTN_SW#	8	PC_BEEP	SPKR
	9	GND	10	NC	RESET
HDD LED	11	+5V	12	EXTRST-	
	13	SATA_LED#	14	GND	

<b>I2C1: I2C Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	PCH_GP38 (I2C_DAT)
3	PCH_GP39 (I2C_CLK)	4	+5V

<b>KB_MS1: Keyboard and mouse connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC	2	MSDATA
3	MSCLK	4	KBDATA
5	KBCLK	6	GND

<b>LED_LAN1: LAN1 link LED connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+3.3V	2	LAN1_LED_LNK#_ACT

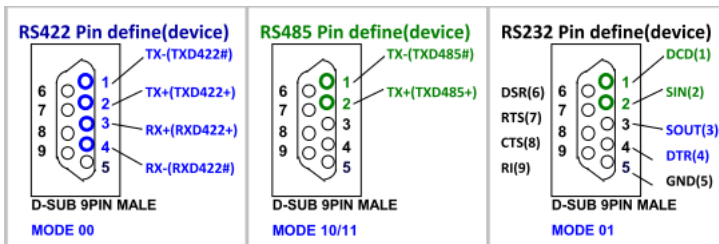
<b>LED_LAN2: LAN2 link LED connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+3.3V	2	LAN2_LED_LNK#_ACT

<b>LPT1: Parallel port connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	STROBE#	14	AUTO FORM FEED #
2	DATA0	15	ERROR#
3	DATA1	16	INITIALIZE#
4	DATA2	17	PRINTER SELECT LN#
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACKNOWLEDGE#	23	GND
11	BUSY	24	GND
12	PAPER EMPTY	25	GND
13	PRINTER SELECT		

<b>MPCIE1: M-SATA card connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	PCIE_WAKE#	2	+3.3V
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	MSATA_CLK#	12	N/C
13	MSATA_CLK	14	N/C
15	GND	16	N/C
17	PLTRST_N	18	GND
19	N/C	20	+3.3V
21	GND	22	PLTRST_N
23	SATA_RX+	24	+3.3V
25	SATA_RX-	26	GND
27	GND	28	1.5V
29	GND	30	SMB_CLK
31	SATA_TX-	32	SMB_DATA
33	SATA_TX+	34	GND
35	GND	36	USB_DATA-
37	GND	38	USB_DATA+
39	+3.3V	40	GND
41	+3.3V	42	N/C
43	+3.3V	44	N/C
45	CLINK_CLK	46	N/C
47	CLINK_DATA	48	1.5V
49	CLINK_RST#	50	GND
51	MSATA_DET	52	+3.3V

COM1, COM2: RS-232 serial port connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RST
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

COM3,COM4: RS-232/422/485 serial port connector			
PIN NO.	RS-232	RS-422	RS-485
1	DCD	TXD422-	TXD485-
2	RXD	TXD422+	TXD485+
3	TXD	RXD422+	--
4	DTR	RXD422-	--
5	GND	--	--
6	DSR	--	--
7	RTS	--	--
8	CTS	--	--
9	RI	--	--



SATA1, SATA2, SATA3, SATA4, SATA5, SATA6: SATA 6Gb/s drive 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

<b>SMB1: SMBUS connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	SMB_DATA
3	SMB_CLK	4	+5V

<b>JSPI1: Flash SPI ROM connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+3.3V	2	SPI_CS#
3	SPI_SO	4	NC
5	GND	6	SPI_CLK
7	SPI_SI	8	NC

<b>JSPI2: Flash EC ROM connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+3.3V	2	SPI_CS#
3	SPI_SO	4	NC
5	GND	6	SPI_CLK
7	SPI_SI	8	NC

<b>SYS_FAN1: System fan connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	FANIO	2	+12V (PWM)
3	GND		

<b>TPM1: TPM connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	LCLK	2	GND
3	LFRAME#	4	KEY
5	LRERST#	6	+5V
7	LAD3	8	LAD2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND	18	GLKRUN#
19	LPCPD#	20	LDRQ#

<b>USB1, USB2, USB3: Internal USB 2.0 connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC	2	GND
3	USB_DATA-	4	USB_DATA+
5	USB_DATA+	6	USB_DATA-
7	GND	8	VCC

<b>USB4: External USB 2.0 type A Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC	2	DATA-
3	DATA+	4	GND

<b>USB3_34: Internal USB 3.0 Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC	11	USB_DATA+
2	USB3_RX-	12	USB_DATA-
3	USB3_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	USB_DATA-	18	USB3_RX-
9	USB_DATA+	19	VCC
10	NC		

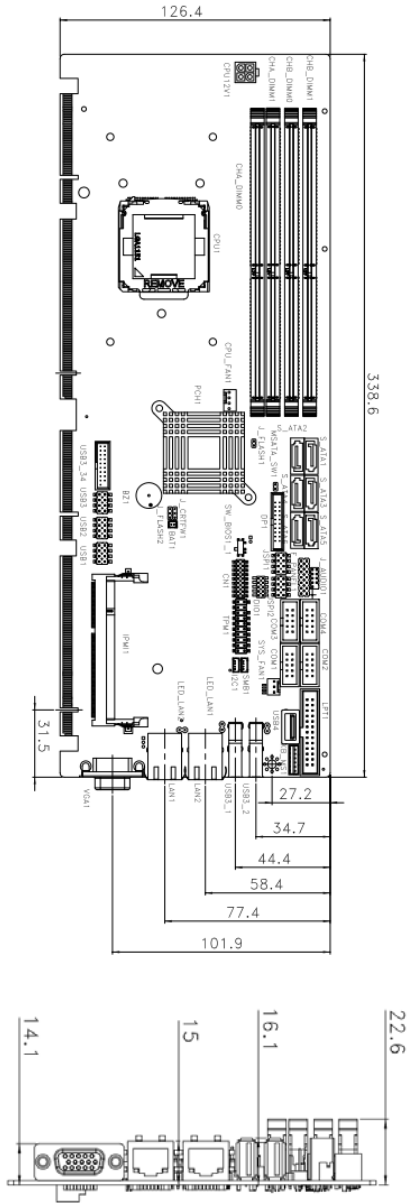
<b>LAN1, LAN2: RJ45 LAN connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	MDIA3-	5	MDIA1+
2	MDIA3+	6	MDIA2+-
3.	MDIA2-	7	MDIA0-
4.	MDIA1-	8	MDIA0+

<b>USB3_1, USB3_2: Internal USB 3.0 connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VBUS	2	D-
3	D+	4	GND
5	STDA_SSRX_N	6	STDA_SSRX_P
7	GND_DRAIN	8	STDA_SSTX_N
9	STDA_SSTX_P		

<b>VGA1: VGA connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	NC	12	DDCDA
13	HSYNC	14	VSYNC
15	DDCCLK		



# Board Layout: Jumper and Connector Locations



(Unit: mm)