

**Full-size PICMG 1.3 CPU card supports LGA1150 Intel® Core™ i7/i5/i3/  
Pentium® and Celeron® CPU per Intel® Q87, DDR3, VGA, IDP,  
Dual Intel® PCIe GbE, SATA 6Gb/s, mSATA, mini PCIe,  
RS-232, Audio, iRIS-2400 and RoHS**

# **PCIE-Q87-i2**

## **Quick Installation Guide**

**Version 1.0**

Feb 10, 2014.

### **Package List**

PCIE-Q87-i2 package includes the following items:

- 1 x PCIE-Q87-i2 single board computer
- 1 x Dual RS-232 cable (P/N: 19800-000051-RS)
- 2 x SATA cable (P/N: 32000-062800-RS)
- 1 x USB cable (P/N: 19800-003100-100-RS)
- 1 x Utility CD
- 1 x QIG (Quick Installation Guide)



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## Specifications

- CPU:  
LGA1150 Intel® 4th generation Core™ i7/i5/i3/ Pentium®/ Celeron® processor supported
- PCH: Intel® Q87
- Memory:  
Four 240-pin 1600/1333MHz dual-channel DDR3 & DDR3L SDRAM unbuffered DIMMs support up to 32GB
- BIOS: UEFI BIOS
- Graphic Engine:  
Intel® HD Graphics Gen 7.5 support for DX11.1 and OpenCL 1.2, OpenGL 3.2 Full MPEG2, VC1, AVC Decode
- Display Output:  
VGA (Up to 1920x1200 @ 60 Hz)  
iDP interface for HDMI, LVDS, VGA, DVI, DP (Up to 3840x2160 @60 Hz)
- Ethernet:  
LAN1: Intel® I217LM Clarkville-V with Intel® iAMT 9.0 support  
LAN2: Intel® I210 PCIe controller
- Super IO: Fintek F81866
- EC: IWDD
- Digital I/O: 8-bit digital I/O (4-bit input / 4-bit output)
- Audio: Supports by IEI AC-KIT-892HD audio kit
- I/O Interface:  
4 x RS-232  
1 x RS-422/485  
1 x LPT  
1 x 6-pin wafer for KB/MS  
1 x mSATA (colay SATA port 6)  
6 x SATA 6GB/s (RAID 0, 1, 5, 10 supported)  
8 x USB 2.0 (4 by pin header, 4 by backplane pin header)  
4 x USB 3.0 (2 on rear IO, 4 by pin header)

- Watchdog Timer:  
Software programmable support 1~255 sec. system reset
- FAN:  
1 x 4-pin CPU fan connector  
1 x 3-pin system fan connector
- 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)
- 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
- IPMI: 1 x DDR3 SO-DIMM slot supports iRIS-2400
- Expansion:  
PCIe signal and PCI signal via golden finger  
PCI signal by ITE 8892 (PCIe to PCI bridge)  
1 x mini PCIe slot supports PCIe x 1, USB devices and mSATA
- Power supply:  
5V/12V, AT/ATX support
- Power Consumption:  
5V@3.55A, 12V@0.37A, Vcore\_12V@7.61A, 3.3V@1.55A,  
5VSB@0.13A  
(3.4GHz Intel® CPU with four GB 1333MHz DDR3 memory)
- Operation Temperature: -20 °C ~ 60 °C
- Operation Humidity: 5% ~ 95%, non-condensing
- Dimensions: 338mm x 126mm
- Weight GW/NW: 1200g / 420g

## Ordering Information

- **PCIE-Q870-i2-R10:**  
Full-size PICMG 1.3 CPU card supports LGA1150 Intel® Core™ i7/i5/i3/Pentium® and Celeron® CPU per Intel® Q87, DDR3, VGA, IDP, Dual Intel® PCIe GbE, SATA 6Gb/s, mSATA, RS-232, mini PCIe, Audio, iRIS-2400 and RoHS
- **32200-074800-RS:** RS-422/485 cable, 200mm
- **19800-010500-100-RS:** USB 3.0 cable with bracket
- **19800-000075-RS:** KB/MS cable with bracket
- **SAIDE-KIT01-R10:** SATA to IDE/CF converter board
- **32102-000100-200-RS:**  
SATA power cable, MOLEX 5264-4P to SATA15P
- **32200-015100-RS:** LPT Cable
- **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
- **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)
- **DP-DP-R10:**  
DisplayPort to DisplayPort converter board (For iEi IDP connector)

## Jumpers setting and connectors

LABEL	FUNCTION
J_ATX_AT1	AT/ATX mode select switch
J_CMOS1	Clear CMOS button
PCIEX16 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
J_AUDIO1	Audio source connector
BAT1	Battery connector
CHASSIS1	Chassis status connector
CPU_FAN1	CPU fan connector
CPU12V1	+12V power connector
CHA_DIMM1,CHA_DIMM2 CHB_DIMM1,CHB_DIMM2	DDR3 DIMM slots
DIO1	Digital I/O connector
DP1	Display port connector
CN3	EC debug connector
F_PANEL1	Front panel connector
IPMI1	Collocation IPMI module (iRIS-2400)
IR1	IrDA Infrared Interface Connector
CN1	I2C Connector
KB_MS1	Keyboard and mouse connector
LED_LAN1	LAN1 link LED connector
LED_LAN2	LAN2 link LED connector
LPT1	Parallel port connector
CN4	M-SATA card connector
COM1, COM3, COM4, COM5	RS-232 serial port connector
COM2	RS-422/485 serial port connector
SATA1, SATA2, SATA3 SATA4, SATA5, SATA6	SATA 6Gb/s drive connectors
CN2	SMBUS connector
SPDIF1	SPDIF connector
JSPI1	Flash SPI ROM connector

JSPI2	Flash EC ROM connector
SYS_FAN1	System fan connector
TPM1	TPM connector
USB1, USB2	Internal USB 2.0 connectors
CN7	Internal USB 3.0 connector
LAN1, LAN2	RJ45 LAN connectors
CN5, CN6	External USB 3.0 ports
VIDEO1	VGA connector

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

<b>PIN NO.</b>	<b>DESCRIPTION</b>
Short 1 - 2	ATX Mode (default)
Short 2 - 3	AT Mode

**J\_CMOS1: Clear CMOS button**

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

<b>PCIEX16 Power: PCIEX16 channel mode setting</b>	
<b>PCIEX16</b>	<b>DESCRIPTION</b>
1 x16 PCIEX16	1 x16 PCIEX16 (default)

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 PCIEX16]	
USB SW1	[+5V DUAL]	
USB SW2	[+5V DUAL]	

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<b>USB SW1, USB SW2: USB power setting</b>	
<b>PCIEX16</b>	<b>DESCRIPTION</b>
+5V DUAL	5V DUAL (default)
+5V	+5V

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 PCIEX16]	
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>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_SDOOUT	4	HDA_SPKR
5	HDA_SDIN	6	HDA_RST#
7	HDA_VCC	8	HDA_GND
9	HDA_+12V	10	HDA_GND

<b>BAT1: Battery Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VBATT	2	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	2	LANE1N
3	LANE1P	4	GND
5	LANE3N	6	LANE3P
7	GND	8	AUX_CTRL_DET_D
9	GND	10	HPD
11	AUXP	12	AUXN
13	GND	14	LANE2P
15	LANE2N	16	GND
17	LANE0P	18	LANE0N
19	+3.3V	20	NC

<b>CN3: 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>IR1: IrDA connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+V5S	2	NC
3	IR-RX	4	IR-RX
5	IR-TX		



<b>CN1: I2C Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	PCH_GP38
3	PCH_GP39	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

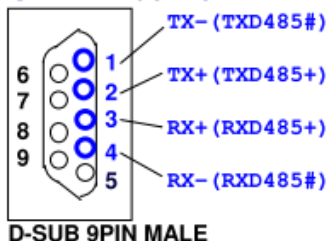
<b>LPT1: Parallel port connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	STROBE#	2	DATA0
3	DATA1	4	DATA2
5	DATA3	6	DATA4
7	DATA5	8	DATA6
9	DATA7	10	ACKNOWLEDGE#
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE#
17	PRINTER SELECT LN#	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND	26	NC

<b>CN4: 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

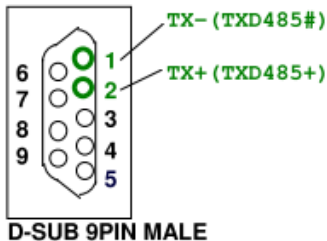
COM1, COM3, COM4, COM5: RS-232 serial port connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RST
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

COM2: RS-422/485 serial port connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RXD485#	2	RXD485+
3	TXD485+	4	TXD485#

#### RS422 Pin define



#### RS485 Pin define



SATA1, SATA2, SATA3, SATA4, SATA5, SATA6: SATA 6Gb/s drive connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SATA_TX+
3	SATA_TX-	4	GND
5	SATA_RX-	6	SATA RX+
7	GND		

CN2: SMBUS connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SMB_DATA
3	SMB_CLK	4	+5V

<b>SPDIF1: SPDIF connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+5V	2	NC
3	SPDIFOUT	4	GND
5	SPDIFIN		

<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	NC
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: 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>CN7: Internal USB 3.0 connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC	2	USB3_RX-
3	USB3_RX+	4	GND
5	USB3_TX-	6	USB3_TX+
7	GND	8	USB_DATA-
9	USB_DATA+	10	NC
11	USB_DATA+	12	USB_DATA-
13	GND	14	USB3_TX+
15	USB3_TX-	16	GND
17	USB3_RX+	18	USB3_RX-
19	VCC	20	NC

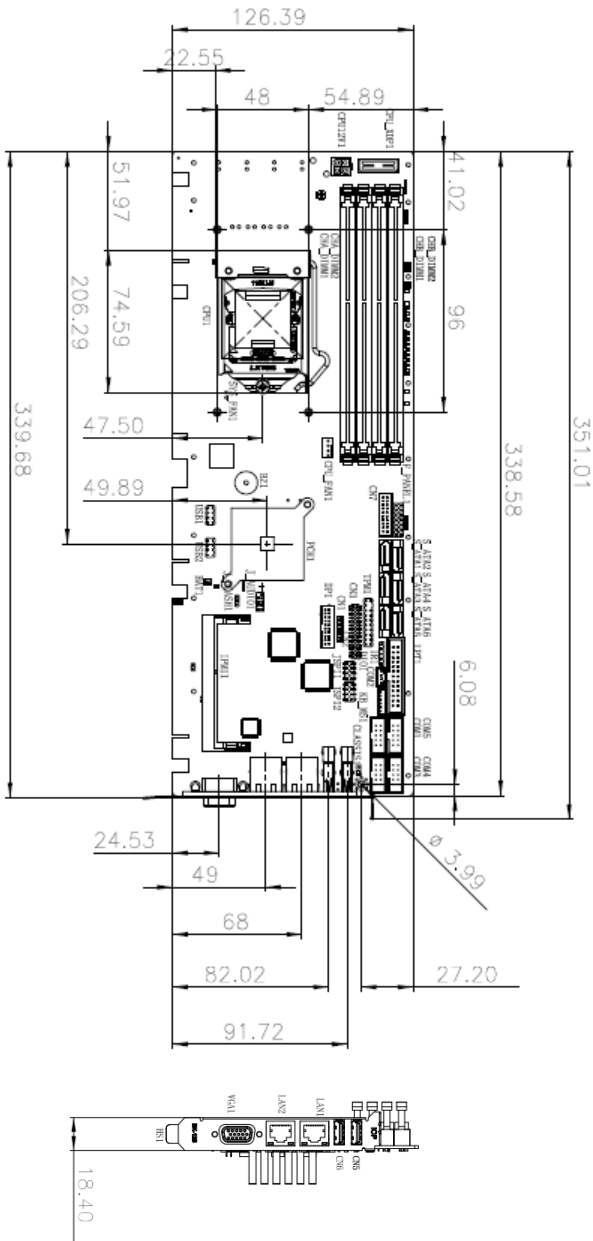
<b>LAN1, LAN2: RJ45 LAN connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	MDIA3-	2	MDIA3+
3	MDIA2-	4	MDIA2+
5	MDIA1-	6	MDIA1+
7	MDIA0-	8	MDIA0+

<b>CN5, CN6: External USB 3.0 ports</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>VIDEO1: 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)