

Half-size PCIe CPU Card with Intel® Celeron® J6412 on-board SoC,
8GB LPDDR4x Memory, HDMI, iDPM, Dual GbE LAN, USB 3.2 Gen 2,
SATA 6Gb/s, COM, M.2, HD Audio and RoHS

PIC0e-EHL-J6412C

Quick Installation Guide

Version 1.0

August 2, 2023

Package List

PIC0e-EHL-J6412C package includes the following items:

- 1 x PIC0e-EHL-J6412C single board computer
- 1 x SATA cable
- 1 x QIG



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Specifications

- CPU:
Intel® Celeron® J6412 on-board SoC
(up to 2.6GHz, quad-core, 1.5M cache, TDP=10W)
- Memory:
On-board 8GB 3200 MHz LPDDR4x (system max. 16GB)
- BIOS:
AMI UEFI BIOS
- Graphics Engine:
Intel® X^e Graphics architecture with SRIOV, Genlock
- Display Output:
Dual independent display
1 x HDMI (up to 4096 x 2304 @ 30Hz)
1 x IEI iDPM 3040 slot (only for IEI eDP/LVDS/VGA module)
- Ethernet:
2 x GbE via Intel® I210AT controller
- External I/O Interface:
2 x USB 3.2 Gen 2x1 Type-A (10Gb/s)
- Internal I/O Interface:
2 x SATA 6Gb/s
4 x USB 2.0 (2x4 pin, p=2.0)
2 x RS-232/422/485 (2x5 pin, p=2.0, RS-485 supports AFC)
2 x RS-232 (2x5 pin, p=2.0)
- Audio:
1 x iAUDIO, support IEI AC-KIT-888S audio module (2x5 pin, p=2.0)
- Front Panel:
1 x Front panel (2x7 pin, p=2.54, power LED, HDD LED, speaker, power button, reset button)
- LAN LED:
2 x LAN LED connector (1x2 pin, p=2.54)
- Expansions:
1 x M.2 2242/2280 M key (PCIe x2, support NVMe)
1 x PCIe x4 (x4 or x1+x1+x1+x1 to backplane)

- Digital I/O:
1 x 12-bit digital I/O (2x7 pin, p=2.0)
- I²C/SMBus:
1 x SMBus (1x4 pin, p=1.25)
1 x I²C (1x4 pin, p=1.25)
- TPM
Support TPM 2.0 (TPM-IN03 module) & Intel PTT
- Fan connector
1 x CPU fan connector (1x4 pin)
1 x System fan connector (1x4 pin)
- Chassis Open
1 x Chassis intrusion (1x2 pin, p=2.54)
- Power Supply:
12V DC power supply
Support AT/ATX mode
ErP/EuP compliant
- Power Consumption:
5V@ 6.39A, 5VSB@ 0.22A, 12V@ 0.96A
(Intel® Celeron® J6412 CPU with 8 GB 3200 MHz LPDDR4x memory, max. loading, EuP mode enabled)
- 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

Ordering Information

- **PIC0e-EHL-J6412C-R10:**
Half-size PCIe CPU card with Intel® Celeron® J6412 on-board SoC, 8GB LPDDR4x memory, HDMI, iDPM, dual GbE LAN, SATA 6Gb/s, USB 3.2 Gen 2, COM, M.2, HD Audio and RoHS
- **32102-000100-200-RS:**
SATA power cable, MOLEX 5264-4P to SATA15P
- **AC-KIT-888S-R10:**
Realtek ALC888S 7.1 Channel HD Audio peripheral board, RoHS
- **iDPM-eDP-R10:**
eDP to eDP converter board (for IEI iDPM slot)
- **iDPM-LVDS-R10:**
eDP to LVDS converter board (for IEI iDPM slot)
- **iDPM-VGA-R10:**
eDP to VGA converter board (for IEI iDPM slot)

All the drivers and utility for the PIC0e-EHL-J6412C are available on IEI Resource Download Center. Type PIC0e-EHL-J6412C 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>



Jumpers Setting and Connectors

LABEL	FUNCTION
J_CMOS1	Clear CMOS button
J_ATX_AT2	AT/ATX power mode setting switch
SW_BIOS1_1	BIOS1/BIOS2 select switch
J_FLASH1	Flash descriptor override setting jumper
RST1	Reset button
IAUDIO1	Audio connector for IEI AC-KIT-888S kit
CPU12V1	ATX power connector
BAT1	Battery connector
BZ1	Buzzer connector
CHASSIS1	Chassis intrusion connector
DIO1	Digital I/O connector
CPU_FAN1, SYS_FAN1	Fan connectors
F_PANEL1	Front panel connector
LED_LAN1, LED_LAN2	LAN LED connectors
PWR_SW1	Onboard power button
COM1, COM2	RS-232 serial port connectors
COM3, COM4	RS-232/422/485 serial port connectors
SATA1, SATA2	SATA 6Gb/s connectors
SATA_PWR1, SATA_PWR2	SATA power connectors
I2C1	I ² C connector
SMB1	SMBus connector
JBIOS2	Flash SPI ROM connector
JEC1	Flash EC ROM connector
EC_DEBUG1	EC debug connector
TPM1	TPM module connector
JUSB3, JUSB4	Internal USB 2.0 connectors
M2_M1	M.2 M-key slot
IDPM1	IEI iDPM slot
LAN1, LAN2	External GbE RJ-45 connectors
USB3_CON1, USB3_CON2	External USB 3.2 Gen 2 connectors
HDMI1	External HDMI connector

J_CMOS1: Clear CMOS Button	
PIN NO.	DESCRIPTION
NC (default)	Keep CMOS Setup (Normal Operation)
Press button	Clear CMOS Setup

J_ATX_AT2: AT/ATX Power Mode Setting Switch	
PIN NO.	DESCRIPTION
Short A - B	ATX Power Mode (default)
Short B - C	AT Power Mode

SW_BIOS1_1: BIOS1/BIOS2 Select Switch	
PIN NO.	DESCRIPTION
Short A - B	BIOS1 (default)
Short B - C	BIOS2

J_FLASH1: Flash Descriptor Override Setting Jumper	
PIN NO.	DESCRIPTION
Short 1 - 2	Disable (default)
Short 2 - 3	Enable

IAUDIO1: Audio Connector for IEI AC-KIT-888S Kit			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HDA_SYNC	2	HDA_CLK
3	HDA_SDOUT	4	HDA_SPKR
5	HDA_SDIN	6	HDA_RST#
7	+5V	8	GND
9	+12V	10	GND

BAT1: RTC Battery Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	VBATT	2	GND

BZ1: Buzzer Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+5V	2	PC_BEEP

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

CHASSIS1: Chassis Intrusion Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	-CASEOPEN	2	GND

DIO1: Digital Input/Output Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	DOUT5	4	DOUT4
5	DOUT3	6	DOUT2
7	DOUT1	8	DOUT0
9	DIN5	10	DIN4
11	DIN3	12	DIN2
13	DIN1	14	DIN0

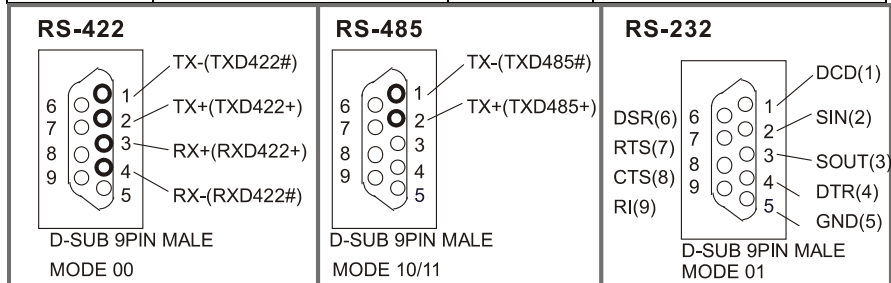
CPU_FAN1, SYS_FAN1: Fan Connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	3	FANIO
2	+12V	4	PWM

LED_LAN1, LED_LAN2: LAN Link LED Connectors			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+3.3V	2	LAN_LED_LNK#_ACT

F_PANEL1: Front Panel Connector					
	PIN	DESCRIPTION	PIN	DESCRIPTION	
PWR LED	1	PWR_LED+	2	SPKR+	SPKR
	3	NC	4	NC	
	5	PWR_LED-	6	NC	
PWR BTN	7	PWR_BTN+	8	SPKR-	
	9	PWR_BTN-	10	NC	
HDD LED	11	HDD_LED+	12	Reset+	RESET
	13	HDD_LED-	14	Reset-	

COM1, COM2: RS-232 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

COM3, COM4: 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



SATA1, SATA2: 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

SATA_PWR1, SATA_PWR2: SATA Power Connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND

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

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

JBIOS2: 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	SPI_CS#	2	+3.3V
3	SPI_SO	4	NC
5	EC_DET_FLASH	6	SPI_CLK
7	GND	8	SPI_SI

EC_DEBUG1: EC Debug Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	4	EDICLK
2	EDICS	5	EDIDI
3	EDIDO	6	GND

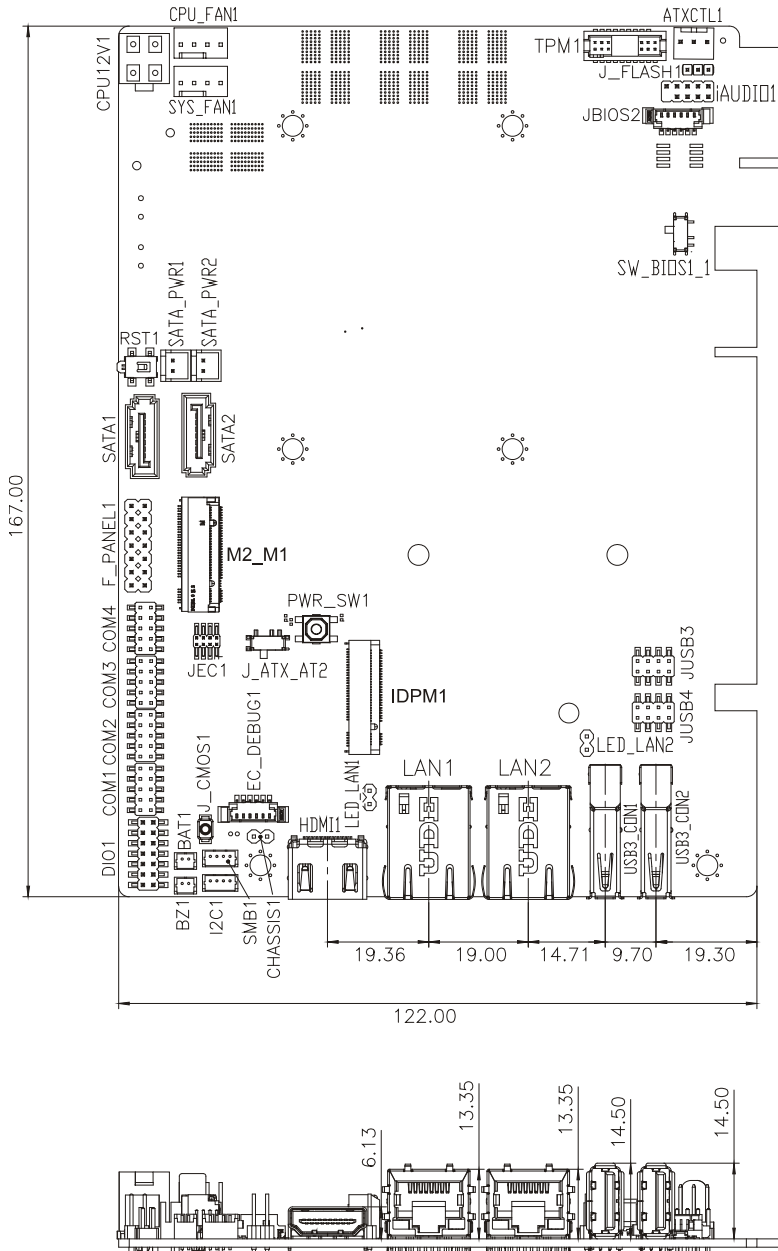
TPM1: TPM Module Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	2	TPM_SPI_CS0_N
3	DEDI_PROG_RST_N	4	TPM_SPI_CS1_N
5	GND	6	+V3P3A
7	SPI_CLK_TPM	8	SPI_TPM_DQ2
9	TPM_SPI_DQ3	10	TPM_SPI_MISO
11	SPI_TPM_HOLD_R_N	12	TPM_SPI_MOSI
13	SPI_TPM_CS2_R	14	GND
15	TPM_WP#	16	NC
17	SPI_TPM_INT_N	18	+V3.3A_1.8A_SPI_CON
19	PLT_RST_N	20	+V3.3A_1.8A_SPI_CON

JUSB3, JUSB4: Internal USB 2.0 Connectors			
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_M1: M.2 M Key 2242/2280 Slot			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+V3.3
3	GND	4	+V3.3
5	NC	6	NC
7	NC	8	NC
9	GND	10	NC
11	NC	12	+V3.3

13	NC	14	+V3.3
15	GND	16	+V3.3
17	NC	18	+V3.3
19	NC	20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	PCIE_1_RX_DN	30	NC
31	PCIE_1_RX_DP	32	NC
33	GND	34	NC
35	PCIE_1_TX_DN	36	NC
37	PCIE_1_TX_DP	38	MKEY_SSD_SLP
39	GND	40	M2_I2C_CLK2
41	PCIE_0_RX_DN	42	M2_I2C_DAT2
43	PCIE_0_RX_DP	44	NC
45	GND	46	NC
47	PCIE_0_TX_DN	48	NC
49	PCIE_0_TX_DP	50	SLOT_RST
51	GND	52	NC
53	PCIE_CLK_DN	54	NC
55	PCIE_CLK_DP	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	M2_IFDET2_N	70	+V3.3
71	GND	72	+V3.3
73	GND	74	+V3.3
75	GND		

Board Layout: Jumper and Connector Locations



(Unit: mm)