IP414

ATX COM Express Type 6 Baseboard

User's Manual

Version 1.0
(July 2023)

iBASE

Compliance

CE

In a domestic environment, this product may cause radio interference in which case users may be required to take adequate measures.

FC

This product has been tested and found to comply with the limits for a Class A device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications.

WEEE

This product must not be disposed of as normal household waste, in accordance with the EU directive of for waste electrical and electronic equipment (WEEE - 2012/19/EU). Instead, it should be disposed of by returning it to a municipal recycling collection point. Check local regulations for disposal of electronic products.

Green IBASE

This product is compliant with the current RoHS restrictions and prohibits use of the following substances in concentrations exceeding 0.1% by weight (1000 ppm) except for cadmium, limited to 0.01% by weight (100 ppm).

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent chromium (Cr6+)
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ether (PBDE)

Important Safety Information

Carefully read the precautions before using the board.

Environmental conditions:

- Use this product in environments with ambient temperatures between 0˚C and 60˚C.
- Do not leave this product in an environment where the storage temperature may be below -20° C or above 80° C. To prevent from damages, the product must be used in a controlled environment.

Care for your IBASE products:

- Before cleaning the PCB, unplug all cables and remove the battery.
- Clean the PCB with a circuit board cleaner or degreaser, or use cotton swabs and alcohol.
- Vacuum the dust with a computer vacuum cleaner to prevent the fan from being clogged.

WARNING

Attention during use:

- Do not use this product near water.
- Do not spill water or any other liquids on this product.
- Do not place heavy objects on the top of this product.

Anti-static precautions

- Wear an anti-static wrist strap to avoid electrostatic discharge.
- Place the PCB on an anti-static kit or mat.
- Hold the edges of PCB when handling.
- Touch the edges of non-metallic components of the product instead of the surface of the PCB.
- Ground yourself by touching a grounded conductor or a grounded bit of metal frequently to discharge any static.

CAUTION

Danger of explosion if the internal lithium-ion battery is replaced by an incorrect type. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions or recycle them at a local recycling facility or battery collection point.

Warranty Policy

- **IBASE standard products:**

  24-month (2-year) warranty from the date of shipment. If the date of shipment cannot be ascertained, the product serial numbers can be used to determine the approximate shipping date.

- **3rd-party parts:**

  12-month (1-year) warranty from delivery for the 3rd-party parts that are not manufactured by IBASE, such as CPU, CPU cooler, memory, storage devices, power adapter, panel and touchscreen.

* PRODUCTS, HOWEVER, THAT FAIL DUE TO MISUSE, ACCIDENT, IMPROPER INSTALLATION OR UNAUTHORIZED REPAIR SHALL BE TREATED AS OUT OF WARRANTY AND CUSTOMERS SHALL BE BILLED FOR REPAIR AND SHIPPING CHARGES.

Technical Support & Services

1. Visit the IBASE website at www.ibase.com.tw to find the latest information about the product.
2. If you need any further assistance from your distributor or sales representative, prepare the following information of your product and elaborate upon the problem.
   - Product model name
   - Product serial number
   - Detailed description of the problem
   - The error messages in text or in screenshots if there is any
   - The arrangement of the peripherals
   - Software in use (such as OS and application software, including the version numbers)
3. If repair service is required, you can download the RMA form at http://www.ibase.com.tw/english/Supports/RMAService/. Fill out the form and contact your distributor or sales representative.

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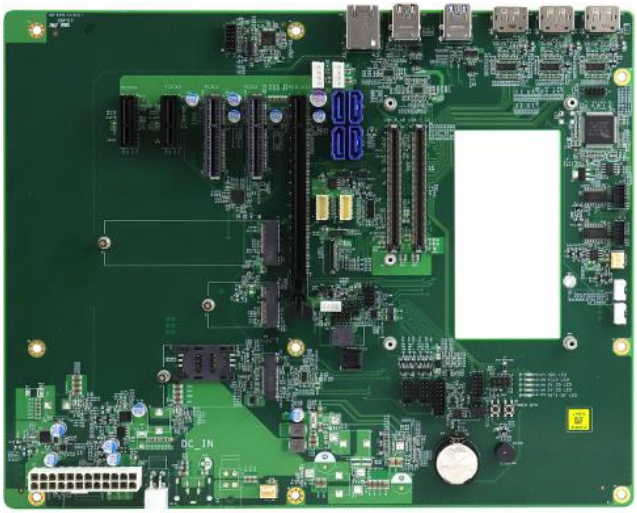
Chapter 1
General Information

The information provided in this chapter includes:

- Features
- Specifications
- Board View
- Board Dimensions

1.1 Introduction

IP414 / IP414-DC is a carrier board with ATX form factor for COM Express Type 6 CPU module; it is compatible with the ET980 COMe module and features expansion slots including PCIe (x1), PCIe (x4) PCIe (x16) and M.2 E-Key / B-Key / M-Key and video outputs (eDP / LVDS, DP++, VGA).



IP414

1.2 Features

- Supports 2x PCIe (x1) 2x PCIe (x4)and 1x PCIe (x16)
- Data transmission and I/O ports: USB 3.0, USB 2.0, 2.5Gb LAN, DisplayPort, audio
- On-board headers for serial ports and eDP / LVDS / audio derived from the COMe module ET980

1.3 Specifications

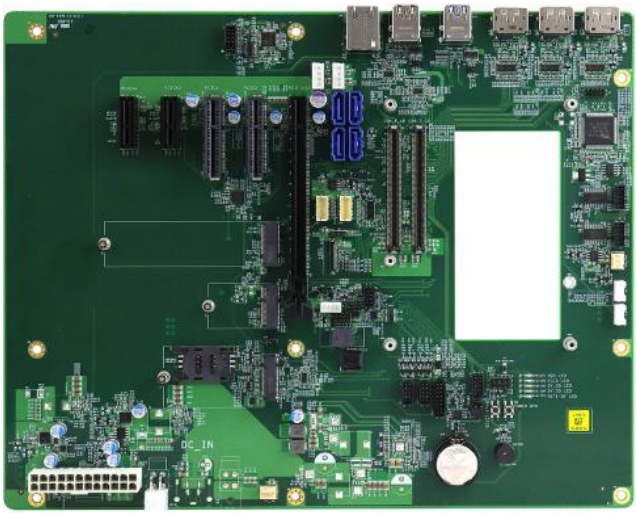
Models	• **IP414** (supports ATX Power) • **IP414-DC** (supports DC-In)
Form Factor	ATX COM Express Type 6 baseboard
Dimensions	305 x 244 mm (12” x 9.61”)
RoHS	Yes
I/O Ports / Connectors	
Power	• ATX Power • DC-In (If your CPU module supports 12V only, please use a 12V power adaptor to avoid malfunction or any damage to your equipment.)
Video Output	• 3x DisplayPort • 1x VGA • 1x 24-bit dual channel LVDS • 1x eDP
LAN	• Derived from COMe module as 2.5GbE #1
USB	• Derived from COM Express module • 2x USB 2.0 ports (2 for USB 2.0 @ M.2, 2 for internal box headers) • 1x USB 2.0 port • 3 x USB 3.2 ports (3 for standard USB 3.2 @ edge I/O)
SATA	• 4 for SATA 3.0 [blue] connector
Serial	• COM1 / COM2 (DF11 2x5 box header) (from Super I/O) • COM3 / COM4 (DF11 2x5 box header) (from COMe, Tx/Rx only, TTL)
Audio	• ALC888S • DF11 2x6 pin box header

Battery for RTC/CMOS	1 x Lithium battery cell for RTC of COM Express module
Mini Type Slots	• 1x M.2 (B3052) • 1x M.2 (M2080) • 1x M.2 (E2230)
Expansion Slots	• 1 x PCIe (x16) slot • 2 x PCIe (x4) slot • 2 x PCIe (x1) slot
Environment	
Temperature	• Operation: 0 ~ 60 °C • Storage: -20 ~ 80 °C
Relative Humidity	10 ~ 90 %

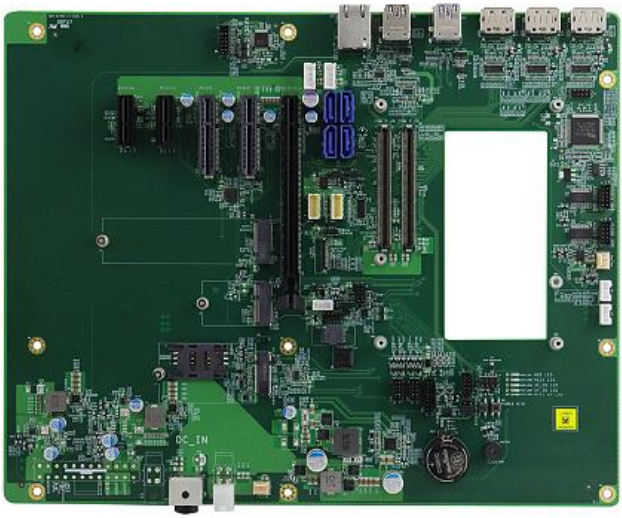
All specifications are subject to change without prior notice.

Board View

Top View



IP414



IP414-DC

I/O View

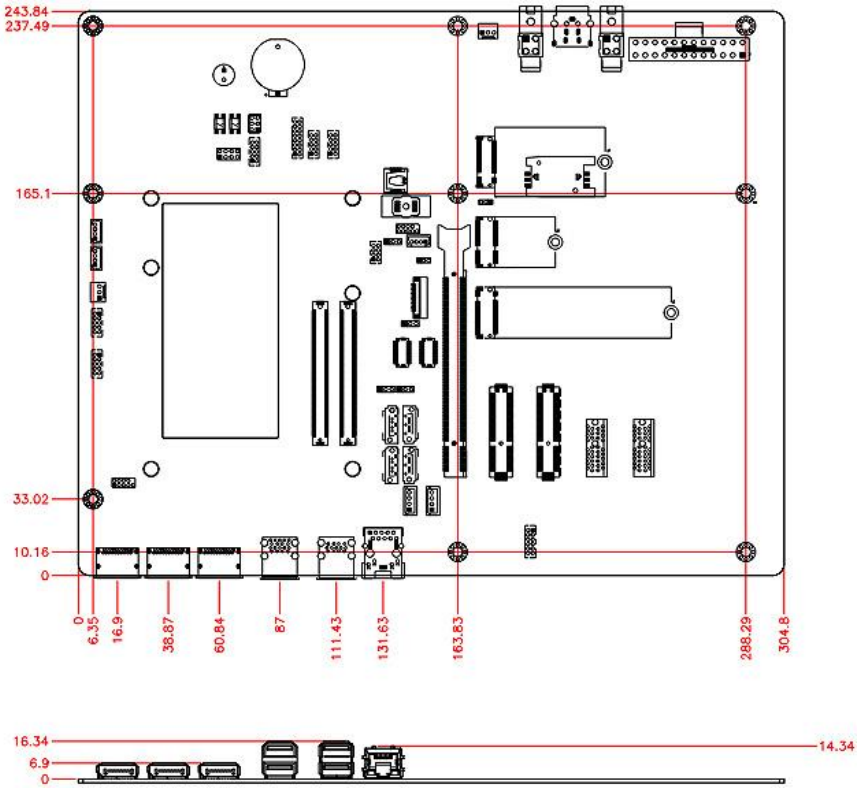
No.*	Connector
1	DP connector x 3
2	USB 3.2 connector x 2
3	USB 3.2 + USB 2.0 Type A stack connector
4	RJ45 connector (2.5G)

* Listed from left to right positions.

DC-In Power DIN 4P 8V~20V Input

*Warning: The DC-in power connector can be used only with COM Express Modules that supports modules 8V~20V power. If your CPU module supports 12V only, please use a 12V power adaptor to avoid malfunction or any damage to your equipment (e.g., ET980).

1.4 Dimensions



Chapter 2
Hardware Configuration

This section provides information on jumper settings and connectors on the IP414 in order to set up a workable system.

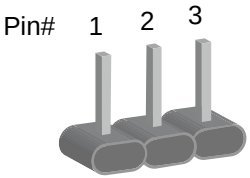
- Jumper and connector locations
- Jumper settings and information of connectors

2.1 Setting the Jumpers

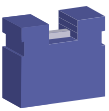
Set up and configure your IP414 by using jumpers for various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your use.

2.2.1 How to Set Jumpers

Jumpers are short-length conductors consisting of several metal pins with a non-conductive base mounted on the circuit board. Jumper caps are used to have the functions and features enabled or disabled. If a jumper has 3 pins, you can connect either PIN1 to PIN2 or PIN2 to PIN3 by shorting.

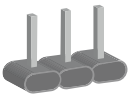
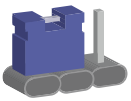
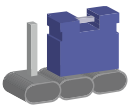
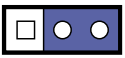


A 3-pin jumper



A jumper cap

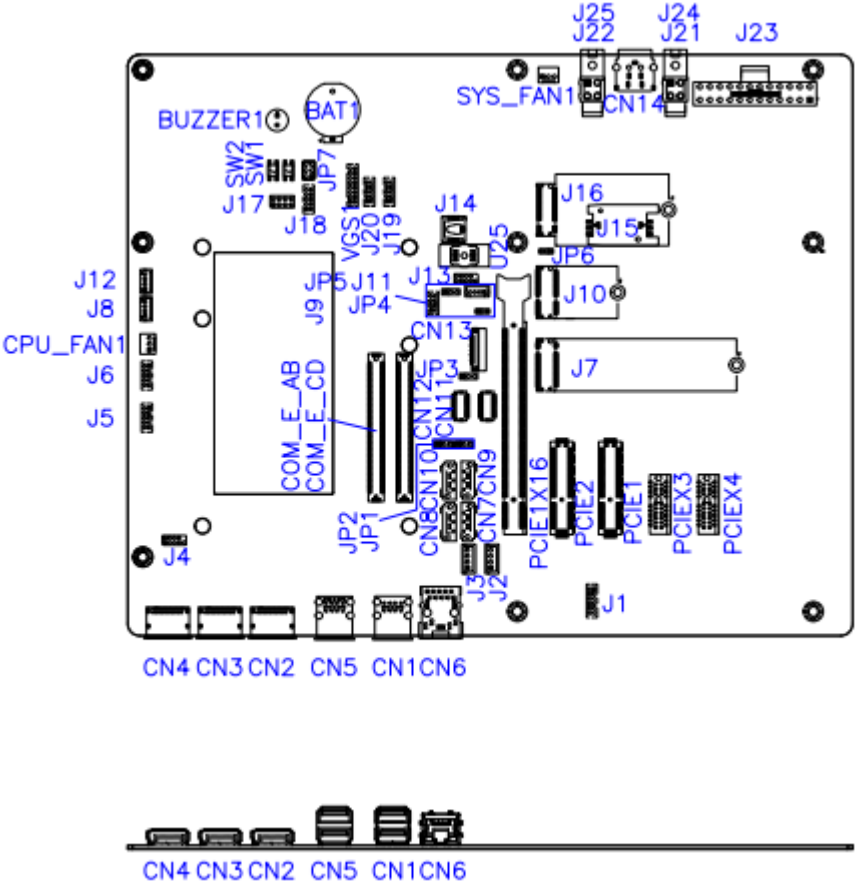
Refer to the illustration below to set jumpers.

Pin closed	Oblique view	Illustration
Open		
1-2		
2-3		

When two pins of a jumper are encased in a jumper cap, this jumper is **closed**, i.e. turned **On**.

When a jumper cap is removed from two jumper pins, this jumper is **open**, i.e. turned **Off**.

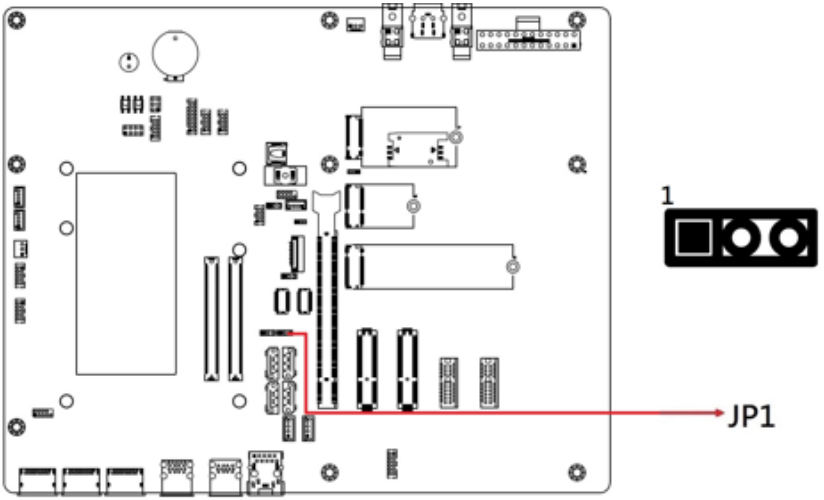
2.2 Connector Locations on IP414



2.3 Jumpers Quick Reference

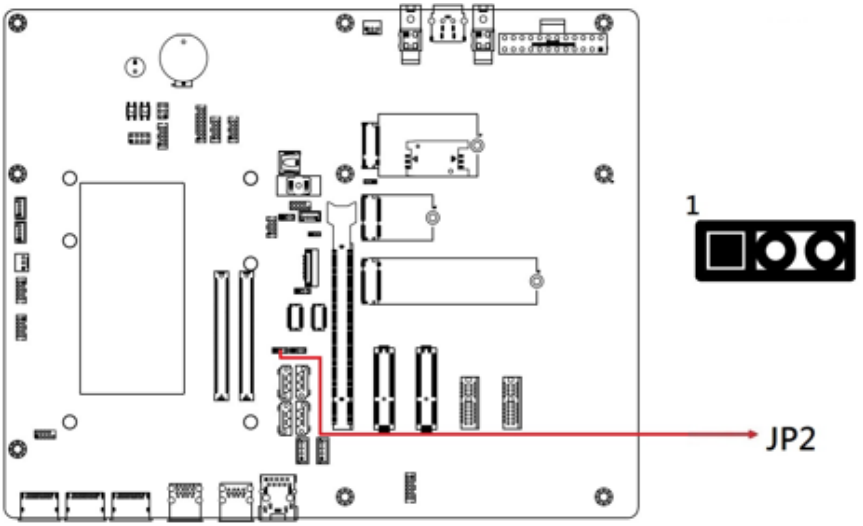
Function	Jumper	Page
LVDS Panel Power	JP1	11
eDP / LVDS Selection	JP2	12
eDP Panel Brightness Selection	JP3	13
LVDS Backlight Power Selection	JP4	14
eDP Panel Power	JP5	15

2.3.1 LVDS Panel Power (JP1)



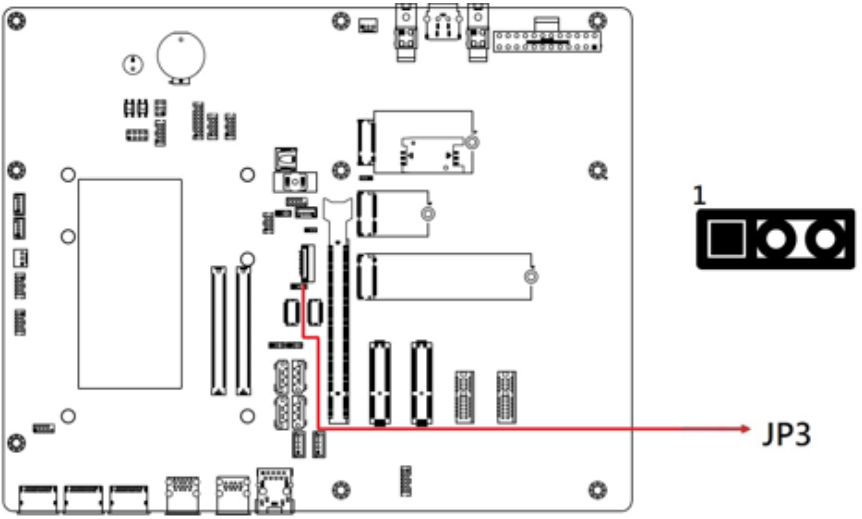
Function	Pin closed	Illustration
3.3V (default)	1-2	1
5V	2-3	1

2.3.2 eDP / LVDS Selection (JP2)



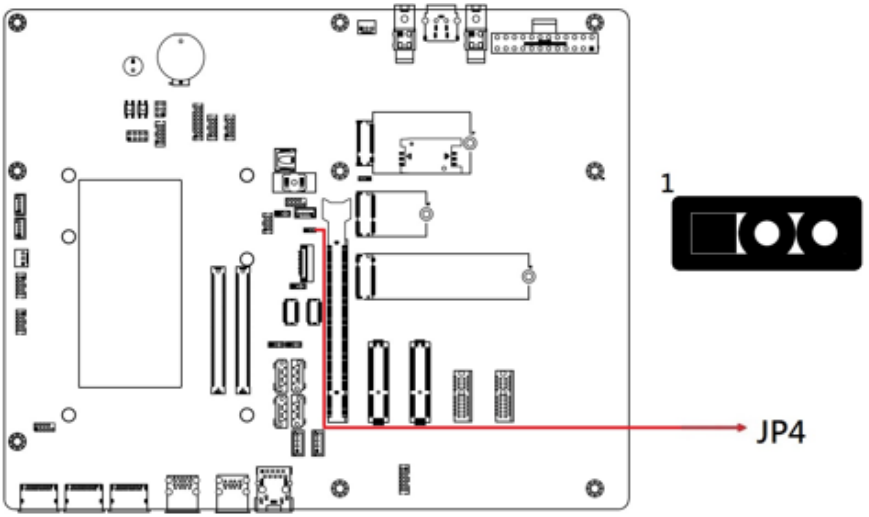
Function	Pin closed	Illustration
eDP (default)	1-2	1
LVDS	2-3	1

2.3.3 eDP Panel Brightness Selection (JP3)



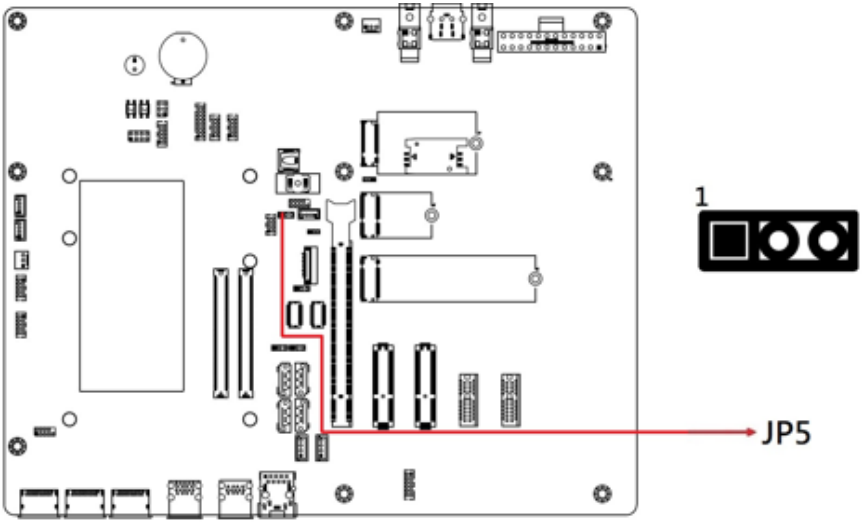
Function	Pin closed	Illustration
5V (default)	1-2	1
12V	2-3	1

2.3.4 LVDS Backlight Power Selection (JP4)



Function	Pin closed	Illustration
3.3V (default)	1-2	 1
5V	2-3	 1

2.3.5 eDP Panel Power (JP5)



Function	Pin closed	Illustration
3.3V (default)	1-2	1
5V	2-3	1

2.4 Connectors Quick Reference

Function	Connector Name	Page
USB 3.0 Connector	CN1, CN5	17
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2.5G Gigabit LAN	CN6	19
SATA Connectors	CN7, CN8, CN9, CN10	20
LVDS Connector	CN11, CN12	21
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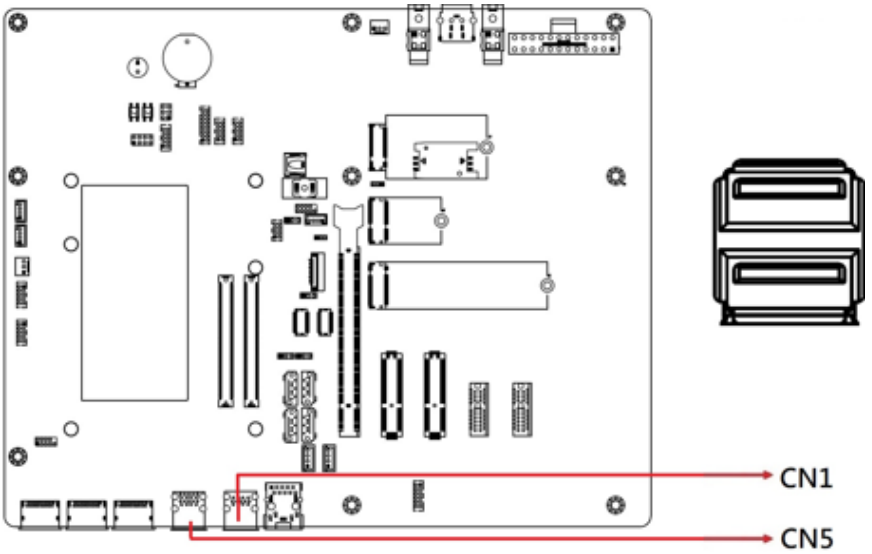
USB 2.0 Connector	J9	29
M.2 E-Key (2230) Connector, PCIe (x1), USB 2.0	J10	31
Panel Inverter Power Connector	J11	32
M.2 B-Key (3052) Connector PCIe (x1), USB 2.0, USB 3.0 SIM Card	J16	33
System Function Connector	J17	34
Digital I/O Connector	J18	35
COM3 & COM4 RX/TX Port	J19, J20	36
ATX Power Connector	J23	37
ATX 12V Power Connector	J24	38
PCIe (x4) Slot	PCIE1, PCIE2	39
PCIe (x16) Slot	PCIEX16	40
PCIe (x1) Slot	PCIE3, PCIE4	41

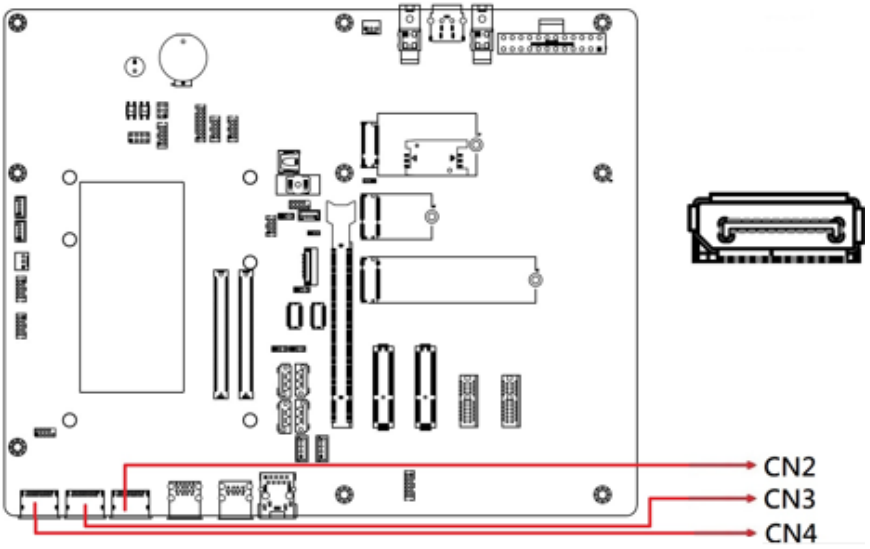
2.4.1 USB 3.0 Connector (CN1, CN5)



Note: CN1 only.1 Port USB 3.0

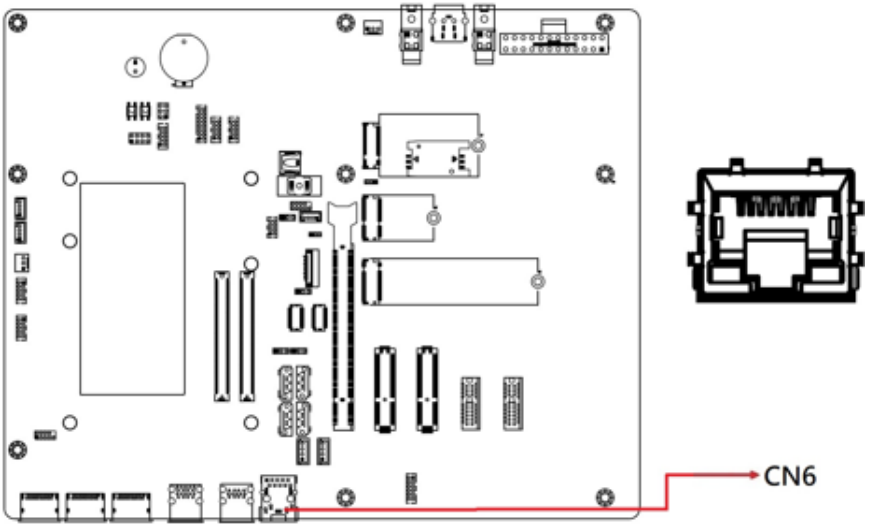
Pin	Assignment	Pin	Assignment
1	+5V	5	SSRX-
2	Data-	6	SSRX+
3	Data+	7	Ground
4	Ground	8	SSTX-
		9	SSTX+

2.4.2 DisplayPort (CN2, CN3, CN4)



Pin	Assignment	Pin	Assignment
1	LAN0_P	11	GND
2	GND	12	LAN3_N
3	LAN0_N	13	CONFIG
4	LAN1_P	14	GND
5	GND	15	AUXP
6	LAN1_N	16	GND
7	LAN2_P	17	AUXN
8	GND	18	Hot Plug
9	LAN2_N	19	GND
10	LAN3_P	20	+5V

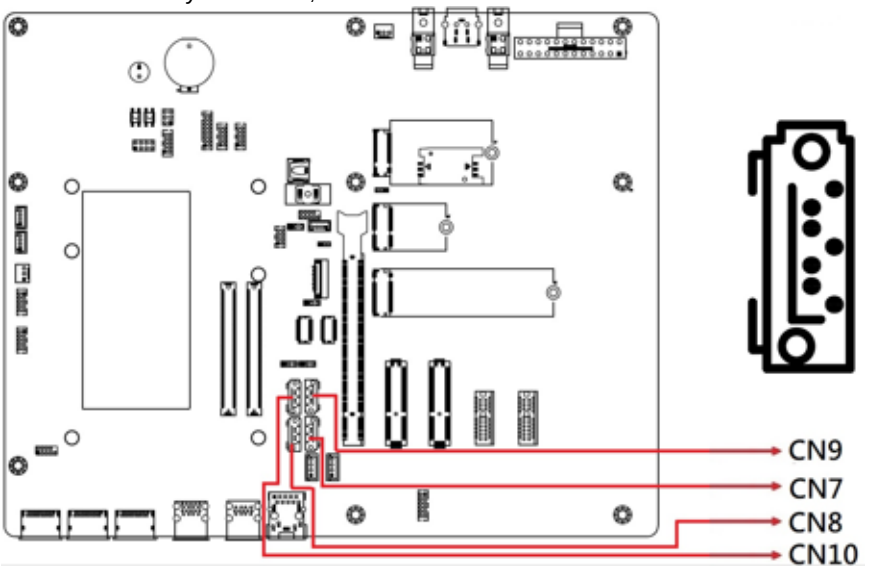
2.4.3 2.5G Gigabit LAN (CN6)



Pin	Assignment
1	MDI0+
2	MDI0-
3	MDI1+
4	MDI2+
5	MDI2-
6	MDI1-
7	MDI3+

2.4.4 SATA Connectors (CN7, CN8, CN9, CN10)

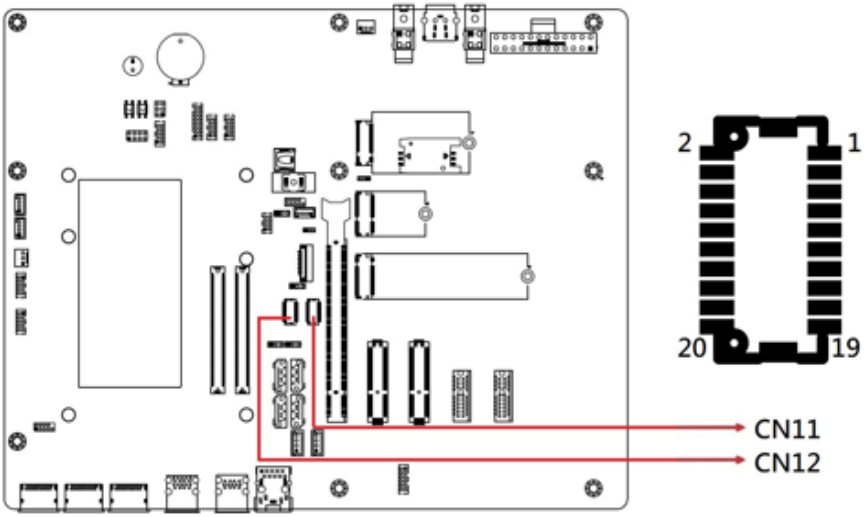
Note: ET980 only.FOR CN7,CN9



Pin	Assignment	Pin	Assignment
1	Ground	5	RX-
2	TX+	6	RX+
3	TX-	7	Ground
4	Ground		

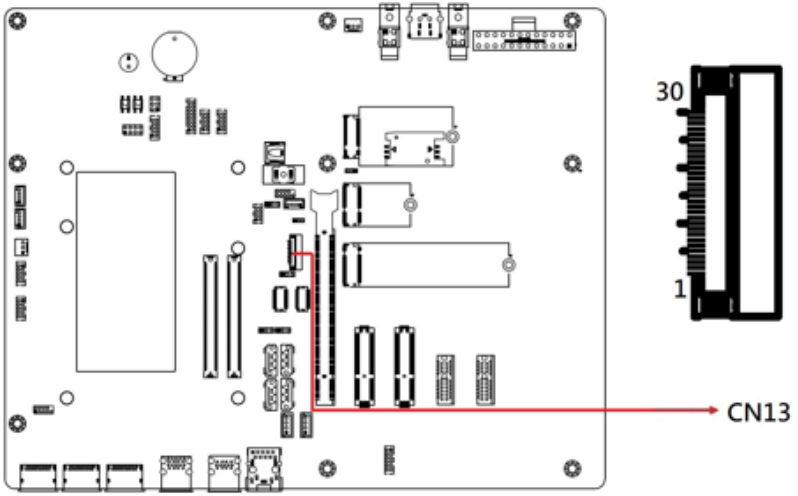
2.4.5 LVDS Connector (CN11, CN12)

Note: CN11 (Channel2), CN12 (Channel1)



Pin	Signal Name	Pin	Signal Name
1	TX0P	2	TX0N
3	Ground	4	Ground
5	TX1P	6	TX1N
7	Ground	8	Ground
9	TX2P	10	TX2N
11	Ground	12	Ground
13	CLKP	14	CLKN
15	Ground	16	Ground
17	TX3P	18	TX3N
19	Power	20	Power

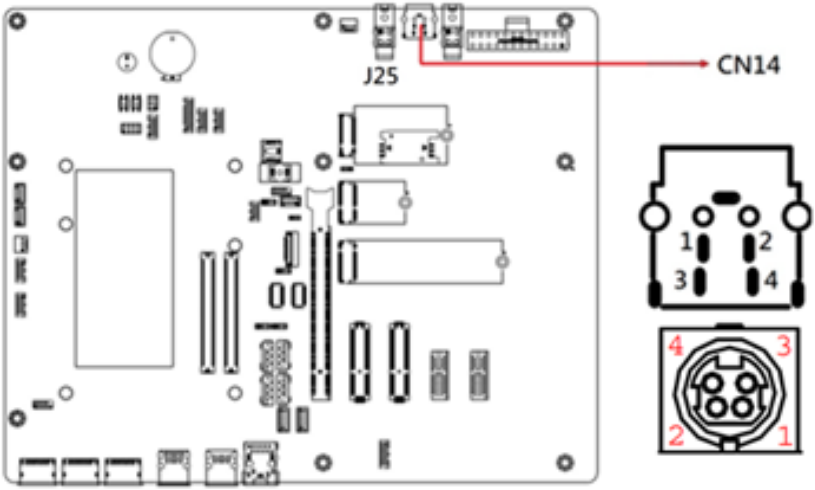
2.4.6 eDP Connector (CN13)



Pin	Signal Name	Pin	Signal Name
1	NC	16	Ground
2	BL_Power	17	NC
3	BL_Power	18	Panel_VDD
4	BL_Power	19	Panel_VDD
5	BL_Power	20	Ground
6	NC	21	AUX_N
7	NC	22	AUX_P
8	Brightness	23	Ground
9	Bklt_en	24	TX0_P
10	Ground	25	TX0_N
11	Ground	26	Ground
12	Ground	27	TX1_P
13	Ground	28	TX1_N
14	HPD	29	Ground
15	Ground	30	NC

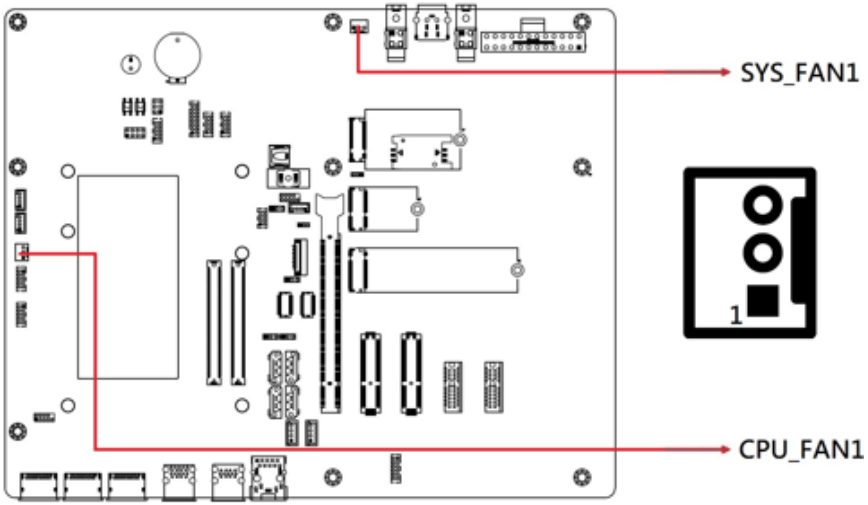
2.4.7 DC-In Power DIN 4P 8V~20V Input (CN14)

Note: DC-in Power Connector (J25 or CN14) is available for **IP414-DC** only.
***Warning:** The DC-in connector can be used only with COM Express Modules that supports modules 8V~20V power. If your CPU module supports 12V only, please use a 12V power adaptor to avoid malfunction or any damage to your equipment.



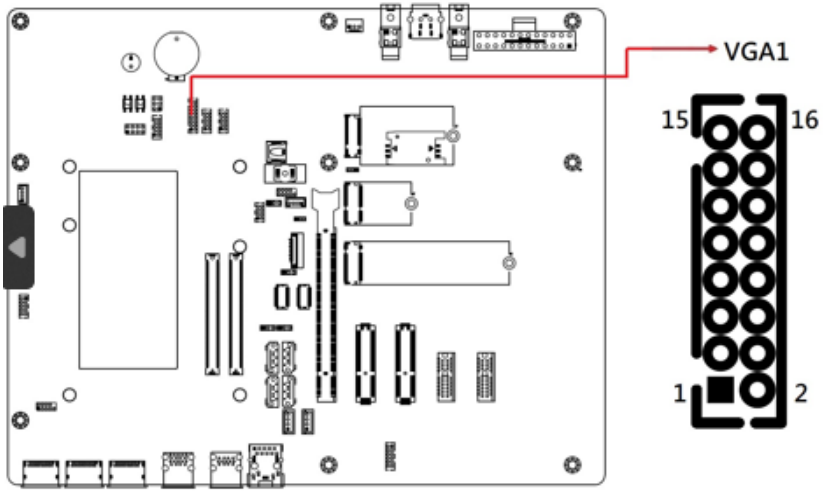
Pin	Assigment
1	Ground
2	Ground
3	+8~20V
4	+8~20V

2.4.8 Fan Power Connector (CPU_FAN1, SYS_FAN1)



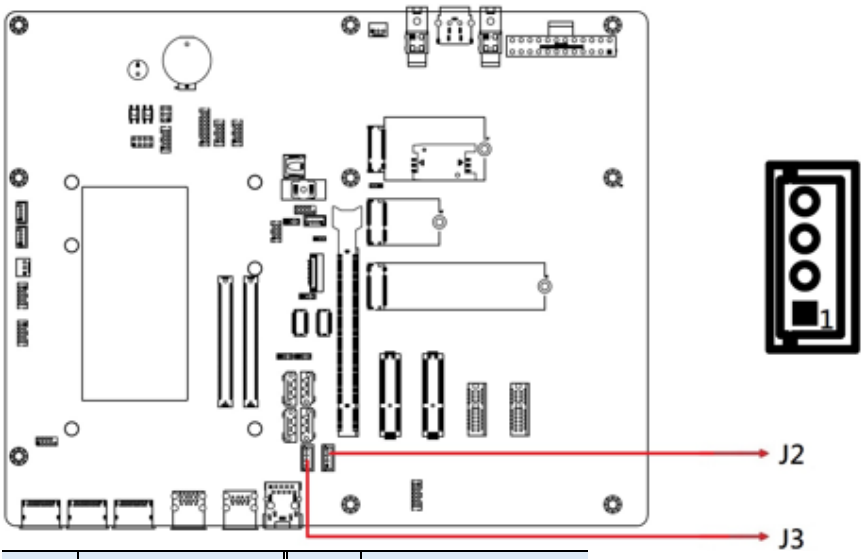
Pin	Assigment	Pin	Assigment
1	Ground	3	NC
2	+12V		

2.4.9 VGA Port (VGA1)



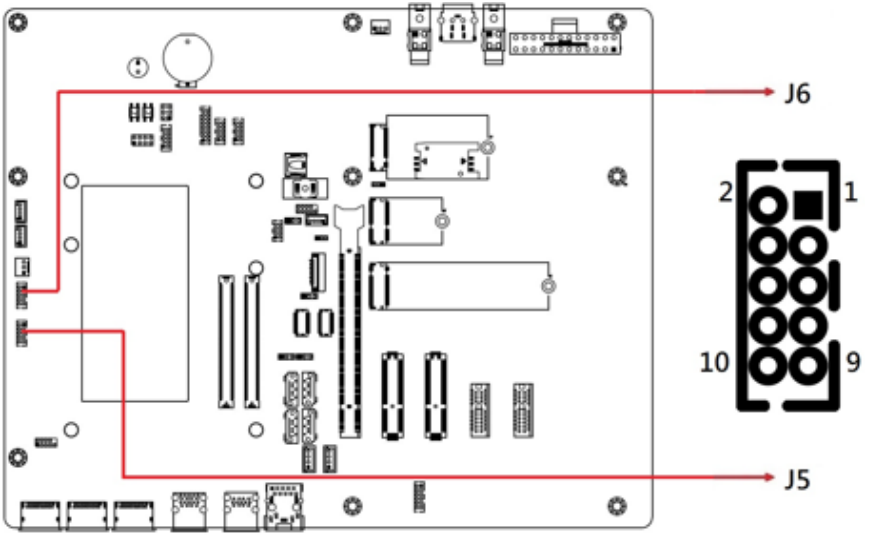
Pin	Signal Name	Pin	Signal Name
1	CRT1_RED	2	5V
3	CRT1_GREEN	4	Ground
5	CRT1_BLUE	6	NC
7	NC	8	CRT1_DDC_DATA_ISO
9	Ground	10	CRT1_HSYN_R
11	Ground	12	CRT1_VSYN_R
13	Ground	14	CRT1_DDC_CLK_ISO
15	Ground	16	NC

2.4.10 SATA Power Connector (J2, J3)



Pin	Signal Name	Pin	Signal Name
1	+5V	3	Ground
2	Ground	4	+12V

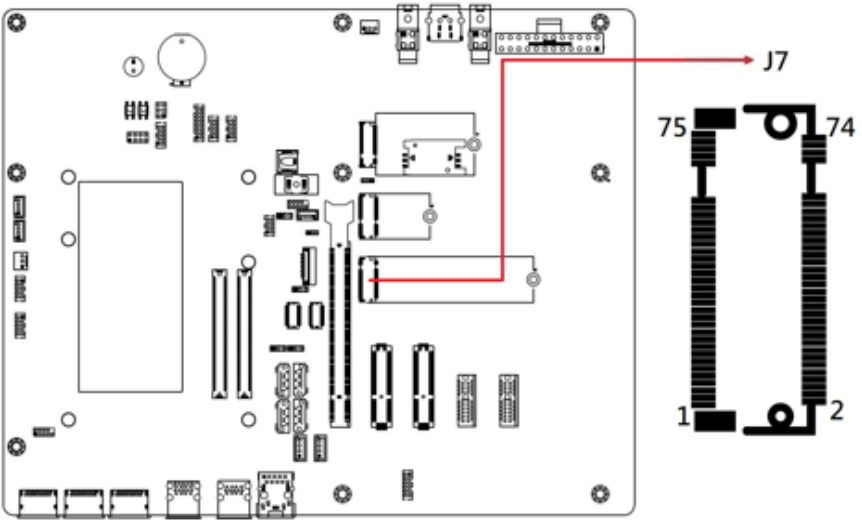
2.4.11 COM1 & COM2 RS-232 Ports (J6, J5)



Pin	Signal Name	Pin	Signal Name
1	Data carrier detect	2	Receive data
3	Transmit data	4	Data terminal ready
5	Ground	6	Data set ready
7	Request to send	8	Clear to send
9	Ring indicator	10	Key

2.4.12 M.2 M-Key 2280 (J7)

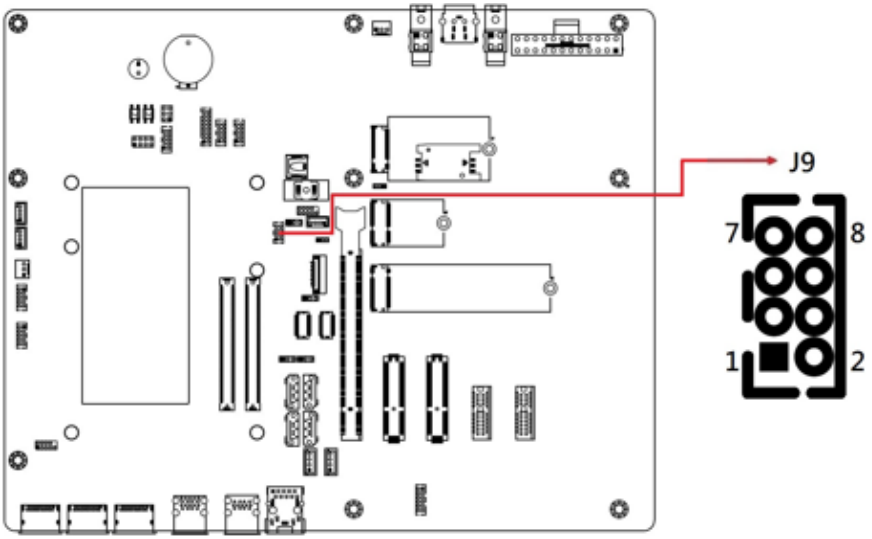
Note: M.2 M-Key (J7) is available for ET980 only.



Pin	Assignment	Pin	Assignment
1	GND	2	+3.3V
3	GND	4	+3.3V
5	PERn3	6	NC
7	PERp3	8	NC
9	GND	10	HDD_LED#
11	PETn3	12	+3.3V
13	PETp3	14	+3.3V
15	GND	16	+3.3V
17	PERn2	18	+3.3V
19	PERp2	20	NC
21	GND	22	NC
23	PETn2	24	NC
25	PETp2	26	NC
27	GND	28	NC
29	PERn1	30	NC
31	PERp1	32	NC
33	GND	34	NC
35	PETn1	36	NC
37	PETp1	38	NC

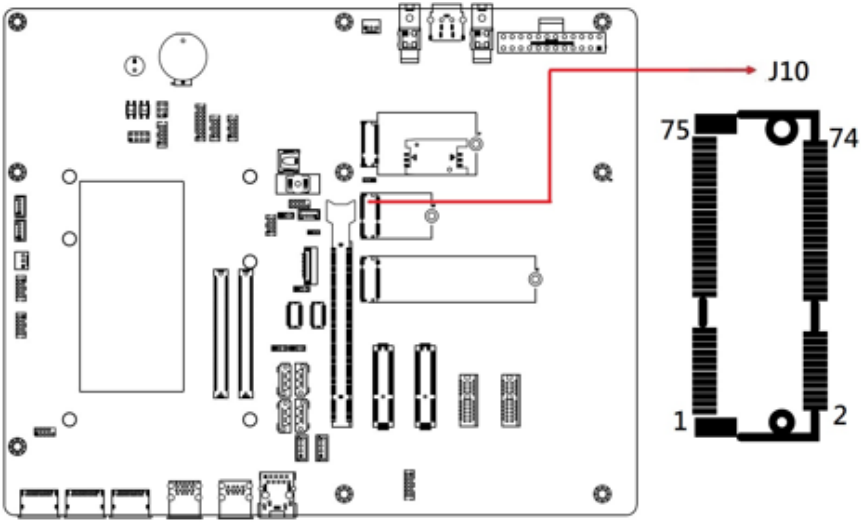
39	GND	40	NC
41	PERn0	42	NC
43	PERp0	44	NC
45	GND	46	NC
47	PETn0	48	NC
49	PETp0	50	PERST#
51	GND	52	CLKREQ#
53	REFCLKn	54	PEWAKE#
55	REFCLKp	56	NC
57	GND	58	NC
	M-KEY		M-KEY
67	NC	68	SUSCLK
69	NC	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		

2.4.13 USB 2.0 Connector (J9)

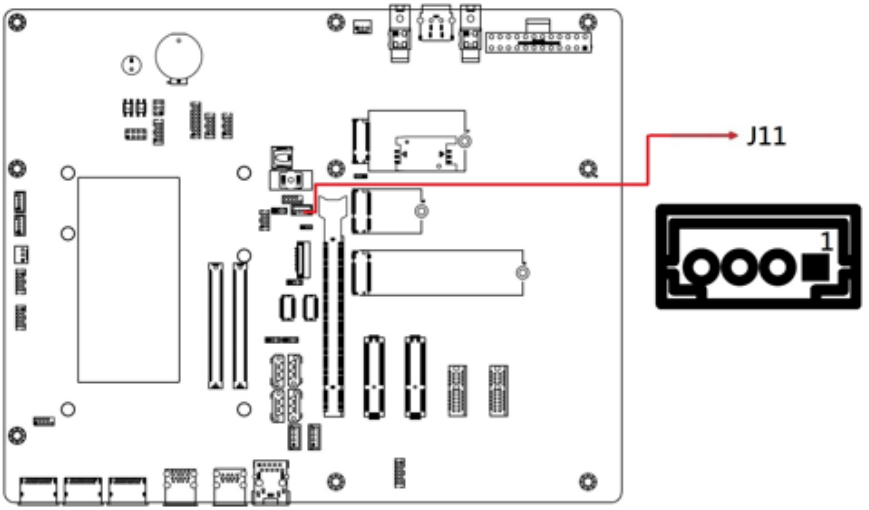


Pin	Signal Name	Pin	Signal Name
1	VCC	2	Ground
3	D0-	4	D1+
5	D0+	6	D1-
7	Ground	8	VCC

2.4.14 M.2 E-Key (2230) Connector PCIe (x1), USB 2.0 (J10)

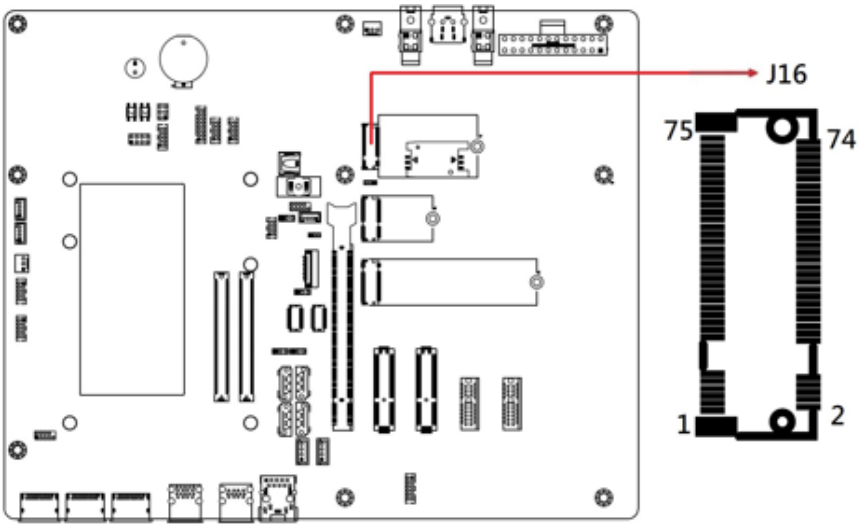


2.4.15 Panel Inverter Power Connector (J11)

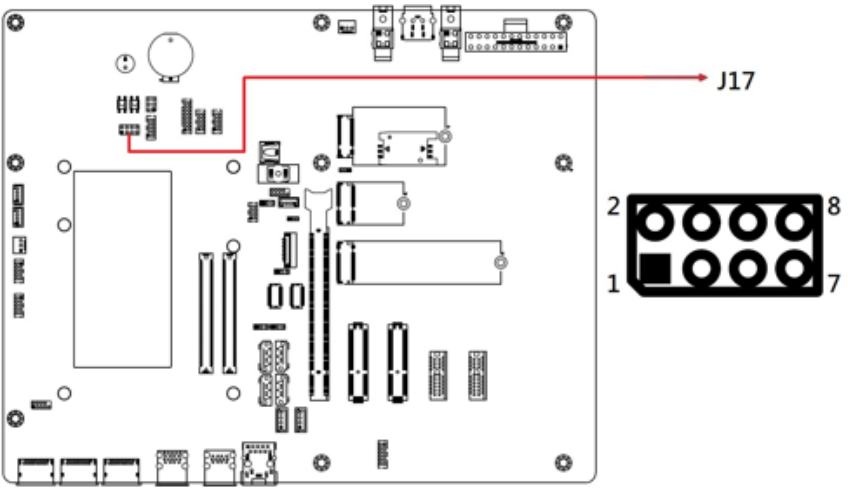


Pin	Signal Name	Pin	Signal Name
1	+12V	3	ADJ
2	Backlight Enable	4	Ground

2.4.16 M.2 B-Key (3052) Connector PCIe (x1), USB 2.0, USB 3.0 SIM Card (J16)



2.4.17 System Function Connector (J17)



Pin	Signal Name	Pin	Signal Name
1	Power BTN	2	Power BTN
3	HDD LED+	4	HDD LED-
5	Reset BTN	6	Reset BTN
7	Power LED+	8	Power LED-

J13 provides light indication of the computer activities and switches to change the computer status.

- **ATX Power ON Switch (Pins 1 and 2)**

  The 2 pins make an “ATX Power Supply On/Off Switch” that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will power off the system.

- **Hard Disk Drive LED Connector (Pins 3 and 4)**

  This LED will flash when the HDD is being accessed.

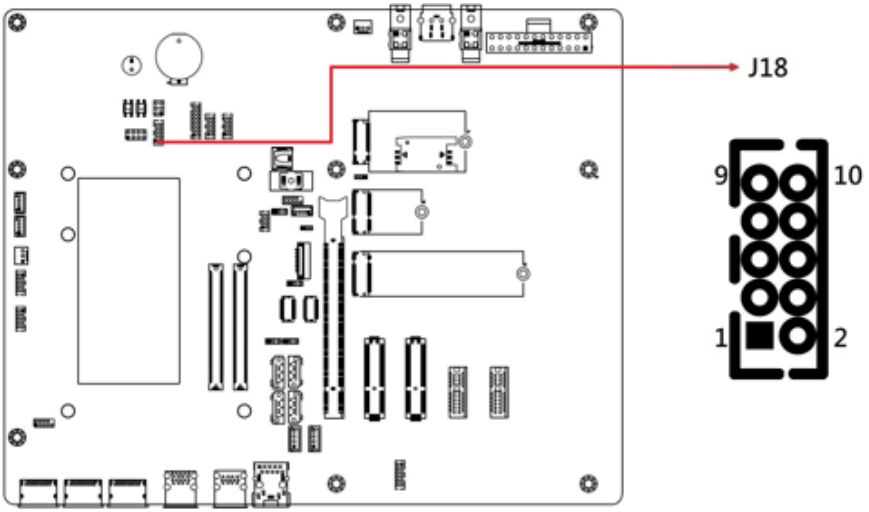
- **Reset Switch (Pins 5 and 6)**

  The reset switch allows you to reset the system without turning the main power switch off and then on again.

- **Power LED (Pins 7 and 8)**

  This connector connects to the system power LED on control panel. This LED will light when the system turns on.

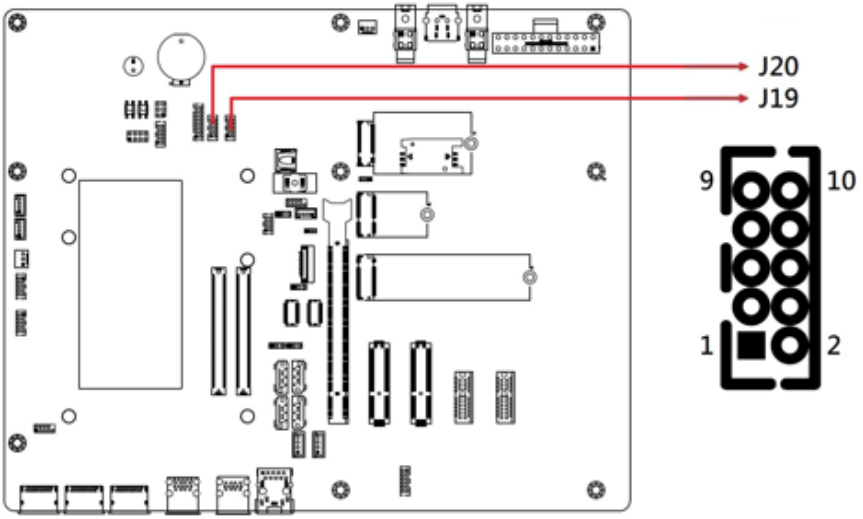
2.4.18 Digital I/O Connector (J18)



Pin	Signal Name	Pin	Signal Name
1	Gorund	2	VCC
3	OUT3	4	OUT1
5	OUT2	6	OUT0
7	IN3	8	IN1
9	IN2	10	IN0

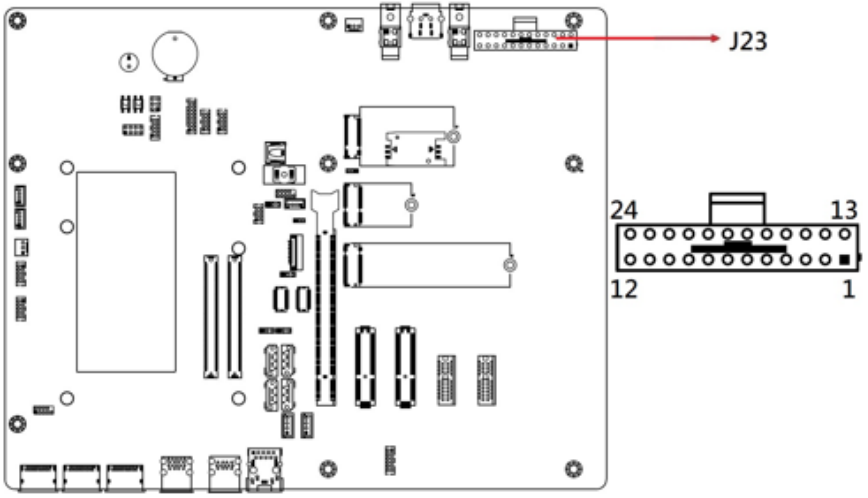
2.4.19 COM3 & COM4 RX/TX Port (J19, J20)

Note: J20 (COM4), J19 (COM3)



Pin	Signal Name	Pin	Signal Name
1	NC	2	RXD, Receive data
3	TXD, Transmit data	4	NC
5	Ground	6	NC
7	NC	8	NC
9	NC	10	NC

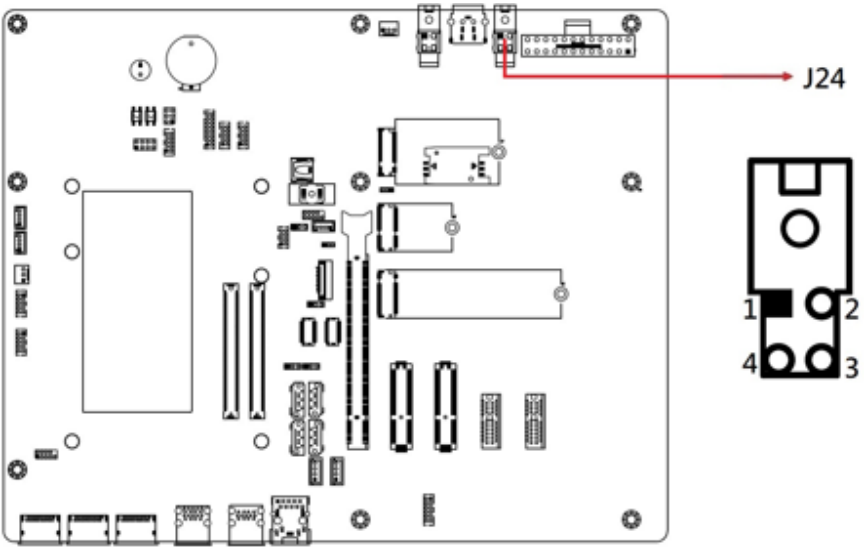
2.4.20 ATX Power Connector (J23)



Note**:** ATX Power Connector (J23, J24) is available for **IP414** only.

Pin	Signal Name	Pin	Signal Name
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	Ground	15	Ground
4	+5V	16	PS-ON
5	Ground	17	Ground
6	+5V	18	Ground
7	Ground	19	Ground
8	Power good	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	Ground

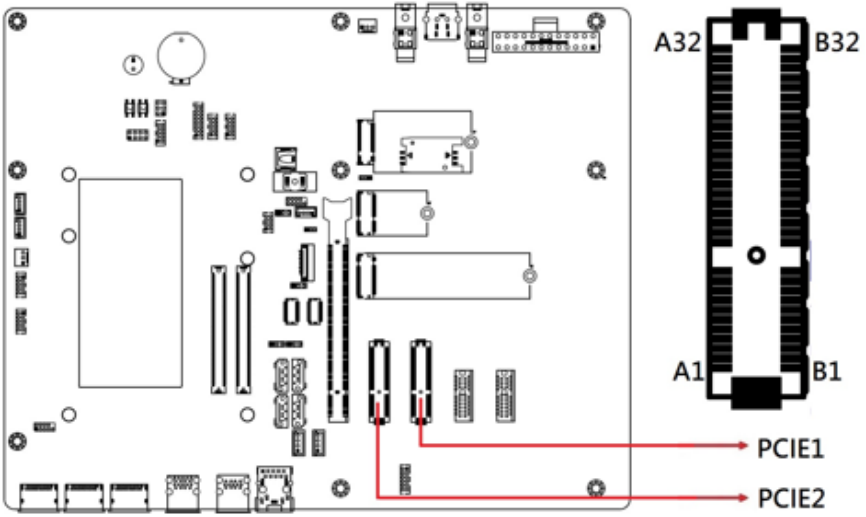
2.4.21 ATX 12V Power Connector (J24)



Pin	Signal Name	Pin	Signal Name
1	Ground	2	Ground
3	+12V	4	+12V

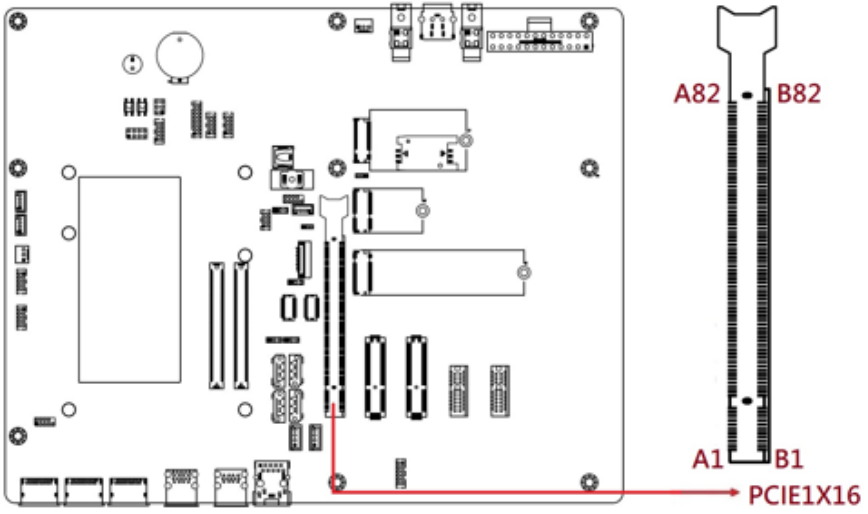
2.4.22 PCIe (x4) Slot (PCIE1, PCIE2)

Note: Available for ET980 only



2.4.23 PCIe (x16) Slot (PCIEX16)

Note: Not supported by ET980



2.4.24 PCIe (x1) Slot (PCIE3, PCIE4)