IP413

ATX COM Express Type 6 Baseboard

User's Manual

Version 1.0
(July 2017)

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.

Table of Contents

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Chapter 1
General Information

The information provided in this chapter includes:

- Features
- Specifications
- Board Overview
- Board Dimensions

1.1 Introduction

IP413 is a ATX COM Express Type 6 baseboard, offering expansion slots like ISA and PCI and rich peripheral ports as the photo shown below. It is able to be operated at the ambient operating temperature ranging from 0 ~ 60 °C and even from -20 ~ 80 °C for storage.

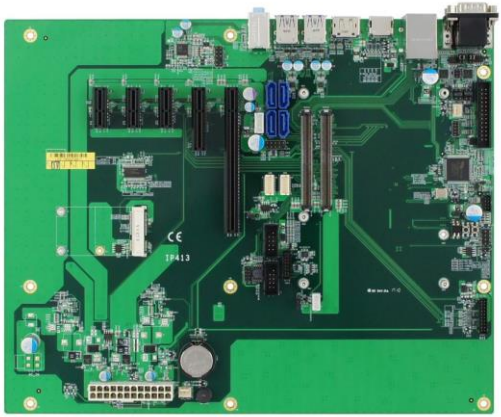


Photo of IP413-ATX

1.2 Features

- 1x PCI-E(x16), 1x PCI-E(x4), 3x PCI-E(x1) expansion slots
- Rich peripheral ports: USB 3.0, USB 2.0, LAN, DP, HDMI, audio jacks, serial COM port
- On-board headers for serial port (from COMe module), PS/2 KB & MS, DVI-D, CRT, and ATX power connector, and COM Express (Type 6) connectors
- ATX power connector / DC-In 12V

1.3 Specifications

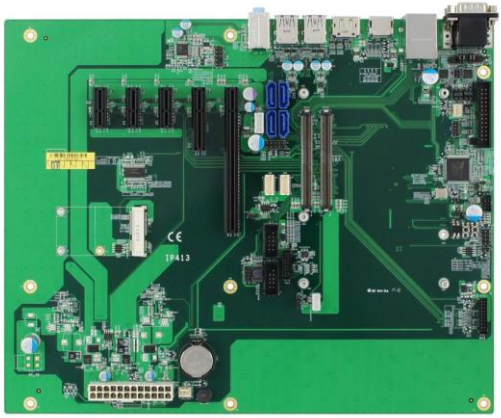
Product Name	IP413
Form Factor	ATX COM Express Type 6 baseboard
Power Supply	ATX Power
Dimensions	305 x 244 mm (12” x 9.61”)
RoHS	Yes
I/O Ports / Connectors	
Power Supply	• ATX Power • DC-In 12V
Display	• 1 x HDMI • 1 x DisplayPort • 1 x DVI-D • 1 x VGA • 1 x LVDS
LAN	1 x RJ45 10/100 Mbps LAN
USB	• 4 x USB 2.0 (2 are on the I/O coastline, and 2 are on-board box-headers.) • 4 x USB 3.0
Serial	**2 x COM ports:** • COM1: RS-232/422/485 (I/O coastline connector) • COM2: RS-232 (full-function) (I/O coastline connector) • COM3 & COM4: RS-232 (TX and RX) (from COMe module, via an on-board box-header)
Audio Jacks	• 1 x Line-In • 1 x Line-Out • 1 x Microphone Input

Keyboard & Mouse	1 x PS/2 keyboard / mouse on-board header
Battery for RTC/CMOS	1 x Lithium battery cell for RTC of COM Express module
Expansion Slots	• 1 x PCIe (x16) slot • 1 x PCIe (x4) slot • 3 x PCIe (x1) slot • 1 x Full-sized mini-PCIe (x1) slot with PCIe only (half-sized mounting hole is reserved.)
Environment	
Temperature	• Operation: 0 ~ 60 °C • Storage: -20 ~ 80 °C
Relative Humidity	10 ~ 90 %

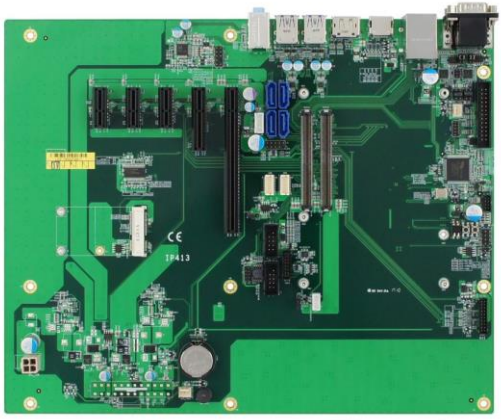
All specifications are subject to change without prior notice.

1.4 Overview

Top View



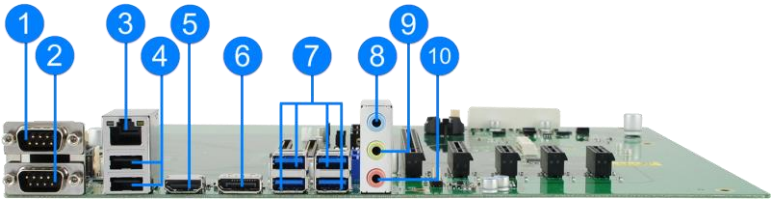
IP413-ATX



IP413-DC

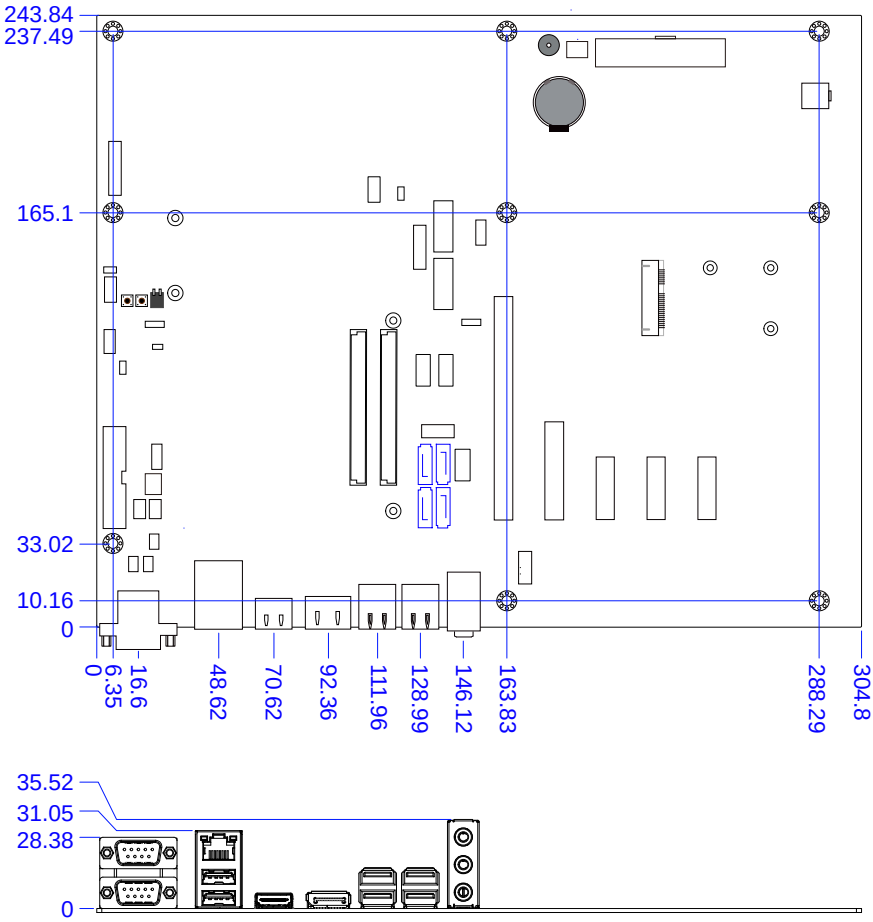
* The photos above are for reference only. Some minor components may differ.

I/O View



No.	Name	No.	Name
1	COM1 RS-232/422/485 Port	6	DisplayPort
2	COM2 RS-232 Port	7	USB 3.0 Ports
3	GbE LAN Port	8	Audio Line-In
4	USB 2.0 Ports	9	Audio Line-Out
5	HDMI Port	10	Microphone Input

1.5 Dimensions



Chapter 2
Hardware Configuration

This section provides information on jumper settings and connectors on the IP413 in order to set up a workable system.

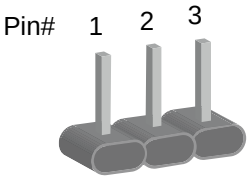
- Jumper and connector locations
- Jumper settings and information of connectors

2.1 Setting the Jumpers

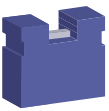
Set up and configure your IP413 by using jumpers for various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your use.

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.

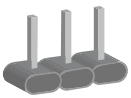
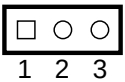
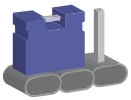
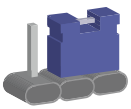


A 3-pin jumper



A jumper cap

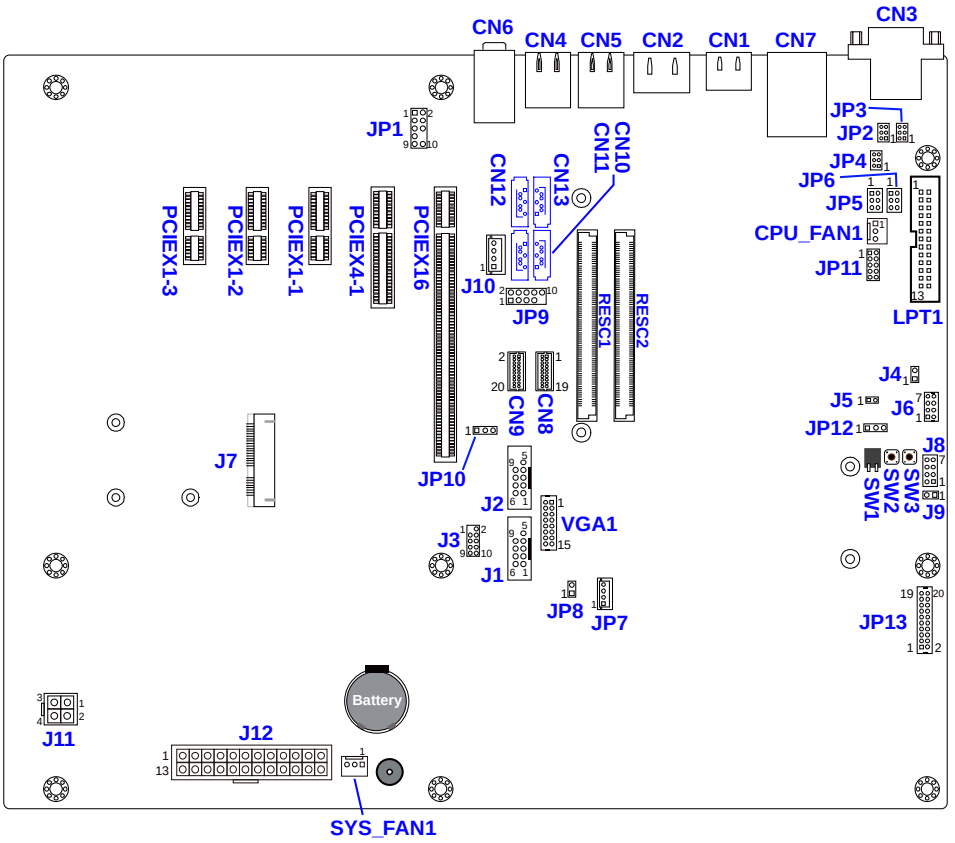
Refer to the illustration below to set jumpers.

Pin closed	Oblique view	Schematic illustration in the manual
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 IP413

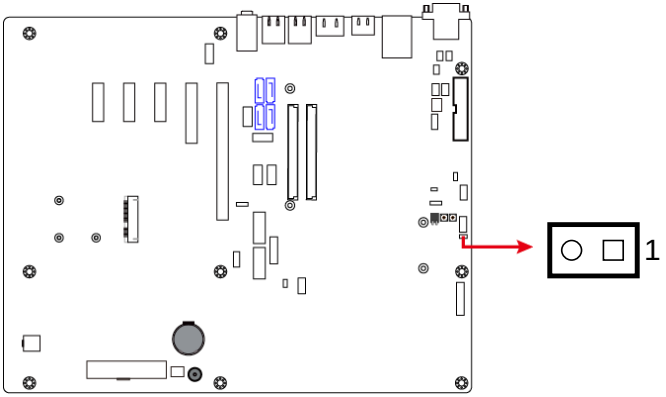


Board diagram of IP413

2.3 Jumpers Quick Reference

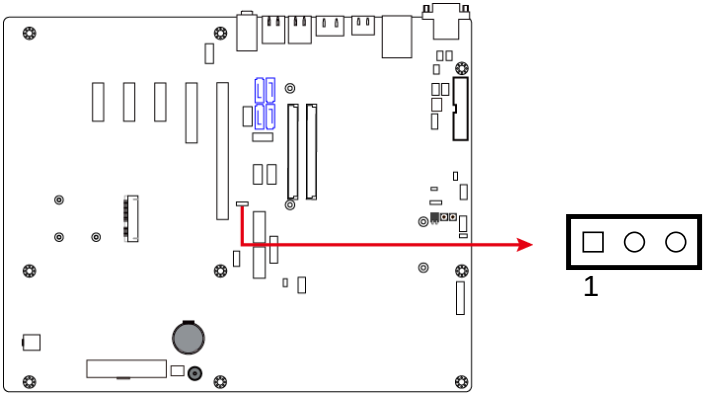
Function	Jumper Name	Page
AT/ATX Power Selection	J9	11
LVDS Panel Power	JP10	12
LVDS Backlight Power Selection	JP8	13
COM1 RS-232/422/485 Selection	JP2, JP3, JP4	14
PS/2 Keyboard & Mouse Power Selection	JP12	15
COM1 & COM2 RS-232 Power Selection	JP6 (for COM1), JP5 (for COM2)	16

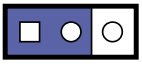
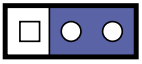
2.3.1 AT/ATX Power Selection (J9)



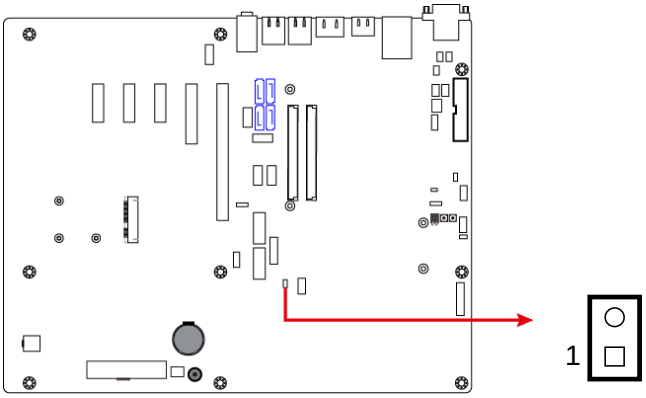
Function	Pin closed	Illustration
ATX (default)	Open	
AT	Close	

2.3.2 LVDS Panel Power (JP10)



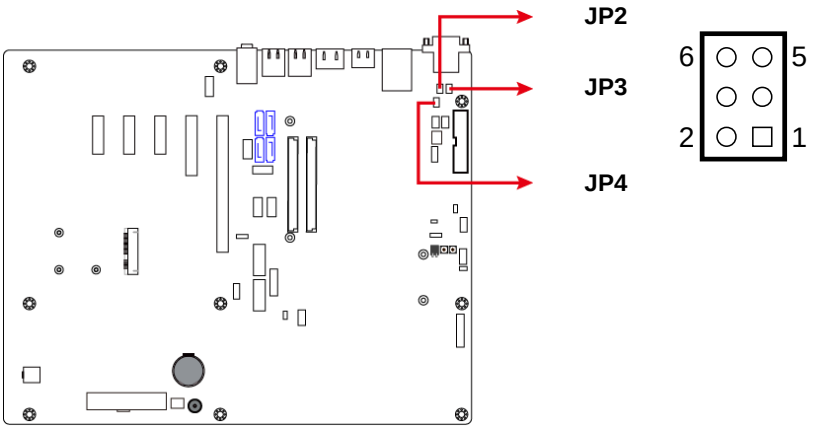
Function	Pin closed	Illustration
3.3V (default)	1-2	
5V	2-3	

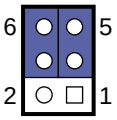
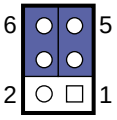
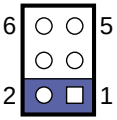
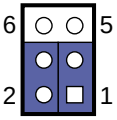
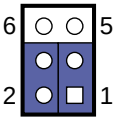
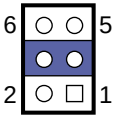
2.3.3 LVDS Backlight Power Selection (JP8)

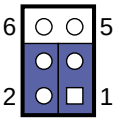
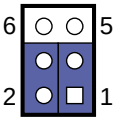
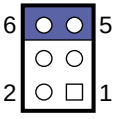


Function	Pin closed	Illustration
3.3V (default)	Open	
5V	Close	

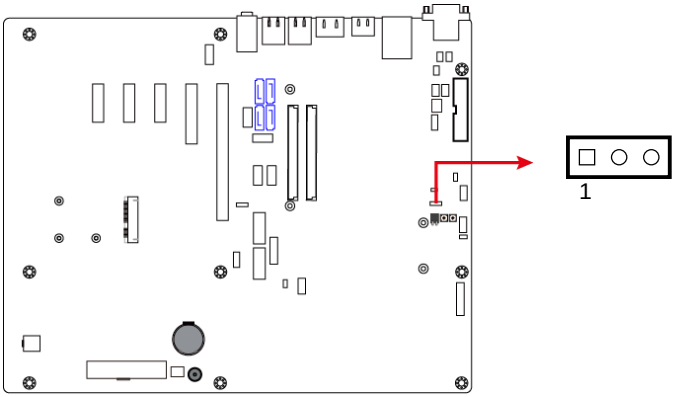
2.3.4 COM1 RS-232/422/485 Selection (JP2, JP3, JP4)

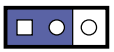
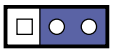


Function	Pin closed	Illustration
RS-232 (default)	**JP2:** 3-5 & 4-6	
	JP3: 3-5 & 4-6	
	JP4: 1-2	
RS-422	**JP2:** 1-3 & 2-4	
	JP3: 1-3 & 2-4	
	JP4: 3-4	

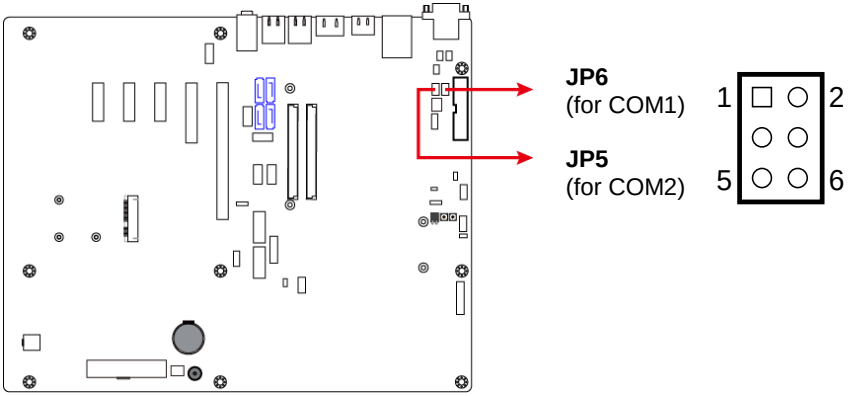
Function	Pin closed	Illustration
RS-485	**JP2:** 1-3 & 2-4	
	JP3: 1-3 & 2-4	
	JP4: 5-6	

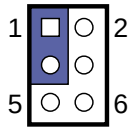
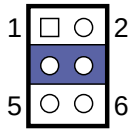
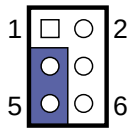
2.3.5 PS/2 KB/MS Power Selection (JP12)



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

2.3.6 COM1 & COM2 RS-232 Power Selection (JP6, JP5)



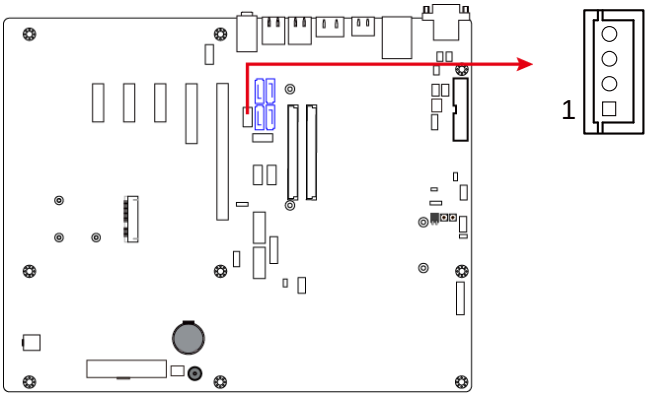
Function	Pin closed	Illustration
12V	1-3	
Normal (default)	3-4	
5V	3-5	

2.4 Connectors Quick Reference

Function	Connector Name	Page
SATA HDD Power Connector	J10	18
PS/2 Keyboard and Mouse Connector	J6	19
COM1 & COM2 RS-232 Ports	CN3	20
Audio Connector for Chassis Front Panel	JP1	21
BIOS Boot Selection	SW1	22
COM3 & COM4 RS-232 Port	J2 (COM3), J1 (COM4)	23
ATX Power Supply Connector	J12	24
DC-In 12V Power Connector	J11	25
Panel Inverter Power Connector	JP7	25
LVDS Connector	CN9 (Channel1), CN8 (Channel2)	26
USB 2.0 Ports	JP9	27
System Function Connector	J8	28
Parallel Port	LPT1	29
Fan Power Conenctor	CPU_FAN1, SYS_FAN1	30
DVI Port	JP13	31
VGA Port	VGA1	32
HDMI Port	CN1	--
DisplayPort	CN2	--
USB 3.0 Ports	CN4, CN5	--
GbE LAN Port	CN7	--
Audio Jacks	CN6	--
COM Express Connector	RECS1, RECS2	--
SATA III Port	CN10, CN11, CN12, CN13	--
PCIe (x1) Slot	PCIEX1-1, PCIEX1-2, PCIEX1-3	--

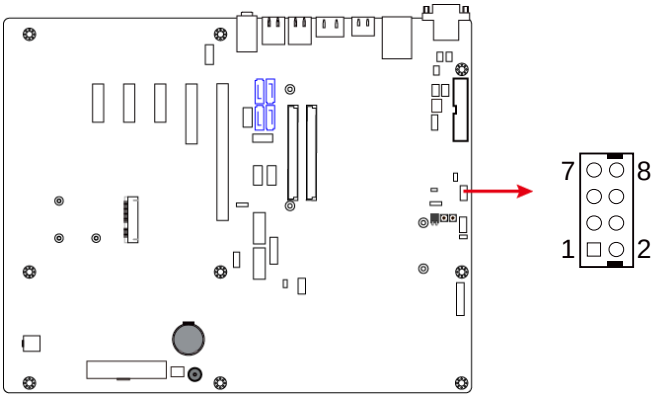
Function	Connector Name	Page
PCIe (x4) Slot	PCIE4-1	--
PCIe (x16) Slot	PCIEX16-1	--
Mini-PCIe Slot	J7	--

2.4.1 SATA HDD Power Connector (J10)



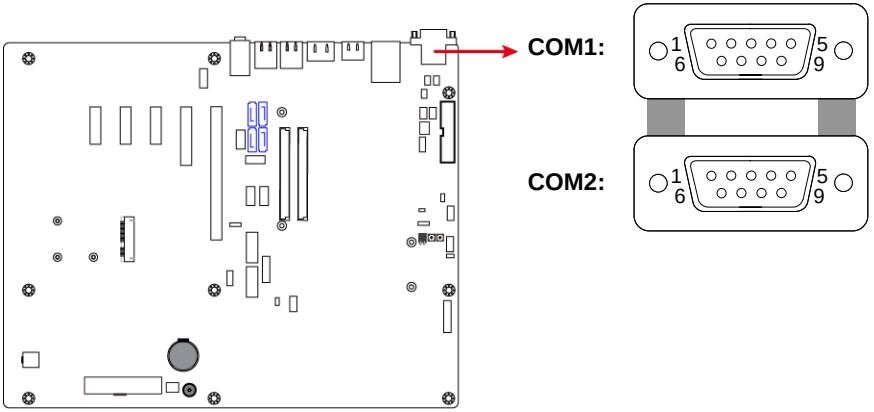
Pin	Assigment	Pin	Assigment
1	+5V	3	Ground
2	Ground	4	+12V

2.4.2 PS/2 Keyboard and Mouse Connector (J6)



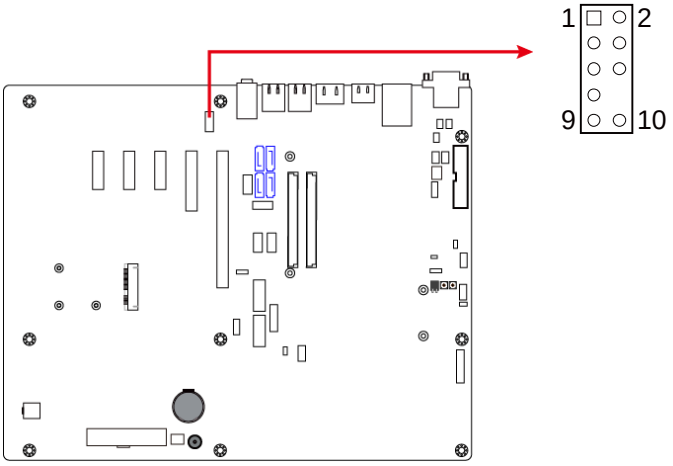
Pin	Assigment	Pin	Assigment
1	5V	2	5V
3	Mouse data	4	Keyboard data
5	Mouse clock	6	Keyboard clock
7	Ground	8	Ground

2.4.3 COM1 & COM2 RS-232/422/485 Ports (CN3)



Pin	Assigment	Pin	Assigment
1	DCD, Data carrier detect	6	DSR, Data set ready
2	RXD, Receive data	7	RTS, Request to send
3	TXD, Transmit data	8	CTS, Clear to send
4	DTR, Data terminal ready	9	RI, Ring indicator
5	Ground		

2.4.4 Audio Connector for Chassis Front Panel (JP1)



Pin	Assigment	Pin	Assigment
1	MIC IN_L	2	Ground
3	MIC IN_R	4	Detection
5	LINE_R	6	Ground
7	Sense	8	NC
9	LINE_L	10	Ground

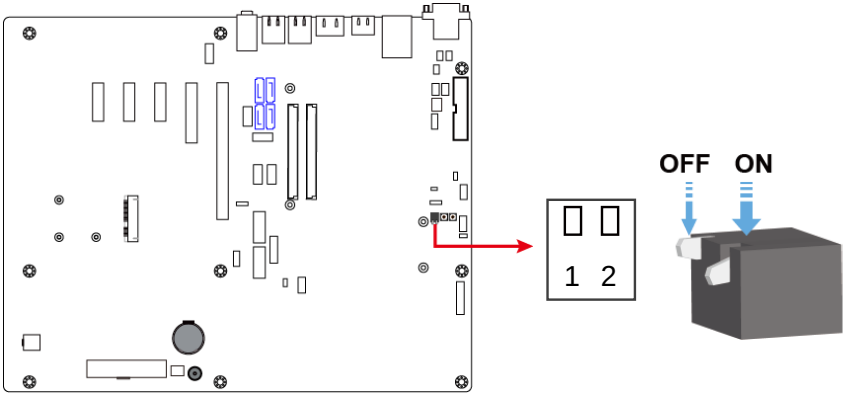
JP1 is utilized for the following front panel functions for your system.

- **Microphone Input (Pins 1 and 3)**

  The two pins are connected to the microphone input connector of your system.
- **Line Input (Pins 5 and 9)**

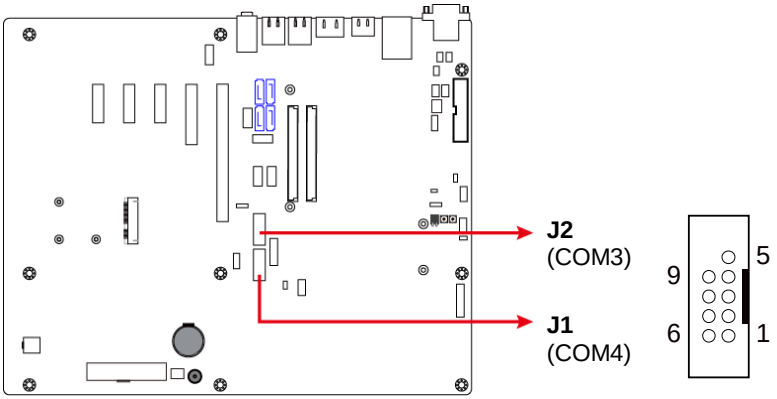
  The two pins are connected to the Line-In connector of your system.

2.4.5 BIOS Boot Selection (SW1)



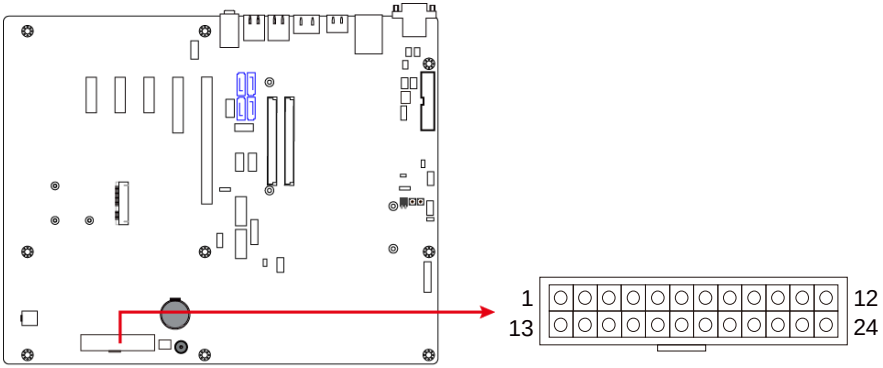
SPICS0#	SPICS1#	SPI0/FWH	Pin 1	Pin 2
Module (default)	Module	SPI0	OFF	OFF
Module	Module	Carrier FWH	ON	OFF
Carrier	Module	SPI0/SPI1	OFF	ON
Module	Carrier	SPI0/SPI1	ON	ON

2.4.6 COM3 & COM4 RS-232 Port (J2, J1)



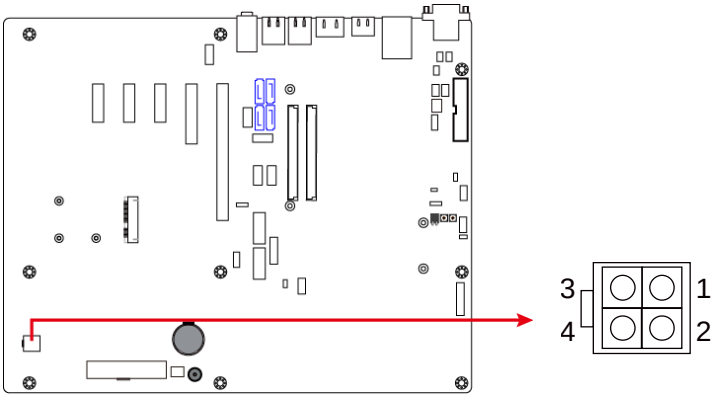
Pin	Assigment	Pin	Assigment
1	NC	6	NC
2	RXD, Receive data	7	NC
3	TXD, Transmit data	8	NC
4	NC	9	NC
5	NC		

2.4.7 ATX Power Supply Connector (J12)



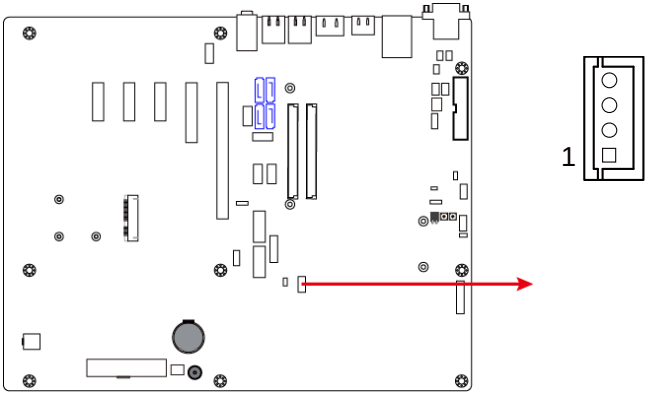
Pin	Assigment	Pin	Assigment
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	Ground	15	Ground
4	+5V	16	PS-ON
5	Ground	17	Ground
6	+5V	18	Ground
7	Ground	19	Ground
8	Power good	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	Ground

2.4.8 DC-In 12V Power Connector (J11)



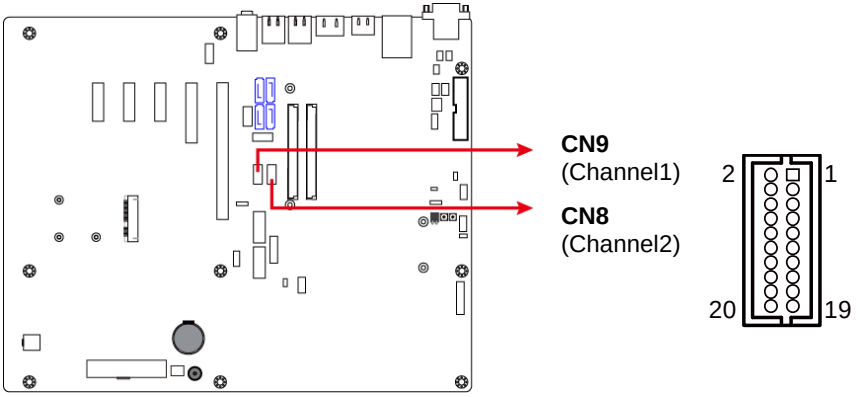
Pin	Assigment	Pin	Assigment
1	Ground	3	+12V
2	Ground	4	+12V

2.4.9 Panel Inverter Power Connector (JP7)



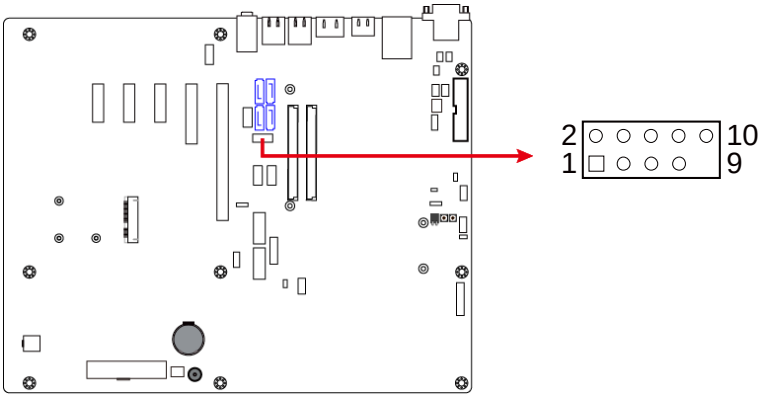
Pin	Assigment	Pin	Assigment
1	+12V	3	ADJ
2	Backlight Enable	4	Ground

2.4.10 LVDS Connector (CN9, CN8)



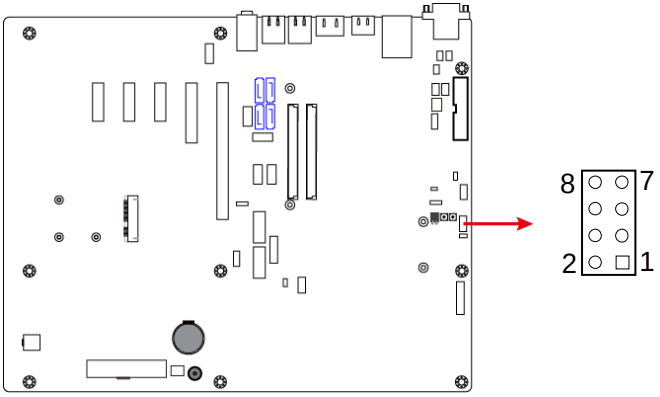
Pin	Assigment	Pin	Assigment
1	TX0P	2	TX0N
3	Ground	4	Ground
5	TX1P	6	TX1N
7	Ground	8	Ground
9	TX2P	10	TX2N
11	Ground	12	Ground
13	CLKP	14	CLKN
15	Ground	16	Ground
17	TX3P	18	TX3N
19	Power	20	Power

2.4.11 USB 2.0 Ports (JP9)



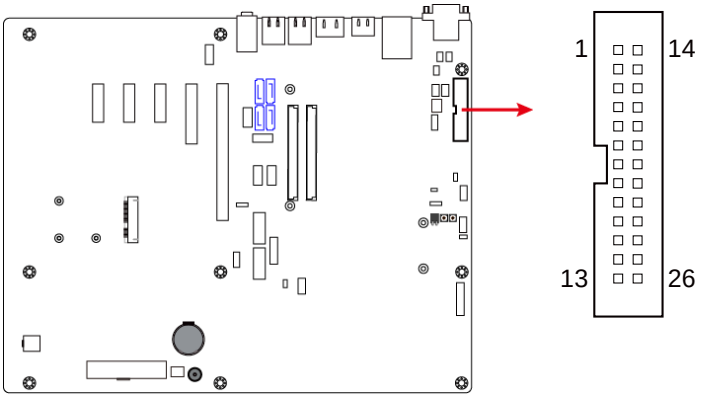
Pin	Assigment	Pin	Assigment
1	VCC	2	VCC
3	D0-	4	D1-
5	D0+	6	D1+
7	Ground	8	Ground
9	NC	10	NC

2.4.12 System Function Connector (J8)



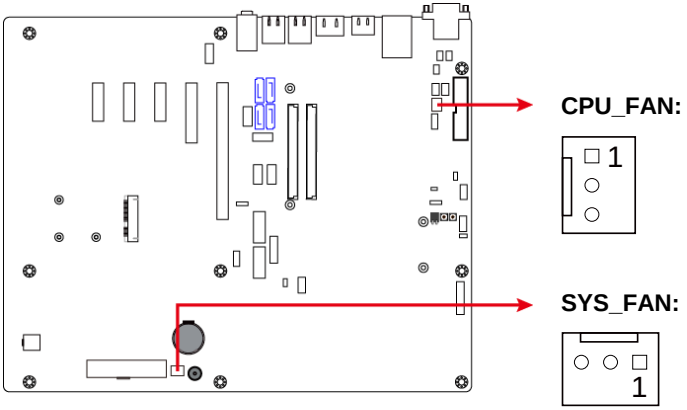
Pin	Assigment	Pin	Assigment
1	Power BTN	2	Power BTN
3	HDD LED+	4	HDD LED-
5	Reset BTN	6	Reset BTN
7	Power LED+	8	Power LED-

2.4.13 Parallel Port (LPT1)



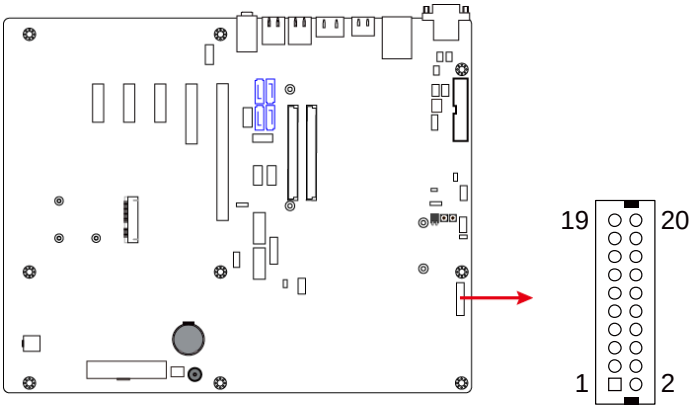
Pin	Assigment	Pin	Assigment
1	Line printer strobe	14	AutoFeed
2	PD0, parallel data 0	15	Error
3	PD1, parallel data 1	16	Initialize
4	PD2, parallel data 2	17	Select
5	PD3, parallel data 3	18	Ground
6	PD4, parallel data 4	19	Ground
7	PD5, parallel data 5	20	Ground
8	PD6, parallel data 6	21	Ground
9	PD7, parallel data 7	22	Ground
10	ACK, acknowledge	23	Ground
11	Busy	24	Ground
12	Paper empty	25	Ground
13	Select	26	N/A

2.4.14 Fan Power Connector (CPU_FAN, SYS_FAN)



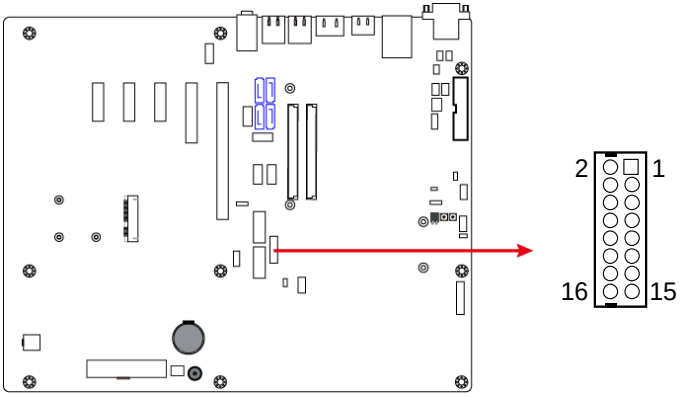
Pin	Assigment	Pin	Assigment
1	Ground	3	NC
2	+12V		

2.4.15 DVI Port (JP13)



Pin	Assigment	Pin	Assigment
1	TX1P	2	TXIN
3	GND	4	GND
5	TXCP	6	TXCN
7	GND	8	+5V
9	HTPG	10	NC
11	TX2P	12	TX2N
13	GND	14	GND
15	TX0P	16	TX0N
17	NC	18	NC
19	DDCDATA	20	DDCCLK

2.4.16 VGA Port (VGA1)



Pin	Assigment	Pin	Assigment
1	CRT_R	2	+5V
3	CRT_G	4	GND
5	CRT_B	6	NC
7	NC	8	DDC_DATA
9	GND	10	CRT_HSYN
11	GND	12	CRT_VSYN
13	GND	14	DDC_CLK
15	GND	16	NC