

## **FCC Warning**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Table Of Contents

<b>FCC Warning .....</b>	<b>1</b>
<b>Chapter 1: Introduction.....</b>	<b>3</b>
1.1 Before You Start .....	3
1.2 Specifications .....	4
1.3 Rear Panel Connectors .....	6
1.4 Motherboard Layout.....	7
<b>Chapter 2: Hardware installation.....</b>	<b>9</b>
2.1 Install Central Processing Unit (CPU) .....	9
2.2 Install a Heatsink .....	11
2.3 Fan Headers .....	12
2.4 Installing Memory Module.....	13
2.5 Expansion Slots .....	14
2.6 Jumper & Switch Setting .....	16
2.7 Headers & Connectors .....	18

# Chapter 1: Introduction

## 1.1 Before You Start

Thank you for choosing our product. Before you start installing the motherboard, please make sure you follow the instructions below:

- Prepare a dry and stable working environment with sufficient lighting.
  - Always disconnect the computer from power outlet before operation.
  - Before you take the motherboard out from anti-static bag, ground yourself properly by touching any safely grounded appliance, or use grounded wrist strap to remove the static charge.
  - Avoid touching the components on motherboard or the rear side of the board unless necessary. Hold the board on the edge, do not try to bend or flex the board.
  - Do not leave any unfastened small parts inside the case after installation. Loose parts will cause short circuits which may damage the equipment.
  - Keep the computer from dangerous area, such as heat source, humid air and water.
  - The operating temperatures of the computer should be 0 to 45 degrees Celsius.
  - To avoid injury, be careful of:
    - Sharp pins on headers and connectors
    - Rough edges and sharp corners on the chassis
    - Damage to wires that could cause a short circuit
- 

### Note

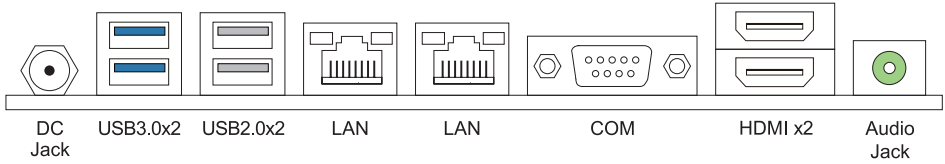
- » *The package contents may be different due to the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.*
-

## 1.2 Specifications

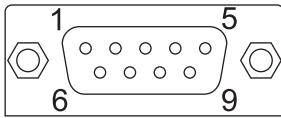
Dimensions	170 x 170 x 1.6 mm
Processor	Intel® Alder lake s for LGA1700 Socket CPU (Max TDP at 65W)
Core Logic (PCH)	Intel® H610
Chipsets	EDP to LVDS : RTD2136 DDI to VGA : RTD2166 LAN controller: Intel I225V, I219V Audio Codec: ALC897 Audio Amplifier: ALC105 Super IO : F81966D-I
System Memory	2 x 260-pin socket support DDR4 3200Mhz SO-DIMM, up to 64 GB
Graphic	Intel® Integrated Graphics
	2xHDMI Support 2x Horizontal HDMI 1. Support HDMI 1.4b
	VGA 2. VGA: RTD2166 3. Support 2x8 pin wafer
	eDP/LVDS 1. Chipset: RTD2136 2. Support LVDS dual channels, co-lay eDP (by BOM option) 3. 2x3 Pin header for LCD voltage select 4. 1x1*20 pin LVDS connector, 1x2*20pin eDP connector (by BOM option)
Ethernet	Support 2 x GbE LAN (1) 1xI225V, 1x I219V GbE LAN (2) Support PXE boot form LAN, wake on LAN
SATA	Support 3x SATAIII (1) 1x SATAIII 7pin connector with 1x4 Power Wafer (2) 1 x full type PCI Express mini card with PCIe1, USB2.0 , SATA (support PCIe+USB or USB+SATA) (3) 1x SATA3 for M.2 B Key
Universal Serial Bus	3 x USB3.1 (1) 2x USB3.1 for 1x stack connector on IO. (2) 1 x M.2 key B type 2242/3042/3052 with PCIe2, SATA3.0 (SATA3), USB3.1 (support SATA+USB or USB3+PCIe) 7 x USB2.0 (1) 2x USB2.0 for 1x stack connector on IO. (2) 1x USB 2.0 + 1 x PCIe1 + SATA3 signal for Mini-PCIe (3) 1x M.2 key E type 2230 with PCIe1 and USB2.0 (4) 1 x USB2.0 for 1x 1*4 pin wafer (5) 2 x USB2.0 for 1x2*5 pin wafer
Super IO	Controller : F81966D-1 Support 4x COM Port, DIO
Serial Port	Support 4xCOM port, define as below, 1 x RS232/422/485 (COM1) (1) DB9 connector on main I/O (2) Mode selection by BIOS control. (3) Support RI/5/12V, jumper selection, default RI. 1x 2*3 PIN header 3x RS232 (COM2~COM4) (1) 3 x 2*5 Header
Expansion Slot	(1) 1x PCIe Gen3 X16 slot (2) 1x USB 2.0 + 1 x PCIe1 + SATA3 signal for Mini-PCIe (3) 1 x M.2 key B type 2242/3042/3052 with PCIe2, SATA3.0 (SATA3), USB3.1 (support SATA+USB or USB3+PCIe) (4) 1 x M.2 key E type 2230 with PCIe1 and USB2.0, support CNVi function. (5) 1x SIM slot, colay MINIPCIe and M.2 Key B slot (by BOM option)
Audio	Audio Codec: ALC897 (1) 1 x Audio jack, support Line-out on Rear I/O.) (2) 1x 2*5-pin wafer box for Mic-in, Line-In, Audio-Out <b>Note:</b> "Audio-Out" can select Line out or speaker out by 0ohm. If ALC105 SMT, then Audio-out is support speaker out, else if ALC105 is non-SMT, then support Line-out function.

Digital I/O	1 x 8-Bit DIO header 1 x 2*5 Pin header
Front Panel	1 x 2*6 Pin header
TPM	TPM 2.0 chip onboard TPM IC: SLB9670 Non-SMT by default (BOM optional)
Indicator	1x Green LED for 5V standby power indicator
Buzzer	1 x Buzzer
Hardware monitor	CPU/System temperature, Voltage monitoring for VCC, 3.3, 5, 12V...
Watchdog Timer	Reset; 1 sec.~255 min. and 1 sec. or 1 min. /step
RTC	Internal RTC, supports Wake On RTC
EuP	Support
Power Input	DC-IN 12~24V ATX 4P connector
Edge IO	1x DC 12~24V Jack 2x HDMI connector 1x Dual-Stack USB3.1 connectors 2x RJ45 connectors, support GbE. 1x DB9 COM connector 1 x Line-out Audio Jack 1x Dual-Stack USB2.0 connectors
Onboard pin-header	<p><b>Expansion slots</b> 2x 260-pin DDR4 sockets 1 x M.2 key B type 1 x PCIe16 Slot 1x M.2 key E slot 1x Mini-PCIe Slot</p> <p><b>SATA</b> 1x SATAIII 7pin connector with 1x4 pin power.</p> <p><b>Display</b> 1x 2*20 Pin connector for eDP 1x 2*20 Pin connector for LVDS 1x 2*3 Pin header for LCD voltage select 1x1*8 pin header for Inverter. 1x 2*8 pin header, support VGA</p> <p><b>Audio</b> 1x 2*5-pin wafer box for Mic-in, Line-In, Audio-Out 1 x Buzzer</p> <p><b>USB</b> 1 x USB2.0 for 1x 1*4 pin wafer</p> <p><b>Power</b> 1x ATX 4PIN Connector</p> <p><b>Serial Port</b> 3x 2*5 pin header for RS232</p> <p><b>FAN</b> 1x 1*4 pin-header for CPU fan 1x 1*3 pin-header for SYSTEM fan</p> <p><b>Others</b> 1x Green LED for 5V standby power indicator 1x1*3 pin header clear CMOS 1x 1*3 pin header for AT/ATX power select jumper 1x SIM slot 1 x 2*5 pin 2mm pitch 8-bit DIO pin header 1 x 2*6 front panel pin header</p>
O.S. support	Windows 10 Pro Linux Ubuntu 20.04
ESD/ EMI	Contact with 4Kv, Air with 8Kv EMI class A
Operation Temp..	0°C ~ 60°C Humidity : 5% ~ 90%
Storage Temp.	-10°C ~ 70°C Humidity : 5% ~ 90%

### 1.3 Rear Panel Connectors

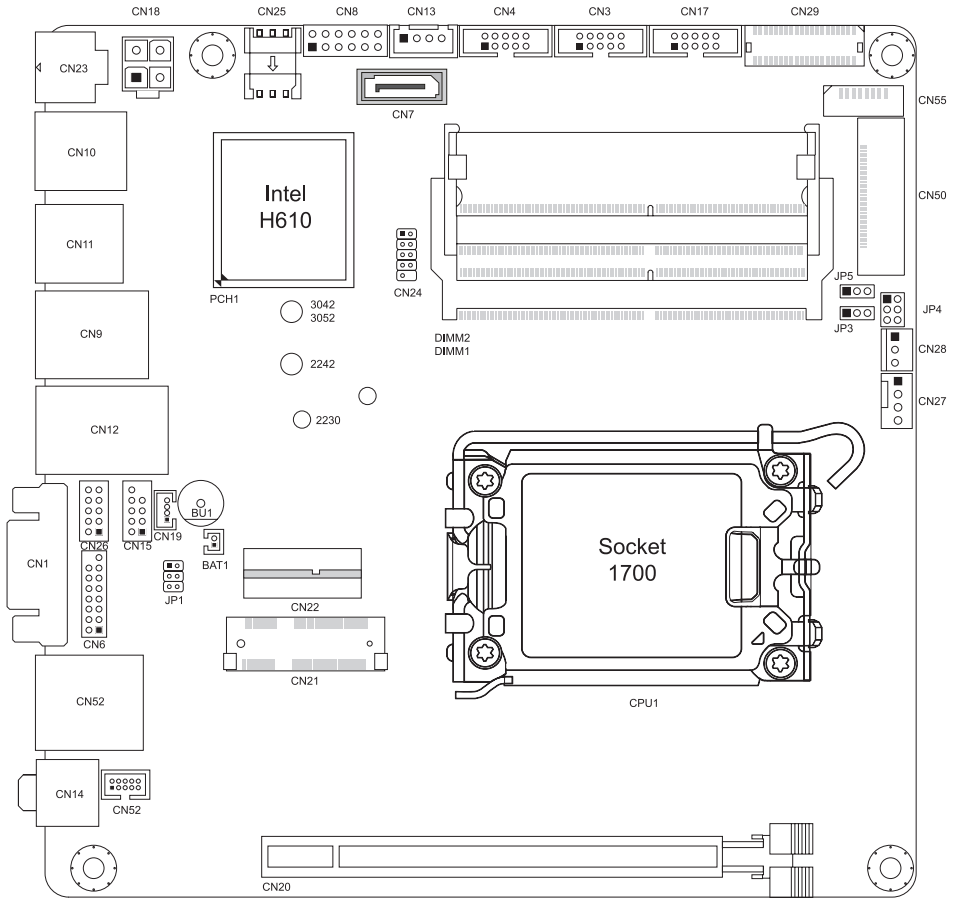


#### CN1: COM Port (DB9)



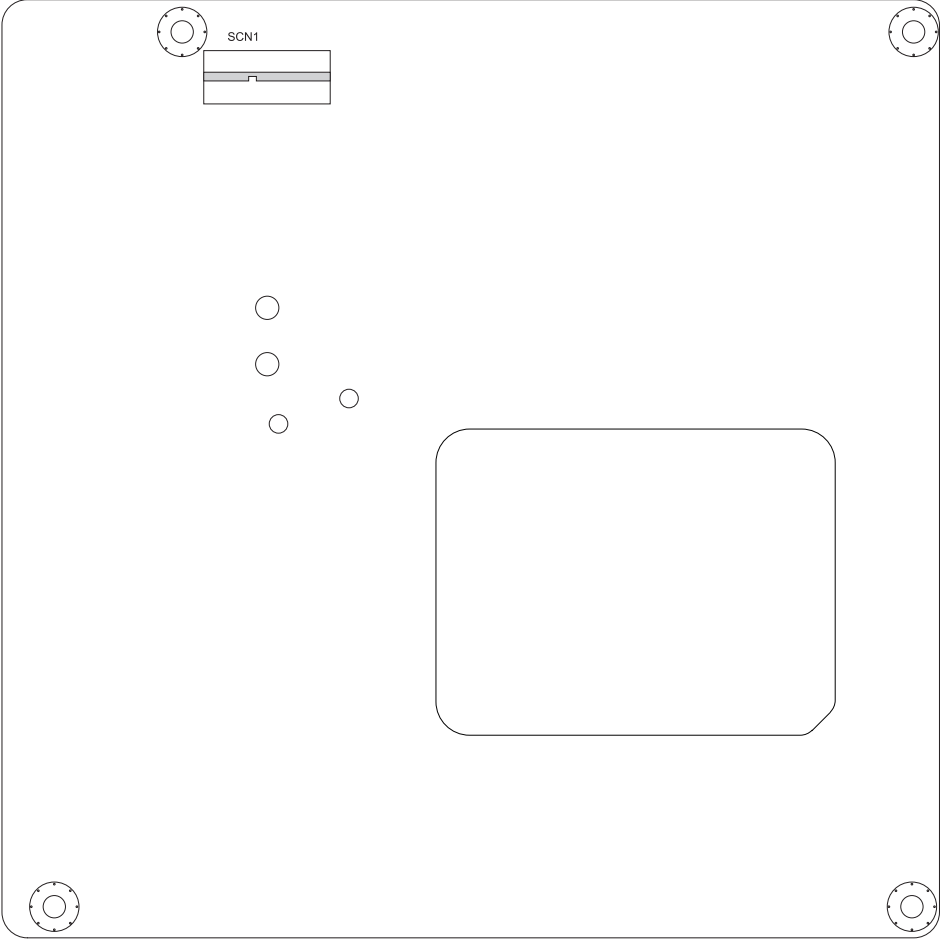
Mode	001	000	010
Pin Define	RS-232 (3T/5R)	RS-422 (1T/1R Full Duplex)	RS-485 (1T/1R TX Enable Low Active)
1	COM1C_DCD	TX(B)	(R(B) / T(B))
2	COM1C_RXD	TX(A)	(R(A) / T(A))
3	COM1C_TXD	RX(A)	NC
4	COM1C_DTR	RX(B)	NC
5	GND	GND	GND
6	COM1C_DSR	NC	NC
7	COM1C_RTS	NC	NC
8	COM1C_CTS	NC	NC
9	COM1C_RI	NC	NC

## 1.4 Motherboard Layout



» ■ represents the 1st pin.

**Back View**

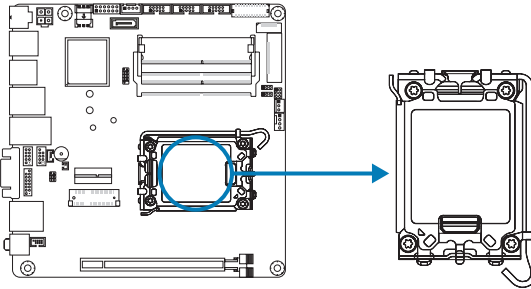




## Chapter 2: Hardware installation

### 2.1 Install Central Processing Unit (CPU)

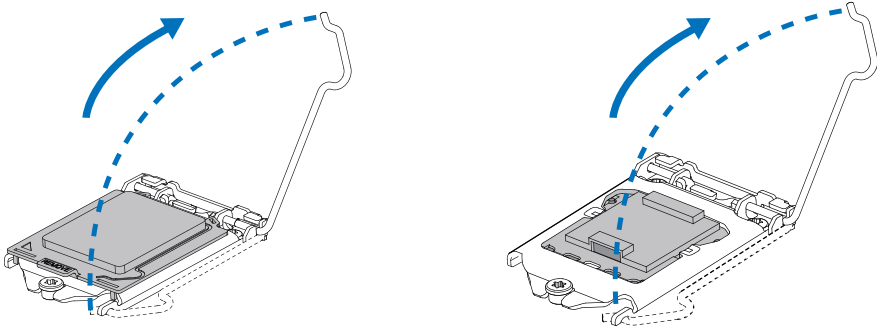
Step 1: Locate the CPU socket on the motherboard



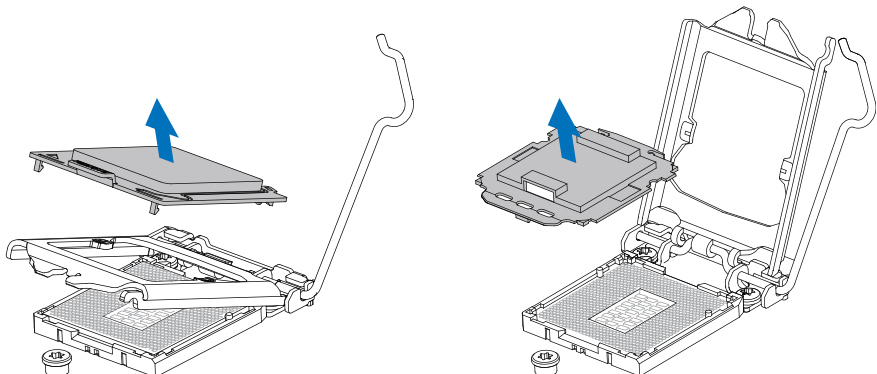
#### Note

- » Remove pin cap before installation, and make good preservation for future use. When the CPU is removed, cover the pin cap on the empty socket to ensure pin legs won't be damaged.
- » The motherboard might equip with two different types of pin cap. Please refer below instruction to remove the pin cap.

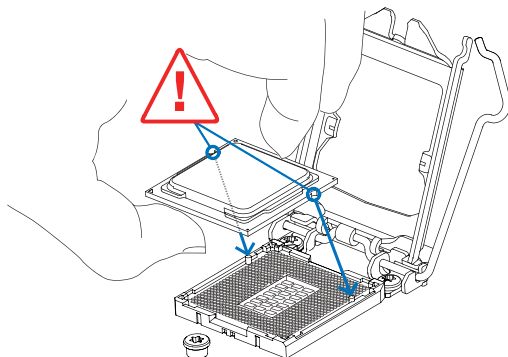
Step 2: Pull the socket locking lever out from the socket and then raise the lever up.



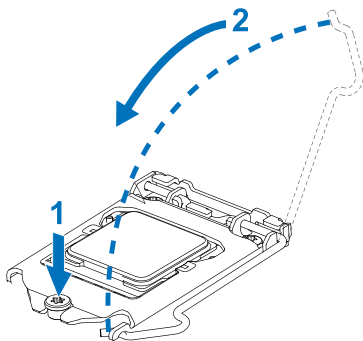
Step 3: Remove the Pin Cap.



Step 4: Hold processor with your thumb and index fingers, oriented as shown. Align the notches with the socket. Lower the processor straight down without tilting or sliding the processor in the socket.



Step 5: Hold the CPU down firmly, and then lower the lever to locked position to complete the installation.



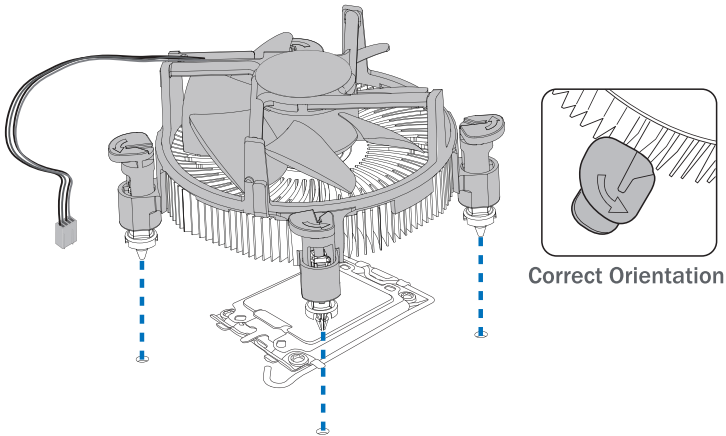
---

**Note**

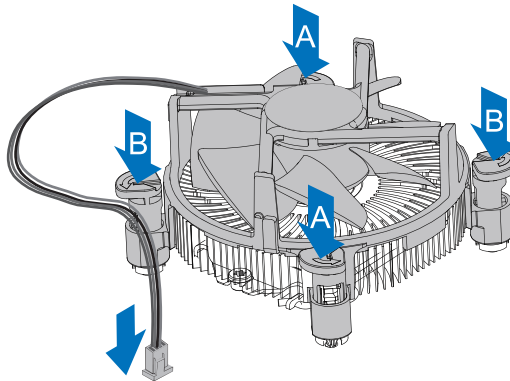
- » Ensure that you install the correct CPU designed for LGA1200 socket.
  - » The CPU fits only in one correct orientation. Do not force the CPU into the socket to prevent damaging the CPU.
-

## 2.2 Install a Heatsink

Step 1: Place the CPU fan assembly on top of the installed CPU and make sure that the four fasteners match the motherboard holes. Orient the assembly and make the fan cable is closest to the CPU fan connector.



Step 2: Press down two fasteners at one time in a diagonal sequence to secure the CPU fan assembly in place. As each fastener locks into position a click should be heard.



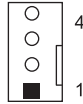
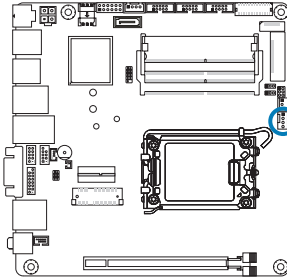
### Note

- » Apply the thermal interface material on the CPU before heatsink installation, if necessary.
- » Do not forget to connect the CPU fan connector.
- » For proper installation, please kindly refer to the installation manual of your CPU heatsink.

## 2.3 Fan Headers

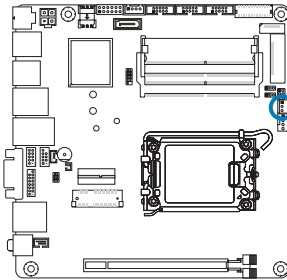
These fan headers support cooling-fans built in the computer. The fan cable and connector may be different according to the fan manufacturer. Connect the fan cable to the connector while matching the black wire to pin#1.

### CN27: CPU Fan Header



Pin	Assignment
1	FANPWMOUT1
2	FAN1_TACH
3	FANPVOUT1
4	GND

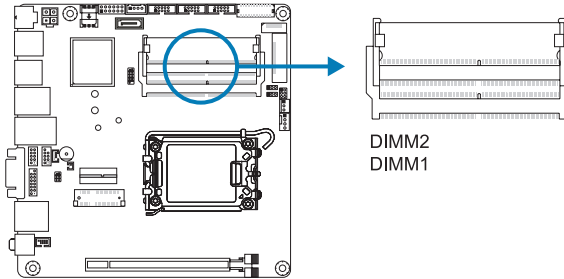
### CN28: SYSTEM Fan Header



Pin	Assignment
1	FAN2_TACH
2	FANPVOUT2
3	GND

## 2.4 Installing Memory Module

### DIMM1/ DIMM2: DDR4 Memory Module Slot (260pins SO-DIMM)

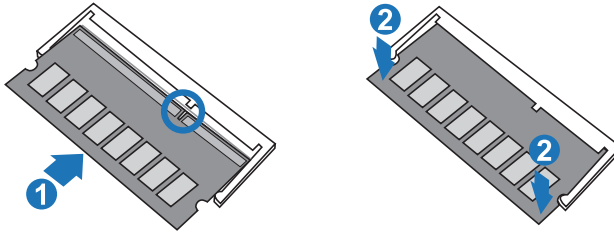


#### Note

- » If the DIMM does not go in smoothly, do not force it. Pull it all the way out and try again.

Insert memory module into SO-DIMM socket at backside of motherboard.

1. Hold the SO-DIMM with its notch aligned with the memory socket of the board and insert it at a 30-degree angle into the socket.
2. Press down on the SO-DIMM so that the tabs of the socket lock on both sides of the module.



- » To avoid generating static electricity and damaging the SO-DIMM, ground yourself by touching a grounded metal surface or use a ground strap before you touch the SO-DIMM.

1. Align a DIMM on the slot such that the notch on the DIMM matches the break on the Slot.
2. Insert the DIMM firmly into the slot until the retaining chip snap back in place and the DIMM is properly seated.

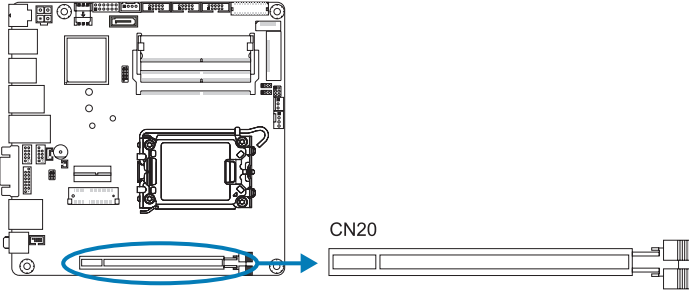
#### Memory Capacity

DIMM Socket Location	DDR4 Module	Total Memory Size
DIMM1	4GB/8GB/16GB/32GB	Max is 64GB
DIMM2	4GB/8GB/16GB/32GB	

## 2.5 Expansion Slots

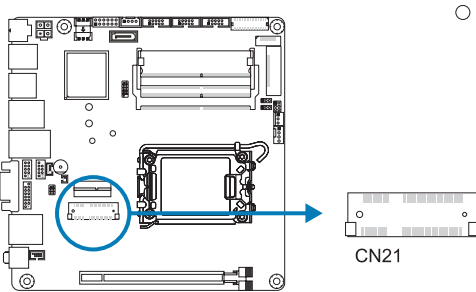
### CN20: PCI-Express Gen3 x16 Slots (x16 mode)

- PCI-Express 3.0 compliant.
- The maximum bandwidth of the PCIe slot is 32GB/s.



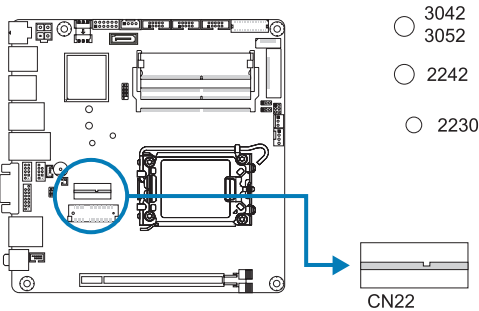
### CN21: Mini PCI-Express Connector

- The half-size mPCIe socket supports mini PCIe module.



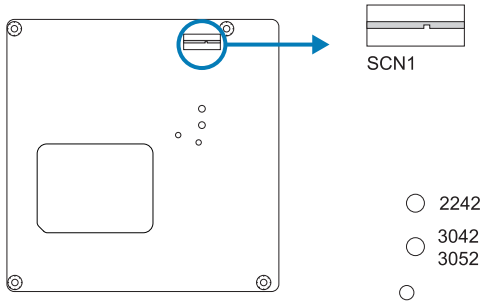
### CN22: M.2 (E Key) Socket

- Support M.2 socket 2230 type module.
- Supports PCIe1 and USB2.0 .



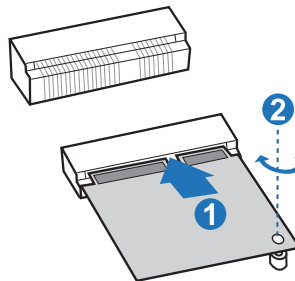
### SCN1: M.2 (B Key) Socket

- Supports M.2 socket 2242/ 2280/ 3042/ 3052 type module.
- Supports PCIex2, PCIe + SATA3.0, PCIe + USB3.1 interfaces by BOM option. (Default is PCIe + USB3.0.)



#### Installing WiFi Module

1. Insert WiFi module into mini PCIe slot (CN21)
2. Secure screw to the motherboard



» *Wi-Fi module & screw sold separately.*

## 2.6 Jumper & Switch Setting

### Jumper Setting

The illustration shows how to set up jumpers. When the jumper cap is placed on pins, the jumper is “close”, if not, that means the jumper is “open”.

Pin opened



Pin closed

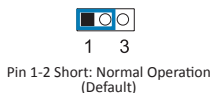
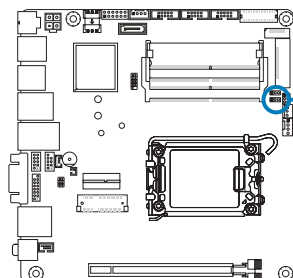


Pin 1-2 closed



### JP3: Clear CMOS Jumper

Placing the jumper on pin2-3 allows user to restore the BIOS safe setting and the CMOS data. Please carefully follow the procedures to avoid damaging the motherboard.



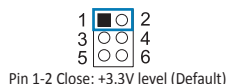
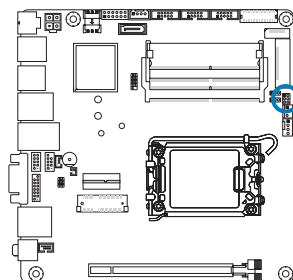
Pin	Assignment
1	VRTC
2	PCH_RTRCRST_PULLUP
3	GND



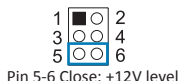
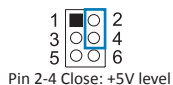
#### Clear CMOS Procedures:

1. Remove AC power line.
2. Set the jumper to “Pin 2-3 short”.
3. Wait for five seconds.
4. Set the jumper to “Pin 1-2 short”.
5. Power on the AC.
6. Reset your desired password or clear the CMOS data.

### JP4: LVDS VDD Select Jumper(+3.3V/ +5V/ +12V)

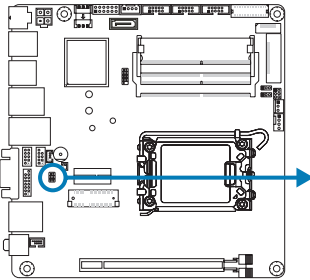


Pin	Assignment
1	VCC 3V3
2	VDD OUT
3	NC
4	VCC 5V0
5	VCC 12V0
6	VDD OUT





### JP1: COM VDD



Pin 3-5 Close: DCD  
(Default)



Pin 1-3 Close: 5V level



Pin 4-6 Close: RI  
(Default)



Pin 2-4 Close: 12V level

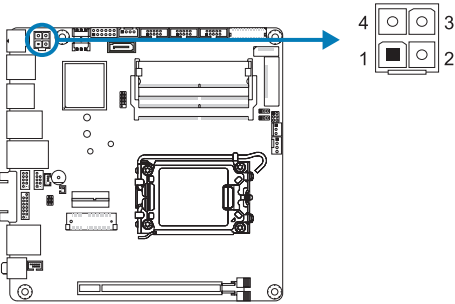


Pin	Assignment
1	COM1_5V
2	COM1_12V
3	COM1C_DCD_H
4	COM1C_RI_H
5	COM1C_DCD
6	COM1C_RI

## 2.7 Headers & Connectors

### CN18: ATX Power Source Connector

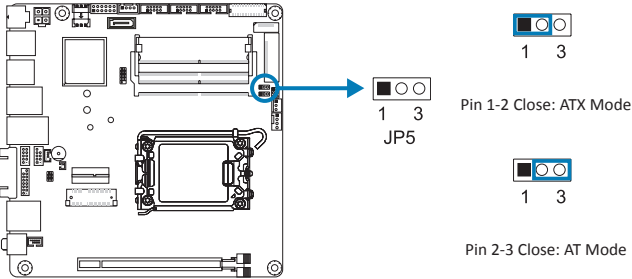
The connector provides +12V to the CPU power circuit.



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

### JP5: AT-ATX Power Source Connector

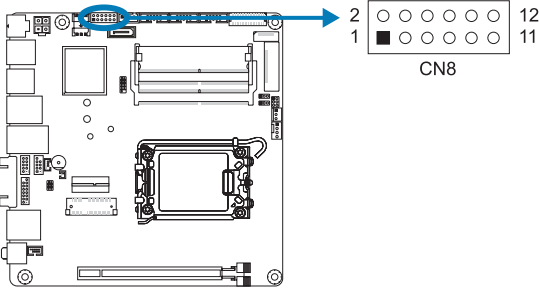
The connector provides +12V to the CPU power circuit.



Pin	Assignment
1	NC
2	AT-ATX
3	GND

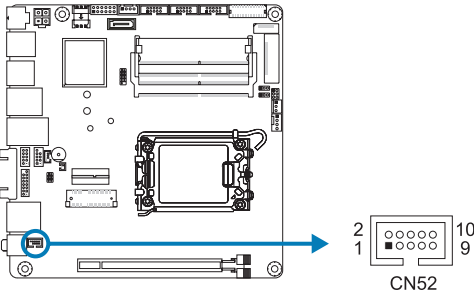
### CN8: Front Panel Pin Header

This connector includes Power-on, Reset, HDD LED and Power LED connections. It allows user to connect the PC case's front panel switch functions.



Pin	Assignment	Pin	Assignment
1	Buzzer	2	Buzzer
3	EXT SPK-	4	EXT SPK+
5	PWRLED-	6	PWRLED+
7	PWRSW-	8	PWRSW+
9	HW RST-	10	HW RST+
11	HDD LED-	12	HDD LED+

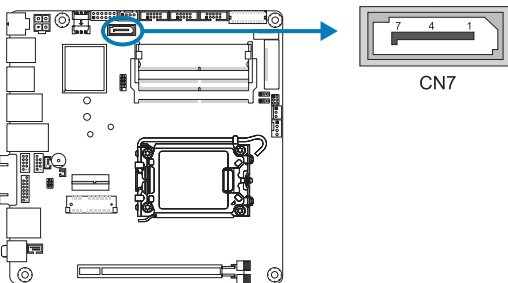
### CN52: AUDIO Header



Pin	Assignment	Pin	Assignment
1	GND	2	GND
3	LINE IN L	4	GND
5	LINE IN R	6	GND
7	SPKOUT L	8	GND
9	SPKOUT R	10	GND

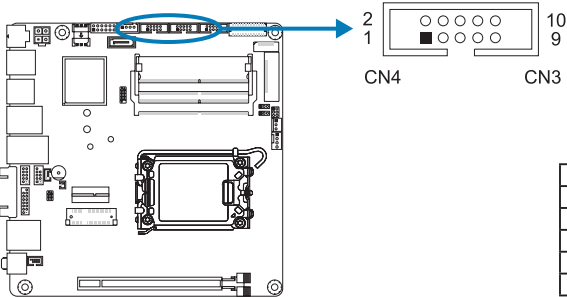
### CN7: Serial ATA 6Gb/s Connectors

These connectors support the thin Serial ATA cable for primary internal storage devices.



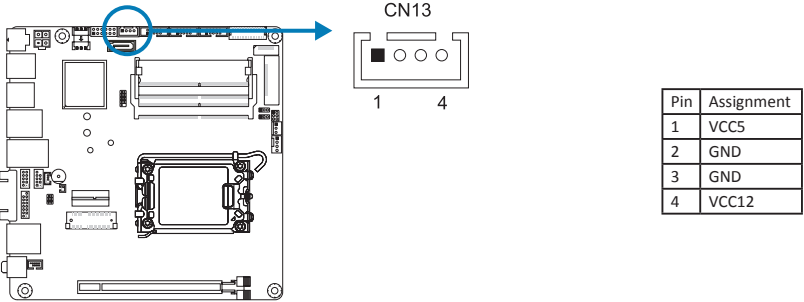
Pin	Assignment
1	Ground
2	TX+
3	TX-
4	Ground
5	RX-
6	RX+
7	Ground

### CN3/ CN4: COM Header



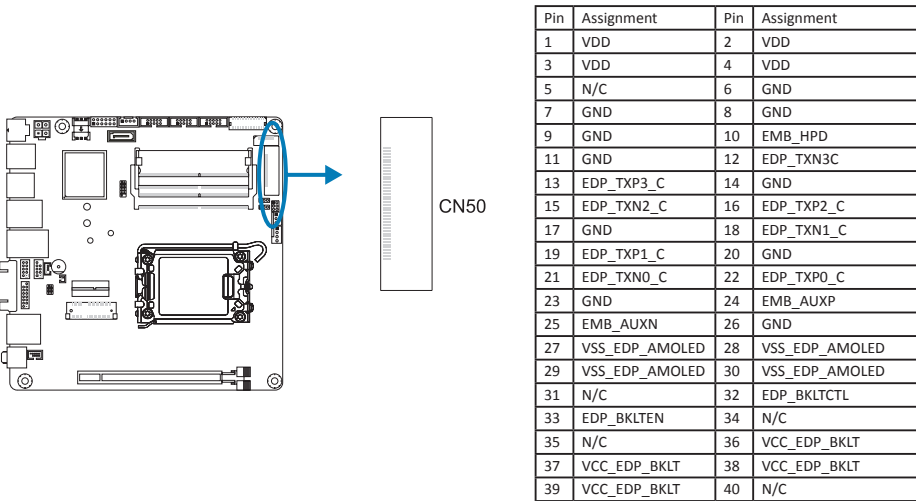
### CN13: SATAPW Header

These connectors support the thin Serial ATA cable for primary internal storage devices.

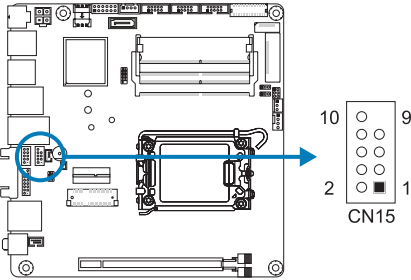


### CN50: EDP Connector

This connector supports 18/24 bit single-channel panels.

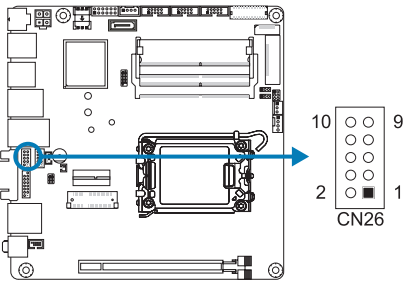


### CN15: USB Header



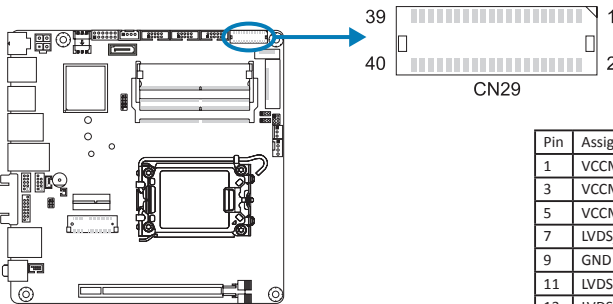
Pin	Assignment
1	VCC
2	VCC
3	D-
4	D-
5	D+
6	D+
7	GND
8	GND
9	KEY
10	NC

### CN26: Digital I/O Connector



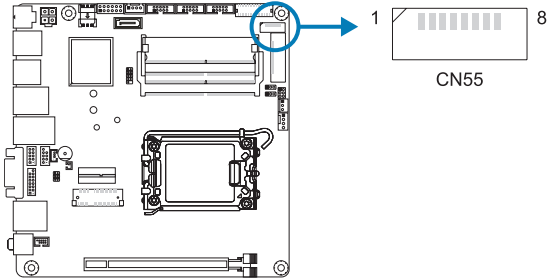
Pin	Assignment
1	5V
2	DO0
3	DI0
4	DO1
5	DI1
6	DO2
7	DI2
8	DO3
9	DI3
10	GND

### CN29: LVDS Connector



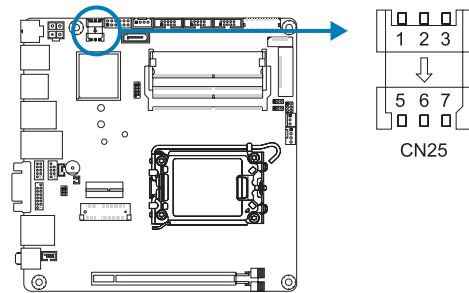
Pin	Assignment	Pin	Assignment
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	LVDS_EDID_SCL	8	LVDS_EDID_SDA
9	GND	10	GND
11	LVDSB_DATA0_N	12	LVDSB_DATA3_N
13	LVDSB_DATA0_P	14	LVDSB_DATA3_P
15	GND	16	GND
17	LVDSB_DATA1_N	18	LVDSB_CLK_N
19	LVDSB_DATA1_P	20	LVDSB_CLK_P
21	GND	22	GND
23	LVDSB_DATA2_N	24	LVDSA_DATA0_N
25	LVDSB_DATA2_P	26	LVDSA_DATA0_P
27	GND	28	GND
29	LVDSA_DATA3_N	30	LVDSA_DATA1_N
31	LVDSA_DATA3_P	32	LVDSA_DATA1_P
33	GND	34	GND
35	LVDSA_CLK_N	36	LVDSA_DATA2_N
37	LVDSA_CLK_P	38	LVDSA_DATA2_P
39	GND	40	GND

### CN55: LVDS BKLT CONTROL



Pin	Assignment
1	VCC 12V0
2	VCC 12V0
3	VCC 5V0
4	BKLTEN_LVDS
5	GND
6	GND
7	GND
8	LVDSPWMOUT

### CN25: SIM Slot



Pin	Assignment
1	UIM_PWR
2	UIM_Reset
3	UIM_CLK
4	N/A
5	GND
6	VPP
7	Data