2NOR01

AI solution Carrier Board

for NVIDIA® Jetson Orin™ Nano / NX SOM

LPDDR5 / HDMI / LAN / USB / M.2 / COM

Carrier Board
Support NVIDIA® Jetson Orin™ Nano / NX SOM
2 x HDMI, 1 x Type C USB (OTG)
3 x M.2, 1 x Nano SIM, 5 x USB
3 x LAN, 2 x COM, 1 x CANBus,
Mic-in / Line-out, 4DI / 4DO
Wide Range DC IN +9~36V

CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS

NO. 2NOR01
Release date: September 19, 2024

Contents

User Manual edition 0.1, SEP. 2024

Warning !

1. Battery
   Batteries on board are consumables.
   The life time of them are not guaranteed.

2. Fanless solution with HDD
   The specification & limitation of HDD should be considered carefully when the fanless solution is implemented.

3. We will not give further notification in case of changes of product information and manual.

4. There might be a 20% inaccuracy of WDT at room temperature.

5. Please make sure the voltage specification meets the requirement of equipment before plugging in.

6. There are two types of SSD, commercial grade and industrial grade, which provide different read / write speed performance, operation temperature and life cycle. Please contact sales for further information before making orders.

7. Caution! Please notice that the heat dissipation problem could cause the MB system unstable. Please deal with heat dissipation properly when buying single MB set.

8. Please avoid approaching the heat sink area to prevent users from being scalded with fanless products.

9. If users repair, modify or destroy any component of product unauthorizedly, We will not take responsibility or provide warranty anymore.

10. DO NOT apply any other material which may reduce cooling performance onto the thermal pad.

11. It is important to install a system fan toward the CPU to decrease the possibility of overheating / system hanging up issues, or customer is suggested to have a fine cooling system to dissipate heat from CPU.

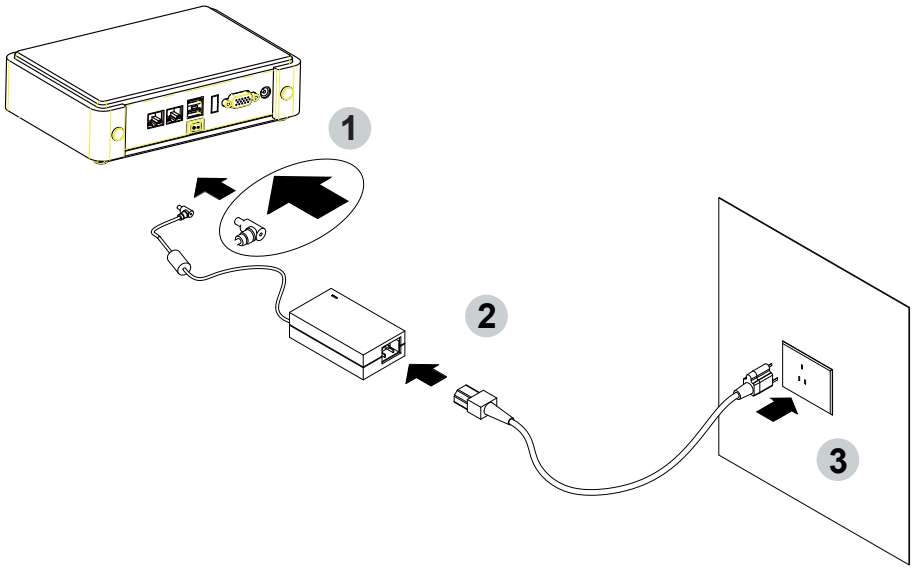
✻ Hardware Notice Guide

1. Before linking power supply with the motherboard, please attach DC-in adapter to the motherboard first. Then plug the adapter power to AC outlet.
   Always shut down the computer normally before you move the system unit or remove the power supply from the motherboard. Please unplug the DC-in adapter first and then unplug the adapter from the AC outlet.
   Please refer photo 1 as standard procedures.
2. In case of using DIRECT DC-in (without adapter), please check the allowed range for voltage & current of cables. And make sure you have the safety protection for outer issues such as short / broken circuit, overvoltage, surge, lightning strike.
3. In case of using DC-out to an external device, please make sure its voltage and current comply with the motherboard specification.
4. The total power consumption is determined by various conditions (CPU / motherboard type, device, application, etc.). Be cautious to the power cable you use for the system, one with UL standard will be highly recommended.
5. It's highly possible to burn out the CPU if you change / modify any parts of the CPU cooler.
6. Please wear wrist strap and attach it to a metal part of the system unit before handling a component. You can also touch an object which is ground connected or attached with metal surface if you don't have wrist strap.
7. Please be careful to handle & don't touch the sharp-pointed components on the bottom of PCBA.
8. Remove or change any components form the motherboard will VOID the warranty of the motherboard.
9. Before you install / remove any components or even make any jumper setting on the motherboard, please make sure to disconnect the power supply first. (follow the aforementioned instruction guide)
10. "POWERON after PWR-Fail" function must be used carefully as below:
    When the DC power adaptor runs out of power, unplug it from the DC current; Once power returns, plug it back after 5 seconds.
    If there is a power outage, unplug it from the AC current, once power returns, plug it back after 30 seconds. Otherwise it will cause system locked or made a severe damage.

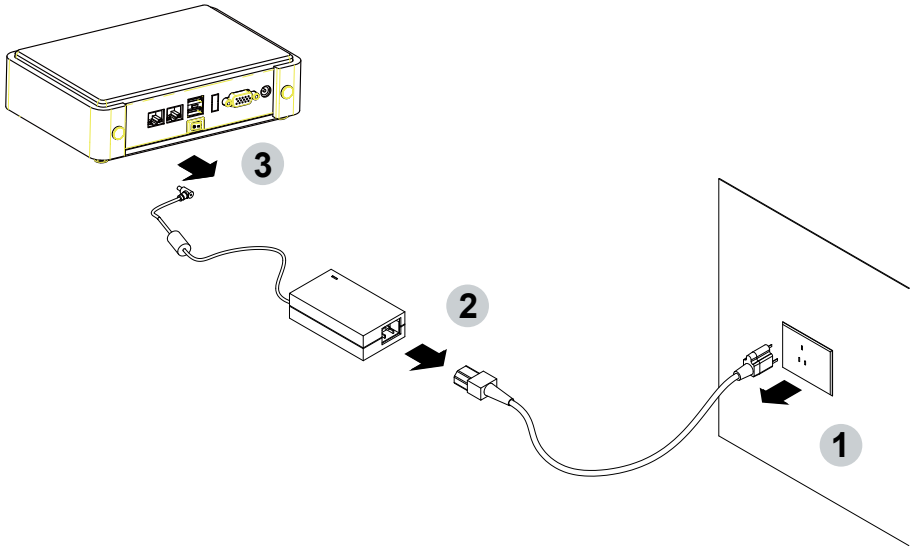
Remark 1:
Always insert / unplug the DC-in horizontally & directly to / from the motherboard. DO NOT twist, it is designed to fit snugly.
Moreover, erratic pull / push action might cause an unpredictable damage to the component & system unit.

Photo 1

Insert



Unplug



Chapter-1

General Information

2NOR01 is a 2.5-inch Plus (110 x 98 mm) carrier board based on Nvidia Orin NX series & Orin Nano series modules.

2NOR01 leverage the NVIDIA Jetson Orin NX / Nano modules to deliver AI performance with 40 up to 100 (TOPS) at the edge which is uniquely suited to AI video compute-intensive applications.

2NOR01 delivers I/O including 3 x LAN, 2 x HDMI, 1 x Nano SIM, 4 x USB 3.1, 1 x Type C USB 3.1 / 2.0 (OTG), 1 x USB 2.0, 3 x M.2, 2 x COM, 1 x CANBus, Line-out / Mic-in for implementing AI video solutions and can fulfill requirements in various applications.

1-1 Major Feature

Support Nvidia Jetson Orin NX 16G / 8G & Nano 8G / 4G Modules

1. 2 x HDMI
2. Support 1 x GbE LAN, 2 x 2.5G LAN
3. Support 2 x RS232
4. Support Mic in / Line out with Audio AMP
5. 1 x Type C, 4 x USB 3.1 / 2.0 (Type A), 1 x USB 2.0 (internal)
6. Support extended 1 x M.2 M-Key 2242 PCIe x 4 for PCIe storage,
   1 x M.2 B-Key 3042 / 2242 PCIe & USB 2.0, 1 x M.2 B-Key 3042 / 2242 USB3.0 / 2.0
   with Nano SIM socket for 4G / 5G communication
7. Support 1 x 1.8V I2C, 2 x 3.3V I2C, 1 x I2S, 1 x CANBus
8. 2 x MIPI CSI for Camera
9. HW TPM
10. Hardware digital Input & Output, 4 x DI / 4 x DO, Software Watch Dog Timer
11. Wide range power input +9V~+36V

1-2 Specification

1. **Display:** 2 x HDMI
2. **LAN:** 1 x GbE LAN + 2 x 2.5 GbE LAN
3. **Audio:** Audio Mic-in / Line-out / AMP
4. **Serial I/O:** 2 x RS232, I2C, I2S
5. **CANBus:** 1 x CANBus
6. **USB:** 1 Type C, 4 type A USB 3.1 / 2.0 and 1 x USB 2.0 (internal)
7. **Expansion interface:** 1 x M.2 M-Key 3042 PCIe x 4 for PCIe storage,
   1 x M.2 B-Key 3042 / 2242 PCIe / USB2.0, 1 x M.2 B-Key 3042 / 2242 USB3.0 / 2.0
   with Nano SIM socket for 4G / 5G
8. **MIPI:** 2 MIPI CSI for Camera
9. **TPM:** SLB 9670VQ2.0
10. **WDT/DIO:** Hardware digital Input & Output, 4 x DI / 4 x DO /
    Software Watch Dog Timer
11. **Power:** On board DC +9V~+36V
12. **Dimension:** 110 x 98 mm

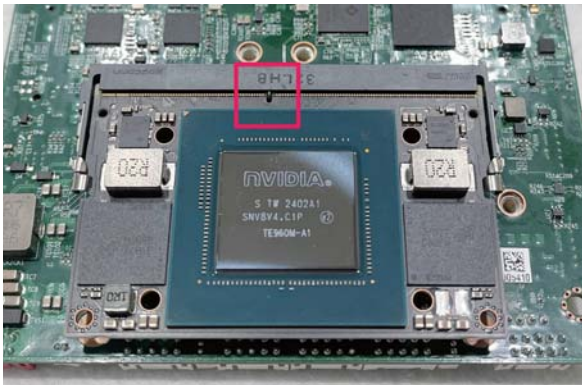
1-3 Installing the Orin™ NX / Nano CPU SOM

1. Align the Orin™ NX / Nano CPU SOM with the connector at a 45 degree angle.

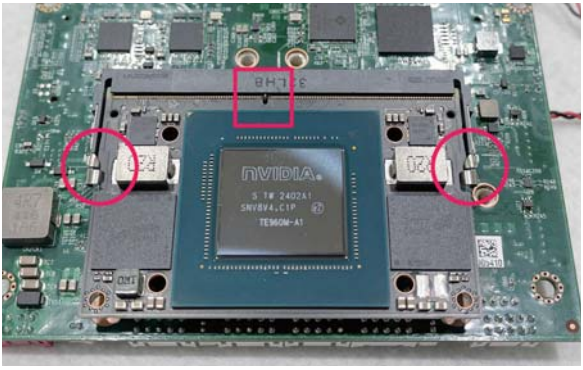
2. Press the Orin™ NX / Nano CPU SOM into the connector until you hear a click.

Notices:

1. The connectors are designed to ensure the correct insertion. If you feel resistance, check the connectors & golden finger direction, and realign the card.

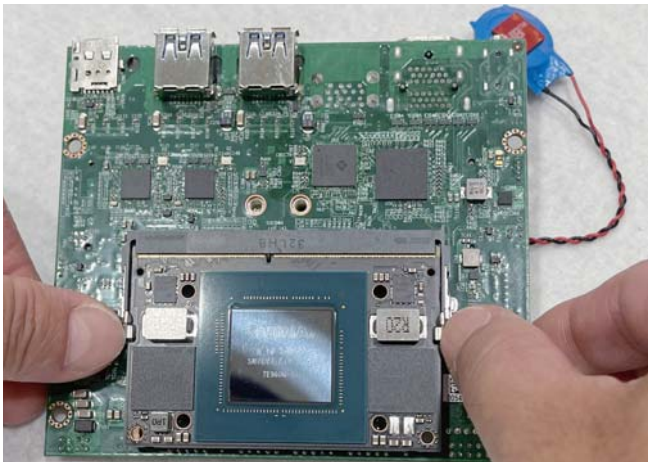


2. Make sure the retaining clips (on two sides of the slot) lock onto the notches of the card firmly.

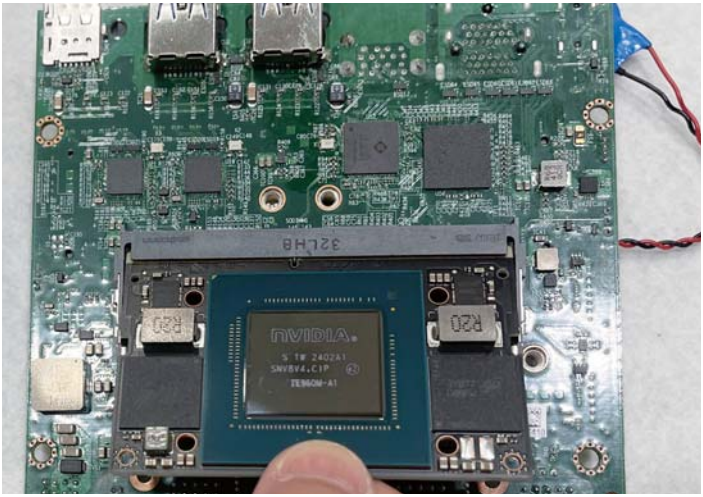


1-3-1 Removing the Orin™ NX / Nano CPU SOM

1. Release the Orin™ NX / Nano CPU SOM by pulling outward the two retaining clips and the Orin™ NX / Nano CPU SOM pops up slightly.

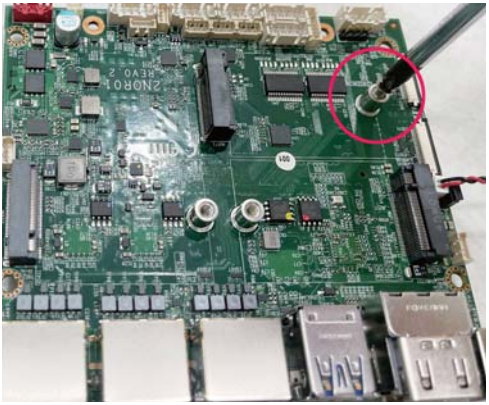


2. Lift the Orin™ NX / Nano CPU SOM out of its connector carefully.



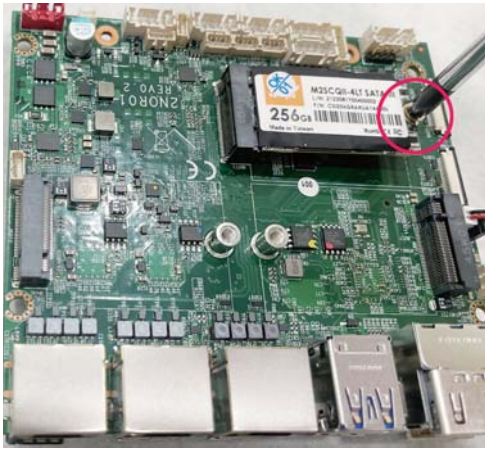
1-4 Directions for installing the M.2 M Key 2242 PCIe x4 Mini Card

1. Unscrew the screw on the board



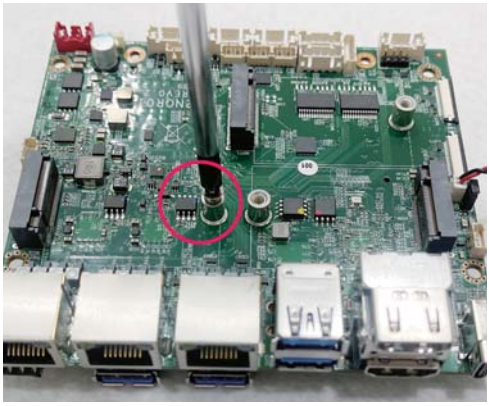
2. Plug in the Mini Card in a 45 angle

3. Gently push down the Mini Card and screw the screw back.



1-5 Directions for installing the M.2 B Key 3042 / 2242 PCIe x1 Mini Card

1. Unscrew the screw on the board

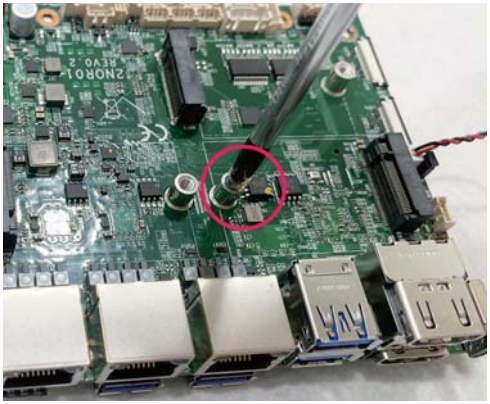


2. Plug in the Mini Card in a 45 angle

3. Gently push down the Mini Card and screw the screw back.

1-6 Directions for installing the M.2 B Key 3042 / 2242 USB 3.1 / USB 2.0 Mini Card

1. Unscrew the screw on the board

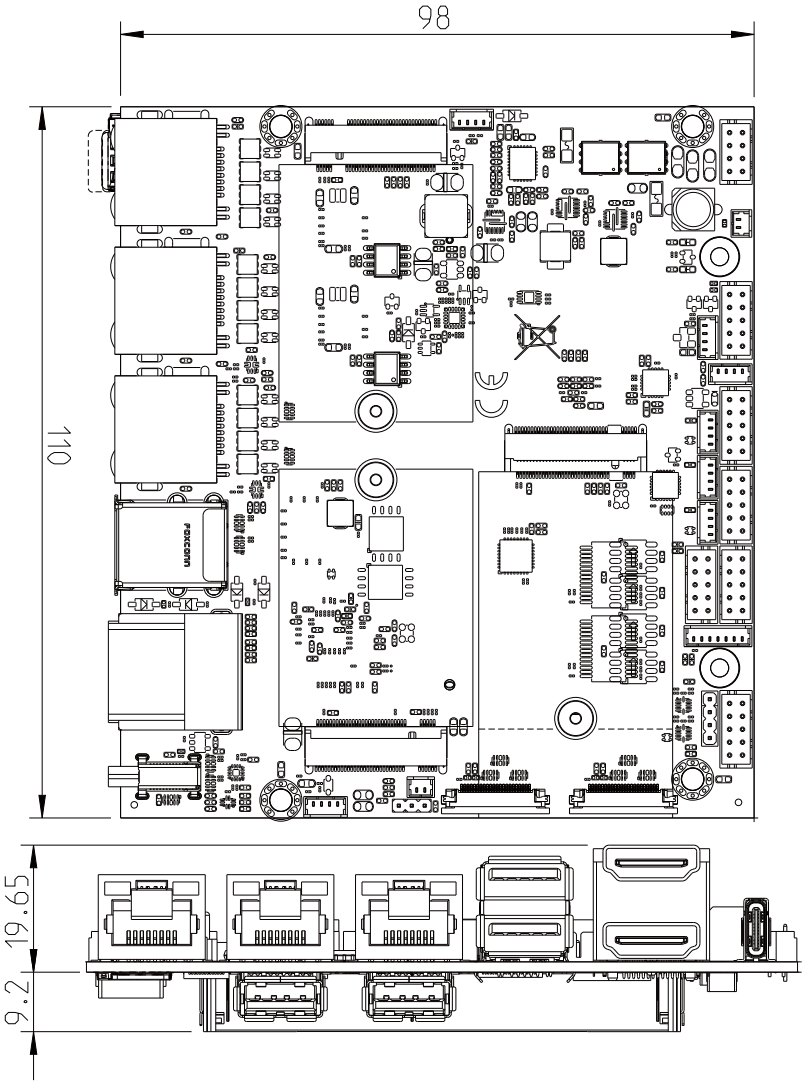


2. Plug in the Mini Card in a 45 angle

3. Gently push down the Mini Card and screw the screw back.

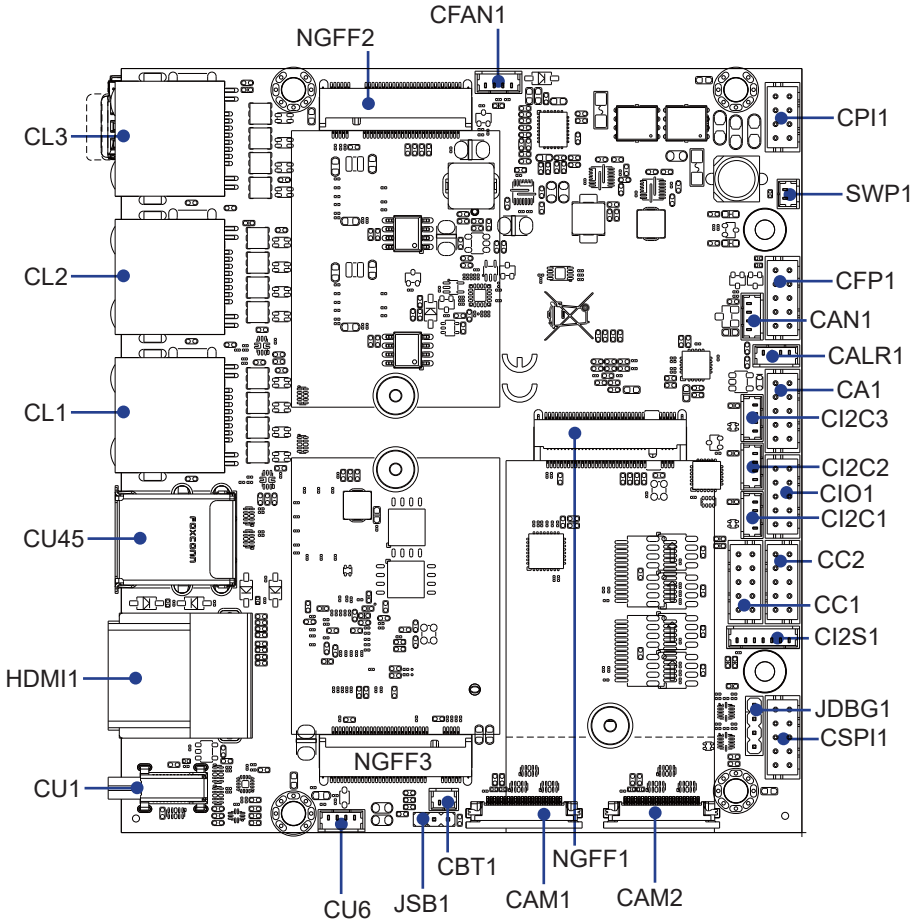
Chapter-2

2-1 Dimension-2NOR01



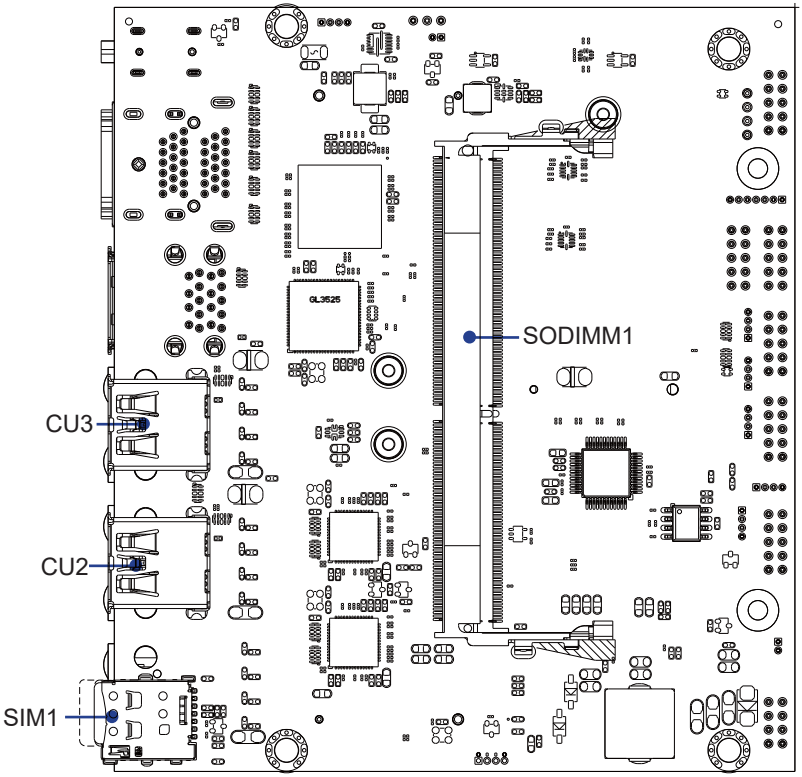
2-2 Layout-2NOR01-Connector and Jumper

TOP



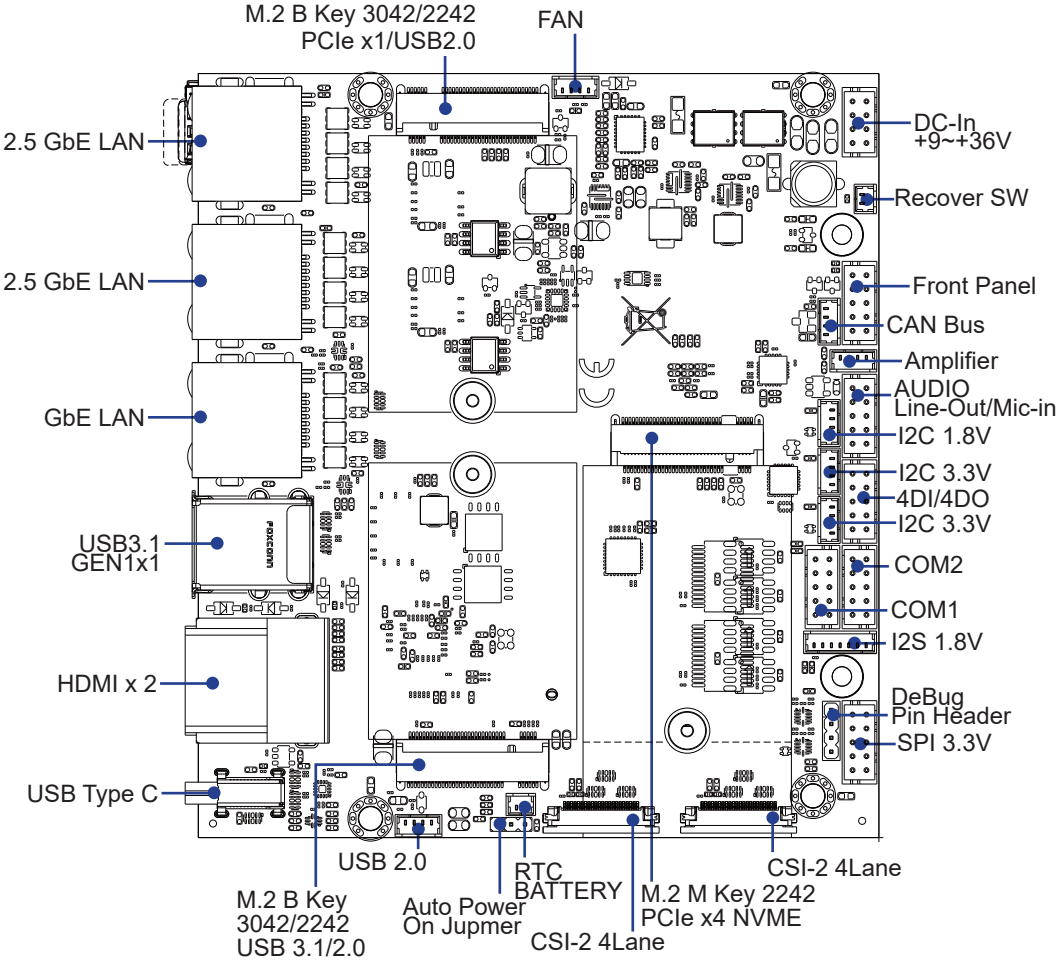
2-2-1 Layout-2NOR01-Connector and Jumper Bottom

BOT



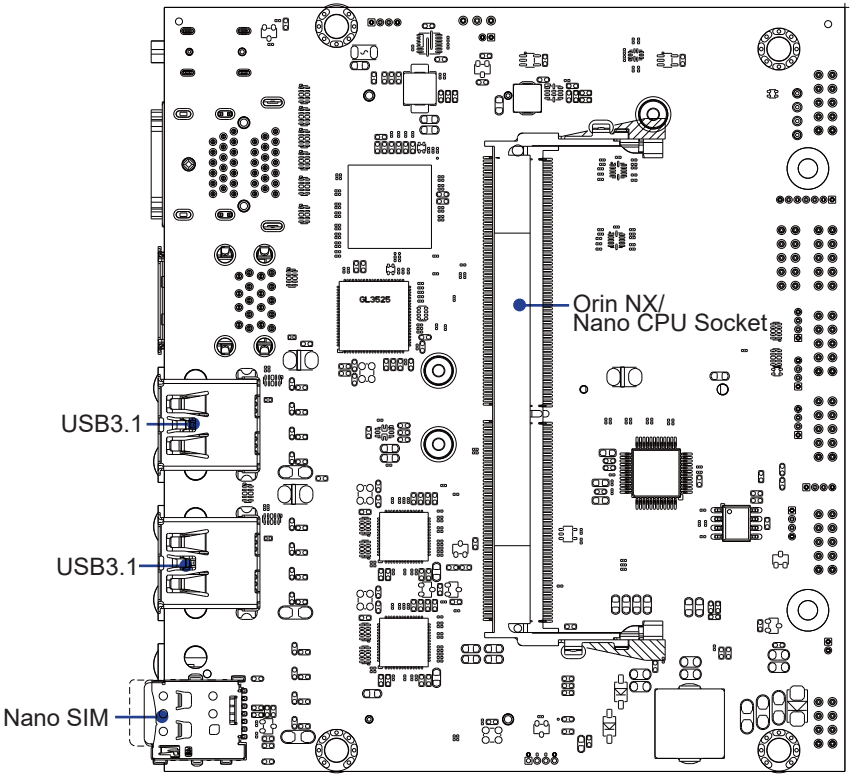
2-3 Layout-2NOR01-Function MAP

TOP



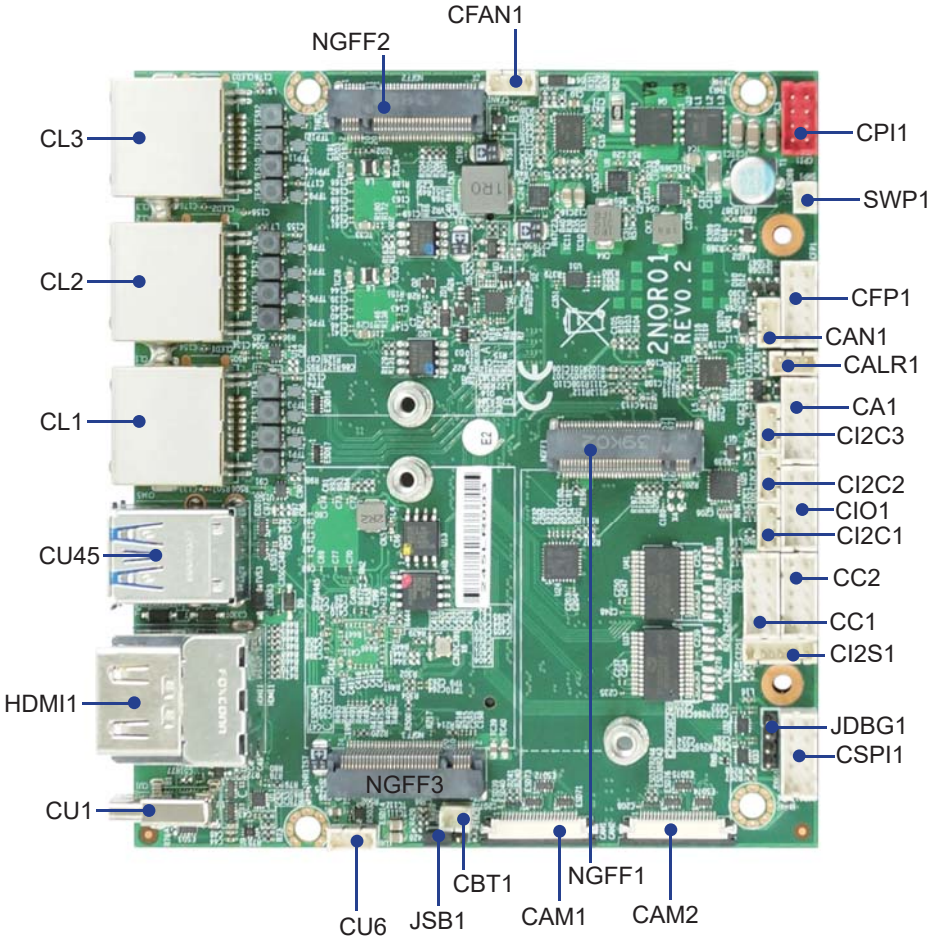
2-3-1 Layout-2NOR01-Function MAP

BOT



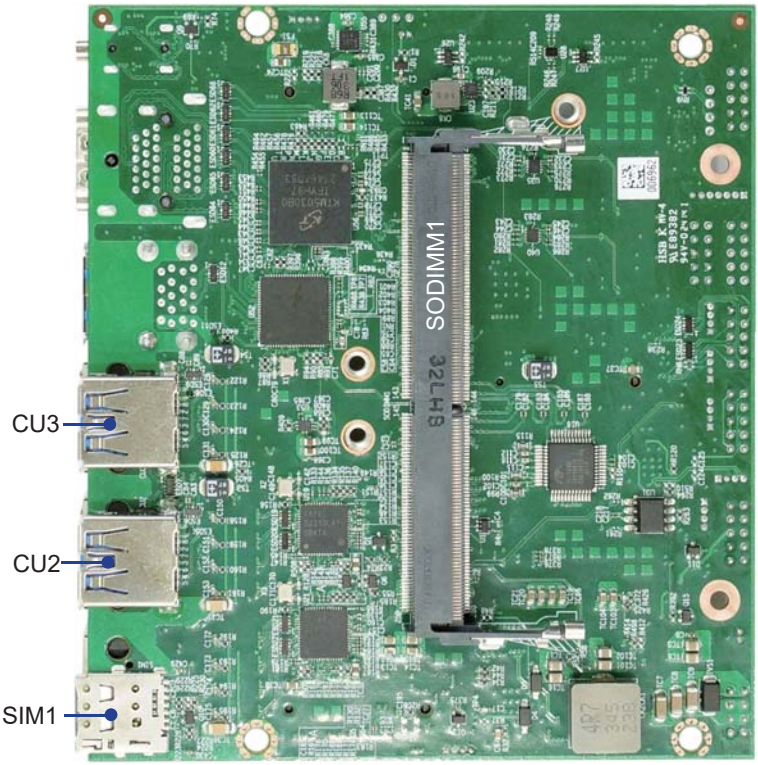
2-4 Diagram-2NOR01

TOP

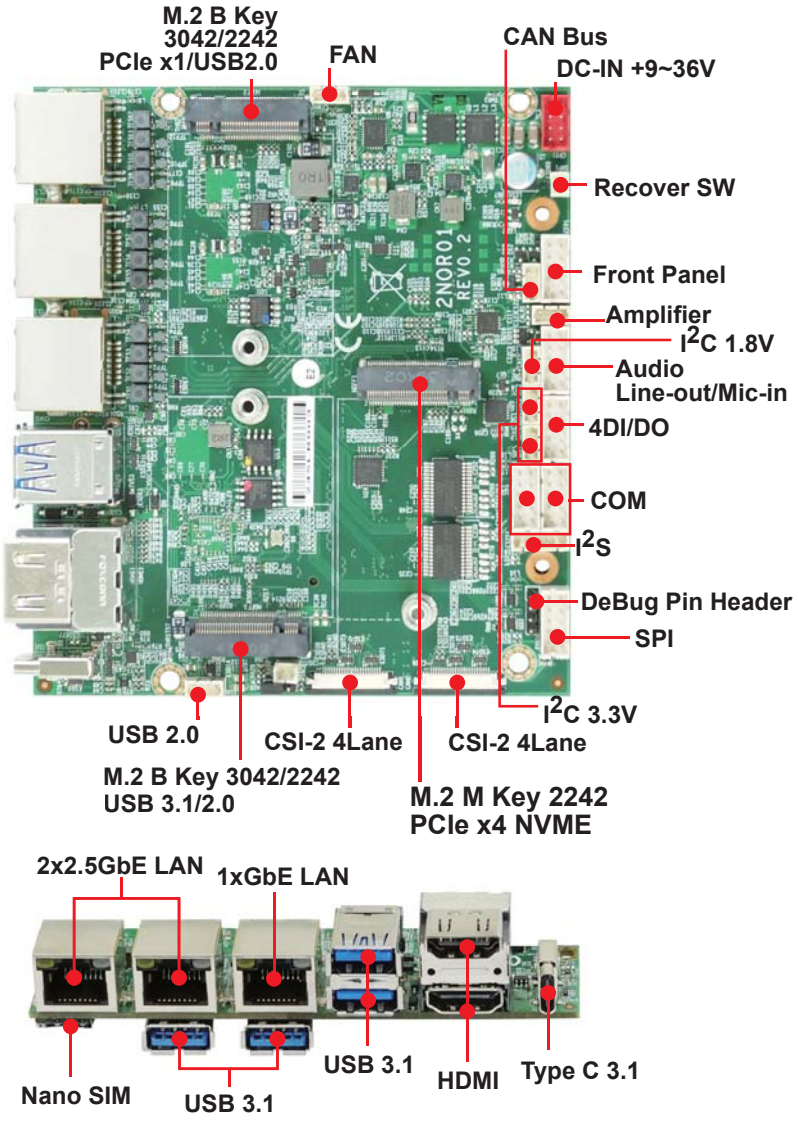


2-4-1 Diagram-2NOR01

BOT



2-5 Function MAP- 2NOR01



2-6 List of Jumpers

JSB1: Auto power ON function

2-7 Jumper Setting Description

A jumper is ON as a closed circuit with a plastic cap covering two pins. A jumper is OFF as an open circuit without the plastic cap. Some jumpers have three pins, labeled 1, 2, and 3. You could connect either pin 1 and 2 or 2 and 3.

The below figure 2.2 shows the examples of different jumper settings in this manual.

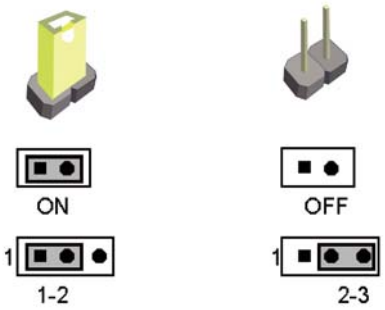


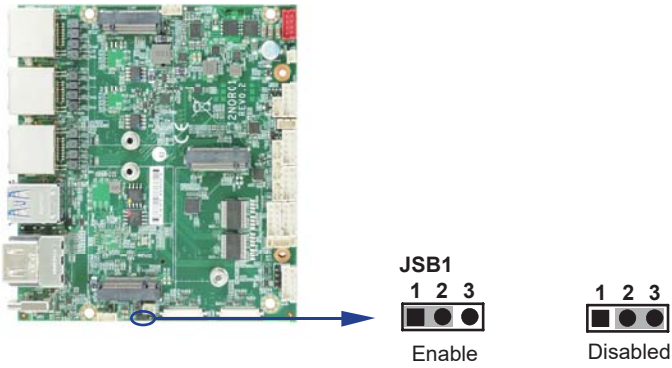
Figure 2.2

All jumpers already have its default setting with the plastic cap inserted as ON, or without the plastic cap as OFF. The default setting may be referred in this manual with a " * " symbol .

2-8 JSB1: Auto power ON function

JSB1	DESCRIPION
*1-2	Enable
2-3	Disabled

NOTE: Auto power ON function default is Enable.



Chapter-3

Connection

This chapter provides all necessary information of the peripheral's connections, switches and indicators. Always power off the board before you install the peripherals.

3-1 List of Connectors

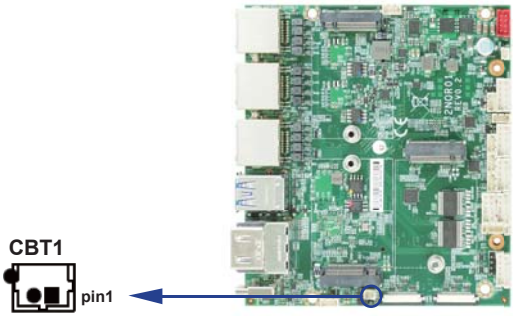
CBT1:	CMOS Battery in 1x2 pin (1.25mm) wafer
CU1:	USB type C connector
CU2:	USB 3.1 type A connector
CU3:	USB 3.1 type A connector
CU45:	USB 3.1 type A dual connector
CU6:	USB 2.0 port 1x4 pin (1.25mm) wafer
CL1:	RJ45 LAN connector
CL2:	RJ45 LAN connector
CL3:	RJ45 LAN connector
CL11:	LAN port 2x4 pin (2.0mm) wafer (option)
CL21:	LAN port 2x4 pin (2.0mm) wafer (option)
CL31:	LAN port 2x4 pin (2.0mm) wafer (option)
CLED1:	LAN LED indication 1x4 pin (1.0mm) wafer (option)
CLED2:	LAN LED indication 1x4 pin (1.0mm) wafer (option)
CLED3:	LAN LED indication 1x4 pin (1.0mm) wafer (option)
CC1:	COM1 2x5 pin (2.0mm) wafer
CC2:	COM2 2x5 pin (2.0mm) wafer
CFP1:	Front Panel connector 2x5 pin (2.0mm) wafer
CIO1:	4DI/4DO 2x5 pin (2.0mm) wafer
CAN1:	CANBus 1x4 pin (1.25mm) wafer
CI2S1:	I2S 1x7 pin (1.25mm) wafer
CI2C1:	I2C 3.3V 1x4 pin (1.25mm) wafer
CI2C2:	I2C 3.3V 1x4 pin (1.25mm) wafer
CI2C3:	I2C 1.8V 1x4 pin (1.25mm) wafer
CSPI1:	SPI 2x5 pin (2.0mm) wafer

CPI1:	DC-IN 2x4 pin (2.0mm) Red wafer
HDMI1:	HDMI typeA dual connector
NGFF1:	M.2 M key 2242 H=8.5 socket 75 pin
NGFF2:	M.2 B key 3042 H=8.5 socket 75 pin
NGFF3:	M.2 B key 3042 H=8.5 socket 75 pin
CA1:	Audio Line out and Mic in 2x5 pin (2.0mm) wafer
CALR1:	Audio Amplifier 1x4 pin (1.25mm) wafer
CFAN1:	CPU Fan 1x4 pin (1.25mm) wafer
CAM1:	MIPI CSI-2 camera FPC 1x22 pin (0.5mm) connector
CAM2:	MIPI CSI-2 camera FPC 1x22 pin (0.5mm) connector
SIM1:	Nano SIM card socket
SODIMM1:	Orin™ NX / Nano CPU SOM Socket H: 9.2mm
SWP1:	Recover button 1x2 pin (1.25mm) wafer
JDBG1:	UART Debug 1x4 pin (2.0mm) header
CBT1:	CMOS Battery in 1x2 pin (1.25mm) wafer

3-2 CBT1: CMOS Battery in 1x2 pin (1.25mm) wafer

PIN NO.	DESCRIPION
1	Battery in (GND)
2	Battery in (+3V)

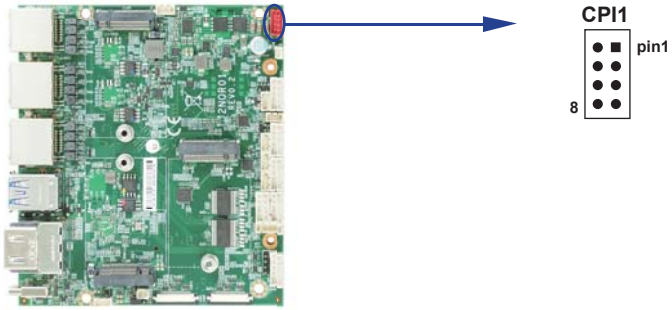
NOTE: CBT1 for external connector can extend battery capacity.



3-3 CPI1: DC Power input 2x4 pin (2.0mm) wafer (RED)

PIN NO.	DESCRIPTION
1,2,7,8	GND
3,4,5,6	DC-IN

Note: Very important check DC-in Voltage.



3-4 USB Interface

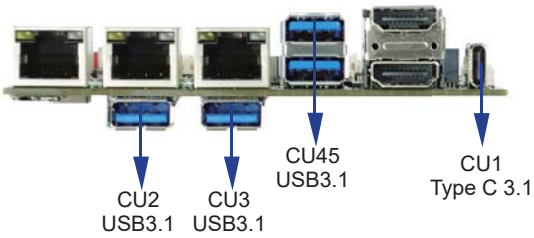
• CU1: USB Type C 24pin connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	GND	B12	GND
A2	TX1_P	B11	RX1_P
A3	TX1_N	B10	RX1_N
A4	+VBUS_5V	B9	+VBUS_5V
A5	CC1	B8	SBU2
A6	USB2_DP	B7	USB2_DN
A7	USB2_DN	B6	USB2_DP
A8	SBU1	B5	CC2
A9	+VBUS_5V	B4	+VBUS_5V
A10	RX2_N	B3	TX2_N
A11	RX2_P	B2	TX2_P
A12	GND	B1	GND

NOTE: Only support USB interface.

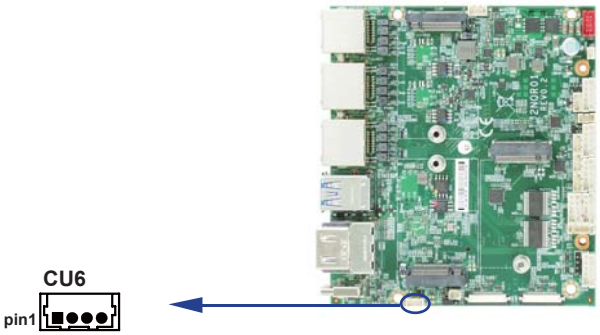
• CU2.CU3.CU45: USB 3.1 / 2.0 Type A connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
		1	USB3.1 TX+
1	+5V		
2	USB 2.0 D-	2	USB3.1 TX-
		3	GND
3	USB 2.0 D+	4	USB3.1 RX+
4	GND		
		5	USB3.1 RX-



• CU6: USB 2.0 1x4 pin (1.25mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	DATA-
3	DATA+	4	GND

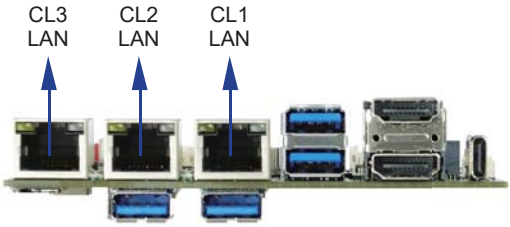


3-5 LAN INTERFACE

• CL1.CL2.CL3: RJ45 LAN connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TD0+	2	TD0-
3	TD1+	4	TD2+
5	TD2-	6	TD1-
7	TD3+	8	TD3-

NOTE: CL1 support 1G ; CL2. CL3 supports 2.5G.



CL1 RJ45 LAN Connector-LED define 1Giga/100Mb/10Mb Connector

Speed	10 Mbps		100 Mbps		1 Gbps	
Indicate	Link LED	Active LED	Link LED	Active LED	Link LED	Active LED
Light						

CL2.CL3 RJ45 LAN Connector-LED define 2.5Giga/1000/100Mb Connector

Speed	100 Mbps		1000 Mbps		2.5 Gbps	
Indicate	Link LED	Active LED	Link LED	Active LED	Link LED	Active LED
Light						

3-6 CL11.CL21.CL31: LAN signal out 2x4 pin (2.0mm) wafer (option)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TR0-	2	TR0+
3	TR2+	4	TR1+
5	TR1-	6	TR2+
7	TR3-	8	TR3+

3-7 CLED1: LAN LED indicator 1x4 pin (1.0mm) wafer (option)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	ACT_VCC	2	ACT_LED
3	Speed 1G	4	Link_VCC

3-8 CLED2.CLED3: LAN LED indicator 1x4 pin (1.0mm) wafer (option)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	Speed 100M
3	Speed 1G	4	Speed 2.5G

3-9 COM interface

- **CC1.CC2: COM1 / COM2 2x5 pin (2.0mm) wafer**
- **RS232 Mode**

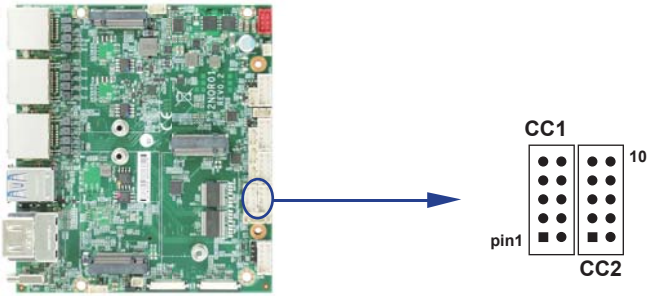
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	2	RXD
3	TXD	4	NC
5	GND	6	NC
7	NC	8	NC
9	NC	10	+5V

Note :

1. COM 1/2 Default RS232, RS422 by BOM control.
2. Pin 10 provides +5V for external device.
3. If RS485 is required, it can be used with CC007.

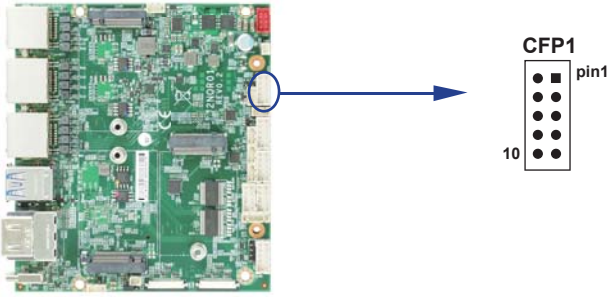
- **RS422 Mode**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX-	2	TX+
3	RX+	4	RX-
5	GND	6	NC
7	NC	8	NC
9	NC	10	+5V



3-10 CFP1: Front Panel 2x5 pin (2.0mm) wafer

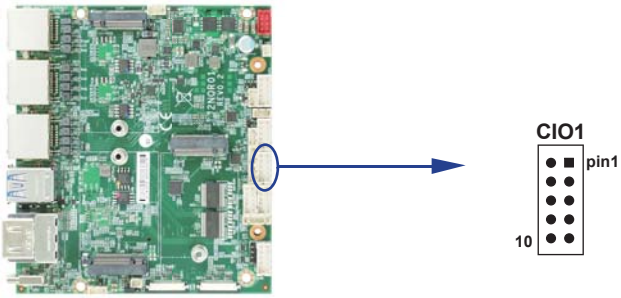
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Power button pin	2	Power button GND
3	Reset pin	4	Reset GND
5	Power LED-	6	Power LED+
7	HDD LED-	8	HDD LED+
9	LAN LED-	10	LAN LED+



3-11 CIO1: DIO 0~3 2x5 pin (2.0mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DI-0	2	DO-3
3	DI-1	4	DO-2
5	DI-2	6	DO-1
7	DI-3	8	DO-0
9	GND	10	+5V

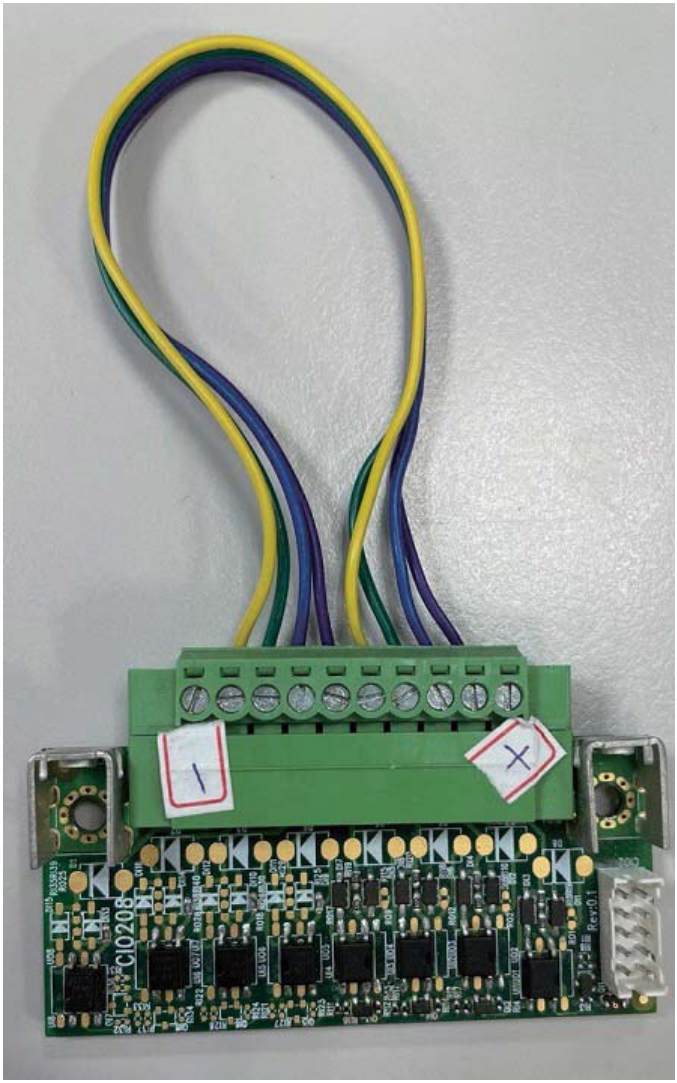
Note: DIO function from F75111.



3-11-1 How to Test DIO F75111

F75111 sample code download: https://drive.google.com/file/d/1IckmlDege0PMRkbx3Py7wBg_OQATqO8P/view?usp=sharing

How to use this Demo Application

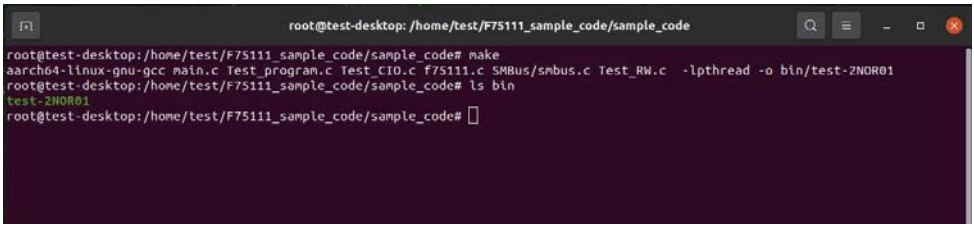


Test Head / Fixture: CIO208

Step1. Unzip "F75111_sample_code.zip" and change user permission

The program must control I/O device. You must change user permission to "root". You could use this command "sudo su"

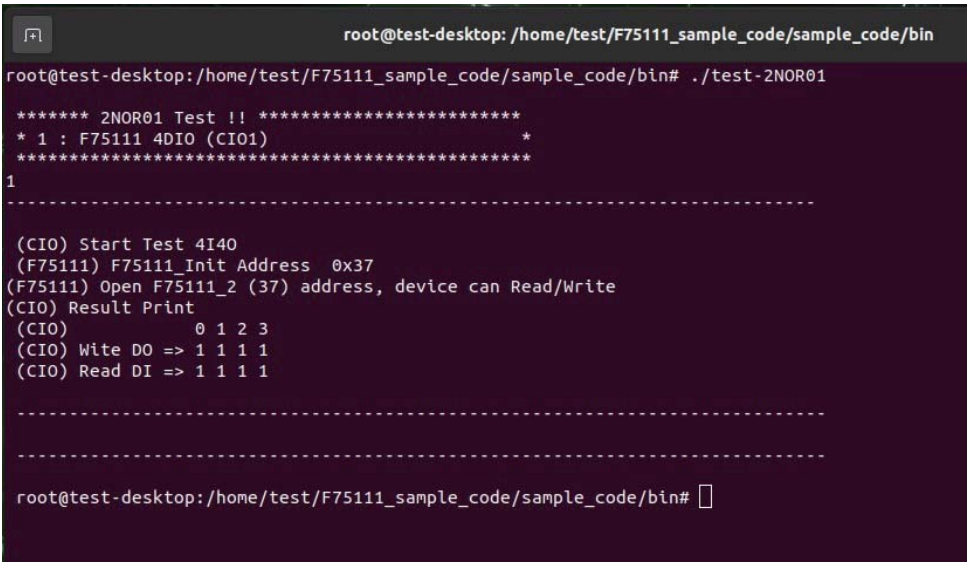
Step2. build program



cd sample_code

make

Step3. Execute program



Example: "./test-2NOR01 " and entry 1

API function

```
bool F75111_Init();
BYTE F75111_GetDigitalInput ();
void F75111_SetDigitalOutput(BYTE byteValue);

BYTE F75111_GetWDTMode();
void F75111_SetWDTMode(BYTE dwvalue);

void F75111_SetWDTEnable    (BYTE byteTimer);
void F75111_SetWDTDisable   ();

void F75111_SetWDT11Enable ();
void F75111_SetWDT11Disable ();
void F75111_GetWDTTimer ();
```

3-12 CI2C1.CI2C2: I²C 1x4 pin (1.25mm) wafer

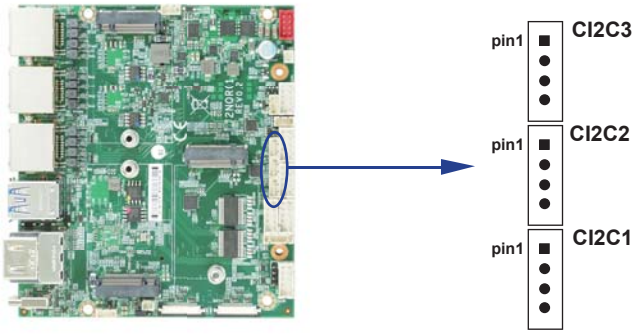
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	GND
3	I2C-Clock	4	I2C-Data

Note: CI2C1.CI2C2 support +3.3V.

• CI2C3: I²C 1x4 pin (1.25mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+1.8V	2	GND
3	I2C-Clock	4	I2C-Data

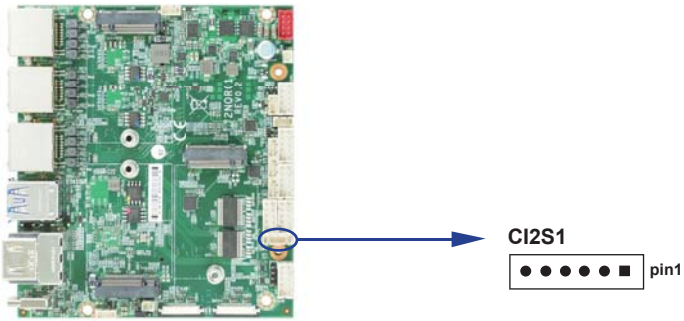
Note: CI2C3 support +1.8V.



3-13 CI2S1: I^{2}S 1x7 pin (1.25mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SDOUT	2	SDIN
3	LRCK	4	SCLK
5	MCLK	6	GND
7	+5V		

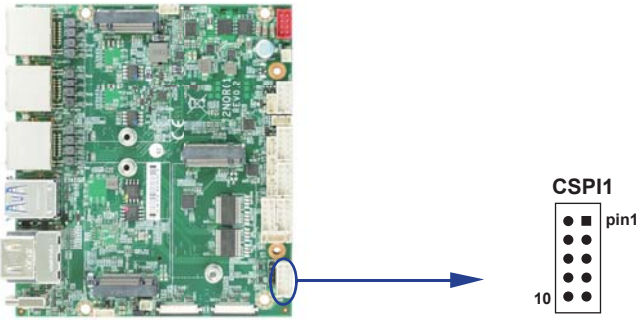
Note: PIN7 can modify +3.3V by BOM control.



3-14 CSPI1: SPI 2x5 pin (2.0mm) wafer

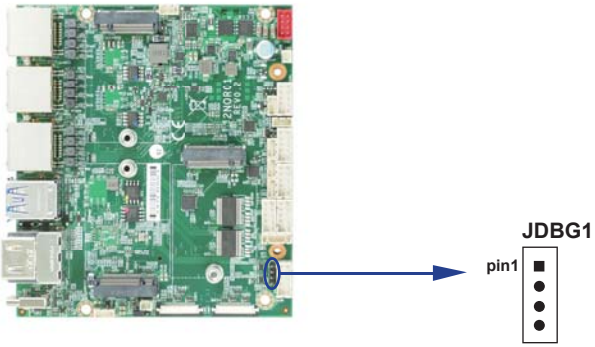
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	2	SCLK
3	CS1	4	CS0
5	NC	6	MOSI
7	NC	8	MISO
9	GND	10	+5V

Note: PIN10 can modify +3.3V by BOM control.



3-15 JDBG1: UART Debug 1x4 pin (2.0mm) header

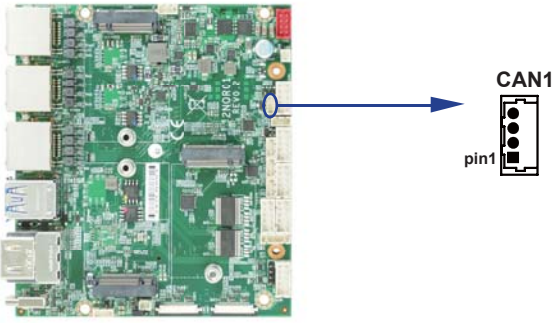
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	TX
3	RX	4	GND



3-16 CAN1: CANBus 1x4 pin (1.25mm) wafer

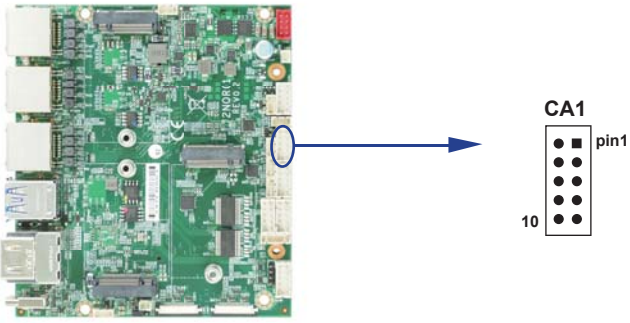
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	2	CANH
3	CANL	4	NC

Note: PIN1 can modify +3.3V by BOM control ;
PIN4 can modify GND by BOM control.



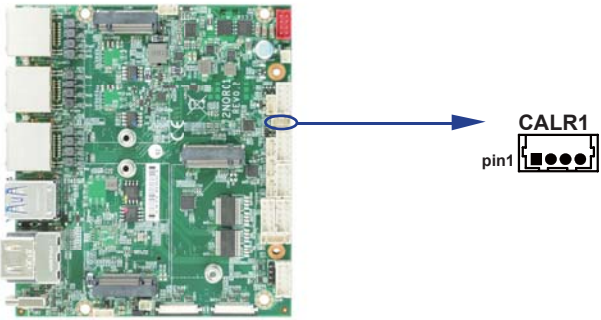
3-17 CA1: Line-out / MIC-in 2x5 pin (2.0mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Line-out-R	2	MIC-IN
3	NC	4	GND
5	GND	6	GND
7	NC	8	+5V
9	Line-out-L	10	MIC-IN



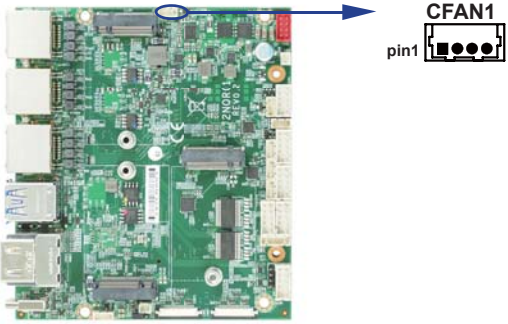
3-18 CALR1: Amplifier Line-out Right & Left channel 1x4 pin (1.25mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Left+	2	Left-
3	Right-	4	Right+



3-19 CFAN1: CPU FAN 1x4 pin (1.25mm) wafer

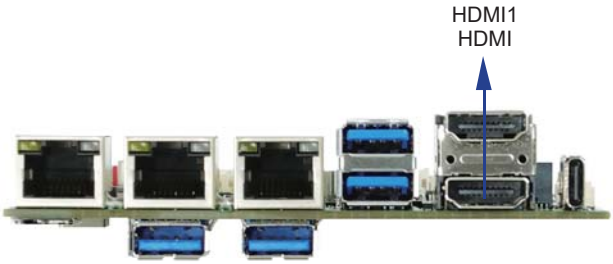
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	FAN_PWM	2	FAN_TACH
3	+5V	4	GND



3-20 HDMI1: HDMI type A dual connector

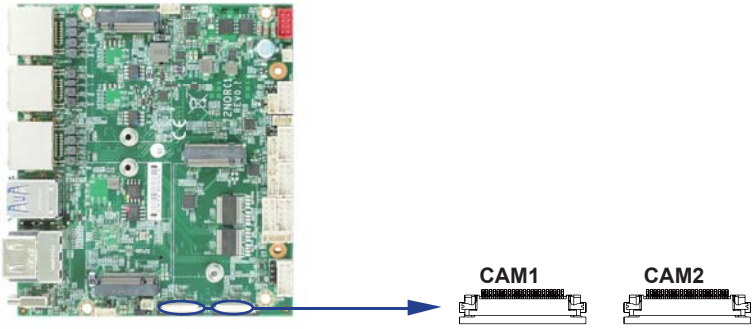
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TMDS DATA2+	2	GND
3	TMDS DATA2-	4	TMDS DATA1+
5	GND	6	TMDS DATA1-
7	TMDS DATA0+	8	GND
9	TMDS DATA0-	10	TMDS CLK+
11	GND	12	TMDS CLK-
13	NC	14	NC
15	DDC CLOCK	16	DDC DATA
17	GND	18	+5V
19	H.P. Detect		

Note:
1. HDMI only support extended mode.
2. If you use the same resolution screen,
   please adjust the different update frequency on the extended screen.



3-21 CAM1.CAM2: CSI-2 4lane FPC 1x22 pin (0.5mm) connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	I2C_SDA
3	I2C_SCL	4	GND
5	CAM_MCLK	6	CAM_PWDN
7	GND	8	CSI_D3_P
9	CSI_D3_N	10	GND
11	CSI_D2_P	12	CSI_D2_N
13	GND	14	CSI_CLK_P
15	CSI_CLK_N	16	GND
17	CSI_D1_P	18	CSI_D1_N
19	GND	20	CSI_D2_P
21	CSI_D0_N	22	GND

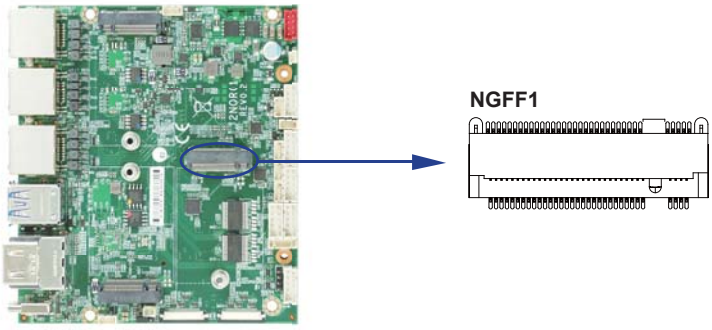


3-22 NGFF1: PCI Express M.2 M key 2242 H=8.5 socket 75pin

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+3.3V
3	GND	4	+3.3V
5	PCIE0_RX3_N	6	NC
7	PCIE0_RX3_P	8	NC
9	GND	10	M2_LED
11	PCIE0_TX3_N	12	+3.3V
13	PCIE0_TX3_P	14	+3.3V
15	GND	16	+3.3V
17	PCIE0_RX2_N	18	+3.3V
19	PCIE0_RX2_P	20	NC
21	GND	22	NC
23	PCIE0_TX2_N	24	NC
25	PCIE0_TX2_P	26	NC
27	GND	28	NC
29	PCIE0_RX1_N	30	NC
31	PCIE0_RX1_P	32	NC
33	GND	34	NC
35	PCIE0_TX1_N	36	NC
37	PCIE0_TX1_P	38	NC
39	GND	40	NC
41	PCIE0_RX0_N	42	NC
43	PCIE0_RX0_P	44	NC
45	GND	46	NC
47	PCIE0_TX0_N	48	NC
49	PCIE0_TX0_P	50	PCIE0_PRST
51	GND	52	PCIE0_CLKREQ
53	PCIE0_CLK_DN	54	PCIE_WAKE
55	PCIE0_CLK_DP	56	NC

57	GND	58	NC
M Key notch			
67	NC	68	NC
69	NC	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		

Note: Support PCIe-SSD signal.

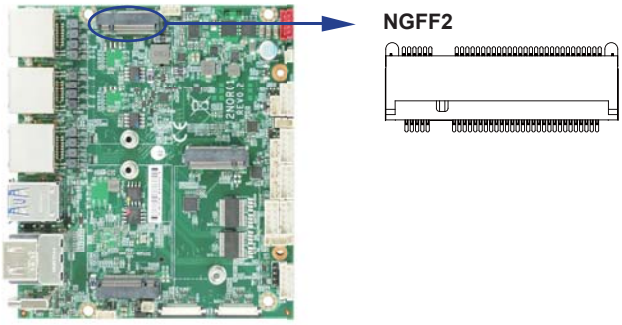


3-23 NGFF2: PCI Express M.2 B key 3042 H=8.5 socket 75pin

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+3.3V
3	GND	4	+3.3V
5	GND	6	FULL_CARD_PWR
7	USB2.0_P	8	NC
9	USB2.0_N	10	M2_LED
11	GND		
B Key notch			
		20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	NC	30	NC
31	NC	32	NC
33	GND	34	NC
35	NC	36	NC
37	NC	38	NC
39	GND	40	NC
41	PCIE1_RX0_N	42	NC
43	PCIE1_RX0_P	44	NC
45	GND	46	NC
47	PCIE1_TX0_N	48	NC
49	PCIE1_TX0_P	50	PCIE1_PRST
51	GND	52	PCIE1_CLKREQ
53	PCIE1_CLK_DN	54	PCIE_WAKE
55	PCIE1_CLK_DP	56	NC
57	GND	58	NC

59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	NC	68	NC
69	NC	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		

Note: NGFF2 support PCIe x1 & USB2.0

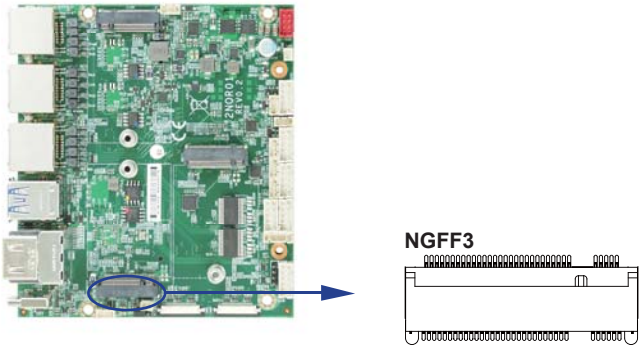


3-24 NGFF3: PCI Express M.2 B key 3042 H=8.5 socket 75pin

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	2	+3.3V / +3.7V
3	GND	4	+3.3V / +3.7V
5	GND	6	FULL_CARD_PWR
7	USB2.0_P	8	W_DISABLE_1
9	USB2.0_N	10	M2_LED
11	GND		
B Key notch			
		20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	W_DISABLE_2
27	GND	28	NC
29	USB3_RX-	30	SIM_RST_M2
31	USB3_RX+	32	SIM_CLK_M2
33	GND	34	SIM_DATA_M2
35	USB3_TX-	36	SIM_PWR_M2
37	USB3_TX+	38	NC
39	GND	40	NC
41	NC	42	NC
43	NC	44	NC
45	GND	46	NC
47	NC	48	NC
49	NC	50	NC
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC
57	GND	58	NC

59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	SIM_DET
67	MD_RESET_N	68	NC
69	NC	70	+3.3V / +3.7V
71	GND	72	+3.3V / +3.7V
73	GND	74	+3.3V / +3.7V
75	NC		

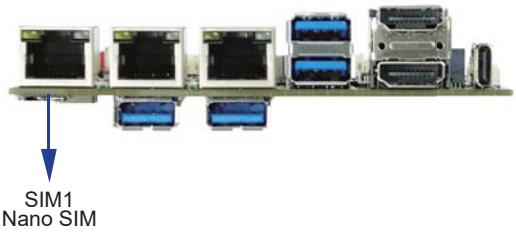
Note:
1. NGFF3 support USB 3.0 & USB 2.0
2. VCC voltage default support +3.3V.
3. BOM control, if need 4G LTE device VCC voltage is +3.7V.



3-25 SIM1: Nano SIM Card Push-Push

- **Follow ISO 7816-2 Smart Card Standard.**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	RST
3	CLK	4	NC
5	GND	6	VPP
7	DATA	8	NC



3-26 SODIMM1: Orin™ Nano / NX CPU SOM socket 260Pin H:9.2mm

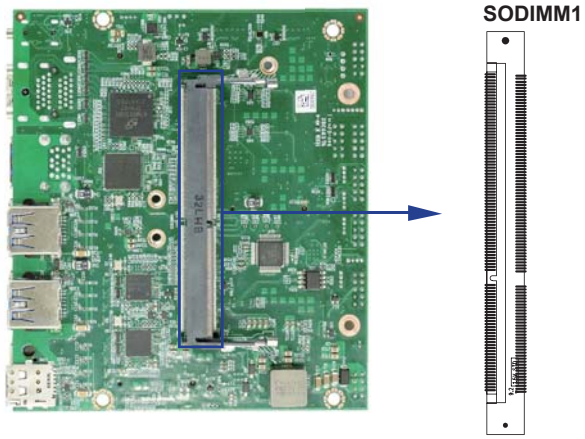
Primary (Top) Side		Secondary (Bottom) Side	
Description	Pin NO.	Pin NO.	Description
GND	1	2	GND
CSI1_D0_N	3	4	CSI0_D0_N
CSI1_D0_P	5	6	CSI0_D0_P
GND	7	8	GND
CSI1_CLK_N	9	10	CSI0_CLK_N
CSI1_CLK_P	11	12	CSI0_CLK_P
GND	13	14	GND
CSI1_D1_N	15	16	CSI0_D1_N
CSI1_D1_P	17	18	CSI0_D1_P
GND	19	20	GND
CSI3_D0_N	21	22	CSI2_D0_N
CSI3_D0_P	23	24	CSI2_D0_P
GND	25	26	GND
CSI3_CLK_N	27	28	CSI2_CLK_N
CSI3_CLK_P	29	30	CSI2_CLK_P
GND	31	32	GND
CSI3_D1_N	33	34	CSI2_D1_N
CSI3_D1_P	35	36	CSI2_D1_P
GND	37	38	GND
USBSS1_RX_N	39	40	PCIE2_RX0_N
USBSS1_RX_P	41	42	PCIE2_RX0_P
GND	43	44	GND
USBSS1_TX_N	45	46	PCIE2_TX0_N
USBSS1_TX_P	47	48	PCIE2_TX0_P
GND	49	50	GND
USBSS2_RX_N	51	52	PCIE2_CLK_N
USBSS2_RX_P	53	54	PCIE2_CLK_P

Primary (Top) Side		Secondary (Bottom) Side	
GND	55	56	GND
USBSS2_TX_N	57	58	PCIE3_RX0_N
USBSS2_TX_P	59	60	PCIE3_RX0_P
GND	61	62	GND
DP1_TXD0_N	63	64	PCIE3_TX0_N
DP1_TXD0_P	65	66	PCIE3_TX0_P
GND	67	68	GND
DP1_TXD1_N	69	70	NC
DP1_TXD1_P	71	72	NC
GND	73	74	GND
DP1_TXD2_N	75	76	NC
DP1_TXD2_P	77	78	NC
GND	79	80	GND
DP1_TXD3_N	81	82	NC
DP1_TXD3_P	83	84	NC
GND	85	86	GND
USB_VBUS_EN0	87	88	NC
SPI0_MOSI	89	90	NC
SPI0_SCK	91	92	NC
SPI0_MISO	93	94	NC
SPI0_CS0	95	96	DP1_HPD
SPI0_CS1	97	98	DP1_AUX_N
UART0_TXD	99	100	DP1_AUX_P
UART0_RXD	101	102	GND
UART0_RTS	103	104	SPI1_MOSI
NC	105	106	SPI1_SCK
GND	107	108	SPI1_MISO
USB2_P0_DN	109	110	SPI1_CS0
USB2_P0_DP	111	112	NC
GND	113	114	CAM0_PWDN

Primary (Top) Side		Secondary (Bottom) Side	
USB2_P1_DN	115	116	CAM0_MCLK
USB2_P1_DP	117	118	CAM2_MCLK
GND	119	120	CAM1_PWDN
USB2_P2_DN	121	122	CAM1_MCLK
USB2_P2_DP	123	124	CAM_MUX_SEL1
GND	125	126	SPI_TPM_INT_N
PWR_LED_CTRL	127	128	NC
GND	129	130	CAM_MUX_SEL
PCIE0_RX0_N	131	132	GND
PCIE0_RX0_P	133	134	PCIE0_TX0_N
GND	135	136	PCIE0_TX0_P
PCIE0_RX1_N	137	138	GND
PCIE0_RX1_P	139	140	PCIE0_TX1_N
GND	141	142	PCIE0_TX1_P
CAN_RX	143	144	GND
Key notch			
CAN_TX	145	146	GND
GND	147	148	PCIE0_TX2_N
PCIE0_RX2_N	149	150	PCIE0_TX2_P
PCIE0_RX2_P	151	152	GND
GND	153	154	PCIE0_TX3_N
PCIE0_RX3_N	155	156	PCIE0_TX3_P
PCIE0_RX3_P	157	158	GND
GND	159	160	PCIE0_CLK_N
USBSS0_RX_N	161	162	PCIE0_CLK_P
USBSS0_RX_P	163	164	GND
GND	165	166	USBSS0_TX_N
PCIE1_RX0_N	167	168	USBSS0_TX_P
PCIE1_RX0_P	169	170	GND
GND	171	172	PCIE1_TX0_N

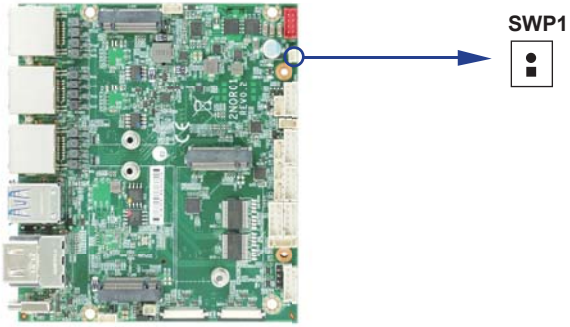
Primary (Top) Side		Secondary (Bottom) Side	
PCIE1_CLK_N	173	174	PCIE1_TX0_P
PCIE1_CLK_P	175	176	GND
GND	177	178	MOD_SLEEP_N
PCIE_WAKE	179	180	PCIE0_CLKREQ
PCIE0_RST	181	182	PCIE1_CLKREQ
PCIE1_RST	183	184	GBE_MDI0_N
I2C0_CLK	185	186	GBE_MDI0_P
I2C0_DATA	187	188	GBE_LED_LINK
I2C1_CLK	189	190	GBE_MDI1_N
I2C1_DATA	191	192	GBE_MDI1_P
I2S0_SDOUT	193	194	GBE_LED_ACT
I2S0_SDIN	195	196	GBE_MDI2_N
I2S0_LRCK	197	198	GBE_MDI2_P
I2S0_SCLK	199	200	GND
GND	201	202	GBE_MDI3_N
UART1_TXD	203	204	GBE_MDI3_P
UART1_RXD	205	206	CAM_MUX_SEL
UART1_RTS	207	208	FAN_TACH
NC	209	210	CLK_32K_OUT
NC	211	212	NC
CAM_I2C_SCL	213	214	FORCE_RECOVERY
CAM_I2C_SDA	215	216	CAM3_MCLK
MODULE_ID	217	218	NC
PCIE2_RST	219	220	NC
PCIE2_CLKREQ	221	222	NC
PCIE3_RST	223	224	NC
PCIE3_CLKREQ	225	226	NC
PCIE3_CLK_N	227	228	NC
PCIE3_CLK_P	229	230	FAN_PWM
GND	231	232	I2C2_CLK

Primary (Top) Side		Secondary (Bottom) Side	
POWER_EN	237	238	UART2_RXD (DEBUG)
SYS_RESET	239	240	PWR_BTN_N
GND	241	242	GND
GND	243	244	GND
GND	245	246	GND
GND	247	248	GND
GND	249	250	GND
VDD_IN	251	252	VDD_IN
VDD_IN	253	254	VDD_IN
VDD_IN	255	256	VDD_IN
VDD_IN	257	258	VDD_IN
VDD_IN	259	260	VDD_IN



3-27 SWP1: Recover button 1x2 pin (1.25mm) wafer

PIN NO.	DESCRIPION
1	GND
2	RECOVERY



3-28 Connector wafer of Compatible Brand and part number list

Location	CKTS	Pitch	Brand name	Mating connector	Cable housing
CBT1.SWP1	1x2 2Pin	1.25mm	MOLEX	53047-0210	51021-0200
CU6.CAN1.CI2C1.CI2C2. CI2C3.CAFN1.CALR1	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CC1.CC2.CPI1	2x4 8Pin	2.0mm	JST	B8B-PHDSS	PHDR-08VS
CFP1.CIO1. CA1.CSPI1	2x5 10Pin	2.0mm	JST	B10B-PHDSS	PHDR-10VS
CI2S1	1x7 7Pin	1.25mm	MOLEX	53047-0710	51021-0700
CAM1.CAM2	1x22 22Pin	0.5mm	MOLEX	54548-2272	