



# IEM7110-3G

## Managed Industrial Ethernet Switch Module Hardware Manual

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# Preface

The manual of managed industrial Ethernet switch module has introduced this module:

- Product overview
- Encapsulation and size
- Pin definition
- Reference circuit

## Readers


This manual mainly suits for engineers as follows:





- On-site technical support and maintenance staffs
- Hardware engineers

## Text Format Convention

Format	Description
“”	Words with "" represent the interface words. e.g.: "The port No."
>	Multi-level path is separated by ">". Such as opening the local connection path description: Open "Control Panel> Network Connection> Local Area Connection".
Light Blue Font	Represent the words click to achieve hyperlink. Font color as: "Light blue".
About This Chapter	The "About This Chapter" section provides links to each section and corresponding principles / operating chapters in this chapter.

## Icon Convention

Format	Description
 Notice	Reminder the announcements in the operation, improper operation may result in data loss or equipment damage.

Format	Description
 Warning	Pay attention to the notes on the mark, improper operation may cause personal injury.
 Note	Make a necessary supplementary instruction for operation description.
 Key	Configuration, operation, or tips for device usage.
 Tips	Pay attention to the operation or information to ensure success device configuration or normal working.

## Revision Record

Version NO.	Revision Data	Revision Description
01	2018-01-15	Product release
02	2018-11-14	Document optimization
03	2018-12-29	Document optimization
04	2020-07-30	Update the structure diagram size of module aperture

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# 1 Product Overview

## 1.1 Introduction

IEM7110-3G is managed layer 2 embedded industrial Ethernet switch module featuring high integration, small size, rich functions and simple operation. The following interface types are included:

- 3 Gigabit Ethernet ports, support 10/100/1000Base-T(X) copper port and 1000Base-X SFP port.
- 7 100M Ethernet ports, support 10/100Base-T(X) copper port and 100Base-FX fiber port.
- 1 CONSOLE port for command line coordination and debugging this module.
- 2 I/O alarm ports for extending relay alarm.

## 1.2 Specification

Port	
100M copper port	10/100Base-T(X), automatic flow control, full/half duplex mode, MDI/MDI-X auto-tunning
100M fiber port	100Base-FX
Gigabit copper port	10/100/1000Base-T(X), achieved via extended PHY chip
Gigabit SFP	1000Base-X SFP
CONSOLE port	CLI command line management port
I/O port	Alarm input and output
Switch property	
Backplane bandwidth	7.6G
Cache size	1Mbit

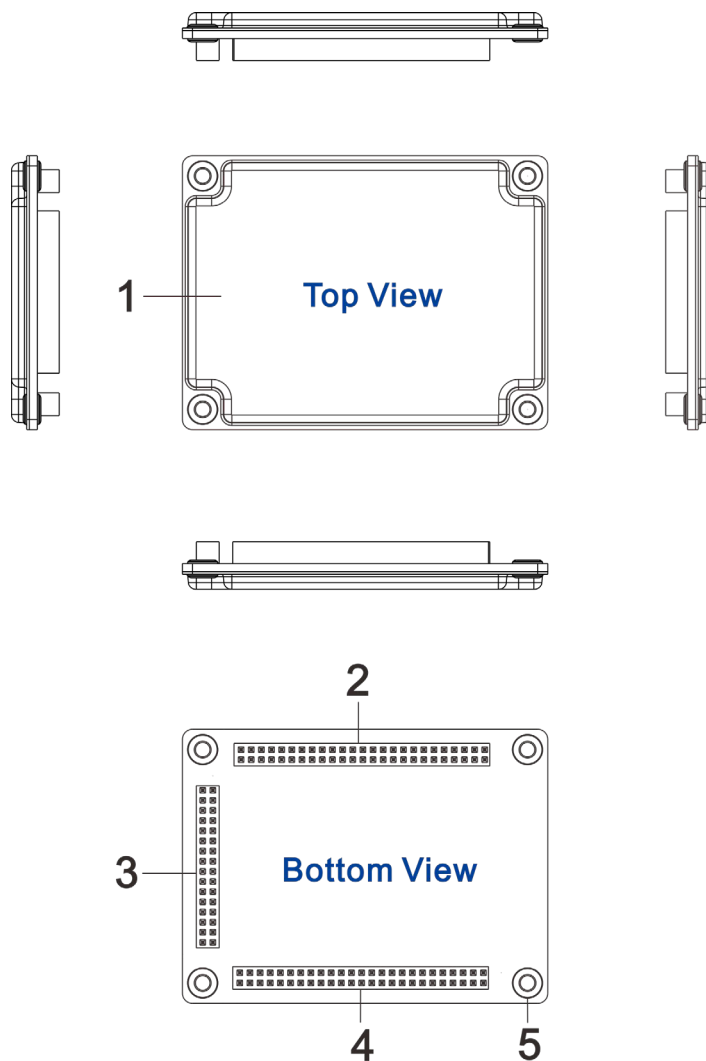
MAC address table	8K
<b>Power supply</b>	
Input power supply	3.3VDC (±5%)
<b>Power consumption</b>	
Full-load	<3W
<b>Operating environment</b>	
Operating temperature	-40~75℃
Storage temperature	-40~85℃
Operating humidity	5%~95%
<b>Mechanical structure</b>	
Installation	Embedded installation (pin header female header connecting style)
Size (WxHxD)	72mm×8.9mm×54mm



# 2 Dimension

## 2.1 Encapsulation Design

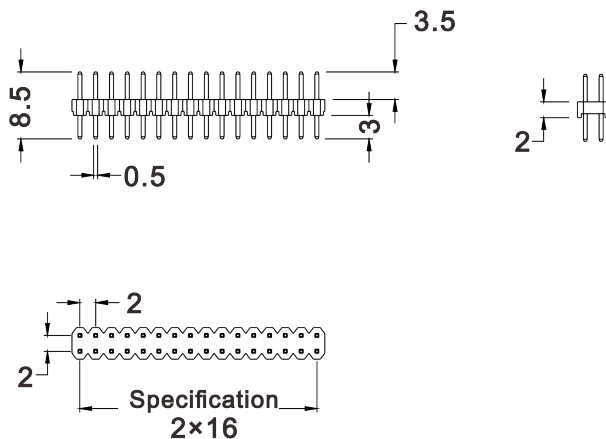
The module structure is as follows:



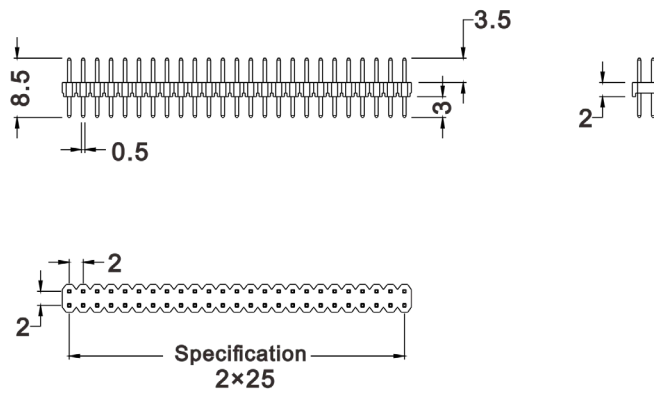
The detailed description of each encapsulation label is as shown below:

Encapsulation	Name	Specification	Description
1	Heat conduction blade	72mm*54mm	Could connect to external heatsink
2	Connector C	Direct plug-in connector 2*25, pin pitch 2mm, connector 4.3mm high, square hole 0.5mm*0.5mm	—
3	Connector B	Direct plug-in connector 2*16, pin pitch 2mm, connector 4.3mm high, square hole 0.5mm*0.5mm	—
4	Connector A	Direct plug-in connector 2*25, pin pitch 2mm, connector 4.3mm high, square hole 0.5mm*0.5mm	—
5	Location hole	The diameter of the location mounting hole is $3.1\pm 0.15\text{mm}$ , which is suitable for M3 screw. and the distance between the center of the circle and the four sides of the PCB board is 4mm. Note: The module could be fixed on the backplane by using copper cylinder.	The four location holes have the same specifications

Please refer to the following views for the corresponding pin header specification of connector B, unit:mm



Please refer to the following views for the corresponding pin headers specification of connector A and C, unit:mm



## 2.2 Product Size

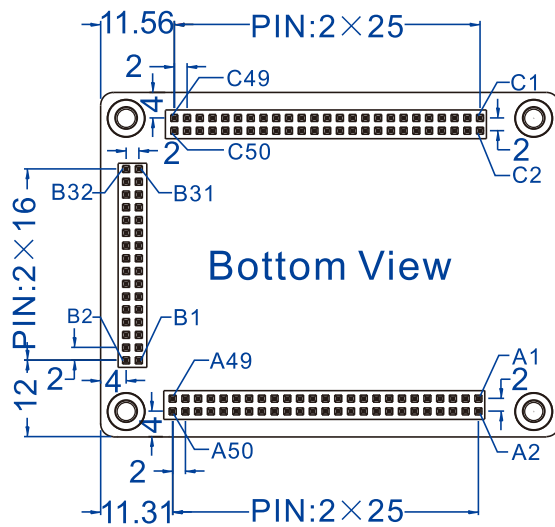
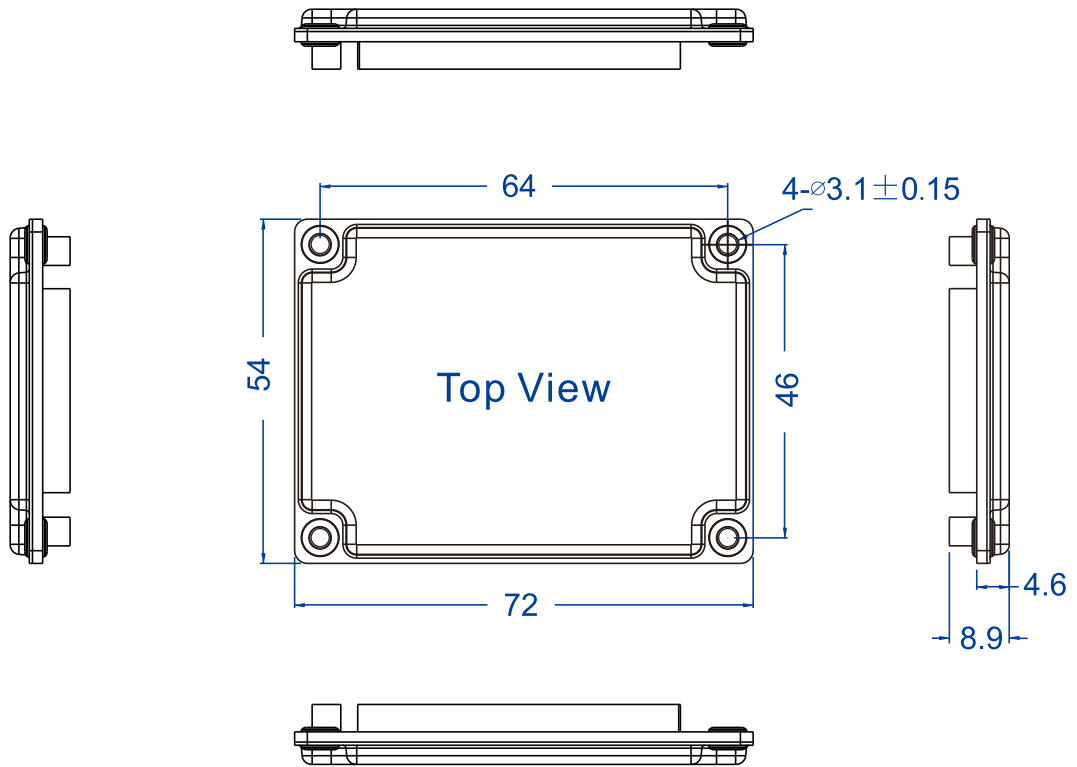
The dimension graph of the module structure is as follows:

Unit: mm



The diameter of the location mounting hole is  $3.1 \pm 0.15$ mm, which is suitable for M3 screw.

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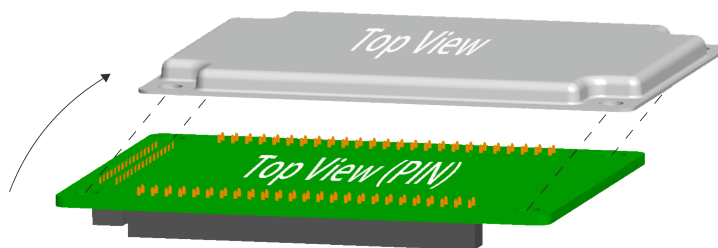
# 3 Pin Definition Description

## 3.1 Pin Definition View

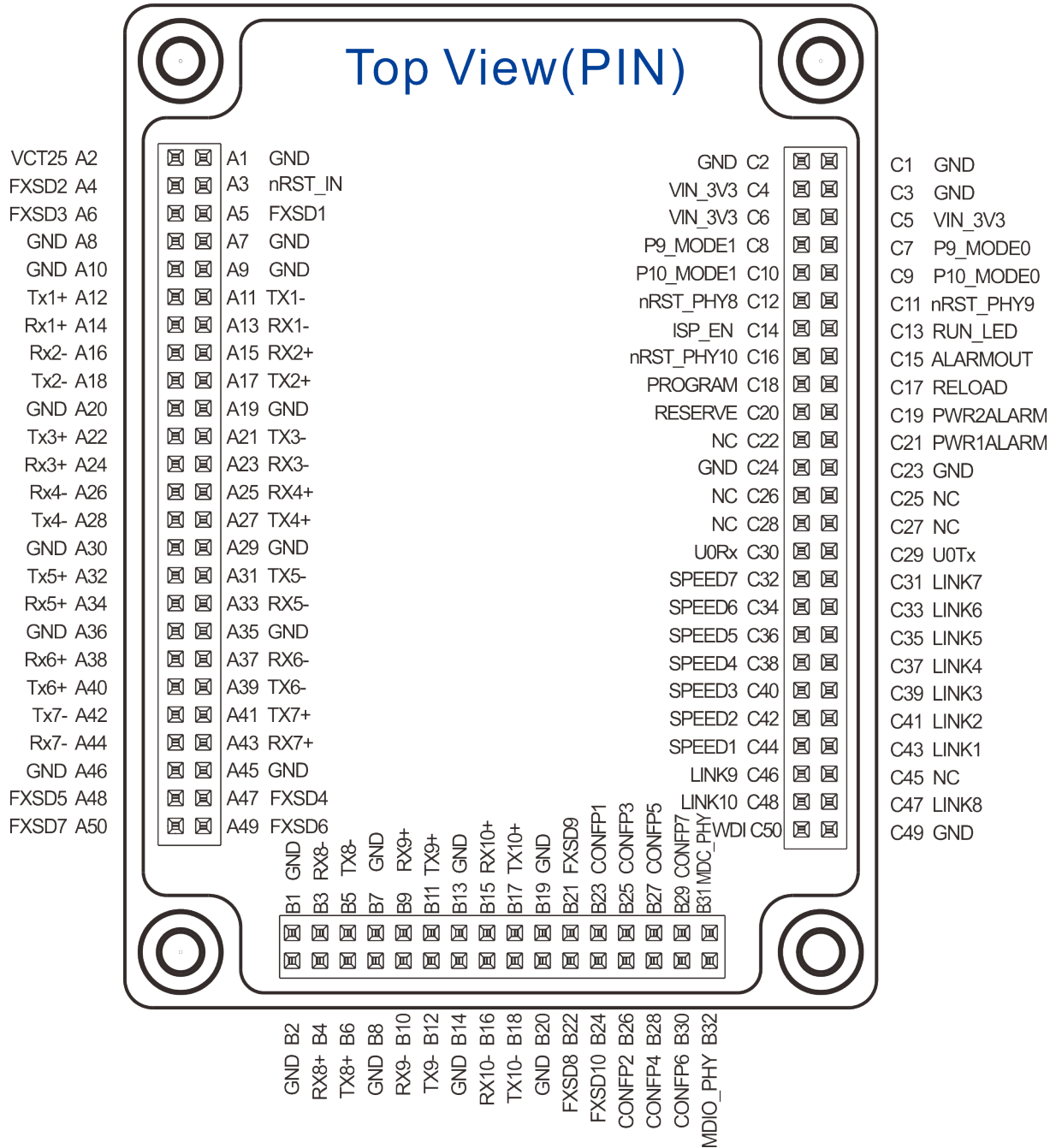


Note

The pin definition view adopts the following top views for user to check pin definitions conveniently during PCB board wiring.



The pin number and name top view of the module is as follows:



### 3.2 Description of Pin Definition and Name

Pin ID	Description
GND	Ground
VCT25	Voltage-Current Output 2.5VDC, voltage output 2.5VDC
nRST	nReset, reset, active-low
IN	Input
FXSD	FX Signal Detection
RX	Receive Data

TX	Transmit Data
CONFP	Config Port
MDIO	Management Data Input/Output
MDC	Management Data Clock
PHY	Physical Layer
VIN_3V3	VIN: Voltage Input; 3V3: 3.3VDC
ISP_EN	ISP: In System Program; EN: Enable
PWR	Power
U0RX	U: UART (Universal Asynchronous Receiver/Transmitter)
U0TX	U: UART (Universal Asynchronous Receiver/Transmitter)
NC	No Connect
WDI	Watch Dog Input

### 3.3 Pin Definition List

#### Pin definition (A1-A50) of connector A (J5)

Pin No.	Pin name	Pin No.	Pin name
A1	GND	A2	VCT25
A3	nRST_IN	A4	FXSD2
A5	FXSD1	A6	FXSD3
A7	GND	A8	GND
A9	GND	A10	GND
A11	TX1-	A12	TX1+
A13	RX1-	A14	RX1+
A15	RX2+	A16	RX2-
A17	TX2+	A18	TX2-
A19	GND	A20	GND
A21	TX3-	A22	TX3+
A23	RX3-	A24	RX3+
A25	RX4+	A26	RX4-
A27	TX4+	A28	TX4-
A29	GND	A30	GND
A31	TX5-	A32	TX5+
A33	RX5-	A34	RX5+
A35	GND	A36	GND

Pin No.	Pin name	Pin No.	Pin name
A37	RX6-	A38	RX6+
A39	TX6-	A40	TX6+
A41	TX7+	A42	TX7-
A43	RX7+	A44	RX7-
A45	GND	A46	GND
A47	FXSD4	A48	FXSD5
A49	FXSD6	A50	FXSD7

### Pin definition (B1-B32) of connector B (J6)

Pin No.	Pin name	Pin No.	Pin name
B1	GND	B2	GND
B3	RX8-	B4	RX8+
B5	TX8-	B6	TX8+
B7	GND	B8	GND
B9	RX9+	B10	RX9-
B11	TX9+	B12	TX9-
B13	GND	B14	GND
B15	RX10+	B16	RX10-
B17	TX10+	B18	TX10-
B19	GND	B20	GND
B21	FXSD9	B22	FXSD8
B23	CONFP1	B24	FXSD10
B25	CONFP3	B26	CONFP2
B27	CONFP5	B28	CONFP4
B29	CONFP7	B30	CONFP6
B31	MDC_PHY	B32	MDIO_PHY

### Pin definition (C1-C50) of connector C (J7)

Pin No.	Pin name	Pin No.	Pin name
C1	GND	C2	GND
C3	GND	C4	VIN_3V3
C5	VIN_3V3	C6	VIN_3V3
C7	P9_MODE0	C8	P9_MODE1
C9	P10_MODE0	C10	P10_MODE1
C11	nRST_PHY9	C12	nRST_PHY8



Pin No.	Pin name	Pin No.	Pin name
C13	RUN_LED	C14	ISP_EN
C15	ALARMOUT	C16	nRST_PHY10
C17	RELOAD	C18	PROGRAM
C19	PWR2ALARM	C20	RESERVE
C21	PWR1ALARM	C22	NC
C23	GND	C24	GND
C25	NC	C26	NC
C27	NC	C28	NC
C29	U0Tx	C30	U0Rx
C31	LINK7	C32	SPEED7
C33	LINK6	C34	SPEED6
C35	LINK5	C36	SPEED5
C37	LINK4	C38	SPEED4
C39	LINK3	C40	SPEED3
C41	LINK2	C42	SPEED2
C43	LINK1	C44	SPEED1
C45	NC	C46	LINK9
C47	LINK8	C48	LINK10
C49	GND	C50	WDI

## 3.4 Detailed Description of Pin Definition

### 3.4.1 100M Ethernet interface

Pin definition description of 7 100M Ethernet interfaces:

Pin name	Pin No.	Type	Function description
RX1+	A14	Input	The positive end of 100M Ethernet interface data receiving. <ul style="list-style-type: none"> <li>When the 100M Ethernet port 1-7 is configured to 100M copper port, the corresponding RXP[1:7] connects to network transformer directly.</li> <li>When the 100M Ethernet port 1-7 is configured to 100M fiber port, the corresponding RXP[1:7] connects to the</li> </ul>
RX2+	A15		
RX3+	A24		
RX4+	A25		
RX5+	A34		
RX6+	A38		
RX7+	A43		

Pin name	Pin No.	Type	Function description
			<p>positive output end of the optical module directly.</p> <ul style="list-style-type: none"> <li>The pin is recommended to be grounding when not used.</li> </ul>
RX1-	A13	Input	<p>The negative end of 100M Ethernet interface data receiving.</p> <ul style="list-style-type: none"> <li>When the 100M Ethernet port 1-7 is configured to 100M copper port, the corresponding RXN[1:7] connects to network transformer directly.</li> <li>When the 100M Ethernet port 1-7 is configured to 100M fiber port, the corresponding RXN[1:7] connects to the negative output end of the optical module directly.</li> <li>The pin is recommended to be grounding when not used.</li> </ul>
RX2-	A16		
RX3-	A23		
RX4-	A26		
RX5-	A33		
RX6-	A37		
RX7-	A44		
TX1+	A12	Output	<p>The positive end of 100M Ethernet interface data transmitting.</p> <ul style="list-style-type: none"> <li>When the 100M Ethernet port 1-7 is configured to 100M copper port, the corresponding TXP[1:7] connects to network transformer directly.</li> <li>When the 100M Ethernet port 1-7 is configured to 100M fiber port, the corresponding TXP[1:7] connects to the positive input end of the optical module directly.</li> <li>The pin is recommended to be grounding when not used.</li> </ul>
TX2+	A17		
TX3+	A22		
TX4+	A27		
TX5+	A32		
TX6+	A40		
TX7+	A41		
TX1-	A11	Output	<p>The negative end of 100M Ethernet interface data transmitting.</p> <ul style="list-style-type: none"> <li>When the 100M Ethernet port 1-7 is configured to 100M copper port, the corresponding TXN[1:7] connects to network transformer directly.</li> <li>When the 100M Ethernet port 1-7 is configured to 100M fiber port, the corresponding TXN[1:7] connects to the negative input end of the optical module</li> </ul>
TX2-	A18		
TX3-	A21		
TX4-	A28		
TX5-	A31		
TX6-	A39		
TX7-	A42		

Pin name	Pin No.	Type	Function description
			directly. <ul style="list-style-type: none"> <li>The pin is recommended to be grounding when not used.</li> </ul>
FXSD1	A5	Input	Optical signal test input of 100M Ethernet fiber port. <ul style="list-style-type: none"> <li>When the 100M Ethernet port 1-7 is configured to fiber port, the corresponding FXSD[1:7] is used to represent whether the optical module has detected signal. High level means optical signal is detected.</li> <li>When the 100M Ethernet 1-7 is configured to copper port or not used, the corresponding FXSD[1:7] can't be suspended and recommends to be grounding via 4.7kΩ resistor.</li> </ul>
FXSD2	A4		
FXSD3	A6		
FXSD4	A47		
FXSD5	A48		
FXSD6	A49		
FXSD7	A50		
CONFP 1	B23	Input	100M Ethernet interface configuration pin. <ul style="list-style-type: none"> <li>When CONFP[1:7] is grounded, the corresponding 100M Ethernet port 1-7 is configured to 100M copper port.</li> <li>When CONFP[1:7] is connected to 3.3VDC power supply via 4.7kΩ resistor, the corresponding 100M Ethernet port 1-7 is configured to 100M fiber port.</li> <li>The pin is recommended to be suspended when not used.</li> </ul>
CONFP 2	B26		
CONFP 3	B25		
CONFP 4	B28		
CONFP 5	B27		
CONFP 6	B30		
CONFP 7	B29		

### 3.4.2 Gigabit Ethernet Interface (SGMII)

Gigabit Ethernet port 8-10 is Gigabit SGMII interface. When the Gigabit Ethernet port 8-10 needs to be designed to copper port, the work mode of the port can be configured via the corresponding LINK8, P9\_MODE[1:0] pin respectively, then connects to and manages external PHY chip via MDIO\_PHY, MDC\_PHY pin to realize the design of Gigabit Ethernet copper port.

Pin definition description of Gigabit Ethernet interface:

Pin name	Pin No.	Type	Function description
RX8+	B4	Input	The positive end of 1000M Ethernet interface data receiving.
RX9+	B9		

RX10+	B15		<ul style="list-style-type: none"> <li>When the 1000M Ethernet port 8-10 is configured to 1000M fiber port mode, the corresponding RXP[8:10] connects to the positive output end of the optical module directly.</li> </ul>
RX8-	B3	Input	<p>The negative end of 1000M Ethernet interface data receiving.</p> <ul style="list-style-type: none"> <li>When the 1000M Ethernet port 8-10 is configured to 1000M fiber port mode, the corresponding RXN[8:10] connects to the negative output end of the optical module directly.</li> </ul>
RX9-	B10		
RX10-	B16		
TX8+	B6	Output	<p>The positive end of 1000M Ethernet interface data transmitting.</p> <ul style="list-style-type: none"> <li>When the 1000M Ethernet port 8-10 is configured to 1000M fiber port mode, the corresponding TXP[8:10] connects to the positive input end of the optical module directly.</li> </ul>
TX9+	B11		
TX10+	B17		
TX8-	B5	Output	<p>The negative end of 1000M Ethernet interface data transmitting.</p> <ul style="list-style-type: none"> <li>When the 1000M Ethernet port 8-10 is configured to 1000M fiber port mode, the corresponding TXN[8:10] connects to the negative input end of the optical module directly.</li> </ul>
TX9-	B12		
TX10-	B18		
FXSD8	B22	Input	<p>Optical signal test input of 1000M Ethernet fiber port.</p> <ul style="list-style-type: none"> <li>When the 1000M Ethernet port 8-10 is configured to fiber port, the corresponding FXSD[8:10] is used to represent whether the optical module has detected signal. High level means optical signal is detected.</li> <li>When the 1000M Ethernet 8-10 is configured to copper port or not used, the corresponding FXSD[8:10] can't be suspended and recommends to be grounding via 4.7kΩ resistor.</li> </ul>
FXSD9	B21		
FXSD10	B24		
LINK8	C47	Output	Multifunction pin of 1000M Ethernet port 8, which could be used for work mode configuration and status indication.

			<ul style="list-style-type: none"> <li>When the pin is connected to +3.3VDC power supply via 4.7kΩ resistor, the corresponding 1000M Ethernet port 8 is configured to 1000M fiber port. <ul style="list-style-type: none"> <li>When the pin outputs high level, it means the corresponding Gigabit Ethernet port 8 has no connection.</li> <li>When the pin outputs low level, it means the corresponding Gigabit Ethernet port 8 has built valid connection.</li> <li>When the pin outputs alternating high and low level, it means the corresponding Gigabit Ethernet port 8 has data transmission.</li> </ul> </li> <li>When the pin is suspended or grounded, the corresponding Gigabit Ethernet port 8 would be configured to SGMII mode and could be connected to external PHY chip as Gigabit copper port.</li> </ul>
P9_MODE0	C7	Input	<p>The work mode configuration pin P9_MODE[1:0] of Gigabit Ethernet port 9. When the pin is suspended, it would be configured to 0; when the pin connects to 3.3VDC power supply via 4.7kΩ resistor, it would be configured to 1. The configuration method of P9_MODE[1:0] is as follows:</p> <ul style="list-style-type: none"> <li>00: reserved</li> <li>01: 1000BASE-X mode (fiber port)</li> <li>10: SGMII mode (1000BASE-T copper port, need to connect external PHY)</li> <li>11: reserved</li> </ul>
P9_MODE1	C8		
P10_MODE 0	C9	Input	<p>The work mode configuration pin P10_MODE[1:0] of Gigabit Ethernet port 10. When the pin is suspended, it would be configured to 0; when the pin connects to 3.3VDC power supply via 4.7kΩ resistor, it would be configured to 1. The configuration method of P10_MODE[1:0] is as follows:</p> <ul style="list-style-type: none"> <li>00: reserved</li> </ul>
P10_MODE 1	C10		

			<ul style="list-style-type: none"> <li>01: 1000BASE-X mode (fiber port)</li> <li>10: SGMII mode (1000BASE-T copper port, need to connect external PHY)</li> <li>11: reserved</li> </ul>
MDIO_PHY	B32	Output /input	External PHY chip SMI management interface, MDIO_PHY is the data management input/output pin of the external PHY chip, and MDC_PHY is the data management clock pin of the external PHY chip.
MDC_PHY	B31	Output	

### 3.4.3 Power and Grounded Signal

Pin definition description of power supply and grounded signal:

Pin name	Pin No.	Type	Function description
VIN_3V3	C4, C5, C6	Input	3.3VDC voltage input, providing power for this module.
VCT25	A2	Output	2.5VDC voltage output, providing power for the center tap of the 100M Ethernet interface network transformer only and not for other purposes.
GND	A1, A7, A8, A9, A10, A19, A20, A29, A30, A35, A36, A45, A46, C1, C2, C3, C23, C24, C49, B1, B2, B7, B8, B13, B14, B19, B20	Grounding	Grounded signal

### 3.4.4 CONSOLE Port (Debugging Port)

Pin definition description of CONSOLE port:

Pin name	Pin No.	Type	Function description
U0TX	C29	Output	Transmitting signal of CONSOLE port, only for the CONSOLE port to debug this module.

Pin name	Pin No.	Type	Function description
U0RX	C30	Input	Receiving signal of CONSOLE port, only for the CONSOLE port to debug this module.

### 3.4.5 I/O Alarm Port

Pin definition description of I/O alarm port:

Pin name	Pin No.	Type	Configuration method
PWR2ALARM	C19	Input	2 alarm signal input pins, which could be self-configured alarm input type, such as power supply alarm information detection. The default configuration is low level alarm, not high level alarm.
PWR1ALARM	C21		
ALARMOUT	C15	Output	1 alarm signal output pin, which corresponds to 2 alarm information input statuses. When any one of the input statuses changes, both the two output statuses would change. ALARMOUT could be extended to relay, which is active low. It 's high level by default.

### 3.4.6 Indicator

Indicator pin definition description:

Pin name	Pin No.	Type	Function description
LINK1	C43	Output	100M Ethernet port connection and data transmission indication pin LINK [1:7]. <ul style="list-style-type: none"> <li>When the pin outputs high level, it means the corresponding 100M Ethernet port 1 -7 has no connection.</li> <li>When the pin outputs low level, it means the corresponding 100M Ethernet port 1 -7 has built valid connection.</li> <li>When the pin outputs alternating high and low level, it means the corresponding 100M Ethernet port 1 -7 has data transmission.</li> </ul>
LINK2	C41		
LINK3	C39		
LINK4	C37		
LINK5	C35		
LINK6	C33		
LINK7	C31		

Pin name	Pin No.	Type	Function description
LINK8	C47	Output	<p>Multifunction pin of 1000M Ethernet port 8, which could be used for work mode configuration and status indication.</p> <ul style="list-style-type: none"> <li>When the pin is connected to +3.3VDC power supply via 4.7kΩ resistor, the corresponding 1000M Ethernet port 8 is configured to 1000M fiber port. <ul style="list-style-type: none"> <li>When the pin outputs high level, it means the corresponding Gigabit Ethernet port 8 has no connection.</li> <li>When the pin outputs low level, it means the corresponding Gigabit Ethernet port 8 has built valid connection.</li> <li>When the pin outputs alternating high and low level, it means the corresponding Gigabit Ethernet port 8 has data transmission.</li> </ul> </li> <li>When the pin is suspended or grounded, the corresponding Gigabit Ethernet port 8 would be configured to SGMII mode and could be connected to external PHY chip as Gigabit copper port.</li> </ul>
LINK9	C46	Output	<p>1000M Ethernet port connection status indication pin LINK [9:10].</p> <p>when the 1000M Ethernet port 9-10 is configured to 1000M fiber port:</p> <ul style="list-style-type: none"> <li>When the pin outputs high level, it means the corresponding Gigabit Ethernet port 9 -10 has no connection.</li> <li>When the pin outputs low level, it means the corresponding Gigabit Ethernet port 9 -10 has built connection.</li> <li>When the pin outputs alternating high and low level, it means the corresponding Gigabit Ethernet port 9 -10 has data transmission.</li> </ul>
LINK10	C48	Output	
SPEED1	C44	Output	<p>100M Ethernet port speed indication pin SPEED [1:7].</p> <ul style="list-style-type: none"> <li>When the 100M Ethernet port is configured to 10BASE-T, which is 10M, the pin outputs high</li> </ul>
SPEED2	C42		
SPEED3	C40		
SPEED4	C38		



Pin name	Pin No.	Type	Function description
SPEED5	C36		level.
SPEED6	C34		<ul style="list-style-type: none"> <li>When the 100M Ethernet port is configured to 100BASE-TX, which is 100M, the pin outputs low level.</li> </ul>
SPEED7	C32		
RUN_LED	C13	Output	<p>Output pin of CPU running indicator, active low. The statuses of indicator are as follows:</p> <ul style="list-style-type: none"> <li>Blinking, means the system operates normally;</li> <li>On, means the system is being enabled or the device is running abnormally;</li> <li>Off, means the device is not powered on or the device is running abnormally;</li> </ul>

### 3.4.7 Other Pins

Pin name	Pin No.	Type	Function description
nRST_IN	A3	Input	System reset pin, active low, recommend to pull up. When the pin inputs low level over 200ms the system enters reset status.
PROGRAM	C18	Input	Program update pin, active low, recommend to pull up. Default to high level.
RELOAD	C17	Input	Module restore factory defaults pin, active low, recommend to pull up. The module collects the signal of this pin during powering on. When the pin connects to low level, the module would restore factory settings after 1s.
nRST_PHY8	C12	Output	Software reset external PHY chip pin, active low. When the Gigabit Ethernet port 8-10 is configured to copper port, the corresponding nRST_PHY[8:10] could connect to the reset signal pin of external PHY chip.
nRST_PHY9	C11		
nRST_PHY10	C16		

### 3.4.8 Reserved Pins

Pin name	Pin No.	Type	Function description
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

Pin name	Pin No.	Type	Function description
NC	C22, C25, C26, C27, C28, C45	Reserved	Please suspend the pin if not used.

# 4 Reference Circuit



Note

The grounded signal identification of reference circuit is as follows:

- : GND, Grounded signal;
- : FG, Frame ground.

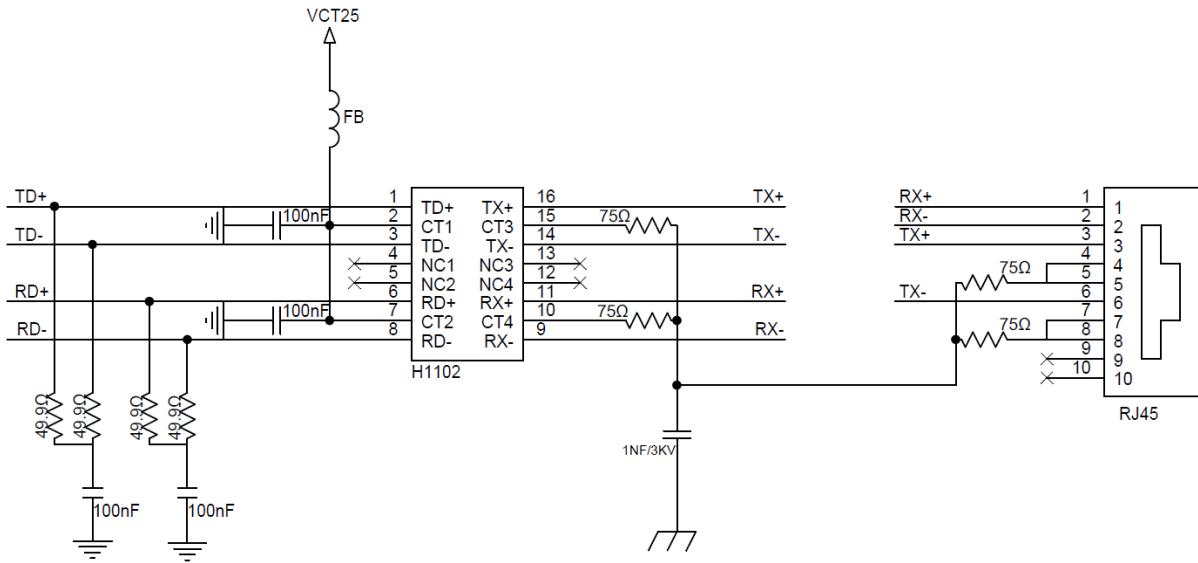
## 4.1 100M Ethernet Interface

Pin name	Type	Configuration method
RX+[1:7]	The positive input end of receiving data.	100M Ethernet interface configuration: <ul style="list-style-type: none"> <li>• When CONFP[1:7] is grounded, the corresponding 100M Ethernet port 1-7 is configured to 100M copper port.</li> <li>• When CONFP[1:7] is connected to 3.3VDC power supply via 4.7kΩ resistor, the corresponding 100M Ethernet port 1-7 is configured to 100M fiber port.</li> <li>• The pin is recommended to be suspended when not used.</li> </ul>
RX-[1:7]	The negative input end of receiving data.	
TX+[1:7]	The positive output end of sending data.	
TX-[1:7]	The negative output end of sending data.	
FXSD[1:7]	Optical signal detection input	
CONFP[1:7]	Configuration port	

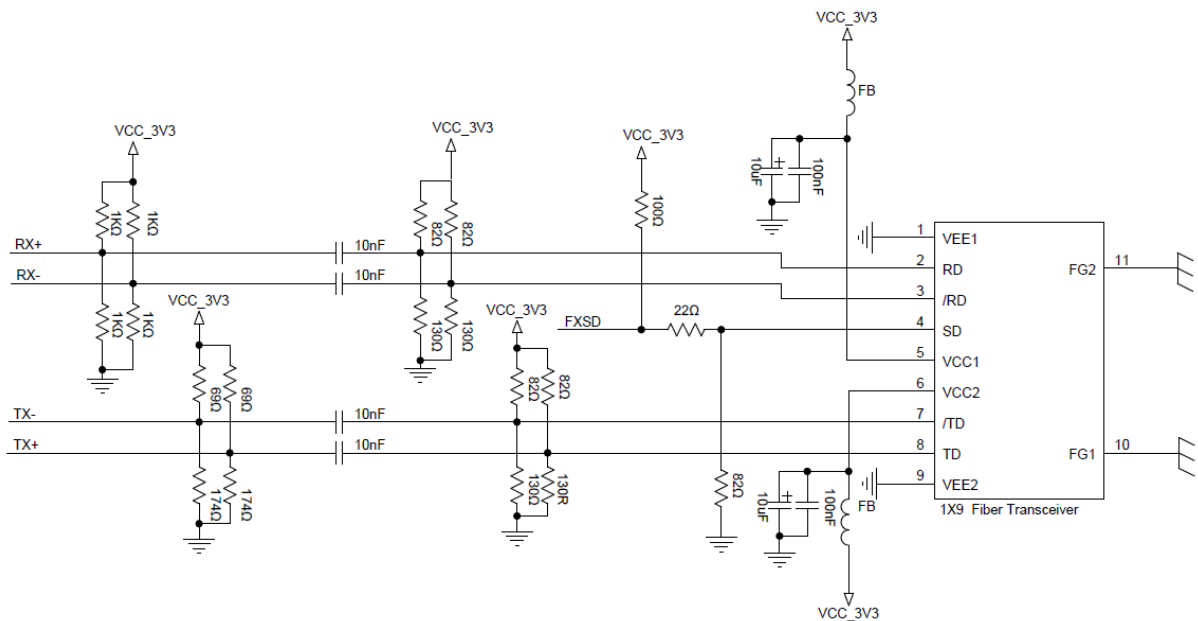
### Reference Circuit of 100M Copper Port

The network transformer in the reference circuit of 100M copper port is 1:1 network transformer. The recommended model is H1102 or other compatible products. The

center tap of the network transformer needs to connect to module's A2, which is ACT25 pin that provides +2.5V level.



## Reference Circuit of 100M Fiber Port

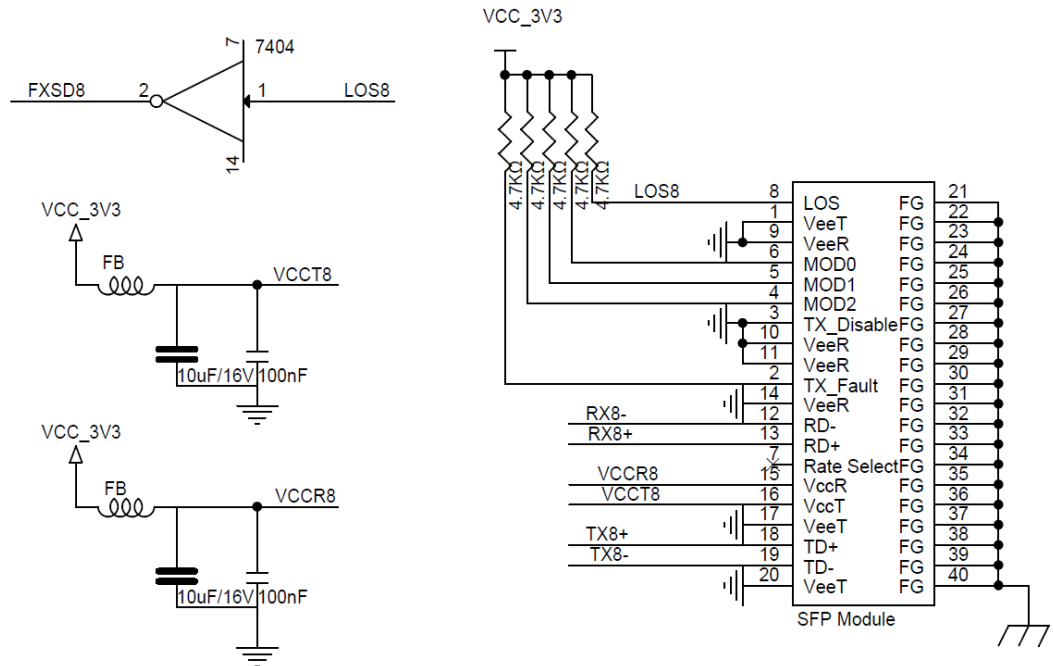


## 4.2 1000M Ethernet Interface (SGMII)

Gigabit Ethernet port 8-10 is Gigabit SGMII interface. When the Gigabit Ethernet port 8-10 needs to be designed to copper port, the work mode of the port can be configured via the corresponding LINK8, P9\_MODE[1:0] pin respectively, then connects to and manages external PHY chip via MDIO\_PHY、MDC\_PHY pin to realize the design of Gigabit Ethernet copper port.

Pin name	Type	Configuration method
RX[8:10]+	The positive input end of receiving data.	<p>Multifunction pin LINK8 of 1000M Ethernet port 8, which could be used for work mode configuration and status indication.</p> <ul style="list-style-type: none"> <li>When the pin is connected to +3.3VDC power supply via 4.7kΩ resistor, the corresponding 1000M Ethernet port 8 is configured to 1000M fiber port.</li> <li>When the pin is suspended or grounded, the corresponding Gigabit Ethernet port 8 would be configured to SGMII mode and could be connected to external PHY chip as Gigabit copper port.</li> </ul> <p>The work mode configuration pin P9_MODE[1:0] and P10_MODE[1:0] of Gigabit Ethernet port 9 -10. When the pin is suspended, it would be configured to 0; when the pin connects to 3.3VDC power supply via 4.7kΩ resistor, it would be configured to 1.</p> <p>The configuration method of MODE1:MODE0 is as follows:</p> <ul style="list-style-type: none"> <li>00: reserved</li> <li>01: 1000BASE-X mode (fiber port)</li> <li>10: SGMII mode (1000BASE-T copper port, need to connect external PHY)</li> <li>11: reserved</li> </ul>
RX[8:10]-	The negative input end of receiving data.	
TX[8:10]+	The positive output end of sending data.	
TX[8:10]-	The negative output end of sending data.	
FXSD[8:10]	Optical signal test input end	
LINK8	The work mode configuration and status indication output end of Gigabit Ethernet port 8	
P9_MODE0	The work mode configuration input end of Gigabit Ethernet port 9	
P9_MODE1		
P10_MODE0	The work mode configuration input end of Gigabit Ethernet port 10	
P10_MODE1		
MDIO_PHY	SMI interface	
MDC_PHY		

## Reference Circuit of Gigabit SFP

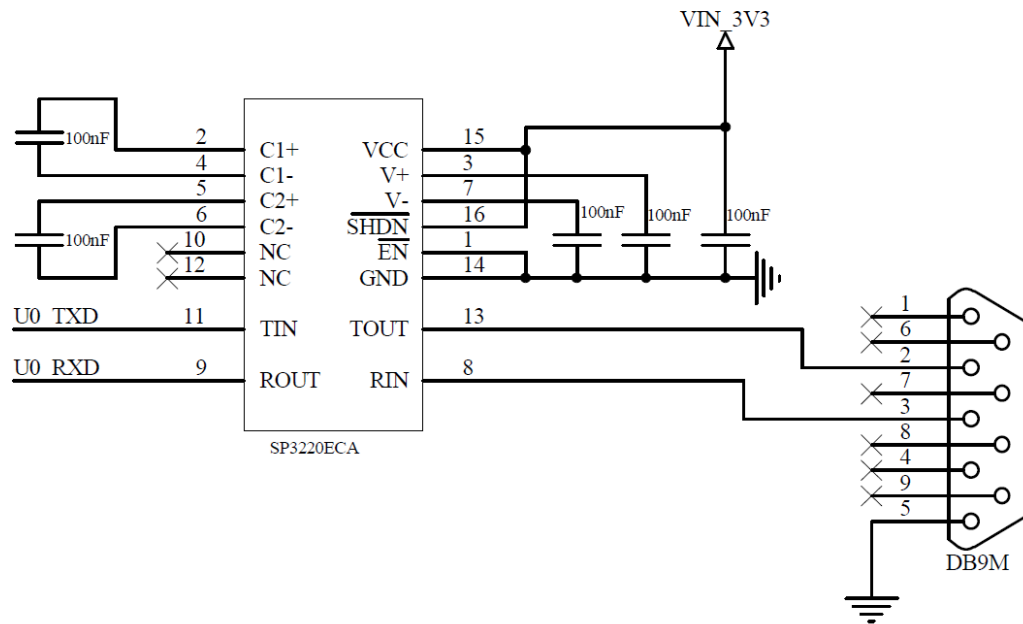


### 4.3 CONSOLE Port (Debugging Port)

The UART0 debugging port is used as the CONSOLE port of this module for building CLI management platform mainly.

Pin name	Type	Configuration method
U0TX	Output	Transmitting signal of CONSOLE port, only for the CONSOLE port to debug this module.
U0RX	Input	Receiving signal of CONSOLE port, only for the CONSOLE port to debug this module.

## Reference Circuit of CONSOLE Port

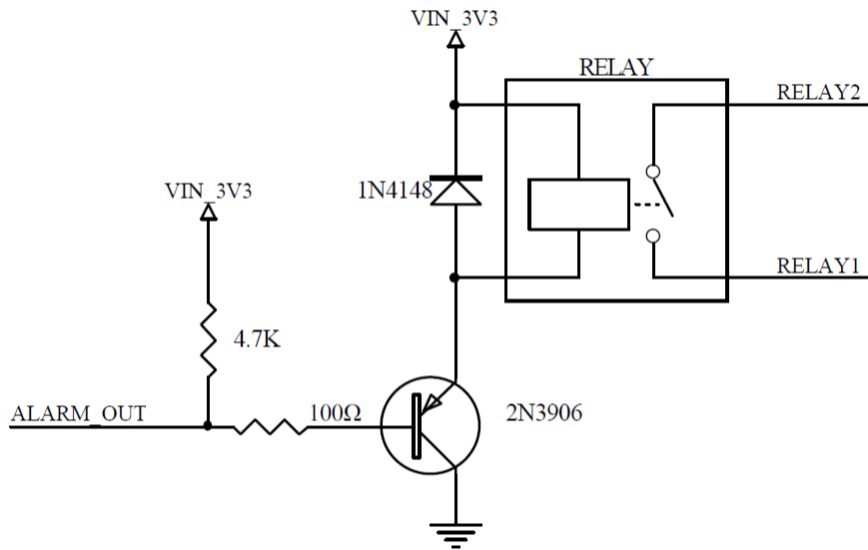


## 4.4 I/O Alarm Port

This module has 2 alarm signal inputs, whose alarm input type could be self-configured; it has 1 alarm signal output, which could be used for relay alarm output, active low.

Pin name	Type	Configuration method
PWR2ALARM	Input	2 alarm signal input pins, whose alarm input type could be self-configured, such as power supply alarm information detection. The default configuration is low level alarm, not high level alarm.
PWR1ALARM		
ALARMOUT	Output	1 alarm signal output pin, which corresponds to 2 alarm information input statuses. When any one of the input statuses changes, both the two output statuses would change. ALARMOUT could be extended to relay, active low. It defaults to high level.

## Reference Circuit of Relay Alarm



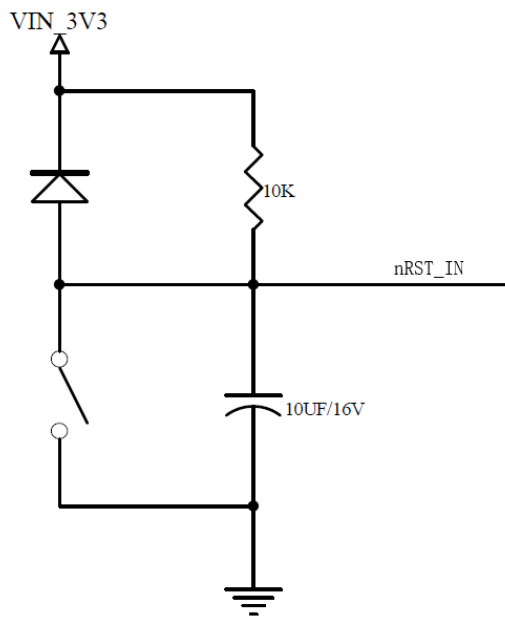
## 4.5 Reset Interface

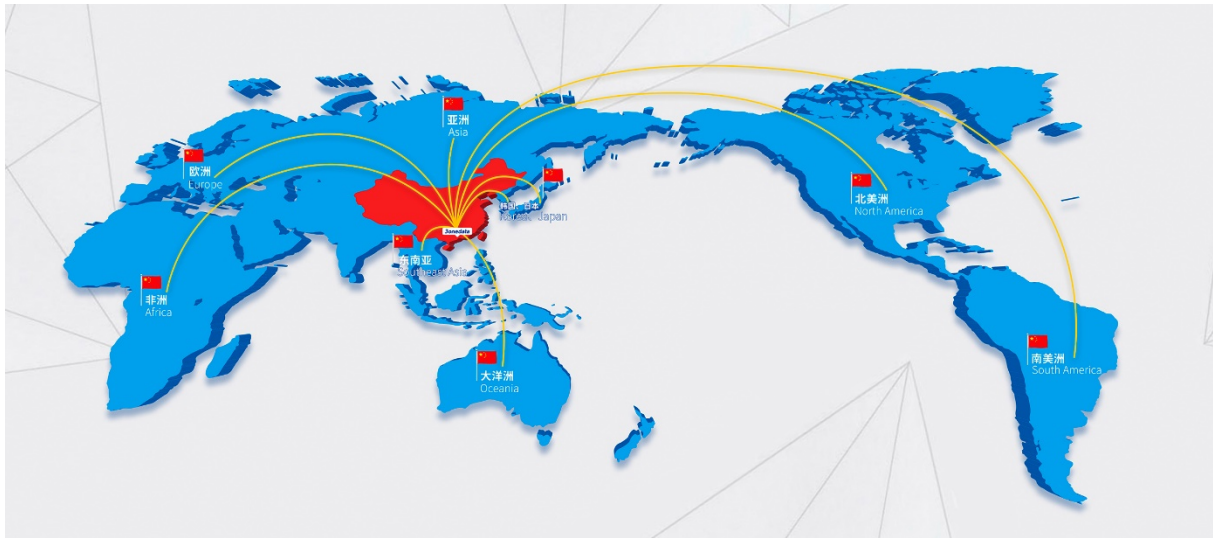
The module provides input pin for external manual reset. User can design external hardware reset circuit for manual reset.

Pin name	Type	Function description
nRST_IN	input	System reset pin, active low, recommend to pull up. When the pin inputs low level over 200ms the system enters reset status.



## Reference Circuit for Reset





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