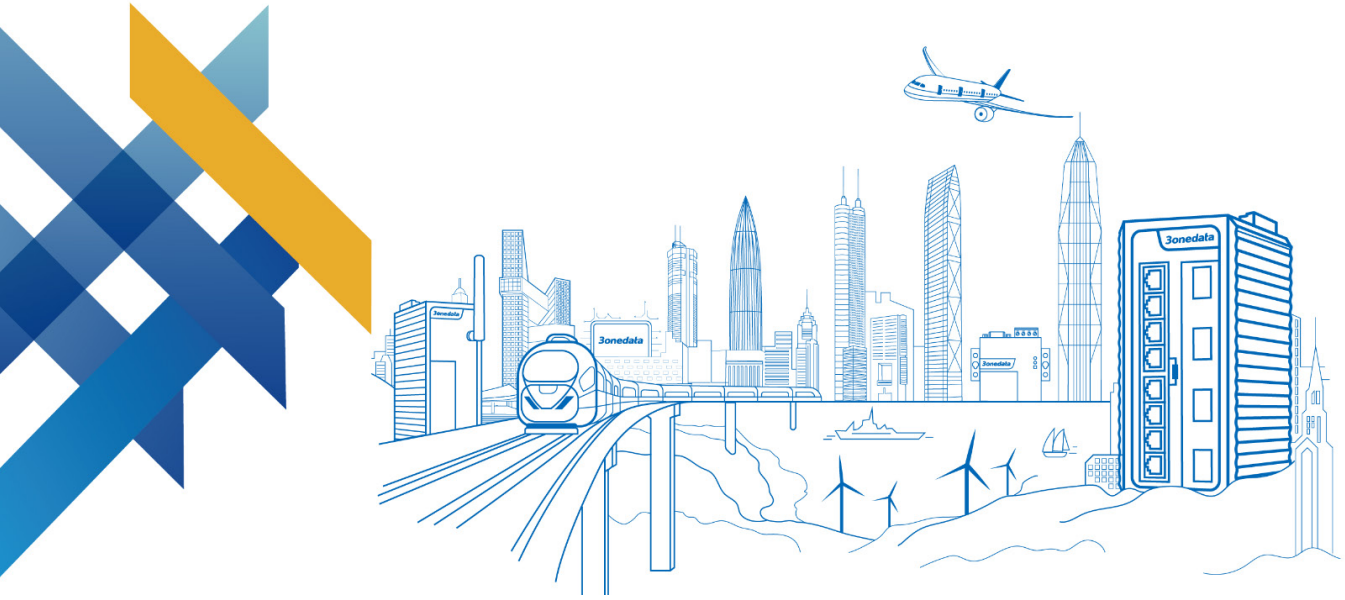
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IEM6200-7T3G

Layer 2 Managed Industrial Ethernet Switch Module

Hardware Quick Installation Manual

Document Version: 01

Issue Date: 03/15/2024

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Preface

Managed industrial Ethernet switch module manual has introduced this module:

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

Audience

This manual applies to the following engineers:

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

Port Convention

The port number in this manual is only an example, and does not represent the actual port with this number on the device. In actual use, the port number existing on the device shall prevail.

Text Format Convention

Format	Description
" "	Words with “” represent the interface words. Fox example: “Port number”.
>	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	It represents the words clicked to achieve hyperlink. The font color is as follows: ‘Light Blue’.
About this chapter	The section ‘about this chapter’ provides links to various sections of this chapter, as well as links to the

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Format	Description
	Principles/Operations Section of this chapter.

Icon Convention

Format	Description
 Notice	Remind the announcements in the operation, improper operation may result in data loss or equipment damage.
 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.
 Tip	Pay attention to the operation or information to ensure success device configuration or normal working.

Revision Record

Version No.	Revision Date	Revision Note
01	2024-03-15	Product release

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1 Product Overview

1.1 Product Introduction

IEM6200-7T3G is a layer 2 managed embedded industrial Ethernet switch module, which has the characteristics of high integration, small size, rich functions, simple and convenient operation. Including the following interface types:

- 3 Gigabit Ethernet interfaces, G1 can be configured to 1000Base-X SFP ports; G2-G3 can be configured to 10/100/1000Base-T (X) copper ports or fiber ports.
- 7 100M Ethernet interfaces, which can be configured to 10/100Base-T(X) copper port or 100Base-FX fiber port.
- 1 CONSOLE port, used for command line to coordinate and debug this module.
- 2 I/O alarm ports, which can be extended to relay alarm.

1.2 Product Specification

Interface	
100M copper port	10/100Base-T(X), Automatic Flow Control, Full/half Duplex Mode, MDI/MDI-X Autotunning
100M fiber port	100Base-FX
Gigabit copper port	10/100/1000Base-T(X), implemented by extending PHY chip
Gigabit SFP	1000Base-X SFP
CONSOLE port	CLI command management port
I/O port	Alarm input/output
Switch Property	
Backplane bandwidth	9.6Gbps
Cache size	2Mbit

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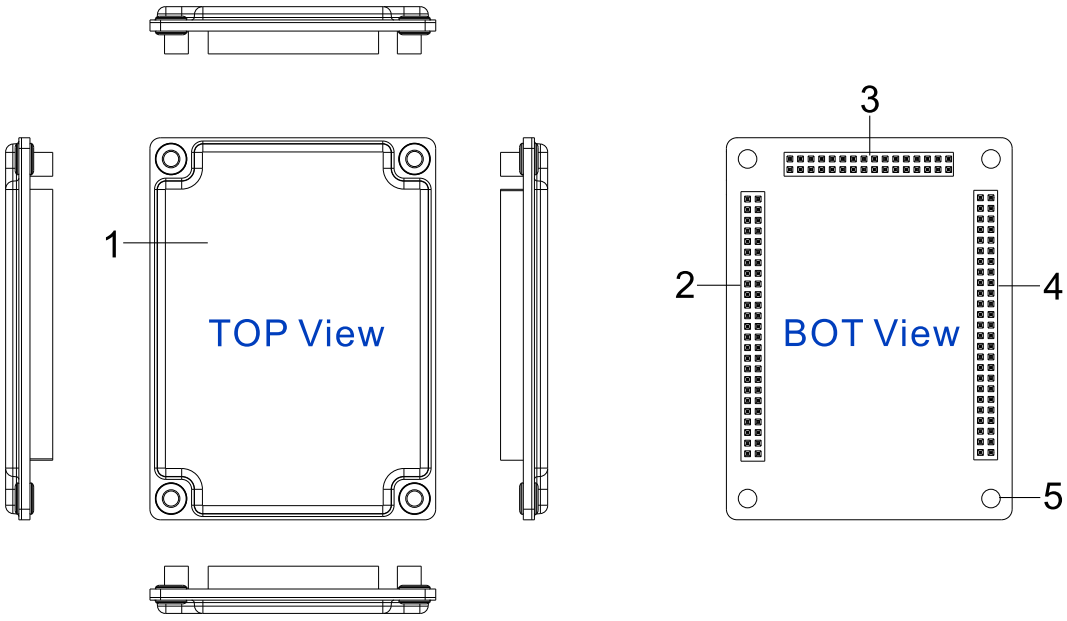
MAC Address Table	4K
Power Supply	
Input power supply	3.3VDC（±5%）
Power Consumption	
No-load	1.226W@3.3VDC
Full-load	1.456W@3.3VDC
Working Environment	
Working temperature	-40~75℃
Storage temperature	-40~85℃
Working humidity	5%~95%
Mechanical Structure	
Mounting	Embedded installation (pin and female header type)
Dimension (W x H x D)	72mm×8.9mm×54mm
Weight	0.023kg

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2 Dimension

2.1 Capsulation Design

The diagram of module structure is as follows:



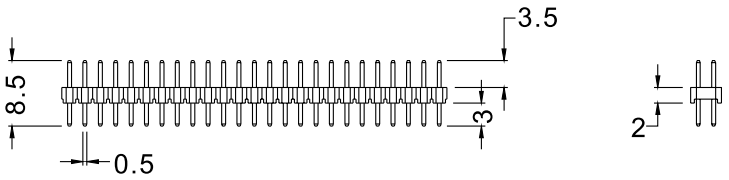
The details of each package label are shown in the following table:

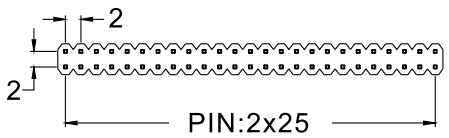
Capsulation	Name	Specification	Note
1	A blade of thermal conductivity	72mm∗54mm	External heat sink available
2	Connector A	Plug-in connector 2*25, pin spacing 2mm, connector dimensions: 50.8*4.5*4.3mm, square hole 0.5mm*0.5mm.	—
3	Connector B	Plug-in connector 2*16, pin	—

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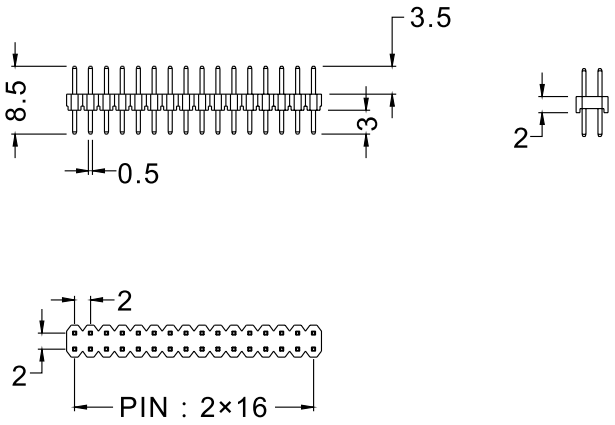
Capsulation	Name	Specification	Note
		spacing 2mm, connector dimensions: 32.2*4.5*4.3mm, square hole 0.5mm*0.5mm.	
4	Connector C	Plug-in connector 2*25, pin spacing 2mm, connector dimensions: 50.8*4.5*4.3mm, square hole 0.5mm*0.5mm.	—
5	Location hole	The diameter of the positioning hole is 3.1±0.15mm, which is suitable for M3 screws. The distance from the center of the circle to the four sides of the PCB is 4mm. Note: A copper column can be used to fix the module on the bottom plate.	The four positioning holes have the same specifications

The needle specifications corresponding to Connector A and C can refer to the following view, unit is mm:





The needle specifications corresponding to Connector B can refer to the following view, unit is mm:



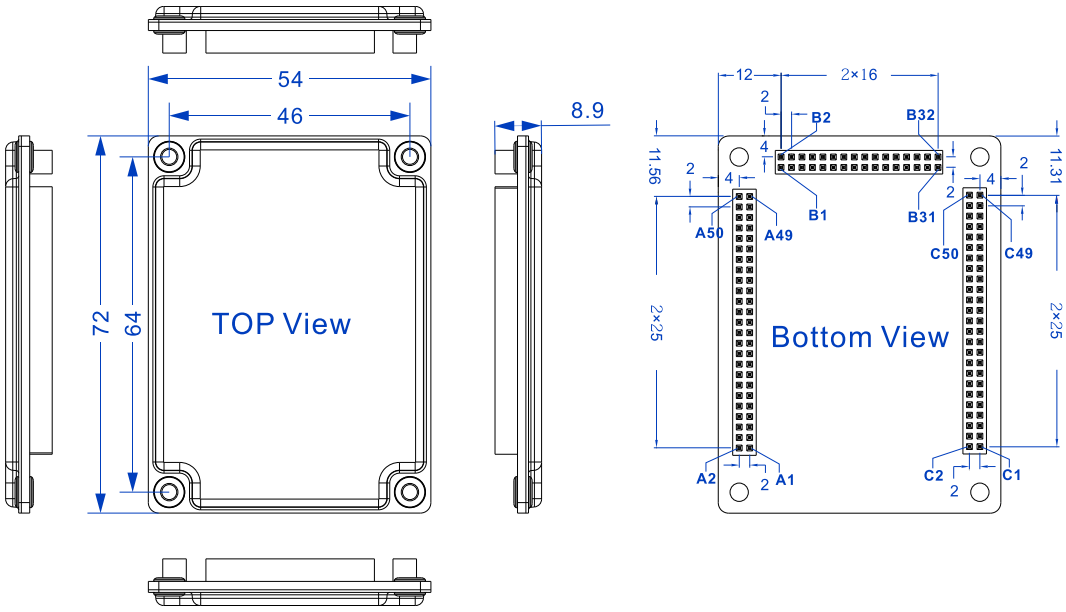
2.2 Product Dimension

The diagram of module structure dimension is as follows:

Unit: mm

Note

The diameter of the positioning hole is 3.1±0.15mm, which is suitable for M3 screws.



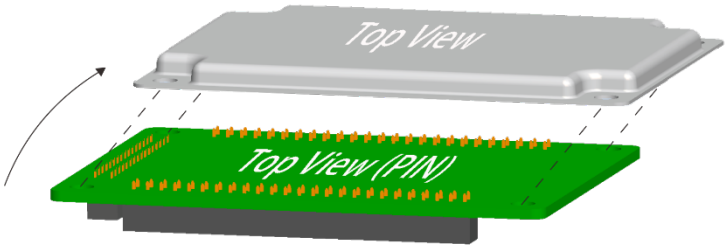
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3 Pin Definition Description

3.1 Pin Definition View

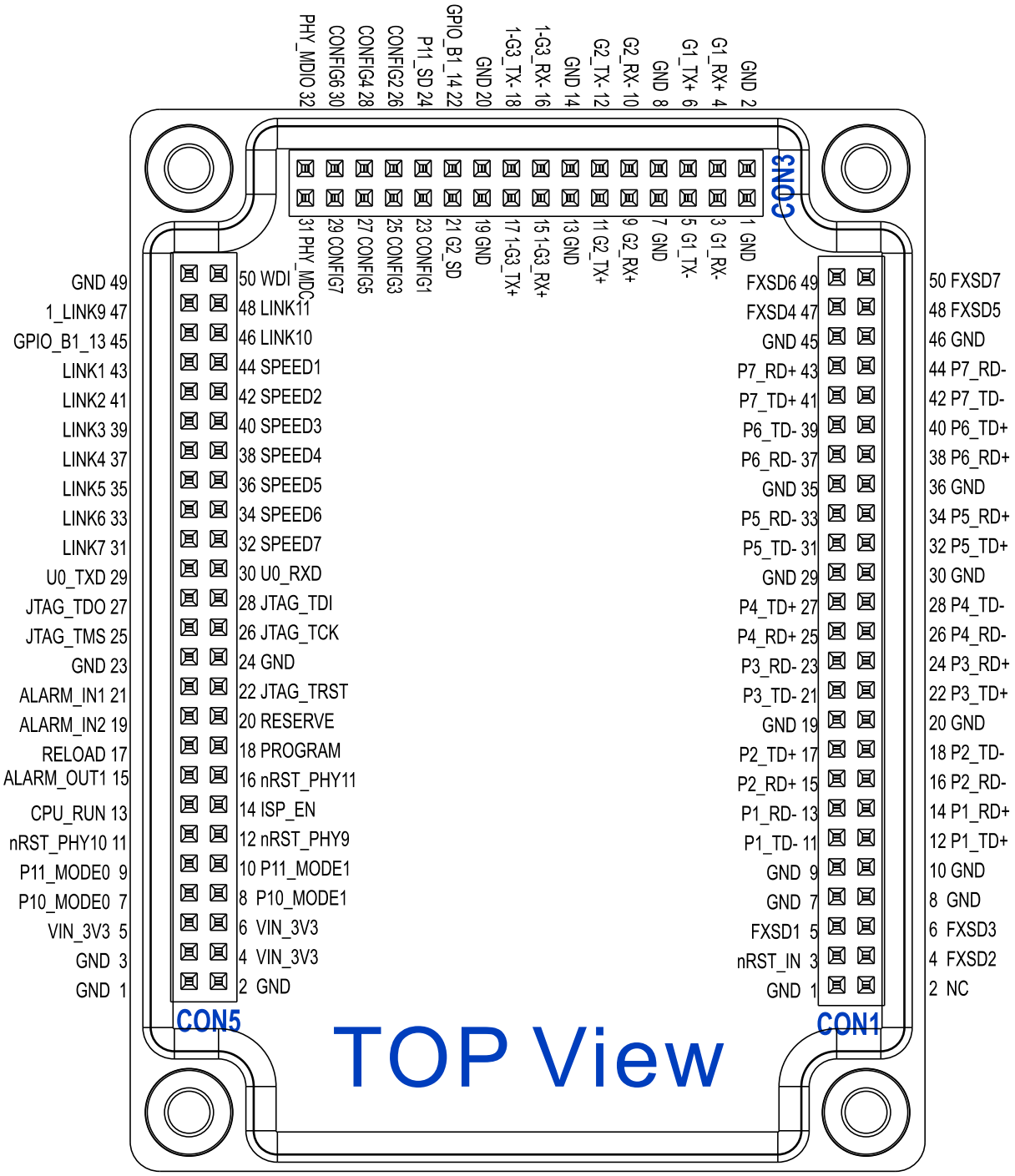
Note

In order to facilitate users to view pin definition when PCB board wiring, the pin definition diagram adopts the top view Angle as shown below.



Top view of module pin number and name is as follows:

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3.2 Pin Definition Name Description

Pin Identification	Note
GND	Ground
nRST	nReset, active-low
IN	Input

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FXSD	FX Signal Detection
RD/RX	Receive Data
TD/TX	Transmit Data
CONFIG	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
U0_RXD	U: UART (Universal Asynchronous Receiver/Transmitter)
U0_TXD	U: UART (Universal Asynchronous Receiver/Transmitter)
NC (reserved)	No Connect, suspended
WDI	Watch Dog Input

3.3 Pin Definition List

Pin Definition (A1-A50) of Connector A (CON1)

Pin No.	PIN Name	Pin No.	PIN Name
A1	GND	A2	NC (reserved)
A3	nRST_IN	A4	FXSD2
A5	FXSD1	A6	FXSD3
A7	GND	A8	GND
A9	GND	A10	GND
A11	P1_TD-	A12	P1_TD+
A13	P1_RD-	A14	P1_RD+
A15	P2_RD+	A16	P2_RD-
A17	P2_TD+	A18	P2_TD-
A19	GND	A20	GND
A21	P3_TD-	A22	P3_TD+
A23	P3_RD-	A24	P3_RD+
A25	P4_RD+	A26	P4_RD-
A27	P4_TD+	A28	P4_TD-
A29	GND	A30	GND
A31	P5_TD-	A32	P5_TD+

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Pin No.	PIN Name	Pin No.	PIN Name
A33	P5_RD-	A34	P5_RD+
A35	GND	A36	GND
A37	P6_RD-	A38	P6_RD+
A39	P6_TD-	A40	P6_TD+
A41	P7_TD+	A42	P7_TD-
A43	P7_RD+	A44	P7_RD-
A45	GND	A46	GND
A47	FXSD4	A48	FXSD5
A49	FXSD6	A50	FXSD7

Pin Definition (B1-B32) of Connector B (CON3)

Pin No.	PIN Name	Pin No.	PIN Name
B1	GND	B2	GND
B3	G1_RX-	B4	G1_RX+
B5	G1_TX-	B6	G1_TX+
B7	GND	B8	GND
B9	G2_RX+	B10	G2_RX-
B11	G2_TX+	B12	G2_TX-
B13	GND	B14	GND
B15	1-G3_RX+	B16	1-G3_RX-
B17	1-G3_TX+	B18	1-G3_TX-
B19	GND	B20	GND
B21	G2_SD	B22	GPIO_B1_14
B23	CONFIG1	B24	P11_SD
B25	CONFIG3	B26	CONFIG2
B27	CONFIG5	B28	CONFIG4
B29	CONFIG7	B30	CONFIG6
B31	PHY_MDC	B32	PHY_MDIO

Pin Definition (C1-C50) of Connector C (CON5)

Pin No.	PIN Name	Pin No.	PIN Name
C1	GND	C2	GND

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Pin No.	PIN Name	Pin No.	PIN Name
C3	GND	C4	VIN_3V3
C5	VIN_3V3	C6	VIN_3V3
C7	P10_MODE0	C8	P10_MODE1
C9	P11_MODE0	C10	P11_MODE1
C11	nRST_PHY10	C12	nRST_PHY9
C13	CPU_RUN	C14	ISP_EN
C15	ALARM_OUT1	C16	nRST_PHY11
C17	RELOAD	C18	PROGRAM
C19	ALARM_IN2	C20	RESERVE
C21	ALARM_IN1	C22	JTAG_TRST
C23	GND	C24	GND
C25	JTAG_TMS	C26	JTAG_TCK
C27	JTAG_TDO	C28	JTAG_TDI
C29	U0_TXD	C30	U0_RXD
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	GPIO_B1_13	C46	LINK10
C47	1_LINK9	C48	LINK11
C49	GND	C50	WDI

3.4 Detailed Pin Definition Description

3.4.1 100M Ethernet Port

Pin definition description of 7 100M Ethernet interfaces:

PIN Name	Pin No.	Type	Function Description
P1_RD+	A14	Input	Positive end of 100M Ethernet interface data

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PIN Name	Pin No.	Type	Function Description
P2_RD+	A15		receiving. • When the 100M Ethernet port 1-7 are configured to 100M copper ports, the corresponding RDP[1:7] is directly connected to the network transformer. • When the 100M Ethernet port 1-7 are configured to 100M fiber ports, the corresponding RDP[1:7] is directly connected to the positive output end of the optical module. • Grounding is recommended when this pin is not in use.
P3_RD+	A24		
P4_RD+	A25		
P5_RD+	A34		
P6_RD+	A38		
P7_RD+	A43		
P1_RD-	A13	Input	Negative end of 100M Ethernet interface data receiving. • When the 100M Ethernet port 1-7 are configured to 100M copper ports, the corresponding RDN[1:7] is directly connected to the network transformer. • When the 100M Ethernet port 1-7 are configured to 100M fiber ports, the corresponding RDN[1:7] is directly connected to the negative output end of the optical module. • Grounding is recommended when this pin is not in use.
P2_RD-	A16		
P3_RD-	A23		
P4_RD-	A26		
P5_RD-	A33		
P6_RD-	A37		
P7_RD-	A44		
P1_TD+	A12	Output	Positive end of 100M Ethernet interface data transmission. • When the 100M Ethernet port 1-7 are configured to 100M copper ports, the corresponding TDP[1:7] is directly connected to the network transformer. • When the 100M Ethernet port 1-7 are configured to 100M fiber ports, the corresponding TDP[1:7] is directly connected to the positive input end of the optical module. • Grounding is recommended when this pin is not in use.
P2_TD+	A17		
P3_TD+	A22		
P4_TD+	A27		
P5_TD+	A32		
P6_TD+	A40		
P7_TD+	A41		
P1_TD-	A11	Output	Negative end of 100M Ethernet interface data

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PIN Name	Pin No.	Type	Function Description
P2_TD-	A18		transmission. • When the 100M Ethernet port 1-7 are configured to 100M copper ports, the corresponding TDN[1:7] is directly connected to the network transformer. • When the 100M Ethernet port 1-7 are configured to 100M fiber ports, the corresponding TDN[1:7] is directly connected to the negative input end of the optical module. • Grounding is recommended when this pin is not in use.
P3_TD-	A21		
P4_TD-	A28		
P5_TD-	A31		
P6_TD-	A39		
P7_TD-	A42		
FXSD1	A5	Input	100M Ethernet fiber port optical signal detection input. • When 100M Ethernet ports 1-7 are configured to fiber ports, the corresponding FXSD[1:7] is used to indicate whether the optical module detects the signal. A high level indicates that an optical signal is detected. • When 100M Ethernet port 1-7 are configured to copper ports or not use, the corresponding FXSD [1:7] cannot be suspended, and it is recommended to be grounded through a 0Ω resistor.
FXSD2	A4		
FXSD3	A6		
FXSD4	A47		
FXSD5	A48		
FXSD6	A49		
FXSD7	A50		
CONFIG1	B23	Input	100M Ethernet interface configuration pin. • When CONFIG[1:7] is grounded, the corresponding 100M Ethernet Port 1-7 are configured to 100M copper ports. • When CONFIG[1:7] is connected to the 3.3VDC power supply through a 4.7kΩ resistor, the corresponding 100M Ethernet Port 1-7 are configured to 100M fiber ports. • When this pin is not used, it is recommended to be suspended.
CONFIG2	B26		
CONFIG3	B25		
CONFIG4	B28		
CONFIG5	B27		
CONFIG6	B30		
CONFIG7	B29		

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3.4.2 Gigabit Ethernet Port

Port G1 only supports Gigabit fiber ports, while G2 and G3 can be configured to Gigabit copper ports or Gigabit fiber ports. The working mode of the interface can be configured separately through the corresponding P10MODE [1:0] and P11MODE [1:0] pins. In the SGMII mode, the port is configured to a Gigabit copper port, and a Gigabit PHY chip needs to be connected externally, and the PHY chip is connected and managed through MDIO and MDC pins.

Pin definition description of Gigabit Ethernet port:

PIN Name	Pin No.	Type	Function Description
G1_RX+	B4	Input	Positive end of 1000M Ethernet interface data receiving. • When Gigabit Ethernet ports G1-G3 are configured to 1000M fiber port mode, the corresponding RDP[G1:G3] is directly connected to the positive output end of the optical module.
G2_RX+	B9		
1-G3_RX+	B15		
G1_RX-	B3	Input	Negative end of 1000M Ethernet interface data receiving. • When Gigabit Ethernet ports G1-G3 are configured to 1000M fiber port mode, the corresponding RDN[G1:G3] is directly connected to the negative output end of the optical module.
G2_RX-	B10		
1-G3_RX-	B16		
G1_TX+	B6	Output	Positive end of 1000M Ethernet interface data transmission. • When the Gigabit Ethernet port G1-G3 are configured to 1000M fiber port mode, the corresponding TDP [G1: G3] is directly connected to the positive input end of the optical module.
G2_TX+	B11		
1-G3_TX+	B17		
G1_TX-	B5	Output	Negative end of 1000M Ethernet interface data transmission. • When Gigabit Ethernet port G1-G3 are configured to 1000M fiber port mode, the corresponding TDN[G1:G3] is directly connected to the negative input
G2_TX-	B12		
1-G3_TX-	B18		

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PIN Name	Pin No.	Type	Function Description
			terminal of the optical module.
GPIO_B1_14	B22	Input	1000M Ethernet fiber port optical signal detection input. • When Gigabit Ethernet port G1 is configured to fiber port, the corresponding FXSD[GPIO_B1_14] is used to indicate whether the optical module detects the signal. A high level indicates that an optical signal is detected. • When Gigabit Ethernet port G1 is not in use, the corresponding FXSD [GPIO_B1_14] cannot be suspended, and it is recommended to be grounded through a 4.7kΩ resistor.
G2_SD	B21		1000M Ethernet fiber port optical signal detection input. • When Gigabit Ethernet port G2 is configured to fiber port, the corresponding FXSD[G2_SD] is used to indicate whether the optical module detects the signal. A high level indicates that an optical signal is detected. • When Gigabit Ethernet port G2 is configured to copper port or not use, the corresponding FXSD [G2_SD] cannot be suspended, and it is recommended to be grounded through a 4.7kΩ resistor.
P11_SD	B24		1000M Ethernet fiber port optical signal detection input. • When Gigabit Ethernet port G3 is configured to fiber port, the corresponding FXSD[P11_SD] is used to indicate whether the optical module detects the signal. A low level indicates that an optical signal is detected. • When Gigabit Ethernet port G3 is configured to copper port or not use, the

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PIN Name	Pin No.	Type	Function Description
			corresponding FXSD [P11_SD] cannot be suspended, and it is recommended to be grounded through a 4.7kΩ resistor.
P10_MODE0	C7	Input	Work mode configuration pin P10_MODE[1:0] of Gigabit Ethernet Port G2. When the pin is suspended, it is configured to 0; When the pin is connected to the 3.3VDC power supply through a 4.7kΩ resistor, it is configured to 1. P10_MODE[1:0] is configured as follows: • 00: Reserved • 01: 1000BASE-X mode (fiber port) • 10: SGMII mode (1000BASE-T copper port, external PHY required) • 11: Reserved
P10_MODE1	C8		
P11_MODE0	C9	Input	Work mode configuration pin P11_MODE[1:0] of Gigabit Ethernet Port G3. When the pin is suspended, it is configured to 0; When the pin is connected to the 3.3VDC power supply through a 4.7kΩ resistor, it is configured to 1. P11_MODE[1:0] is configured as follows: • 00: Reserved • 01: 1000BASE-X mode (fiber port) • 10: SGMII mode (1000BASE-T copper port, external PHY required) • 11: Reserved
P11_MODE1	C10		
PHY_MDIO	B32	Output /Input	External PHY chip SMI management interface, PHY_MDIO is the external PHY chip management data input/output pin, and PHY_MDC is the external PHY chip management data clock pin.
PHY_MDC	B31	Output	

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3.4.3 Power and Ground Signal

Pin definition description of power supply and ground signal:

PIN Name	Pin No.	Type	Function Description
VIN_3V3	C4, C5, C6	Input	3.3VDC voltage input, which supplies power to the module.
NC (reserved)	A2	Reserved	Unused pin, please suspend it.
GND	A1, A7, A8, A9, A10, A19, A20, A29, A30, A35, A36, A45, A46, B1, B2, B7, B8, B13, B14, B19, B20, C1, C2, C3, C23, C24, C49,	Ground	Ground signal

3.4.4 CONSOLE Port (Debugging Port)

Pin definition description of CONSOLE port:

PIN Name	Pin No.	Type	Function Description
U0_TXD	C29	Output	CONSOLE port transmitting signal, which is only used for debugging this module by CONSOLE port.
U0_RXD	C30	Input	CONSOLE port receiving signal, which is only used for debugging this module by CONSOLE port.

3.4.5 I/O Alarm Interface

Pin definition description of I/O alarm port:

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PIN Name	Pin No.	Type	Configuration Method
ALARM_IN2	C19	Input	2 alarm signal input pins, which can configure alarm input types by yourself, such as power alarm information detection. The default configuration is low-level alarm, and high-level alarm is not available.
ALARM_IN1	C21		
ALARM_OUT1	C15	Output	1 alarm signal output pin, corresponding to 2 alarm information input states. When any input state changes, both output states will change. ALARM_OUT1 can be extended as a relay, which is active at low level and defaults to high level.

3.4.6 Indicator

Pin definition description of indicator:

PIN Name	Pin No.	Type	Function Description
LINK1	C43	Output	100M Ethernet port connection and data transceiving indication pin LINK[1:7]. • When this pin outputs high level, it indicates that the corresponding 100M Ethernet Port 1-7 are not connected. • When this pin outputs low level, it indicates that the corresponding 100M Ethernet Port 1-7 have established a valid connection. • When this pin outputs alternating high and low levels, it indicates that the corresponding 100M Ethernet Port 1-7 have data transmission.
LINK2	C41		
LINK3	C39		
LINK4	C37		
LINK5	C35		
LINK6	C33		
LINK7	C31		
1_LINK9	C47	Output	Port G1 lighting signal. • When this pin outputs high levels, it indicates that the corresponding Gigabit Ethernet Port G1 is not connected. • When this pin outputs low levels, it

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PIN Name	Pin No.	Type	Function Description
			indicates that the corresponding Gigabit Ethernet Port G1 has established a connection. • When this pin outputs alternating high and low levels, it indicates that there is data transmission in the corresponding Gigabit Ethernet Port G1.
LINK10	C46	Output	1000M Ethernet port connection status indication pin LINK[10:11]. When Gigabit Ethernet Port G2-G3 is configured to 1000M fiber port: • When this pin outputs high levels, it indicates that the corresponding Gigabit Ethernet Port G2-G3 is not connected. • When this pin outputs low levels, it indicates that the corresponding Gigabit Ethernet Port G2-G3 has established a connection. • When this pin outputs alternating high and low levels, it indicates that there is data transmission in the corresponding Gigabit Ethernet Port G2-G3.
LINK11	C48	Output	
SPEED1	C44	Output	100M Ethernet interface rate indication pin SPEED[1:7]. • When the 100M Ethernet port is configured to 10BASE-T, that is, 10M rate, this pin outputs high levels. • When the 100M Ethernet port is configured to 100BASE-TX, that is, 100M rate, this pin outputs low levels.
SPEED2	C42		
SPEED3	C40		
SPEED4	C38		
SPEED5	C36		
SPEED6	C34		
SPEED7	C32		
CPU_RUN	C13	Output	Output pin of CPU running indicator, active low level. The indicator status is as follows: • Blinking, it indicates that the system is running normally; • ON, it indicates that the system is starting or the device is running abnormally; • OFF, it indicates that the device is powered off or the device is abnormal.

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3.4.7 Other Pins

PIN Name	Pin No.	Type	Function Description
nRST_IN	A3	Input	System reset pin, active low level, and it is recommended to pull high. When the input low level of this pin lasts longer than 200ms, the system enters the reset state.
PROGRAM	C18	Input	Program upgrade pin, active low level, it is recommended to pull high. Default to high level.
RELOAD	C17	Input	The restoring factory settings pin of the module. Active low level, it is recommended to pull high. When the module is powered on, it collects the pin signal. When the pin is connected to low level, the module restores the factory setting after about 1s.
nRST_PHY9	C12	Reserved	This pin is not used, reserved.
nRST_PHY10	C11	Output	Software reset pin of external PHY chip, and active low level. When Gigabit Ethernet Port G2-G3 is configured to copper port, the corresponding nRST_PHY[G2:G3] can be connected with the external PHY chip reset signal pin.
nRST_PHY11	C16		
JTAG_TRST	C22	Input	JIAG Debugging
JTAG_TMS	C25	Input	
JTAG_TCK	C26	Input	
JTAG_TDO	C27	Output	
JTAG_TDI	C28	Input	
GPIO_B1_13	C45	Input / output	Reserved GPIO

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4 Reference circuit

Note

The ground signal in the reference circuit is identified as follows:

- ⏚: GND, ground signal;
- ⏥: FG, frame grounding.

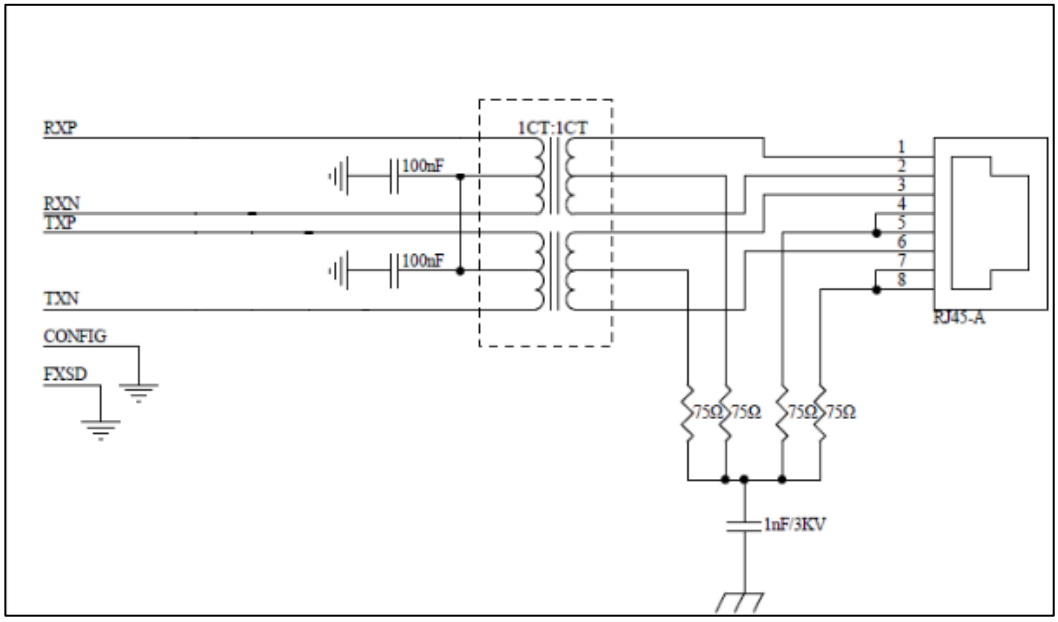
4.1 100M Ethernet Port

PIN Name	Type	Configuration Method
RD+[1:7]	Positive input end of data receiving	100M Ethernet interface configuration pin CONFIG[1:7]. • When CONFIG[1:7] is grounded, the corresponding 100M Ethernet Port 1-7 are configured to 100M copper ports. • When CONFIG[1:7] is connected to the 3.3VDC power supply through a 4.7kΩ resistor, the corresponding 100M Ethernet Port 1-7 are configured to 100M fiber ports. • When this pin is not used, it is recommended to be suspended.
RD-[1:7]	Negative input end of data receiving	
TD+[1:7]	Positive output end of data transmission	
TD-[1:7]	Negative output end of data transmission	
FXSD[1:7]	Detection input of optical signal	
CONFIG[1:7]	Configure port	

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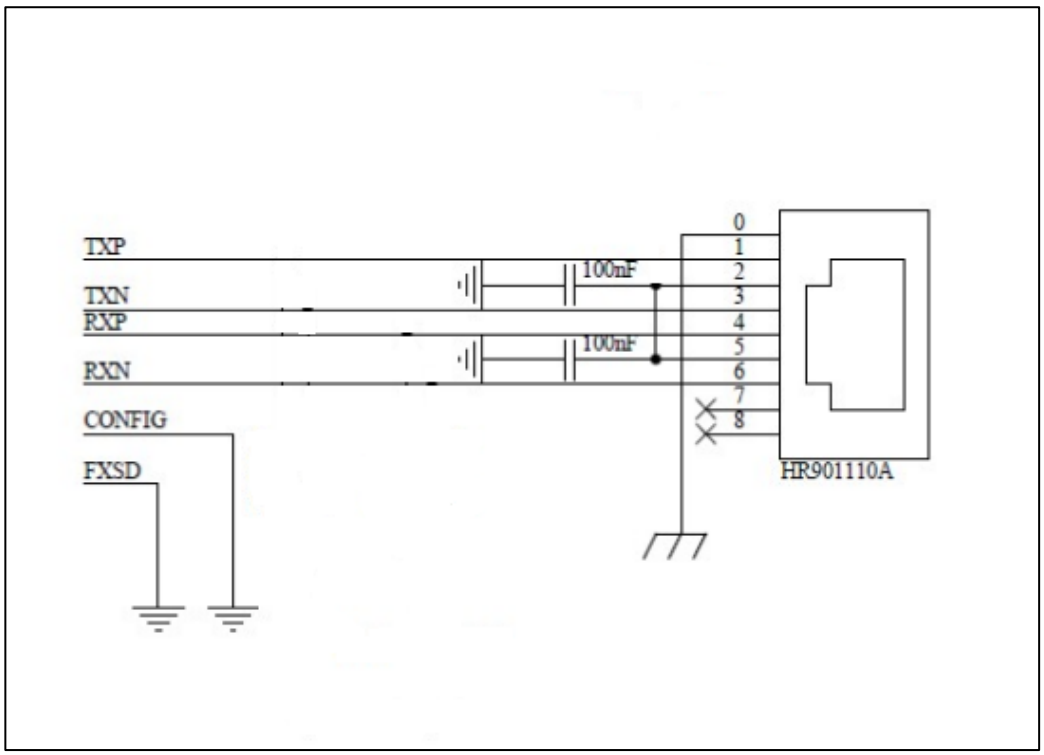
Reference Circuit of 100M Copper Port (with Independent Network Transformer)

The dotted line in the reference circuit diagram of the 100M copper port is a 1: 1 network transformer, and the recommended models are H1102, H1200, H1164, XFMR-H4001CG or other compatible products. When the port is used as a copper port, the CONFIG and FXSD pins of the module need to be grounded.



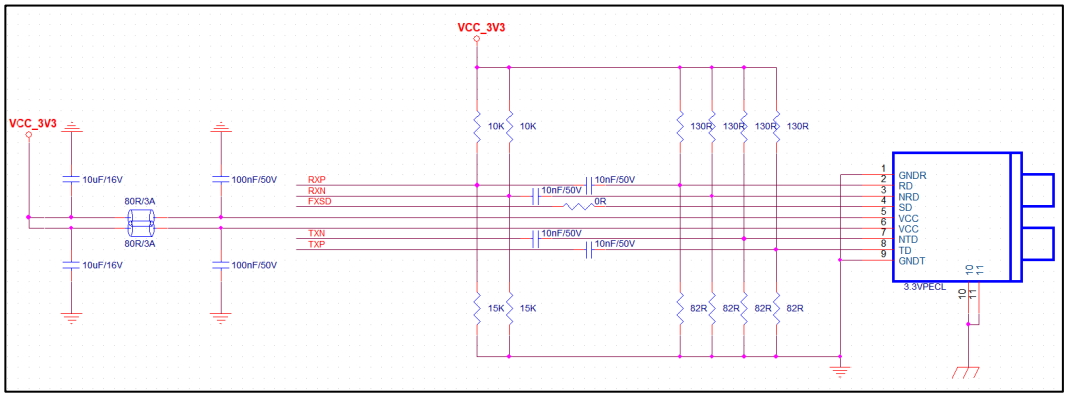
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Reference Circuit of 100M Copper Port (with Built-in Network Port Transformer)



Reference Circuit of 100M Fiber Port

100M optical module is used in the reference circuit: 1X9 welding transceiver optical module, generally with a speed not higher than Gigabit, and SC interface is mostly used. The optical module adopts positive emitter coupling logic with 3.3V and 5V power supply. If a 5V optical module is used, the matching resistance in the box in the figure needs to refer to the circuit of the optical module manufacturer. CONFIG is connected to +3.3V(DC) through 4.7K resistor, and FXSD is connected to SD signal of optical module as shown in the figure.



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4.2 Gigabit Ethernet Port

Port G1 only supports Gigabit fiber ports, while G2 and G3 can be configured to Gigabit copper ports or Gigabit fiber ports. The working mode of the interface can be configured separately through the corresponding P10MODE [1:0] and P11MODE [1:0] pins. In the SGMII mode, the port is configured to a Gigabit copper port, and a Gigabit PHY chip needs to be connected externally, and the PHY chip is connected and managed through MDIO and MDC pins.

Note

The PHY address configuration is: G2: 0x06, G3: 0x07.

PIN Name	Type	Configuration Method
RD[G1:G3]+	Positive input end of data receiving	Work mode configuration pin P10_MODE[1:0] and P11_MODE[1:0] of 1000M Ethernet Port G2-G3. When the pin is suspended, it is configured to 0; When the pin is connected to the 3.3VDC power supply through a 4.7kΩ resistor, it is configured to 1. MODE1:MODE0 is configured as follows: • 00: Reserved • 01: 1000BASE-X mode (fiber port) • 10: SGMII mode (1000BASE-T copper port, external PHY required) • 11: Reserved
RD[G1:G3]-	Negative input end of data receiving	
TD[G1:G3]+	Positive output end of data transmission	
TD[G1:G3]-	Negative output end of data transmission	
FXSD[G1:G3]	Input end of optical signal detection	
1_LINK9	Port G1 lighting signal output end	
P10_MODE0	Work mode configuration input end of Gigabit Ethernet Port G2	
P10_MODE1		
P11_MODE0	Work mode configuration input	
P11_MODE1		

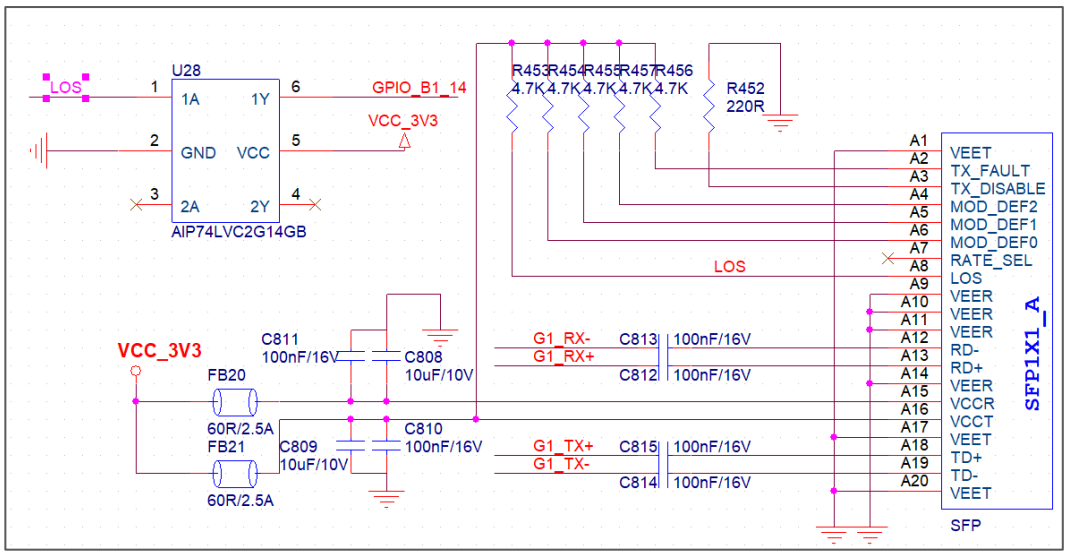
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PIN Name	Type	Configuration Method
	end of Gigabit Ethernet Port G3	
PHY_MDIO	SMI interface	
PHY_MDC		

Reference Circuit of Gigabit Fiber Port

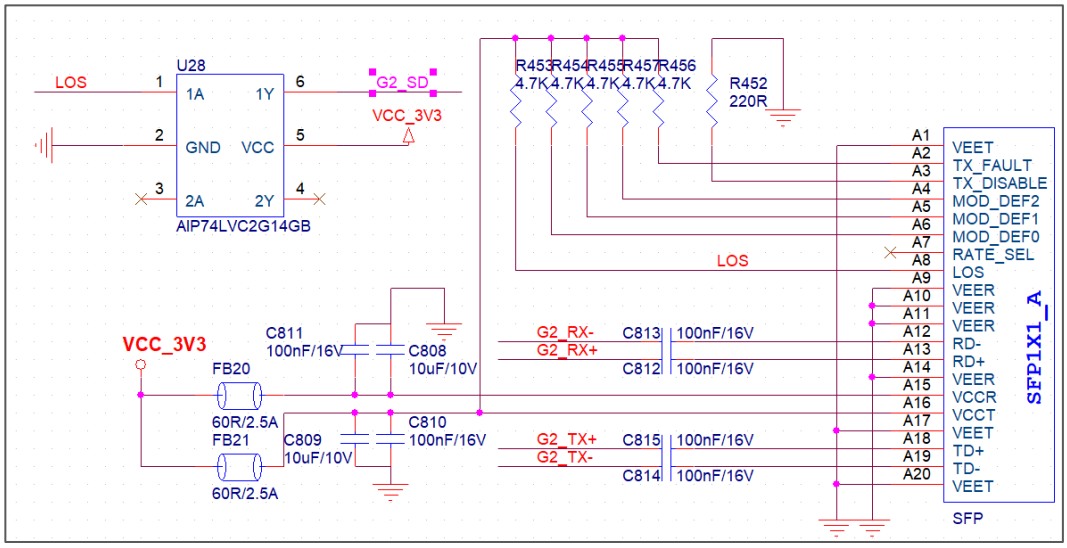
The 1000M fiber port adopts SFP optical module (SFP-encapsulated-hot-plug small encapsulated module, currently the highest speed can reach 10G, and LC interface is mostly used), and the connection line is shown in the figure below. VccT and VccR are the transmitting and receiving part power supplies, respectively, which require 3.3V±5% and the maximum power supply current is over 300mA. The LOS valid signal of SFP optical module is low level, which needs to be changed to high level through an inverter, GPIO_B1_14 and G2_SD high levels indicate that optical signals are detected; P11_SD low level Indicates that an optical signal is detected.

- G1 Reference Circuit Diagram;

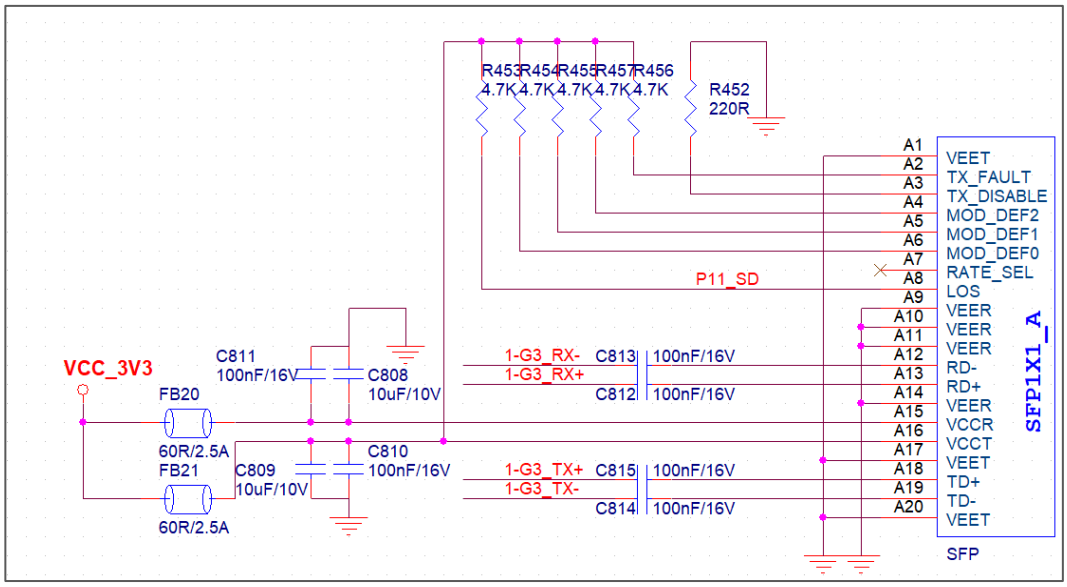


- G2 Reference Circuit Diagram:

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- G3 reference circuit, LOS signal does not need to connect to inverter:



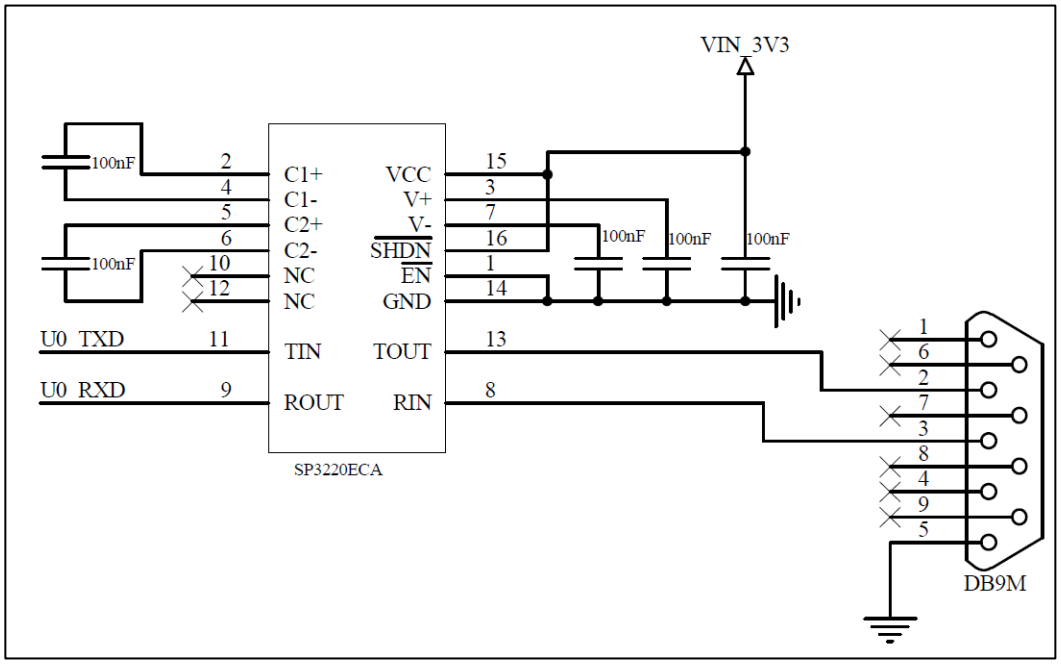
4.3 CONSOLE Port (Debugging Port)

UART0 debugging interface serves as the CONSOLE port of this module, mainly used for building CLI management platform.

PIN Name	Type	Configuration Method
U0_TXD	Output	CONSOLE port transmitting signal, which is only used for debugging this module by CONSOLE port.
U0_RXD	Input	CONSOLE port receiving signal, which is only used for debugging this module by CONSOLE port.

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Reference Circuit of CONSOLE Port



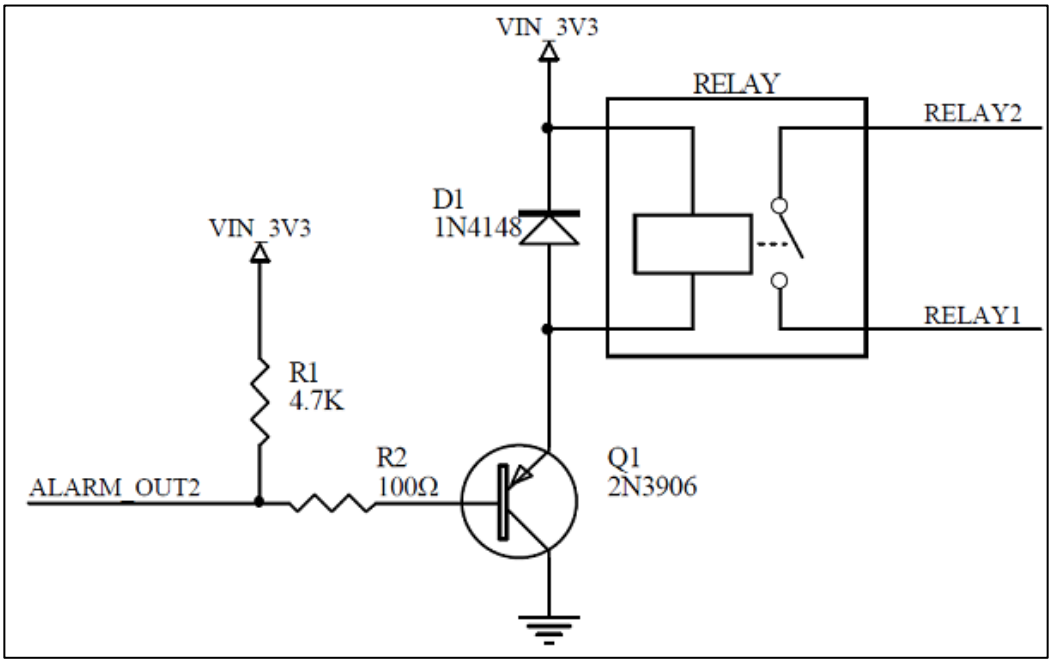
4.4 I/O Alarm Interface

The module has two alarm signal inputs, and the alarm input type can be self-configured. There is 1 alarm signal output for relay alarm output, which is active-low.

PIN Name	Type	Configuration Method
ALARM_IN2 ALARM_IN1	Input	2 alarm signal input pins, which can configure alarm input types by yourself, such as power alarm information detection. The default is low-level alarm, and high-level alarm is not available.
ALARM_OUT1	Output	1 alarm signal output pin, corresponding to 2 alarm information input states. When any input state changes, both output states will change. ALARM_OUT1 can be extended as a relay, which is active at low level and defaults to high level.

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Reference Circuit of Relay Alarm



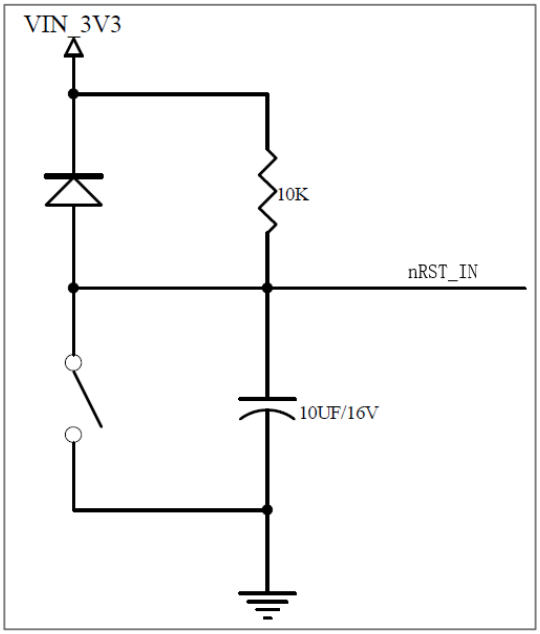
4.5 Reset Interface

The module provides an external manual reset input pin, and an external hardware reset circuit can be designed for manual reset.

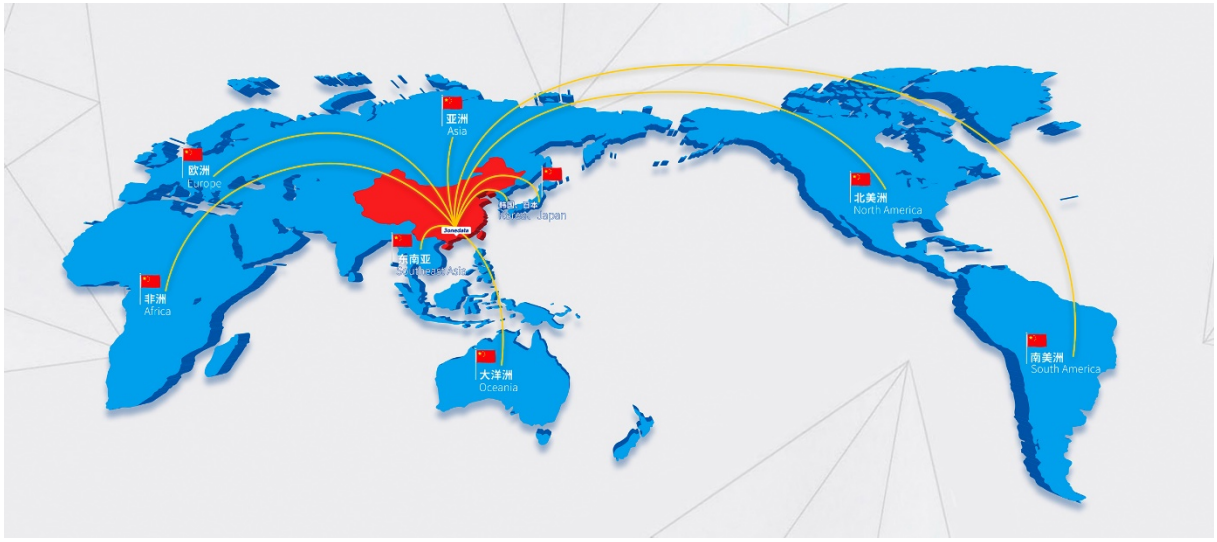
PIN Name	Type	Function Description
nRST_IN	Input	System reset pin, active low level, and it is recommended to pull high. When the input low level of this pin lasts longer than 200ms, the system enters the reset state.

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Reset Reference Circuit



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