3onedata



IEM6400TSN-8GT4XS

Managed Industrial Ethernet Switch Module

Hardware Quick Installation Manual

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Preface

The manual has introduced the following contents:

- Product Overview
- Encapsulation and size
- Pin definition
- Interface Description

Audience

This manual applies to the following engineers:

- Network administrators responsible for network configuration and maintenance
- On-site technical support and maintenance personnel
- 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. Such as: “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	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 Principles/Operations Section of this chapter.

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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	Conduct necessary supplements and explanations for the description of operation content.
 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 Date	Revision Note
01	2024-09-26	Product release

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1 Product Overview

1.1 Product Introduction

IEM6400TSN-8GT4XS is a managed embedded industrial Ethernet switch module, which is used in conjunction with the Ethernet switch backplane to form a complete industrial network managed Ethernet switch function.

- Support 8 10/100/1000Base-T(X) Ethernet copper ports, automatic flow rate control or forced mode, full/half-duplex mode self-adaptation.
- Support 4 10Gigabit SFP+ slot, 10G Base-X self-adaption, 1G/2.5G forced mode, full/half duplex mode self-adaption.
- Support 1 CONSOLE port, used for command line to coordinate and debug this module.
- Standard industrial design can meet the requirements of various industrial sites;
- All devices are industrial-grade, which can achieve high reliability.
- Support 3.3VDC±5% voltage input.

1.2 Product Specification

Interface	
Gigabit copper port	8 10/100/1000Base-T(X) copper ports, self-adaption or forced mode, Automatic Flow Control, Full/Half Duplex self-adaption, MDI/ MDI-X Autotunning
10Gigabit SFP+ slot	4 10G Base-X self-adaption, 1G/2.5G forced mode, SFP+ slot
CONSOLE port	CLI command management port, TTL level serial data
Alarm interface	1 relay alarm output
Switch Property	
Backplane bandwidth	50Gbps

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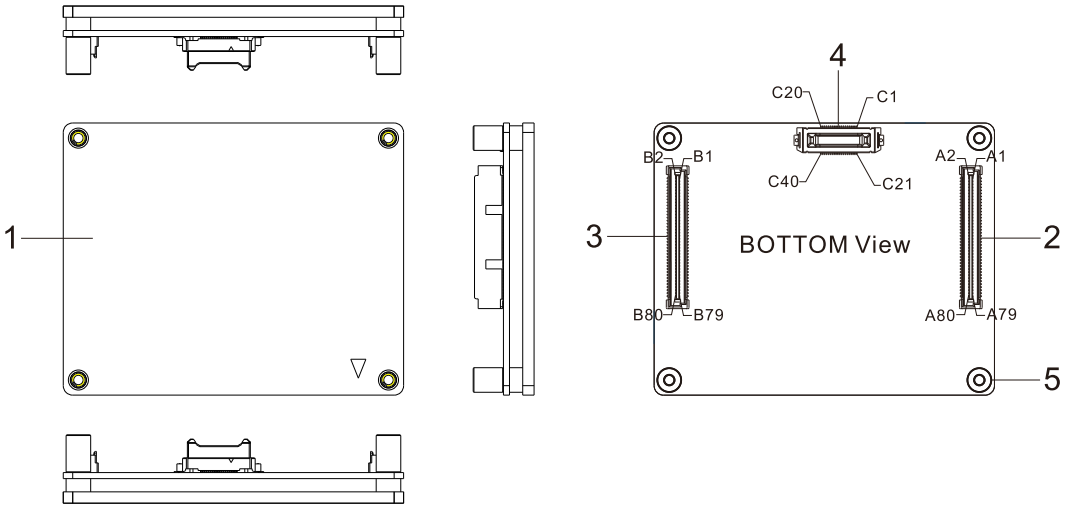
Cache size	3Mbit
MAC address table	32K
Power Supply	
Input power supply	3.3VDC (±5%)
Power Consumption	
No-load	5.6W@12VDC (including DEMO board)
Full load	11.5W@12VDC (including DEMO board)
Working Environment	
Working temperature	-40~70℃
Storage temperature	-40~85℃
Working humidity	5%~95%
Mechanical Structure	
Mounting	Embedded installation (pin and female header type)
Dimension (W x D x H)	90mm×18.1mm×72mm

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2 Hardware Description

2.1 Dimension

2.1.1 Capsulation Design



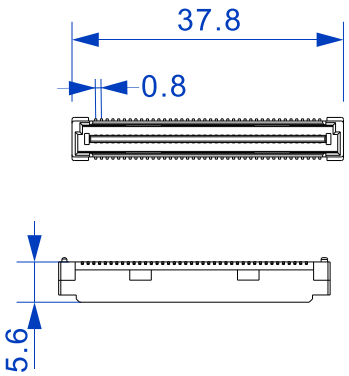
The details of each package label are shown in the following table:

Capsulation	Name	Specification	Description
1	A blade of thermal conductivity	90mm*72mm	External heat sink available
2	Connector A	Connector 2*40, pin spacing 0.8mm, connector height 5.6mm	—
3	Connector B	Connector 2*40, pin spacing 0.8mm, connector height 5.6mm	—

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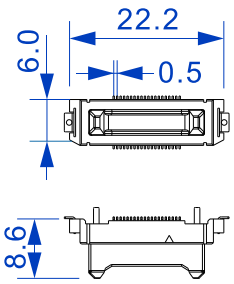
Capsulation	Name	Specification	Description
4	Connector C	Connector 2*20, pin spacing 0.5mm, connector height 8.6mm	—
5	Location hole	The distance from the center of the circle to the four sides of the PCB is 4mm. Note: • 4 positioning holes can be planned on the bottom plate, and M3 screws are used to connect the copper column of the module through the bottom plate to fix the module; • The diameter of the positioning hole of the bottom plate should be greater than Φ3.0mm to avoid the screw being unable to pass because the diameter is too small.	The four positioning holes have the same specifications

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

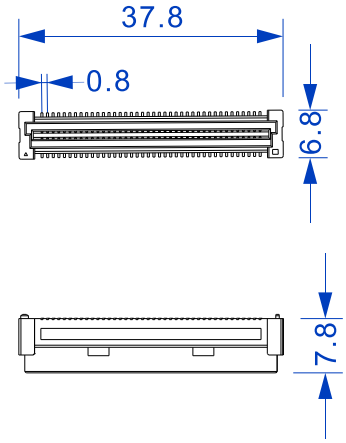


The needle specifications corresponding to Connector C can refer to the following view, unit is mm:

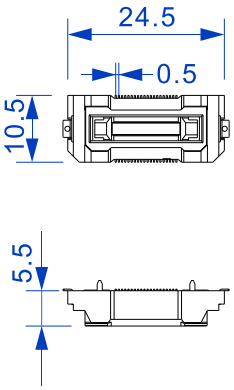
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Supporting switch baseplate receptacle, the needle specifications corresponding to Connector A, B can refer to the following view, unit is mm:



Supporting switch baseplate receptacle, the needle specifications corresponding to Connector C can refer to the following view, unit is mm:

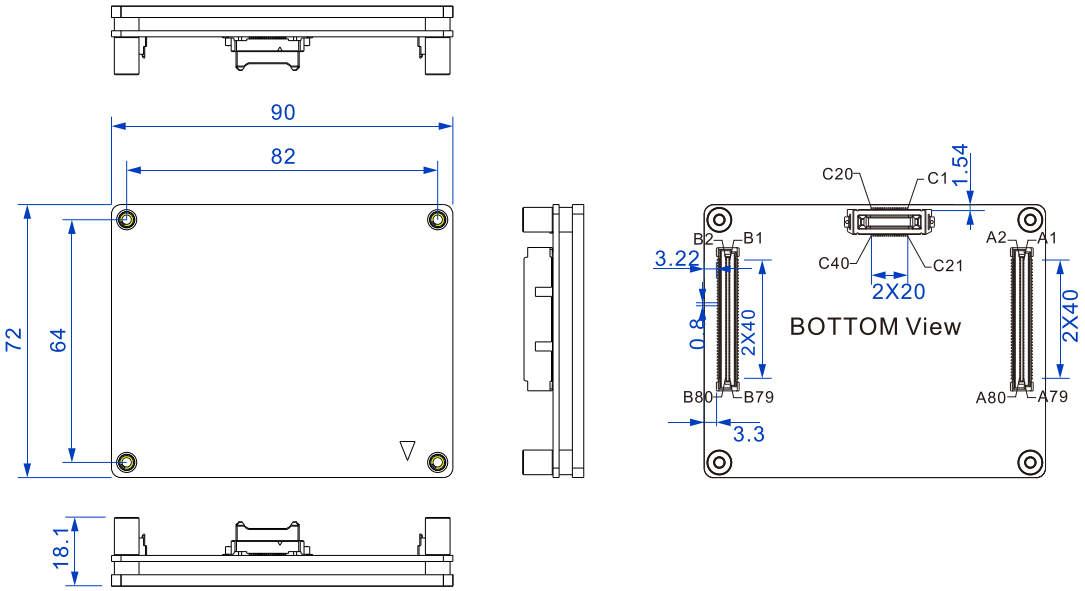


2.1.2 Product Dimension

The diagram of module structure dimension is as follows:

Unit: mm

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Notes:

Except the connector, the bottom of the module contains some protruding components. In order to avoid installation conflicts, the height of the components in the position corresponding to the motherboard is limited to 3mm.

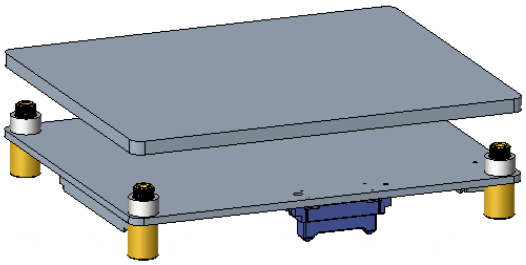
2.2 Pin Definition Description

2.2.1 Pin Definition View

The pin definitions in this document all adopt the perspective as shown in the figure below.

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.



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2.2.2 A1-A80 Pin Definition of Connector A

The pin number and name of Module A connector are shown in the figure below.

Pin No.	Pin Name	Pin No.	Pin Name
A1	USBD_N	A2	NC (reserved)
A3	USBD_P	A4	NC (reserved)
A5	NC (reserved)	A6	NC (reserved)
A7	NC (reserved)	A8	NC (reserved)
A9	NC (reserved)	A10	NC (reserved)
A11	LED_CLK	A12	ALA_LED
A13	LED_STB	A14	RUN_LED
A15	LED_DATA	A16	POE_INT
A17	GND	A18	GND
A19	UA0_TXD	A20	TXDISABLE_S1
A21	UA0_RXD	A22	MODDETn_S1
A23	PWR2_LED	A24	LOS_S1
A25	GND	A26	GND
A27	NC (reserved)	A28	TXDISABLE_S0
A29	NC (reserved)	A30	MODDETn_S0
A31	NC (reserved)	A32	LOS_S0
A33	GND	A34	GND
A35	NC (reserved)	A36	TXDISABLE_S2
A37	NC (reserved)	A38	MODDETn_S2
A39	LOS_S3	A40	LOS_S2
A41	TXDISABLE_S3	A42	PWR1_LED
A43	MODDETn_S3	A44	RELOAD_DEFAULT
A45	NC (reserved)	A46	MPP48
A47	LED_PWM	A48	I2C0_SDA
A49	PTP_A	A50	I2C0_SCL
A51	nRESET_RESERVE	A52	PTP_B
A53	MPP29	A54	ALARMOUT
A55	NC (reserved)	A56	NC (reserved)
A57	GND	A58	GND
A59	GND	A60	GND
A61	GND	A62	GND
A63	GND	A64	GND
A65	GND	A66	GND
A67	GND	A68	GND
A69	VCC_3V3	A70	VCC_3V3
A71	VCC_3V3	A72	VCC_3V3

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A73	VCC_3V3	A74	VCC_3V3
A75	VCC_3V3	A76	VCC_3V3
A77	VCC_3V3	A78	VCC_3V3
A79	VCC_3V3	A80	VCC_3V3

2.2.3 B1-B80 Pin Definition of Connector B

The pin number and name of Module B connector are shown in the figure below.

Pin No.	Pin Name	Pin No.	Pin Name
B1	P0_MDI2+	B2	P0_MDI0+
B3	P0_MDI2-	B4	P0_MDI0-
B5	P0_MDI3+	B6	P0_MDI1+
B7	P0_MDI3-	B8	P0_MDI1-
B9	GND	B10	GND
B11	P1_MDI1-	B12	P1_MDI3-
B13	P1_MDI1+	B14	P1_MDI3+
B15	P1_MDI0-	B16	P1_MDI2-
B17	P1_MDI0+	B18	P1_MDI2+
B19	GND	B20	GND
B21	P2_MDI2+	B22	P2_MDI0+
B23	P2_MDI2-	B24	P2_MDI0-
B25	P2_MDI3+	B26	P2_MDI1+
B27	P2_MDI3-	B28	P2_MDI1-
B29	GND	B30	GND
B31	P3_MDI1-	B32	P3_MDI3-
B33	P3_MDI1+	B34	P3_MDI3+
B35	P3_MDI0-	B36	P3_MDI2-
B37	P3_MDI0+	B38	P3_MDI2+
B39	GND	B40	GND
B41	P4_MDI2+	B42	P4_MDI0+
B43	P4_MDI2-	B44	P4_MDI0-
B45	P4_MDI3+	B46	P4_MDI1+
B47	P4_MDI3-	B48	P4_MDI1-
B49	GND	B50	GND
B51	P5_MDI1-	B52	P5_MDI3-
B53	P5_MDI1+	B54	P5_MDI3+
B55	P5_MDI0-	B56	P5_MDI2-
B57	P5_MDI0+	B58	P5_MDI2+
B59	GND	B60	GND

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B61	P6_MDI2+	B62	P6_MDI0+
B63	P6_MDI2-	B64	P6_MDI0-
B65	P6_MDI3+	B66	P6_MDI1+
B67	P6_MDI3-	B68	P6_MDI1-
B69	GND	B70	GND
B71	P7_MDI1-	B72	P7_MDI3-
B73	P7_MDI1+	B74	P7_MDI3+
B75	P7_MDI0-	B76	P7_MDI2-
B77	P7_MDI0+	B78	P7_MDI2+
B79	GND	B80	GND

2.2.4 C1-C40 Pin Definition of Connector C

The pin number and name of Module C connector are shown in the figure below.

Pin No.	Pin Name	Pin No.	Pin Name
C1	GND	C2	GND
C3	L_P11_RXP	C4	L_P11_RXN
C5	GND	C6	GND
C7	L_P11_TXN	C8	L_P11_TXP
C9	GND	C10	GND
C11	L_P10_RXP	C12	L_P10_RXN
C13	GND	C14	GND
C15	L_P10_TXN	C16	L_P10_TXP
C17	GND	C18	GND
C19	GND	C20	GND
C21	GND	C22	GND
C23	L_P12_RXN	C24	L_P12_RXP
C25	GND	C26	GND
C27	L_P12_TXN	C28	L_P12_TXP
C29	GND	C30	GND
C31	L_P9_RXP	C32	L_P9_RXN
C33	GND	C34	GND
C35	L_P9_TXN	C36	L_P9_TXP
C37	GND	C38	GND
C39	GND	C40	GND

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2.3 Detailed Pin Description

2.3.1 Positive End of 1000M Ethernet Interface Data Transmission

Pin No.	Pin Name	Type	Function Description
B1	P0_MDI2+	Typical output	Positive end 0 of 1000M Ethernet interface data transmission. When the port is configured to 1000M copper port, PX_MDI[0:3]+ is directly connected to the receiving network transformer, and X is 0-7. Note: Grounding is recommended when this pin is not in use.
B5	P0_MDI3+		
B13	P1_MDI1+		
B17	P1_MDI0+		
B21	P2_MDI2+		
B25	P2_MDI3+		
B33	P3_MDI1+		
B37	P3_MDI0+		
B41	P4_MDI2+		
B45	P4_MDI3+		
B53	P5_MDI1+		
B57	P5_MDI0+		
B61	P6_MDI2+		
B65	P6_MDI3+		
B73	P7_MDI1+		
B77	P7_MDI0+		
B2	P0_MDI0+		
B6	P0_MDI1+		
B14	P1_MDI3+		
B18	P1_MDI2+		
B22	P2_MDI0+		
B26	P2_MDI1+		
B34	P3_MDI3+		
B38	P3_MDI2+		
B42	P4_MDI0+		
B46	P4_MDI1+		
B54	P5_MDI3+		
B58	P5_MDI2+		

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Pin No.	Pin Name	Type	Function Description
B62	P6_MDI0+		
B66	P6_MDI1+		
B74	P7_MDI3+		
B78	P7_MDI2+		

2.3.2 Negative End of 1000M Ethernet Interface Data Transmission

Pin No.	Pin name	Type	Function Description
B3	P0_MDI2-	Typical output	Negative end 0 of 1000M Ethernet interface data transmission. When the port is configured to 1000M copper port, PX_MDI[0:3]- is directly connected to the receiving network transformer, and X is 0-7. Note: Grounding is recommended when this pin is not in use.
B7	P0_MDI3-		
B11	P1_MDI1-		
B15	P1_MDI0-		
B23	P2_MDI2-		
B27	P2_MDI3-		
B31	P3_MDI1-		
B35	P3_MDI0-		
B43	P4_MDI2-		
B47	P4_MDI3-		
B51	P5_MDI1-		
B55	P5_MDI0-		
B63	P6_MDI2-		
B67	P6_MDI3-		
B71	P7_MDI1-		
B75	P7_MDI0-		
B4	P0_MDI0-		
B8	P0_MDI1-		
B12	P1_MDI3-		
B16	P1_MDI2-		
B24	P2_MDI0-		
B28	P2_MDI1-		
B32	P3_MDI3-		
B36	P3_MDI2-		

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Pin No.	Pin name	Type	Function Description
B44	P4_MDI0-		
B48	P4_MDI1-		
B52	P5_MDI3-		
B56	P5_MDI2-		
B64	P6_MDI0-		
B68	P6_MDI1-		
B72	P7_MDI3-		
B76	P7_MDI2-		

2.3.3 10Gigabit SFP+ Slot Ethernet Fiber Port Signal Transmission Positive

Pin No.	Pin Name	Type	Function Description
C36	L_P9_TXP	Output	10Gigabit SFP + slot Ethernet fiber port Port9 transmission positive
C16	L_P10_TXP		10Gigabit SFP + slot Ethernet fiber port Port10 transmission positive
C8	L_P11_TXP		10Gigabit SFP + slot Ethernet fiber port Port11 transmission positive
C28	L_P12_TXP		10Gigabit SFP + slot Ethernet fiber port Port12 transmission positive

2.3.4 10Gigabit SFP+ Slot Ethernet Fiber Port Signal Transmission Negative

Pin No.	Pin name	Type	Function Description
C35	L_P9_TXN	Output	10Gigabit SFP + slot Ethernet fiber port Port9 transmission negative
C15	L_P10_TXN		10Gigabit SFP + slot Ethernet fiber port Port10 transmission negative
C7	L_P11_TXN		10Gigabit SFP + slot Ethernet fiber port Port11 transmission negative

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C27	L_P12_TXN		10Gigabit SFP + slot Ethernet fiber port Port12 transmission negative

2.3.5 10Gigabit SFP+ Slot Ethernet Fiber Port Signal Receiving Positive

Pin No.	Pin Name	Type	Function Description
C31	L_P9_RXP	Output	10Gigabit SFP + slot Ethernet fiber port Port9 receiving positive
C11	L_P10_RXP		10Gigabit SFP + slot Ethernet fiber port Port10 receiving positive
C3	L_P11_RXP		10Gigabit SFP + slot Ethernet fiber port Port11 receiving positive
C24	L_P12_RXP		10Gigabit SFP + slot Ethernet fiber port Port12 receiving positive

2.3.6 10Gigabit SFP+ Slot Ethernet Fiber Port Signal Receiving Negative

Pin No.	Pin Name	Type	Function Description
C32	L_P9_RXN	Output	10Gigabit SFP + slot Ethernet fiber port Port9 receiving negative
C12	L_P10_RXN		10Gigabit SFP + slot Ethernet fiber port Port10 receiving negative
C4	L_P11_RXN		10Gigabit SFP + slot Ethernet fiber port Port11 receiving negative
C23	L_P12_RXN		10Gigabit SFP + slot Ethernet fiber port Port12 receiving negative

2.3.7 Fiber Port Signal

Pin No.	Pin Name	Type	Function Description

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Pin No.	Pin Name	Type	Function Description
TXDISABLE_S1	A20	Output	Signal transmission switch for controlling optical module emitter
TXDISABLE_S0	A28		
TXDISABLE_S2	A36		
TXDISABLE_S3	A41		
LOS_S0	A32	Output	Detecting whether the optical signal level is lower than the standard value
LOS_S1	A24		
LOS_S2	A40		
LOS_S3	A39		
MODDETn_S0	A30	Output	Detect whether the optical module is inserted
MODDETn_S1	A22		Detect whether the optical module is inserted
MODDETn_S2	A36		Detect whether the optical module is inserted
MODDETn_S3	A43		Detect whether the optical module is inserted

2.3.8 Power Supply

Pin No.	Pin Name	Type	Function Description
A69-A80	VDD3_3V	Power Supply	+ 3V3 input

2.3.9 CONSOLE Port (Debugging Port)

Pin Name	Pin No.	Type	Function Description
UA0_TXD	A19	Output	Serial port transmitting Note: Serial port is only used as CONSOLE port, not for other purposes.
UA0_RXD	A21	Input	Serial port receiving Note: Serial port is only used as CONSOLE port, not for other purposes.

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2.3.10 PTP Signal

Pin Name	Pin No.	Type	Function Description
PTP_A	A49	Output	Output precision clock information
PTP_B	A52	Input	Receive precision clock information

2.3.11 Indicator Signal

Pin No.	Pin Name	Type	Function Description
A11	LED_CLK	Output	Serial LED clock output
A13	LED_STB	Output	STB latch signal of serial LED
A15	LED_DATA	Output	Serial LED data output
A12	ALA_LED	Output	Alarm indicator
A14	RUN_LED	Output	Running indicator
A16	POE_INT	Output	POE indicator, reserved
A42	PWR1_LED	Output	Power 1 indicator
A23	PWR2_LED	Output	Power 2 indicator
A47	LED_PWM	Output	Lamp pulse width modulation signal

2.3.12 Reset and Restore Factory Configuration Output

Pin No.	Pin Name	Type	Function Description
A51	nRESET_RESERVE	Input	Button reset, system reset.
A44	RELOAD_DEFAULT	Output	The reset signal is output by the system to reset peripheral devices.

2.3.13 System Ground

Pin Name	Pin No.	Type	Function Description
GND	A17-A18, A25-A26, A33-A34, A57-A68,	Output	System Ground

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Pin Name	Pin No.	Type	Function Description
	B9-B10, B19-B20, B29-B30, B39-B40, B49-B50, B59-B60, B69-B70, B79-B80, C1-C2, C5-C6, C9-C10, C13-C14, C17-C22, C25-C26, C29-C30, C33-C34, C37-C40		

2.3.14 I2C Signal

Pin No.	Pin Name	Type	Function Description
48	I2C0_SDA	Output	Communication data of I2C
50	I2C0_SCL	Output	I2C Clock

2.3.15 Universal IO

Pin No.	Pin Name	Type	Function Description
A46	MPP48	Bidirectional	Universal IO Port
A53	MPP29	Bidirectional	Universal IO Port

2.3.16 Alarm

Pin No.	Pin Name	Type	Function Description
A54	ALARMOUT	Output	Alarm information

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2.3.17 USB Port

Pin No.	Pin Name	Type	Function Description
A1	USBD_N	Output	USB port negative
A3	USBD_P		USB port positive

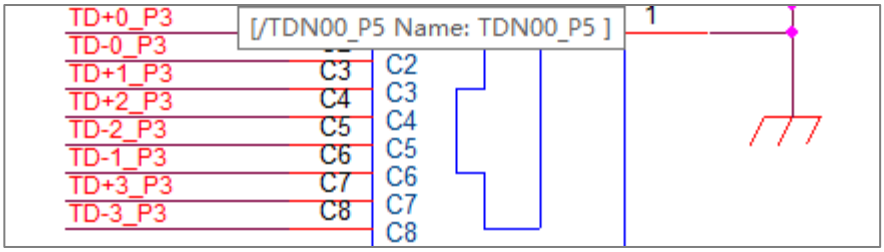
2.3.18 Unused PIN

Pin No.	Function Description
A2, A4-A10, A27, A29, A31, A35, A37, A45, A55, A56	Port is not used.

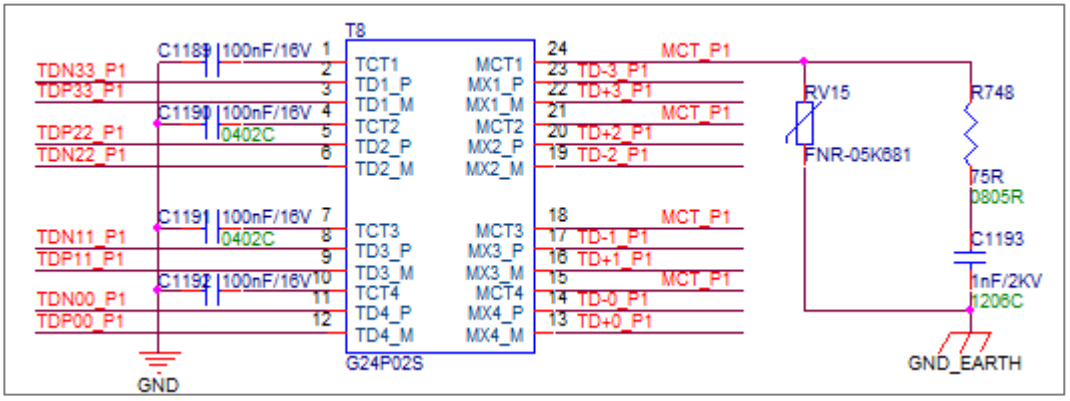
2.4 Reference Circuit

2.4.1 1000M Ethernet Interface

RJ45

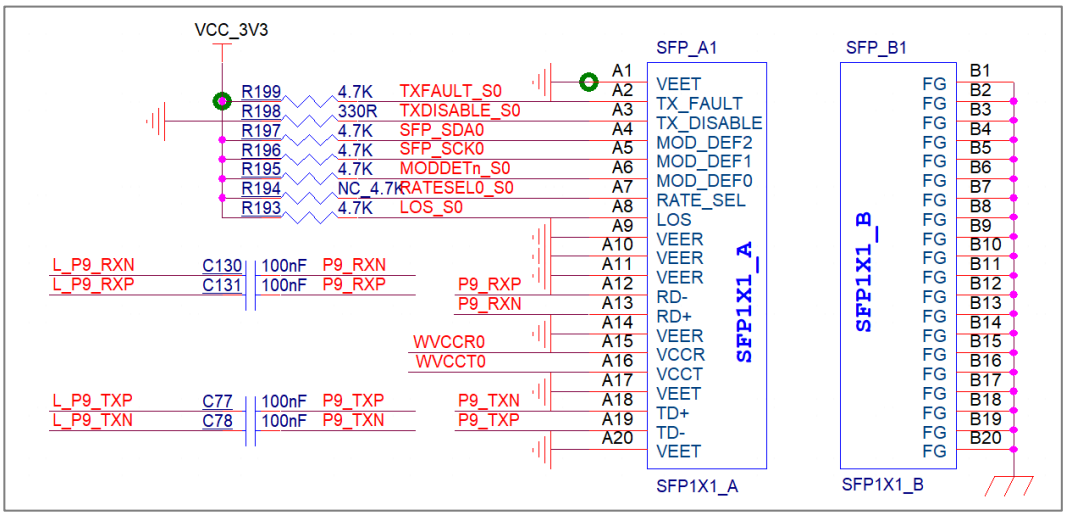


Network Transformer

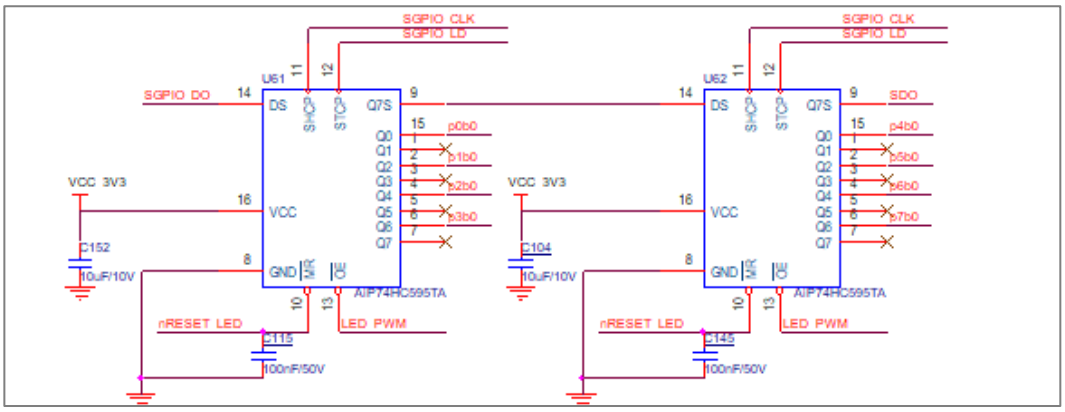


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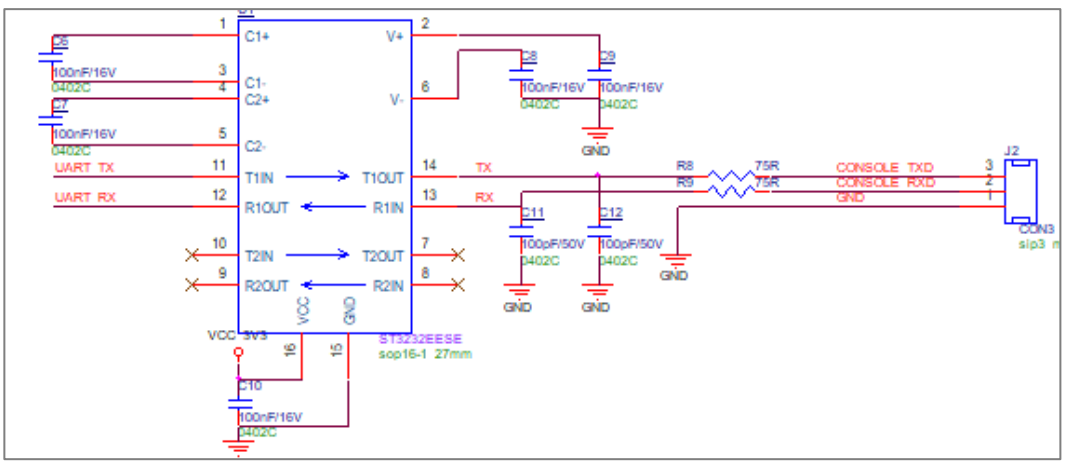
2.4.2 10Gigabit SFP+ slot Ethernet Fiber Port



2.4.3 LED Indicator Interface

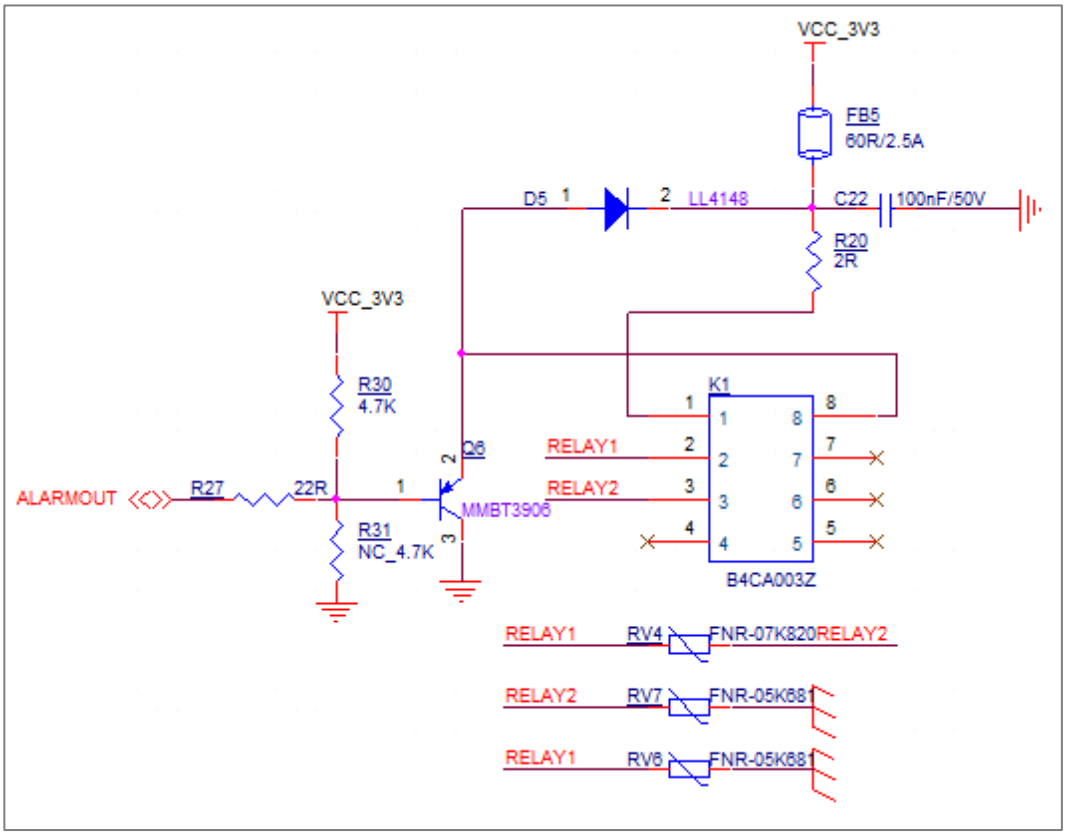


2.4.4 CONSOLE Port



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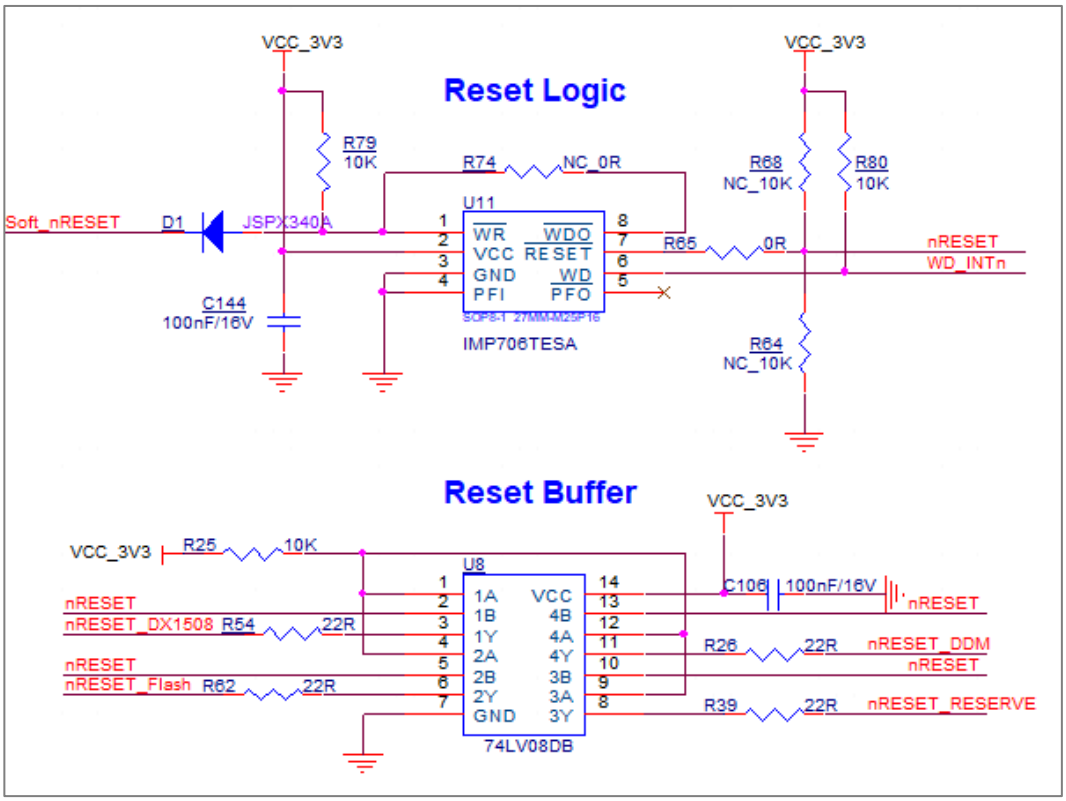
2.4.5 I/O Alarm Interface



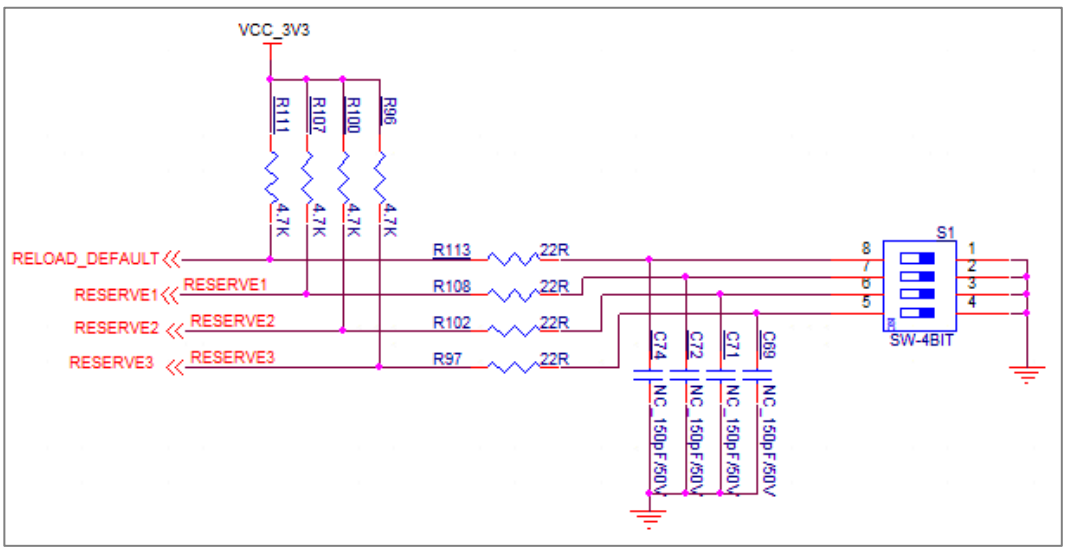
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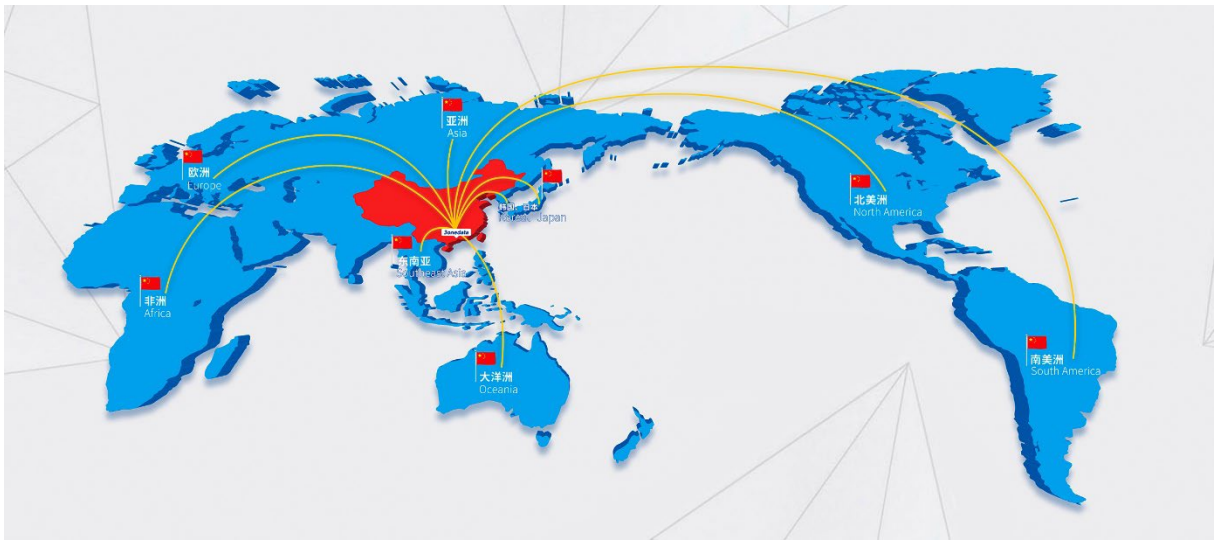
2.4.6 System Reset

System Reset Reference Circuit



Peripheral Reset Reference Circuit





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