

### QSFP28-1SFP28-PDACXM-C

MSA and TAA Compliant 25GBase-CU QSFP28 to 1xSFP28 Direct Attach Cable (Passive Twinax, Up to 5m)

#### Features

- QSFP28 End: Compliant with QSFP28 MSA specifications
- SFP28 End: Compliant with SFP28 MSA specifications
- 1 independent duplex channels operating at 25Gbps
- AC coupled inputs and outputs
- 100 Ohm differential impedance
- 26AWG to 30AWG Wire Gauge
- All-metal housing for superior EMI performance
- Single power supply 3.3V, low power consumption
- Operating Temperature: 0°C to 70°C
- ROHS Compliant



#### Applications

- Serial Data Transmission Storage
- Fiber Channel

#### Product Description

This is an MSA compliant 25GBase-CU QSFP28 to 1xSFP28 direct attach cable that operates over passive copper with a maximum reach up to 5.0m (16.4ft). It has been programmed, uniquely serialized, and data-traffic and application tested to ensure it is 100% compliant and functional. This direct attach cable is TAA (Trade Agreements Act) compliant, and is built to comply with MSA (Multi-Source Agreement) standards. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' direct attach cables are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."



## Order Information

Part Number	Description
QSFP28-1SFP28-PDAC0-5M-C	MSA and TAA Compliant 25GBase-CU QSFP28 to 1xSFP28 Direct Attach Cable (Passive Twinax, 0.5m)
QSFP28-1SFP28-PDAC1M-C	MSA and TAA Compliant 25GBase-CU QSFP28 to 1xSFP28 Direct Attach Cable (Passive Twinax, 1m)
QSFP28-1SFP28-PDAC1-5M-C	MSA and TAA Compliant 25GBase-CU QSFP28 to 1xSFP28 Direct Attach Cable (Passive Twinax, 1.5m)
QSFP28-1SFP28-PDAC2M-C	MSA and TAA Compliant 25GBase-CU QSFP28 to 1xSFP28 Direct Attach Cable (Passive Twinax, 2m)
QSFP28-1SFP28-PDAC2-5M-C	MSA and TAA Compliant 25GBase-CU QSFP28 to 1xSFP28 Direct Attach Cable (Passive Twinax, 2.5m)
QSFP28-1SFP28-PDAC3M-C	MSA and TAA Compliant 25GBase-CU QSFP28 to 1xSFP28 Direct Attach Cable (Passive Twinax, 3m)
QSFP28-1SFP28-PDAC4M-C	MSA and TAA Compliant 25GBase-CU QSFP28 to 1xSFP28 Direct Attach Cable (Passive Twinax, 4m)
QSFP28-1SFP28-PDAC5M-C	MSA and TAA Compliant 25GBase-CU QSFP28 to 1xSFP28 Direct Attach Cable (Passive Twinax, 5m)

## Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compliant with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

## General Specifications

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Bit Error Rate	BER			$10^{-12}$		
Operating Temperature	T <sub>c</sub>	0		70	°C	1
Storage Temperature	T <sub>STO</sub>	-40		85	°C	2
Input Voltage	V <sub>CC</sub>	3.14	3.3	3.46	V	

### Notes:

1. Case temperature
2. Ambient temperature

### Insertion Loss Level and Wire Gauge

Cable Length	Wire Gauge	Insertion Loss Level
0.5m	30AWG	CA-25G-N
1m	30AWG	CA-25G-N
1.5m	30AWG	CA-25G-N
2m	30AWG	CA-25G-N
2.5m	28AWG	CA-25G-N
3m	28AWG	CA-25G-S
4m	26AWG	CA-25G-L
5m	26AWG	CA-25G-L

#### Notes:

1. Cable insertion loss classification standard: IEEE 802.3by 110-10

### Weight

Parameter	Symbol	Typ Max	Unit	Notes
30AWG Product Weight	GD30	96	g/PCS	1
28AWG Product Weight	GD28	105	g/PCS	1
26AWG Product Weight	GD26	110	g/PCS	1
30AWG Cable Weight	GC30	32	g/M	2
28AWG Cable Weight	GC28	38	g/M	2
26AWG Cable Weight	GC26	43	g/M	2
SFP28 END Dust CapWeight	G <sub>s</sub>	0.80	g/PCS	
QSFP28 END Dust CapWeight	G <sub>Q</sub>	1.40	g/PCS	

#### Notes:

1. The weight of the product.
2. The weight of unit length cable (two sticks). For example: the weight of 26AWG cable is:  $110+43*(5-1)+0.80+1.40=284.2g$

### Cable Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Wire Gauge		30		26	AWG	
Cable Impedance	Z	90	100	110	Ohm	

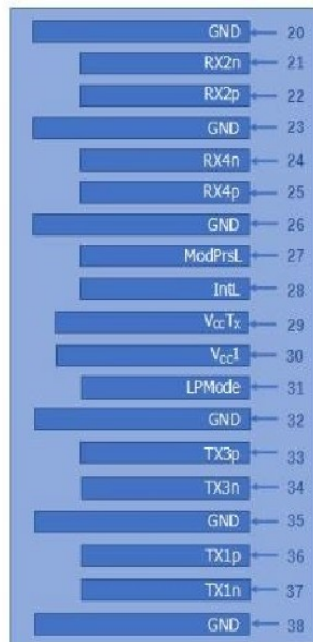
## Cable Dimension

Serial number	Standard Wire Gauge(AWG)	Cable diameter OD(mm)	Minimum bending radius R (mm)
1	30	4.6	26
2	28	5.0	28
3	26	5.6	30

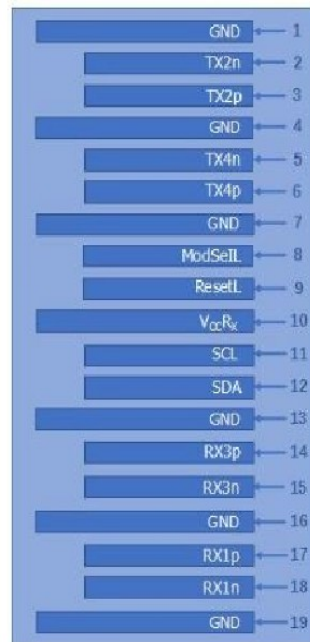
## Nominal Length

Serial number	Module nominal length L1 (cm)	Tolerance range $\pm$ (cm)
1	$L1 \leq 3$	2
2	$3 < L1 \leq 4$	4
3	$4 < L1 \leq 5$	6

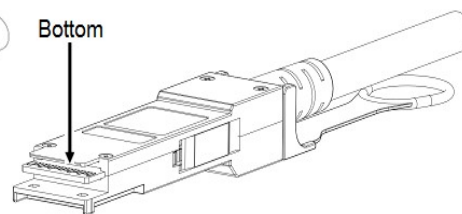
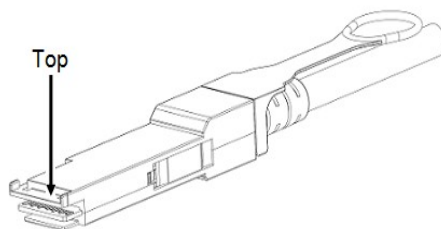
## Electrical Pin-out Details (QSFP28 END)



Top of Board



Bottom of Board



### Pin Descriptions (QSFP28 END)

Pin	Symbol	Descriptions	Notes
1	GND	Ground	5
2	Tx2n	Transmitter Inverted Data Input, LAN2	
3	Tx2p	Transmitter Non-Inverted Data Input, LAN2	
4	GND	Ground	5
5	Tx4n	Transmitter Inverted Data Input, LAN4	
6	Tx4p	Transmitter Non-Inverted Data Input, LAN4	
7	GND	Ground	5
8	ModSelL	Module select pin, the module responds to two-wire serial communication when low level	1
9	ResetL	Module Reset	2
10	V <sub>CC</sub> RX	+3.3V Power Supply Receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	5
14	Rx3p	Receiver Non-Inverted Data Output, LAN3	
15	Rx3n	Receiver Inverted Data Output, LAN3	
16	GND	Ground	5
17	Rx1p	Receiver Non-Inverted Data Output, LAN1	
18	Rx1n	Receiver Inverted Data Output, LAN1	
19	GND	Ground	5
20	GND	Ground	5
21	Rx2n	Receiver Inverted Data Output, LAN2	
22	Rx2p	Receiver Non-Inverted Data Output, LAN2	
23	GND	Ground	5
24	Rx4n	Receiver Inverted Data Output, LAN4	
25	Rx4p	Receiver Non-Inverted Data Output, LAN4	
26	GND	Ground	5
27	ModPrsL	The module is inserted into the indicate pin and grounded in the module.	3
28	IntL	Interrupt	4
29	V <sub>CC</sub> TX	+3.3V Power Supply transmitter	
30	VCC1	+3.3V Power Supply	
31	LPMODE	Low Power Mode	5
32	GND	Ground	5
33	Tx3p	Transmitter Non-Inverted Data Input, LAN3	
34	Tx3n	Transmitter Inverted Data Input, LAN3	
35	GND	Ground	5
36	Tx1p	Transmitter Non-Inverted Data Input, LAN1	
37	Tx1n	Transmitter Inverted Data Input, LAN1	
38	GND	Ground	5

### Notes:

1. ModSelL is the input pin. The module responds to 2-wire serial communication commands when it is held low by the host. ModSelL allows multiple QSFP modules to be used on a single 2-wire interface bus. If ModSelL is High, the module will not respond to any 2-wire interface communication from the host. ModSelL has internal pull-up resistors in the module
2. The module restart pin, when the low level on the ResetL pin lasts longer than the minimum pulse length, resets the module and restores all user modules to their default state. When performing reset device, the host should ignore all status bits. Until the module reset interrupt is completed, please note that during hot plugging, the module will issue this information to complete the reset interrupt without resetting
3. This pin is active high, indicating that the module is running under a low power module. The signal has no effect on the functionality of this product.
4. IntL is the output pin, which is the open collector output and must be pulled up to Vcc with a 4.7k $\Omega$ -10k $\Omega$  resistor on the motherboard. When it is low, it indicates that the module may malfunction. The host uses a 2-wire serial interface to identify the interrupt source
5. Circuit ground is internally isolated from chassis ground.

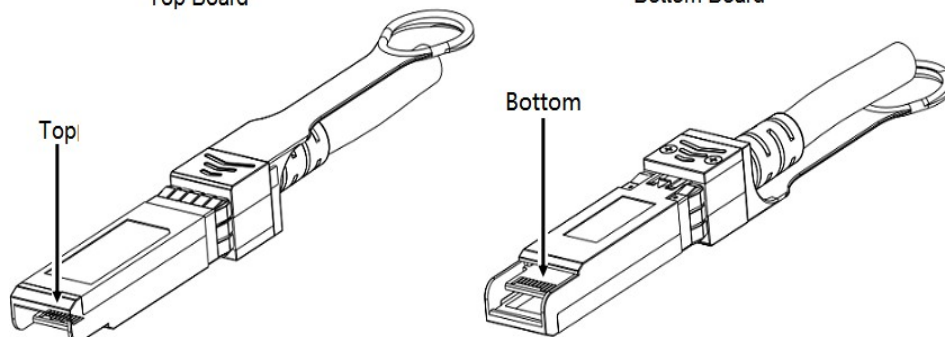
### Electrical Pin-out Details (SFP28 END)

20	TX GND
19	TD- TX DATA IN-
18	TD+ TX DATA IN+
17	TX GND
16	Vcc TX
15	Vcc RX
14	RX GND
13	RD+ RX DATA OUT+
12	RD- RX DATA OUT-
11	RX GND

Top Board

1	TX GND
2	TX FAULT
3	TX DISABLE
4	SDA
5	SCL
6	MOD_ABS
7	RS0
8	RX_LOS
9	RS1
10	RX GND

Bottom Board



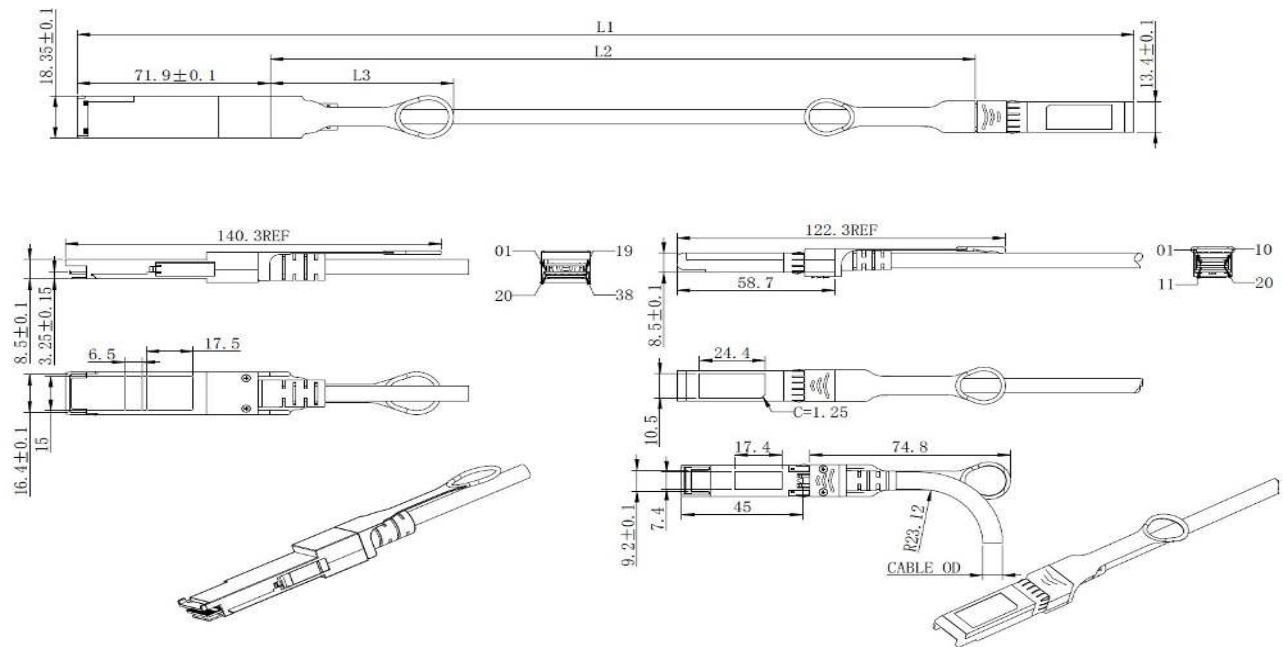
**Pin Descriptions (SFP28 END)**

Pin	Symbol	Descriptions	Notes
1	VEET	Transmitter ground (common with receiver ground)	1
2	TX_FAULT	Transmitter failure alarm, not used	
3	TX_DISABLE	The signal turns off the module transmitter when it is high or open, not used.	
4	SDA	Data line for serial ID	2
5	SCL	Clock line for serial ID	2
6	MOD_ABS	Module Absent. Grounded within the module	2
7	RS0	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation	
9	RS1	No connection required	
10	VEER	Receiver ground (common with transmitter ground)	1
11	VEER	Receiver ground (common with transmitter ground)	1
12	RD-	Receiver Inverted DATA out. AC coupled	
13	RD+	Receiver Non-inverted DATA out. AC coupled	
14	VEER	Receiver ground (common with transmitter ground)	1
15	VCCR	Receiver power supply	
16	VCCT	Transmitter power supply	
17	VEET	Transmitter ground (common with receiver ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC coupled	
19	TD-	Transmitter Inverted DATA in. AC coupled	
20	VEET	Transmitter ground (common with receiver ground)	1

**Notes:**

1. Circuit ground is isolated from chassis ground
2. Should Be pulled up with 4.7k - 10k ohm on host board to a voltage between 2V and 3.6V

## Mechanical Specifications



ALL DIMENSIONS ARE  $\pm 0.2 \text{ mm}$  UNLESS OTHERWISE SPECIFIED

UNIT: mm



**About ProLabs**

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

**Complete Portfolio of Network Solutions**

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

**Trusted Partner**

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.

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