

## ACU10M-QSFP-4SFP10G-C

Cisco® QSFP-4SFP10G-ACU10M Compatible TAA Compliant 40GBase-CU QSFP+ to 4xSFP+ Direct Attach Cable (Active Twinax, 10m)

#### **Features:**

- QSFP End: Compliant with QSFP+ MSA Specifications
- SFP End: Compliant with SFP+ MSA Specifications
- 4 Independent Duplex Channels Operating at 10Gbps
- Support for 2.5Gbps, 5Gbps Data Rates
- All-Metal Housing for Superior EMI Performance
- Single Power Supply 3.3V, Low Power Consumption
- Operating Temperature: 0 to 70 Celsius
- RoHS Compliant and Lead-Free



## **Applications:**

- 40GBase Ethernet
- Serial Data Transmission

### **Product Description**

This is a Cisco® QSFP-4SFP10G-ACU10M Compatible 40GBase-CU QSFP+ to 4xSFP+ direct attach cable that operates over active copper with a maximum reach of 10m. It has been programmed, uniquely serialized, and data-traffic and application tested to ensure it is 100% compliant and functional. We stand behind the quality of our products and proudly offer a limited lifetime warranty. This cable is TAA (Trade Agreements Act) compliant and is built to comply with MSA (Multi-Source Agreement) standards.

ProLabs' transceivers 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."



# **Absolute Maximum Ratings**

Parameter	Symbol	Min.	Тур.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.14	3.3	3.46	V	
Storage Temperature	Tstg	-40		85	°C	1
Operating Temperature	Тс	0		70	°C	2
Bit Error Rate	BER			10-12		
Cable Impedance	Z	90	100	110	Ω	
Product Weight	GD		310	g/PCS		
Cable Weight	GC		170	g/M		3
QSFP End Dust Cap Weight	GQ		1.40	g/PCS		
SFP End Dust Cap Weight	GQ		.80	g/PCS		
Wire Gauge	AWG		28			

## Notes:

- 1. Ambient temperature.
- 2. Case Temperature.
- 3. The weight of unit length cable (four sticks). For example, the weight of a 10m cable is 310 +170\*(10-1)+0.80\*4+1.40=1844.6g.

# **QSFP Pin Descriptions**

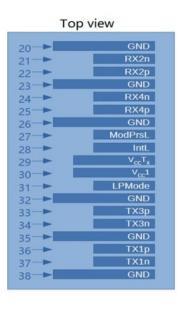
1         GND         Module Ground.         5           2         Tx2-         Transmitter Inverted Data Input. LAN2.	Pin	Symbol	Name/Description	Notes
Transmitter Non-Inverted Data Input. LAN2.	1	GND	Module Ground.	5
A	2	Tx2-	Transmitter Inverted Data Input. LAN2.	
No.	3	Tx2+	Transmitter Non-Inverted Data Input. LAN2.	
6         TX4+         Transmitter Non-Inverted Data Input. LAN4.           7         GND         Module Ground.         5           8         ModSelL         Module Select Pin. The module responds to 2-wire serial communication when low level.         1           9         ResetL         Module Reset.         2           10         Vccrx         +3.3V Receiver Power Supply.         2           11         SCL         2-Wire Serial Interface Clock.         3           12         SDA         2-Wire Serial Interface Data.         5           13         GND         Module Ground.         5           14         Rx3+         Receiver Non-Inverted Data Output. LAN3.         5           15         Rx3-         Receiver Inverted Data Output. LAN3.         5           16         GND         Module Ground.         5           17         Rx1+         Receiver Inverted Data Output. LAN1.         5           19         GND         Module Ground.         5           20         GND         Module Ground.         5           21         Rx2-         Receiver Inverted Data Output. LAN2.         5           21         Rx2-         Receiver Inverted Data Output. LAN2.         5 <t< th=""><td>4</td><td>GND</td><td>Module Ground.</td><td>5</td></t<>	4	GND	Module Ground.	5
Module Ground.   5	5	Tx4-	Transmitter Inverted Data Input. LAN4.	
ModSell ModSell Module Select Pin. The module responds to 2-wire serial communication when low level.  Module Reset. 2  Nodule Reset. 2  VccRx +3.3V Receiver Power Supply.  SCL 2-Wire Serial Interface Clock. 5  AR3- Receiver Inverted Data Output. LAN3. 6  RR3+ Receiver Inverted Data Output. LAN3. 7  RR1+ Receiver Inverted Data Output. LAN1. 7  RR1+ Receiver Inverted Data Output. LAN1. 7  RR1- Receiver Inverted Data Output. LAN1. 7  RR2- Receiver Inverted Data Output. LAN2. 7  RR2- Receiver Non-Inverted Data Output. LAN2. 7  RR2- Receiver Inverted Data Output. LAN4. 7  RR2- Receiver Inverted Data Output. LAN4. 7  RR2- Receiver Inverted Data Output. LAN4. 7  RR2- RR2- Receiver Inverted Data Output. LAN4. 7  RR2- RR2- RR2- RR2- RR2- RR2- RR2- RR2	6	Tx4+	Transmitter Non-Inverted Data Input. LAN4.	
9         Resett.         Module Reset.         2           10         VccRx         +3.3V Receiver Power Supply.         2           11         SCL         2-Wire Serial Interface Clock.         3           12         SDA         2-Wire Serial Interface Data.         5           14         Rx3+         Receiver Non-Inverted Data Output. LAN3.         5           15         Rx3-         Receiver Inverted Data Output. LAN3.         5           16         GND         Module Ground.         5           17         Rx1+         Receiver Inverted Data Output. LAN1.         5           18         Rx1-         Receiver Inverted Data Output. LAN1.         5           19         GND         Module Ground.         5           20         GND         Module Ground.         5           21         Rx2-         Receiver Inverted Data Output. LAN2.         5           22         Rx2-         Receiver Non-Inverted Data Output. LAN2.         5           23         GND         Module Ground.         5           24         Rx4-         Receiver Inverted Data Output. LAN4.         5           25         Rx4+         Receiver Inverted Data Output. LAN4.         5           26 <td>7</td> <td>GND</td> <td>Module Ground.</td> <td>5</td>	7	GND	Module Ground.	5
No.	8	ModSelL	Module Select Pin. The module responds to 2-wire serial communication when low level.	1
SCL   2-Wire Serial Interface Clock	9	ResetL	Module Reset.	2
SCL 2-Wire Serial Interface Data.  2-Wire Serial Interface Data.  5 SDA 2-Wire Serial Interface Data.  5 Rx3+ Receiver Non-Inverted Data Output. LAN3.  15 Rx3- Receiver Inverted Data Output. LAN3.  16 GND Module Ground.  5 Rx1+ Receiver Non-Inverted Data Output. LAN1.  17 Rx1+ Receiver Non-Inverted Data Output. LAN1.  19 GND Module Ground.  5 GND Module Ground.  5 CND Honde Low-Power Mode.  5 CND Module Ground.  5 CND Module Ground.  5 CND Module Ground.  5 CND Module Ground.  5 CND Transmitter Power Supply.	10	VccRx	+3.3V Receiver Power Supply.	
GND Module Ground.  Receiver Non-Inverted Data Output. LAN3.  Receiver Non-Inverted Data Output. LAN1.  Receiver Inverted Data Output. LAN1.  Receiver Non-Inverted Data Output. LAN1.  Receiver Inverted Data Output. LAN1.  Receiver Inverted Data Output. LAN1.  Receiver Inverted Data Output. LAN1.  Module Ground.  S  GND Module Ground.  S  Rx2- Receiver Inverted Data Output. LAN2.  Rx4- Receiver Non-Inverted Data Output. LAN2.  Rx4- Receiver Inverted Data Output. LAN4.  S  Rx4- Receiver Inverted Data Output. LAN4.  S  Rx4- Receiver Non-Inverted Data Output. LAN4.  S  Rx4- Receiver Non-Inverted Data Output. LAN4.  The module Ground.  S  Intl. Interrupt.  4  VccTx +3.3V Transmitter Power Supply.  Vcc1 +3.3V Power Supply.  I LPMode Low-Power Mode.  S  GND Module Ground.  S  GND Module Ground.  S  GND Module Ground.  S  GND Module Ground.  S  Transmitter Non-Inverted Data Input. LAN3.  Transmitter Inverted Data Input. LAN3.	11	SCL	2-Wire Serial Interface Clock.	
Note	12	SDA	2-Wire Serial Interface Data.	
15	13	GND	Module Ground.	5
16 GND Module Ground. 5  17 Rx1+ Receiver Inverted Data Output. LAN1.	14	Rx3+	Receiver Non-Inverted Data Output. LAN3.	
17         Rx1+         Receiver Non-Inverted Data Output. LAN1.         18         Rx1-         Receiver Inverted Data Output. LAN1.         19         GND         Module Ground.         5         20         GND         Module Ground.         5         21         Rx2-         Receiver Inverted Data Output. LAN2.         10         22         Rx2-         Receiver Inverted Data Output. LAN2.         10	15	Rx3-	Receiver Inverted Data Output. LAN3.	
Receiver Nor-Inverted Data Output. LAN1.  Receiver Inverted Data Output. LAN1.  Module Ground.  Solution Module Ground.  Receiver Inverted Data Output. LAN2.  Receiver Inverted Data Output. LAN2.  Receiver Inverted Data Output. LAN2.  Receiver Non-Inverted Data Output. LAN2.  Receiver Non-Inverted Data Output. LAN2.  Receiver Inverted Data Output. LAN4.  Receiver Inverted Data Output. LAN4.  Receiver Non-Inverted Data Output. LAN4.  Module Ground.  Module Ground.  Foliation Module Ground.  Intl. Interrupt.  Intl. Interrupt.  Interrupt.  VccTx +3.3V Transmitter Power Supply.  Intl. Inversupt.  Module Ground.  Solution Module Ground.  Receiver Non-Inverted Data Output. LAN4.  Foliation Module Ground.  Solution Module Ground.  Solution Module Ground.  Solution Module Ground.  The module Low-Power Mode.  Solution Module Ground.  Solution	16	GND	Module Ground.	5
19 GND Module Ground. 5 20 GND Module Ground. 5 21 Rx2- Receiver Inverted Data Output. LAN2. 22 Rx2+ Receiver Non-Inverted Data Output. LAN2. 3 23 GND Module Ground. 5 24 Rx4- Receiver Inverted Data Output. LAN4. 3 25 Rx4+ Receiver Inverted Data Output. LAN4. 3 26 GND Module Ground. 5 27 MosPrsL The module is inserted into the indicate pin and grounded within the module. 3 28 IntL Interrupt. 4 29 VccTx +3.3V Transmitter Power Supply. 30 30 Vcc1 +3.3V Power Supply. 31 31 LPMode Low-Power Mode. 5 32 GND Module Ground. 5 33 Tx3+ Transmitter Non-Inverted Data Input. LAN3. 34 34 Tx3- Transmitter Inverted Data Input. LAN3.	17	Rx1+	Receiver Non-Inverted Data Output. LAN1.	
20 GND Module Ground. 5 21 Rx2- Receiver Inverted Data Output. LAN2.	18	Rx1-	Receiver Inverted Data Output. LAN1.	
21 Rx2- Receiver Inverted Data Output. LAN2. 22 Rx2+ Receiver Non-Inverted Data Output. LAN2. 23 GND Module Ground. 24 Rx4- Receiver Inverted Data Output. LAN4. 25 Rx4+ Receiver Non-Inverted Data Output. LAN4. 26 GND Module Ground. 5 27 MosPrsL The module is inserted into the indicate pin and grounded within the module. 3 IntL Interrupt. 4 Pxc1 Handward Handwar	19	GND	Module Ground.	5
Receiver Inverted Data Output. LAN2.  Receiver Non-Inverted Data Output. LAN2.  Receiver Inverted Data Output. LAN2.  Receiver Inverted Data Output. LAN4.  Receiver Inverted Data Output. LAN4.  Receiver Non-Inverted Data Output. LAN4.  Intervettory Non-Inverted Data Output. LAN4.  Intervettory Non-Inverted Data Output. LAN4.  Intervettory Non-Inverted Data Input. LAN3.  Receiver Non-Inverted Data Input. LAN3.  Receiver Non-Inverted Data Input. LAN3.  Receiver Non-Inverted Data Input. LAN3.	20	GND	Module Ground.	5
GND Module Ground. 5  Rx4- Receiver Inverted Data Output. LAN4.  ENAMELY Receiver Inverted Data Output. LAN4.  Rx4- Receiver Inverted Data Output. LAN4.  MosPrsL The module is inserted into the indicate pin and grounded within the module. 3  IntL Interrupt. 4  Proceiver Nor-Inverted Data Output. LAN4.  Interrupt. 4  Proceiver Nor-Inverted Data Output. LAN4.  Interrupt. 5  Rx4+ Receiver Inverted Data Output. LAN4.  Interrupt. 5  Intl Interrupt. 4  Interrupt. 4  Interrupt. 5  Intl Interrupt. 6  Intl Inte	21	Rx2-	Receiver Inverted Data Output. LAN2.	
24 Rx4- Receiver Inverted Data Output. LAN4.  25 Rx4+ Receiver Non-Inverted Data Output. LAN4.  26 GND Module Ground.  5 MosPrsL The module is inserted into the indicate pin and grounded within the module.  3 IntL Interrupt.  4 VccTx +3.3V Transmitter Power Supply.  30 Vcc1 +3.3V Power Supply.  31 LPMode Low-Power Mode.  5 GND Module Ground.  5 S	22	Rx2+	Receiver Non-Inverted Data Output. LAN2.	
25 Rx4+ Receiver Non-Inverted Data Output. LAN4.  26 GND Module Ground.  27 MosPrsL The module is inserted into the indicate pin and grounded within the module.  28 IntL Interrupt.  29 VccTx +3.3V Transmitter Power Supply.  30 Vcc1 +3.3V Power Supply.  31 LPMode Low-Power Mode.  3 Signal Supply:  32 GND Module Ground.  33 Tx3+ Transmitter Non-Inverted Data Input. LAN3.  34 Tx3- Transmitter Inverted Data Input. LAN3.	23	GND	Module Ground.	5
GND Module Ground. 5  The module is inserted into the indicate pin and grounded within the module. 3  IntL Interrupt. 4  VccTx +3.3V Transmitter Power Supply. 5  LPMode Low-Power Mode. 5  GND Module Ground. 5  Transmitter Non-Inverted Data Input. LAN3. 5  Transmitter Inverted Data Input. LAN3.	24	Rx4-	Receiver Inverted Data Output. LAN4.	
MosPrsL The module is inserted into the indicate pin and grounded within the module.  IntL Interrupt. 4  VccTx +3.3V Transmitter Power Supply.  LPMode Low-Power Mode. 5  GND Module Ground. 5  Transmitter Non-Inverted Data Input. LAN3.  Transmitter Inverted Data Input. LAN3.	25	Rx4+	Receiver Non-Inverted Data Output. LAN4.	
IntL Interrupt. 4  29 VccTx +3.3V Transmitter Power Supply.  30 Vcc1 +3.3V Power Supply.  31 LPMode Low-Power Mode. 5  32 GND Module Ground. 5  33 Tx3+ Transmitter Non-Inverted Data Input. LAN3.  34 Tx3- Transmitter Inverted Data Input. LAN3.	26	GND	Module Ground.	5
29       VccTx       +3.3V Transmitter Power Supply.         30       Vcc1       +3.3V Power Supply.         31       LPMode       Low-Power Mode.       5         32       GND       Module Ground.       5         33       Tx3+       Transmitter Non-Inverted Data Input. LAN3.         34       Tx3-       Transmitter Inverted Data Input. LAN3.	27	MosPrsL	The module is inserted into the indicate pin and grounded within the module.	3
30         Vcc1         +3.3V Power Supply.           31         LPMode         Low-Power Mode.         5           32         GND         Module Ground.         5           33         Tx3+         Transmitter Non-Inverted Data Input. LAN3.         5           34         Tx3-         Transmitter Inverted Data Input. LAN3.	28	IntL	Interrupt.	4
31         LPMode         Low-Power Mode.         5           32         GND         Module Ground.         5           33         Tx3+         Transmitter Non-Inverted Data Input. LAN3.           34         Tx3-         Transmitter Inverted Data Input. LAN3.	29	VccTx	+3.3V Transmitter Power Supply.	
32 GND Module Ground. 5  33 Tx3+ Transmitter Non-Inverted Data Input. LAN3.  34 Tx3- Transmitter Inverted Data Input. LAN3.	30	Vcc1	+3.3V Power Supply.	
33 Tx3+ Transmitter Non-Inverted Data Input. LAN3.  34 Tx3- Transmitter Inverted Data Input. LAN3.	31	LPMode	Low-Power Mode.	5
34 Tx3- Transmitter Inverted Data Input. LAN3.	32	GND	Module Ground.	5
Transmitter inverted but input. EANS.	33	Tx3+	Transmitter Non-Inverted Data Input. LAN3.	
35 GND Module Ground. 5	34	Tx3-	Transmitter Inverted Data Input. LAN3.	
	35	GND	Module Ground.	5

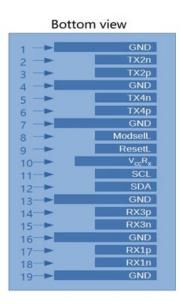
36	Tx1+	Transmitter Non-Inverted Data Input. LAN1.	
37	Tx1-	Transmitter Inverted Data Input. LAN1.	
38	GND	Module Ground.	5

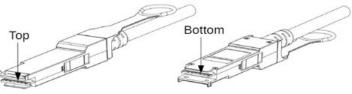
#### Notes:

- 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 the Vcc with a  $4.7k\Omega$  to  $10k\Omega$  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. The circuit ground is internally isolated from the chassis ground.

### **QSFP End Pin Layout**







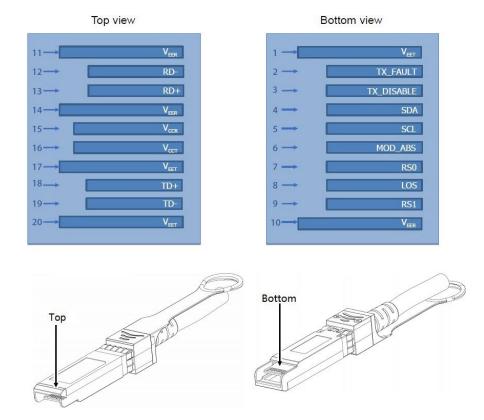
## **SFP+ Pin Descriptions**

Pin	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground (Common with Receiver Ground).	1
2	Tx_Fault	Transmitter Fault.	
3	Tx_Disable	Transmitter Disable. Laser output disabled on "high" or "open."	2
4	SDA	Data Line for Serial ID.	3
5	SCL	Clock Line for Serial ID.	
6	MOD_ABS	Module Absent. Grounded within the module.	3
7	RS0	No Connection Required.	
8	LOS	Loss of Signal Indication. "Logic 0" indicates normal operation.	4
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	VccT	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

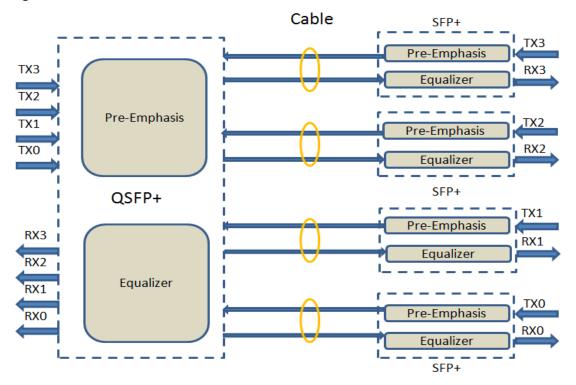
## Notes:

- 1. The circuit ground is isolated from the chassis ground.
- 2. Disabled: Tdis>2V or Open, Enabled: Tdis<0.8V.
- 3. Should be pulled up with  $4.7k\Omega$  to  $10k\Omega$  on the host board to a voltage between 2V and 3.6V.
- 4. LOS is an open collector output.

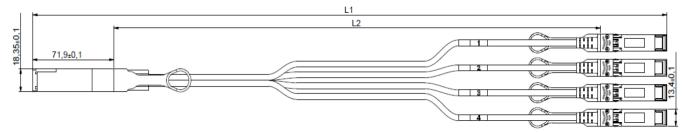
## **SFP End Pin Layout**



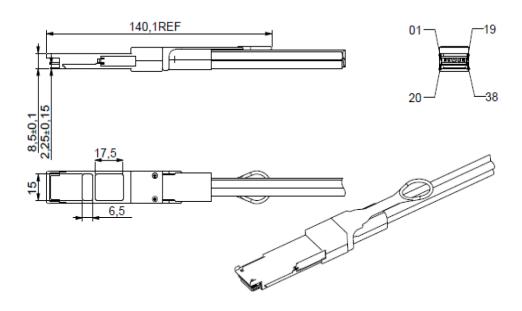
## **Block Diagram**



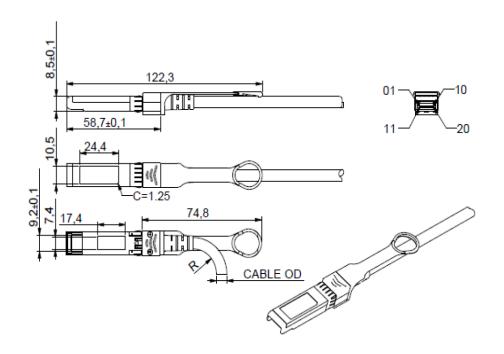
# **Mechanical Specifications**



# **QSFP** End



## SFP End



#### **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.















#### **Contact Information**

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