

## DATA SHEET

### MODULETEK : DAC-QSFP10-4SFP10-P-x-xxAWG-aa.aaM-C0C0B

QSFP+ to 4 SFP+ Passive Copper Cable Assembly

#### DAC-QSFP10-4SFP10-P-x-xxAWG-aa.aaM-C0C0B Overview

ModuleTek's QSFP+ to 4SFP+ passive cable is the preferred solution for 40G speed short-range data transmission with low power consumption, good stability and high cost performance. The QSFP+ to 4SFP+ passive cable is used for data transfer between a 40G QSFP+ port and four 10G SFP+ ports, providing a low-cost solution for data transfer services within and between data center racks. This product complies with the SFF-8436, QSFP+ MSA and IEEE 802.3ae standards.

#### Product Features

- QSFP+ End: Compliant with QSFP+ MSA specifications
- SFP+ End: Compliant with SFP+ MSA specifications
- 4 independent duplex channels operating at 10Gbps, also support for 2.5Gbps, 5Gbps data rates
- AC coupled inputs and outputs
- 100 Ohm differential impedance
- All-metal housing for superior EMI performance
- Single power supply 3.3V, low power consumption
- RoHS Compliant
- Operating temperature range: 0°C to 70°C

#### Applications

- 10Gigabit Ethernet
- Serial Data Transmission
- Storage
- Fiber Channel
- Switch, Router

## Ordering Information

Part Number	Description	Gauge	Length
DAC-QSFP10-4SFP10-P-E-30AWG-aa.aaM-C0C0B	QSFP+ to 4 SFP+ Direct Attach Copper Cable Assembly,without MCU aa.aa<3	30AWG	<3m
DAC-QSFP10-4SFP10-P-E-28AWG-aa.aaM-C0C0B	QSFP+ to 4 SFP+ Direct Attach Copper Cable Assembly,without MCU 3<aa.aa≤5	28AWG	3m<length≤5m
DAC-QSFP10-4SFP10-P-M-30AWG-aa.aaM-C0C0B	QSFP+ to 4 SFP+ Direct Attach Copper Cable Assembly,with MCU aa.aa≤3	30AWG	≤3m
DAC-QSFP10-4SFP10-P-M-28AWG-aa.aaM-C0C0B	QSFP+ to 4 SFP+ Direct Attach Copper Cable Assembly,with MCU 3<aa.aa≤5	28AWG	3m<length≤5m
<p><b>Note:</b></p> <ol style="list-style-type: none"> <li>1. "P" indicates passive cable</li> <li>2. "E" indicates no built-in MCU , "M" indicates built-in MCU</li> <li>3. "aa.aa" indicates the cable length in meters.</li> <li>4. The wire diameter of the products in the above list is the default value under different lengths. We can also provide other wire products to customers with special requirements.</li> </ol>			
<p><b>For More Information:</b>            ModuleTek Limited            Web: <a href="http://www.moduletek.com">www.moduletek.com</a>            Email: <a href="mailto:sales@moduletek.com">sales@moduletek.com</a></p>			

## General Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
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	

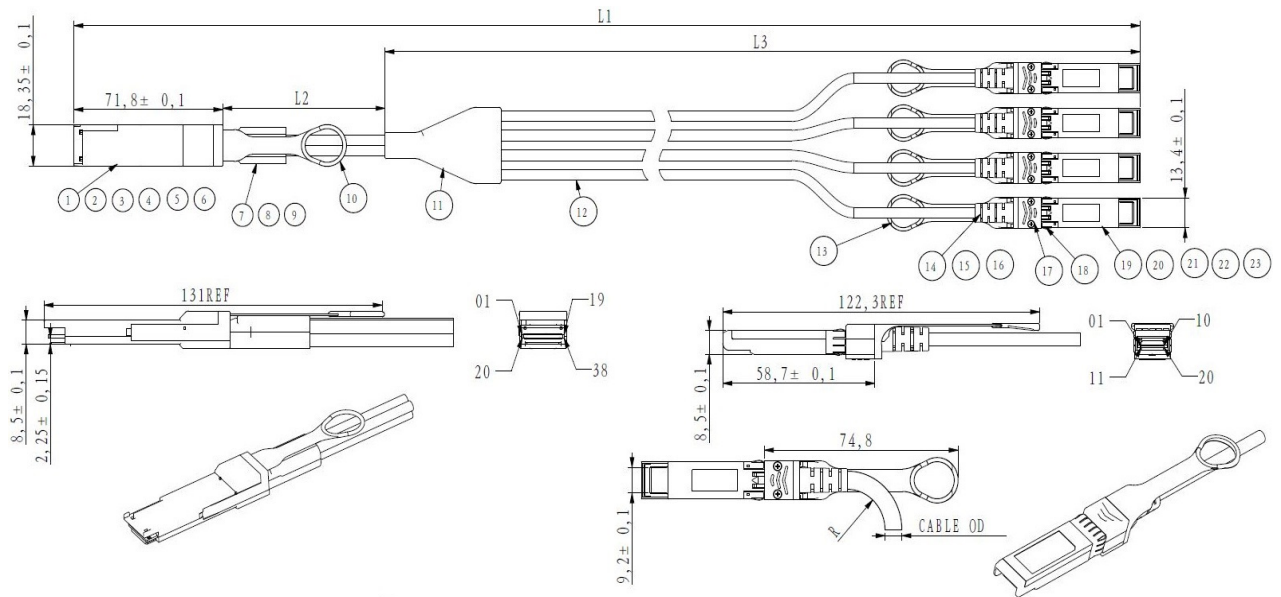
**Notes:**

1. Case temperature
2. Ambient temperature

## Cable Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Wire Gauge		30AWG		28AWG	AWG	
Cable Impedance	Z	90	100	110	Ohm	

## Dimensions



ALL DIMENSIONS ARE  $\pm 0.2$ mm UNLESS OTHERWISE SPECIFIED  
UNIT: mm

## Cable dimension

serial number	Standard Wire Gauge AWG	Cable diameter OD (mm)	Minimum bending radius R (mm)
1	30	4.2	25
2	28	4.7	26

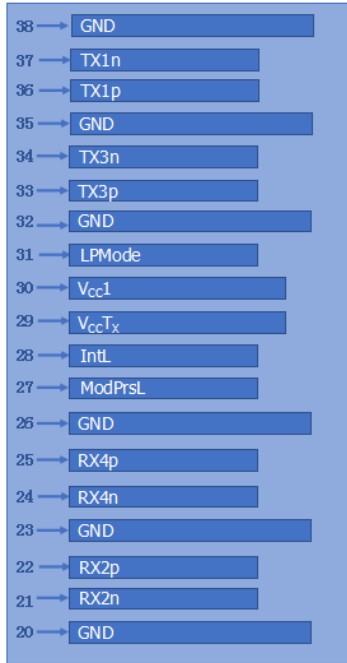
## Nominal length

Serial number	Module nominal length L1 (cm)	Module nominal length L3(cm)
1	100	70
2	200	100
3	300	200
4	400	200
5	500	200

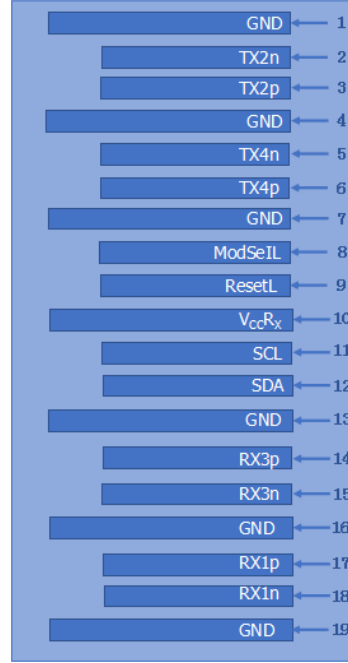
## Product Structure

Serial number	Name	Description	Amount
1	Bottom Shell for QSFP	Zn Alloy , Plated Ni Over Cu	1
2	Top Shell for QSFP	Zn Alloy , Plated Ni Over Cu	1
3	PCB Assembly for QSFP	QSFP PCB ,38P,Au 30u"Min	1
4	Spring for QSFP	Handed Rotation,SWPB	2
5	Pull Rod for QSFP	Zn Alloy, Plated Ni Over Cu	1
6	Screw for QSFP	Mild Steel	4
7	Plastic Boot for QSFP	PC AND ABS ,Black	1
8	Copper Ring for QSFP	Copper, Plated Ni	1
9	Aluminum Ring for QSFP	Aluminium Alloy	1
10	Pull TAB for QSFP	PA66,Blue 300C	1
11	Plastic Splitter	PC AND ABS ,Black	1
12	Raw cable	2Pairs,Black,Roths2.0	4
13	Pull TAB for SFP	PA66 ,Blue 300C	4
14	Plastic Boot for SFP	PVC, Black	4
15	Copper Ring for SFP	Copper, Plated Ni	4
16	Aluminum Ring for SFP	Aluminium Alloy	4
17	Screw for SFP	Mild Steel	8
18	Grounding Springs	SUS303	4
19	Bottom Shell for SFP	Zn Alloy , Plated Ni Over Cu	4
20	Top Shell for SFP	Zn Alloy , Plated Ni Over Cu	4
21	PCB Assembly for SFP	SFP PCB ,38P,Au 30u"Min	4
22	Spring for SFP	Handed Rotation,SWPB	8
23	Pull Rod for SFP	SUS316	8

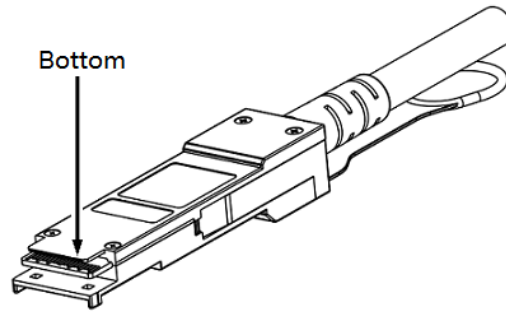
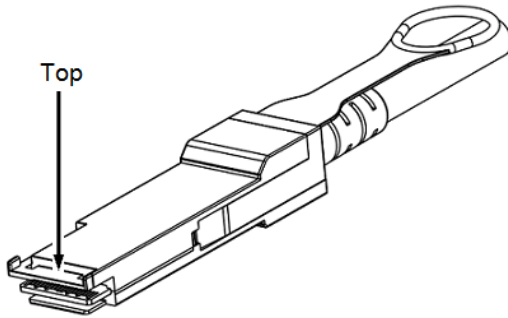
## Electrical Pad Layout (QSFP+ END)



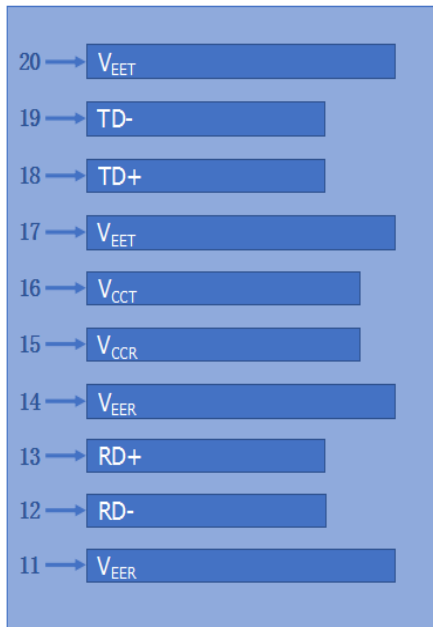
Top of Board



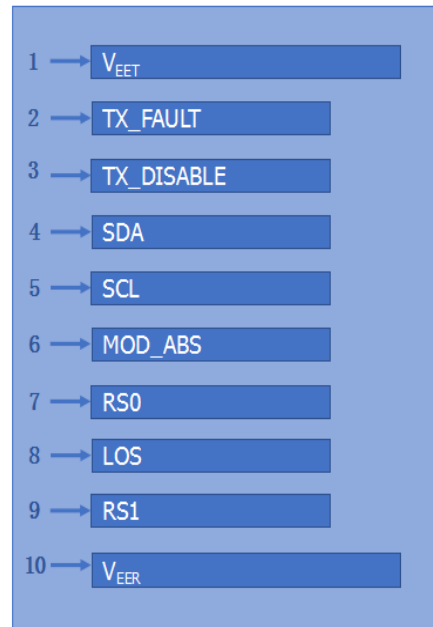
Bottom of Board



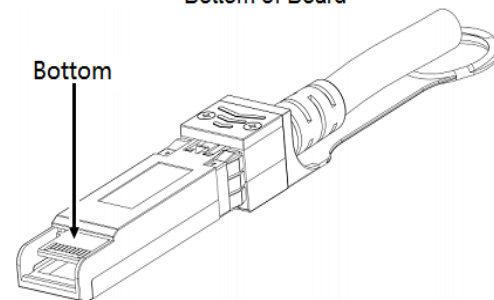
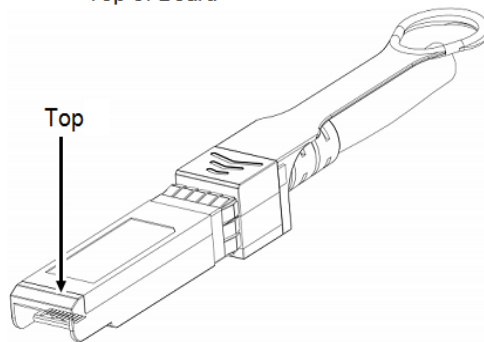
## Electrical Pad Layout (SFP+ END)



Top of Board



Bottom of Board



## Pin Assignment (QSFP+ END)

PIN #	Symbol	Description	Remarks
1	GND	Ground	5
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	5
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	5
8	ModSelL	Module Select	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	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	5
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	5
20	GND	Ground	5
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	5
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	5
27	ModPrsL	Module Present	3
28	IntL	Interrupt	4
29	V <sub>CC</sub> TX	+3.3V Power Supply transmitter	
30	V <sub>CC</sub> 1	+3.3V Power Supply	
31	LPMODE	Low Power Mode	5
32	GND	Ground	5
33	Tx3p	Transmitter Non-Inverted Data Input	

34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground	5
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
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 4.7kΩ-10kΩ 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.



## Pin Assignment (SFP+ END)

PIN #	Symbol	Description	Remarks
1	V <sub>EET</sub>	Transmitter ground (common with receiver ground)	1
2	TX_FAULT	Transmitter Fault.	
3	TX_DISABLE	Transmitter Disable. Laser output disabled on high or open	
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	V <sub>EER</sub>	Receiver ground (common with transmitter ground)	1
11	V <sub>EER</sub>	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	V <sub>EER</sub>	Receiver ground (common with transmitter ground)	1
15	V <sub>CCR</sub>	Receiver power supply	
16	V <sub>CCT</sub>	Transmitter power supply	
17	V <sub>EET</sub>	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	V <sub>EET</sub>	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

## References

1. Enhanced 8.5 and 10 Gigabit Small Form Factor Pluggable Module “SFP+” - SFF-8431
2. IEEE standard 802.3ae. IEEE Standard Department, 2008.
3. QSFP+ 10Gbps 4X PLUGGABLE TRANSCEIVER - SFF-8436