

## DATA SHEET

### MODULETEK-QSFP10-PLR4-C10

40Gb/s QSFP+ PSM4 10km Optical Transceiver

#### QSFP10-PLR4-C10 Overview

ModuleTek's QSFP10-PLR4-C10 QSFP+ 40Gbps PSM4 optical transceivers are based on Ethernet IEEE 802.3ba standard and SFF-8436 standard. The QSFP+ full-duplex optical module offers 4 independent transmit and receive channels, each capable of 10.3125Gbps operation for an aggregate data rate of 41.25 Gbps 10km of single mode fiber. An optical fiber ribbon cable with an MPO/MTP connector can be plugged into the QSFP module receptacle.

#### Product Features

- Compliant with QSFP+ MSA (SFF-8436)
- Up to 11.2Gbps data rate per channel
- MPO optical connector
- Built-in digital diagnostic functions
- Up to 10km transmission on SMF
- Maximum 2W operation power
- RoHS-6 Compliant
- Operating temperature range: 0°C to 70°C

#### Applications

- 40G Ethernet
- Infiniband interconnects

## Ordering Information

Part Number	Description	Color on Clasp
QSFP10-PLR4-C10	40G QSFP+ PSM4 1310nm MPO Connectors, up to 10km on SMF, with DOM function	Blue
<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>		

## General Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Bit Error Rate	BER			$10^{-12}$		
Operating Temperature	T <sub>OP</sub>	0		70	°C	1
Storage Temperature	T <sub>STO</sub>	-40		85	°C	2
Supply Current	I <sub>S</sub>			600	mA	
Input Voltage	V <sub>CC</sub>	3.14	3.3	3.46	V	
Maximum Voltage	V <sub>MAX</sub>	0		3.8	V	3
Power Consumption	V <sub>CC</sub>			2	W	

### Notes:

1. Case temperature
2. Ambient temperature
3. For electrical power interface

## Link Distances

Parameter	Fiber Type	Distance Range (km)
40 Gb/s	9/125um SMF	2

## Optical-Characteristics-Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Average Launch Power(Each Lane)	$P_{TX}$	-8.2		0.5	dBm	
Optical Center Wavelength	$\lambda_C$	1260		1360	nm	
Optical Modulation Amplitude(Each Lane)	OMA	-5.2		2.0	dB	
Extinction Ratio	ER	3.5			dB	
Side Mode Suppression Ratio	SMSR	30			dB	
Relative Intensity Noise	RIN			-128	dB/Hz	
Optical Return Loss Tolerance	TOL			12	dB	
Launch Power of OFF Transmitter(each lane)	$P_{OUT\_OFF}$			-30	dBm	

## Optical-Characteristics-Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Optical Center Wavelength	$\lambda_C$	1260		1360	nm	
Optical Input Power(each lane)	$P_{RX}$			0.5	dBm	1
Damage Threshold	P	3			dBm	
Receiver Sensitivity (OMA)(each Lane)	$R_{X\_SEN1}$			-12.6	dBm	
LOS Assert	$LOS_A$	-30			dBm	
LOS De-Assert	$LOS_D$			-15	dBm	
LOS Hysteresis	$LOS_H$	0.5		6	dB	

### Notes:

1. Average, Informative

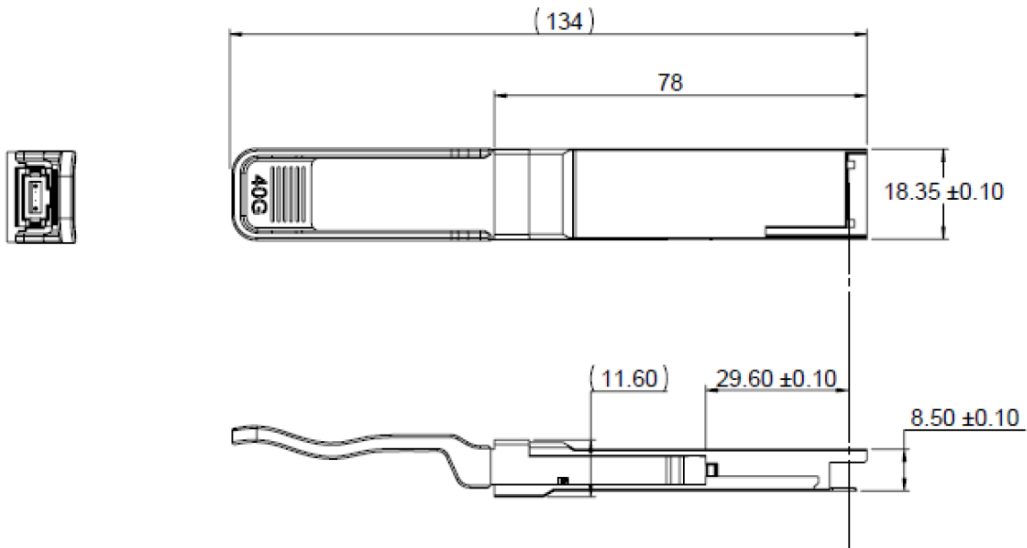
## Electrical - Characteristics - Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Input differential impedance	$R_{IN}$	90	100	110	$\Omega$	
Differential data input swing	$V_{IN\_PP}$	200		800	mV	
TP1/TP1a Interface	Compliant to IEEE802.3ba XLPP1					

## Electrical - Characteristics - Receiver

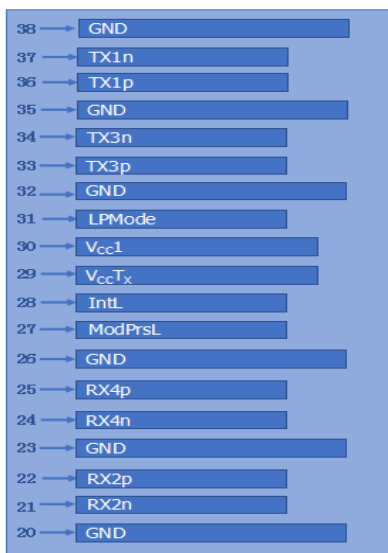
Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Output differential impedance	$R_{OUT}$	90	100	110	$\Omega$	
Differential data output swing	$V_{OUT\_PP}$	400	600	850	mV	
TP4 Interface	Compliant to IEEE802.3ba XLPP1					

## Dimensions

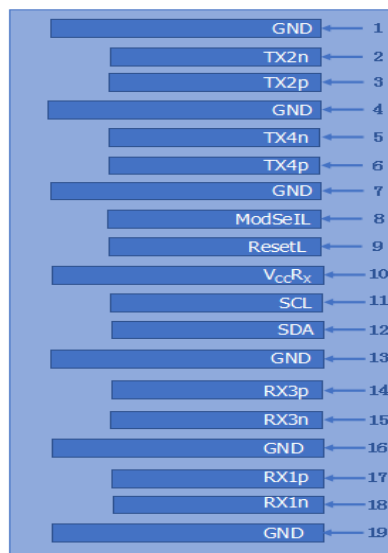


ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED  
UNIT: mm

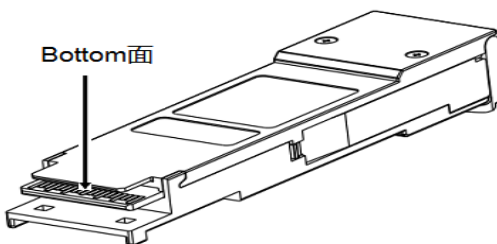
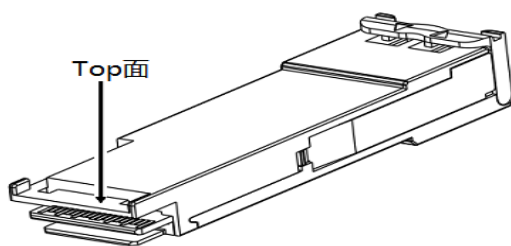
## Electrical Pad Layout



Top of Board



Bottom of Board



## Pin Assignment

PIN #	Symbol	Description	Remarks
1	GND	Ground	
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	V <sub>cc</sub> R <sub>X</sub>	+3.3V Power Supply Receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	
20	GND	Ground	
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	V <sub>cc</sub> T <sub>X</sub>	+3.3V Power Supply transmitter	
30	V <sub>cc</sub> 1	+3.3V Power Supply	
31	LPMMode	Low Power Mode	
32	GND	Ground	
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	

35	GND	Ground	
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	

## References

1. IEEE standard 802.3ba. IEEE Standard Department, 2010.
2. QSFP+ 10Gbs 4X PLUGGABLE TRANSCEIVER –SFF-8436