



深圳市源拓光电技术有限公司
产品规格书

WTQSFP+ -SR4

D-S-200824004

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WTQSFP+ -SR4

40Gb/s QSFP+ SR4 Transceiver Module

1. Feature

- RoHS-6 compliant
- High speed / high density: support up to 4X10 Gb/s bi-directional operation
- Compliant to industrial standard SFF-8436 QSFP+ standard
- Low power consumption : less than 1.5W
- Distance up to 100 meters by OM3 fiber and 150M by OM4 fibre
- Reliable VCSEL and PIN photonic devices
- I2C standard management interface
- Excellent high speed signal integrity

2. Description

The WTQSFP+-SR4 is a 40Gbps, hot pluggable fiber transceivers for Infiniband QDR and 40G Ethernet data transmission. It provides full duplex, parallel interconnects: 4 transmitting / 4 receiving data lanes and each lane at data rate up to 10.3125Gbps.

Distance support could be up to 100 meters using OM3 fiber and 150 meters using OM4 fiber. Each lane could also be configured as independent 10G Ethernet transmission. Therefore facilitate higher port density at 10G Ethernet.

WTQSFP+-SR4 is designed to meet the requirements of high speed, high density and low power consumption for applications in today's data centers.

3. Application

- 40G Ethernet (40GBASE-SR4)
- Proprietary high speed, high density data transmission.
- Switch and router high speed backplane interconnect
- High performance computing, server and data storage.

4. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Units	Notes
Storage Temperature	TS	-40		85	°C	
Storage Ambient Humidity	HA	0		85	%	
+3.3V Power Supply	VCC3	0		3.6	V	

5. General Operating Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Notes
Operating Case Temperature	TC	0		70	°C	[1]
Ambient Humidity	HA	5		85	%	[2]
+3.3V Supply Voltage	VCC3	3.135		3.465	V	
+3.3V Supply Current	IVCC3			400	mA	
Total Power Dissipation	PD			1.5	W	
Bit rate	B		10.3125		Gb/s	[3]
Input Control Voltage- High	ViH	2.0		Vcc+0.3	V	[4]
Input Control Voltage - Low	ViL	-0.3		0.8	V	[4]
Digital Output Voltage- High	VoH	2.0		Vcc+0.3		[5]
Digital Output Voltage- Low	VoL	0		0.8		[5]
Clock Rate-I2C				400	kHz	[6]

Notes:

1. See ordering information. The position for measuring case temperature is shown as following
2. Non-condensing
3. Tested with PRBS 231-1, BER 1X10-12
4. For all control input pins: LPMode, Reset and ModSelL
5. For all status output pins: ModPrsL , IntL
6. For management interface.

6. High Speed Characteristics- Transmitter

Parameter	Symbol	Min	Typ	Max	Units	Notes
Reference Differential Input Impedance	Zd		100		Ω	
Central Wavelength		840		860	nm	
Spectral Width	σ			0.65	nm	
Differential Data Input Swing	Vin_pp	180		600	mV	
Differential Data Input Threshold			50		mV	[1]
Average Launch Power	Po	-7.6		2.4	dBm	Each lane
Peak Average Launch Power				4	dBm	
Average Launch Power at OFF				-30	dBm	Each lane
Optical Modulation Amplitude	OMA	-5.6		3	dBm	Each lane
OMA difference				4	dB	Any2lanes
Transmitter Dispersion Penalty	TDP			3.5	dB	Each lane
Extinction Ratio	ER	3			dB	
Optical Return Loss Tolerance	ORL			12	dB	

Encircled Flux	$\cong 86\%$ in 38um diameter $\cong 30\%$ in 9um diameter	
Eye Mask	Meet IEEE802.3BA Tab 86-6	[2]

Notes:

1. Input swing to trigger TX-squelch.
2. Hit ratio: 5X10⁻⁵

7. High Speed Characteristics- Receiver

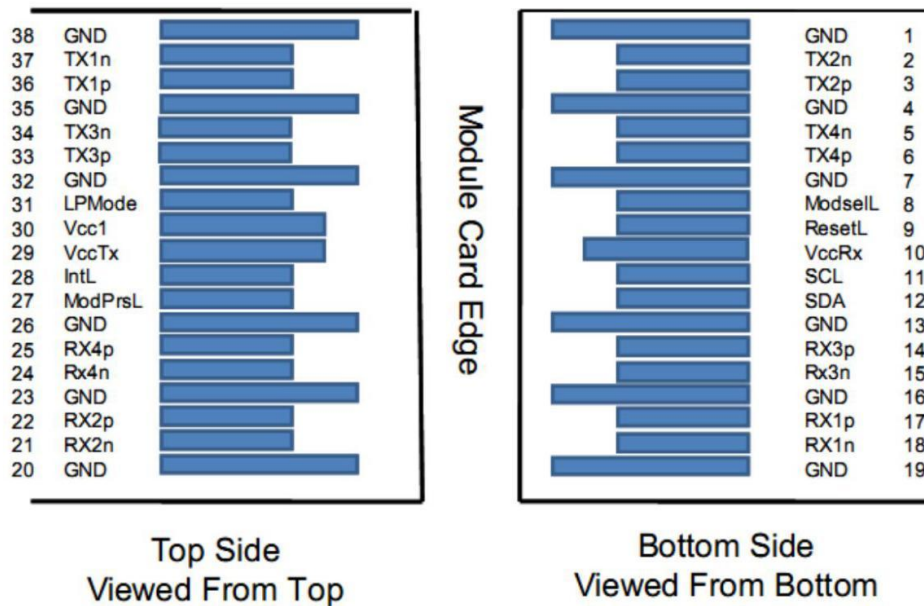
Parameter	Symbol	Min	Typ	Max	Units	Notes
Reference Differential Input Impedance	Zd		100		Ω	
Differential Output Swing		400		800	mV	[1]
Differential Output Swing When Squelched				50	mV	
Rise / Fall Time (20% ~80%)		24			ps	
Central Wavelength		840		860	nm	
Average Power at Receiver Input		-9.5		+2.4	dBm	Each lane [2]
Damage Threshold	DT			3.4	dBm	Each lane [2]
LOS De-Assert				-9.5		
LOS Assert		-27				
LOS Hysteresis		0.5				

Notes:

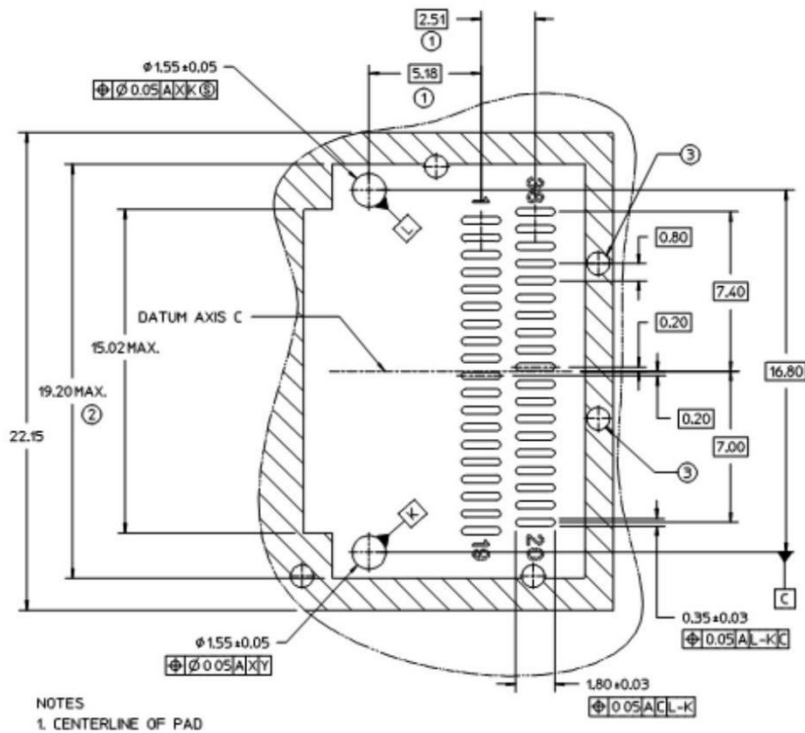
1. Receiver output swing could be changed by I2C interface.
2. Measured with reference optical input with PRBS2³¹-1 BER:1E-12 at ER:4.75 dB

8. Pin Description

QSFP Module Pad Layout (Top View)



Host PCB Layout (Top View)



8. Module Electrical Pin Function Definition

Pin	Logic	Symbol	Name/Description	Note
1		GND	Ground	[1]
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-inverted Data Input	
4		GND	Ground	[1]
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-inverted Data Input	
7		GND	Ground	[1]
8	LVTTL-I	ModSelL	Module Select	
9	LVTTL-I	ResetL	Module Reset	
10		Vcc Rx	+3.3V Power Supply Receiver	
11	LVCMO S-I/O	SCL	2-Wire Serial Interface Clock	[2]
12	LVCMO S-I/O	SDA	2-Wire Serial Interface Data	[2]
13		GND	Ground	[1]
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	[1]
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	

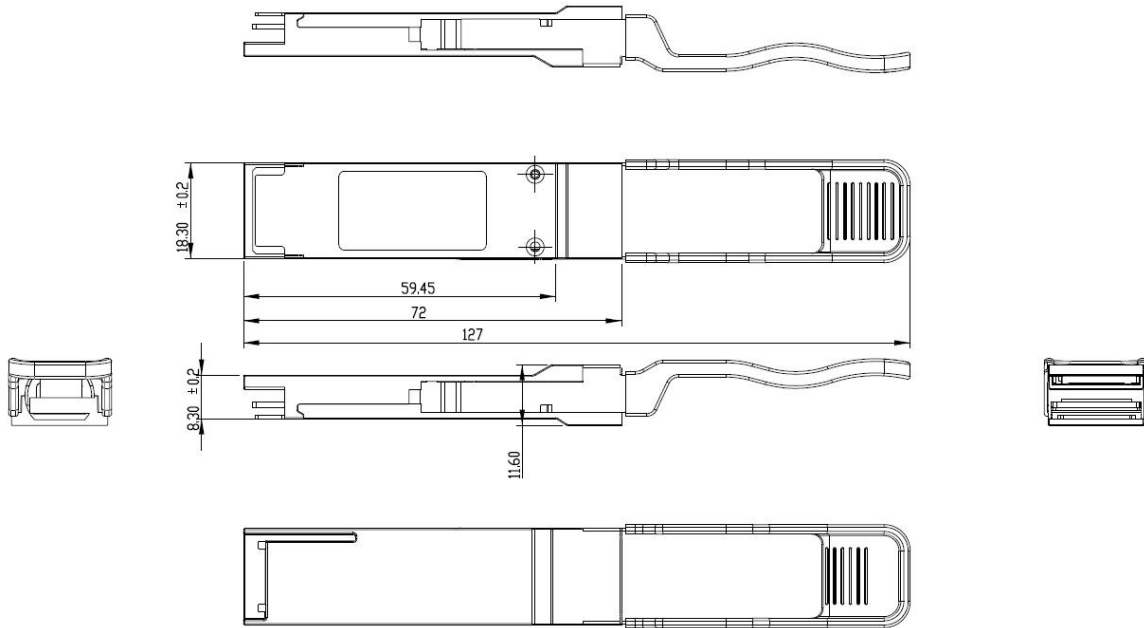


18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	[1]
20		GND	Ground	[1]
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	[1]
24	CML-O	Rx4n	Receiver Inverted Data Output	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	[1]
27	LVTTL-O	ModPrsL	Module Present	[2]
28	LVTTL-O	IntL	Interrupt	[2]
29		Vcc Tx	+3.3V Power Supply Transmitter	
30		Vcc1	+3.3V Power Supply	
31	LVTTL-I	LPMODE	Low Power Mode	
32		GND	Ground	[1]
33	CML-I	Tx3p	Transmitter Non-inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Input	
35		GND	Ground	[1]
36	CML-I	Tx1p	Transmitter Non-inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Input	
38		GND	Ground	[1]

Notes:

1. Module ground pins GND are isolated from the module case and chassis ground within the module.
2. Shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.45V on the host board.

9. Mechanical Specification



10. Regulatory Compliance

Feature	Test Method	Reference
Electrostatic Discharge (ESD) to the Electrical Pins	Human Body Model (HBM)	MIL-STD-883E Method 3015.7 EIA-JESD22-A114
	Machine Model (MM)	EIA-JESD22-A115
Electrostatic Discharge (ESD) to the Simplex Receptacle	Contact Discharge	IEC/EN 61000-4-2
	Air Discharge	IEC/EN 61000-4-2
Electromagnetic Interference (EMI)		FCC Part 15 Class B EN 55022 Class B (CISPR 22A)
Laser Eye Safety	FDA/CDRH TUV	FDA 21CFR 1040.10, 1040.11 EN 60825-1 EN 60825-2