

40Gbps QSFP+ SR4 MMF Transceiver

Product Features:

- Supports 41.25Gb/s aggregate bit rate
- Multirate capability: 1.06Gb/s to 10.5Gb/s per channel
- Maximum link length of 100m links on OM3 multimode fiber or 150m links on OM4 multimode fiber
- High Reliability 850nm VCSEL technology
- Unretimed XLPPI electrical interface
- Single MPO-12 receptacle
- Digital diagnostic SFF-8436 compliant
- Case operating temperature range: 0°C to +70°C
- Maximum Power dissipation < 1.5 W
- RoHS Compliant



Applications:

- 40GBASE-SR4 Ethernet
- Infiniband QDR interconnects
- Breakout to 10GBASE-SR Ethernet

Standards:

- Compliant to IEEE 802.3ba
- Compliant to SFF-8436
- RoHS Compliant

1. General Description

The QSFP-40G-SR4 is a QSFP+ Optical transceiver for 4 x10 Gb/s optical links. It operates at 10.3125Gb/s up to 100m over OM3 multimode optical fiber and 150m over OM4 fiber. The optical transmitter portion of the transceiver incorporates a 4 channels VCSEL array, a 4 channels input buffer and laser driver, diagnostic monitors, control and bias blocks. For module control, the control interface incorporates a Two Wire Serial interface of clock and data signals. Diagnostic monitors for VCSEL bias, module temperature, TX power, RX power and supply voltage are implemented and results are available through the Two Wire Serial interface. Alarm and warning thresholds are established for the monitored attributes. Flags are set and interrupts generated when the attributes are outside the thresholds. All flags are latched and will remain set even if the condition initiating the latch clears and operation resumes. The optical output will squelch for loss of input signal unless squelch is disabled.

The optical receiver portion of the transceiver incorporates a 4 channels PIN photodiode array, a 4 channels TIA array, a 4 channel output buffer, diagnostic monitors. Alarm and warning thresholds are established for the monitored attributes. Flags are set and interrupts generated when the attributes are outside the thresholds. All flags are latched and will remain set even if the condition initiating the flag clears and operation resumes. All interrupts can be masked and flags are reset upon reading the appropriate flag register. The electrical output will squelch for loss of input signal (unless squelch is disabled) and channel de-activation through Two Wire Serial interface.

2. Absolute Maximum Ratings

It has to be noted that the operation in excess of any individual absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40		85	°C	
Relative Humidity	RH	5		95	%	
Power Supply Voltage	VCC	-0.3		4	V	
Signal Input Voltage		Vcc-0.3		Vcc+0.3	V	

3. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	Tcase	0		70	°C	Without air flow
Power Supply Voltage	VCC	3.13	3.3	3.47	V	
Power Supply Current	ICC			450	mA	
Data Rate	BR		10.3125		Gbps	Each channel

Transmission Distance	TD			100	m	OM3	MMF
				150	m	OM4	MMF

4. Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Transmitter						
Center Wavelength	λ_{out}	840		860	nm	
Average Launch Power each lane		-7.6		2.4	dBm	
Spectral Width (RMS)	σ			0.65	nm	
Optical Extinction Ratio	ER	3			dB	
Transmitter and Dispersion Penalty each lane	TDP			3.5	dB	
Optical Return Loss Tolerance	ORL			12	dB	
Transmitter eye mask definition{X1, X2, X3, Y1, Y2, Y3}	0.23, 0.34, 0.43, 0.27, 0.35, 0.4					
Receiver						
Receiver Wavelength	λ_{in}	840		860	nm	
Receiver sensitivity in OMA	SOMA			-11.5	dBm	1
LOS Assert	LOSA	-30			dBm	
LOS De-Assert	LOSD			-12	dBm	
LOS Hysteresis		0.5			dB	
Input Saturation Power (Overload)	Psat	2.4			dBm	
Receiver Reflectance	Rr			-12	dB	

Notes:

1. Measured with a PRBS 231-1 test pattern, @10.3125Gb/s, BER<1E-12 .

5. Electrical Characteristics

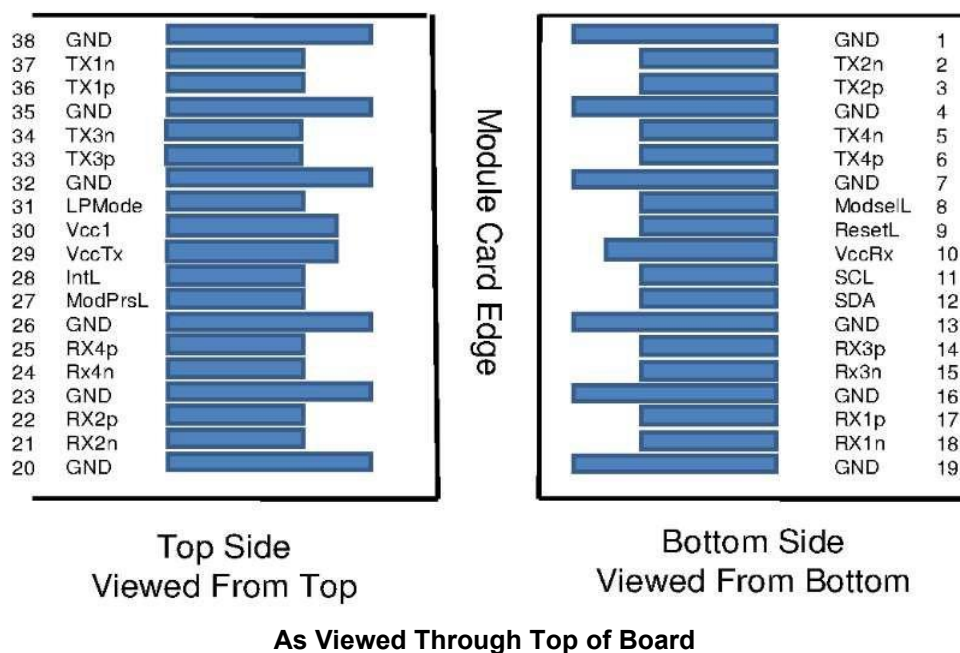
Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Icc			450	mA	
Transmitter						
Input differential impedance	Rin		100		Ω	
Differential data input swing	Vin,pp	600		1000	mV	
Single ended input voltage tolerance	VinT	-0.3		4.0	V	
Receiver						

Differential data output swing	Vout,pp	300		850	mV	
Single-ended output voltage		-0.3		4.0	V	

6. Digital Diagnostic Monitoring Information

Parameter	Accuracy	Calibration	Note
Temperature	±3°C	Internal	0~70°C
Voltage	±3%	Internal	3.1~3.5V
Bias Current	±10%	Internal	Specified by normal value
TX Power	±2dB	Internal	-7.6~2.4dBm
RX Power	±2dB	Internal	-18~2.4dBm

7. Pin Assignment



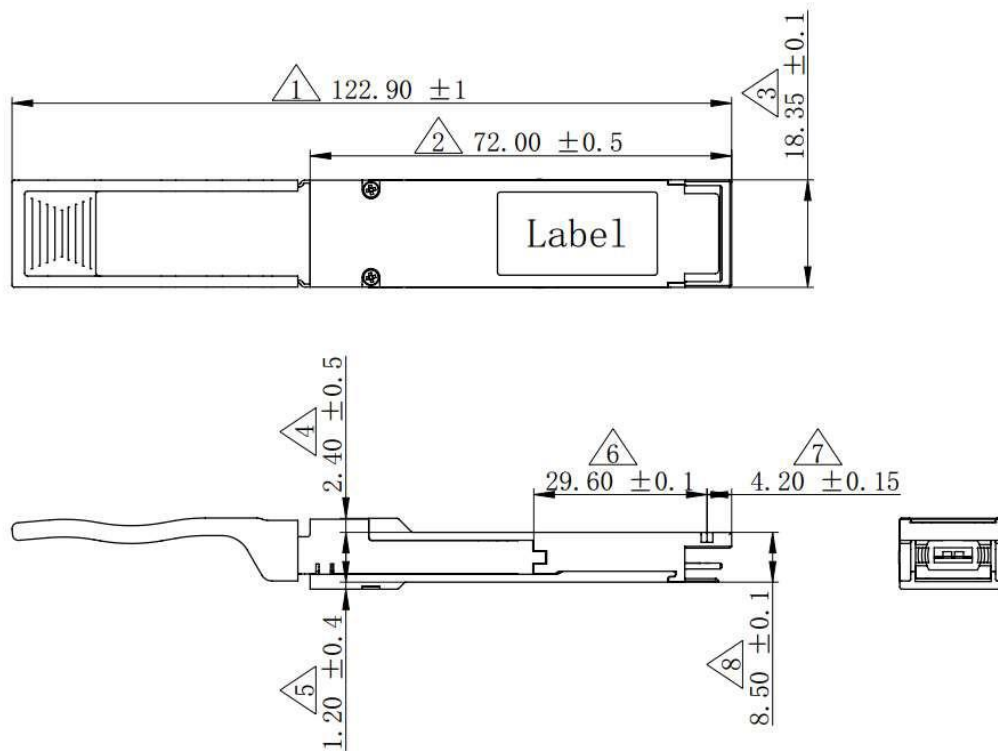
PIN	Symbol	Name/Description	NOTE
1	GND	Transmitter Ground (Common with Receiver Ground)	
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data output	
4	GND	Transmitter Ground (Common with Receiver Ground)	
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data output	
7	GND	Transmitter Ground (Common with Receiver Ground)	
8	ModSelL	Module Select	

9	ResetL	Module Reset	
10	VccRx	3.3V Power Supply Receiver	1
11	SCL	2-Wire serial Interface Clock	
12	SDA	2-Wire serial Interface Data	
13	GND	Transmitter Ground (Common with Receiver Ground)	
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Transmitter Ground (Common with Receiver Ground)	
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Transmitter Ground (Common with Receiver Ground)	
20	GND	Transmitter Ground (Common with Receiver Ground)	
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Transmitter Ground (Common with Receiver Ground)	
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Transmitter Ground (Common with Receiver Ground)	
27	ModPrsl	Module Present	
28	IntL	Interrupt	
29	VccTx	3.3V power supply transmitter	1
30	Vcc1	3.3V power supply	1
31	LPMODE	Low Power Mode, not connect	
32	GND	Transmitter Ground (Common with Receiver Ground)	
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Output	
35	GND	Transmitter Ground (Common with Receiver Ground)	
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Output	
38	GND	Transmitter Ground (Common with Receiver Ground)	

Note:

1. VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown below. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the QSFP28 transceiver module in any combination.

8. Package Outline



Ordering Information

Part No.	Data Rate	DDM	Wave	Fiber Type	Dist.	Temp.
QSFP-40G-SR4	40Gbps	yes	850nm	MMF	150m	0~70°C

NOTICE:

Connlight reserves the right to make changes to this product in this specification without notice, in order to improve product performance.