QSFP+ to 4*LC Full Duplex Active Optical Cable

Features

- 4 channels 850nm VCSEL and PIN
- Electrical interface compliant to SFF-8436
- Support 40GE data rate
- Hot Pluggable QSFP form factor
- Four double LC connector receptacle
- Built-in digital diagnostic functions
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage
- UL certification cables (optional)

Absolute Maximum Rating

Parameter	Symbol	Min	Type	Max	Unit
Storage Temperature	T_{STG}	-20		85	°C
Case Operating Temperature	T_{Case}	0		70	°C
Supply Voltage	V_{CC}	-0.5	3.3	3.6	V
Input Voltage	Vilvttl	-0.5		VCC+0.5	V
Damage Threshold	DT	3			dBm

Recommended Operating Conditions

Parameter	Symbol	Min	Type	Max	Unit
Case Operating Temperature	TCase	0		70	°C
Supply Voltage	VCC	3.15	3.3	3.45	V
Differential data input voltage per lane	Vdin	200		1200	mV
Signaling rate per lane	Dr	2.5	10.3125		Gbit/s
Differential Termination Resistance	Zin	80	100	120	Ω
Module power	P			1.5	W

Transmitter

Parameter	Symbol	Min	Type	Max	Unit
Center wavelength	λc	840	850	860	nm
RMS Spectral Width	Pm			0.6	nm
Average Launch Power per Lane	PAVG	-8.2	-1	+2.4	dBm
Optical Extinction Ratio	ER	3	4		dB
Total Jitter	TJTx			120	ps
Transition time (20% to 80%)	τR ,τF			100	ps
Differential data input voltage per lane	VINpp	120		1600	mV

Note: Tested with a PRBS31 test pattern, Top = 0 to 70°C, VCC = 3.15 to 3.45 V

Receiver

Parameter	Symbol	Min	Type	Max	Unit
Center wavelength	λc	840	850	860	nm
Sensitivity	Psen		-12	-10	dBm
Bit Error Ratio	BER			10-12	
Optical Return Loss Tolerance	RL			-12	dB
Differential data output voltage per lane	VOUTpp	320	450		mV
Differential Termination Resistance	Zout	80	100	120	Ω
Transition time (20% to 80%)	tR, tF			100	ps
LOS De-Assert	LOSD			-15	dBm
LOS Assert	LOSA	-30			dBm
LOS Hysteresis		0.5	2		dB

Note: Tested with a PRBS31 test pattern, T_{OP} = 0 to 70℃, VCC = 3.15 to 3.45 V
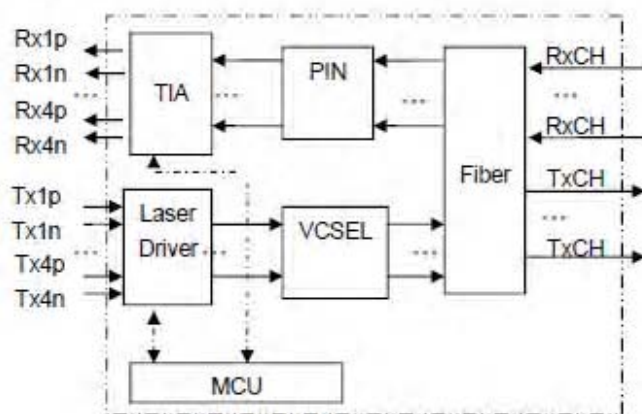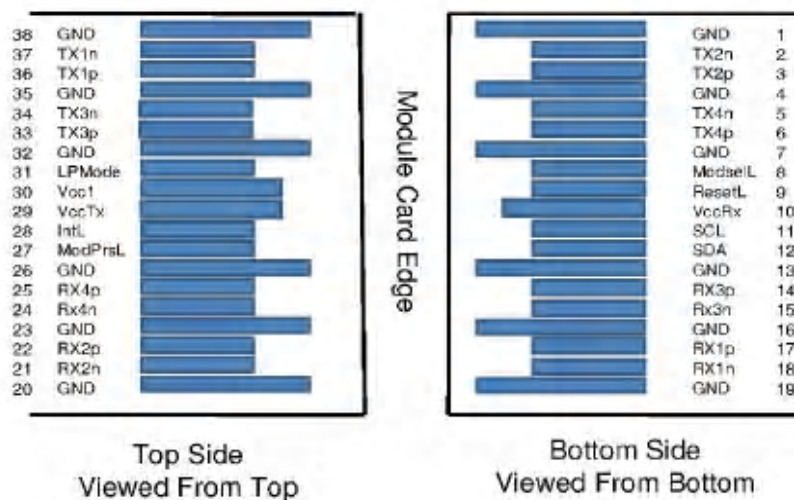
Module Block Diagram

Figure1. Module Block Diagram

Pin Descriptions

Top Side
Viewed From Top

Bottom Side
Viewed From Bottom

Pin Definition

Parameter	Symbol	Name/Description
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	Vcc Rx	+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	Vcc Tx	+3.3V Power supply transmitter
30	Vcc1	+3.3V Power supply
31	LPMode	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

QSFP Side Mechanical Design Diagram
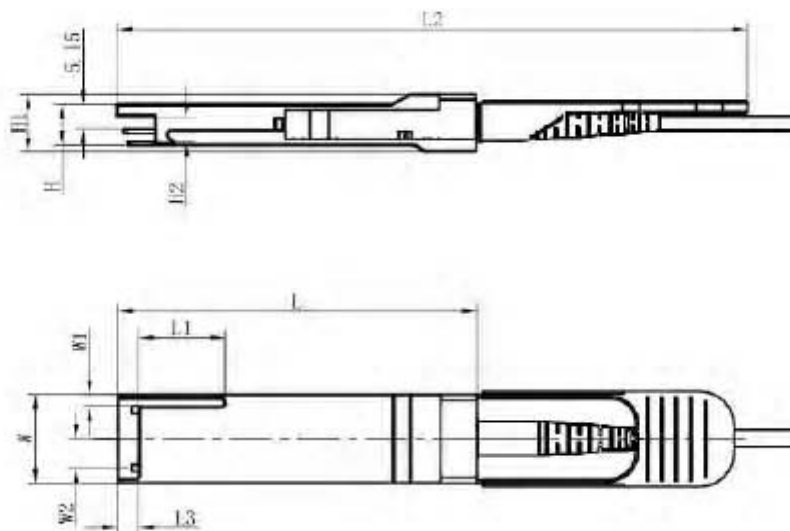
Unit: mm

	L	L1	L2	L3	W	W1	W2	H	H1	H2
Max	72.2	-	122	4.35	18.5	-	6.2	8.6	12.1	5.35
Type	-	-	-	-	-	-	-	-	-	-
Min	68.8	16.5	118	4.05	18.1	2.2	5.8	8.4	11.7	5.05

Cable Side Mechanical Design Diagram
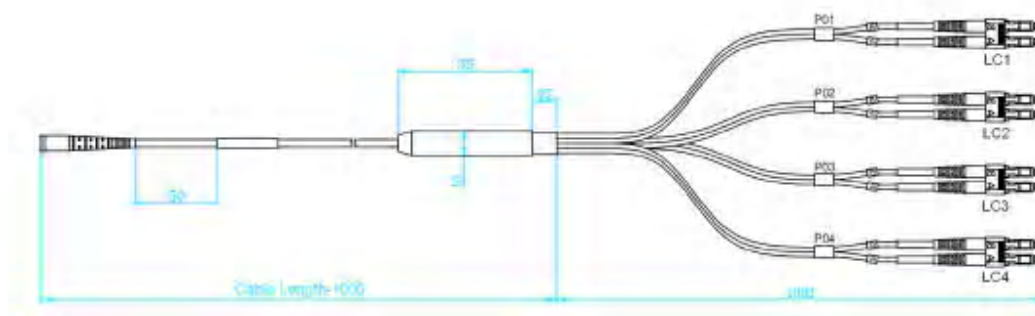
Optical Interface

Channel	Optical Interface
TX1	LC1 side A
TX2	LC2 side A
TX3	LC3 side A
TX4	LC4 side A
RX4	LC4 side B
RX3	LC3 side B
RX2	LC2 side B
RX1	LC1 side B

Ordering information

QSFP+-4*LC-AOC1M	1 meter 40G QSFP+ to 4*LC full duplex Active Optical Cable
QSFP+-4*LC-AOC50M	50 meter 40G QSFP+ to 4*LC full duplex Active Optical Cable
QSFP+-4*LC-AOC100M	100 meter 40G QSFP+ to 4*LC full duplex Active Optical Cable

Notice:

Performance figures, data and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing by T-TECH before they become applicable to any particular order or contract. In accordance with the T-TECH policy of continuous improvement specifications may change without notice. The publication of information in this data sheet does not imply freedom from patent or other protective rights of T-TECH or others. Further details are available from any T-TECH sales representative.

Contact:

E-mail:sales@t-techvip.com
http://www.t-techvip.com