

TSQL4-E11LD3C Optical Transceiver

Single-mode 200G BASE FR4 Transceiver, With Diagnostic Monitoring
Duplex QSFP56 2km Transceiver

Features

- Hot-pluggable QSFP56 form factor
- LC/UPC connecting interface compliant
- Data Rate up to 50 Gb/s PAM4 per lane
- Integrated CWDM LD and PD array
- Maximum link length of 2km via SMF fiber
- Digital diagnostics functions are available via the I2C interface
- Single 3.3V Power Supply
- Power Dissipation: < 6.5W
- International class 1 laser safety certified
- Operating Case Temperature: 0°C~+70°C
- RoHS compliant 

Applications

- 200G BASE-FR4 Ethernet
- Switch & Router Connections
- Data Centers
- Other 200G Interconnect Requirements

Production Description

This module is designed to transmit and receive optical data links 50 Gb/s bit rate per channel with PAM4 modulation format via up to 2km single mode fiber. It is hot pluggable transceiver with QSFP56 package. The module comprises high performance LD PIN DSP etc.

Absolute Maximum Rating

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions.

Parameters	Symbol	Min.	Max.	Unit
Power Supply Voltage	VCC	-0.5	+4.0	V
Storage Temperature	T _c	-40	+85	°C
Relative Humidity	RH	5	85	%

Recommended Operating Environment

Recommended Operating Environment specifies parameters for which the electrical and optical characteristics hold unless otherwise noted.

Parameter	Symbol	Min.	Typical	Max	Unit
Power Supply Voltage	VCC	3.135	3.30	3.465	V
Operating Case Temperature	T _{ca}	0		70	°C

Electrical Characteristics

The following electrical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

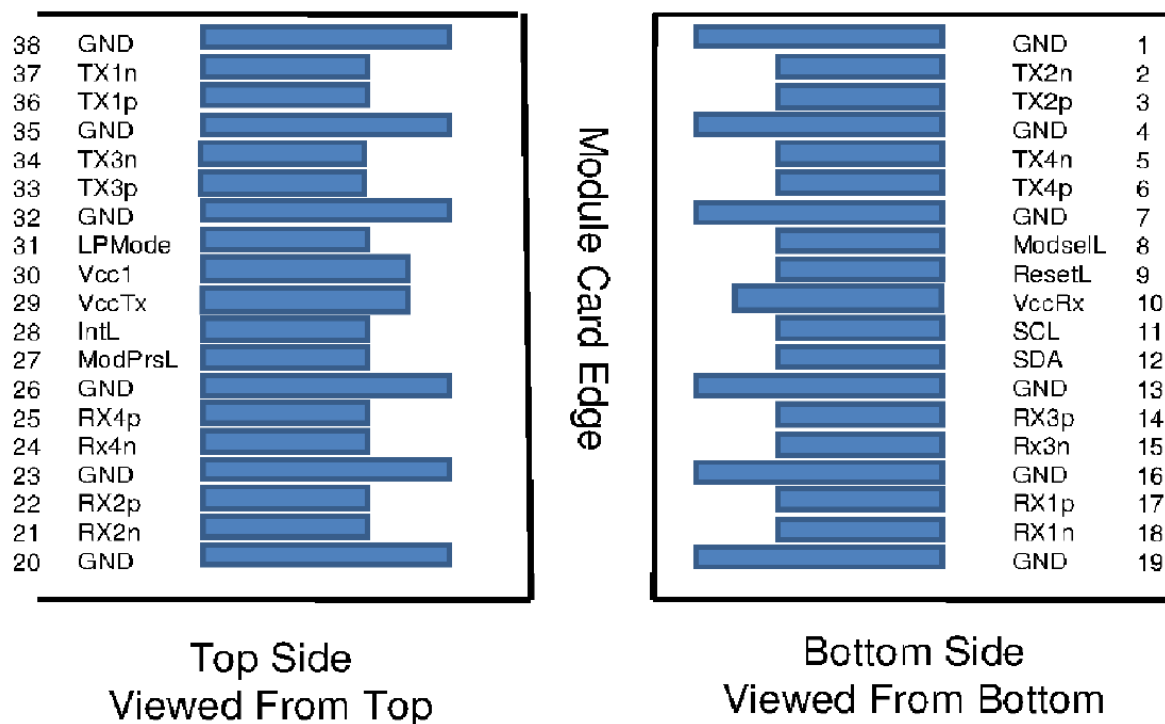
Parameter	Symbol	Min.	Typical	Max	Unit	Notes
Signaling Rate per lane		-	26.5625	-	Gbd	
Transmitter						
Differential data input voltage	ΔV _{in}	900	-	-	mVp-p	
Differential Input Impedance	Z _{in}	90	100	110	ohm	
Receiver						
Differential output voltage	ΔV _{out}			900	mVp-p	
Differential Output Impedance	Z _{out}	90	100	110	ohm	

Optical Characteristics

The following optical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter		Symbol	Min.	Typical	Max	Unit	Notes
Transmitter							
Center Wavelength	Ch0	λ_0	1264.5	1271	1277.5	nm	
	Ch1	λ_1	1284.5	1291	1297.5		
	Ch2	λ_2	1304.5	1311	1317.5		
	Ch3	λ_3	1324.5	1331	1337.5		
Side-mode suppression ratio		SMSR	30			dB	
Average Optical Power		Po	-4.2	-	4.7	dBm	
Tx OMA per lane		TxOMA	-1.2		4.5	dBm	
Extinction Ratio		ER	3.5	-	-	dBm	
Optical Modulation Amplitude		OMA	-4.5	-	3	dB	
Transmitter and Dispersion Eye Closure for PAM4 per lane		TDECQ			3.3	dB	
Optical Return Loss Tolerance		ORL	-	-	16.5	dB	
Relative Intensity Noise		RIN			-132	dB/Hz	
Receiver							
Center Wavelength	Ch0	λ_0	1264.5	1271	1277.5	nm	
	Ch1	λ_1	1284.5	1291	1297.5		
	Ch2	λ_2	1304.5	1311	1317.5		
	Ch3	λ_3	1324.5	1331	1337.5		
Damage Threshold		DT	5.7			dBm	
Average Receive power ,each lane			-8.2		4.7	dBm	
Receiver reflectance		Rfl			-26	dB	
Difference in receive power between any two lanes			-	-	4.1	dB	
Receiver sensitivity (OMAouter)				-	-6	dBm	
Stressed receiver sensitivity (OMAouter)					-3.6	dBm	

Qsfp56 Transceiver Electrical Pad Layout



Pin Definition

Pin	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	+3.3 V 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

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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	+3.3 V Power supply transmitter
30	VCC1	+3.3 V 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

Ordering Information

Part Number	Product Description
TSQL4-E11LD3C	200G QSFP56 FR4, 2Km, 0°C ~ +70°C

Important Notice

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