

TSQL4-F22JG8C Optical Transceiver

100G QSFP28 ER4 30km Transceiver, With Diagnostic Monitoring

Features

- Compliant with IEEE 802.3ba, 100GBASE-ER4
- Support rates 103.125 Gb/s
- Cooled 4x25Gb/s LAN WDM EML laser and APD ROSA
- Up to 30km reach for G.652 SMF
- Hot pluggable 38 pin electrical interface
- QSFP28 MSA compliant
- Duplex LC optical receptacle
- RoHS-6 compliant and lead-free
- Single +3.3V power supply
- Maximum power consumption 4.5W
- Case operating temperature: Commercial: 0 ~ +70 °C

Applications

- 100GBASE-ER4 Ethernet Links

Description

This product is designed for 30km optical communication applications. This module contains 4-lane optical transmitter, 4-lane optical receiver and module management block including 2 wire serial inter-face. The optical signals are multiplexed to a single-mode fiber through an industry standard LC connector.

The product is designed with form factor, optical/electrical connection and digital diagnostic interface according to the QSFP+ Multi-Source Agreement (MSA). It has been designed to meet the harshest external operating conditions including temperature, humidity and EMI interference.

Absolute Maximum Ratings

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
Supply Voltage	V _{cc}	-0.5	+3.6	V
Storage Temperature	T _c	-40	+85	°C
Relative Humidity	RH	0	85	%

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Power Supply Voltage	V _{CC}	3.13	3.3	3.47	V
Operating Case Temperature	T _{ca}	0		70	°C

Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max	Unit	Ref.
Transmitter						
Input differential impedance	Z _{in}	90	100	110	Ω	1
Differential Input Voltage Amplitude	V _{in}	900	-	-	mVp-p	2
Receiver						
Output differential impedance	Z _{out}	90	100	110	Ω	1
Differential Output Voltage Amplitude	V _{out}	-	-	900	mVp-p	3

Notes:

- [1] AC coupled.
- [2] Differential input voltage amplitude is measured between TxnP and TxnN.
- [3] Differential output voltage amplitude is measured between RxnP and RxnN.

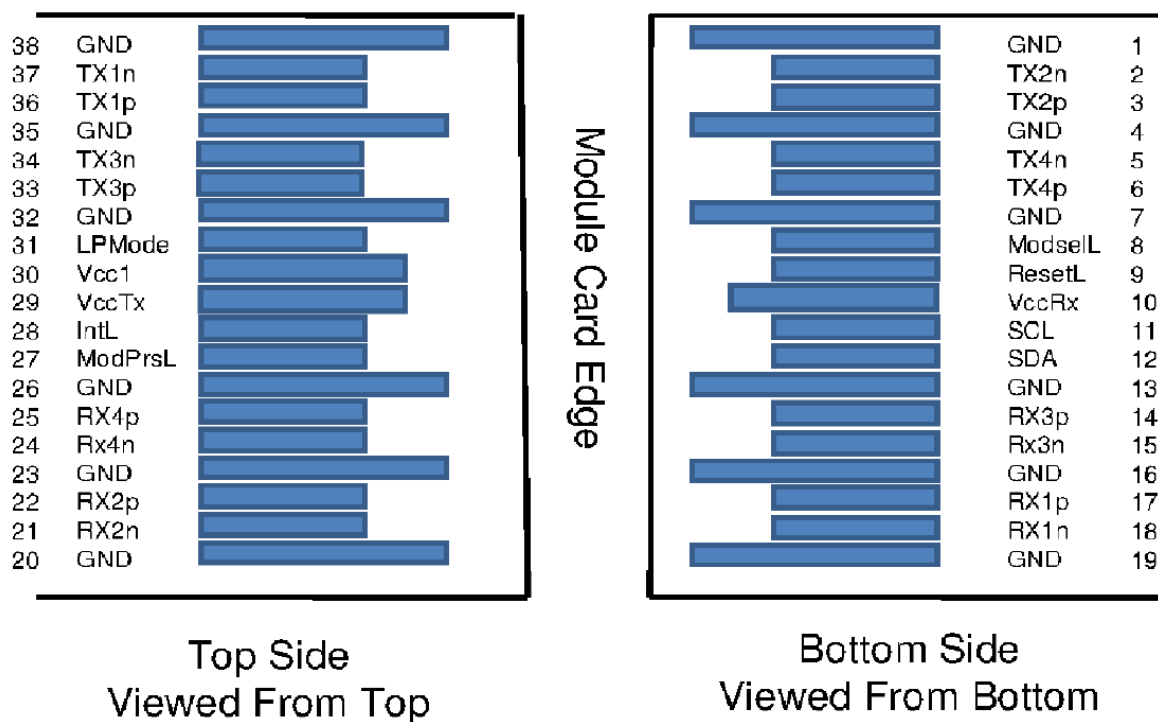
Transmitter Specifications – Optical

Parameter		Symbol	Min	Typical	Max	Unit
Center Wavelength	Ch0	λ_0	1294.53	1295.56	1296.59	nm
	Ch1	λ_1	1299.02	1300.05	1301.09	nm
	Ch2	λ_2	1303.54	1304.58	1305.63	nm
	Ch3	λ_3	1308.09	1309.14	1310.09	nm
Bit Rate per Channel		B	25.78125±100ppm			Gb/s
Side Mode Suppression Ratio		SMSR	30	-	-	dB
Average launch power, each lane			-2.5		4.5	dBm
Launch power in OMA minus TDP, each lane		OMA-TDP	-1.0			dBm
Transmission & dispersion penalty, each lane		TDP			2.5	dB
Relative Intensity Noise		RIN			-130	dB/Hz
Transmitter Reflectance					-12	dB
Extinction Ratio		ER	4			dB
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				
Average launch power of OFF transmitter, each lane					-30	dBm
Optical return loss tolerance					20	dB

Receiver Specifications – Optical

Parameter		Symbol	Min	Typical	Max	Unit
Center Wavelength	Ch0	λ_0	1294.53	1295.56	1296.59	nm
	Ch1	λ_1	1299.02	1300.05	1301.09	nm
	Ch2	λ_2	1303.54	1304.58	1305.63	nm
	Ch3	λ_3	1308.09	1309.14	1310.09	nm
Bit Rate per Channel		B	25.78125±100ppm			Gb/s
Damage threshold, each lane			6.5			dBm
Average receive power, each lane			-16.9		-4.9	dbm
Receiver Sensitivity (OMA), Each Lane (BER = 1x10 ⁻¹²)		SEN	-	-16	-15	dBm
LOS Assert		LOSA		-26		dBm
LOS De-assert		LOSD		-24		dBm

Pin Descriptions



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
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-F22JG8C	100Gbps QSFP28 ER4 30km, 0°C ~ +70°C

Important Notice

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