

TRQ5E21FNF-AF000

100G QSFP28 LR4/OTU4 10 km Transceiver



Description

CIG's 100Gbit QSFP28 LR4 transceiver module (TRQ5E21FNF) enables dense port count and high throughput capacity with its compact size (W x L x H = 18.4 x 72 x 8.5 (mm)) and low power consumption (3.5 W). These modules can be used in a wide range of network applications, including high capacity Ethernet switches and IP routers. A maximum transmission distance of up to 10km over single mode fiber is realized using an EA-DFB-based optical transmitter and PIN-PD based optical receiver operating on the LAN-WDM wavelength grid. Clock and data recovery ICs in transmit and receive paths ensure robust link performance over all operating conditions. The module is hot pluggable when mated to a compliant 38-pin connector that delivers a supply voltage of 3.3 V.

Features

- 100 Gigabit Ethernet (100GbE) 100GBASE-LR4 & ITU-T G.959.1 4I1-9D1F Dual Protocol
- Aggregate Data Rate: 103.125 Gbit/s & 111.810 Gbit/s
- Optical Interface: Compliant to 100GBASE-LR4 [1] and ITU-T G.959.1 4I1-9D1F[3]
- Electrical Interface: Compliant to CAUI-4 [2] and CEI-28G-VSR [4]
- Reach: Up to 10km over single mode fiber
- Form Factor: Compliant to QSFP+ 28Gb/s 4X Pluggable Transceiver Specification (SFF-8665) [5]
- Optical Transmitter: L-WDM EA-DFB
- Optical Receiver: PIN photodetector
- Power Consumption: 3.5 W max
- Operating Case Temperature: 0 to 70 degC
- Size (W x L (with pull tab) x H): 18.4 mm x 72 (122) mm x 8.5 mm
- Hot Z-Pluggable to 38-pin electrical connector
- Latching Mechanism: Pull tab
- Management Interface: Two-wire management interface protocol (SFF-8636) [6]
- Environmental: RoHS6 compliant

References

- [1] IEEE Std 802.3ba-2010
- [2] IEEE Std 802.3bm-2015
- [3] ITU-T G.959.1 (04/2016)
- [4] OIF CEI-28G-VSR (OIF-CEI-03.1 Feb. 2014)
- [5] SFF-8665 Rev 1.9 June 29, 2015
- [6] SFF-8636 Rev 2.9 April 21, 2017
- [7] SFF-8679 Rev 1.7 August 12, 2014

Operating Environments

Table 1 Operating Environment

No	Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
1	Supply Voltage	Vcc	3.135	3.3	3.465	V	
2	Power Consumption	P	-	-	3.5	W	
3	Case Temperature	Tc	0	-	70	°C	

Optical Characteristics

Table 2 Optical Characteristics of LR4

No.	Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
1	Channel data rate		25.78125			Gbit/s	
2	Aggregate data rate		103.125			Gbit/s	IEEE 802.3ba
3	Transmitter Center Wavelength						
	Lane 0		1294.53		1296.59	nm	
	Lane 1		1299.02		1301.09		
	Lane 2		1303.54		1305.63		
	Lane 3		1308.09		1310.19		
4	Optical Output Power (OMA), each lane	OMA	-1.3		+4.5	dBm	
5	Average Optical Output Power of OFF Transmitter	P _{off}			-30	dBm	
6	Extinction Ratio	ER	4			dB	
7	Receiver Sensitivity (OMA), each lane				-8.6	dBm	
8	Stressed Receiver Sensitivity (OMA), each lane	SRS			-6.8	dBm	
9	Average Receive Power (OMA), each lane		-10.6		+4.5	dBm	

Table 3 Optical Characteristics of OTU4

No.	Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
1	Channel data rate		27.9525			Gbit/s	
2	Aggregate data rate		111.80997			Gbit/s	ITU-T G.709
3	Transmitter Center Wavelength						
	Lane 0		1294.53		1296.59	nm	
	Lane 1		1299.02		1301.09		
	Lane 2		1303.54		1305.63		
	Lane 3		1308.09		1310.19		
4	Average Optical Power per lane		-0.6 / -2.5		+4.0 / +2.9	dBm	
5	Average Optical Output Power of OFF Transmitter	P _{off}			-30	dBm	
6	Extinction Ratio	ER	4 / 7			dB	
7	Mean Channel Input Power		-6.9/-8.8		+4/+2.9	dBm	
8	Channel Power difference				5.5	dB	
9	Optical Path Penalty				1.5	dB	
10	Equivalent Sensitivity		-8.4/-10.3			dBm	

EMI Compliance

This product meets Electromagnetic Interference (EMI) specifications of following standards.

- 1 FCC Part 15, Subpart B (Class B)
- 2 EN55032 (Class B)

Laser Safety

Certified as a Class 1 laser product per international standard IEC 60825-1:2014 3rd edition

Complies with 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, and IEC 60825-1 as Class 1 and with FDA 21 CFR as Class I laser product.

For more Information

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