

SFP28-25G-LR

25GBASE, SFP28, LR, SMF TRANSCEIVER

1310nm, 10km REACH, DUPLEX LC CONNECTOR

Product Features

- Up to 25.78Gbps Data Links
- Up to 10km transmission on SMF
- Compliant to IEEE802.3by 25GBASE-LR
- Power dissipation < 1.5W
- Metal enclosure for lower EMI
- 2-wire interface for management specifications compliant with SFF-8472 digital diagnostic monitoring interface for optical transceivers
- 25G 1310nm DFB transmitter
- 25G PIN photo-detector
- RoHS compliant
- Available operating temperature ranges:
 - Commercial: 0°C to 70°C
 - Industrial: -40°C to 85°C



Product Applications

- 25GBase-LR Ethernet
- FC / CPRI

I. Maximum Ratings

Exceeding the limits below may damage the transceiver module permanently.

Parameter	Symbol	Min.	Typ.	Max.	Units
Storage Temperature	TS	-40		+85	°C
Power Supply Voltage	Vcc	0		3.6	V
Relative Humidity	RH	5		85	%
Damage Threshold	THd	3.5			dBm

II. Operating Specifications

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Case Operating Temperature	TC	0		+70	°C	Commercial
		-40		+85	°C	Industrial
Power Supply Voltage	VCC	3.14	3.3	3.47	V	
Data Rate, each lane	BR		25.78125		Gbps	
Data Rate Accuracy		-100		100	ppm	
Control Input Voltage High		2		Vcc	V	
Control Input Voltage Low		0		0.8	V	
Transmission Distance	TD			10	km	
Coupled fiber	Single mode fiber					9/125um SMF

III. Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength	λ	1295		1325	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Optical Power	PAVG	-7		2	dBm	
Optical Power OMA	POMA	-4		2.2	dBm	1
Launch power in OMA minus Transmitter and Dispersion Penalty		-5			dBm	
Transmitter Dispersion Penalty	TDP			2.7	dB	
Extinction Ratio	ER	3.5			dB	
Relative Intensity Noise	RIN20OMA			-130	dB/Hz	
Optical Return Loss Tolerance	OTL			20	dB	
Transmitter Reflectance	TR			-12	dB	
Average Launch Power OFF Transmitter	Poff			-30	dBm	
Eye Mask {X1, X2, X3, Y1, Y2, Y3}		{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}				2

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Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Receiver						
Center Wavelength	λ	1260		1350	Nm	
Damage Threshold	THD	3.5			dBm	
Average Receive Power		-13.3		2	dBm	
Receive Power (OMA)				2.2	dBm	
Receiver Sensitivity (OMA)	SEN			-11.3	dBm	
Stressed Receiver Sensitivity (OMA)				-8.8	dBm	
Receiver Reflectance	RR			-26	dB	
LOS Assert	LOS A	-30			dBm	
LOS Deassert	LOS D			-14	dBm	
LOS Hysteresis	LOS H	0.5			dB	
Receiver Electrical 3 dB upper Cutoff Frequency	Fc			31	GHz	
Stressed Receiver Sensitivity Test Condition						5
Verical Eye Closure Penalty, each lane			1.9		dB	
Stressed Eye J2 Jitter	J2		0.27		UI	
Stressed Eye J4 Jitter	J4		0.39		UI	
SRS Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3} Hit ratio 5x10 ⁻⁵ per sample		{0.24, 0.5, 0.5, 0.24, 0.24, 0.4}				

Notes:

1. Even if the TDP < 1 dB, the OMA min must exceed the minimum value specified here.
2. Hit ratio 5x10⁻⁵ per sample.
3. The receiver shall be able to tolerate, without damage, continuous exposure to a modulated optical input signal having this power level on one lane. The receiver does not have to operate correctly at this input power.
4. Measured with conformance test signal at receiver input for BER = 5x10⁻⁵.
5. Vertical eye closure penalty, stressed eye J2 jitter, stressed eye J4 jitter, and SRS eye mask definition are test conditions for measuring stressed receiver sensitivity. They are not the required characteristics of the receiver.

IV. Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Consumption				1.5	W	
Supply Current	Icc			450	mA	
Transmitter						
Overload Differential Voltage pk-pk	TP1a	900			mV	
Common Mode Voltage (Vcm)	TP1	-350		2850	mV	1
Differential Termination Resistance Mismatch	TP1			10	%	@1MHz
Differential Return Loss (SDD11)	TP1	See CEI-28G-VSR Equation 13-19			dB	
Common Mode to Differential conversion and Differential to Common Mode conversion (SDC11, SCD11)	TP1	See CEI-28G-VSR Equation 13-20			dB	
Stressed Input Test	TP1a	See CEI-28G-VSR Section 13.3.11.2.1				
Receiver						
Differential Voltage, pk-pk	TP4			900	mV	
Common Mode Voltage (Vcm)	TP4	-350		2850	mV	
Common Mode Noise, RMS	TP4			17.5	mV	
Differential Termination Resistance Mismatch	TP4			10	%	@1MHz
Differential Return Loss (SDD22)	TP4	See CEI-28G-VSR Equation 13-19			dB	
Common Mode to Differential conversion and Differential to Common Mode conversion (SDC11, SCD11)	TP4	See CEI-28G-VSR Equation 13-21			dB	
Common Mode Return Loss (SCC22)	TP4			-2	dB	2
Transition Time, 20 to 80%	TP4	9.5			Ps	
Vertical Eye Closure (VEC)	TP4			5.5	dB	
Eye Width at 10 ⁻¹⁵ probability (EW15)	TP4	0.57			UI	
Eye Height at 10 ⁻¹⁵ probability (EH15)	TP4	228			mV	

Notes:

1. V_{cm} is generated by the host. Specification includes effects of ground offset voltage.
2. From 250MHz to 30GHz.

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v. Ordering Information

Pivotal Part Number	Description
SFP28-LR	SFP28, 1310nm, LR SMF 10km, 25G DDM, C-Temp
SFP28-LRI	SFP28, 1310nm, LR SMF 10km, 25G DDM, I-Temp

Notes:

1. Please contact sales for specific OEM Platform part numbers to fit your network.

Warranty

<https://pivotaloptics.com/warranty/>

Disclaimer

External physical characteristics are subject to variation. This may include, but is not limited to, external case designs, pull tab colors and/or shapes, removal latch styles or colors, and label sizes and placement. These variations do not affect the function or characteristics of the transceivers.