



25Gbps 1310nm SMF 40km SFP28 Optical Transceiver with Duplex LC Connector

CS13-25GF-3L-Tx-L



DESCRIPTION

The CS13-25GF-3L-Tx-L SFP28 optical transceivers are designed for use in Ethernet links up to 25.78Gb/s data rate and provide up to 40km transmission distance over single-mode fiber at nominal wavelength of 1310nm. They are compliant with SFF-8472 diagnostic monitoring interface and compatible with SFP+ MSA SFF-8431. The optical transceiver is RoHS compliant.

FEATURES

- Up to 25.78 Gb/s data links
- Compliant with SFP+ MSA SFF-8431
- Compliant with SFF8472 diagnostic monitoring interface
- Duplex LC connector
- Single power supply 3.3V
- Hot pluggable
- EML laser and APD receiver
- Support CPRI line bit rate option 10: 24330.24 Mbit/s
- Class 1 laser product compliant with EN 60825-1
- Link distance up to 40km single mode fiber
- Input/Output: AC/AC

APPLICATIONS

- 25GBASE-ER

PRODUCT OVERVIEW

PART NUMBER	OPERATING TEMPERATURE
CS13-25GF-3L-TC-L	0°C to 70°C
CS13-25GF-3L-TI-L	-40°C to 85°C

DIAGNOSTICS

PARAMETER	RANGE	ACCURACY	UNIT	CALIBRATION
Internal Transceiver Temperature	-40 to 85	±3	°C	Internal
Internal Transceiver Voltage	3.14 to 3.46	±0.1	V	
Bias Current	0 to 120	±10%	mA	
TX Power	-1 to +6	±3	dB	
RX Average Power	-5 to -19	±3	dB	

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT
Storage Temperature	T _S	-40	85	°C
Supply Voltage	V _{CC}	-0.4	3.6	V
Operating Relative Humidity	RH	5	85	%

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTES
Case Operating Temperature	T _C	0	70	°C	CS13-25GF-3L-TC-L
		-40	85		CS13-25GF-3L-TI-L
Supply Voltage	V _{CC}	3.14	3.46	V	CS13-25GF-3L-TC-L
Supply Current @ 3.3V	I _{TX} + I _{RX}		462	mA	CS13-25GF-3L-TI-L
			578		
Power Consumption @ 3.3V	P		1.6	W	CS13-25GF-3L-TC-L
			2		CS13-25GF-3L-TI-L

TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS (V_{CC} = 3.14V to 3.46V, T_C = 0°C to 70°C, -40°C to 85°C)

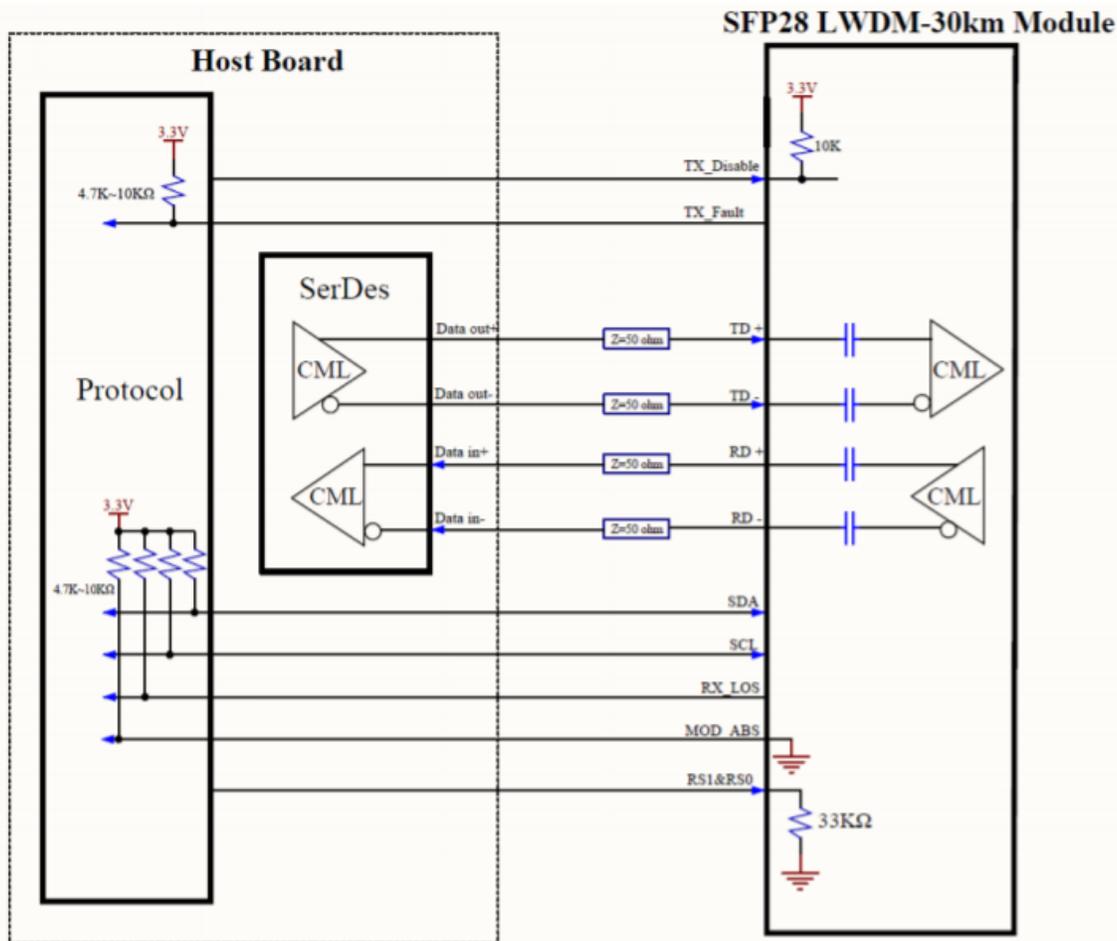
PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT
Data Rate	B	24	25.78	26.5	Gbps
Average Launch Power	P _{IN}	-1	-	+6	dBm
Optical Modulation Amplitude (OMA)	P _{OMA}	0		+6	dBm
Extinction Ratio	ER	6.5			dB
Center Wavelength	λ _C	1300	1310	1320	nm
Spectral Width (-20dB)	Δλ	-	-	1	nm
Side Mode Suppression Ratio	SMSR	30			dB
Max. P _{out} TX-DISABLE Asserted	P _{OFF}	-	-	-45	dBm
Transmitter and Dispersion Penalty	TDP			2.7	dB
OMA-TDP		-1			dBm
Differential Input Voltage	V _{DIFF}	200		1000	mV
Transmit Fault Output-Low	TX_FAULT _L	0.0	-	0.5	V
Transmit Fault Output-High	TX_FAULT _H	2.4	-	V _{CC}	V
TX_DISABLE Assert Time	t _{off}	-	-	100	μs
TX_DISABLE Negate Time	t _{on}	-	-	2	ms
Time to Initialize, include reset of TX_FAULT	t _{init}	-	-	300	ms
TX_FAULT assert for cooled module	t _{fault}	-	-	50	ms
TX_DISABLE Time to start reset	t _{reset}	10	-	-	μs

RECEIVER ELECTRO-OPTICAL CHARACTERISTICS ($V_{CC} = 3.14V$ to $3.46V$, $T_C = 0^{\circ}C$ to $70^{\circ}C$, $-40^{\circ}C$ to $85^{\circ}C$)

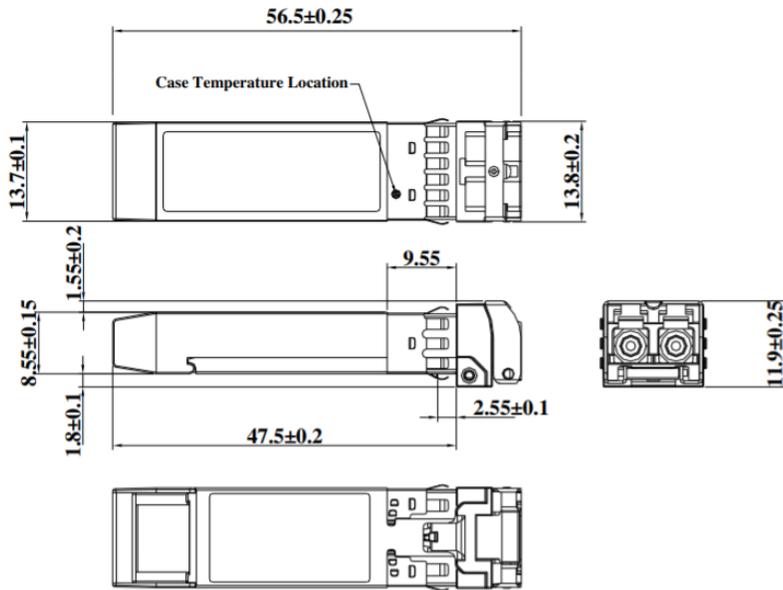
PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTES
Data Rate	B	24	25.78	26.5	Gbps	
Optical Input Power-Maximum	P_{IN}	-5	-	-	dBm	
Receiver Sensitivity (OMA)	P_{IN}	-	-	-19	dBm	@BER=5E-5
Stressed Receiver Sensitivity (OMA)	P_{IN}	-	-	-6.8	dBm	
Operating Center Wavelength	λ_C	1270	-	1330	nm	
Optical Return Loss	ORL	26	-	-	dB	
Channel Insertion Loss				18	dB	(1)
Loss of Signal-Asserted	P_A	-35	-	-	dBm	
Loss of Signal-Deasserted	P_D	-	-	-20	dBm	
Differential Output Voltage	V_{DIFF}	500	-	1000	mV	
Receiver Loss of Signal Output Voltage-Low	RX_LOS _L	0	-	0.5	V	
Receiver Loss of Signal Output-High	RX_LOS _H	2.4	-	V_{CC}	V	
Receiver Loss of Signal Assert Time (off to on)	t_{A,RX_LOS}	-	-	100	μs	
Receiver Loss of Signal Assert Time (on to off)	t_{D,RX_LOS}	-	-	100	μs	
Time to initialize	t_{start_up}			10	s	

Note (1): Attenuation for such links needs to be less than the worst case for cables containing IEC 60793-2-50 type B1.1, type B1.3, or type B6_a single-mode cabled optical fiber.

BLOCK DIAGRAM OF TRANSCEIVER

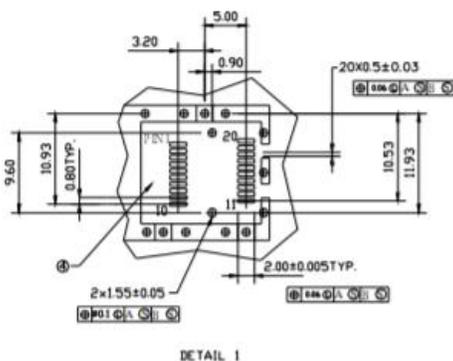
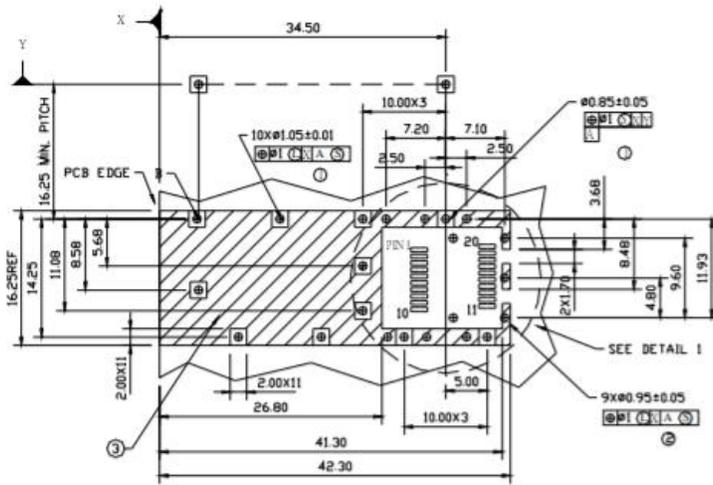


DIMENSIONS (unit: mm)



**The bail color is red.

SFP HOST BOARD MECHANICAL LAYOUT



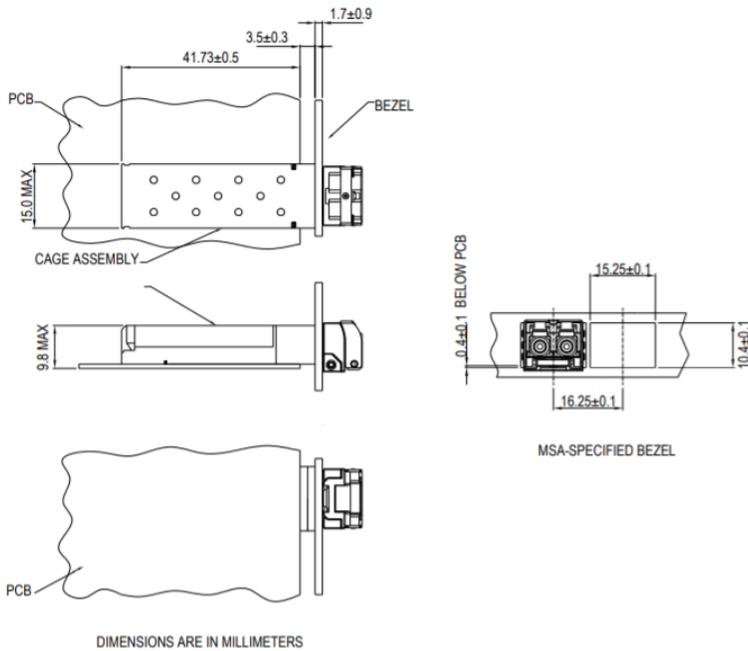
LEGEND

1. PADS AND VIAS ARE CHASSIS GROUND
2. THROUGH HOLES, PLATING OPTIONAL
3. HATCHED AREA DENOTES COMPONENT AND TRACE KEEPOUT (EXCEPT CHASSIS GROUND)
4. AREA DENOTES COMPONENT KEEPOUT (TRACES ALLOWED)

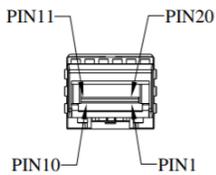
DIMENSIONS ARE IN MILLIMETERS

Unit: mm

ASSEMBLY DRAWING



PIN ASSIGNMENT



PIN	SIGNAL NAME	DESCRIPTION	PIN	SIGNAL NAME	DESCRIPTION
1	T _{GND}	Transmit Ground	11	R _{GND}	Receiver Ground
2	TX_FAULT	Transmit Fault	12	RX-	Receive Data Bar, ac coupled
3	TX_DISABLE	Transmit Disable	13	RX+	Receive Data, ac coupled
4	SDA	SDA Serial Data Signal	14	R _{GND}	Receiver Ground
5	SCL	SCL Serial Clock Signal	15	V _{CCR}	Receiver Power Supply
6	MOD_ABS	Internal connected to ground	16	V _{CCT}	Transmitter Power Supply
7	RS0	Rate select 0, not used (2)	17	T _{GND}	Transmitter Ground
8	RX_LOS	Receiver Loss of Signal, LVTTTL High, open collector	18	TX+	Transmit Data, ac coupled
9	RS1	Rate select 1, not used (2)	19	TX-	Transmit Data Bar, ac coupled
10	R _{GND}	Receiver Ground	20	T _{GND}	Transmitter Ground

Note (2): RS0 and RS1 are module inputs and are pulled low to VeeT with >30kΩ resistors in the module.

ADDITIONAL NOTES

- Avoid eye or skin exposure to laser radiations.
- The device is sensitive to electro-static discharge (ESD). The device should be handled with ESD proof tools. To assemble the device on PCB, proper grounding is required to prevent ESD.
- Specifications are subject to change without notice.



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