FluxLight
OPTICAL TRANSCEIVERS

Datasheet

SFP-10/25G-CSR-S-FL

10G/25G, SFP28, Duplex LC, 10/25GBASE-CSR, MMF, 400m, COM

Quick Spec

Rate Category:	25G
Supported Rate(s):	10G/25G
Form Factor:	SFP28
Interface Type:	10/25GBASE-CSR
Standard / Protocol:	IEEE 802.3by 25GBASE-SR, IEEE 802.3ae 10GBASE-SR (extended reach)
TX Wavelength:	850nm
RX Wavelength:	850nm
Cable Type:	MMF
Reach:	300m (OM3), 400m (OM4)
DDM:	Supported
Connector Type:	Duplex LC (UPC)
Power Consumption:	1W max
Operating Temperature:	0°C to +70°C (COM)



Overview

The FluxLight SFP-10/25G-CSR-S-FL is a dual-rate SFP28 transceiver for extended-reach multimode fiber links. It operates at 25Gb/s or 10Gb/s over 850 nm duplex LC, reaching up to 300 m on OM3 and 400 m on OM4 fiber, well beyond the 70/100 m of standard 25GBASE-SR. The transmitter uses an 850 nm VCSEL and the receiver an integrated GaAs photodetector with a limiting post-amplifier, with built-in clock and data recovery (CDR). Full 25G reach requires RS-FEC (Clause 108) enabled on the host.

The hot-pluggable module draws less than 1 W from a single +3.3V supply and provides real-time digital diagnostic monitoring of temperature, supply voltage, laser bias current and transmit/receive optical power over the two-wire serial (I2C) interface per SFF-8472. Every FluxLight optic is programmed and tested for 100% compatibility with the target OEM platform and is backed by a lifetime warranty.

Features

- Dual-rate 10G/25G operation (10/25GBASE-CSR)
- SFP28 MSA compliant (SFF-8402), hot-pluggable
- 25.78125Gb/s and 10.3125Gb/s data rates
- 850nm VCSEL transmitter, GaAs photodetector receiver
- Average launch power −6.4 to +2.4 dBm; stressed receiver sensitivity −5.2 dBm OMA (25G)
- Built-in clock and data recovery (CDR)
- Up to 300m on OM3 and 400m on OM4 multimode fiber (RS-FEC required on host at 25G)
- Duplex LC (UPC) connector
- Digital Diagnostics Monitoring (DDM/DOM) per SFF-8472
- Single +3.3V power supply, <1W power dissipation
- Operating case temperature: 0°C to +70°C (COM)
- Class 1 laser product (IEC 60825-1)
- RoHS 6 compliant
- 100% compatible with and programmed for the target OEM platform
- Backed by a FluxLight lifetime warranty

Applications

- 10G and 25G Ethernet over multimode fiber (OM3/OM4)
- Extended-reach data center links between rows, halls and floors over existing MMF
- Migration from 10G to 25G over the same multimode cable plant
- Server, storage and switch uplinks beyond 100 m

Absolute Maximum Rating

Parameter	Symbol	Min	Max	Unit
Storage Temperature	TS	-40	85	°C
Operating Case Temperature	TOP	0	70	°C
Power Supply Voltage	VCC	-0.3	3.6	V
Relative Humidity (non-condensation)	RH	5	85	%

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	TOP	0		70	°C	
Power Supply Voltage	VCC	3.135	3.3	3.465	V	
Data Rate			10.3125 25.78125		Gb/s	
Data Rate Accuracy		-100		100	ppm	
Tx_DISABLE Input Voltage – High		2			V	
Tx_DISABLE Input Voltage – Low				0.8	V	
50 / 125 um MMF OM3	D			300	m	RS-FEC required at 25G

Recommended Operating Conditions (Continued)

Parameter	Symbol	Min	Typical	Max	Unit	Notes
50 / 125 um MMF OM4	D			400	m	RS-FEC required at 25G

Electrical and Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Power Consumption				1.0	W	
Supply Current	Icc			300	mA	
Transmitter						
Center Wavelength	λC	840	850	860	nm	
Spectral Width (RMS)	Δλ			0.5	nm	
Average Output Power	Pout	-6.4		2.4	dBm	
Extinction Ratio	ER	2			dB	
Optical Modulation Amplitude	OMA	-4.3		3	dBm	
Receiver						
Center Wavelength	λC	840	850	860	nm	
Average Receiver Power	Pin	-10.3		2.4	dBm	
Unstressed Receiver Sensitivity	Sen			-7.2	dBm	1
Stressed Receiver Sensitivity (OMA)	SRS			-5.2	dBm	1
Receiver Reflectance	RR			-12	dB	
LOS Assert	LOSA	-30			dBm	
LOS De-Assert	LOSD			-13	dBm	
LOS Hysteresis	LOSH	0.5			dB	

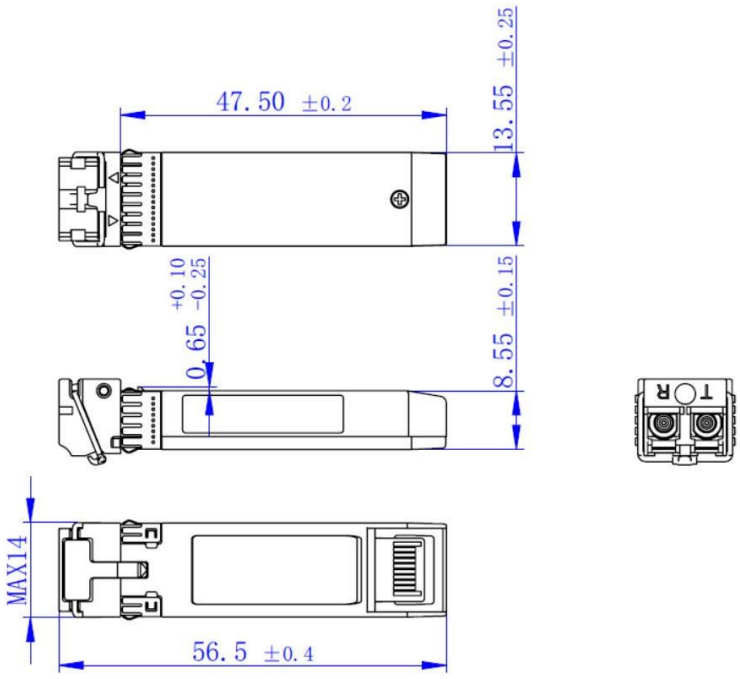
1. Optical values specified at 25.78125Gb/s; BER = 5×10^{-5}, measured with PRBS $2^{31}-1$.

Digital Diagnostic Functions

The following digital diagnostic characteristics are defined over the normal operating conditions unless otherwise specified.

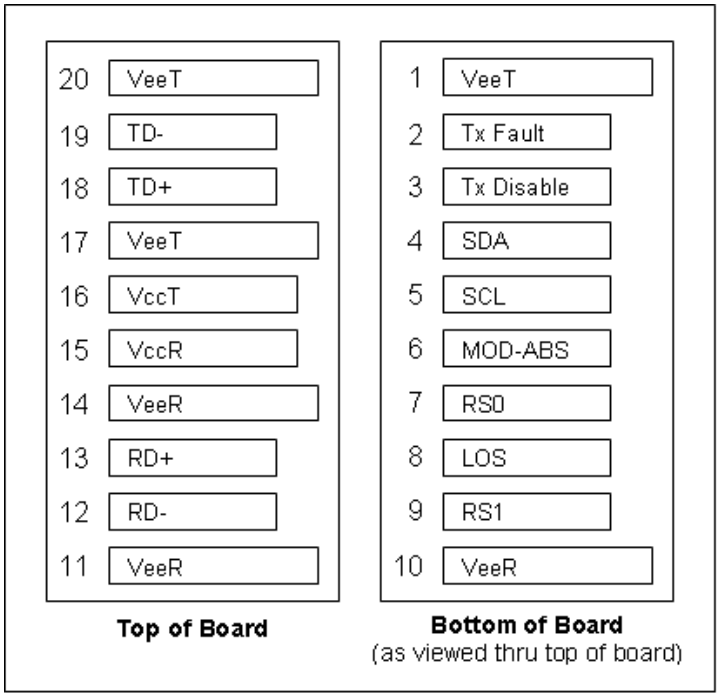
Parameter	Symbol	Min	Max	Unit
Temperature monitor absolute error	DMI_Temp	-5	5	°C
Supply voltage monitor absolute error	DMI_VCC	-0.1	0.1	V
RX power monitor absolute error	DMI_RX	-3	3	dB
Bias current monitor absolute error	DMI_Ibias	-10%	10%	mA
TX power monitor absolute error	DMI_TX	-3	3	dB

Mechanical Dimensions



Units: mm

Pin Assignment and Description



Pin	Signal Name	Description	Plug Seq.
1	VeeT	Transmitter Ground	1
2	TX FAULT	Transmitter Fault Indication	3
3	TX DISABLE	Transmitter Disable	3
4	SDA	SDA Serial Data Signal	3
5	SCL	SCL Serial Clock Signal	3
6	MOD_ABS	Module Absent. Grounded within the module	3
7	RS0	Not Connected	3
8	LOS	Loss of Signal	3
9	RS1	Not Connected	3
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Inv. Received Data Out	3
13	RD+	Received Data Out	3
14	VeeR	Receiver Ground	1
15	VccR	Receiver Power Supply	2
16	VccT	Transmitter Power Supply	2
17	VeeT	Transmitter Ground	1
18	TD+	Transmit Data In	3
19	TD-	Inv. Transmit Data In	3
20	VeeT	Transmitter Ground	1

ESD

This transceiver is specified as ESD threshold 1kV for high-speed data pins and 2kV for all other electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

Laser Safety

This is a Class 1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).