

## 25GBASE-LR SFP28 Optical Transceiver

### Product Features

- Compliant to the IEEE802.3cc, SFF-8472, SFF-8431 and SFF-8432
- Supports 9.8304Gbps,10.1376Gbps,10.3125Gbps,24.33024Gbps, and 25.78125Gbps for 25G Ethernet, CPRI and eCPRI applications
- 25Gbps NRZ electric interface and 25Gbps NRZ optical interface.
- Duplex LC Connector
- Built-in digital diagnostic functions
- 2m~10km link length over G.652 fiber
- 1310nm DFB transmitter and PIN receiver
- Single +3.3V power supply, and maximum power dissipation 1W Operation case temperature -40~85°C for industrial application
- RoHS compliance, and Class 1 laser safety

### Absolute Maximum Ratings

Parameter	Unit	Min.	Typical	Max.
Storage Temperature	°C	-40		85
Operating Case Temperature	°C	-40		85
Operating Relative Humidity	%	5		85
Power Supply not Damaged Voltage	V	-0.5		3.63
Power Supply Working Voltage	V	3.135	3.3	3.465
Power Consumption	W			1
Bit Rate	Gbps		25.78	

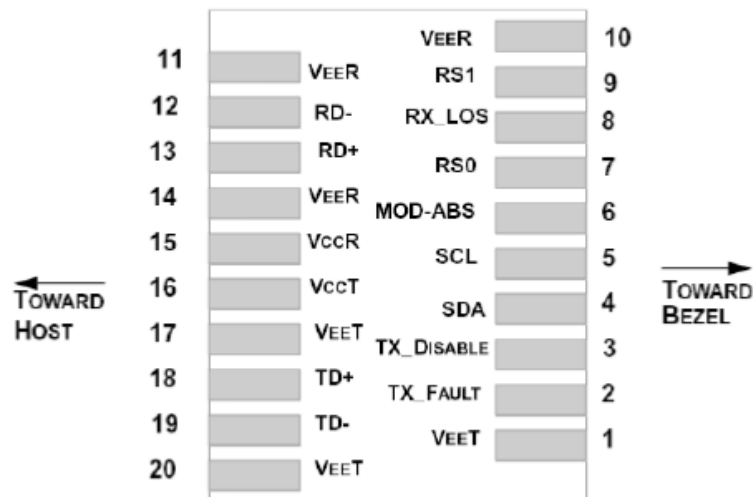
**Characteristics**

All performance is specified at whole working temperature and conditions

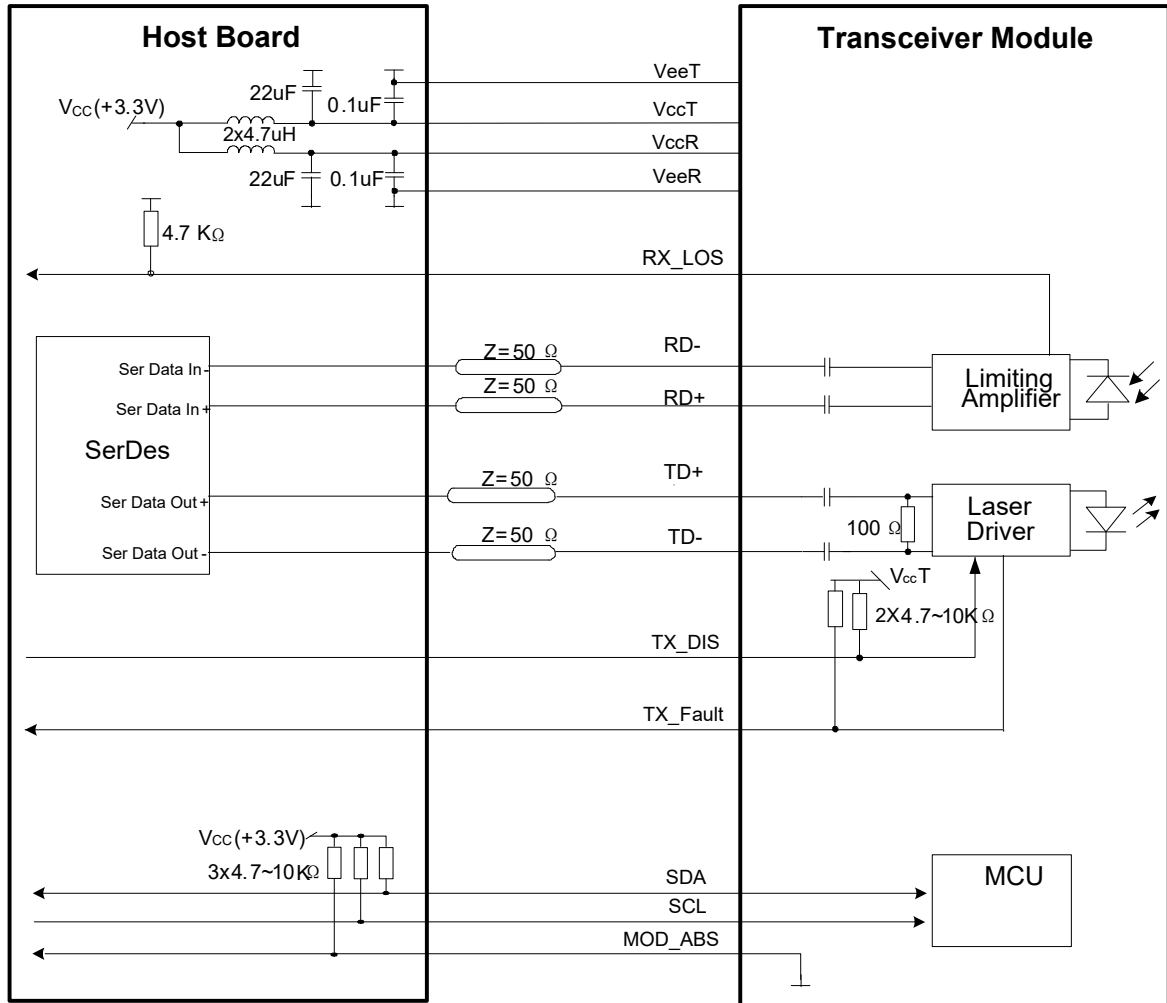
Parameter	Unit	Min.	Typical	Max.
<b>Transmitter</b>				
TX Central Wavelength	nm	1295	1310	1325
Spectral Width (-20dB)	nm			1
Side-Mode Suppression Ratio	dB	30		
Launch Optical Power	dBm	-7		2
Optical Modulation Amplitude	dBm	-4		2.2
Launch Optical Power when Tx_Disabled	dBm			-30
Extinction Ratio	dB	3.5		
Optical Return Loss Tolerance	dB			20
Transmitter and Dispersion Penalty	dB			2.7
Transmitter Mask (PRBS <sup>31</sup> -1@9.8304Gb/s~10.3125Gb/s)	Compliant With IEEE Std 802.3ae			
Transmitter Mask (PRBS <sup>31</sup> -1@24.33024Gb/s~25.78125Gb/s )	Compliant With IEEE Std 802.3cc			
<b>Receiver</b>				
RX Central Wavelength	nm	1295	1310	1325
OMA Sensitivity @BER<5E-5, PRBS <sup>31</sup> -1, ER>3.5dB, 24.33024G~25.78125G @BER<1E-12, PRBS <sup>31</sup> -1, ER>3.5dB, 9.8304G ~10.3125G	dBm			-11.3
Saturation Input Optical Power	dBm	2.0		
LOS De-assert	dBm			-16
LOS Assert	dBm	-30		
LOS Hysteresis	dB	0.5		
Receiver reflectance	dB			-26
Receiver Output Emphasis	dB		1	2
<b>Electrical</b>				
Data Input Swing Differential of 25G	mV	50	-	900
Data Input Swing Differential of 10G	mV	190	-	1200
Data Differential Impedance	Ω	90	100	110
Data Output Swing Differential I of 25G	mV	450		750
Data Output Swing Differential I of 10G	mV	450		750
Data Differential Impedance	Ω	90	100	110
LVTTL Output High	V	2		Vcc
LVTTL Output Low	V	0		0.4
LVTTL Input High	V	2.0		Vcc+0.3
LVTTL Input Low	V	-0.3		0.8

**PIN Function Definitions**

Pin No.	Symbol	Level / Logic	Description
1	VeeT		Module Transmitter Ground
2	Tx_Fault	LVTTL-O	Module Transmitter Fault Indication
3	Tx_DIS	LVTTL-I	Transmitter Disable; Active High Disable Transmitter Output
4	SDA	LVTTL-I	2-Wire Serial Interface Data Line
5	SCL	LVTTL-I/O	2-Wire Serial Interface Clock
6	MOD_ABS	LVTTL-O	Module Absent, connected to ground in the module
7	RS0		Rate Select 0, optionally controls SFP28 module receiver
8	RX_LOS	LVTTL-O	Loss of Receiver Signal Indication
9	RS1		Rate Select 1, optionally controls SFP28 module transmitter
10	VeeR		Module Receiver Ground
11	VeeR		Module Receiver Ground
12	RD-	CML-O	Receiver Inverted Data Output
13	RD+	CML-O	Receiver Non-Inverted Data Output
14	VeeR		Module Receiver Ground
15	VccR		Module Receiver 3.3V Supply
16	VccT		Module Transmitter 3.3V Supply
17	VeeT		Module Transmitter Ground
18	TD+	CML-I	Transmitter Non-Inverted Data Input
19	TD-	CML-I	Transmitter Inverted Data Input
20	VeeT		Module Transmitter Ground

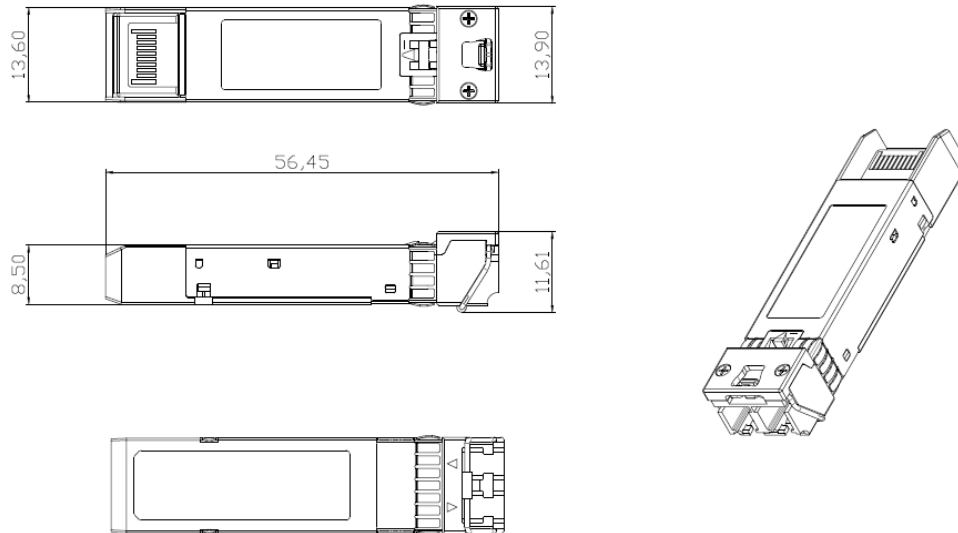


**Typical Interface Circuit**



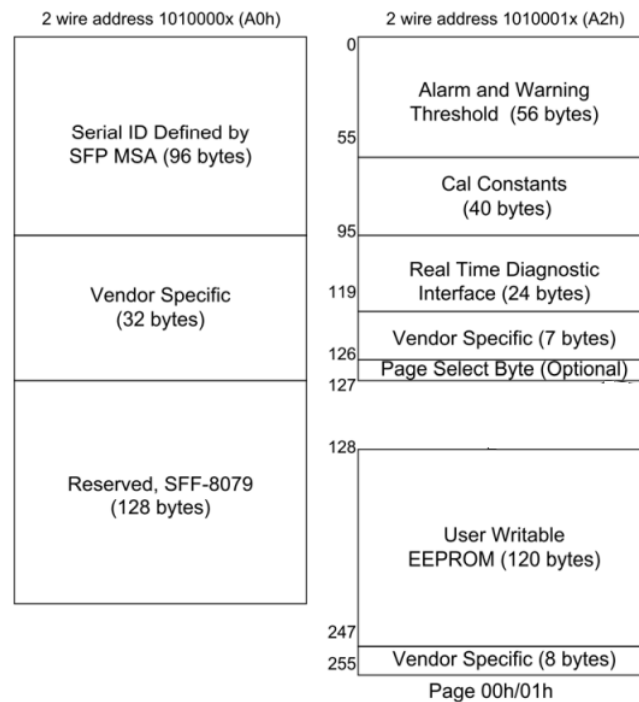
**Mechanical Specifications**

For detail mechanical information, please refer to the related document of SFF-8432.



**EEPROM Information**

The digital diagnostic memory map specific data field define as following. For detail EEPROM information, please refer to the related document of SFF 8472 Rev 12.0.



**ESD**

The SFP+ module and host SFI contacts (High Speed Contacts) shall withstand 1kV electrostatic discharge based on Human Body Model and all host contacts with exception of the SFI contacts (High Speed Contacts) shall withstand 2kV electrostatic discharge based on Human Body Model. The SFP+ module shall meet ESD requirements given in EN61000-4-2, criterion B test specification such that units are subjected to 15kV air discharges during operation and 8kV direct contact discharges to the case per section 2.9 in SFF-8431 REV4.1. 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).

**Ordering Information**

Ordering P/Ns	Description
D133bb-SLHC	10~25G 10km SFP28 NRZ-NRZ, Tx 1310nm, Rx 1310nm, SFP28 form-factor, Duplex LC receptacle connector, -40~85°C Industrial temperature

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