

25G SFP28 1270nm-TX/1330nm-RX 20km DOM LC SMF Transceiver

SFP-25G-BD-LL



Application

- 25GBASE-LR
- CPRI option 10 / eCPRI

Features

- Up to 20 km Transmission Distance
- LC Single Connector
- Low Power Consumption <1.2W
- -40°C to 85°C Operating Case Temperature Range
- Single 3.3V ± 5% Power Supply
- Compliant with SFF-8472

Standards

- SFF-8472
- SFF-8402
- SFF-8432
- SFF-8431
- CEI-28G-VSR

Description

The SFP-25G-BD-LL is designed to transmit and receive optical data up to 20km over single mode fiber. The transceiver is compliant with SFF-8472, SFF-8402, SFF-8432 and applicable portions of SFF-8431. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472.

Product Specifications

I. Ordering Information

Form Factor	Data Rate (Gb/s)	Laser	Average Power (dBm)	Detector	OMA Sensitivity 5E-5 (dBm)	Top (°C)	Reach (km)
SFP28	25.78125	1270nm DFB	0~6	PIN	<-14	-40~85	20

II. Absolute Maximum Ratings

Parameter	Symbol	Unit	Min.	Max.
Storage Temperature Range	T _s	°C	-40	85
Relative Humidity	RH	%	0	85
Supply Voltage	V _{CC}	V	-0.3	3.6

III. Recommended Operating Conditions

Parameter	Symbol	Unit	Min.	Typ.	Max.
Operating Case Temperature Range	T _c	°C	-40		85
Power Supply Voltage	V _{CC}	V	3.135	3.3	3.465
Bit Rate	BR	Gb/s	24.33024	25.78125	
Max. Supported Link Length	L	km	10	20	

IV. Electrical Characteristics

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Supply Voltage	V_{CC}	V	3.14	3.3	3.46	
Supply Current	I_{CC}	mA			360	@3.3V
Transmitter						
Input Differential Impedance	R_{IN}	Ω		100		
Single Ended Data Input Swing	V_{IN}	mVp-p	90		450	
Transmit Disable Voltage	V_{DIS}	V	2		V_{CCHOST}	
Transmit Enable Voltage	V_{EN}	V	V_{EE}		$V_{EE}+0.8$	
Transmit Fault Assert Voltage	V_{FA}	V	2.2		V_{CCHOST}	
Transmit Fault De-Assert Voltage	V_{FDA}	V	V_{EE}		$V_{EE}+0.4$	
Receiver						
Single Ended Data Output Swing	V_{OD}	mVp-p	200		450	
LOS Fault	V_{LOSFT}	V	2.2		V_{CCHOST}	
LOS Normal	V_{LOSNR}	V	V_{EE}		$V_{EE}+0.4$	

V. Optical Characteristics

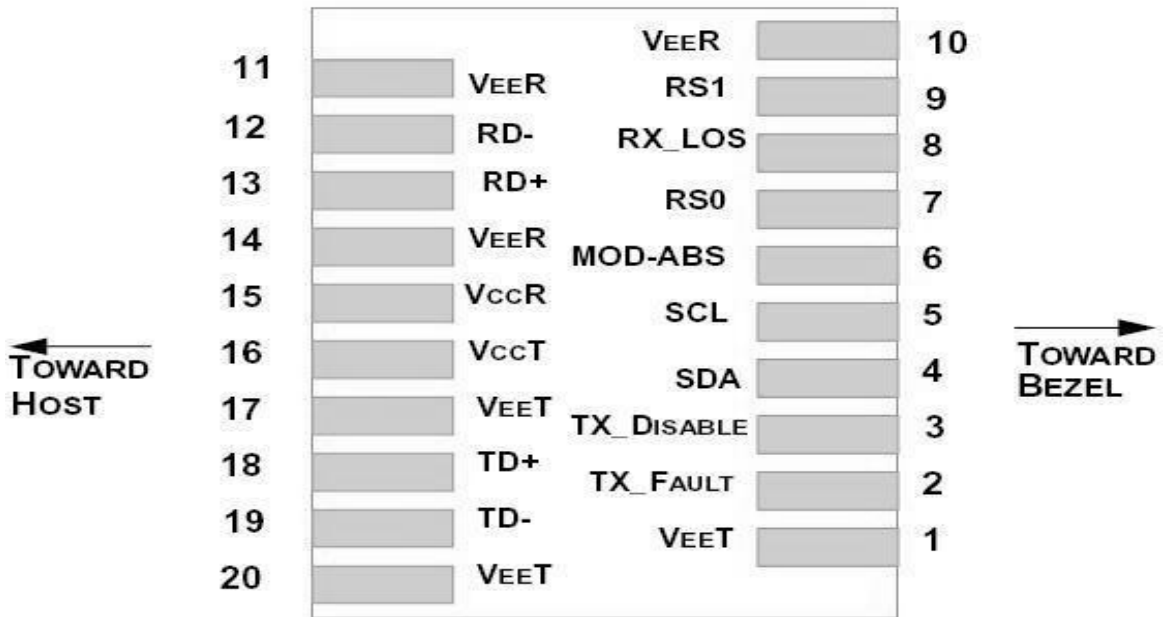
(tested under recommended operating conditions, unless otherwise noted)

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Transmitter						
Center Wavelength Range	λ	nm	1260		1280	Upstream
Spectral Width -20dB		nm			1	
Side Mode Suppression Ratio	SMSR	dB	30			
Average Launch Power	P_{AVG}	dBm	0		6	
OMA Launch Power	P_{OMA}	dBm	-2			
Transmitter and Dispersion Penalty 25G BER=5E-5	TDP	dB			4	
Average Launch Power of OFF Transmitter	P_{OFF}	dBm			-30	
Extinction Ratio	ER	dB	3.5			
RIN20 OMA	R_{IN}	dB/Hz			-130	
Optical Return Loss Tolerance		dB			20	
Mask Margin		%	5			1

Note 1: Template: {0.31, 0.40, 0.45, 0.34, 0.38, 0.40}, Hit Ratio: 5E-5

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Receiver						
Center Wavelength	λ	nm	1320	1330	1340	Upstream
Overload		dBm	2.5			
OMA Receiver Sensitivity Up to 25G 5E-5	POMA	dBm			-14	
Assert LOS	LOSA	dBm	-30			
De-Assert LOS	LOSD	dBm			-17	
LOS Hysteresis		dB	0.5			

VI. Pin Function Definitions



VII. Transceiver Pin Descriptions

Pin No.	Symbol	Logic	Description
1,17,20	VeeT		Connected to signal ground on the host board.
2	TX Fault	LVTTL Output	Module transmitter fault output
3	TX Disable	LVTTL Input	Module transmitter disable control
4	SDA	LVTTL Input/Output	2-wire serial interface data
5	SCL	LVTTL Input/Output	2-wire serial interface clock
6	MOD-ABS		Module absent (connected to Module ground)
7	RS0	LVTTL Input	Rate select 0 (Rx): Low=CDR Bypass; High=CDR Select

Pin No.	Symbol	Logic	Description
8	LOS	LVTTTL Output	Receiver loss of signal
9	RS1	LVTTTL Input	Rate select 1 (Tx): Low=CDR Bypass; High=CDR Select
10,11,14	VeeR		Connected to signal ground on the host board.
12	RD-	CML Output	Receiver inverted data output, internally AC coupled and terminated.
13	RD+	CML Output	Receiver non-inverted data output, internally AC coupled and terminated.
15	VccR		Receiver Power 3.3V Supply
16	VccT		Transmitter Power 3.3V Supply
18	TD+	CML Input	Transmitter non-inverted data input, internally AC coupled and terminated.
19	TD-	CML Input	Transmitter inverted data Input, internally AC coupled and terminated.

VIII. Software Control

1. CDR control (Volatile parameter. Reset to default value on boot)

	Hard:Pin#7	Soft:A2h, Byte 110d bit 3	Mode of Operation	Rate	Note
RS0	0	0	Rx CDR Bypass	Rx: 9.8304Gb/s, 10.1376Gb/s or 10.3125Gb/s	
	0	1	Rx CDR Select	Rx: 24.33024Gb/s or 25.78125Gb/s. Module auto detect data rate and CDR lock accordingly.	Default
	1	0	Rx CDR Select		
	1	1	Rx CDR Select		

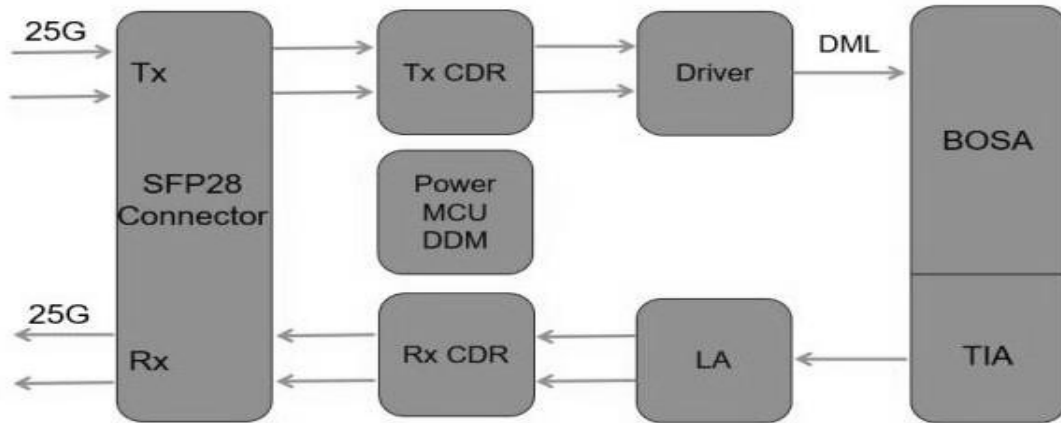
	Hard: Pin#9	Soft:A2h, Byte 118d bit 3	Mode of Operation	Rate	Note
RS1	0	0	Tx CDR Bypass	Tx: 9.8304Gb/s, 10.1376Gb/s or 10.3125Gb/s	
	0	1	Tx CDR Select	Tx: 24.33024Gb/s or 25.78125Gb/s. Module auto detect data rate and CDR lock accordingly.	Default
	1	0	Tx CDR Select		
	1	1	Tx CDR Select		

2. Input EQ and Output Emphasis (Volatile parameter. Reset to default value onboot)

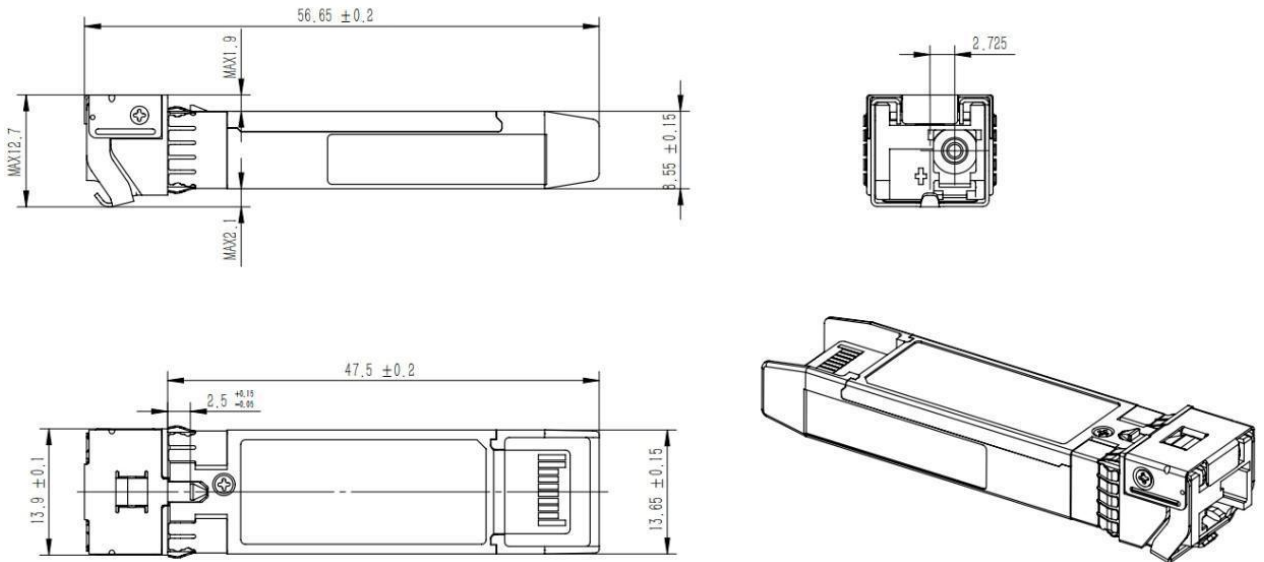
A2H,114d	7-4	Tx Input Equalization@Tx CDR Select	Input Equalization Level Control
	3-0	Tx Input Equalization@Tx CDR Bypass	Input Equalization Level Control
A2H,115d	7-4	RX Output Emphasis@Rx CDR Select	Output Emphasis Level Control
	3-0	RX Output Emphasis@Rx CDR Bypass	Output Emphasis Level Control

ADDRESS A2H BYTE 114d				ADDRESS A2H BYTE 115d			
Code	Transmitter Input Equalization			Code	Receiver Output Emphasis		
	Nominal	Units	Note		Nominal	Units	Note
11xx	Reserved	dB					
1011	Reserved	dB		1xxx	Vendor Specific		
1010	10	dB		0111	7	dB	
1001	9	dB		0110	6	dB	
1000	8	dB		0101	5	dB	
0111	7	dB		0100	4	dB	
0110	6	dB		0011	3	dB	
0101	5	dB		0010	2	dB	
0100	4	dB		0001	1	dB	Default
0011	3	dB		0000	0	No Emphasis	
0010	2	dB	Default				
0001	1	dB					
0000	0	NO EQ					

IX. Principle Diagram



X. Package Outline



Unit: mm
 Unspecified Tolerance: ± 0.1 mm