



## Description

This product applies 1310/1270nm DFB laser and 1270/1310 PIN receiver intending to transmit through single mode fiber for the link length up to 10km. The connector is a single LC for bi-directional transmission and compliant with SFP28 and SFP+ pluggable. The module operates with power supply of 3.3V and power consumption lower than 1.5W.

## Applications

- 25G BASE-LR Ethernet
- 5G Fronthaul Networks

## Key Features

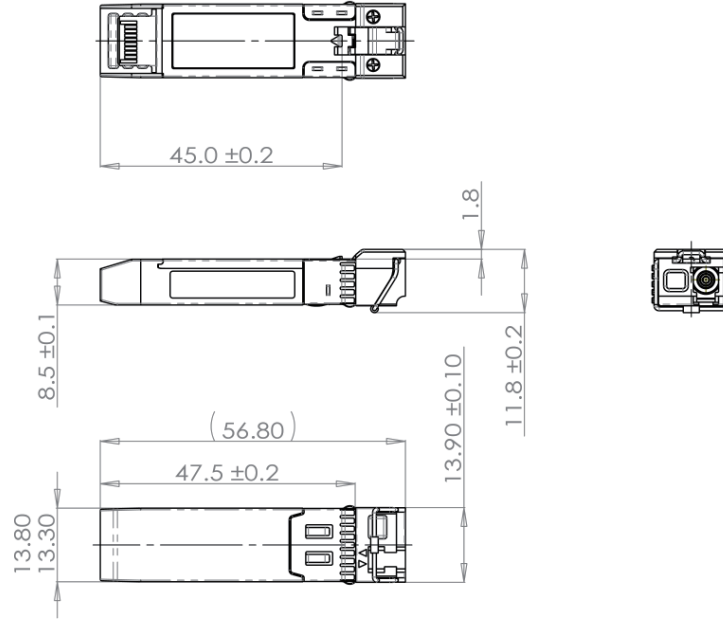
- Up to 25.78125Gbps Data Links
- 1310/1270nm DFB laser transmitter and 1270/1310nm PIN receiver
- Up to 10km on SMF
- Hot-pluggable SFP footprint
- Single LC/UPC type pluggable optical interface, Bi-directional
- Metal enclosure, for lower EMI
- RoHS compliant
- Support Digital Diagnostic Monitor interface
- Single +3.3V power supply
- Case operating temperature  
Industrial: -40°C to +85°C



# Transceiver

**25G SFP28 BIDI (10km)** BS3712L-IN & BS7312L-IN

## Dimensions



Unit: mm

## General Product Characteristics

Parameter	Value	Unit.	Comments
Module Form Factor	SFP28		Module form factor
Maximum Aggregate Data Rate	25.78125	Gb/s	
Supported Protocols	Ethernet		
Electrical Interface and Pin-out	20-pin edge connector		Pin-out as defined by SFF-8419
Management Interface	Serial, I <sup>2</sup> C-based, 400kHz maximum frequency		As defined by SFF-8419

## Absolute Maximum Parameters

Exceeding the limits below may damage the active optical cable permanently.

Parameter	Symbol	Min.	Typ.	Max.	Unit.	Ref.
Maximum Supply Voltage	V <sub>cc</sub>	-0.5		3.6	V	
Storage Temperature	T <sub>sto</sub>	-40		85	°C	
Case Operating Temperature	T <sub>op</sub>	-40		85	°C	
Relative Humidity (Non-condensing)	RH	0		85	%	

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### Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit.	Ref.
Supply Voltage	V <sub>cc</sub>	3.13	3.3	3.47	V	
Case Operating Temperature	T <sub>op</sub>	-40		85	°C	
Relative Humidity (Non-condensing)	RH	5		85	%	
I <sup>2</sup> C Clock Frequency	f		100	400	kHz	

### Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit.	Ref.
Transceiver Power Supply Current	I <sub>cc</sub>			450	mA	

#### Transmitter

Differential Data Input Voltage Peak to Peak Swing	V <sub>in,pp</sub>	200		900	mV	
Differential Input Impedance		90	100	110	Ohms	

#### Receiver

Differential Data Output Voltage Peak to Peak Swing	V <sub>opp</sub>	385		850	mV	
Differential Output Impedance	Z <sub>os</sub>	90	100	110	Ohms	

### Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit.	Note
<b>Transmitter</b>						
Signaling Speed Lane			25.78125±100ppm		Gb/s	
Optical Wavelength	λ	1260 1300	1270 1310	1280 1320	nm	BS7312L-IN BS3712L-IN
Spectral Width (-20dB)	Δλ <sub>rms</sub>			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Output Power	P <sub>out</sub>	-7		2	dBm	
Optical Modulation Amplitude	OMA	-4		2.2	dBm	
Optical Extinction Ratio	ER	3			dB	
Average Launch Power of OFF Transmitter	P <sub>OFF</sub>			-20	dBm	
Transmitter Reflectance				-26	dB	
Optical Return Loss Tolerance				20	dB	

#### Receiver

Signaling Speed Lane			25.78125±100ppm		Gb/s	
Optical Wavelength	λ	1300 1260	1310 1270	1320 1280	nm	BS7312L-IN BS3712L-IN
Average Receive Power	P <sub>rx</sub>	-13.3		2	dBm	
Maximum Receiver Power (OMA)				2.2	dBm	
Rx Sensitivity (OMA)	R <sub>SENS2</sub>			-12	dBm	BER=5e-5
Input Saturation Power (Overload)	PSAT	3			dBm	
Loss of Signal Assert	LOSA	-30			dBm	
Loss of Signal De-assert	LOSD			-17	dBm	
LOS Hysteresis	LOSH	0.5			dB	
Receiver Reflectance				-26	dB	

# Transceiver

## 25G SFP28 BIDI (10km) BS3712L-IN & BS7312L-IN



### Pin Configuration

Pin#	Symbol	Name/Description	Note	Pin#	Symbol	Name/Description	Note
1	VEET	Transmitter ground (Common with receiver ground)	1	11	VEER	Receiver ground (Common with transmitter ground)	1
2	TFAULT	Transmitter fault. Not supported		12	RD-	Receiver inverted data out.	
3	TDIS	Transmitter disable. PHY disabled on high or open	2	13	RD+	Receiver non-inverted data out.	
4	SDA	2-wire serial interface data Line		14	VEER	Receiver ground (Common with transmitter ground)	1
5	SCL	2-wire serial interface clock		15	VCCR	Receiver power supply	
6	MOD_ABS	Module Absent, connection to VeeT or		16	VCCT	Transmitter power supply	
7	RS0	Rate select 0, optionally controls		17	VEET	Transmitter ground (Common with receiver ground)	1
8	RX_LOS	Loss of signal indication		18	TD+	Transmitter non-inverted data in.	
9	RS1	Rate select 1, optionally controls		19	TD-	Transmitter inverted data in.	
10	VEER	Receiver ground (Common with transmitter ground)	1	20	VEET	Transmitter ground (Common with receiver ground)	1

- Notes:
1. Circuit ground is isolated from chassis ground.
  2. Open drain/collector and shall be pulled up to the Vcc host with a resistor in the range of 4.7kOhms to 10kOhms.
  3. Tx\_Disable is an input contact with a 4.7kOhms to 10kOhms pullup to VccT inside the module.
  4. SCL and SDA are pulled up to Vcc\_Host\_2w by resistors in the host.
  5. Rx\_LOS is an open drain/collector output. For a nominally 3.3 V Vcc\_Host using a resistive pull up to Vcc\_Host the resistor value shall be in the range 4.7kOhms to 10kOhms. For a nominally 2.5 V Vcc\_Host using a resistive pull up to Vcc\_Host the resistor value shall be in the range 4.7kOhms to 7.2kOhms.

### Pin Diagram

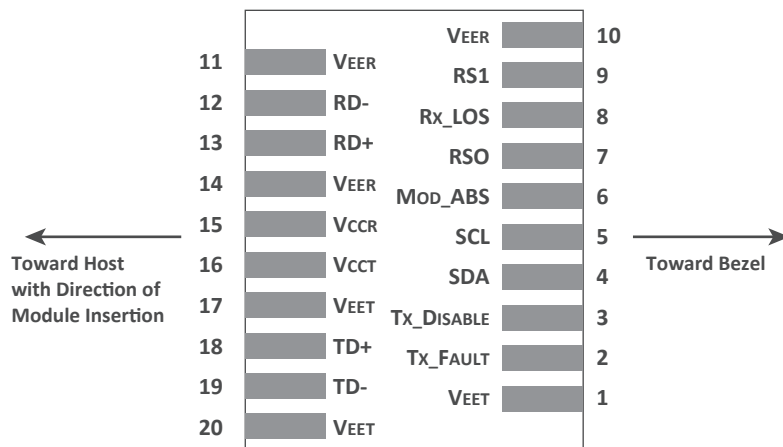


Diagram of Module Interface to Host

### Digital Diagnostic Specifications

Parameter	Symbol	Accuracy	Units	Notes
Transceiver Case Temperature	DMI_Temp	±3	°C	Over operating temp
Supply Voltage Monitor Absolute Error	DMI_VCC	±3%	V	Full operating range
Channel Bias Current Monitor	DMI_Ibias	±10%	mA	Per channel
Channel RX Power Monitor Absolute Error	DMI_RX	±3	dB	Per channel
Channel TX Power Monitor Absolute Error	DMI_TX	±3	dB	Per channel

#### OptiWorks Headquarters

##### OptiWorks, Inc.

47211 Bayside Parkway, Fremont, CA 94538, USA  
 Phone +1 510 438 4560  
 sales@optiworks.com  
 www.optiworks.com

#### OptiWorks (Kunshan) Co., Ltd.

No. 168, Nanhe Rd., Kunshan Economic & Technology Development Zone, Kunshan City, Jiangsu 215300, China  
 Phone +86 512 5763 0863  
 contact@optiworks.com

#### OptiWorks (Shanghai) Co., Ltd.

Room 810-811, Changchun Business Building, No. 953 Qinzhou North Road, Shanghai 200233, China  
 Phone +86 021 6485 8787  
 contact@optiworks.com

#### BizLink International Corp.

3F., No.186, Jian 1st Rd., Zhonghe Dist., New Taipei City 23553, Taiwan  
 Phone +886 2 8226 1000  
 websupport@bizlinktech.com