25G-SFP28-BD23(32)-30

25Gb/s SFP28 1270nm/1310nm 1310nm/1270nm BiDi 30km Transceiver

PRODUCT FEATURES

- Up to 25.78Gbps Data Links
- Up to 30km transmission on SMF
- 1270nm/1310nm 1310nm/1270nm DFB Laser and APD receiver
- Metal enclosure, for lower EMI
- 2-wire interface with integrated Digital Diagnostic monitoring
- Hot-pluggable SFP28 footprint
- Specifications compliant with SFF 8472
- Compliant with SFF-8402 with LC connector
- Single 3.3V power supply
- Power dissipation < 1.5 W Case operating temperature

  Commercial: 0°C to +70°C

  Extended: -10°C to +80°C

  Industrial: -40°C to +85°C

APPLICATIONS

- 25GBASE-LR/ER
- 24.33G CPRI
- Wireless

SATE CO., LIMITED / Web: www.sateoptics.com / Tel: +86 755 83156349 / E-mail: sales@sateoptics.com

PRODUCT DESCRIPTION

The transceiver consists of two sections: The transmitter section incorporates a DFB laser. And the receiver section consists of an APD photodiode integrated with a TIA. All modules satisfy class I laser safety requirements. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage.

Absolute Maximum Ratings

Parameter	Symbo	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40	-	85	ºC	
Relative Humidity	RH	5	-	95	%	
Power Supply Voltage	VCC	-0.3	-	4	V	
Signal Input Voltage	VSI	Vcc-0.3	-	Vcc+0.	V	
Rx Damage Threshold	PRdmg	-3	-		dBm	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	Tcase	0	-	70	ºC	25G-SFP28-BD23(32)-30
		-10		80	ºC	25G-SFP28-BD23(32)-30E
		-40		85	ºC	25G-SFP28-BD23(32)-30I
Power Supply Voltage	V_{CC}	3.14	3.3	3.47	V	
Power Supply Current	I_{CC}	-		450	mA	
Data Rate	BR		25.78		Gbps	TX Rate/RX Rate
Transmission Distance	TD			30	km	
Coupled fiber	Single mode fiber					9/125um SMF

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Average Launched Power	Po	1		6	dBm	
Average Launched Power(Laser Off)	Poff	-	-	-30	dBm	
Center Wavelength Range	λC	1260	-	1280	nm	1270Tx/1310Rx
		1300		1320	nm	1310Tx/1270Rx
Spectrum Bandwidth(-20dB)	Δ λ	-	-	1	nm	
Side-Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio	ER	4		-	dB	Note (1)
Output Eye Mask	Compliant with IEEE 802.3cc					Note (2)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Receiver						
Center Wavelength Range	λ_C	1300		1320	nm	1270Tx/1310Rx
		1260	-	1280	nm	1310Rx/1270Tx
Damage threshold		-3			dBm	
Receiver Sensitivity (OMA)	P_{sen1}	-	-	-17.5	dBm	Note (3)
Los Of Signal Assert	P_A	-35	-	-	dBm	
Los Of Signal De-assert	P_D	-	-	-19	dBm	
LOS -Hysteresis	P_{Hys}	0.5	2	6	dB	

Note:
Note (1): Measured with a PRBS 2_{31}-1 test pattern, @25.78Gb/s.
Note (2): Transmitter eye mask definition,Compliant with IEEE 802.3cc.
Note (3): Measured with Light source 1270nm/1310nm ER=4dB; BER =<5X10-5 @PRBS=2_{31}-1 NRZ.

Electrical Interface Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Transmitter Fault Output-High	V_{FaultH}	2	-	Vcc+0.3	V	
Transmitter Fault Output-Low	V_{FaultL}	0	-	0.8	V	
Transmitter Disable Voltage- High	V_{DisH}	2	-	Vcc+0.3	V	
Transmitter Disable Voltage- low	V_{DisL}	0	-	0.8	V	
Receiver						
LOS Output Voltage-High	V_{LOSH}	2	-	Vcc+0.3	V	
LOS Output Voltage-Low	V_{LOSL}	0	-	0.8	V	

Pin Description

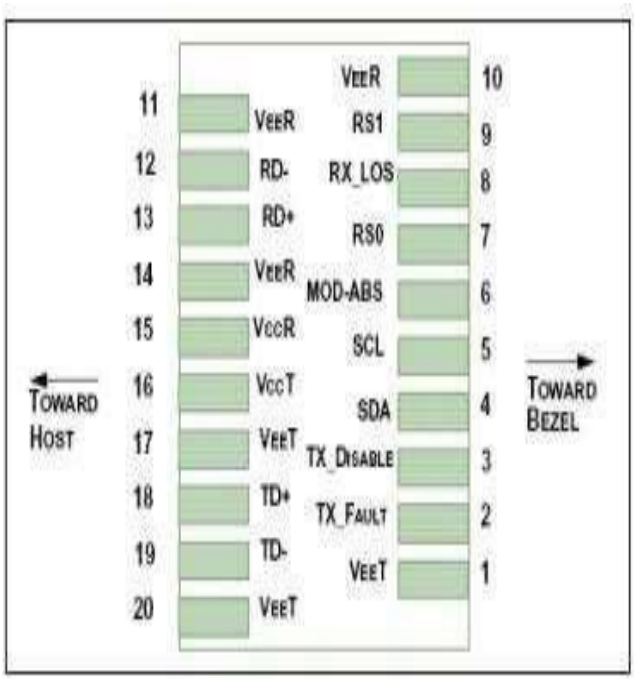


Diagram of Host Board Connector Block Pin Numbers and Name

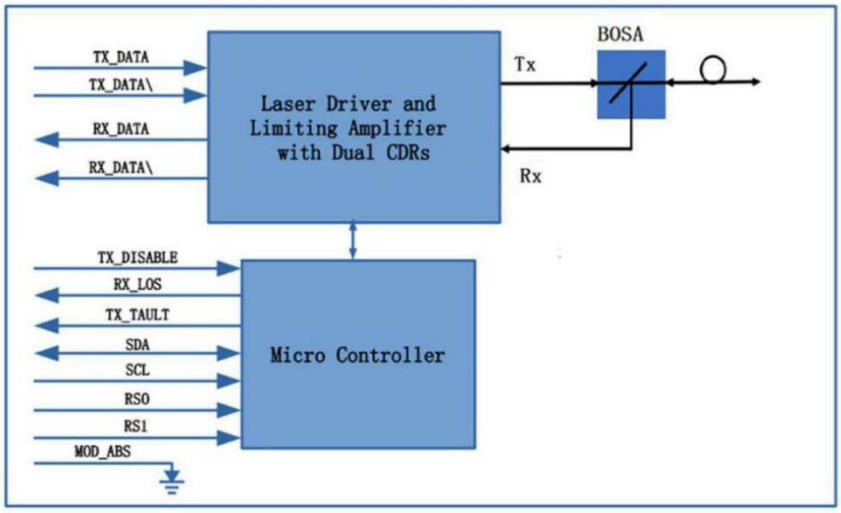
SATE CO., LIMITED / Web: www.sateoptics.com / Tel: +86 755 83156349 / E-mail: sales@sateoptics.com

Pin	Symbol	Name/Description	NOTE
1	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1
2	T_{FAULT}	Transmitter Fault.	2
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	4
5	SCL	2-wire Serial Interface Clock Line	4
6	MOD_ABS	Module Absent. Grounded within the module	4
7	RS0	Rate Select 0, internal pull down	5
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	6
9	RS1	Rate Select 1, internal pull down	5
10	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
11	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
15	V_{CCR}	Receiver Power Supply	
16	V_{CCT}	Transmitter Power Supply	
17	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1

Notes:

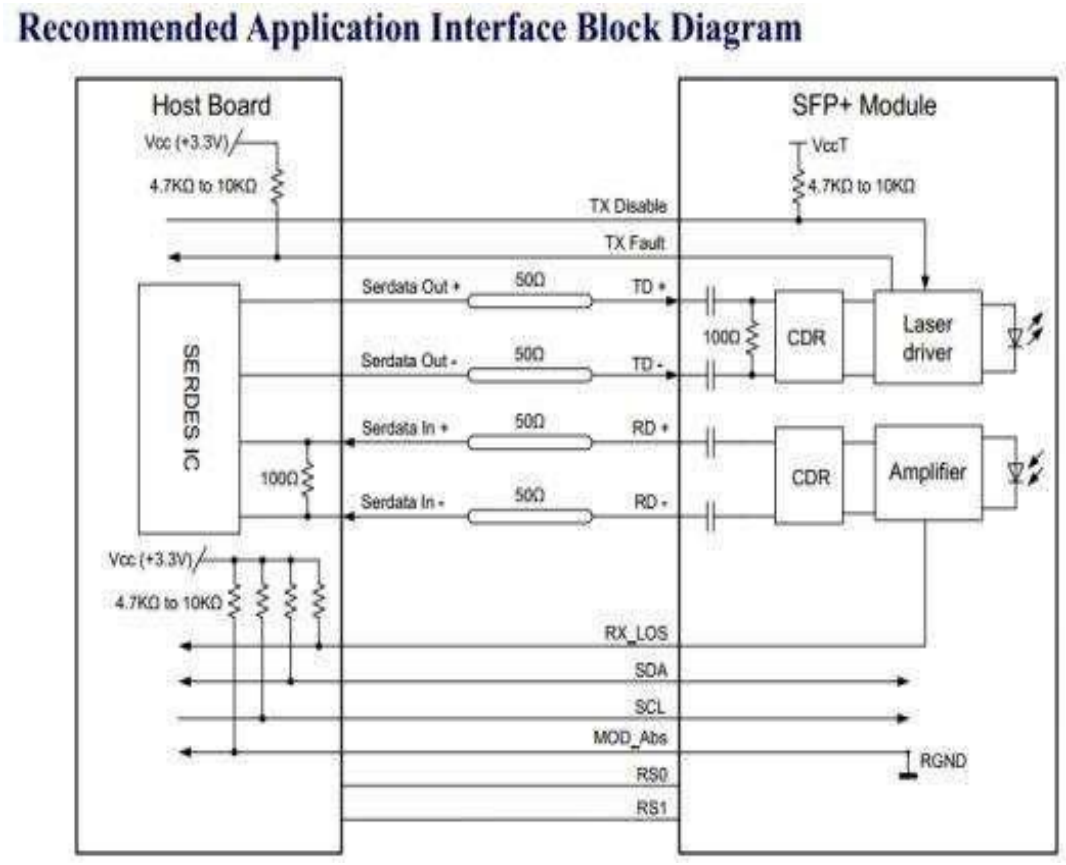
1. Circuit ground is internally isolated from chassis ground.
2. T_{FAULT} is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V.A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
3. Laser output disabled on T_{DIS}>2.0V or open, enabled on T_{DIS}<0.8V.
4. Should be pulled up with 4.7kΩ- 10kΩ host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
5. Rate select can also be set through the 2-wire bus in accordance with SFF-8472. Rx Rate Select is set at Bit 3, Byte 110, Address A2h. Tx Rate Select is set at Bit 3, Byte 118, Address A2h.
6. LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

Block Diagram of Transceiver

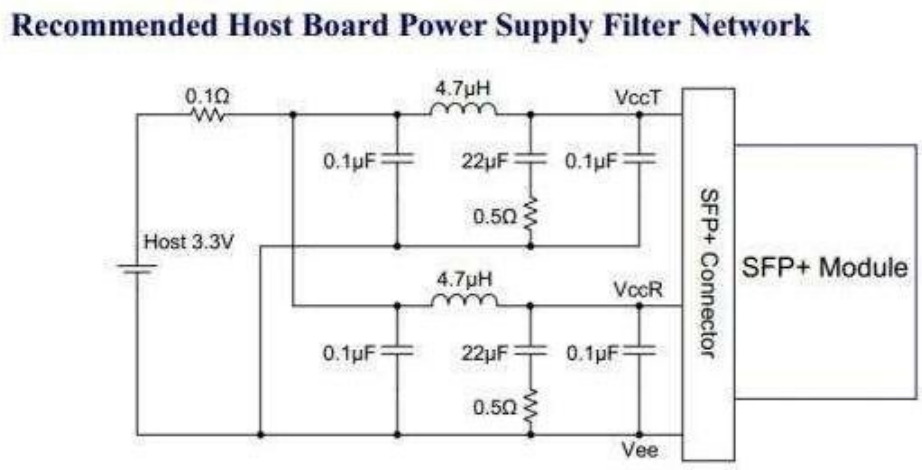


SATE CO., LIMITED / Web: www.sateoptics.com / Tel: +86 755 83156349 / E-mail: sales@sateoptics.com

Recommended Interface Circuit

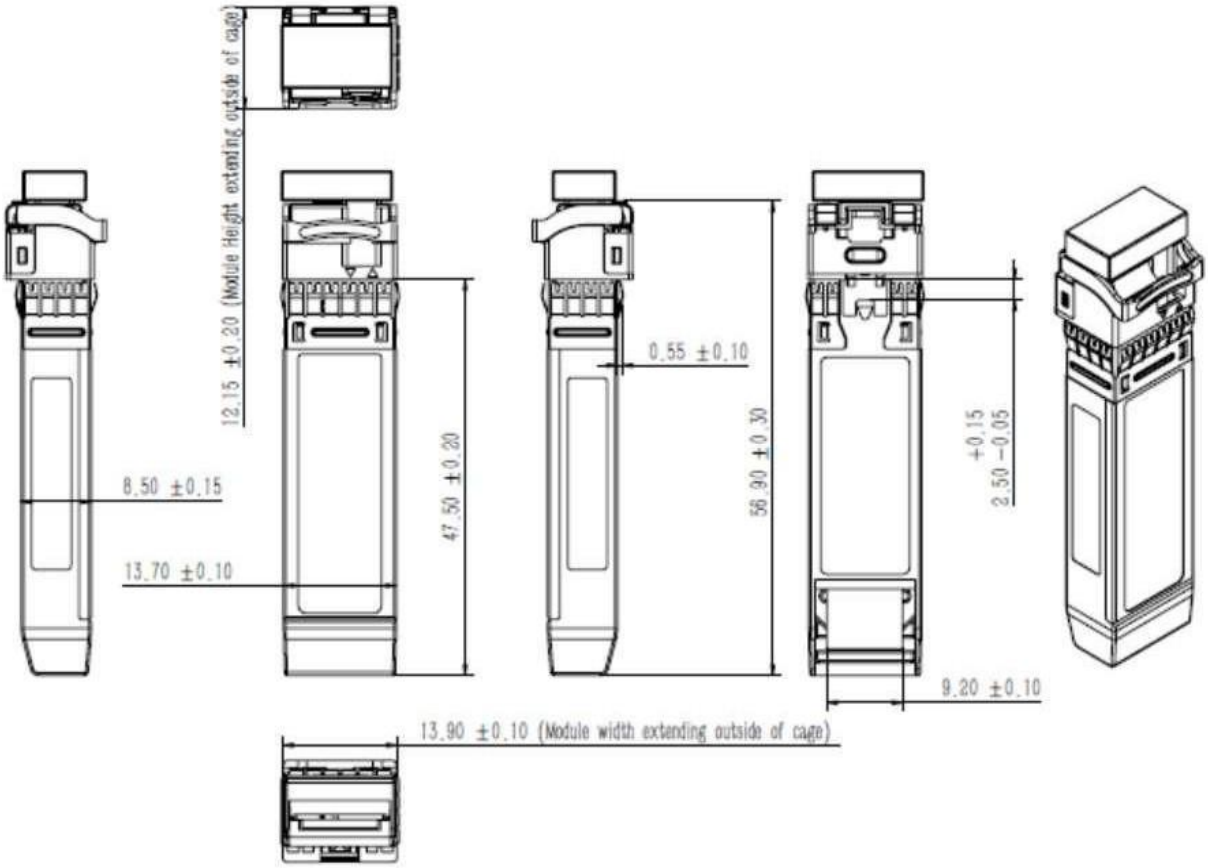


Recommended Filter for Voltage Supply



SATE CO., LIMITED / Web: www.sateoptics.com / Tel: +86 755 83156349 / E-mail: sales@sateoptics.com

Outline Dimensions



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 EN 60825-1:2014. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

Caution: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Document Revision

Version No.	Date	Description
1.00	2019-06-13	Initial release
1.10	2019-08-06	Update Outline Dimensions