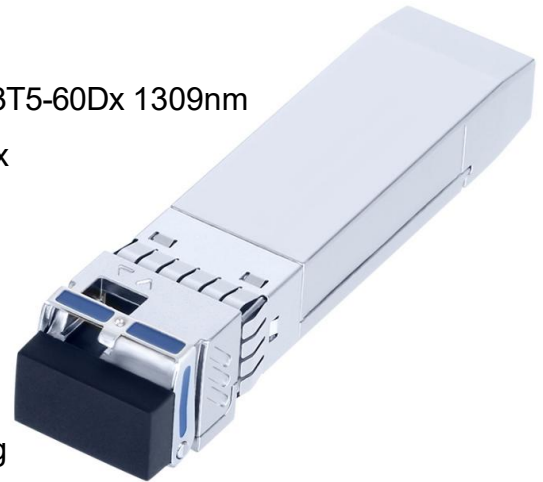


**SFP-BLxxT5-60Dx**  
25Gb/s SFP28 BIDI 60km DDM Transceiver

**PRODUCT FEATURES**

- All metal housing for superior EMI performance
- Support 25GE and CPRI, data rate up to 25.78125Gbps
- Link distance up to 40km single mode fiber without FEC Link  
distance up to 60km single mode fiber with FEC
- 1295nm EML Transmitter and APD receiver for SFP-BL23T5-60Dx 1309nm  
EML Transmitter and APD receiver for SFP-BL32T5-60Dx
- Low DC power consumption :
  - Commercial : <1.6W
  - Industrial : <1.8W
- High speed I/O electrical interface
- I2C interface with integrated Digital Diagnostic monitoring
- RoHS 6 compliance
- Compliant to IEEE 802.3cc, SFF-8402 and SFF-8419
- Complies with EU Directive 2015/863/EU
- Case Operating temperature ranges:
  - Commercial : 0 °C to 70 °C
  - Industrial : -40 °C to 85 °C



**APPLICATIONS**

- 25GBASE Ethernet

## Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units
Storage Temperature	T <sub>stg</sub>	-40	+85	°C
Case Operating Temperature (Commercial)	T <sub>o</sub>	0	+70	°C
Case Operating Temperature (Industrial)	T <sub>o</sub>	-40	+85	°C
Relative Humidity - Storage	RH <sub>s</sub>	5	95	%
Relative Humidity - Operating	RH <sub>o</sub>	5	85	%
DC Supply Voltage	VCC	0	3.6	V

### Notes:

1. Exceeding the Absolute Maximum Ratings may cause irreversible damage to the device.
2. The device is not intended to be operated under the condition of simultaneous Absolute Maximum Ratings, a condition which may cause irreversible damage to the device.

## Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units
Case Operating Temperature (Commercial)	T <sub>case</sub>	0		+70	°C
Case Operating Temperature (Industrial)		-40		+85	°C
Supply Voltage	VCC	3.13		3.46	V
Power Supply Current(Commercial)	I <sub>cc</sub>			480	mA
Power Supply Current(Industrial)				540	

## Electrical Characteristics

High-Speed Signal: Compliant to CEI-28G-VSR

Low-Speed Signal: Compliant to SFF-8419

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
<b>Transmitter (Module Input)</b>						
Differential Data Input Amplitude	V <sub>IN,P-P</sub>			900	mVpp	
Differential Impedance		90	100	110	Ω	
Tx_Disable	Normal Operation	V <sub>IL</sub>	-0.3	0.8	V	
	Laser Disable	V <sub>IH</sub>	2.0	V <sub>CC</sub> +0.3	V	

Receiver (Module Output)						
Differential Data Output Amplitude	$V_{OUT,P-P}$			900	mVpp	
Differential Termination Mismatch(1MHZ)				10	%	
Differential Impedance		90	100	110	$\Omega$	
Rx_LOS	Normal Operation	$V_{OL}$	-0.3		0.4	V
	Loss Signal	$V_{OH}$	2		$V_{CCHOST}$	V

## Optical Characteristics

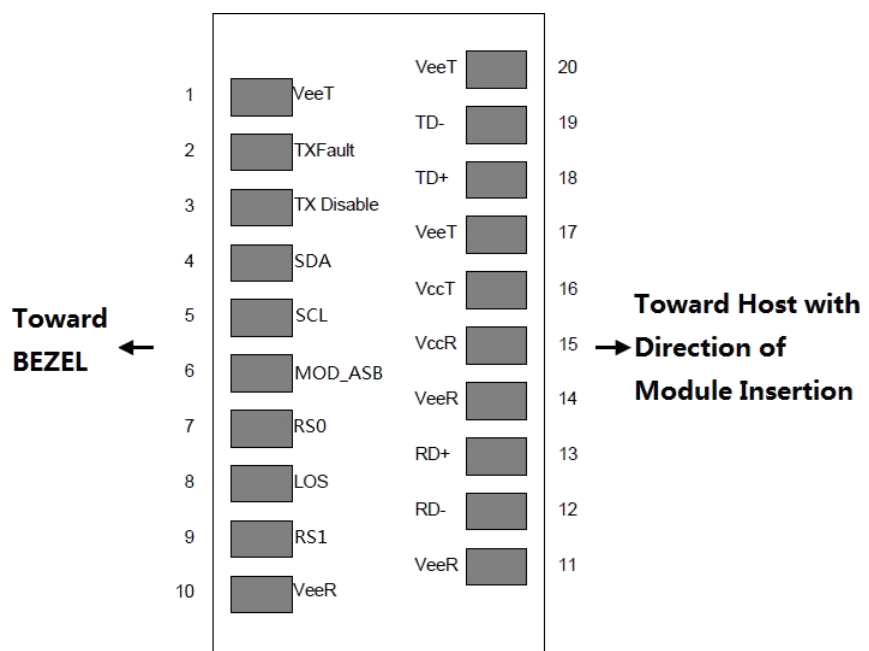
Parameter	Symbol	Min	Typ	Max	Units	Notes
<b>Transmitter</b>						
Optical Modulation Amplitude(OMA)	POMA	2		6	dBm	
Average Output Power	POUT	1		6	dBm	
Average Output Power(Laser Off)	POFF			-30	dBm	
Wavelength	$\lambda$	1281		1297	nm	SFP-BL23T5-Dx
		1306		1322		SFP-BL32T5-Dx
Spectrum Bandwidth @ -20dB	$\Delta\lambda$			1	nm	
Side mode suppression ratio(SMSR)	SMSR	30			dB	
Extinction ratio	ER	4			dB	
Transmitter and dispersion penalty(TDP)				2.7	dB	
RIN20OMA	RIN			-130	dB/Hz	
Transmitter Reflectance (max)	TFL			-26	dB	
<b>Receiver</b>						
Wavelength	$\lambda$	1306		1322	nm	SFP-BL23T5-Dx
		1281		1297		SFP-BL32T5-Dx
Receiver sensitivity (OMA)(40km)	$R_{SEN-OMA}$			-19	dBm	40km NO FEC
Receiver sensitivity (OMA)(60km)	$R_{SEN-OMA}$			-21	dBm	60km With FEC

Optical Power Overload	P <sub>IN</sub> (SAT)	-4			dBm	
Rx_LOS of Signal Assert	PA	-35			dBm	
Rx_LOS of Signal De-assert	PD			-21	dBm	
Rx_LOS of Signal Hysteresis	PHy	0.5		5	dB	

### Digital Diagnostic Functions

Parameter	Range	Accuracy	Unit	Calibration
Temperature	-40 to 85	±3	°C	Internal
Voltage	3.13 to 3.47	±3%	V	Internal
Tx Bias Current Per Lane	0 to 100	±10%	mA	Internal
Tx Output Power Per Lane	0 to 6	±3	dBm	Internal
Rx Power	-21 to -4	±3	dBm	Internal

### Pin Diagram



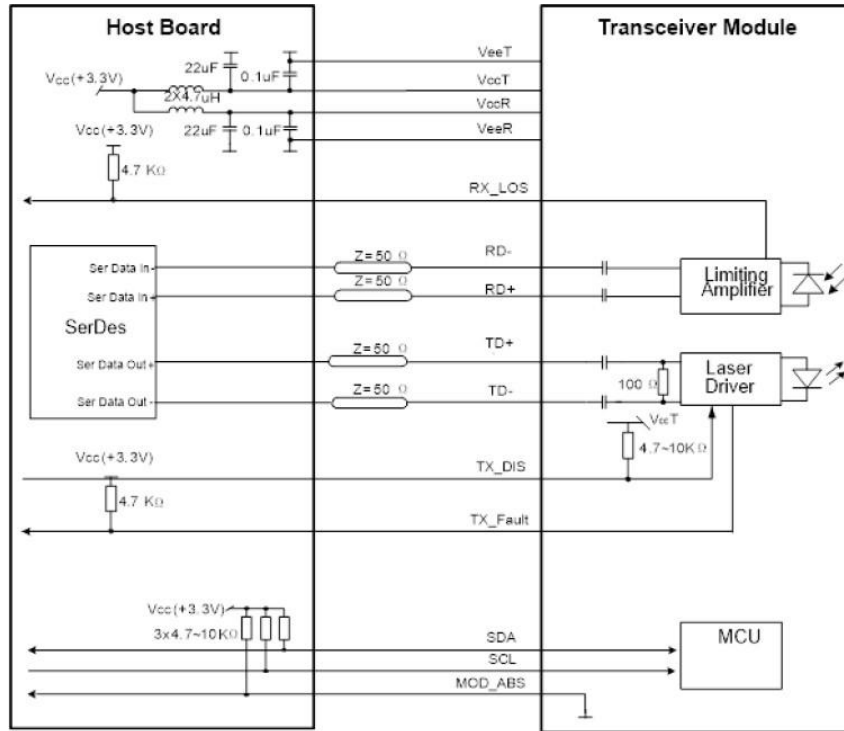
## Pin Descriptions

PIN	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground	1
2	Tx_Fault	Transmitter Fault - High indicates a fault condition	2
3	Tx_Disable	Transmitter Disable – High or open disables the transmitter	
4	SDA	2-wire Serial Interface Data Line (MOD-DEF2)	3
5	SCL	2-wire Serial Interface Clock (MOD-DEF1)	3
6	MOD_ABS	Module Absent, connected to VeeT or VeeR in the module	
7	RS0	Rate Select 0	5
8	RX_LOS	Receiver Loss of Signal(LVTTL-O). Logic 0 indicates normal operation	4
9	RS1	Rate Select 1	5
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Inverse Received Data out (CML-O), AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	VeeR	Receiver Ground	1
15	VccR	Receiver Power Supply	
16	VccT	Transmitter Power Supply	
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VeeT	Transmitter Ground	1

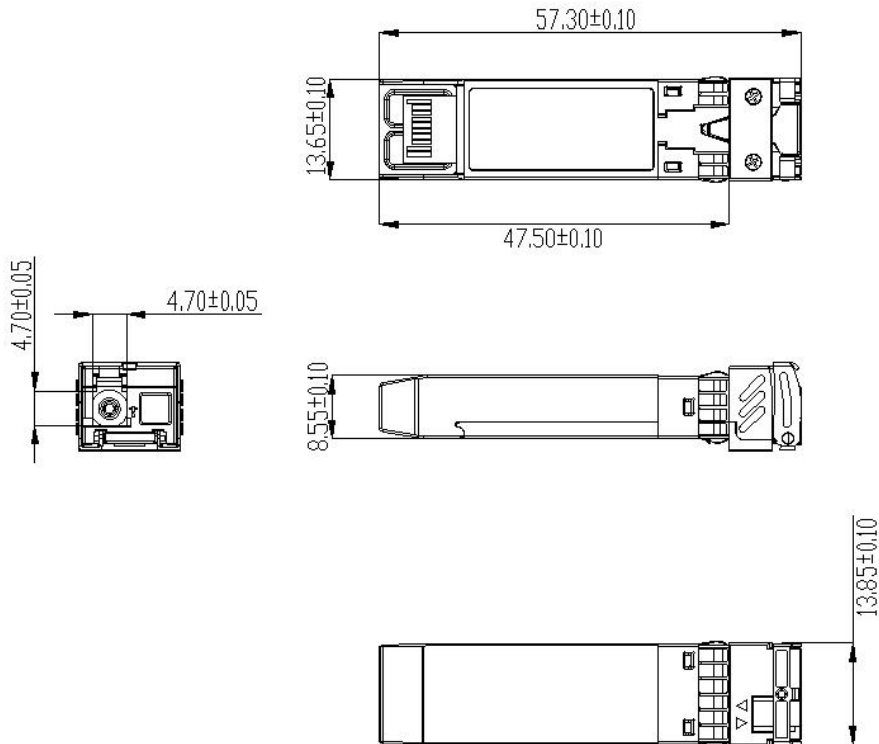
### Note:

1. Module ground pins GND are isolated from the module case.
2. Tx\_Fault is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on Host board.
3. Should be pulled up with 4.7k–10kohms on host board to a voltage between 2.0V and 3.6V.
4. LOS is open collector output. Should be pulled up with 4.7k–10kohms on host board to a voltage between 2.0V and 3.6V.
5. RS0 and RS1 pins are pulled low to GND with a resistor > 30KΩ in module.

### Recommend Circuit Schematic



### Mechanical Specifications(Unit: mm)



## Ordering information

Part Number	Product Description
SFP-BL23T5-60DC	1295T/1309R, 25.78Gbps, LC, 60km, 0°C~+70°C, with FEC
SFP-BL23T5-60DI	1295T/1309R, 25.78Gbps, LC, 60km, -40°C~+85°C, with FEC
SFP-BL32T5-60DC	1309T/1295R, 25.78Gbps, LC, 60km, 0°C~+70°C, with FEC
SFP-BL32T5-60DI	1309T/1295R, 25.78Gbps, LC, 60km, -40°C~+85°C, with FEC

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