

Light Optics

Building a brighter future

LO-SP-10G-2S3-60
10G BIDI SFP+ Transceiver
10GBASE-BX

Product Features

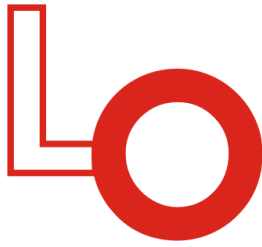
- Electrical interface specifications per SFF-8431
- Management interface specifications per SFF-8431 and SFF-8472
- SFP+ MSA package with Single LC receptacle
- 1270nm DFB Laser, APD photo-detector
- Up to 10.5G bi-directional data links
- Single +3.3V power supply
- Class 1 laser safety certified
- Operating temperature Options
 - (Commercial) 0°C to +70°C
- Up to 60km on 9/125µm SMF
- RoHS Compliant

Applications

- 10GBASE-BX Ethernet
- Other high speed data connections

Ordering Information

Part Number	Transmitter	Output Power	Receiver	Sensitivity	Reach	Temp	DDM	RoHS
LO-SP-10G-2S3-60	1270nm DFB	0 ~ +5dBm	1330nm APD	< -20dBm	60km	0 ~ 70°C	Available	Compliant



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Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Unit
Storage Temperature	T_S	-40	85	$^{\circ}\text{C}$
Relative Humidity	RH	5	95	%
Supply Voltage	V_{CC}	-0.3	4.0	V

Recommended Operating Conditions

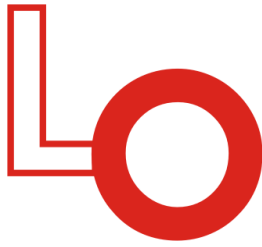
Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	LO-SP-10G-2S3-60 T_C	0	25	70	$^{\circ}\text{C}$
Supply Voltage	V_{CC}	3.135	3.3	3.465	V
Data Rate	-	9.95	-	10.52	Gb/s

Transceiver Electrical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes	
Module Supply Current	I_{CC}	-	-	450	mA	-	
Power Dissipation	P_D	-	-	1200	mW	-	
Transmitter							
Input Differential Impedance	Z_{IN}	-	100	-	Ω	-	
Differential Data Input Swing	$V_{IN, P-P}$	180	-	700	mV _{P-P}	-	
TX_FAULT	Transmitter Fault	V_{OH}	2.0	-	V_{CCHOST}	V	-
	Normal Operation	V_{OL}	0	-	0.8	V	-
TX_DISABLE	Transmitter Disable	V_{IH}	2.0	-	V_{CCHOST}	V	-
	Transmitter Enable	V_{IL}	0	-	0.8	V	-
Receiver							
Output Differential Impedance	Z_O	-	100	-	Ω	-	
Differential Data Output Swing	$V_{OUT, P-P}$	400	-	850	mV _{P-P}	1	
Data Output Rise Time, Fall Time	t_r, t_f	-	-	60	ps	2	
RX_LOS	Loss of signal (LOS)	V_{OH}	2.0	-	V_{CCHOST}	V	3
	Normal Operation	V_{OL}	0	-	0.8	V	3

Notes:

- Internally AC coupled, but requires a external 100 Ω differential load termination.
- 20–80%.
- LOS is an open collector output. Should be pulled up with 4.7k Ω on the host board.



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Transmitter Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Launch Optical Power	P _o	0	-	+5	dBm	1
Center Wavelength Range	λ _c	1260	1270	1280	nm	-
Extinction Ratio	EX	3.5	-	-	dB	2
Optical Modulation Amplitude	OMA	-5.2	-	-	dBm	
Spectral Width (-20dB)	Δλ	-	-	1	nm	-
Side Mode Suppression Ratio	SMSR	30	-	-	dB	-
Relative Intensity Noise	RIN			-128	dB/Hz	
P _{out} @TX-Disable Asserted	P _{off}	-	-	-35	dBm	1

Notes:

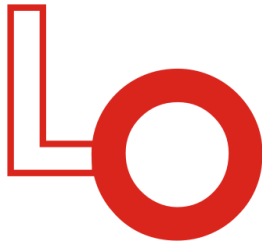
1. The optical power is launched into 9/125μm SMF.
2. Measured with a PRBS 2³¹-1 test pattern @10.3125Gbps.

Receiver Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Center Wavelength	λ _c	1320	1330	1340	nm	-
Receiver Sensitivity (P _{avg})	S	-	-	-20	dBm	1
Receiver Overload (P _{avg})	P _{OL}	-7	-	-	dBm	1
Optical Return Loss	ORL	12	-	-	dB	-
LOS De-Assert	LOS _D	-	-	-21	dBm	-
LOS Assert	LOS _A	-30	-	-	dBm	-
LOS Hysteresis	-	0.5	-	-	dB	-

Notes:

1. Measured with PRBS 2³¹-1 test pattern, 10.3125Gb/s, BER<10⁻¹².



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Mechanical specifications

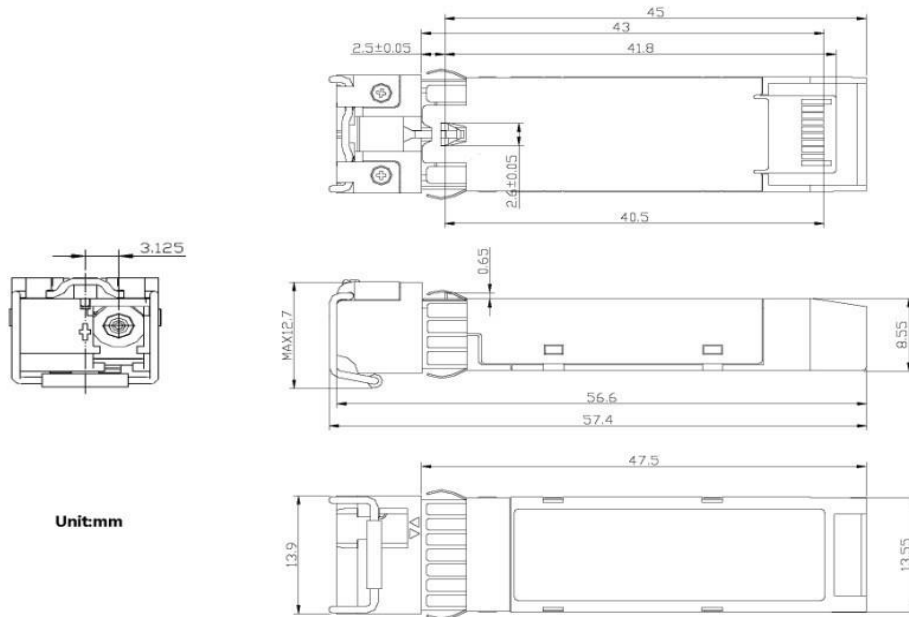


Figure 5. Outline Drawing