

SPP-LR20-xx

10Gb/s 20km 1310nm SFP+ Optical Transceiver

Optomark's SPP-LR-xx Small Form Factor Pluggable 10 Gb/s (SFP+) is compliant with the current Multi-Sourcing Agreement (MSA) SFF-8431 and SFF-8472, revision 10.4, are designed for 10G Ethernet serial optical data communication up to 10km on single mode fiber. They are compliant with IEEE Std. 802.3-2005 10Gb Ethernet 10GBase-LR/LW and 10G Fiber Channel 1200-SM-LL-L.



Product Features

- Compliant to IEEE Std. 802.3-2005 10GBASE-LR /LW
- Electrical interface compliant to SFF-8431
- Management interface compliant with SFF-8431 and SFF-8472
- SFP+ MSA package with duplex LC connector
- Uncooled 1310nm DFB Laser, PIN receiver
- Up to 10.3Gb/s bi-directional data links
- Single 3.3V power supply
- Case operating temperature range: 0°C to 70°C (Commercial) / -40°C to 85°C (Industrial)
- Up to 10Km on 9/125um SMF
- Class 1 Laser Safety certified
- RoHS Compliant

Applications

- 10G Ethernet 10GBASE-LR/LW
- 10G Fiber Channel 1200-SM-LL-L

SPECIFICATIONS

Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Unit	Notes
Storage Temperature	T_s	-40	85	°C	
Relative Humidity	RH	5	95	%	
Supply Voltage	V_{CC}	-0.5	4.0	V	

Recommended Operating Conditions

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Operating Case Temperature	T_c	0	25	70	°C	
Supply Voltage	V_{CC}	3.135	3.3	3.465	V	
Data Rate	-	-	10.3125	-	Gb/s	

Electrical Characteristics

Parameter		Symbol	Minimum	Typical	Maximum	Unit	Notes
Module Supply Current		I_{CC}	-	-	290	mA	-
Power Dissipation		P_D	-	-	1000	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		$V_{OUT, P-P}$	300	-	850	mV _{P-P}	1
Data Output Rise Time, Fall Time		t_r, t_f	28	-	-	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

Note:

1. Internally AC coupled, but requires a external 100 Ω differential load termination.
2. 20 – 80 %.
3. LOS is an open collector output. Should be pulled up with 4.7k Ω on the host board.

SPECIFICATIONS

Transmitter Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Launch Optical Power	P _o	-6	-	+0.5	dBm	1
Center Wavelength Range	λ_c	1260	1310	1355	nm	-
Extinction Ratio	EX	3.5	-	-	dB	2
Optical Modulation Amplitude	OMA	-5.2	-	-	dBm	
Spectral Width (-20dB)	$\Delta\lambda$	-	-	1	nm	-
Side Mode Suppression Ratio	SMSR	30	-	-	dB	-
Transmitter and Dispersion Penalty	TDP	-	-	3.2	dB	-
Optical Return Loss Tolerance	ORLT	-	-	12	dB	-
Pout @TX-Disable Asserted	P _{off}	-	-	-30	dBm	1
Eye Diagram	IEEE Std 802.3-2005 10Gb Ethernet 10GBASE-LR compatible					

Note:

1. The optical power is launched into 9/125 μ m 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	1260	1310	1355	nm	-
Receiver Sensitivity (P _{avg})	S	-	-	-16	dBm	1
Receiver Overload (P _{avg})	P _{OL}	0.5	-	-	dBm	1
Stressed Sensitivity (OMA)	-	-	-	-10.3	dBm	2
Optical Return Loss	ORL	12	-	-	dB	-
LOS De-Assert	LOS _D	-	-	-17	dBm	-
LOS Assert	LOS _A	-30	-	-	dBm	-
LOS Hysteresis	-	0.5	-	-	dB	-

Note:

1. Measured with PRBS 2³¹-1 test pattern, 10.3125Gb/s, BER<10⁻¹².
2. Comply with IEEE 802.3-2005.

IMPORTANT NOTICE

In accordance with the Optomark policy of continuous improvement specifications may change without notice. Further details are available from Optomark representative.