

# 50 Mb/s - 2.97 Gb/s Transceivers 1310 nm, Single Mode, 2-40 km SDI SFP Dual LC Connector



SDI Video Small Form Pluggable (SDI SFP)

## Description

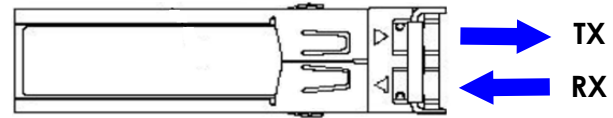
OptixCom's advanced video SFP optical transceivers are deployed for the increasing demand of high definition video applications over a long distance. The design supports pathological patterns for SD, ED, HD, and 3G SDI (Serial Digital Interface) signals from 50 Mb/s to 3 Gb/s. The high data rate enables crystal clear video resolution with minimum degradation. In addition to standard optical transceiver components used in the module, a micro-controller IC is utilized to process video signals. This electrical-optical interface is also compatible with SMPTE 297-2006 standard and SFP Multi-Source Agreement (MSA) package specifications.

This particular transceiver module supports a two-way optical video link. The transceiver has >14 dB power budget for 2 km, >16 dB for 20 km, and >20 dB for 40 km of transmission distance with standard single mode fibers. This product is RoHS compliant and typical power consumption is < 1.5 W.



Lead-Free

**SDI-2970LX-TRXXK**  
(XX = 2, 20, 40)



## Key Features

- 1310 nm single mode optical transceiver
- 50 Mb/s – 3 Gb/s; SMPTE 297-2006 compatible
- 14–20 dB power budget for 2–40 km distance
- Support SMPTE 424M/292M/297M/259M
- Duplex LC connector optical interface
- Single 3.3V power supply
- Z-axis hot pluggable
- SFF-8472 MSA Compliant
- RoHS compliant

## Applications

- ✓ Serial Digital Interface (SDI) standard
- ✓ SMPTE 297-2006 compatible electrical-optical interface
- ✓ Remote digital display systems or security surveillance
- ✓ Professional video broadcast
- ✓ Digital cinema system

## Ordering Information

**Part Number:** SDI-2970LX-TRXXK

### Description:

1310 nm, 50 Mb/s to 2.97 Gb/s, single mode, SDI video SFP optical transceivers, XX km reach, 0-70°C

**XX = 2, 20, 40**

## Operating Conditions

Parameter	Min.	Typical	Max.	Units
Operate Temperature	0	25	70	°C
Data Rate	50	2970	3000	Mb/s
Supply Voltage	3.15	3.3	3.45	V
Supply Current	---	---	450	mA

**U.S.A. Office: Optix Communications, Inc.**

17901 Von Karman Avenue, Suite 600,  
Irvine, CA 92614

Tel: (949) 679-5712 Fax: (949) 420-2134

<http://www.OptixCom.com>

<http://www.OpticalTransceiver.com>

Email: [Support@OptixCom.com](mailto:Support@OptixCom.com)

**Germany Office: OptixCom GmbH**

Freiherr vom Stein Strasse 19, 60323  
Frankfurt am Main, Germany

Tel: +49 (0)69 7953-3646

(XX = 2, 20, 40)

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Storage Temperature	$T_{st}$	-40	85	°C
Humidity	$R.H.$	---	85	%
Soldering Temperature (10 sec. on leads)	$T_{sd}$	---	260	°C

### Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Input Voltage <sup>1</sup>	$\Delta V_i$	0.4	---	1.8	V
Differential Input Impedance <sup>2</sup>	$Z$	90	100	110	ohm
Optical Output Power (2 km) <sup>3</sup>	$P_o$	-8	-3	0	dBm
Optical Output Power (20 km) <sup>3</sup>	$P_o$	-6	-2	0	dBm
Optical Output Power (40 km) <sup>3</sup>	$P_o$	-2	0	+3	dBm
Optical Wavelength	$\lambda_o$	1260	1310	1360	nm
Spectral Width (-20 dB)	$\Delta\lambda$	---	---	1	nm
Side Mode Suppression Ratio	$SMSR$	30	---	---	dB
Extinction Ratio	$ET$	5	8	---	dB
Rise/Fall Time (20% - 80%)	SD-SDI	---	---	1500	ps
	HD-SDI	$T_r/T_f$	---	270	
	3G-SDI	---	---	135	
Total Jitter PRBS & Color Bar	SD-SDI	---	70	200	ps
	HD-SDI	$T_j$	---	135	
	3G-SDI	---	70	100	
Total Jitter Pathological	SD-SDI	---	200	300	ps
	HD-SDI	$T_j$	---	115	
	3G-SDI	---	120	---	

Notes:

1. Applied to AC LVPECL I/O coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.
3. Output of coupling optical power into 9/125  $\mu$ m SMF.

**Class 1 Laser Product**  
Complies with  
**21 CFR 1040.10 and 1040.11**

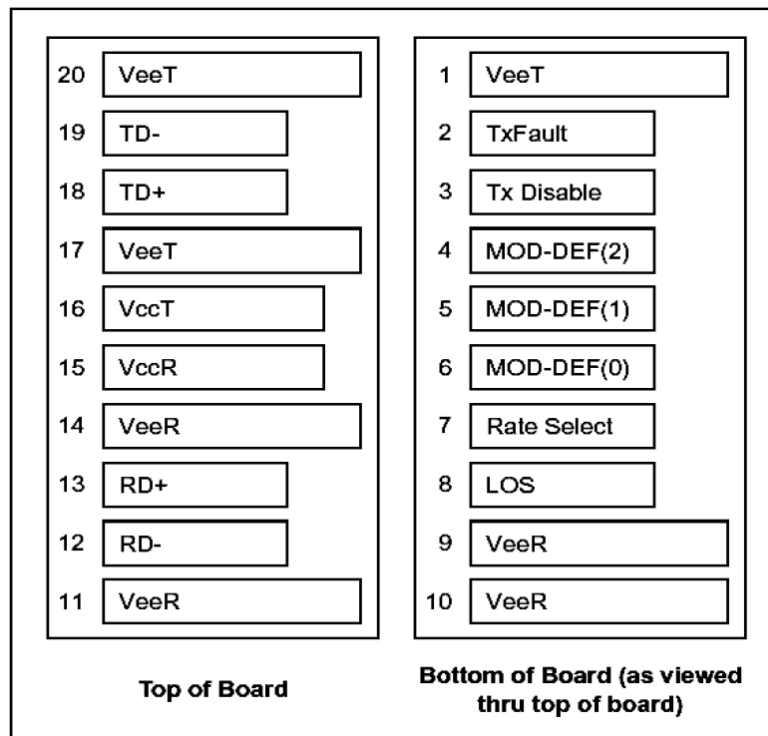


(XX = 2, 20, 40)

**Transmitter Electro-Optical Characteristics (Cont'd)**

Parameter	Symbol	Min.	Typical	Max.	Units
TX Disable Voltage – High	$V_{DH}$	2.0	---	$V_{CC}$	V
TX Disable Voltage - Low	$V_{DL}$	0	---	0.8	V
TX Fault Output - High	$V_{FH}$	2.0	---	$V_{CC}$	V
TX Fault Output - Low	$V_{FL}$	0	---	0.8	V
TX Disable Assert Time	$T_{ass}$	---	---	10	$\mu$ s
TX Disable Deassert Time	$T_{disass}$	---	---	1.0	ms
Serial ID Clock Rate	$f_c$	---	---	280	kHz
Time to Initialize	$T_{as}$	---	---	300	ms
TX Fault from Fault to Assertion	$T_{fault}$	---	---	100	$\mu$ s
TX Disable Time to Start Reset	$T_{reset}$	10	---	---	$\mu$ s

**PIN Assignment and Description**



Class 1 Laser Product  
Complies with  
21 CFR 1040.10 and 1040.11



**Receiver Electro-Optical Characteristics**

Parameter	Symbol	Min.	Typical	Max.	Units
Differential Output Voltage <sup>1</sup>	$\Delta V_i$	0.6	0.8	1.0	V
Differential Impedance <sup>2</sup>	Z	90	100	110	ohm
RX Signal Loss – Deasserted	$P_{RL-}$	-29	---	---	dBm
RX Signal Loss – Asserted	$P_{RL+}$	---	---	-22	dBm
Receiver Overload	$P_{max}$	+0	---	---	dBm
Optical Wavelength	$\lambda_o$	1260	---	1580	nm
Signal Detect Hysteresis	$P_{RL+} - P_{RL-}$	1	---	---	dB
Receiver Sensitivity (PBRs) <sup>3</sup>	SD-SDI	---	---	-25	dBm
	HD-SDI	$P_i$	---	-23	
	3G-SDI	---	---	-22	
Receiver (Pathological) <sup>3</sup>	SD-SDI	---	---	-25	dBm
	HD-SDI	$P_i$	---	-23	
	3G-SDI	---	---	-22	
Rise/Fall Time (20% - 80%)	SD-SDI	---	---	1500	ps
	HD-SDI	$T_r/T_f$	---	270	
	3G-SDI	---	---	135	
Total Jitter PRBS & Color Bar	SD-SDI	---	70	200	Ps
	HD-SDI	$T_j$	50	135	
	3G-SDI	---	70	100	
Total Jitter Pathological	SD-SDI	---	200	300	ps
	HD-SDI	$T_j$	115	---	
	3G-SDI	---	120	---	
RX Signal Loss Output - High	$V_{RL+}$	2.0	---	$V_{cc}$	V
RX Signal Loss Output - Low	$V_{RL-}$	0	---	0.8	V
RX Signal Loss Assert Time	$T_{RL+}$	---	---	100	$\mu s$
RX Signal Loss Deassert Time	$T_{RL-}$	---	---	100	$\mu s$

Notes:

1. Applied to AC LVPECL I/O coupling. See the design guide for proper termination.
2. Single ended will be 50 ohm for each signal line.
3. Test at 3 Gb/s, 2<sup>7</sup> - 1 PRBS data pattern, and > 1x10<sup>-12</sup> of Bit-Error-Rate (BER)

**Class 1 Laser Product**  
Complies with  
**21 CFR 1040.10 and 1040.11**

