

SDI Video Optical Modules Small Form Pluggable



Features

- 1310 and 1550 nm single mode, 50 Mb/s to 2.97 Gb/s
- SD, ED, HD, and 3G SDI for all video resolutions
- One-way transmitters or receivers, and 2-way transceivers
- 3 Gb/s data rate with 1080p video resolution up to 40 km
- Duplex LC connector, Z-axis hot pluggable

Applications

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



SDI Video SFP

Products Selection Guide

| Part Number * | Wavelength | Data Rate | Power Budget | Distance** | Temp. Range |
|-----------------------------------|--------------|-----------|---------------|------------|-------------|
| Dual-Channel Transmitter | | | | | |
| SDI-2970LX-2T2K | 1310 nm | 2.97 Gb/s | > -8dB (TX) | 2 km | 0 – 70°C |
| SDI-2970LX-2T20K | 1310 nm | 2.97 Gb/s | > -6dB (TX) | 20 km | 0 – 70°C |
| SDI-2970LX-2T40K | 1310 nm | 2.97 Gb/s | > -2dB (TX) | 40 km | 0 – 70°C |
| SDI-2970EX-2T40K | 1550 nm | 2.97 Gb/s | > -2dB (TX) | 40 km | 0 – 70°C |
| Dual-Channel Receiver | | | | | |
| SDI-2970EX-2R40K | 1260-1580 nm | 2.97 Gb/s | > -22 dB (RX) | 40 km | 0 – 70°C |
| Single-Channel Transceiver | | | | | |
| SDI-2970LX-TR2K | 1310 nm | 2.97 Gb/s | > 14 dB | 2 km | 0 – 70°C |
| SDI-2970LX-TR20K | 1310 nm | 2.97 Gb/s | > 16 dB | 20 km | 0 – 70°C |
| SDI-2970LX-TR40K | 1310 nm | 2.97 Gb/s | > 20 dB | 40 km | 0 – 70°C |
| SDI-2970EX-TR40K | 1550 nm | 2.97 Gb/s | > 20 dB | 40 km | 0 – 70°C |

*: Add "-T" in the Part Number for products with extended temperature range -40–85 °C. For example, SDI-2970LX-2T2K-T.

** : The indicated distance is for reference only, not guaranteed specifications. The actual transmission distance depends on system configuration and power budget. For single mode fibers, the typical loss is 0.25 dB/km @ 1550 nm and 0.35 dB/km @ 1310 nm.

Dual Channel Transmitters 1310 nm Single Mode, 2-40 km SDI SFP Dual LC Connector



SDI Video Small Form Pluggable (SDI SFP)

Description

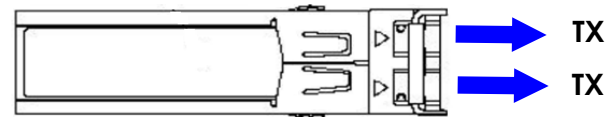
OptixCom's video SFP optical modules are deployed for the increasing demand of high definition video applications over a long distance. The design supports pathological patterns for SD, ED, HD, and 3G SDI (Serial Digital Interface) signals from 50 Mb/s to 3 Gb/s. The high data rate enables crystal clear 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 optical module supports two channels of transmitter for one-way video transmission. 1310 nm laser is used with a typical transmission distance of 2-40 km. This product is RoHS compliant and typical power consumption is < 1.7 W.



Lead-Free

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



Key Features

- 1310 nm single mode
- Dual transmitter channels
- 50 Mb/s – 3 Gb/s, 2-40 km reach
- SMPTE 297-2006 compatible
- Support SMPTE 424M/292M/297M/259M
- Duplex LC connector optical interface
- Single 3.3 V 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-2TXXK

Description:

1310 nm, 50 Mb/s to 2.97 Gb/s, single mode, SDI video SFP dual channel transmitters, **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 | --- | --- | 500 | mA |

(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 ¹ | ΔV_i | 0.4 | --- | 1.8 | V |
| Differential Input Impedance ² | Z | 90 | 100 | 110 | ohm |
| Optical Output Power (2 km) ³ | P_o | -8 | -3 | 0 | dBm |
| Optical Output Power (20 km) ³ | P_o | -6 | -2 | 0 | dBm |
| Optical Output Power (40 km) ³ | P_o | -2 | 0 | +3 | dBm |
| Optical Wavelength | λ_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 μ m SMF.

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



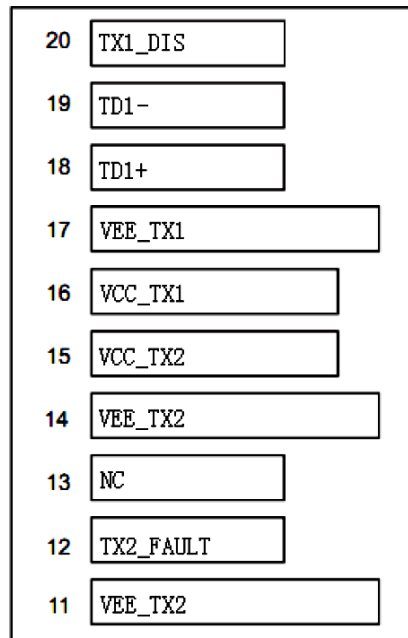
(XX = 2, 20, 40)

Transmitter Electro-Optical Characteristics (Cont'd)

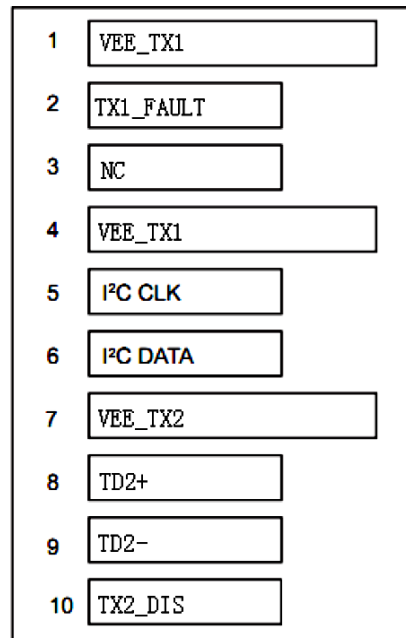
| Parameter | Symbol | Min. | Typical | Max. | Units |
|----------------------------------|--------------|------|---------|----------|---------|
| TX Disable Voltage – High | V_{DH} | 2.0 | --- | V_{CC} | V |
| TX Disable Voltage - Low | V_{DL} | 0 | --- | 0.8 | V |
| TX Fault Output - High | V_{FH} | 2.0 | --- | V_{CC} | V |
| TX Fault Output - Low | V_{FL} | 0 | --- | 0.8 | V |
| TX Disable Assert Time | T_{ass} | --- | --- | 10 | μ 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 | μ s |
| TX Disable Time to Start Reset | T_{reset} | 10 | --- | --- | μ s |

PIN Assignment and Description

Top of Board



**Bottom of Board
(as viewed through top of board)**



Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11



Dual Channel Transmitters 1550 nm Single Mode, 40 km SDI SFP Dual LC Connector



SDI Video Small Form Pluggable (SDI SFP)

Description

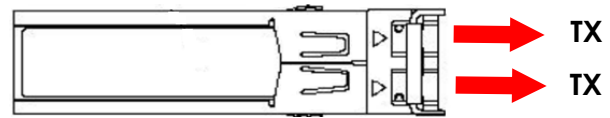
OptixCom's video SFP optical modules are deployed for the increasing demand of high definition video applications over a long distance. The design supports pathological patterns for SD, ED, HD, and 3G SDI (Serial Digital Interface) signals from 50 Mb/s to 3 Gb/s. The high data rate enables crystal clear 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 optical module supports two channels of transmitter for one-way video transmission. 1550 nm DFB laser is used with a typical transmission distance of 40 km. This product is RoHS compliant and typical power consumption is < 1.7 W.



Lead-Free

SDI-2970EX-2T40K



Key Features

- 1550 nm single mode
- Dual transmitter channels
- 50 Mb/s – 3 Gb/s, 40 km reach
- SMPTE 297-2006 compatible
- Support SMPTE 424M/292M/297M/259M
- Duplex LC connector optical interface
- Single 3.3 V power supply
- Z-axis hot pluggable
- SFF-8472 MSA Compliant
- RoHS compliant

Ordering Information

Part Number: SDI-2970EX-2T40K

Description:

1550 nm, 50 Mb/s to 2.97 Gb/s, single mode, SDI video SFP dual channel transmitters, 40 km reach, 0-70°C

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

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 | --- | --- | 500 | mA |

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 ¹ | ΔV_i | 0.4 | --- | 1.8 | V |
| Differential Input Impedance ² | Z | 90 | 100 | 110 | ohm |
| Optical Output Power (40 km) ³ | P_o | -2 | 0 | +3 | dBm |
| Optical Wavelength | λ_o | 1480 | 1550 | 1580 | 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 | --- | --- | 270 | |
| | 3G-SDI | --- | --- | 135 | |
| Total Jitter PRBS & Color Bar | SD-SDI | --- | 70 | 200 | ps |
| | HD-SDI | --- | 50 | 135 | |
| | 3G-SDI | --- | 70 | 100 | |
| Total Jitter Pathological | SD-SDI | --- | 200 | 300 | ps |
| | HD-SDI | --- | 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 μm SMF.

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

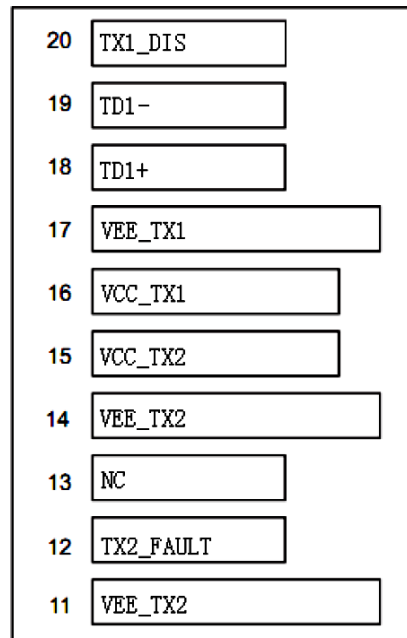


Transmitter Electro-Optical Characteristics (Cont'd)

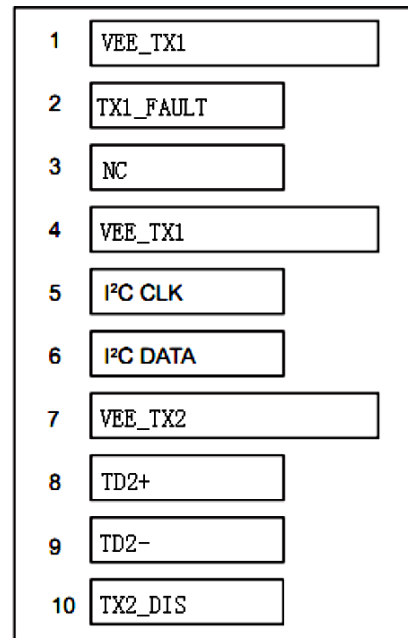
| Parameter | Symbol | Min. | Typical | Max. | Units |
|----------------------------------|--------------|------|---------|----------|---------|
| TX Disable Voltage – High | V_{DH} | 2.0 | --- | V_{CC} | V |
| TX Disable Voltage - Low | V_{DL} | 0 | --- | 0.8 | V |
| TX Fault Output - High | V_{FH} | 2.0 | --- | V_{CC} | V |
| TX Fault Output - Low | V_{FL} | 0 | --- | 0.8 | V |
| TX Disable Assert Time | T_{ass} | --- | --- | 10 | μ 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 | μ s |
| TX Disable Time to Start Reset | T_{reset} | 10 | --- | --- | μ s |

PIN Assignment and Description

Top of Board



**Bottom of Board
(as viewed through top of board)**



Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11



Dual Channel Receivers 1260 - 1580 nm Single Mode SDI SFP Dual LC Connector



SDI Video Small Form Pluggable (SDI SFP)

Description

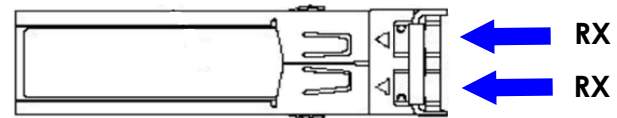
OptixCom's video SFP optical modules are deployed for the increasing demand of high definition video applications over a long distance. The design supports pathological patterns for SD, ED, HD, and 3G SDI (Serial Digital Interface) signals from 50 Mb/s to 3 Gb/s. The high data rate enables crystal clear 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 optical module supports two channels of receiver for one-way video receiving. The module uses PIN photodiode for 1260-1580 nm incoming optical wavelength with -22 dB of sensitivity and 40 km reach typically. This product is RoHS compliant and typical power consumption is < 0.5 W.



Lead-Free

SDI-2970EX-2R40K



Key Features

- 1260 nm - 1580 nm single mode
- Dual receiver channels
- 50 Mb/s – 3 Gb/s, -22 dB sensitivity
- SMPTE 297-2006 compatible
- Support SMPTE 424M/292M/297M/259M
- Duplex LC connector optical interface
- Single 3.3 V 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-2970EX-2R40K

Description:

1260 nm – 1580 nm, 50 Mb/s to 2.97 Gb/s, single mode, SDI video SFP dual channel receivers, 40 km reach, 0-70°C

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 | --- | --- | 150 | mA |

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 |

Receiver Electro-Optical Characteristics

| Parameter | Symbol | Min. | Typical | Max. | Units |
|--|---------------------|-----------|---------|------|-------|
| Differential Output Voltage ¹ | ΔV_i | 0.6 | 0.8 | 1.0 | V |
| Differential Impedance ² | 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 | λ_o | 1260 | --- | 1580 | nm |
| Signal Detect Hysteresis | $P_{RL+} - P_{RL-}$ | 1 | --- | --- | dB |
| Receiver Sensitivity (PBRs) ³ | SD-SDI | --- | --- | -25 | dBm |
| | HD-SDI | P_I | --- | -23 | |
| | 3G-SDI | --- | --- | -22 | |
| Receiver (Pathological) ³ | 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 | |

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, 2⁷ – 1 PRBS data pattern, and > 1x10⁻¹² of Bit-Error-Rate (BER)

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

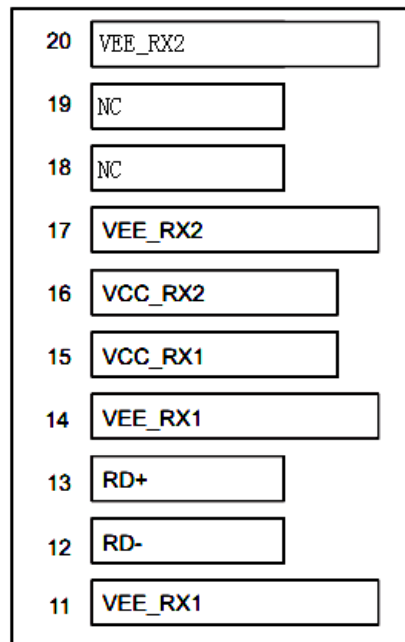


Receiver Electro-Optical Characteristics (Cont'd)

| Parameter | Symbol | Min. | Typical | Max. | Units |
|----------------------------------|-----------|------|---------|----------|---------|
| Total Jitter PRBS & Color Bar | SD-SDI | --- | 70 | 200 | ps |
| | HD-SDI | --- | 50 | 135 | |
| | 3G-SDI | --- | 70 | 100 | |
| Total Jitter Pathological | SD-SDI | --- | 200 | 300 | ps |
| | HD-SDI | --- | 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 | μ s |
| RX Signal Loss Deassert Time | T_{RL-} | --- | --- | 100 | μ s |

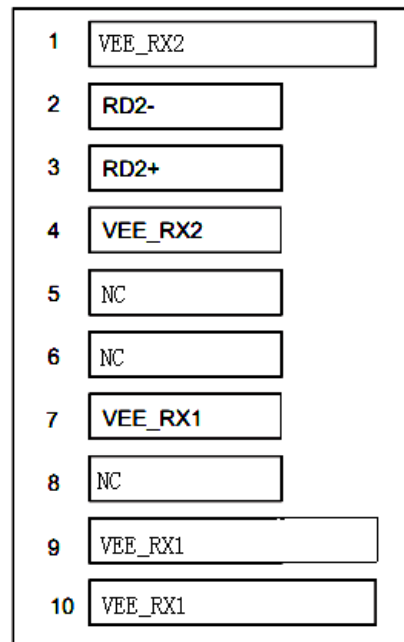
PIN Assignment and Description

Top of Board



Bottom of Board

(as viewed through top of board)



Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11



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

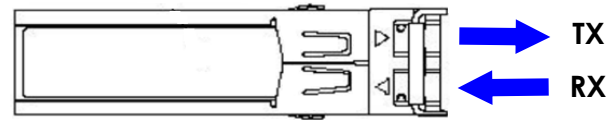
OptixCom's advanced video SFP optical transceivers are deployed for the increasing demand of high definition video applications over a long distance. The design supports pathological patterns for SD, ED, HD, and 3G SDI (Serial Digital Interface) signals from 50 Mb/s to 3 Gb/s. The high data rate enables 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 |

(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 ¹ | ΔV_i | 0.4 | --- | 1.8 | V |
| Differential Input Impedance ² | Z | 90 | 100 | 110 | ohm |
| Optical Output Power (2 km) ³ | P_o | -8 | -3 | 0 | dBm |
| Optical Output Power (20 km) ³ | P_o | -6 | -2 | 0 | dBm |
| Optical Output Power (40 km) ³ | P_o | -2 | 0 | +3 | dBm |
| Optical Wavelength | λ_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 μ m SMF.

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

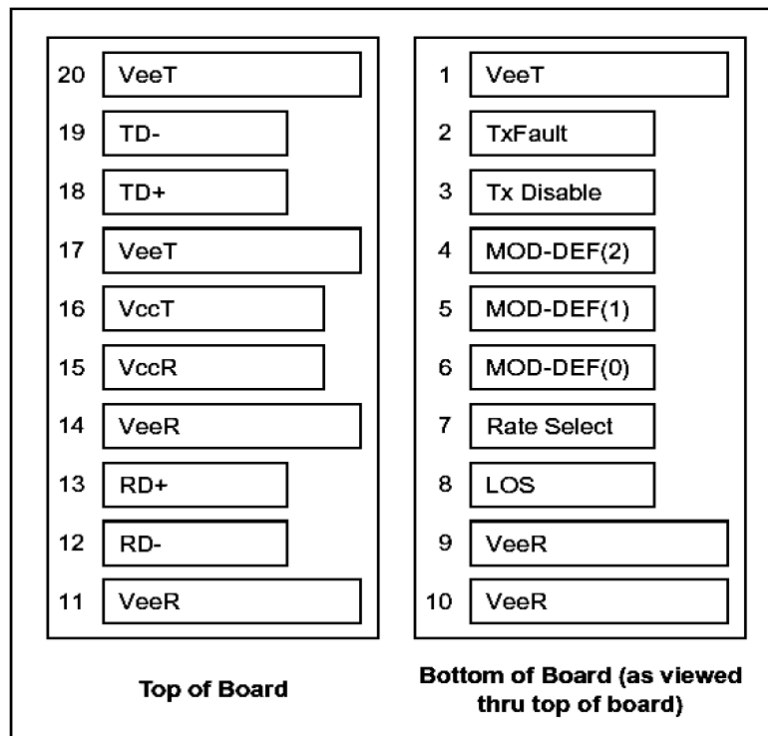


(XX = 2, 20, 40)

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 | μ 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 | μ s |
| TX Disable Time to Start Reset | T_{reset} | 10 | --- | --- | μ s |

PIN Assignment and Description



Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11



(XX = 2, 20, 40)

Receiver Electro-Optical Characteristics

| Parameter | Symbol | Min. | Typical | Max. | Units |
|--|---------------------|-----------|---------|----------|---------|
| Differential Output Voltage ¹ | ΔV_i | 0.6 | 0.8 | 1.0 | V |
| Differential Impedance ² | 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 | λ_o | 1260 | --- | 1580 | nm |
| Signal Detect Hysteresis | $P_{RL+} - P_{RL-}$ | 1 | --- | --- | dB |
| Receiver Sensitivity (PBRs) ³ | SD-SDI | --- | --- | -25 | dBm |
| | HD-SDI | P_i | --- | -23 | |
| | 3G-SDI | --- | --- | -22 | |
| Receiver (Pathological) ³ | 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 | μs |
| RX Signal Loss Deassert Time | T_{RL-} | --- | --- | 100 | μs |

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, 2⁷ - 1 PRBS data pattern, and > 1x10⁻¹² of Bit-Error-Rate (BER)

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



50 Mb/s - 2.97 Gb/s Transceivers
1550 nm, Single Mode, 40 km
SDI SFP Dual LC Connector



SDI Video Small Form Pluggable (SDI SFP)

Description

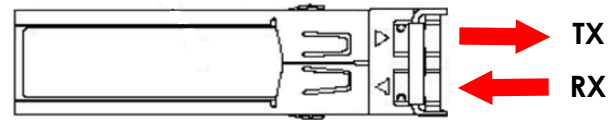
OptixCom's advanced video SFP optical transceivers are deployed for the increasing demand of high definition video applications over a long distance. The design supports pathological patterns for SD, ED, HD, and 3G SDI (Serial Digital Interface) signals from 50 Mb/s to 3 Gb/s. The high data rate enables 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 >20 dB power budget 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-2970EX-TR40K



Key Features

- 1550 nm single mode optical transceiver
- 50 Mb/s – 3 Gb/s; SMPTE 297-2006 compatible
- 20 dB power budget for 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-2970EX-TR40K

Description:

1310 nm, 50 Mb/s to 2.97 Gb/s, single mode, SDI video SFP optical transceivers, 40 km reach, 0-70°C

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 |

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 ¹ | ΔV_i | 0.4 | --- | 1.8 | V |
| Differential Input Impedance ² | Z | 90 | 100 | 110 | ohm |
| Optical Output Power ³ | P_o | -2 | 0 | +3 | dBm |
| Optical Wavelength | λ_o | 1480 | 1550 | 1580 | 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 | --- | --- | 270 | |
| | 3G-SDI | --- | --- | 135 | |
| Total Jitter PRBS & Color Bar | SD-SDI | --- | 70 | 200 | ps |
| | HD-SDI | --- | 50 | 135 | |
| | 3G-SDI | --- | 70 | 100 | |
| Total Jitter Pathological | SD-SDI | --- | 200 | 300 | ps |
| | HD-SDI | --- | 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 μ m SMF.

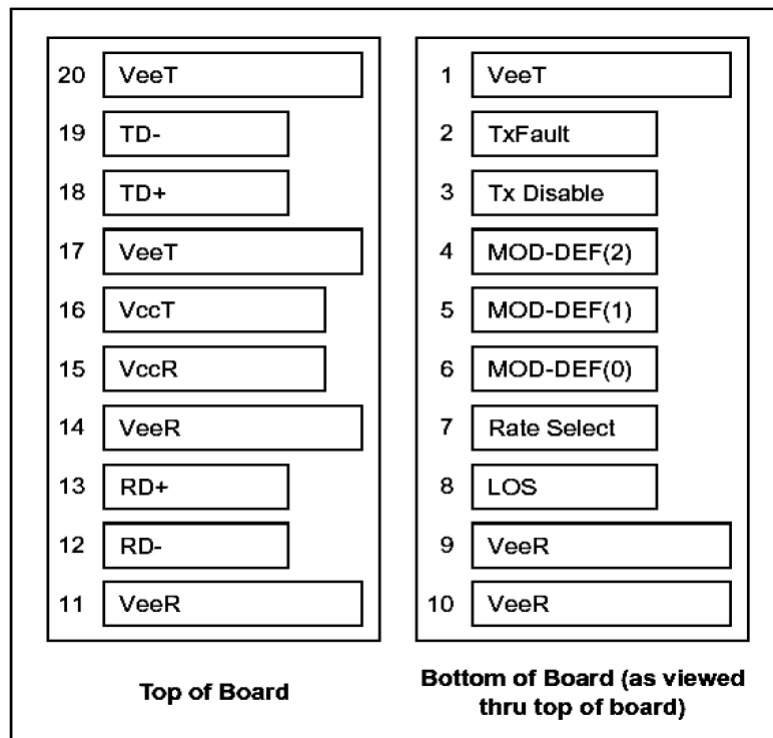
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21 CFR 1040.10 and 1040.11**



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 | μ 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 | μ s |
| TX Disable Time to Start Reset | T_{reset} | 10 | --- | --- | μ s |

PIN Assignment and Description



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Receiver Electro-Optical Characteristics

| Parameter | Symbol | Min. | Typical | Max. | Units |
|--|---------------------|-----------|---------|----------|---------|
| Differential Output Voltage ¹ | ΔV_i | 0.6 | 0.8 | 1.0 | V |
| Differential Impedance ² | 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 | λ_o | 1260 | --- | 1580 | nm |
| Signal Detect Hysteresis | $P_{RL+} - P_{RL-}$ | 1 | --- | --- | dB |
| Receiver Sensitivity (PBRs) ³ | SD-SDI | --- | --- | -25 | dBm |
| | HD-SDI | P_i | --- | -23 | |
| | 3G-SDI | --- | --- | -22 | |
| Receiver (Pathological) ³ | 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 | μs |
| RX Signal Loss Deassert Time | T_{RL-} | --- | --- | 100 | μs |

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, 2⁷ - 1 PRBS data pattern, and > 1x10⁻¹² of Bit-Error-Rate (BER)

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