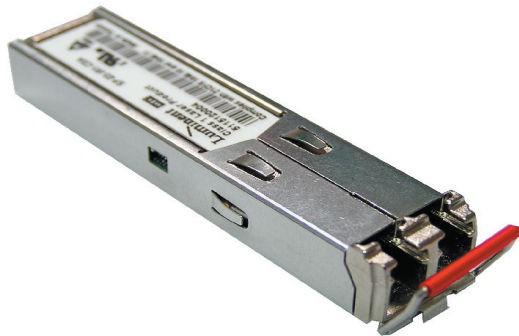


SPC-48-LR-xx



Features

- Single 3.3 V supply
- 80 km reach
- 26dB min, 30.5 dB typical link budget
- Commercial and Reduced Industrial temperature available
- CWDM wavelength, DFB laser
- SFP MSA SFF-8074i compliant
- GR 253/STM G.957 compliant
- Digital Diagnostic SFF-8472 Rev.9.3 compliant
- Telcordia GR-468 compliant
- RoHS 5/6 compliant (Lead Exemption)

General Operating

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|---|------------------|-------|------|-------|-------|
| Supply Voltage | V _{cc} | 3.135 | 3.3 | 3.465 | V |
| Total Current | I _{cc} | - | - | 300 | mA |
| Power Supply Noise Rejection ^a | | 100 | - | - | mVp-p |
| Operating Temperature(-Cxx) | T _{opr} | -5 | - | 70 | °C |
| Operating Temperature(-Rxx) | T _{opr} | -20 | - | 85 | °C |
| Storage Temperature | T _{stg} | -40 | - | 85 | °C |
| Data Rate | DR | - | 2488 | - | Mbps |

a) 20Hz to 155MHz

Transmitter Specifications (Optical)

| Parameter | Symbol | Min | Typical | Max | Unit |
|--|------------------|---------------------|---------|------------|-------|
| Optical power | P _{op} | -2 | 0.5 | 3 | dBm |
| Average Launch power of off Tx | P _{off} | - | - | -30 | dBm |
| Extinction Ratio | ER | 8.2 | - | - | dB |
| Eye Mask | | SONET/SDH Compliant | | | |
| Optical Jitter generation | J _{gen} | - | - | 0.007 | UI |
| Optical Rise time ^b | t _r | - | - | 160 | ps |
| Optical Fall time ^b | t _f | - | - | 160 | ps |
| Mean Wavelength | λ | 1xxx-6.5nm | 1xxx | 1xxx+6.5nm | nm |
| Spectral width (20dB) | Δλ | - | - | 1 | nm |
| Side Mode Suppression Ratio | SMSR | 30 | - | - | dB |
| Dispersion penalty 1600 ps/nm ^c | RIN | - | 1 | 2 | dB |
| Relative Intensity Noise | rp | - | - | -120 | dB/Hz |
| Reflectance Tolerance ^d | dp | -24 | - | - | dB |

b) 20%-80% values

c) Measured at BER of 1e-12, PRBS of 2²³-1, at eye center

d) 1 dB degradation of receiver sensitivity

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Transmitter Specifications

| Parameter | Symbol | Min | Typical | Max | Unit |
|------------------------------------|---------------|----------|---------|----------------|----------|
| Input Differential Impedence | R_{in} | 80 | 100 | 120 | Ω |
| PECL Single Ended data input swing | $V_{in, p-p}$ | 250 | - | 1200 | mV |
| TxFault_Fault | V_{fault} | 2 | - | V_{cc} | V |
| TxFault_Normal | V_{normal} | V_{ee} | - | $V_{ee} + 0.5$ | V |
| TxDisable_Disable | V_d | 2 | - | V_{cc} | V |
| TxDisable_Enable | V_{en} | V_{ee} | - | $V_{ee} + 0.8$ | V |

Receiver Specifications

| Parameter | Symbol | Min | Typical | Max | Unit |
|----------------------------------|------------------|------|---------|------|------|
| Receiver Power Lowe | $R_{sens,low}$ | - | -30 | -28 | dBm |
| Receiver Power High ^e | $R_{sens,high}$ | -9 | - | - | dBm |
| Damage Threshold for Receiver | $P_{in, damage}$ | 4 | - | - | dBm |
| Wavelength ^f | λ | 1200 | - | 1625 | nm |
| Maximum Reflectance of Receiver | RX_r | - | - | -27 | dB |
| LOS Assert | - | -42 | - | - | dBm |
| LOS De-assert | - | - | - | -28 | dBm |
| LOS hysteresis | - | 0.5 | - | - | dB |

e) at 10^{-10} BER, PRBS 2²³-1

f) Operational over 1200-1625 nm range

Electrical Output

| Parameter | Symbol | Min | Typical | Max | Unit |
|--------------------------|---------------|-----|---------|-----|------|
| Single ended data output | $V_{out,p-p}$ | 185 | - | 800 | mV |
| Data output rise time | t_r | - | - | 175 | ps |
| Data output fall time | t_f | - | - | 175 | ps |

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Timing and Electrical

| Parameter | Symbol | Min | Typical | Max | Unit |
|---|-------------------------|-----------------|---------|-----------------------|------|
| Tx Disable Negate time | t_on | - | - | 1 | ms |
| Tx Disable assert time | t_off | - | - | 10 | µs |
| Time to initialize, including reset of Tx fault | t_init | - | - | 300 | ms |
| Tx fault Assert time | t_fault | - | - | 100 | µs |
| Tx Disable to reset | t_reset | 10 | - | - | µs |
| LOS Assert time | t_loss_on | - | - | 100 | µs |
| LOS De-assert time | t_loss_off | - | - | 100 | µs |
| Serial ID Clock Rate | f_serial_clock | - | - | 100 | KHz |
| RX_LOS Voltage (high) | - | 2 | - | - | V |
| RX_LOS Voltage (low) | - | - | - | 0.8 | V |
| LOS output voltage-Fault | V _{LOS} fault | 2 | - | V _{cc} | V |
| LOS output voltage-Normal | V _{LOS} normal | V _{ee} | - | V _{ee} + 0.5 | V |
| MOD_DEF (0:2)-High | V _h | 2 | - | V _{cc} | V |
| MOD_DEF (0:2)-Low | V _l | V _{ee} | - | V _{ee} + 0.5 | V |

λ Wavelength Ordering

SPC-48-LR-xxCDA

See table below for "XX" values

λc Wavelength Guide

| Code | λc | Unit | Code | λc | Unit | Code | λc | Unit | Code | λc | Unit |
|------|------|------|------|------|------|------|------|------|------|------|------|
| 31 | 1310 | nm | 39 | 1390 | nm | 47 | 1470 | nm | 55 | 1550 | nm |
| 33 | 1330 | nm | 41 | 1410 | nm | 49 | 1490 | nm | 57 | 1570 | nm |
| 35 | 1350 | nm | 43 | 1430 | nm | 51 | 1510 | nm | 59 | 1590 | nm |
| 37 | 1370 | nm | 45 | 1450 | nm | 53 | 1530 | nm | 61 | 1610 | nm |

Diagnostics

| Parameter | Range | Accuracy | Unit | Calibration | Bit Value | Formula |
|-------------------|-----------|----------|------|-------------|-----------|--|
| Temperature(-CDx) | -5 to 70 | ±3 | °C | Internal | 1/256 C | Tc(C) = Tad(16 bit signed twos complement)/256 |
| Temperature(-RDx) | -20 to 85 | ±3 | °C | Internal | 1/256 C | Tc(C) = Tad(16 bit signed twos complement)/256 |
| Voltage | 0 to Vcc | .1 | V | Internal | 100µV | V(Volts) = Vad(16 bit unsigned integer)*0.1 |
| Bias Current | 0 to 120 | 5 | mA | External | - | I(mA) = Islope * Iad(16 bit unsigned integer)+Ioffset |
| Tx Power | -2 to 3 | ±3dB | dBm | External | - | Tx_PWR(µW) = Tx_PWRslope*T _x _PWRad(16 bit unsigned integer)+Tx_PWRoffset |
| Rx Power | -32 to -9 | ±3dB | dBm | External | - | Rx_PWR(µW) = A0+A1*x+A2*x^2+A3*x^3+A4*x^4 |

SPC-48-LR-xx

| EEPROM Serial ID | | | | |
|------------------|---|---------|-----|-------|
| Name Of Field | Description of Field | Address | Hex | ASCII |
| Vendor Name | SFP Vendor Name (ASCII) | 20 | 4C | L |
| | | 21 | 55 | U |
| | | 22 | 4D | M |
| | | 23 | 49 | I |
| | | 24 | 4E | N |
| | | 25 | 45 | E |
| | | 26 | 4E | N |
| | | 27 | 54 | T |
| | | 28 | 4F | O |
| | | 29 | 49 | I |
| | | 30 | 43 | C |
| Vendor OUI | IEEE Vendor OUI Code For Luminent Inc. | 37 | 00 | |
| | | 38 | 06 | |
| | | 39 | B5 | |
| Vendor PN | Part Number in ASCII, e.g. SPC-48-LR-xxCDA | 40 | 53 | S |
| | | 41 | 50 | P |
| | | 42 | 43 | C |
| | | 43 | 34 | 4 |
| | | 44 | 38 | 8 |
| | | 45 | 4C | L |
| | | 46 | 52 | R |
| | | 47 | x | x |
| | | 48 | x | x |
| | | 49 | 43 | C |
| | | 50 | 44 | D |
| 51 | 41 | A | | |

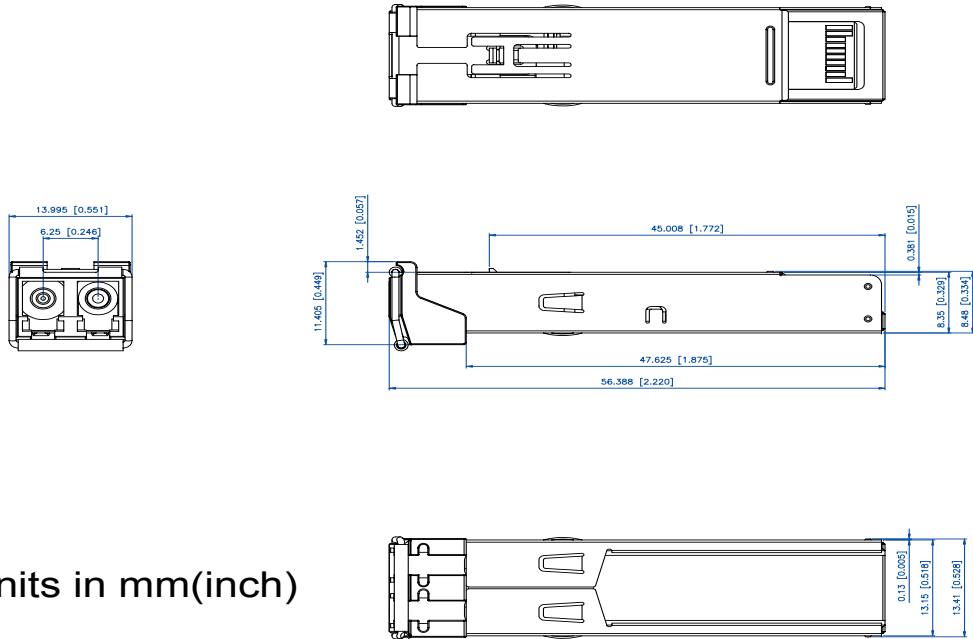
SPC-48-LR-xx

Pinout Definitions

| Pin | Function | Notes |
|-----|-------------------|------------------------|
| 1 | V _{ee} T | TX GND |
| 2 | TX_FAULT | Open Collector |
| 3 | TX_DISABLE | Internally Pulled High |
| 4 | MOD_DEF2 | Serial Data Input |
| 5 | MOD_DEF1 | Serial Clock Input |
| 6 | MOD_DEF0 | Internally Grounded |
| 7 | NC | Not Connected |
| 8 | LOS | Open Collector |
| 9 | V _{ee} R | RX Ground |
| 10 | V _{ee} R | RX Ground |
| 11 | V _{ee} R | RX Ground |
| 12 | RXD- | RX Data Negative |
| 13 | RXD+ | RX Data Positive |
| 14 | V _{ee} R | RX GND |
| 15 | V _{cc} R | RX Power |
| 16 | V _{cc} T | TX Power |
| 17 | V _{ee} T | TX GND |
| 18 | TXD+ | TX Data Positive |
| 19 | TXD- | TX Data Negative |
| 20 | V _{ee} T | TX GND |

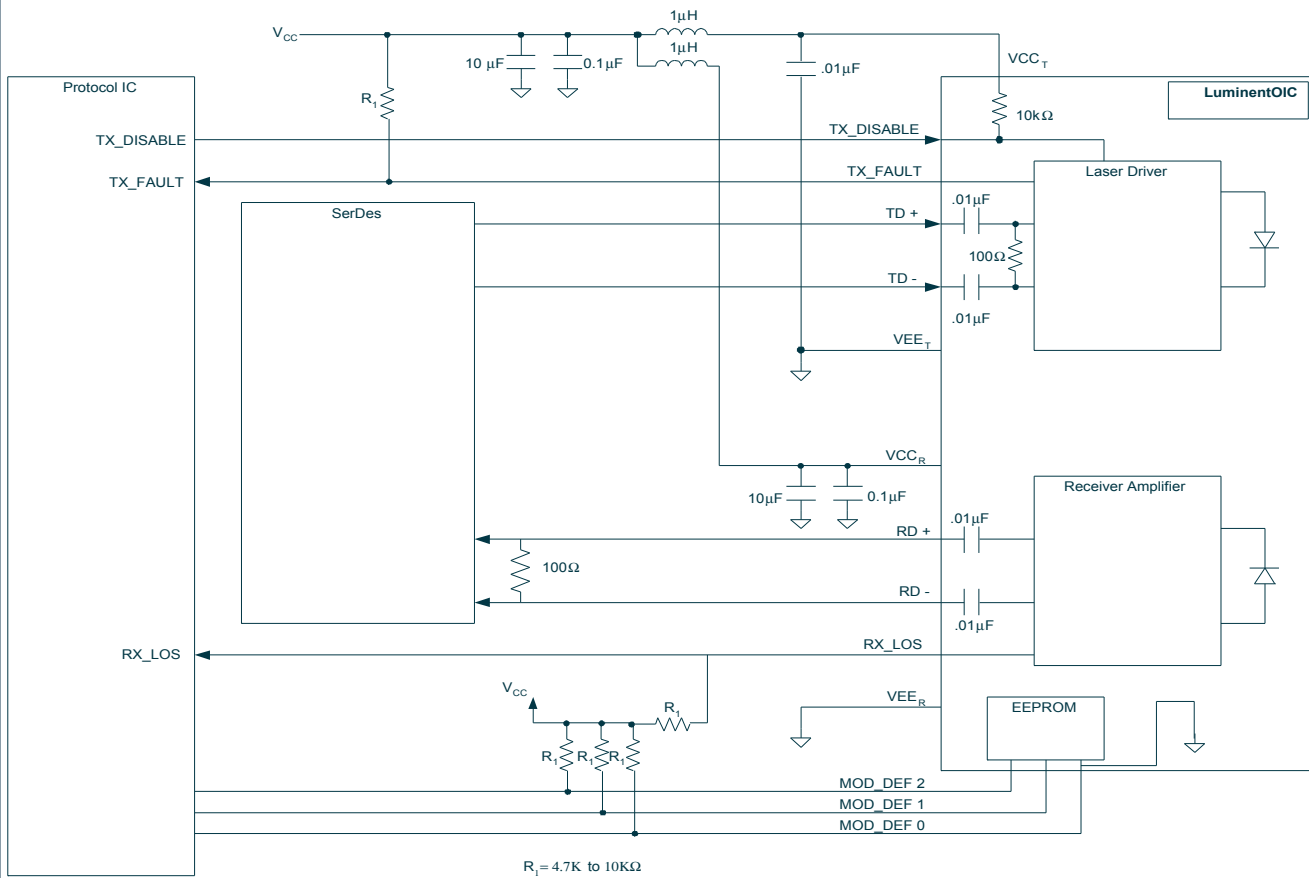
SPC-48-LR-xx

Outline Drawing



Units in mm(inch)

Suggested Transceiver Interface



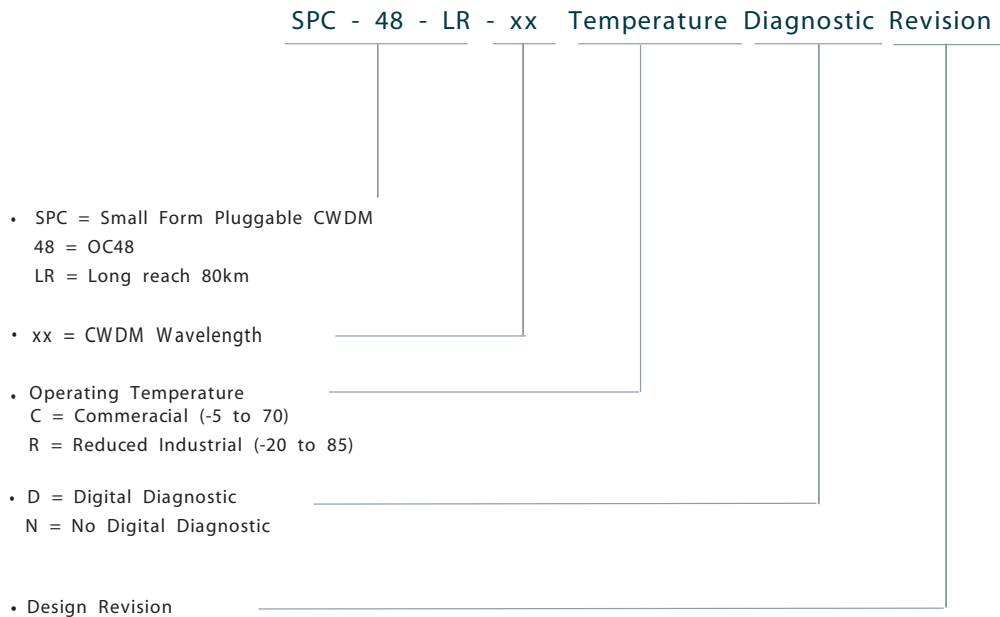
SPC-48-LR-xx

Ordering Information

Available Options:

- SPC-48-LR-xxCDA
- SPC-48-LR-xxCNA
- SPC-48-LR-xxRDA
- SPC-48-LR-xxRNA

Part numbering Definition:



Warnings:

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

Legal Notes:

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