



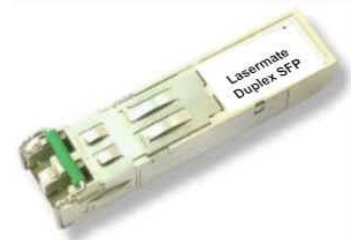
1.25Gbps 1470nm~1610nm SMF 24dB CWDM SFP Optical Transceiver with Duplex LC Connector

Model No. CS15xxD-24F-3U-TC-LD

Where **xx** value is as follows: **xx = 47** for 1470nm, **xx = 49** for 1490nm, **xx = 51** for 1510nm, **xx = 53** for 1530nm, **xx = 55** for 1550nm, **xx = 57** for 1570nm, **xx = 59** for 1590nm, **xx = 61** for 1610nm

FEATURES

- Compliant with IEEE802.3z Gigabit Ethernet Standard
- Compliant with Fiber Channel 100-SM-LC-L standard
- Compliant with SFF8472 diagnostic monitoring interface
- Industry standard small form pluggable (SFP) package
- Duplex LC connector
- Differential PECL inputs and outputs
- Hot pluggable
- Class 1 laser product compliant with EN 60825-1
- Single power supply 3.3V
- TTL signal detect indicator
- Input/Output: AC/AC
- Operating case temperature range: 0°C to 70°C



DIAGNOSTICS

| PARAMETER | RANGE | ACCURACY | UNIT | CALIBRATION |
|--------------|-----------|----------|------|-------------|
| Temperature | -40 to 95 | ±3 | °C | External |
| Voltage | 0 to VCC | ±0.1 | V | |
| Bias Current | 0 to 120 | ±5 | mA | |
| TX Power | -3 to +8 | ±3 dB | dBm | |
| RX Power | -24 to -3 | ±3 dB | dBm | |

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | MIN | MAX | UNIT |
|---------------------|-----------------|------|-----------------|------|
| Storage Temperature | T _S | -40 | 85 | °C |
| Supply Voltage | V _{CC} | -0.5 | 4.0 | V |
| Input Voltage | V _{IN} | -0.5 | V _{CC} | V |
| Output Current | I _o | - | 50 | mA |
| Operating Current | I _{OP} | - | 400 | mA |

RECOMMENDED OPERATING CONDITIONS

| PARAMETER | SYMBOL | MIN | MAX | UNIT |
|----------------------------|-----------------------------------|-----|-----|------|
| Case Operating Temperature | T _C | 0 | 70 | °C |
| Supply Voltage | V _{CC} | 3.1 | 3.5 | V |
| Supply Current | I _{TX} + I _{RX} | - | 300 | mA |

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**TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS ($V_{CC} = 3.1V$ to $3.5V$, $T_C = 0^\circ C$ to $70^\circ C$)**

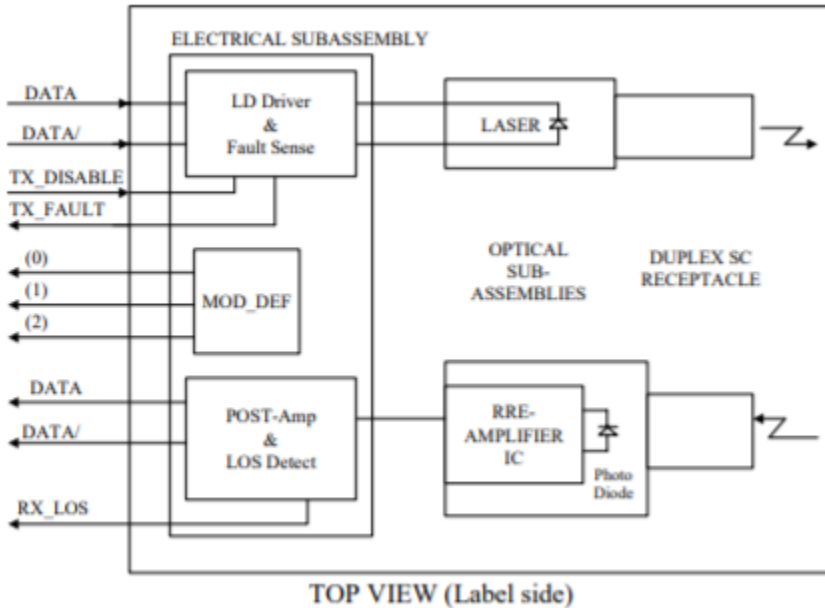
| PARAMETER | SYMBOL | MIN | TYP. | MAX | UNIT | NOTES | |
|---------------------------------------|-----------------|----------------------------|------|--------|-------|---------|--|
| Output Optical Power 9/125um fiber | P_{out} | 0 | +2 | +5 | dBm | Average | |
| Extinction Ratio | ER | 7 | - | - | dB | | |
| Center Wavelength (1470nm) | λ_c | 1464.5 | - | 1477.5 | nm | | |
| Center Wavelength (1490nm) | | 1484.5 | - | 1497.5 | | | |
| Center Wavelength (1510nm) | | 1504.5 | - | 1517.5 | | | |
| Center Wavelength (1530nm) | | 1524.5 | - | 1537.5 | | | |
| Center Wavelength (1550nm) | | 1544.5 | - | 1557.5 | | | |
| Center Wavelength (1570nm) | | 1564.5 | - | 1577.5 | | | |
| Center Wavelength (1590nm) | | 1584.5 | - | 1597.5 | | | |
| Center Wavelength (1610nm) | | 1604.5 | - | 1617.5 | | | |
| Spectral Width (-20dB) | $\Delta\lambda$ | - | - | 0.8 | nm | | |
| Side Mode Suppression Ratio | SMSR | 30 | | | dB | | |
| Rise/Fall Time, (20~80%) | $T_{r,f}$ | - | - | 260 | ps | | |
| Relative Intensity Noise | RIN | - | - | -120 | dB/Hz | | |
| Total Jitter | TJ | - | - | 227 | ps | | |
| Output Eye | | Compliant with IEEE802.3ae | | | | | |
| Differential Input Voltage | V_{DIFF} | 0.4 | - | 2.0 | V | | |
| Max. P_{out} TX-DISABLE Asserted | P_{OFF} | - | - | -45 | dBm | | |

RECEIVER ELECTRO-OPTICAL CHARACTERISTICS ($V_{CC} = 3.1V$ to $3.5V$, $T_C = 0^\circ C$ to $70^\circ C$)

| PARAMETER | SYMBOL | MIN | TYP. | MAX | UNIT | NOTES |
|---|---------------------|------|------|----------|------|-----------------------|
| Optical Input Power – maximum | P_{IN} | -1.0 | - | - | dBm | BER<10 ⁻¹² |
| Optical Input Power – minimum (Sensitivity) | P_{IN} | - | -27 | -24 | dBm | BER<10 ⁻¹² |
| Operating Center Wavelength | λ_c | 1260 | - | 1620 | nm | |
| Signal Detect-Asserted | P_A | - | - | -24 | dBm | |
| Signal Detect-Deasserted | P_D | -40 | - | - | dBm | |
| Differential Output Voltage | V_{DIFF} | 0.5 | - | 1.2 | V | |
| Data Output Rise, Fall Time (20~80%) | $T_{r,f}$ | - | - | 0.35 | ns | |
| Receiver Loss of Signal Output Voltage-Low | RX_LOS _L | 0 | - | 0.5 | V | |
| Receiver Loss of Signal Output-High | RX_LOS _H | 2.4 | - | V_{CC} | V | |



BLOCK DIAGRAM OF TRANSCEIVER



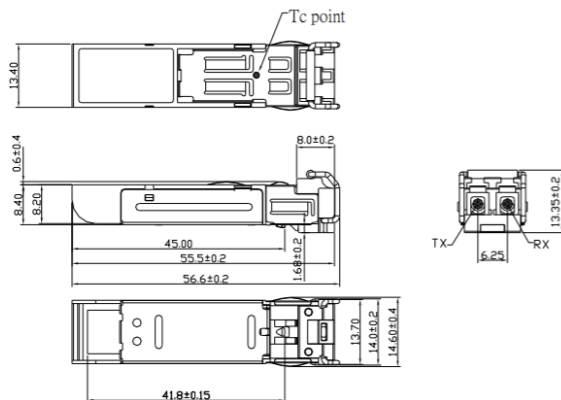
Transmitter Section - The transmitter section consists of a 1550 nm InGaAsP laser in an eye safe optical subassembly (OSA) which mates to the fiber cable. The laser OSA is driven by a LD driver IC which converts differential input LVPECL logic signals into an analog laser driving current.

TX_DISABLE - The TX_DISABLE signal is high (TTL logic "1") to turn off the laser output. The laser will turn on when TX_DISABLE is low (TTL logic "0").

Receiver Section - The receiver utilizes an InGaAs PIN photodiode mounted together with a trans-impedance preamplifier IC in an OSA. This OSA is connected to a circuit providing post-amplification quantization, and optical signal detection.

Receive Loss (RX_LOS) - The RX_LOS is high (logic "1") when there is no incoming light from the companion transceiver. This signal is normally used by the system for the diagnostic purpose. The signal is operated in LVTTTL level.

DIMENSIONS



DIMENSIONS ARE IN MILLIMETERS
ALL DIMENSIONS ARE ± 0.1mm UNLESS OTHERWISE SPECIFIED

Unit: mm

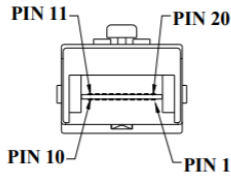
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PIN ASSIGNMENT



| PIN | SIGNAL NAME | DESCRIPTION | PIN | SIGNAL NAME | DESCRIPTION |
|-----|------------------|---|-----|------------------|--|
| 1 | T _{GND} | Transmit Ground | 11 | R _{GND} | Receiver Ground |
| 2 | TX_FAULT | Transmit Fault | 12 | RX- | Receive Data Bar, Differential PECL, ac coupled |
| 3 | TX_DISABLE | Transmit Disable | 13 | RX+ | Receive Data, Differential PECL, ac coupled |
| 4 | MOD_DEF (2) | SDA Serial Data Signal | 14 | R _{GND} | Receiver Ground |
| 5 | MOD_DEF (1) | SCL Serial Clock Signal | 15 | V _{CCR} | Receiver Power Supply |
| 6 | MOD_DEF (0) | TTL Low | 16 | V _{CCT} | Transmitter Power Supply |
| 7 | RATE SELECT | Open Circuit | 17 | T _{GND} | Transmitter Ground |
| 8 | RX_LOS | Receiver Loss of Signal, TTL High, open collector | 18 | TX+ | Transmit Data, Differential PECL, ac coupled |
| 9 | R _{GND} | Receiver Ground | 19 | TX- | Transmit Data Bar, Differential PECL, ac coupled |
| 10 | R _{GND} | Receiver Ground | 20 | T _{GND} | Transmitter Ground |

ORDERING INFORMATION

| PART NUMBER | WAVELENGTH | OPERATING TEMPERATURE |
|----------------------|------------|-----------------------|
| CS1547D-24F-3U-TC-LD | 1470nm | 0°C to 70°C |
| CS1549D-24F-3U-TC-LD | 1490nm | 0°C to 70°C |
| CS1551D-24F-3U-TC-LD | 1510nm | 0°C to 70°C |
| CS1553D-24F-3U-TC-LD | 1530nm | 0°C to 70°C |
| CS1555D-24F-3U-TC-LD | 1550nm | 0°C to 70°C |
| CS1557D-24F-3U-TC-LD | 1570nm | 0°C to 70°C |
| CS1559D-24F-3U-TC-LD | 1590nm | 0°C to 70°C |
| CS1561D-24F-3U-TC-LD | 1610nm | 0°C to 70°C |

Note: The specifications subject to change without notice.