

**1.25 Gb/s, 40 - 160 km  
CWDM 1270 nm – 1610 nm  
SFP Dual LC Package**

**Description**

OptixCom's CWDM transceivers are designed with high performance DFB laser and cover the wavelength spectrum from 1270 nm to 1610 nm, with industry standard 20 nm spacing. Dual LC connectors are used as standard interface and the package is compliant with Small Form Pluggable (SFP) specifications.

The module is compliant with SFP Multi-Source Agreement (MSA). This product can be used at 1.0625 Gb/s for Fiber Channel or 1.25 Gb/s for Gigabit Ethernet applications. They offer 40 - 160 km of transmission distance with single mode fibers. The products are RoHS compliant.



Lead-Free

**SFP-1250CX-ATXXK-YY**  
(XX = 40, 80, 120, 160)



**Key Features**

- 1270 - 1610 nm single mode, 1.25 Gb/s
- 40 - 160 km with 19 - 36 dB power budget
- Duplex LC connector optical interface
- Z-axis hot pluggable
- SFF-8472 MSA Compliant
- AC coupling LVPECL differential I/O logics
- TTL Signal detect to monitor optical signals
- -40-85 °C operating temperatures available
- Single 3.3 V power supply
- RoHS compliant

**Applications**

- ✓ 1X Fiber Channel and Gigabit Ethernet
- ✓ High speed I/O for file server
- ✓ Video over fiber links
- ✓ Media converter
- ✓ Data Communication for SAN and LAN
- ✓ Central offices routers and switches
- ✓ Mass storage systems interconnect
- ✓ Computer cluster cross-connect

**Ordering Information**

**Part Number:** SFP-1250CX-ATXXK-YY

**Description:**

CWDM 1270 - 1610 nm 1.0625/1.25 Gb/s SFP Fiber Optics Transceiver, XX km reach, 1YY0 nm wavelength, 0 - 70°C.

- YY specifies the wavelength described below, i.e., SFP-1250CX-ATXXXK-27 is the 1270 nm module.
- Add "-T" in the Part Number for extended temperature range -40-85 °C, i.e., SFP-1250CX-ATXXXK-27-T.

| YY | Wavelength | YY | Wavelength | YY | Wavelength |
|----|------------|----|------------|----|------------|
| 27 | 1270 nm    | 39 | 1390 nm    | 51 | 1510 nm    |
| 29 | 1290 nm    | 41 | 1410 nm    | 53 | 1530 nm    |
| 31 | 1310 nm    | 43 | 1430 nm    | 55 | 1550 nm    |
| 33 | 1330 nm    | 45 | 1450 nm    | 57 | 1570 nm    |
| 35 | 1350 nm    | 47 | 1470 nm    | 59 | 1590 nm    |
| 37 | 1370 nm    | 49 | 1490 nm    | 61 | 1610 nm    |

**Operating Conditions**

| Parameter           | Min. | Typical | Max. | Units |
|---------------------|------|---------|------|-------|
| Operate Temperature | 0    | 25      | 70   | °C    |
| Data Rate           | ---  | 1.25    | 1.3  | Gb/s  |
| Supply Voltage      | 3.1  | 3.3     | 3.5  | V     |

### Absolute Maximum Ratings

| Parameter                                | Symbol   | Min. | Max.     | Units |
|--|----------|------|----------|-------|
| Storage Temperature                      | $T_{st}$ | -40  | 85       | °C    |
| Supply Voltage                           | $V_{CC}$ | -0.5 | 6.0      | V     |
| Input Voltage                            | $V_{IN}$ | -0.5 | $V_{CC}$ | V     |
| Operating Current                        | $I_{op}$ | ---  | 400      | mA    |
| Output Current                           | $I_o$    | ---  | 50       | mA    |
| Soldering Temperature (10 sec. on leads) | $T_{sd}$ | ---  | 260      | °C    |

### General Transmitter 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> | $Z$          | ---  | 100     | ---      | ohm   |
| Side Mode Suppression Ratio               | $SMSR$       | 30   | ---     | ---      | dB    |
| Rise/Fall Time (20% - 80%)                | $T_r/T_f$    | ---  | ---     | 260      | ps    |
| Relative Intensity Noise                  | $RIN$        | ---  | ---     | -120     | dB/Hz |
| TX Disable Asserted                       | $P_{OFF}$    | ---  | ---     | -45      | dBm   |
| Total Jitter                              | $T_j$        | ---  | ---     | 227      | ps    |
| TX Fault Output - Low                     | $V_{FL}$     | 0    | ---     | 0.8      | V     |
| TX Fault Output - High                    | $V_{FH}$     | 2.0  | ---     | $V_{CC}$ | V     |
| TX Disable Voltage - Low                  | $V_{DL}$     | 0    | ---     | 0.8      | V     |
| TX Disable Voltage - High                 | $V_{DH}$     | 2.0  | ---     | $V_{CC}$ | V     |
| TX Disable Deassert Time                  | $T_{disass}$ | ---  | ---     | 1.0      | ms    |
| TX Disable Assert Time                    | $T_{ass}$    | ---  | ---     | 10       | μs    |
| TX Fault from Fault to Assertion          | $T_{fault}$  | ---  | ---     | 100      | μs    |
| TX Disable Time to Start Reset            | $T_{reset}$  | 10   | ---     | ---      | μs    |
| Time to Initialize                        | $T_{as}$     | ---  | ---     | 300      | ms    |

Notes:

1. Module is designed for AC coupling. DC voltage will be filtered by internal capacitor.
2. Single ended will be 50 ohm for each signal line.
3. Optical eye diagram is compliant with IEEE 802.3z standard.

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



### General Receiver Characteristics

| Parameter                                | Symbol              | Min. | Typical | Max.     | Units   |
|--|---------------------|------|---------|----------|---------|
| Differential Output Voltage <sup>1</sup> | $\Delta V_o$        | 0.4  | ---     | 1.8      | V       |
| Differential Input Impedance             | $Z$                 | ---  | 100     | ---      | Ohm     |
| Optical Return Loss                      | OL                  | 12   | ---     | ---      | dB      |
| Rise/Fall Time (20% - 80%)               | $T_r/T_f$           | ---  | ---     | 350      | ps      |
| Signal Detect Hysteresis                 | $P_{RL+} - P_{RL-}$ | 1    | ---     | ---      | dB      |
| Serial ID Clock Rate                     | $f_c$               | ---  | ---     | 100      | kHz     |
| 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. Module is designed for AC LVPECL coupling. See the design guide for proper termination.

### Wavelength Characteristics

| Parameter                   | Symbol      | Min.   | Typical | Max.   | Units |
|-----------------------------|-------------|--------|---------|--------|-------|
| Center Wavelength – 1270 nm | $\lambda_c$ | 1264.5 | 1270    | 1277.5 | nm    |
| Center Wavelength – 1290 nm | $\lambda_c$ | 1284.5 | 1290    | 1297.5 | nm    |
| Center Wavelength – 1310 nm | $\lambda_c$ | 1304.5 | 1310    | 1317.5 | nm    |
| Center Wavelength – 1330 nm | $\lambda_c$ | 1324.5 | 1330    | 1337.5 | nm    |
| Center Wavelength – 1350 nm | $\lambda_c$ | 1344.5 | 1350    | 1357.5 | nm    |
| Center Wavelength – 1370 nm | $\lambda_c$ | 1364.5 | 1370    | 1377.5 | nm    |
| Center Wavelength – 1390 nm | $\lambda_c$ | 1384.5 | 1390    | 1397.5 | nm    |
| Center Wavelength – 1410 nm | $\lambda_c$ | 1404.5 | 1410    | 1417.5 | nm    |
| Center Wavelength – 1430 nm | $\lambda_c$ | 1424.5 | 1430    | 1437.5 | nm    |
| Center Wavelength – 1450 nm | $\lambda_c$ | 1444.5 | 1450    | 1457.5 | nm    |
| Center Wavelength – 1470 nm | $\lambda_c$ | 1464.5 | 1470    | 1477.5 | nm    |
| Center Wavelength – 1490 nm | $\lambda_c$ | 1484.5 | 1490    | 1497.5 | nm    |
| Center Wavelength – 1510 nm | $\lambda_c$ | 1504.5 | 1510    | 1517.5 | nm    |
| Center Wavelength – 1530 nm | $\lambda_c$ | 1524.5 | 1530    | 1537.5 | nm    |
| Center Wavelength – 1550 nm | $\lambda_c$ | 1544.5 | 1550    | 1557.5 | nm    |
| Center Wavelength – 1570 nm | $\lambda_c$ | 1564.5 | 1570    | 1577.5 | nm    |
| Center Wavelength – 1590 nm | $\lambda_c$ | 1584.5 | 1590    | 1597.5 | nm    |
| Center Wavelength – 1610 nm | $\lambda_c$ | 1604.5 | 1610    | 1617.5 | nm    |

**Transmitter Electro-Optical Characteristics**

| Parameter                         | Symbol          | Min. | Typical | Max. | Units |
|-----------------------------------|-----------------|------|---------|------|-------|
| Optical Output Power <sup>1</sup> | $P_o$           | -4   | ---     | 0    | dBm   |
| Spectral Width (-20 dB)           | $\Delta\lambda$ | ---  | ---     | 1    | nm    |
| Extinction Ratio                  | $ET$            | 9    | ---     | ---  | dB    |

**Receiver Electro-Optical Characteristics**

| Parameter                         | Symbol      | Min. | Typical | Max. | Units |
|-----------------------------------|-------------|------|---------|------|-------|
| Operating Wavelength              | $\lambda_c$ | 1260 | ---     | 1620 | nm    |
| Receiver Overload                 | $P_{max}$   | -1   | ---     | ---  | dBm   |
| Receiver Sensitivity <sup>2</sup> | $P_I$       | ---  | ---     | -24  | dBm   |
| RX Signal Loss – Asserted         | $P_{RL+}$   | ---  | ---     | -25  | dBm   |
| RX Signal Loss – Deasserted       | $P_{RL-}$   | -35  | ---     | ---  | dBm   |

Notes:

1. Output of coupling optical power into 9/125  $\mu\text{m}$  SMF.
2. Test at 1.25 Gb/s,  $2^7 - 1$  PRBS data pattern, and  $> 1 \times 10^{-12}$  of Bit-Error-Rate (BER).
3. Optical eye diagram is compliant with IEEE 802.3z standard.
4. Maximum supply current for the transceiver from Vcc is 300 mA.

Class 1 Laser Product  
Complies with  
21 CFR 1040.10 and 1040.11

