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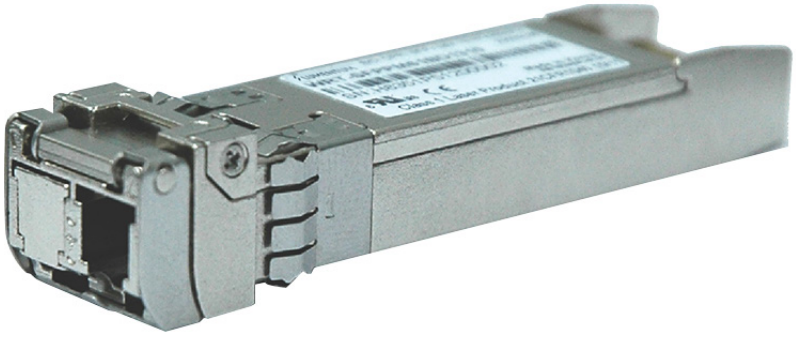
# WaveReady® CWDM Single Channel Bidirectional 1.25 Gbps SFP Transceiver (40 km)

WRT-SFPI3C10BDxxx



The Lumentum WaveReady bidirectional 1.25 Gbps single-channel CWDM optical SFP transceivers enable optical Gigabit Ethernet data links over single fiber up to 40 km as well as 1X Fiber Channel and CPRI Line Rate Option 2: 1.2288 Gbps.

WRT-SFPI3C10BDDxx (downlink) and WRT-SFPI3C10BDUxx (uplink) SFPs comply with Gigabit Ethernet as specified in IEEE 802.3ah, Fiber Channel FC-PI 13.0 and LTE wireless backhaul.

Digital diagnostics functions are available via the 2-wire serial bus specified in the SFF-8472 rev.11.0.

The transmitter features AC-coupled differential data inputs, and an LVTTL for Tx disable input and Tx fault output.

The receiver features differential AC-coupled data outputs and LVTTL for LOS (Loss of Signal) output.

**Key Benefits**

- Enables 40 km CWDM bidirectional Gigabit Ethernet, 1X Fiber Channel and CPRI data transmission over a single fiber
- Maximizes fiber resource usage
- Doubles bandwidth compared to two fiber applications
- Allows up 16 channel CWDM mux/demux

**Features**

- Bidirectional single CWDM channel over a single fiber
- Very low jitter
- Cooled DFB laser transmitters
- Wide dynamic range: InGaAs PIN photodiode
- Metal package for lower EMI
- Single power supply voltage : +3.3 V
- Low power dissipation
- Receptacle with LC/UPC connector
- Operating temperature range: –40°C to 85°

**Compliance**

- RoHS compliant
- Compliant with SFP MSA
- Digital diagnostic SFF-8472 compliant

## Receiver Optical Wavelengths

| Optical Wavelength | Minimum | Typical | Maximum | Note |
|---|---|---|---|---|
| Channel 1271 nm | 1264.50 nm | 1267 nm | 1268.00 nm | uplink |
| | 1274.00 nm | 1276 nm | 1277.50 nm | downlink |
| Channel 1291 nm | 1284.50 nm | 1287 nm | 1288.00 nm | uplink |
| | 1294.00 nm | 1296 nm | 1297.50 nm | downlink |
| Channel 1311 nm | 1304.50 nm | 1307 nm | 1308.00 nm | uplink |
| | 1314.00 nm | 1316 nm | 1317.50 nm | downlink |
| Channel 1331 nm | 1324.50 nm | 1327 nm | 1328.00 nm | uplink |
| | 1334.00 nm | 1336 nm | 1337.50 nm | downlink |
| Channel 1351 nm | 1344.50 nm | 1347 nm | 1348.00 nm | uplink |
| | 1354.00 nm | 1356 nm | 1357.50 nm | downlink |
| Channel 1411 nm | 1404.50 nm | 1407 nm | 1408.00 nm | uplink |
| | 1414.00 nm | 1416 nm | 1417.50 nm | downlink |
| Channel 1431 nm | 1424.50 nm | 1427 nm | 1428.00 nm | uplink |
| | 1434.00 nm | 1436 nm | 1437.50 nm | downlink |
| Channel 1451 nm | 1444.50 nm | 1447 nm | 1448.00 nm | uplink |
| | 1454.00 nm | 1456 nm | 1457.50 nm | downlink |
| Channel 1471 nm | 1464.50 nm | 1467 nm | 1468.00 nm | uplink |
| | 1474.00 nm | 1476 nm | 1477.50 nm | downlink |
| Channel 1491 nm | 1484.50 nm | 1487 nm | 1488.00 nm | uplink |
| | 1494.00 nm | 1496 nm | 1497.50 nm | downlink |
| Channel 1511 nm | 1504.50 nm | 1507 nm | 1508.00 nm | uplink |
| | 1514.00 nm | 1516 nm | 1517.50 nm | downlink |
| Channel 1531 nm | 1524.50 nm | 1527 nm | 1528.00 nm | uplink |
| | 1534.00 nm | 1536 nm | 1537.50 nm | downlink |
| Channel 1551 nm | 1544.50 nm | 1547 nm | 1548.00 nm | uplink |
| | 1554.00 nm | 1556 nm | 1557.50 nm | downlink |
| Channel 1571 nm | 1564.50 nm | 1567 nm | 1568.00 nm | uplink |
| | 1574.00 nm | 1576 nm | 1577.50 nm | downlink |
| Channel 1591 nm | 1584.50 nm | 1587 nm | 1588.00 nm | uplink |
| | 1594.00 nm | 1596 nm | 1597.50 nm | downlink |
| Channel 1611 nm | 1604.50 nm | 1607 nm | 1608.00 nm | uplink |
| | 1614.00 nm | 1616 nm | 1617.50 nm | downlink |

## Transmitter Optical Wavelengths

| Optical Wavelength | Minimum | Typical | Maximum | Note |
|---|---|---|---|---|
| Channel 1271 nm | 1264.50 nm | 1267 nm | 1268.00 nm | downlink |
| | 1274.00 nm | 1276 nm | 1277.50 nm | uplink |
| Channel 1291 nm | 1284.50 nm | 1287 nm | 1288.00 nm | downlink |
| | 1294.00 nm | 1296 nm | 1297.50 nm | uplink |
| Channel 1311 nm | 1304.50 nm | 1307 nm | 1308.00 nm | downlink |
| | 1314.00 nm | 1316 nm | 1317.50 nm | uplink |
| Channel 1331 nm | 1324.50 nm | 1327 nm | 1328.00 nm | downlink |
| | 1334.00 nm | 1336 nm | 1337.50 nm | uplink |
| Channel 1351 nm | 1344.50 nm | 1347 nm | 1348.00 nm | downlink |
| | 1354.00 nm | 1356 nm | 1357.50 nm | uplink |
| Channel 1411 nm | 1404.50 nm | 1407 nm | 1408.00 nm | downlink |
| | 1414.00 nm | 1416 nm | 1417.50 nm | uplink |
| Channel 1431 nm | 1424.50 nm | 1427 nm | 1428.00 nm | downlink |
| | 1434.00 nm | 1436 nm | 1437.50 nm | uplink |
| Channel 1451 nm | 1444.50 nm | 1447 nm | 1448.00 nm | downlink |
| | 1454.00 nm | 1456 nm | 1457.50 nm | uplink |
| Channel 1471 nm | 1464.50 nm | 1467 nm | 1468.00 nm | downlink |
| | 1474.00 nm | 1476 nm | 1477.50 nm | uplink |
| Channel 1491 nm | 1484.50 nm | 1487 nm | 1488.00 nm | downlink |
| | 1494.00 nm | 1496 nm | 1497.50 nm | uplink |
| Channel 1511 nm | 1504.50 nm | 1507 nm | 1508.00 nm | downlink |
| | 1514.00 nm | 1516 nm | 1517.50 nm | uplink |
| Channel 1531 nm | 1524.50 nm | 1527 nm | 1528.00v | downlink |
| | 1534.00 nm | 1536 nm | 1537.50 nm | uplink |
| Channel 1551 nm | 1544.50 nm | 1547 nm | 1548.00 nm | downlink |
| | 1554.00 nm | 1556 nm | 1557.50 nm | uplink |
| Channel 1571 nm | 1564.50 nm | 1567 nm | 1568.00 nm | downlink |
| | 1574.00 nm | 1576 nm | 1577.50 nm | uplink |
| Channel 1591 nm | 1584.50 nm | 1587 nm | 1588.00 nm | downlink |
| | 1594.00 nm | 1596 nm | 1597.50 nm | uplink |
| Channel 1611 nm | 1604.50 nm | 1607 nm | 1608.00 nm | downlink |
| | 1614.00 nm | 1616 nm | 1617.50 nm | uplink |

## Receiver Specifications

| **Optical Characteristics** | | | |
|---|---|---|---|
| ***Parameter*** | ***Minimum*** | ***Typical*** | ***Maximum*** |
| Sensitivity[1] (RSENS) | – | – | –22 |
| Maximum input power (overload) | 1 | – | – |
| Receiver reflectance | – | – | –27 |
| LOS assert (LOS_A) | –35 | – | – |
| LOS de-assert (LOS_D) | – | – | –22 |
| LOS hysteresis | 0.5 | 2 | 5 |
| Receiver reflectance | – | – | –27 dB |
| LOS assert | –35 dBm | – | – |
| LOS de-assert | – | – | –22 dBm |
| LOS hysteresis | 0.5 dB | 2 dB | 5 dB |
| ***Electrical Characteristics*** | | | |
| Bit rate | – | 1.25 Gbps | – |
| Differential data output swing ($V_{out}$,pp) | 600 mV | – | 1200 mV |

1. Measured with a PRBS of 27–1 at 1 x 10–12 BER and 9 dB extinction ratio.

## Transmitter Specifications

| **Optical Characteristics** | | | |
|---|---|---|---|
| ***Parameter*** | ***Minimum*** | ***Typical*** | ***Maximum*** |
| Optical power[1] ($P_{out}$) | | | |
| 1271 to 1451 nm | –2 dBm | – | 3 dBm |
| 1471 to 1611 nm | –4 dBm | – | 1 dBm |
| Extinction ratio (ER) | 9 | – | – |
| Side mode suppression ratio (SMSR) | 30 | – | – |
| Spectral width (–20dB, ($\sigma_{20}$) | – | – | 1 nm |
| Transmitter off output power | – | – | –45 dbm |
| Relative intensity noise ($OMA_{12}$RIN) | – | – | –118 dB/Hz |
| Total generated transmitter jitter (peak-to-peak) (JTXp-p) | – | – | 0.07 UI |
| Dispersion penalty (DP) | – | – | 1 dB |
| Optical output eye | Compliant with Telcordia GR-253-CORE and ITU-T Recommendation G.957 | | |
| ***Electrical Characteristics*** | | | |
| Bit rate | – | 1.25 Gbps | – |
| Input differential Impedance (Rin) | – | 100 Ω | – |
| Differentialdata Input swing (Vin,pp) | 200 | – | 2000 mV |
| Tx disable voltage (Vd) | 2.4 V | – | – |
| Tx enable voltage (Ven) | – | – | 0.8 V |

1. Using 9/125 SMF: guaranteed for random mating of patch codes.

## Ordering Information

| Description | Product Code |
|---|---|
| Bidirectional SFP CWDM DownLink GE IR 1271 nm | WRT-SFPI3C10BDD27 |
| Bidirectional SFP CWDM UpLink GE IR 1271 nm | WRT-SFPI3C10BDU27 |
| Bidirectional SFP CWDM DownLink GE IR 1291 nm | WRT-SFPI3C10BDD29 |
| Bidirectional SFP CWDM UpLink GE IR 1291 nm | WRT-SFPI3C10BDU29 |
| Bidirectional SFP CWDM DownLink GE IR 1311 nm | WRT-SFPI3C10BDD31 |
| Bidirectional SFP CWDM UpLink GE IR 1311nm | WRT-SFPI3C10BDU31 |
| Bidirectional SFP CWDM DownLink GE IR 1331 nm | WRT-SFPI3C10BDD33 |
| Bidirectional SFP CWDM UpLink GE IR 1331 nm | WRT-SFPI3C10BDU33 |
| Bidirectional SFP CWDM DownLink GE IR 1351 nm | WRT-SFPI3C10BDD35 |
| Bidirectional SFP CWDM UpLink GE IR 1351 nm | WRT-SFPI3C10BDU35 |
| Bidirectional SFP CWDM DownLink GE IR 1411 nm | WRT-SFPI3C10BDD41 |
| Bidirectional SFP CWDM UpLink GE IR 1411 nm | WRT-SFPI3C10BDU41 |
| Bidirectional SFP CWDM DownLink GE IR 1431 nm | WRT-SFPI3C10BDD43 |
| Bidirectional SFP CWDM UpLink GE IR 1431 nm | WRT-SFPI3C10BDU43 |
| Bidirectional SFP CWDM DownLink GE IR 1451 nm | WRT-SFPI3C10BDD45 |
| Bidirectional SFP CWDM UpLink GE IR 1451 nm | WRT-SFPI3C10BDU45 |
| Bidirectional SFP CWDM DownLink GE IR 1471 nm | WRT-SFPI3C10BDD47 |
| Bidirectional SFP CWDM UpLink GE IR 1471 nm | WRT-SFPI3C10BDU47 |
| Bidirectional SFP CWDM DownLink GE IR 1491 nm | WRT-SFPI3C10BDD49 |
| Bidirectional SFP CWDM UpLink GE IR 1491 nm | WRT-SFPI3C10BDU49 |
| Bidirectional SFP CWDM DownLink GE IR 1511 nm | WRT-SFPI3C10BDD51 |
| Bidirectional SFP CWDM UpLink GE IR 1511 nm | WRT-SFPI3C10BDU51 |
| Bidirectional SFP CWDM DownLink GE IR 1531 nm | WRT-SFPI3C10BDD53 |
| Bidirectional SFP CWDM UpLink GE IR 1531 nm | WRT-SFPI3C10BDU53 |
| Bidirectional SFP CWDM DownLink GE IR 1551 nm | WRT-SFPI3C10BDD55 |
| Bidirectional SFP CWDM UpLink GE IR 1551 nm | WRT-SFPI3C10BDU55 |
| Bidirectional SFP CWDM DownLink GE IR 1571 nm | WRT-SFPI3C10BDD57 |
| Bidirectional SFP CWDM UpLink GE IR 1571 nm | WRT-SFPI3C10BDU57 |
| Bidirectional SFP CWDM DownLink GE IR 1591 nm | WRT-SFPI3C10BDD59 |
| Bidirectional SFP CWDM UpLink GE IR 1591 nm | WRT-SFPI3C10BDU59 |
| Bidirectional SFP CWDM DownLink GE IR 1611 nm | WRT-SFPI3C10BDD61 |
| Bidirectional SFP CWDM UpLink GE IR 1611 nm | WRT-SFPI3C10BDU61 |

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