

# 10Gb/s BIDI SFP+ 1270nm/1330nm Transceiver(V1.0)



The RTX228-461/462 1270nm/1330nm DFB 10Gigabit Transceiver is designed to transmit and receive serial optical data links up from 2.5 to 10.3 Gb/s data rate over single-mode fiber. The Transceiver is compliant with SFF-8432, and applicable portions of SFF-8431. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472.

## Features

- Compliant to SFP+ MSA
- Fully RoHS Compliant
- Operating data rate 2.5 to 10.3Gb/s
- Transmission distance up to 10km
- 1270nm/1330nm DFB Laser
- LC single connector
- Hot pluggable 20pin connector
- -40°C to 85°C operating wide temperature range
- Low power consumption <1W
- Single +3.3V±5% power supply
- Digital Monitoring SFF-8472 Rev 10 compliant

## Applications

- 10GBASE-LR/LW
- 10G Ethernet
- OBSAI rates 3.072 Gb/s, 6.144Gb/s
- CPRI rates 2.4576 Gb/s, 4.9152Gb/s, 6.144Gb/s, 9.8304 Gb/s

## Standards

- IEEE 802.3ae 10GBASE-LR
- SFF-8431 Rev 4
- SFF-8472 Rev 10

## Specifications

(Tested under recommended operating conditions, unless otherwise noted)

| Parameter                                                                                                                                                                                                   | Symbol                | Unit    | Min  | Typ  | Max   | Note |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------|------|------|-------|------|
| Optical Transmitter Characteristics                                                                                                                                                                         |                       |         |      |      |       |      |
| Data Rate                                                                                                                                                                                                   | -                     | Gbps    | 2.5  |      | 10.3  |      |
| Transmission Distance                                                                                                                                                                                       | L                     | km      |      |      | 10    |      |
| Center Wavelength                                                                                                                                                                                           | $\lambda$             | nm      | 1260 | 1270 | 1280  |      |
|                                                                                                                                                                                                             |                       |         | 1320 | 1330 | 1340  |      |
| Spectral width(-20dB)                                                                                                                                                                                       | $\Delta\lambda_{rms}$ | nm      |      |      | 1     | 1    |
| Optical Output Power                                                                                                                                                                                        | $P_O$                 | dBm     | -8.2 |      | +0.5  | 2    |
| Average Launch Power of OFF Transmitter                                                                                                                                                                     | $P_{OFF}$             | dBm     |      |      | -30   |      |
| Extinction Ratio                                                                                                                                                                                            | ER                    | dB      | 3.5  |      |       |      |
| Relative Intensity Noise                                                                                                                                                                                    | $R_{IN}$              | dB/Hz   |      |      | -128  |      |
| SMSR                                                                                                                                                                                                        | -                     | dB      | 30   |      |       |      |
| Optical Receiver Characteristics                                                                                                                                                                            |                       |         |      |      |       |      |
| Data Rate                                                                                                                                                                                                   | -                     | Gbps    | 2.5  |      | 10.3  |      |
| Center Wavelength                                                                                                                                                                                           | $\lambda_C$           | nm      | 1320 | 1330 | 1340  |      |
|                                                                                                                                                                                                             |                       |         | 1260 | 1270 | 1280  |      |
| Receiver Sensitivity                                                                                                                                                                                        | $R_{SEN}$             | dBm     |      |      | -14.4 | 3    |
| Receiver Overload                                                                                                                                                                                           | -                     | dBm     | 0.5  |      |       | 3    |
| Receiver Reflectance                                                                                                                                                                                        | $R_{REFL}$            | dB      |      |      | -12   |      |
| LOS                                                                                                                                                                                                         | Optical Assert        | $LOS_A$ | dBm  | -30  |       |      |
|                                                                                                                                                                                                             | Optical Dessert       | $LOS_D$ | dBm  |      | -15   |      |
| LOS Hysteresis                                                                                                                                                                                              | -                     | dB      | 0.5  |      | 6     |      |
| Note 1: Spectral width has to be defined over -20dBm.<br>Note 2: Minimum output optical level is at end of life.<br>Note 3: Sensitivity for PRBS 2 <sup>31</sup> -1 and BER better than or equal to 10E-12. |                       |         |      |      |       |      |

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## Ordering Information

| Part No.    | Specifications |              |            |               |            |             |           |       |        | Application              |
|-------------|----------------|--------------|------------|---------------|------------|-------------|-----------|-------|--------|--------------------------|
|             | Package        | Data rate    | Laser      | Optical Power | Detector   | Sensitivity | Temp      | Reach | Others |                          |
| RTXM228-461 | SFP+           | 2.5~10.3Gb/s | 1270nm DFB | -8.2~+0.5dBm  | 1330nm PIN | <-14.4dBm   | -40~85 °C | 10km  | DDM    | 10GBASE-LR/LW OBSAI/CPRI |
| RTXM228-462 | SFP+           | 2.5~10.3Gb/s | 1330nm DFB | -8.2~+0.5dBm  | 1270nm PIN | <-14.4dBm   | -40~85 °C | 10km  | DDM    | 10GBASE-LR/LW OBSAI/CPRI |

## Absolute Maximum Ratings

| Parameter                 | Symbol          | Unit | Min  | Max |
|---------------------------|-----------------|------|------|-----|
| Storage Temperature Range | Ts              | °C   | -40  | 85  |
| Relative Humidity         | RH              | %    | 5    | 95  |
| Supply Voltage            | V <sub>CC</sub> | V    | -0.3 | 4.0 |

## Recommended Operating Conditions

| Parameter                        | Symbol          | Unit | Min  | Typ | Max               |
|----------------------------------|-----------------|------|------|-----|-------------------|
| Operating Case Temperature Range | Tc              | °C   | -40  |     | 85                |
| Power Supply Voltage             | V <sub>CC</sub> | V    | 3.14 | 3.3 | 3.46              |
| Bit Rate                         | BR              | Gb/s | 2.5  |     | 10.3              |
| Bit Error Ratio                  | BER             |      |      |     | 10 <sup>-12</sup> |
| Max Supported Link Length        | L               | km   |      |     | 10                |

## Principle diagram

