



## SFP-10GB-CW-37-40-J-SKY

Juniper Networks® Compatible 10GBase-CWDM SFP+ Transceiver (SMF, 1370nm, 40km, LC, DOM)

### Product Description

This Juniper Networks® compatible SFP+ transceiver provides 10GBase-CWDM throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1370nm via an LC connector. The listed reach has been determined using a link budget calculation and tested in a standard environment. Actual link distances achieved will be dependent upon the deployed environment. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Juniper Networks®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty. Skylane's transceivers are RoHS compliant and lead-free.

### Features:

- SFF-8432 and SFF-8472 Compliance
- Duplex LC Connector
- Commercial Temperature 0 to 70 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



### Applications:

- 10x Gigabit Ethernet over CWDM
- Access, Metro and Enterprise
- 8x/10x Fibre Channel
- Mobile Fronthaul CPRI/OBSAI

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*For your product safety, please read the following information carefully before any manipulation of the transceiver:*



#### ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



#### LASER SAFETY

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

*The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.*

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### CWDM Available Wavelengths

| Wavelengths | Min.   | Typ. | Max.   |
|-------------|--------|------|--------|
| 27          | 1264.5 | 1271 | 1277.5 |
| 29          | 1284.5 | 1291 | 1297.5 |
| 31          | 1304.5 | 1311 | 1317.5 |
| 33          | 1324.5 | 1331 | 1337.5 |
| 35          | 1344.5 | 1351 | 1357.5 |
| 37          | 1364.5 | 1371 | 1377.5 |
| 39          | 1384.5 | 1391 | 1397.5 |
| 41          | 1404.5 | 1411 | 1417.5 |
| 43          | 1424.5 | 1431 | 1437.5 |
| 45          | 1444.5 | 1451 | 1457.5 |

### Absolute Maximum Ratings

| Parameter                          | Symbol           | Min. | Typ.          | Max. | Unit |
|------------------------------------|------------------|------|---------------|------|------|
| Maximum Supply Voltage             | V <sub>CC</sub>  | -0.5 |               | 3.6  | V    |
| Storage Temperature                | T <sub>stg</sub> | -40  |               | 85   | °C   |
| Operating Case Temperature         | T <sub>c</sub>   | 0    |               | 70   | °C   |
| Relative Humidity (Non-Condensing) | RH               | 0    |               | 85   | %    |
| Data Rate                          | DR               | 0.6  | 9.953/10.3125 |      | Gbps |

### Notes:

1. Exceeding any one of these values may destroy the device immediately.

## Electrical Characteristics

| Parameter                     |      | Symbol            | Min. | Typ. | Max.                 | Unit  | Notes                                           |
|-------------------------------|------|-------------------|------|------|----------------------|-------|-------------------------------------------------|
| Power Supply Voltage          |      | V <sub>CC</sub>   | 3.15 | 3.30 | 3.43                 | V     |                                                 |
| Power Consumption             |      | P <sub>DISS</sub> |      |      | 1.5                  | W     |                                                 |
| Transmitter                   |      |                   |      |      |                      |       |                                                 |
| CML Differential Inputs       |      | V <sub>IN</sub>   | 150  |      | 1200                 | mVp-p | AC Coupled Inputs                               |
| Input AC Common-Mode Voltage  |      |                   | 0    |      | 25                   | mV    | RMS                                             |
| Input Differential Impedance  |      | Z <sub>IN</sub>   | 85   | 100  | 115                  | Ω     | R <sub>IN</sub> >100kΩ @DC                      |
| Tx_Disable                    | High |                   | 2    |      | V <sub>CC</sub>      | V     |                                                 |
|                               | Low  |                   | 0    |      | 0.8                  |       |                                                 |
| Tx_Fault                      | High |                   | 2    |      | V <sub>CC</sub> +0.3 | V     | I <sub>O</sub> = 400μA;<br>Host_V <sub>CC</sub> |
|                               | Low  |                   | 0    |      | 0.5                  |       | I <sub>O</sub> = -4.0mA                         |
| Receiver                      |      |                   |      |      |                      |       |                                                 |
| CML Differential Outputs      |      | V <sub>OUT</sub>  | 350  |      | 700                  | mVp-p | AC Coupled Outputs                              |
| Output Differential Impedance |      | Z <sub>OUT</sub>  | 85   | 100  | 115                  | Ω     |                                                 |
| Rx_LOS                        | High |                   | 2    |      | V <sub>CC</sub> +0.3 |       | I <sub>O</sub> = 400μA;<br>Host_V <sub>CC</sub> |
|                               | Low  |                   | 0    |      | 0.8                  |       | I <sub>O</sub> = -4.0mA                         |
| MOD_DEF(0.2)                  |      | V <sub>OH</sub>   | 2.5  |      |                      | V     | With Serial ID                                  |
|                               |      | V <sub>OL</sub>   | 0    |      | 0.5                  | V     | With Serial ID                                  |

## Optical Characteristics

| Parameter                        | Symbol          | Min.          | Typ.      | Max.          | Unit  | Notes |
|----------------------------------|-----------------|---------------|-----------|---------------|-------|-------|
| Transmitter                      |                 |               |           |               |       |       |
| Center Wavelength                | $\lambda_C$     | $\lambda-6.5$ | $\lambda$ | $\lambda+6.5$ | nm    |       |
| Average Output Power             | POUT            | 0             |           | 6             | dBm   | 1     |
| Extinction Ratio                 | ER              | 3.5           |           | dB            | dB    |       |
| Average Power of Off Transmitter | Poff            |               |           | -30           | dBm   |       |
| Side-Mode Suppression Ratio      | SMSR            | 30            |           | dB            |       |       |
| -20dB Spectral Width             | $\Delta\lambda$ |               |           | 1             | nm    |       |
| Transmitter Dispersion Penalty   | TDP             |               |           | 3             | dB    |       |
| Relative Intensity Noise         | RIN             |               |           | -128          | dB/Hz |       |
| Tx_Disable Assert Time           | T_off           |               |           | 10            | us    |       |
| Receiver                         |                 |               |           |               |       |       |
| Center Wavelength                | $\lambda_C$     | 1260          |           | 1620          | nm    |       |
| Receiver Sensitivity             | Pmin            |               |           | -15           | dBm   | 2     |
| Receiver Overload                | Pmax            | 0             |           | dBm           | nm    |       |
| LOS De-Assert                    | LOSD            |               |           | -17           | dBm   |       |
| LOS Assert                       | LOSA            | -28           |           | dBm           |       |       |
| LOS Hysteresis                   | LOSH            | 0.5           |           | dB            |       |       |

### Notes:

1. Output is coupled into a 9/125 $\mu$ m SMF.
2. Measured with worst ER, BER less than  $1E^{-12}$ , and PRBS  $2^{31}-1$  @10.3125Gbps.

## Pin Descriptions

| Pin | Symbol     | Name/Description                                                           | Notes |
|-----|------------|----------------------------------------------------------------------------|-------|
| 1   | VeeT       | Transmitter Ground (Common with Receiver Ground).                          | 1     |
| 2   | Tx_Fault   | Transmitter Fault. LVTTTL-O.                                               | 2     |
| 3   | Tx_Disable | Transmitter Disable. Laser output disabled on “high” or “open.” LVTTTL-I.  | 3     |
| 4   | SDA        | 2-Wire Serial Interface Data (Same as MOD-DEF2 in INF-8074i). LVTTTL-I/O.  |       |
| 5   | SCL        | 2-Wire Serial Interface Clock (Same as MOD-DEF2 in INF-8074i). LVTTTL-I.   |       |
| 6   | MOD_ABS    | Module Absent. Connect to the VeeT or VeeR in the module.                  | 4     |
| 7   | RS0        | Rate Select 0. Not Used.                                                   | 5     |
| 8   | LOS        | Loss of Signal Indication. “Logic 0” indicates normal operation. LVTTTL-O. | 2     |
| 9   | RS1        | Rate Select 1. Not Used.                                                   | 5     |
| 10  | VeeR       | Receiver Ground (Common with Transmitter Ground).                          | 1     |
| 11  | VeeR       | Receiver Ground (Common with Transmitter Ground).                          | 1     |
| 12  | RD-        | Receiver Inverted Data Out. AC Coupled. CML-O.                             |       |
| 13  | RD+        | Receiver Non-Inverted Data Out. AC Coupled. CML-O.                         |       |
| 14  | VeeR       | Receiver Ground (Common with Transmitter Ground).                          | 1     |
| 15  | VccR       | Receiver Power Supply.                                                     |       |
| 16  | VccT       | Transmitter Power Supply.                                                  |       |
| 17  | VeeT       | Transmitter Ground (Common with Receiver Ground).                          | 1     |
| 18  | TD+        | Transmitter Non-Inverted Data In. AC Coupled. CML-I.                       |       |
| 19  | TD-        | Transmitter Inverted Data In. AC Coupled. CML-O.                           |       |
| 20  | VeeT       | Transmitter Ground (Common with Receiver Ground).                          | 1     |

### Notes:

1. The module signal ground contacts, VeeR and VeeT, should be isolated from the module case.
2. This contact is an open collector/drain output and should be pulled up to the Host\_Vcc with resistor in the range 4.7kΩ to 10kΩ. Pull-ups can be connected to one or several power supplies; however, the host board design shall ensure that no module contact has a voltage exceeding the module VccT/R+0.5V.
3. Tx\_Disable is an input contact with a 4.7kΩ to 10kΩ pull-up resistor to the VccT inside the module.
4. MOD\_ABS is connected to the VeeT or VeeR in the SFP+ module. The host may pull the contact up to the Host\_Vcc with a resistor in the range from 4.7kΩ to 10kΩ. MOD\_ABS is asserted “high” when the SFP+ module is physically absent from a host slot.
5. Internally pulled down per SFF-8431.



**Mechanical Specifications**

Small Form Factor Pluggable (SFP) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).



# About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

