

### **SFP-10GB-CW-45-40-N2-AO**

Alcatel-Lucent Nokia® Compatible TAA 10GBase-CWDM SFP+ Transceiver (SMF, 1450nm, 40km, LC, DOM)

#### **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**

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

#### **Product Description**

This Alcatel-Lucent Nokia® SFP+ transceiver provides 10GBase-CWDM throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1450nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Alcatel-Lucent Nokia® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

AddOn's transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."



### 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.



Pin-Out of Connector Block on the Host Board

### Recommended Circuit Schematic



**Mechanical Specifications**

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



## About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is ingrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications from ranging from NEBS Level 3 to ISO 9001:2005 with every new development while maintaining the signature reliability of its products.



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