



## 3FE53441BC-SKY

Alcatel-Lucent Nokia® 3FE53441BC Compatible 2.4Gbs/1.2Gbs-C+ SFP Transceiver (SMF, 1490nmTx/1310nmRx, 20km, SC, DOM, -40 to 85C)

### Product Description

This Alcatel-Lucent Nokia® 3FE53441BC compatible SFP transceiver provides 2.4Gbs/1.2Gbs-C+ throughput up to 20km over single-mode fiber (SMF) using a wavelength of 1490nmTx/1310nmRx via a SC 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. 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:

- INF-8074 and SFF-8472 Compliance
- Simplex SC Connector
- Industrial Temperature -40 to 85 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



### Applications:

- GPON
- Access and Enterprise

---

*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.*

---

### Absolute Maximum Ratings

| Parameter                  | Symbol           | Min. | Typ.      | Max.              | Unit | Notes |
|----------------------------|------------------|------|-----------|-------------------|------|-------|
| Maximum Supply Voltage     | V <sub>cc</sub>  | -0.5 |           | 4.0               | V    | 1     |
| Storage Temperature        | T <sub>sto</sub> | -40  |           | 85                | °C   | 2     |
| Operating Case Temperature | T <sub>op</sub>  | -40  |           | 85                | °C   |       |
| Data Rate                  | DR               |      | 2488/1244 |                   | Mb/s | 3     |
| Bit Error Rate             | BER              |      |           | 10 <sup>-10</sup> |      |       |

### Notes:

1. For electrical power interface
2. Ambient temperature
3. Downstream/Upstream

### Electrical Characteristics (V<sub>cc</sub>=3.14V to 3.46V, T<sub>c</sub>=- 40°C to 85°C)

| Parameter                      | Symbol               | Min. | Typ. | Max.            | Unit | Notes |
|--------------------------------|----------------------|------|------|-----------------|------|-------|
| Input Voltage                  | V <sub>cc</sub>      | 3.14 | 3.30 | 3.46            | V    |       |
| Power Supply Current           | I <sub>cc</sub>      |      |      | 450             | mA   |       |
| Differential data input swing  | V <sub>in,pp</sub>   | 600  |      | 1600            | mV   |       |
| Input differential impedance   | R <sub>in</sub>      |      | 100  |                 | Ω    |       |
| Differential data output swing | V <sub>out, pp</sub> | 400  |      | 1600            | mV   |       |
| Input Signal Level (LVTTL H)   | V                    | 2.0  |      | V <sub>CC</sub> | V    |       |
| Input Signal Level (LVTTL L)   | V                    | 0    |      | 0.8             |      |       |
| Output Signal Level (LVTTL H)  | V                    | 2.4  |      | V <sub>CC</sub> | V    |       |
| Output Signal Level (LVTTL L)  | V                    | 0    |      | 0.4             | V    |       |

**Optical Characteristics** ( $V_{CC}=3.14V$  to  $3.46V$ ,  $T_C=-40^{\circ}C$  to  $85^{\circ}C$ )

| Parameter                           | Symbol                             | Min. | Typ. | Max.               | Unit | Notes |
|-------------------------------------|------------------------------------|------|------|--------------------|------|-------|
| Transmitter                         |                                    |      |      |                    |      |       |
| Transmitter Type                    | 1490nm DFB Laser with Isolator     |      |      |                    |      | 1     |
| Downstream Signaling Speed          | STX                                |      | 2488 |                    | Mb/s |       |
| Output Optical Power                | PTX                                | 3    |      | 7                  | dBm  | 2     |
| Optical Output with TX OFF          | Pout_off                           |      |      | -40                | dBm  |       |
| Optical Extinction Ratio            | ER                                 | 8.2  |      |                    | dB   |       |
| Optical Center Wavelength           | $\lambda_c$                        | 1480 |      | 1500               | nm   |       |
| Spectral Width (-20dB)              | $\Delta\lambda$                    |      |      | 1                  | nm   |       |
| Side Mode Suppression Ratio         | SMSR                               | 30   |      |                    | dB   |       |
| Output Eye                          | Compliant with G.984. 2            |      |      | Data Rate=2488Mb/s |      |       |
| Receiver                            |                                    |      |      |                    |      |       |
| Receiver Type                       | 1310nm APD/TIA burst-mode Receiver |      |      |                    |      |       |
| Signaling Speed                     | Srx                                |      | 1244 |                    | MB/s |       |
| Optical Center Wavelength           | $\lambda_c$                        | 1280 | 1310 | 1360               | Nm   |       |
| Average Rx Sensitivity @1244Mb/s    | Rx_sen                             |      |      | -30                | dBm  | 3     |
| Burst Sensitivity Receiver Overload | Pmax                               | -12  |      |                    | dBm  |       |
| Receiver Burst Mode Dynamic Range   |                                    | 15   |      |                    | dB   |       |
| LOS Assert                          | LOS_A                              | -45  |      |                    | dBm  |       |
| LOS De-Assert                       | LOS_D                              |      |      | -32                | dBm  |       |
| LOS Hysteresis                      | LOS_H                              | 0.5  |      |                    |      |       |

**Notes:**

1. Continuous-mode
2. Class 1 Product
3. @BER  $10^{-10}$  PRBS  $2^{23}-1$

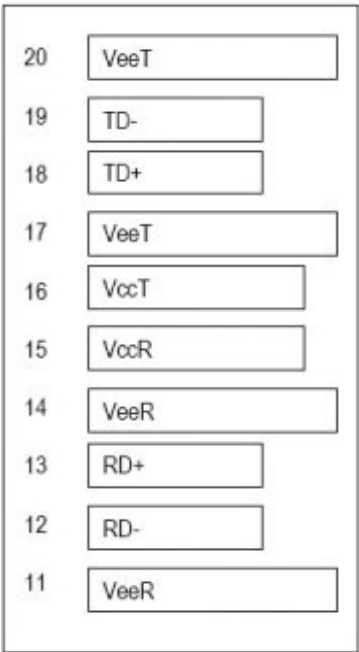
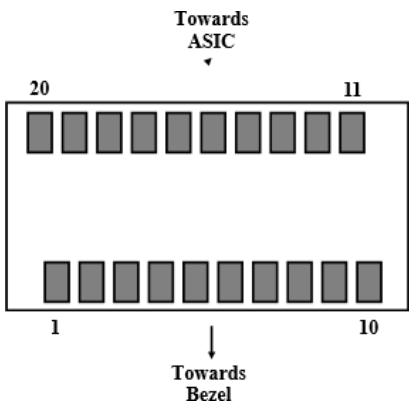
## Pin Descriptions

| Pin | Symbol       | Name/Descriptions                                          | Ref. |
|-----|--------------|------------------------------------------------------------|------|
| 1   | VEET         | Transmitter ground (common with receiver ground)           | 1    |
| 2   | TFAULT       | Transmitter Fault.                                         |      |
| 3   | TDIS         | Transmitter Disable. Laser output disabled on high or open | 2    |
| 4   | MOD_DEF (2)  | Module Definition 2. Data line for serial ID               | 3    |
| 5   | MOD_DEF (1)  | Module Definition 1. Clock line for serial ID              | 3    |
| 6   | MOD_DEF (0)  | Module Definition 0. Grounded within the module            | 3    |
| 7   | RESET        | Receiver Reset                                             | 4    |
| 8   | BPD          | Burst Packet Detect                                        | 5    |
| 9   | RSSI Trigger | RSSI Trigger Signal From Host                              | 6    |
| 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                     |      |
| 13  | RD+          | Receiver Non-inverted DATA out. AC coupled                 |      |
| 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               |      |
| 19  | TD-          | Transmitter Inverted DATA in. AC coupled                   |      |
| 20  | VEET         | Transmitter ground (common with receiver ground)           | 1    |

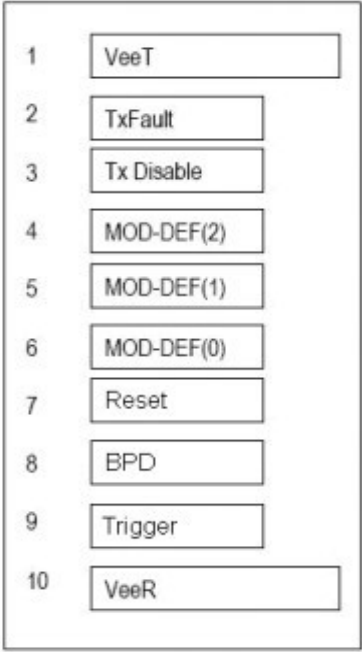
## Notes:

1. Circuit ground is isolated from chassis ground
2. Disabled:  $T_{DIS} > 2V$  or open, Enabled:  $T_{DIS} < 0.8V$
3. Should Be pulled up with 4.7k – 10k ohm on host board to a voltage between 2V and 3.6V
4. Reset is a LVTTTL input which is used to clear receiver status before receiving the next burst packet
5. BPD is a LVTTTL output. Low Level indicates that burst packet is detected by the receiver
6. RSSI Trigger is a LVTTTL input from host for starting ADC of digital RSSI circuit to sample the analog RSSI signal

Electrical Pad Layout



Top of Board



Bottom of Board (as viewed thru top of board)

### Digital Diagnostic Functions

This transceiver supports the 2-wire serial communication protocol as defined in the SFP MSA. Digital diagnostic information is accessible over the 2-wire interface at the address 0xA2. Digital diagnostics for this module are internally calibrated by default. A micro controller unit inside the transceiver gathers the monitoring information and reports the status of transceiver.

**Transceiver Temperature**, internally measured, represented as a 16 bit signed twos complement value in increments of 1/256 degrees Celsius, Temperature accuracy is better than  $\pm 3$  degrees Celsius over specified operating temperature and voltage.

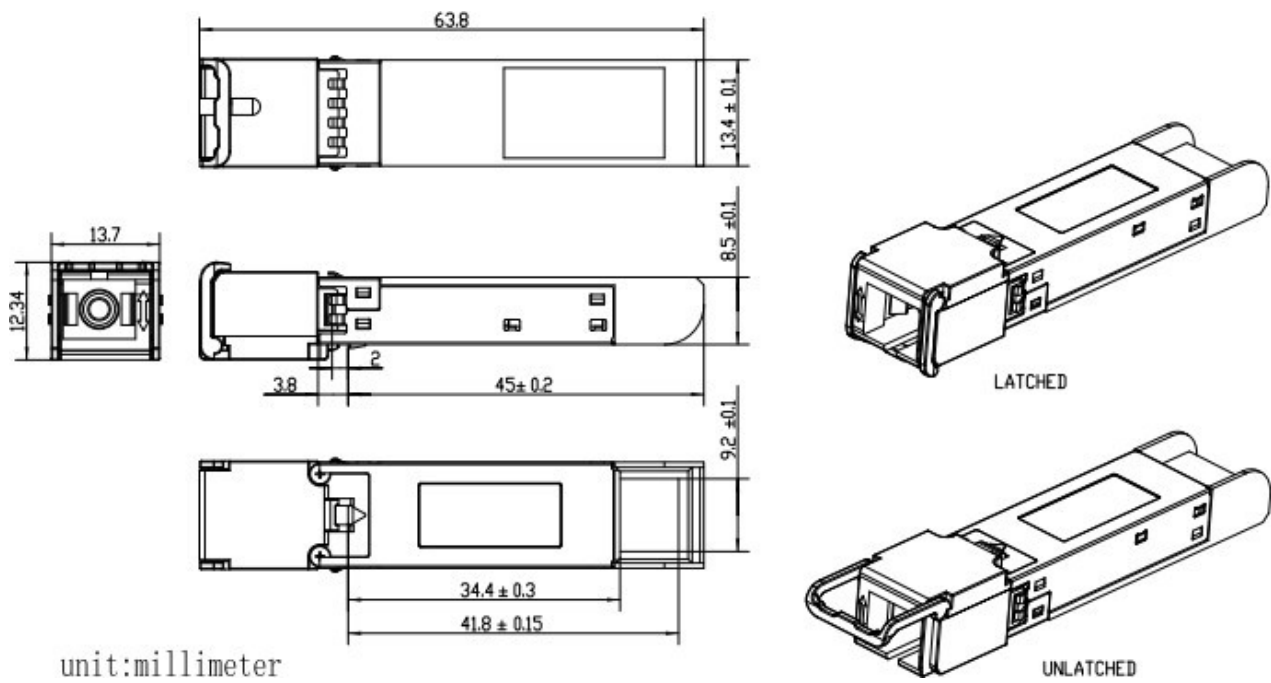
**Transceiver Supply Power**, internally measured, represented as a 16 bit unsigned integer with the voltage defined as the full 16 bit value (0 – 65535) with LSB equal to 100  $\mu$ Volt, yielding a total range of 0 to +6.55 Volts.

**Transceiver TX bias current**, internally measured, represented as a 16 bit unsigned integer with the current defined as the full 16 bit value (0 – 65535) with LSB equal to 2  $\mu$ A, yielding a total range of 0 to 131mA. Accuracy is better than  $\pm 10\%$  over specified operating temperature and voltage.

**Transceiver TX output power**, internally measured, represented as a 16 bit unsigned integer with the power defined as the full 16 bit value (0 – 65535) with LSB equal to 0.1  $\mu$ W. Data is assumed to be based on measurement of laser monitor photodiode current. Accuracy is better than  $\pm 3$ dB over specified temperature and voltage. Data is not valid when the transmitter is disabled.

**Transceiver RX received optical power**, internally measured, represented as a 16 bit unsigned integer with the power defined as the full 16 bit 35 value (0 – 65535) with LSB equal to 0.1  $\mu$ W. Accuracy is better than  $\pm 3$ dB over specified temperature and voltage.

Mechanical Specifications



ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED UNIT: mm

# 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.

