**SFP-25GBASE-LR-N1-OPC**

Alcatel-Lucent Nokia® Compatible TAA 25GBase-LR SFP28 Transceiver (SMF, 1310nm, 10km, LC, DOM)

**Features**

- SFF-8402 and SFF-8472 Compliance
- Duplex LC Connector
- Single-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free

**Applications:**

- 25GBase Ethernet
- Access and Enterprise

**Product Description**

This Alcatel-Lucent Nokia® compatible SFP28 transceiver provides 25GBase-LR throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It can operate at temperatures between 0 and 70C. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Alcatel-Lucent Nokia®. 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. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

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

### Absolute Maximum Ratings

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| **Supply Voltage** | Vcc | -0.5 | | 4.0 | V | |
| **Storage Temperature** | TS | -40 | | 85 | °C | |
| **Operating Case Temperature** | Tc | 0 | 25 | 70 | °C | |
| **Relative Humidity** | RH | 5 | | 95 | % | |
| **Data Rate** | BR | | 25.78 | | Gb/s | |
| **Bit Error Rate** | BER | | | $5x10^{-5}$ | | 1 |
| **Supported Link Length on 9/125um SMF, 25.78GB/s** | L | | 10 | | km | 2 |

**Notes:**

1. Tested with a PRBS 231-1 test pattern for 25.78Gb/s operation.
2. Distances are based on FC-PI-6 Rev 3.1 and IEEE 802.3 standards.

### Electrical Characteristics

| Parameter | | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|---|
| **Supply Voltage** | | Vcc | 3.135 | 3.3 | 3.465 | V | |
| **Data Rate** | | | | 25.78 | | GB/s | |
| **Module Supply Current** | | Icc | | | 450 | mA | |
| **Power Dissipation** | | $P_D$ | | | 1500 | mW | |
| **Transmitter** | | | | | | | |
| **Input Differential Impedance** | | $Z_{IN}$ | | 100 | | Ω | |
| **Differential Data Input Swing** | | $V_{IN, P-P}$ | 180 | | 700 | $mV_{P-P}$ | |
| **TX_FAULT** | **Transmitter Fault** | $V_{OH}$ | 2.0 | | $V_{CCHOST}$ | V | |
| | **Normal Operation** | $V_{OL}$ | 0 | | 0.8 | V | |
| **TX_DISABLE** | **Transmitter Disable** | $V_{IH}$ | 2.0 | | $V_{CCHOST}$ | V | |
| | **Transmitter Enable** | $V_{IL}$ | 0 | | 0.8 | V | |
| **Receiver** | | | | | | | |
| **Output Differential Impedance** | | $Z_O$ | | 100 | | Ω | |
| **Differential Data Output Swing** | | $V_{OUT, P-P}$ | 300 | | 850 | $mV_{P-P}$ | 1 |
| **Data Output Rinse Time, Fall Time** | | tr, tf | 15 | | | Ps | 2 |
| **Rx_LOS** | **Loss of Signal (LOS)** | $V_{OH}$ | 2.0 | | $V_{CCHOST}$ | V | 3 |
| | **Normal Operation** | $V_{OL}$ | 0 | | 0.8 | V | 3 |

**Notes:**

1. Internally AC coupled, but requires an external 100Ω differential load termination.
2. 20-80%
3. LOS is an open collector output. Should be pulled up with 4.7Ω on the host board.

**Optical Characteristics**

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| **Transmitter** | | | | | | |
| **Launch Optical Power** | Po | -5 | | 2 | dBm | 1 |
| **Extinction Ratio** | ER | 4 | | | dB | |
| **Center Wavelength Range** | λc | 1295 | 1310 | 1325 | nm | |
| **Optical Modulation Amplitude** | OMA | 631 | | | uW | |
| **Transmitter Dispersion Penalty** | TDP | | | 2.7 | dB | |
| **Spectral Width** | Δλ | | | 1 | nm | 2 |
| **Optical Rise/Fall Time @25.78 Gb/s** | tr/tf | | | 15 | ps | 3 |
| **Optical Return Loss Tolerance** | ORLT | | | 12 | dB | |
| **Pout @TX-Disable Asserted** | POFF | | | -30 | dBm | 1 |
| **Receiver** | | | | | | |
| **Center Wavelength** | λc | 1260 | 1310 | 1370 | nm | |
| **Receiver OMA Sensitivity** | RxSENS | | | -11.4 | dBm | 4 |
| **Receiver Overload (P avg)** | $P_{OL}$ | 2 | | | dBm | |
| **Optical Return Loss** | ORL | 26 | | | dB | |
| **LOS De-Assert** | $LOS_D$ | | | -13 | dBm | |
| **LOS Assert** | $LOS_A$ | -30 | | | dBm | |
| **LOS Hysteresis** | | 0.5 | | | dB | |

**Notes:**

1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. 20dB spectral width.
3. Unfiltered, 20-80%.
4. Measured with PRBS $2^{31}$-1 at $5\times10^{-5}$ BER

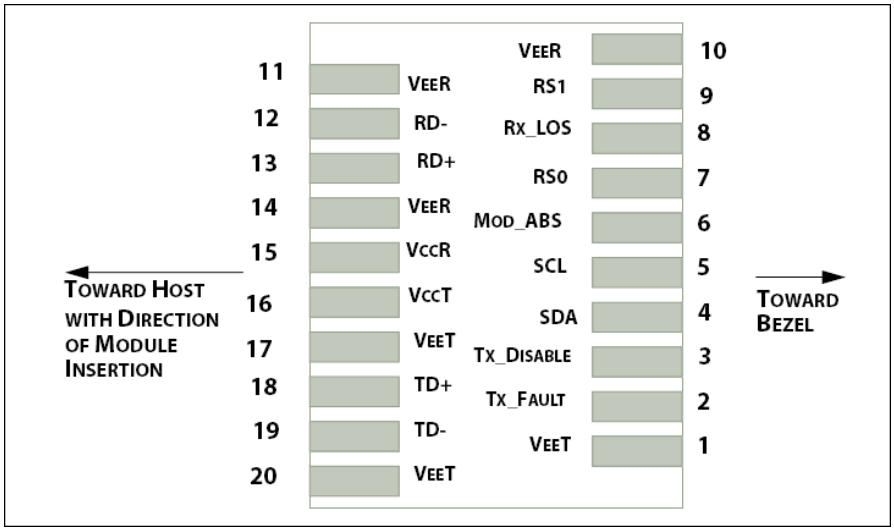
**Pin Descriptions**

| Pin | Symbol | Name/Descriptions | Notes |
|---|---|---|---|
| **1** | VeeT | Transmitter Ground | 1 |
| **2** | TX_Fault | Transmitter Fault (LVTTL-O) - High indicates a fault condition | 2 |
| **3** | TX_Disable | Transmitter Disable (LVTTL-I) – High or open disables the transmitter | 3 |
| **4** | SDA | Two wire serial interface Data Line (LVCMOS-I/O) (MOD-DEF2) | 4 |
| **5** | SCL | Two wire serial interface Clock Line (LVCMOS-I/O) (MOD-DEF1) | 4 |
| **6** | MOD_ABS | Module Absent (Output), connected to VeeT or VeeR in the module | 5 |
| **7** | RSO | | 6 |
| **8** | RX_LOS | Receiver Loss of Signal (LVTTL-O) | 2 |
| **9** | RS1 | | 6 |
| **10** | VeeR | Receiver Ground | 1 |
| **11** | VeeR | Receiver Ground | 1 |
| **12** | RD- | Inverse Received Data out (CML-O) | |
| **13** | RD+ | Received Data out (CML-O) | |
| **14** | VeeR | Receiver Ground | |
| **15** | VccR | Receiver Power - +3.3V | |
| **16** | VccT | Transmitter Power - +3.3 V | |
| **17** | VeeT | Transmitter Ground | 1 |
| **18** | TD+ | Transmitter Data In (CML-I) | |
| **19** | TD- | Inverse Transmitter Data In (CML-I) | |
| **20** | VeeT | Transmitter Ground | 1 |

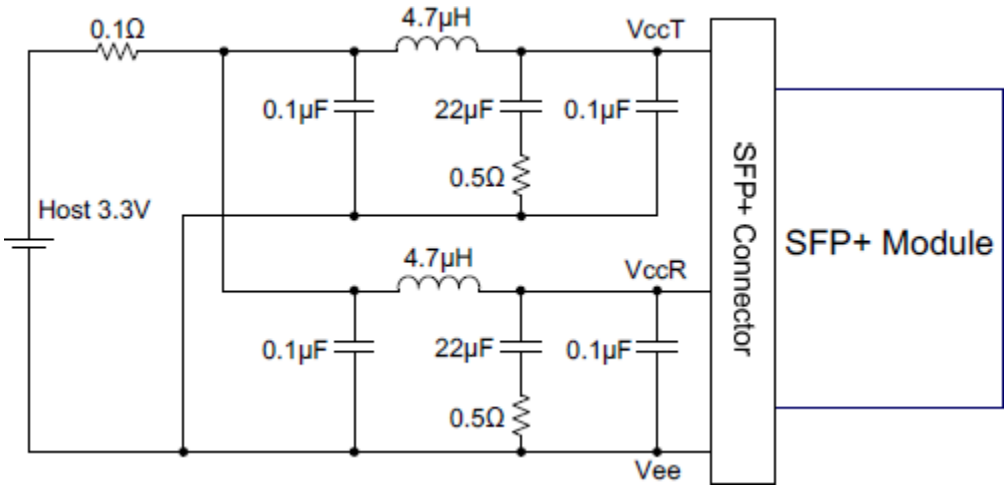
**Notes:**

1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to VccHost.
3. This input is internally biased high with a 4.7KΩ to 10KΩ pull-up resistor to VccT.
4. Two-Wire Serial interface clock and data lines require an external pull-up resistor dependent on the capacitance load.
5. This is a ground return that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to VccHost.
6. Rate select can also be set through the 2-wire bus in accordance with SFF-8472 v. 12.1, Rx Rate Select is set at Bit 3, Byte 110, Address A2h. Tx Rate Select is set at Bit 3, Byte 118, Address A2h. Note: writing a “1” selects maximum bandwidth operation. Rate select is the logic OR of the input state of Rate Select Pin and 2-wire bus.

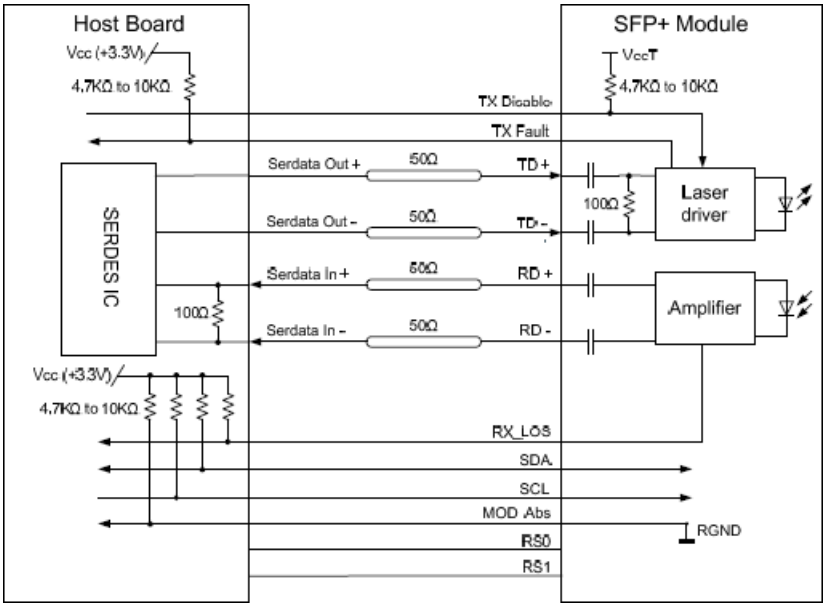
**Electrical Pin-Out Details**



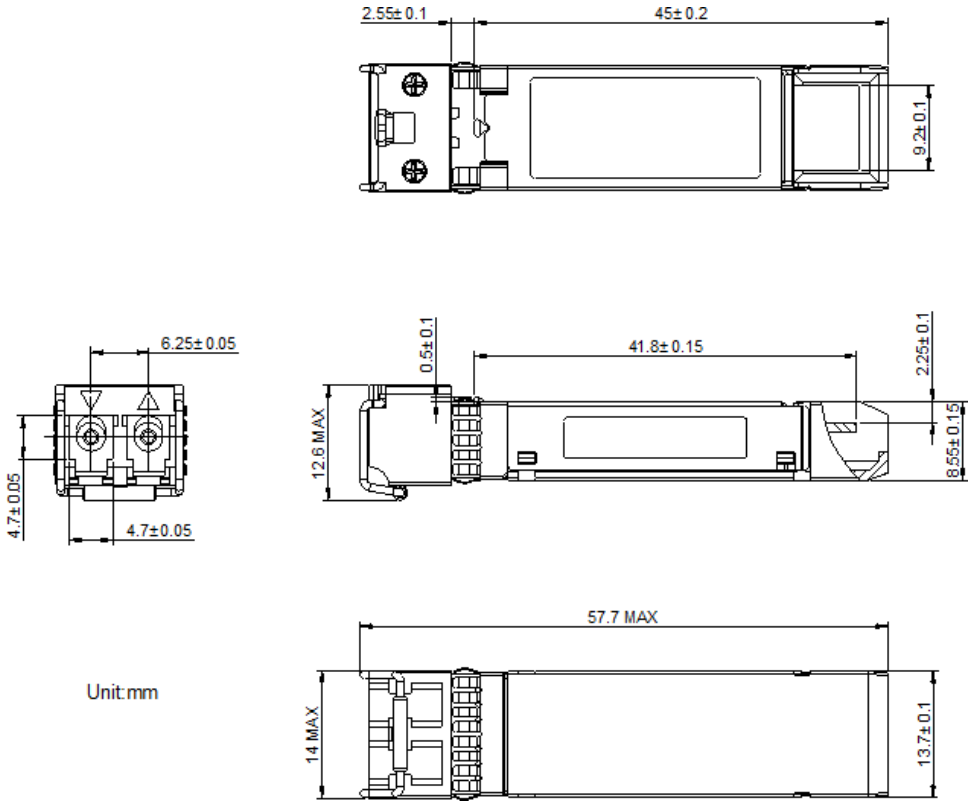

**Recommended Host Board Power Supply Filter Network**



## Recommended Application Interface Block Diagram




## Mechanical Specifications



**OptioConnect**
**Innovation for the Future of High-Speed Networking**

**Who We Are**
OptioConnect is reshaping the landscape of communication and high-speed networking through intelligent technology. With a core focus on cutting edge technology, we deliver smarter fiber optic solutions for enterprise networks, data centers, and next-gen telecom infrastructures.

**What We Do**
At OptioConnect, we fuse advanced engineering with intelligent automation to drive the future of networking. Our AI-integrated solutions are designed to optimize performance and streamline operations with:

- Superior Performance
- Network and traffic optimization
- Intelligent energy management
- Seamless OEM compatibility
- Scalable cost-efficiency

**Smarter Networks by Design**
Innovation isn't just a goal—it's our process. We embed AI and machine learning across our R&D and product lines, enabling adaptive performance, automated tuning, and faster deployment cycles. The result? Networks that don't just work—they learn, evolve, and outperform.

**Our Team**
Our engineers, data scientists, and network architects bring decades of experience and a future-focused mindset. We provide hands-on support with intelligent insights that turn complex challenges into simple solutions.

**Our Mission**
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