**QSFP28-100GB-2DW33-N-AO**

Alcatel-Lucent Nokia® Compatible TAA 100GBase-DWDM PAM4 QSFP28 Transceiver C-Band Channel DW33 (SMF, 1550.92nm, 80km w/EDFA/DCM, LC, DOM)

**Features:**

- SFF-8665 Compliance
- 100GHz DWDM ITU Grid
- Duplex LC Connector
- Commercial Temperature 20 to 70 Celsius
- Hot Pluggable
- Single-mode Fiber
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



**Applications:**

- 100GBase Ethernet
- Access, Metro and Enterprise

**Product Description**

This Alcatel-Lucent Nokia® compatible QSFP28 transceiver provides 100GBase-DWDM throughput up to 80km over single-mode fiber (SMF) PAM4 using a wavelength of 1550.92nm 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.

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."

TAA COMPLIANT

**Regulatory Compliance**

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

**Wavelength Guide (100GHz ITU-T Channel)**

| Channel # | Frequency (GHz) | Wavelength (nm) | Frequency (GHz) | Wavelength (nm) |
|---|---|---|---|---|
| | L0 | | L1 | |
| **16** | 191600 | 1564.68 | 191650 | 1564.27 |
| **17** | 191700 | 1563.86 | 191750 | 1563.45 |
| **18** | 191800 | 1563.05 | 191850 | 1562.64 |
| **19** | 191900 | 1562.23 | 191950 | 1561.83 |
| **20** | 192000 | 1561.42 | 192050 | 1561.01 |
| **21** | 192100 | 1560.61 | 192150 | 1560.2 |
| **22** | 192200 | 1559.79 | 192250 | 1559.39 |
| **23** | 192300 | 1558.98 | 192350 | 1558.58 |
| **24** | 192400 | 1558.17 | 192450 | 1557.77 |
| **25** | 192500 | 1557.36 | 192550 | 1556.96 |
| **26** | 192600 | 1556.56 | 192650 | 1556.15 |
| **27** | 192700 | 1555.75 | 192750 | 1555.34 |
| **28** | 192800 | 1554.94 | 192850 | 1554.54 |
| **29** | 192900 | 1554.13 | 192950 | 1553.73 |
| **30** | 193000 | 1553.33 | 193050 | 1552.93 |
| **31** | 193100 | 1552.52 | 193150 | 1552.12 |
| **32** | 193200 | 1551.72 | 193250 | 1551.32 |
| **33** | 193300 | 1550.92 | 193350 | 1550.52 |
| **34** | 193400 | 1550.12 | 193450 | 1549.72 |
| **35** | 193500 | 1549.32 | 193550 | 1548.91 |
| **36** | 193600 | 1548.52 | 193650 | 1548.11 |
| **37** | 193700 | 1547.72 | 193750 | 1547.32 |
| **38** | 193800 | 1546.92 | 193850 | 1546.52 |
| **39** | 193900 | 1546.12 | 193950 | 1545.72 |
| **40** | 194000 | 1545.32 | 194050 | 1544.92 |
| **41** | 194100 | 1544.53 | 194150 | 1544.13 |
| **42** | 194200 | 1543.73 | 194250 | 1543.33 |
| **43** | 194300 | 1542.94 | 194350 | 1542.54 |
| **44** | 194400 | 1542.14 | 194450 | 1541.75 |
| **45** | 194500 | 1541.35 | 194550 | 1540.95 |
| **46** | 194600 | 1540.56 | 194650 | 1540.16 |
| **47** | 194700 | 1539.77 | 194750 | 1539.37 |
| **48** | 194800 | 1538.98 | 194850 | 1538.58 |

| | | | | |
|---|---|---|---|---|
| **49** | 194900 | 1538.19 | 194950 | 1537.79 |
| **50** | 195000 | 1537.4 | 195050 | 1537 |
| **51** | 195100 | 1536.61 | 195150 | 1536.22 |
| **52** | 195200 | 1535.82 | 195250 | 1535.43 |
| **53** | 195300 | 1535.04 | 195350 | 1534.64 |
| **54** | 195400 | 1534.25 | 195450 | 1533.86 |
| **55** | 195500 | 1533.47 | 195550 | 1533.07 |
| **56** | 195600 | 1532.68 | 195650 | 1532.29 |
| **57** | 195700 | 1531.9 | 195750 | 1531.51 |
| **58** | 195800 | 1531.12 | 195850 | 1530.72 |
| **59** | 195900 | 1530.33 | 195950 | 1529.94 |
| **60** | 196000 | 1529.55 | 196050 | 1529.16 |
| **61** | 196100 | 1528.77 | 196150 | 1528.38 |

### Absolute Maximum Ratings

| Parameter | Symbol | Min. | Typical | Max. | Unit |
|---|---|---|---|---|---|
| **Signal Input Voltage** | Vin | -0.5 | | Vcc+0.5 | V |
| **Power Supply Voltage** | Vcc | -0.5 | | 3.6 | °C |
| **Storage Temperature** | TS | 5 | | 85 | °C |
| **Operating Temperature** | Tcase | 20 | | 70 | °C |

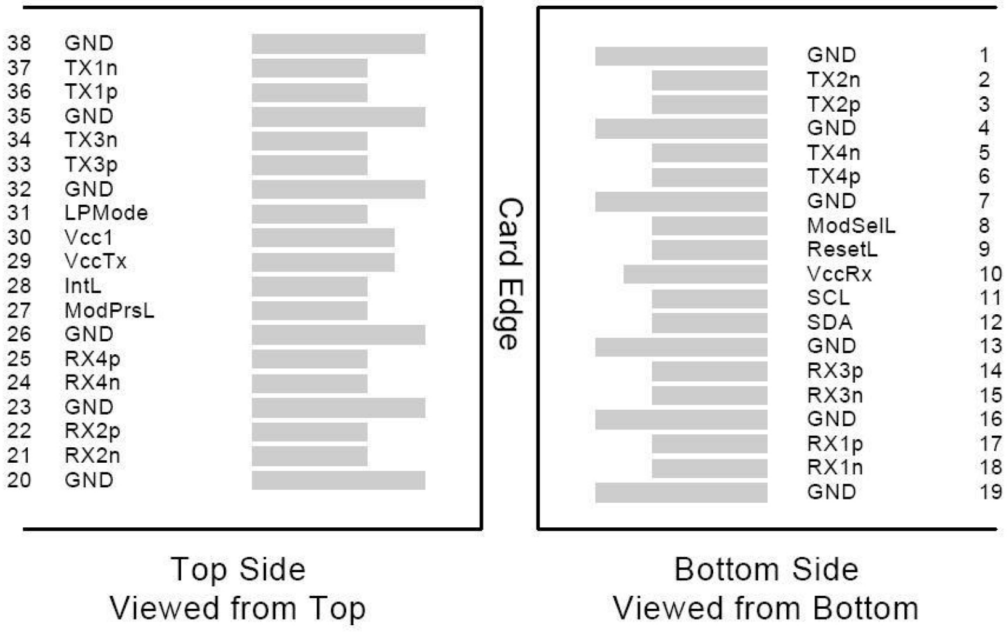
### Electrical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| **Power Supply Voltage** | Vcc | 3.135 | 3.3 | 3.465 | V | |
| **Power Dissipation** | $P_D$ | | 4 | 5 | W | |

## Optical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| **Transmitter** | | | | | | |
| **Optical Wavelength** | λC | 1480 | λ | 1580 | nm | |
| **Channel Spacing** | Δf | | 100 | | GHz | |
| **Optical Extinction Ratio** | ER | | 6 | | dB | |
| **Side-Mode Suppression Ratio** | SMSR | 30 | | | dB | |
| **Spectral Width** | Δλ | | +/-25 | 1 | GHz | |
| **Optical Transmit Power** | Pout/lane | -11 | -10 | -8 | dBm | |
| **Receiver** | | | | | | |
| **Optical Wavelength** | λC | 1480 | | 1580 | nm | |
| **Receiver Max. Sensitivity** | Pmin | -3 | -2.5 | -2 | dBm | |
| **Damage Threshold** | Pmax | 10 | | | dBm | |
| **Optical Return Loss** | ORL | | | 20 | dBm | |
| **LOS Hysteresis** | LOSH | | 1.0 | | dB | |
| **LOS Assert** | LOSA | -10 | | | dBm | |
| **LOS De-Assert** | LOSD | | | -3 | dBm | |

## Electrical Pin-out Details



**Pin Descriptions**

| Pin | Logic | Symbol | Name/Descriptions | Plug Sequence | Ref. |
|---|---|---|---|---|---|
| **1** | | GND | Ground | 1 | 1 |
| **2** | CML-I | Tx2n | Transmitter Inverted Data Input | 3 | |
| **3** | CML-I | Tx2p | Transmitter Non-Inverted Data output | 3 | |
| **4** | | GND | Ground | 1 | 1 |
| **5** | CML-I | Tx4n | Transmitter Inverted Data Input | 3 | |
| **6** | CML-I | Tx4p | Transmitter Non-Inverted Data output | 3 | |
| **7** | | GND | Ground | 1 | 1 |
| **8** | LVTTL-I | ModSelL | Module Select | 3 | |
| **9** | LVTTL-I | ResetL | Module Reset | 3 | |
| **10** | | VccRx | +3.3V Power Supply Receiver | 2 | 2 |
| **11** | LVCMOS- I/O | SCL | 2-Wire Serial Interface Clock | 3 | |
| **12** | LVCMOS- I/O | SDA | 2-Wire Serial Interface Data | 3 | |
| **13** | | GND | Ground | 1 | 1 |
| **14** | CML-O | Rx3p | Receiver Non-Inverted Data output | 3 | |
| **15** | CML-O | Rx3n | Receiver Inverted Data output | 3 | |
| **16** | | GND | Ground | 1 | 1 |
| **17** | CML-O | Rx1p | Receiver Non-Inverted Data output | 3 | |
| **18** | CML-O | Rx1n | Receiver Inverted Data output | 3 | |
| **19** | | GND | Ground | 1 | 1 |
| **20** | | GND | Ground | 1 | 1 |
| **21** | CML-O | Rx2n | Receiver Inverted Data output | 3 | |
| **22** | CML-O | Rx2p | Receiver Non-Inverted Data output | 3 | |
| **23** | | GND | Ground | 1 | 1 |
| **24** | CML-O | Rx4n | Receiver Inverted Data output | 3 | |
| **25** | CML-O | Rx4p | Receiver Non-Inverted Data output | 3 | |
| **26** | | GND | Ground | 1 | 1 |
| **27** | LVTTL-O | ModPrsL | Module Present | 3 | |
| **28** | LVTTL-O | IntL | Interrupt | 3 | |
| **29** | | VccTx | +3.3V Power Supply Transmitter | 2 | 2 |
| **30** | | Vccl | +3.3V Power Supply | 2 | 2 |
| **31** | LVTTL-I | LPMode | Low Power Mode | 3 | |
| **32** | | GND | Ground | 1 | 1 |
| **33** | CML-I | Tx3p | Transmitter Non-Inverted Data input | 3 | |
| **34** | CML-I | Tx3n | Transmitter Inverted Data Input | 3 | |
| **35** | | GND | Ground | 1 | 1 |
| **36** | CML-I | Tx1p | Transmitter Non-Inverted Data input | 3 | |
| **37** | CML-I | Tx1n | Transmitter Inverted Data Input | 3 | |
| **38** | | GND | Ground | 1 | 1 |

**Notes:**

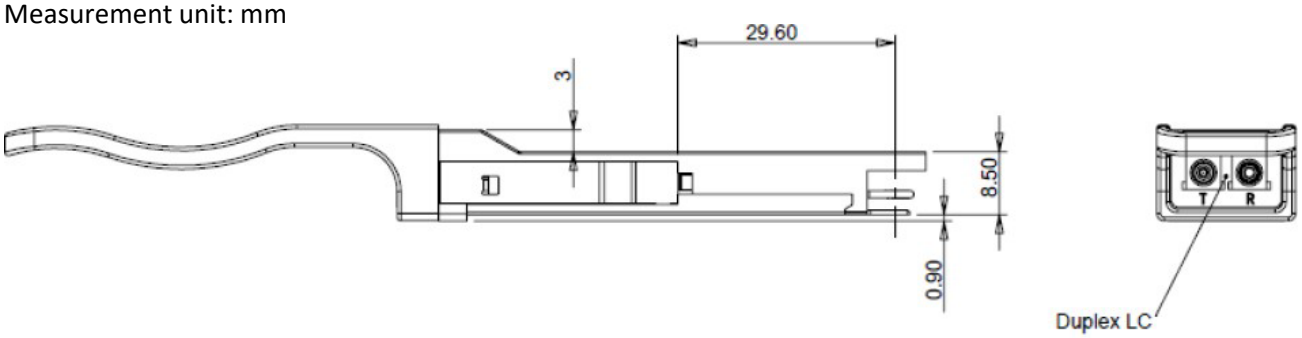
1. GND is the symbol for signal and supply (power) common for the QSFP28 module. All are common within the QSFP28 module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. VccRx, Vcc1 and VccTx are the receiver and transmitter power supplies and shall be applied concurrently. Requirements defined for the host side of the Host Edge Card Connector are listed in Table 6. Recommended host board power supply filtering is shown in Figures 3 and 4. Vcc Rx Vcc1 and Vcc Tx may be internally connected within the QSFP28 Module in any combination. The connector pins are each rated for a maximum current of 500Ma.

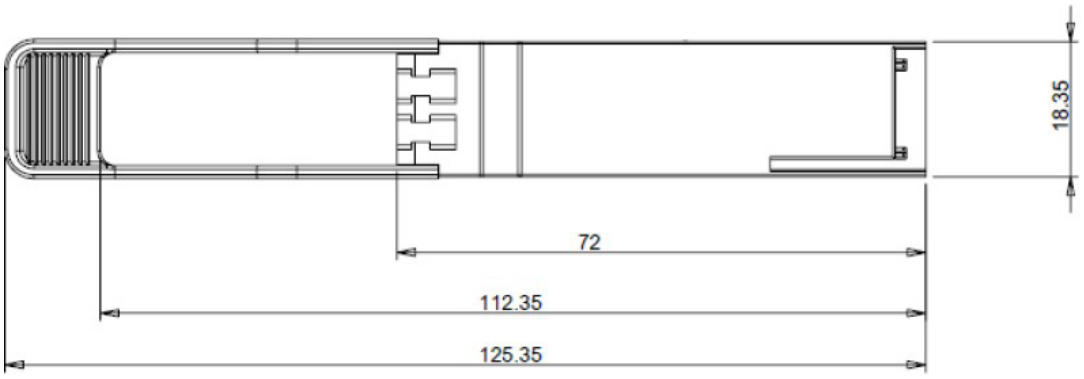
**DOM Specifications**

| Parameter | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|
| **Receive Power Monitor Accuracy** | -2 | | 2 | dB |
| **Transmit Power Monitor** | -2 | | 2 | dB |
| **Laser Bias Current Monito Accuracy** | -10 | | 10 | % |
| **Transceiver Temperature Monitor Accuracy** | -5 | | 5 | ˚C |
| **Internally Measured Transceiver Supply Voltage** | | | 3 | % |

**Mechanical Specifications**

Measurement unit: mm



**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 ranging from NEBS Level 3 to ISO 9001:2015 with every new development while maintaining the signature reliability of its products.




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