


TSDR8-NAANA1C Optical Transceiver

Multi-mode 850nm 800G SR8 QSFP-DD Transceiver, With Diagnostic Monitoring

Features

- Hot-pluggable QSFP-DD form factor
- Data Rate 106.25 Gb/s PAM4 per lane
- 8x106Gbps PAM4 transmitter and PAM4 receiver
- 8 channels 850nm VCSEL laser array and 8 channels PIN photo-detector array
- Maximum link length of 50m on OM3 MMF and 100m on OM4 MMF
- Digital diagnostics functions are available via the I2C interface
- Single 3.3V Power Supply and Power Dissipation < 14W
- MPO-16 connector
- Operating Case Temperature: 0°C~+70°C
- RoHS compliant 

Applications

- 800G SR8 Ethernet

Production Description

The TSDR8-NAANA1C is an 8-Channel, Pluggable, Fiber-Optic QSFP-DD for 800Gbps SR8 Applications. It is a high performance module for short-range data communication and interconnect applications which operate at 106.25Gbps per lane up to 50m using OM3 fiber and 100m using OM4 fiber. The optical interface uses MPO receptacles.

This module is designed to operate over multimode fiber systems using a nominal wavelength of 850nm. The electrical interface uses a 76 contact edge type connector.

Absolute Maximum Rating

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions.

| Parameters | Symbol | Min. | Max. | Unit |
|----------------------|--------|------|------|------|
| Power Supply Voltage | VCC | -0.5 | +3.6 | V |
| Storage Temperature | Tc | -40 | +85 | °C |
| Relative Humidity | RH | 0 | 85 | % |

Recommended Operating Environment

Recommended Operating Environment specifies parameters for which the electrical and optical characteristics hold unless otherwise noted.

| Parameter | Symbol | Min. | Typical | Max | Unit |
|----------------------------|-----------------|------|---------|------|------|
| Power Supply Voltage | VCC | 3.15 | 3.30 | 3.45 | V |
| Operating Case Temperature | T _{Ca} | 0 | | 70 | °C |

Electrical Characteristics

The following electrical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

| Parameter | Symbol | Min. | Typical | Max | Unit | Notes |
|---------------------------------------|------------------|------|---------|------|------|----------|
| Data Rate per lane | DR | - | 106.25 | - | Gbps | |
| Transmitter | | | | | | |
| Single Ended Output Voltage Tolerance | | -0.3 | - | 4.0 | V | |
| Common mode voltage tolerance | | 15 | - | - | mV | |
| Input differential impedance | R _{in} | - | 100 | - | Ω | |
| Differential Input Voltage swing | V _{in} | 300 | - | 1100 | mV | |
| Tx Fault | VoL | -0.3 | | 0.4 | V | At 0.7mA |
| Receiver | | | | | | |
| Single Ended Output Voltage Tolerance | | -0.3 | - | 4.0 | V | |
| Differential Output Swing | V _{out} | 300 | - | 900 | mV | |
| Output differential impedance | R _{out} | | 100 | | Ω | |

Optical Characteristics

The following optical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

| Parameter | Symbol | Min. | Typical | Max | Unit | Notes |
|--|----------------|-------------------------------|---------|-----|------|-------|
| Transmitter | | | | | | |
| Center Wavelength | λ | 844 | 850 | 863 | nm | |
| RMS spectral width | P _m | - | - | 0.6 | nm | 1 |
| Average Optical Power | P _o | -4.6 | - | 4 | dBm | 2 |
| Extinction Ratio | ER | 2.5 | - | - | dBm | |
| Optical Modulation Amplitude(OMA _{outer}) (max) | OMA | 3.5 | | | dBm | |
| Optical Modulation Amplitude (OMA _{outer}) (min) max(TECQ, TDECQ) ≤1.8dB 1.8<max(TECQ, TDECQ) ≤4.4dB | | -2.6 -4.4+max(TECQ, TDECQ) | | | | |
| Transmitter and Dispersion Eye Closure | TDECQ | | | 4.4 | dB | |
| Transmitter Eye Closure | TECQ | | | 4.4 | dB | |

Information and specifications are subject to change without notice.
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|--|-----------|-------------------|-----|------|-----|---|
| Optical Return Loss Tolerance | ORL | - | - | 14 | dB | |
| Receiver | | | | | | |
| Center Wavelength | λ | 842 | 850 | 948 | nm | |
| Average Receive power ,each lane | | -6.4 | | 4 | dBm | |
| Receive power (OMAouter), each lane | | | | 3.5 | dBm | |
| Receiver Sensitivity (OMAouter) Max (TECQ, TDECQ) ≤ 1.8 dB 1.8 < max(TECQ, TDECQ) ≤ 4.4 dB | Psens | -4.6 -6.4+TECQ | | | dBm | 3 |
| LOS Asserted | Lsa | -15 | - | - | dBm | |
| LOS De-Asserted | Lda | - | - | -6.6 | dBm | |
| LOS Hysteresis | Lh | 0.5 | - | - | dB | |

Note:

- [1] Trade-offs are available between spectral width, center wavelength and minimum OMA.
- [2] The optical power is launched into MMF
- [3] BER=2.4E-4; PRBS31Q@53.125GBd.

Qsfp-Dd Transceiver Electrical Pad Layout

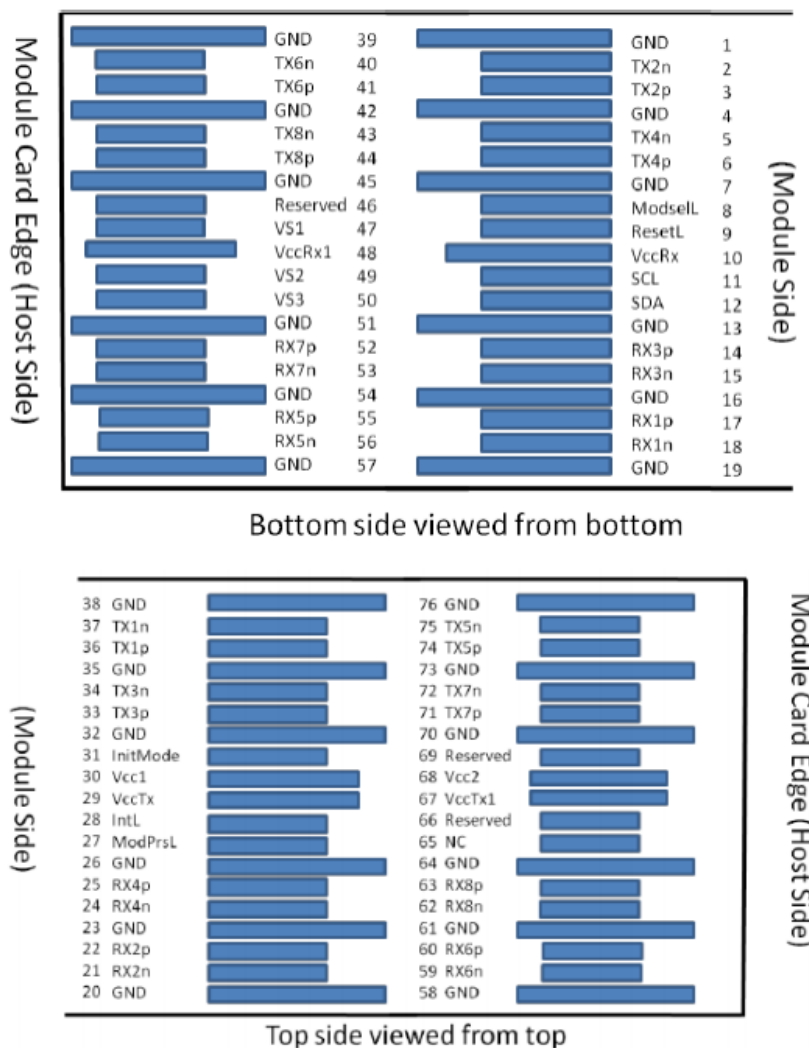


Figure 1 – QSFP-DD -compliant 76-pin connector (per QSFP-DD MSA)

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Pin Definition

| Pin | Symbol | Name/Description |
|-----|----------|---|
| 1 | GND | Ground |
| 2 | Tx2n | Transmitter Inverted Data Input |
| 3 | Tx2p | Transmitter Non-Inverted Data Input |
| 4 | GND | Ground |
| 5 | Tx4n | Transmitter Inverted Data Input |
| 6 | Tx4p | Transmitter Non-Inverted Data Input |
| 7 | GND | Ground |
| 8 | ModSelL | Module Select |
| 9 | ResetL | Module Reset |
| 10 | Vcc Rx | +3.3 V Power supply receiver |
| 11 | SCL | 2-wire serial interface clock |
| 12 | SDA | 2-wire serial interface data |
| 13 | GND | Ground |
| 14 | Rx3p | Receiver Non-Inverted Data Output |
| 15 | Rx3n | Receiver Inverted Data Output |
| 16 | GND | Ground |
| 17 | Rx1p | Receiver Non-Inverted Data Output |
| 18 | Rx1n | Receiver Inverted Data Output |
| 19 | GND | Ground |
| 20 | GND | Ground |
| 21 | Rx2n | Receiver Inverted Data Output |
| 22 | Rx2p | Receiver Non-Inverted Data Output |
| 23 | GND | Ground |
| 24 | Rx4n | Receiver Inverted Data Output |
| 25 | Rx4p | Receiver Non-Inverted Data Output |
| 26 | GND | Ground |
| 27 | ModPrsL | Module Present |
| 28 | IntL | Interrupt |
| 29 | VCC Tx | +3.3 V Power supply transmitter |
| 30 | VCC1 | +3.3 V Power Supply |
| 31 | InitMode | Initialization mode; In legacy QSFP applications, the InitMode pad is called LPMODE |
| 32 | GND | Ground |
| 33 | Tx3p | Transmitter Non-Inverted Data Input |
| 34 | Tx3n | Transmitter Inverted Data Input |
| 35 | GND | Ground |
| 36 | Tx1p | Transmitter Non-Inverted Data Input |
| 37 | Tx1n | Transmitter Inverted Data Input |
| 38 | GND | Ground |
| 39 | GND | Ground |
| 40 | Tx6n | Transmitter Inverted Data Input |

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| | | |
|----|----------|-------------------------------------|
| 41 | Tx6p | Transmitter Non-Inverted Data Input |
| 42 | GND | Ground |
| 43 | Tx8n | Transmitter Inverted Data Input |
| 44 | Tx8p | Transmitter Non-Inverted Data Input |
| 45 | GND | Ground |
| 46 | Reserved | For future use |
| 47 | VS1 | Module Vender Specific 1 |
| 48 | Vcc Rx1 | +3.3 V Power supply receiver |
| 49 | VS2 | Module Vender Specific 2 |
| 50 | VS3 | Module Vender Specific 3 |
| 51 | GND | Ground |
| 52 | Rx7p | Receiver Non-Inverted Data Output |
| 53 | Rx7n | Receiver Inverted Data Output |
| 54 | GND | Ground |
| 55 | Rx5p | Receiver Non-Inverted Data Output |
| 56 | Rx5n | Receiver Inverted Data Output |
| 57 | GND | Ground |
| 58 | GND | Ground |
| 59 | Rx6n | Receiver Inverted Data Output |
| 60 | Rx6p | Receiver Non-Inverted Data Output |
| 61 | GND | Ground |
| 62 | Rx8n | Receiver Inverted Data Output |
| 63 | Rx8p | Receiver Non-Inverted Data Output |
| 64 | GND | Ground |
| 65 | NC | No Connect |
| 66 | Reserved | For future use |
| 67 | VCC Tx1 | +3.3 V Power supply transmitter |
| 68 | VCC2 | +3.3 V Power Supply |
| 69 | Reserved | For future use |
| 70 | GND | Ground |
| 71 | Tx7p | Transmitter Non-Inverted Data Input |
| 72 | Tx7n | Transmitter Inverted Data Input |
| 73 | GND | Ground |
| 74 | Tx5p | Transmitter Non-Inverted Data Input |
| 75 | Tx5n | Transmitter Inverted Data Input |
| 76 | GND | Ground |

Ordering Information

| Part Number | Product Description |
|---------------|---|
| TSDR8-NAANA1C | 800G QSFP-DD SR8 Optical Transceiver 50m on OM3 MMF and 100m on OM4 MMF 0°C ~ +70°C |

Important Notice

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