

100GBASE-DR QSFP28 Optical Transceiver

Product Features

- Supports 100GBASE-DR
- Up to 500m over SMF
- DFB Transmitter and PIN Receiver
- Supports 4x25Gbps NRZ Host Interface
- Supports 53.125Gbd PAM4 optical Interface
- QSFP28 MSA Package with Duplex LC Connector
- I2C management interface with Digital Diagnostic Monitoring
- Compliant to SFF-8636
- Single 3.3V power supply
- Operating case temperature: 0~70°C
- Maximum power dissipation 3.5W
- RoHS-6 compliance

Application

- 100GBASE-DR Ethernet Links

Absolute Maximum Ratings

| Parameter | Unit | Min. | Typical | Max. |
|----------------------------------|------|------|---------|------|
| Storage Temperature | °C | -40 | | 85 |
| Operating Case Temperature | °C | 0 | | 70 |
| Operating Relative Humidity | % | 5 | | 85 |
| Power Supply not Damaged Voltage | V | 0 | | 3.6 |

Recommended Operating Conditions

| Parameter | Unit | Min. | Typical | Max. |
|------------------------------|------|-------|---------|-------|
| Operating Case Temperature | °C | 0 | | 70 |
| Operating Relative Humidity | % | 5 | | 85 |
| Power Supply Working Voltage | V | 3.135 | 3.3 | 3.465 |
| Power Consumption | W | | | 3.5 |
| Link Distance | m | | | 500 |

Characteristics

All performance is specified at whole working temperature and conditions

| Parameter | Unit | Min. | Typical | Max. | Note |
|---|-------|---------------|---------|------------------------|-------|
| Transmitter | | | | | |
| Signaling Rate | GBd | 53.125±100ppm | | | |
| Module Format | | PAM4 | | | |
| TX Central Wavelength | nm | 1304.5 | | 1317.5 | |
| Side-Mode Suppression Ratio | dB | 30 | | | |
| Average launch power | dBm | -2.9 | | 4.0 | |
| Launch Power in OMA minus TDECQ | dBm | -2.2 -1.9 | | | Note1 |
| Outer Optical Modulation Amplitude (OMA _{outer}) | dBm | | | 4.2 | |
| TDECQ | dB | | | 3.4 | |
| Average launch power of OFF transmitter | dB | | | -15 | |
| Extinction ratio | dB | 3.5 | | | |
| RIN _{15.5} OMA | dB/Hz | | | -136 | |
| Optical return loss tolerance | dB | | | 15.5 | |
| Transmitter reflectance | dB | | | -26 | |
| Receiver | | | | | |
| Signaling Rate | GBd | 53.125±100ppm | | | |
| Module Format | | PAM4 | | | |
| RX Central Wavelength | nm | 1304.5 | | 1317.5 | |
| Damage threshold | dBm | 5 | | | |
| Average receive power | dBm | -5.9 | | 4 | |
| Receive power OMA | dBm | | | 4.2 | |
| Receiver reflectance | dB | | | -26 | |
| Receiver sensitivity OMA | dBm | | | max{-3.9,SECQ -5.3} | |
| Stress Sensitivity OMA | dBm | | | -1.9 | |
| Stressed eye closure for PAM4 (SECQ) | dB | | 3.4 | | |

Note1: -2.2dBm@for extinction ratio ≥ 5 dB,-1.9dBm@for extinction ratio < 5 dB

PIN Function Definitions

| Pin No. | Symbol | 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 | +3.3V 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 | VccTx | +3.3V Power supply transmitter |
| 30 | Vcc1 | +3.3V Power supply |
| 31 | LPMODE | Low Power Mode |
| 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 |

Typical Interface Circuit

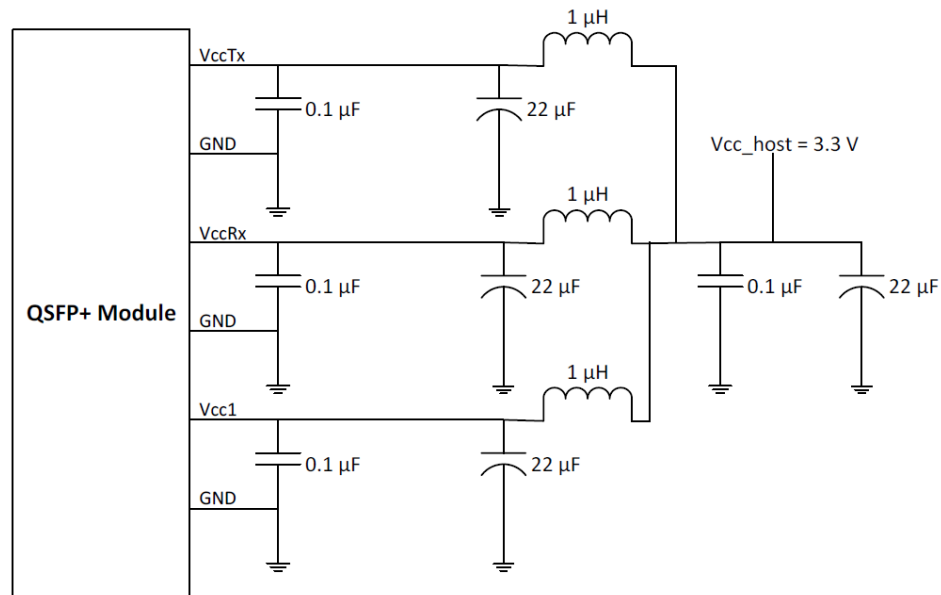


Figure 1 Recommended Interface Circuit

QSF28 Transceiver Electrical Pad Layout

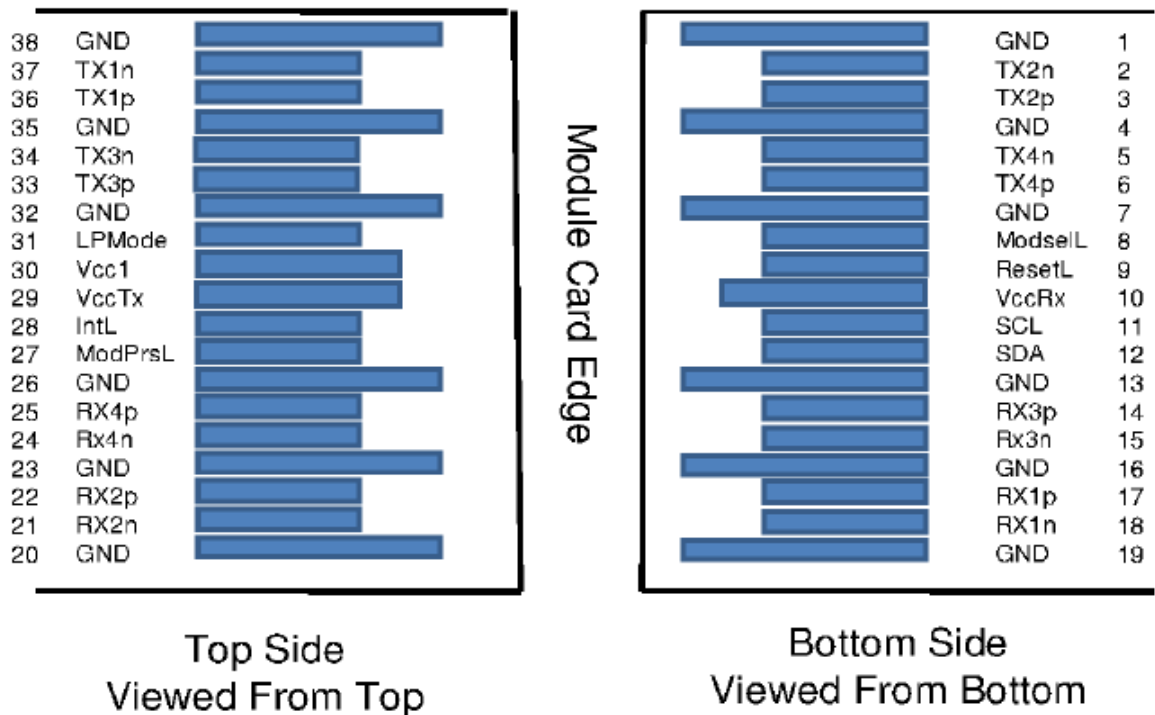


Figure 2 PIN MAP

Mechanical Specifications

For detail mechanical information, please refer to the related document of SFF-8661.

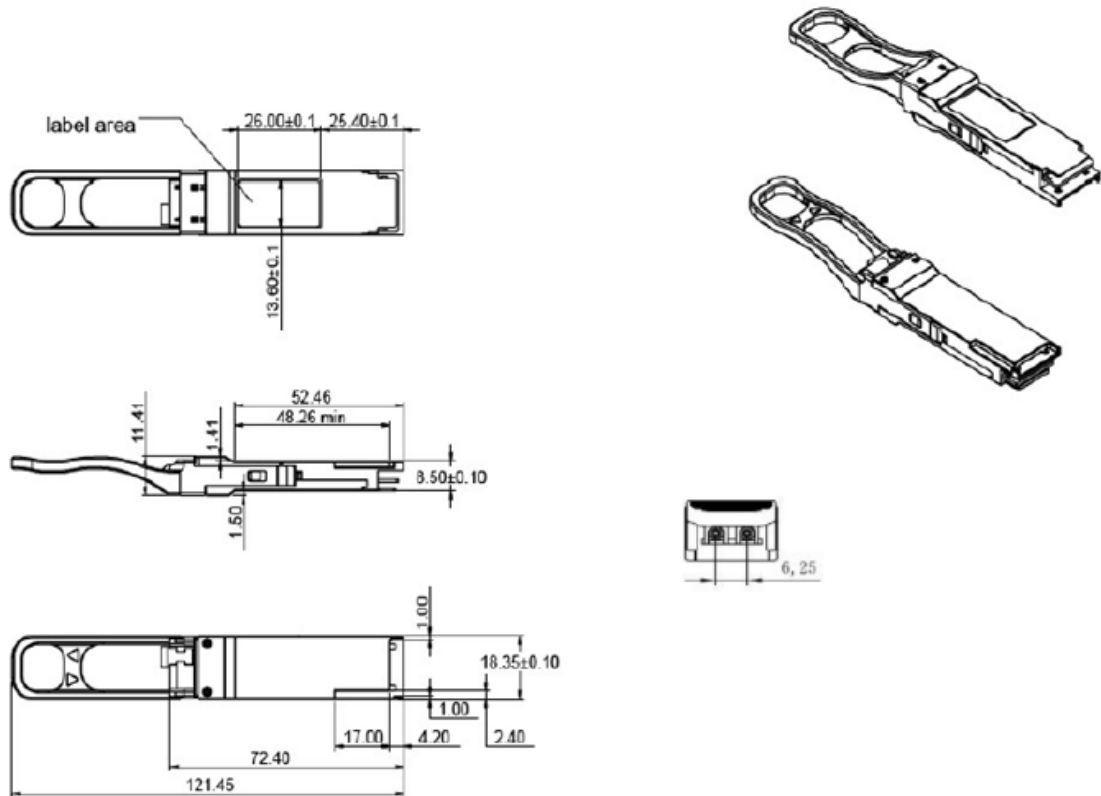


Figure 3 Mechanical

EEPROM Information

The digital diagnostic memory map specific data field defined as following. For detail EEPROM information, please refer to the related document of SFF 8636.

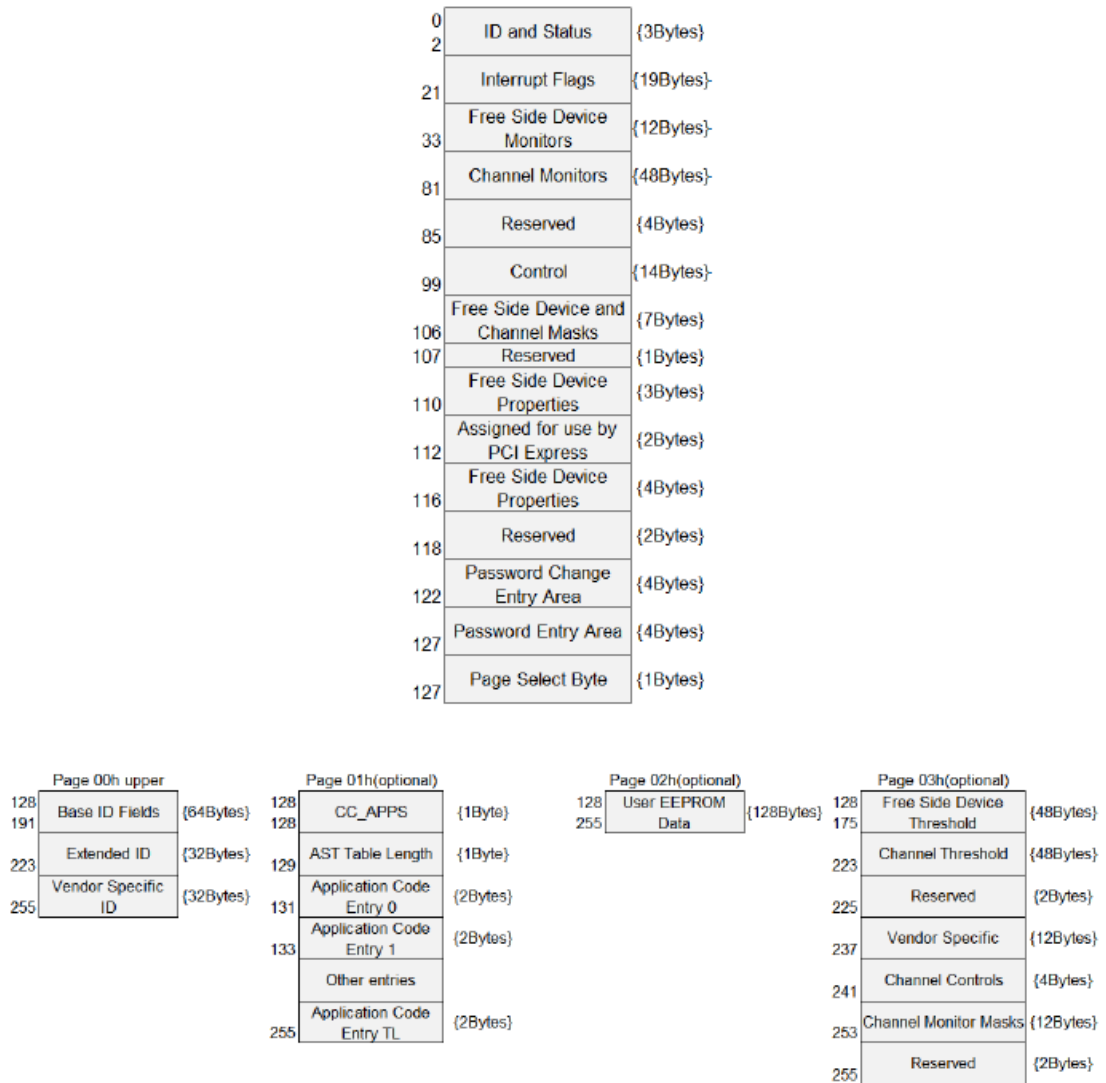


Figure 4 QSFP28 Memory Map

ESD

The QSFP28 module and host SFI contacts (High Speed Contacts) shall withstand 1000 V electrostatic discharge based on Human Body Model and all host contacts with exception of the SFI contacts (High Speed Contacts) shall withstand 2 kV electrostatic discharge based on Human Body Model. The QSFP28 module shall meet ESD requirements given in EN61000-4-2, criterion B test specification such that units are subjected to 15 kV air discharges during operation and 8 kV direct contact discharges to the case according section 5.3 in SFF-8679 REV1.5.

Laser Safety

This is a Class 1 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).

Ordering Information

| Ordering P/Ns | Description |
|---------------|---|
| DK33ii-QLCA | 500m, 1310nm, 4*25G NRZ electrical interface, 1*100G PAM4 at LC/UPC optical interface, SiPh based, QSFP28, commercial temperature |

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