

SFP-2.5G-SR85-03

2.5Gb/s, 850nm, LC, 300m, MMF

1. Feature:

- SFP+ package with LC connector
- 850nm VCSEL Laser and PIN photo detector
- Up to 300m transmission on 2000MHz-km MMF
- Up to 2.6Gbps Data Links
- Power dissipation < 1W
- LVPECL compatible data input/output interface
- Low EMI and excellent ESD protection
- laser safety standard IEC-60825 compliant
- Compatible with RoHS
- Compatible with SFF8472

2. Application

- 2.5GBASE-SR/SW 2.5G Ethernet
- 2500-Mx-SN-I 2.5G Fibre Channel

3. Absolute Maximum Ratings

| Parameter | Symbol | Minimum | Maximum | Units |
|-----------------------------|--------|---------|---------|-------|
| Storage Temperature | Tst | -40 | +85 | °C |
| Supply Voltage | Vcc | 0 | +3.6 | V |
| Operating Relative Humidity | RH | 0 | 85 | % |

4. Operation Environment

| Parameter | Symbol | Min | Typical | Max | Units |
|----------------------------|--------|------|---------|------|-------|
| Supply Voltage | Vcc | 3.15 | | 3.45 | V |
| Operating Case Temperature | Tc | 0 | | +70 | °C |
| Power Dissipation | | | | 1 | W |
| Data Rate | | | 2.6213 | | Gbps |

5. Optical Characteristics

(Ambient Operating Temperature 0°C to +70°C, Vcc =3.3 V)

| Parameter | Symbol | Min. | Typ. | Max. | Units |
|----------------------------|-----------------------|--------------|------|-------|-------|
| Transmitter Section | | | | | |
| Center Wavelength | λ_o | 840 | 850 | 860 | nm |
| RMS Spectral Width | $\Delta\lambda$ | - | - | 0.45 | dB |
| Average Output Power | Po | -5 | - | 0 | dBm |
| Extinction Ratio | Er | 3.0 | - | - | dB |
| Dispersion Penalty | | | | 3.9 | dB |
| Relative Intensity Noise | RIN ₁₂ OMA | | | -128 | dB/Hz |
| Total jitter | Tj | IEEE 802.3ae | | | |
| Receiver Section | | | | | |
| Center Wavelength | λ_o | | 850 | | nm |
| Receiver Sensitivity | Rsen | | | -11.5 | dBm |
| Stressed Sensitivity | Rsen | | | -10.5 | dBm |
| Receiver Overload | Rov | 0 | | | dBm |
| Return Loss | | 12 | | | dB |
| LOS Assert | LOS _A | -25 | | | dBm |
| LOS Dessert | LOS _D | | | -13 | dBm |
| LOS Hysteresis | | 0.5 | | 4 | |

6. Electrical Characteristics

(Ambient Operating Temperature 0°C to +70°C, Vcc =3.3 V)

| Parameter | Symbol | Min. | Typ. | Max. | unit |
|--------------------------------|----------|------|------|------|------|
| Transmitter Section | | | | | |
| Input Differential Impedence | Zin | 90 | 100 | 110 | Ohm |
| Data Input Swing Differential | Vin | 180 | | 700 | mV |
| TX Disable | Disable | 2.0 | | Vcc | V |
| | Enable | 0 | | 0.8 | V |
| TX Fault | Assert | 2.0 | | Vcc | V |
| | Deassert | 0 | | 0.8 | V |
| Receiver Section | | | | | |
| Output differential impedence | Zout | | 100 | | Ohm |
| Data output Swing Differential | Vout | 300 | | 800 | mV |
| Rx_LOS | Assert | 2.0 | | Vcc | V |
| | Deassert | 0 | | 0.8 | V |

7. Maximum Supported Distances

| Parameter | Symbol | Min. | Typ. | Max. | unit |
|------------|---------------------|------|------|------|------|
| Fiber Type | 850nm OFL BandWidth | | | | |
| 62.5 um | 160MHz-km | | | 26 | m |
| | 200MHz-km | | | 33 | m |
| 50 um | 400MHz-km | | | 66 | m |
| | 500MHz-km | | | 82 | m |
| | 2000MHz-km | | | 300 | m |

8. Diagnostics

| Parameter | Range | Accuracy | Unit | Calibration |
|--------------|-------------|----------|------|-------------|
| Temperature | 0 ~ 70 | ±5 | ℃ | Internal |
| Voltage | 3.15 ~ 3.45 | 0.1 | V | Internal |
| Bias Current | 2 ~ 12 | ±2 | mA | Internal |
| Tx Power | -8 ~ 1 | ±2 | dBm | Internal |
| Rx Power | -18 ~ -3 | ±3 | dBm | Internal |

9. EEPROM INFORMATION (A0) :

| Addr | Field Size (Bytes) | Name of Field | HEX | Description |
|-------|--------------------|-----------------|--|------------------------------|
| 0 | 1 | Identifier | 03 | SFP |
| 1 | 1 | Ext. Identifier | 04 | MOD4 |
| 2 | 1 | Connector | 07 | LC |
| 3-10 | 8 | Transceiver | 10 00 00 00 00 00 00 00 | Transmitter Code |
| 11 | 1 | Encoding | 06 | 64B66B |
| 12 | 1 | BR, nominal | 67 | 2500M bps |
| 13 | 1 | Reserved | 00 | |
| 14 | 1 | Length (9um)-km | 00 | |
| 15 | 1 | Length (9um) | 00 | |
| 16 | 1 | Length (50um) | 08 | |
| 17 | 1 | Length (62.5um) | 02 | |
| 18 | 1 | Length (copper) | 00 | |
| 19 | 1 | Reserved | 00 | |
| 20-35 | 16 | Vendor name | 57 49 4E 54 4F 50 20 20 20 20 20 20 20 20 20 20 | |
| 36 | 1 | Reserved | 00 | |
| 37-39 | 3 | Vendor OUI | 00 00 00 | |
| 40-55 | 16 | Vendor PN | xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx | ASC II |
| 56-59 | 4 | Vendor rev | 31 2E 30 20 | V1.0 |
| 60-61 | 2 | Wavelength | 03 52 | 850nm |
| 62 | 1 | Reserved | 00 | |
| 63 | 1 | CC BASE | XX | Check sum of byte 0~62 |
| 64-65 | 2 | Options | 00 1A | LOS, TX_DISABLE, TX_FAULT |

| | | | | |
|--------|-----|------------------|--|-------------------------|
| 66 | 1 | BR, max | 00 | |
| 67 | 1 | BR, min | 00 | |
| 68-83 | 16 | Vendor SN | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 | Unspecified |
| 84-91 | 8 | Vendor date code | XX XX XX 20 | Year, Month, Day |
| 92-94 | 3 | Reserved | 00 | |
| 95 | 1 | CC_EXT | XX | Check sum of byte 64~94 |
| 96-255 | 160 | Vendor specific | | |

10. Pin Description:

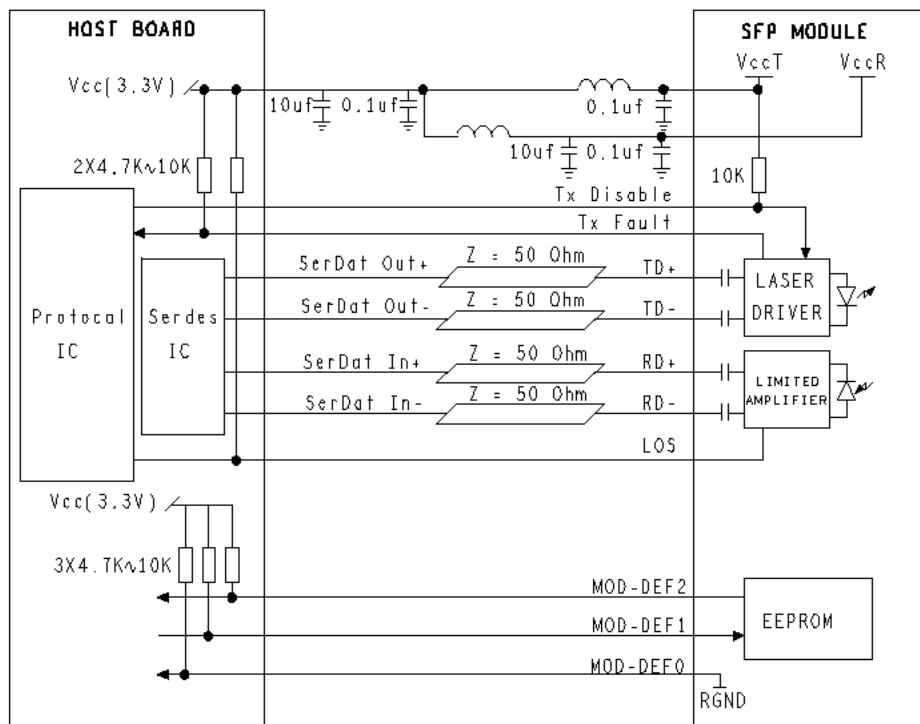
| Pins | Name | Discription | NOTE |
|------|------------|------------------------------|------|
| 1 | VeeT | Transmitter Ground | |
| 2 | Tx Fault | Transmitter Fault Indication | 1 |
| 3 | Tx Disable | Transmitter Disable | 2 |
| 4 | MOD DEF2 | Module Definition 2 | 3 |
| 5 | MOD DEF1 | Module Definition 1 | 3 |
| 6 | MOD DEF0 | Module Definition 0 | 3 |
| 7 | RS0 | Not Connected | |
| 8 | LOS | Loss of Signal | 4 |
| 9 | RS1 | Not Connected | |
| 10 | VeeR | Receiver Ground | |
| 11 | VeeR | Receiver Ground | |
| 12 | RD- | Inv. Received Data Output | 5 |
| 13 | RD+ | IReceived Data Output | 5 |
| 14 | VeeR | Receiver Ground | |
| 15 | VccR | Receiver Power | |
| 16 | VccT | Transmitter Power | |
| 17 | VeeT | Transmitter Ground | |
| 18 | TD+ | Transmit Data Input | 6 |
| 19 | TD- | Inv. Transmit Data Input | 6 |
| 20 | VeeT | Transmitter Ground | |

Notes:

1. TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates a laser fault of some kind. In the low state, the output will be

- pulled to less than 0.8V.
- TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k~10kΩ resistor. Its states are:
 Low (0~0.8V): Transmitter on
 (>0.8V, <2.0V): Undefined
 High (2.0~3.465V): Transmitter Disabled
 Open: Transmitter Disabled
 - MOD-DEF 0,1,2 are the module definition pins. They should be pulled up with a 4.7k~10kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.
 MOD-DEF 0 is grounded by the module to indicate that the module is present
 MOD-DEF 1 is the clock line of two wire serial interface for serial ID
 MOD-DEF 2 is the data line of two wire serial interface for serial ID
 - LOS is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates loss of signal. In the low state, the output will be pulled to less than 0.8V.
 - These are the differential receiver output. They are internally AC-coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES.
 - These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module.

11. Recommended Application Circuit



12. Outline Dimensions (mm)

