**DATASHEET**

## RAYMARK: RM-SFP10G-SR

10Gb/s SFP+ Short Wavelength (850nm) Transceiver

## RM-SFP10G-SR Overview

Raymark RM-SFP10G-SR SFP optical transceivers are based on 10G Ethernet IEEE 802.3ae standard and SFF-8431 standard, providing a fast and reliable interface for 10G Ethernet applications. The product implements digital diagnostics via a 2-wire serial bus ,compliant with the SFF-8472 standard.

## Product Features

- Supports from 9.83 Gb/s to 11.3 Gb/s bit rates
- Compliant with IEEE 802.3ae 10GBASE-SR/SW
- Compliant with SFF-8431
- Hot-pluggable SFP+ footprint
- 850nm VCSEL laser transmitter
- Duplex LC connector
- Built-in digital diagnostic functions
- Upto 300m on OM3 MMF
- Upto 400m on OM4 MMF
- Low power consumption (Module work consumption <1W)
- Single power supply 3.3V
- RoHS Compliant
- Class 1 laser product complies with EN 60825-1
- Operating temperature range (Case Temperature): Commercial Level: 0°C to 70°C

## Applications

- 10GBASE-SR/SW Ethernet
- 10G Fibre Channel
- 10G CPRI

## Ordering Information

| Part Number | Description | Color on Clasp |
|---|---|---|
| RM-SFP10G-SR | 10GBASE-SR SFP+ 850nm LC 400m on OM4 MMF, with DOM function,Commercial Temperature | black |

## General Specifications

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Data Rate | DR | 9.83 | 10.3125 | 11.3 | Gb/s | 1 |
| Bit Error Rate | BER | | | $10^{-12}$ | | |
| Operating Temperature | Tc | 0 | | 70 | °C | 3 |
| Storage Temperature | Tsto | -40 | | 85 | °C | 3 |
| Supply Current | Icc | | 180 | 290 | mA | 4 |
| Input Voltage | Vcc | 3.14 | 3.3 | 3.46 | V | |
| Maximum Voltage | Vmax | -0.5 | | 4 | V | 4 |

**Notes:**

1. IEEE 802.3ae
2. Case temperature
3. Ambient temperature
4. For electrical power interface

## Link Distances

| Data Rate | Fiber Type | Modal Bandwidth @850nm (MHz-km) | Distance Range (m) |
|---|---|---|---|
| 9.83-11.3 Gb/s | 62.5/125umMMF | 160 | 26 |
| 9.83-11.3 Gb/s | 62.5/125umMMF | 200 | 33 |
| 9.83-11.3 Gb/s | 50/125umMMF | 400 | 66 |
| 9.83-11.3 Gb/s | 50/125umMMF | 500 | 82 |
| 9.83-11.3 Gb/s | 50/125umMMF | 2000 | 300 |
| 9.83-11.3 Gb/s | 50/125umMMF | 4700 | 400 |

## Optical – Characteristics – Transmitter

### $V_{CC}$=3.14V to 3.46V, $T_C$

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Output Optical Power | $P_{TX}$ | -7 | | -1 | dBm | 1 |
| Optical Center Wavelength | $\lambda_C$ | 840 | | 860 | nm | |
| Optical Modulation Amplitude | OMA | | -1.5 | | dBm | 2 |
| Extinction Ratio | ER | 3 | 5.5 | | dB | |
| Spectral Width (RMS) | $\Delta\lambda$ | | | 0.45 | nm | |
| Relative Intensity Noise | RIN | | | -128 | dB/Hz | |
| Transmitter Dispersion Penalty | TDP | | | 3.9 | dB | |
| Transmitter Jitter | | | | | | 3 |
| Launch Power of OFF Transmitter | $P_{OUT\_OFF}$ | | | -30 | dBm | 1 |

**Notes:**

1. Average
2. IEEE 802.3ae
3. According to IEEE 802.3ae requirement

## Optical – Characteristics – Receiver

### $V_{CC}$=3.14V to 3.46V, $T_C$

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Optical Center Wavelength | $\lambda_C$ | 840 | | 860 | nm | |
| Receiver Sensitivity@10.3Gb/s | $R_{X\_SEN}$ | | | -10 | dBm | 1 |
| Receiver Overload | $P_{OL}$ | 0.5 | | | dBm | |
| Receiver Reflectance | $TR_{RX}$ | | | -12 | dB | |
| LOS Assert | $LOS_A$ | -30 | | | dBm | |
| LOS De-Assert | $LOS_D$ | | | -14 | dBm | |
| LOS Hysteresis | $LOS_H$ | 0.5 | | | dB | |

**Notes:**

1. Measured with worst ER; BER<$10^{-12}$; $2^{31}$-1 PRBS

## Electrical – Characteristics – Transmitter

### $V_{CC}$=3.14V to 3.46V, $T_C$

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Input differential impedance | $R_{IN}$ | | 100 | | Ω | |
| Differential data input swing | $V_{IN\_PP}$ | 180 | | 700 | mV | |
| Transmit disable voltage | $V_D$ | 2 | | $V_{CC}$ | V | |
| Transmit enable voltage | $V_{EN}$ | $V_{EE}$ | | $V_{EE}$+0.8 | V | |

## Electrical – Characteristics – Receiver

### $V_{CC}$=3.14V to 3.46V, $T_C$

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Differential data output swing | $V_{OUT\_PP}$ | 300 | | 850 | mV | |
| Data output rise/fall time (20%-80%) | $t_r/t_f$ | 28 | | | ps | |
| LOS Assert | $V_{LOS\_A}$ | 2 | | $V_{CC\_HOST}$ | V | |
| LOS De-Assert | $V_{LOS\_D}$ | $V_{EE}$ | | $V_{EE}$+0.5 | V | |

## DDM Threshold Information

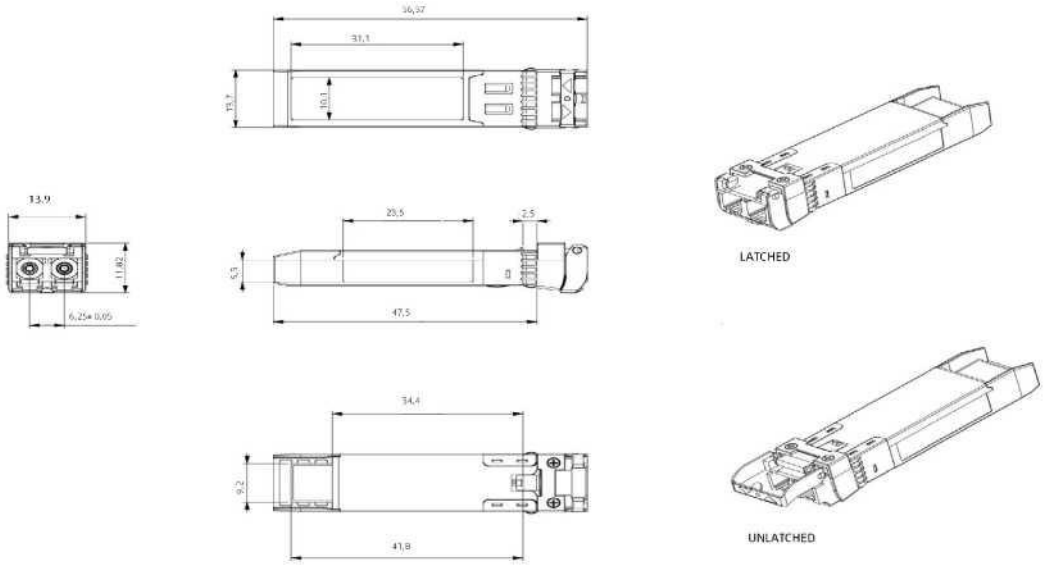
| Parameter | Alarm Threshold | | Warning Threshold | |
|---|---|---|---|---|
| | High Value | Low Value | High Value | Low Value |
| **Temperature (°C)** | 90 (5A 00) | -10 (F6 00) | 85 (55 00) | -5 (FB 00) |
| **Vcc (V)** | 3.63(8D CC) | 2.97 (74 04) | 3.46 (87 28) | 3.13 (7A 44) |
| **Bias (mA)** | 15 (1D 4C) | 1 (01 F4) | 12 (17 70) | 2 (03 E8) |
| **TxPower (dBm)** | 0.79 (2E E0) | -7.97 (06 3C) | 0.0 (27 10) | -7.0 (07 CB) |
| **RxPower (dBm)** | 3.01 (4E 20) | -16.02 (00 FA) | 0.0 (27 10) | -13.0 (01 F5) |

## Product Weight

Net weight of module：18.6g/pcs

Net weight of dust cap：0.95g/pcs

## Dimensions

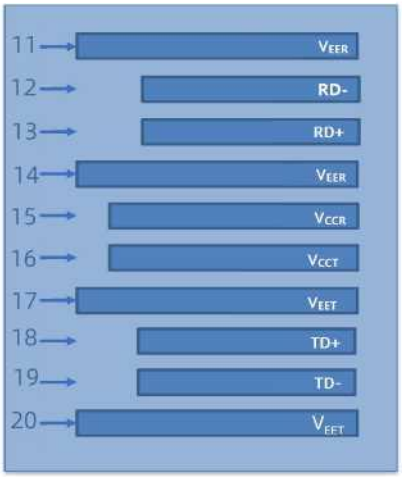



ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED

UNIT: mm

## Electrical Pad Layout

Top view




Bottom view