125-155 Mbps Multi-mode SFP Transceivers

SFP-MR2-M

Highlights

- SFP transceiver
- Data Rates: 125 - 155 Mbps
- Protocols:
  - SDH STM-1
  - SONET OC-3
  - Fast Ethernet
- Multi-mode fiber
- 1310 nm
- 0 - 2 km
- Duplex LC connector
- Hot-swap

Overview

Small Form-Factor Pluggable (SFP) interfaces from MRV Communications provide flexible high speed links in a small industry standard package. They deliver the deployment options and inventory control that network administrators demand for growing networks.

SFPs are designed to Multi-Source Agreement (MSA) standards to ensure network equipment compatibility. They are a perfect addition to MRV 's extensive lines of networking equipment.

Visit the MRV website at *www.mrv.com* or contact your nearest authorized MRV Communications dealer for more information.

Specifications Overview	
Data Rate	125 - 155 Mbps
Tx Wavelength	1310 nm
Tx Power (Minimum)	-20 dBm
Tx Disable	Yes
Rx Wavelength Range	1260 - 1570 nm
Rx Sensitivity	-30 dBm
Rx Saturation	-10 dBm
Operating Temperature Range	0 to 70 ºC
Power Consumption	1 Watt

Transmitter Specifications (Optical and Electrical)

Parameter	Symbol	Min	Max	Unit	Notes
Center Wavelength	λ_C	1270	1380	nm	-
Average Output Power	P_{OUT}	-20	-14	dBm	1
P_{OUT} @ TX Disable Asserted	P_{OUT}	-	-45	dBm	1
Spectral Width (RMS)	σ	-	7.7	nm	-
Extinction Ratio	EX	10	-	dB	-
Riise/Fall Time (20% - 80%)	t_r/t_f	-	3	ns	2
Output Optical Eye	Compliant with Eye Mask Bellcore TR-NWT-000253 for 100BASE-LX				3
Data Input Swing Differential	V_{IN}	500	1200	mV	4
Input Differential Impedence	Z_{IN}	80	120	Ω	-
TxDisable_Disable	-	2.0	Vcc	V	-
TxDisable_Enable	-	Vee	Vee + 0.8	V	-
TxFault_Fault	-	2.0	Vcc	V	-
TxFault_Normal	-	Vee	Vee + 0.5	V	-

Notes:
1. The optical power is launched into MMF 62.5/125 um.
2. Unfiltered, measured with 4B/5B code for 125 Mbps.
3. Measured with 4B/5B code for 125 Mbps.
4. Internally AC coupled, connected with 100 ohm differential load.

Receiver Specifications (Optical and Electrical)

Parameter	Symbol	Min	Max	Unit	Notes
Center Wavelength	λ_C	1260	1570	nm	-
Receiver Sensitivity	-	-	-30	dBm	5
Receiver Overload	-	-10	-	dBm	5
Return Loss	-	12	-	dB	-
LOS De-Assert	-	-	-31	dBm	-
LOS Assert	-	-45	-	dBm	-
LOS Hysteresis	-	0.5	4.5	dB	-
Total Jitter	T_J	-	0.43	UI	-
Data Output Swing Differential	V_{OUT}	370	2000	mV	6
LOS High	-	2.0	Vcc + 0.3	V	-
LOS Low	-	Vee	Vee + 0.5	V	-

Notes:
5. Measured with a PRBS 2^{23} - 1 test pattern @ 155Mbps, extinction ratio EX=10dB, BER ≤1×10^{-10}.
6. Internally AC coupled.

Absolute Maximum Rating

Parameter	Symbol	Min.	Max.	Unit	Notes
Storage Temperature	T_S	-40	85	°C	-
Supply Voltage	V_{CC}	-0.5	3.6	V	-
Operating Relative Humidity	-	5	95	%	-

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit	Notes
Operating Temperature (case)	T_C	0	70	°C	-
Power Supply Voltage	V_{CC}	3.13	3.47	V	-
Power Supply Total Current	I_{CC}	-	300	mA	-
Data Rate	DR	125	155	Mbps	-

Pin Function Definitions

Pin	Name	Function	Plug Sequence	Note
1	V_{eeT}	Transmitter Ground	1	-
2	TX Fault	Transmitter Fault Indication	3	1
3	TX Disable	Transmitter Disable	3	2
4	MOD_DEF(2)	Module Definition 2	3	3
5	MOD_DEF(1)	Module Definition 1	3	3
6	MOD_DEF(0)	Module Definition 0	3	3
7	Rate Select	Not Connected	3	-
8	LOS	Loss of Signal Indication	3	4
9	V_{eeR}	Receiver Ground	1	-
10	V_{eeR}	Receiver Ground	1	-
11	V_{eeR}	Receiver Ground	1	-
12	RD-	Inverted Receiver Data Out	3	5
13	RD+	Receiver Data Out	3	5
14	V_{eeR}	Receiver Ground	1	-
15	V_{ccR}	Receiver Power	2	-
16	V_{ccT}	Transmitter Power	2	-
17	V_{eeT}	Transmitter Ground	1	-
18	TD+	Transmitter Data In	3	6
19	TD-	Inverted Transmitter Data In	3	6
20	V_{eeT}	Transmitter Ground	1	-

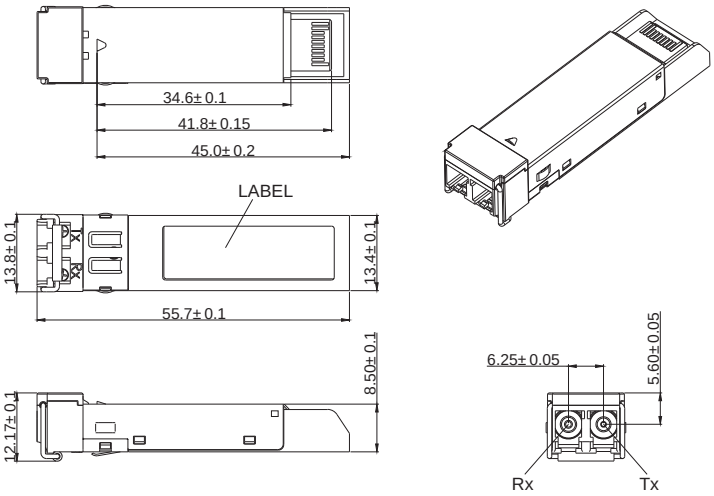
Notes:

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

Optical Communications Systems™

Datasheet

Mechanical Drawing



Ordering Information

Model	Description	Data Rate (Mbps)	Wavelength (nm)	Connector	Bail Latch Color	Maximum Distance Range (km)
SFP-MR2-M	SDH STM-1, SONET OC-3 SR1, Fast Ethernet SFP Transceiver, MM	125 - 155	1310	Duplex LC	Gray	0 - 2

Regulatory and Industry Compliances

Class 1 Laser Product, complies with EN 60825-1 and 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50. dated June 24, 2007

MSA SFF-8074i

Certified by one or more of the following agencies: TÜV, UL, CSA

RoHS Directive; China RoHS; California RoHS Law, REACH Directive SVHC; WEEE Directive

The Quality Management System is certified to ISO 9001 by QMI-SAI Global

The Environmental Management System is in compliance with ISO 14001

Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic descharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

MRV has more than 50 offices throughout the world. Addresses, phone numbers and fax numbers are listed at www.mrv.com.
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