

SO-SFP-MR2D

SFP, 100Mbps-2.7Gbps, Multirate, 1310nm, SM, DDM, 8dB, 2km

OVERVIEW

The SO-SFP-MR2D series single mode transceiver is small form factor pluggable module for serial optical data communications such as GE, STM1, STM4 and STM16. It is with the SFP 20-pin connector to allow hot plug capability. This module is designed for single-mode fiber and operates at a nominal wavelength of 1310nm. The transmitter section uses a multiple quantum well 1310nm FP laser and is a class 1 laser compliant according to International Safety Standard IEC-60825. The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC. The SO-SFP-MR2D series are designed to be compliant with SFF-8472.

PRODUCT FEATURES

- Operating data rate up to 2.67Gbps
- FP laser transmitter and PIN receiver
- 2km with 9/125 μm SMF
- Single 3.3V power supply and TTL logic interface
- Hot-Pluggable SFP footprint duplex LC connector interface
- Class 1 FDA and IEC60825-1 laser safety compliant
- Operating temperature
 - Standard: 0°C ~ +70°C
 - Industrial: -40 °C~+85 °C
- Compliant with SFP MSA
- Compliant with SFF-8472 MSA
- Compatible with ITU-T G.957
- Compatible with IEEE 802.3z

APPLICATIONS

- Sonet / SDH
- Optical networking and equipment connectivity

ORDERING INFORMATION

Part Number	Description
SO-SFP-MR2D	SFP, 100Mbps-2.7Gbps, Multirate, 1310nm, SM, DDM, 8dB, 2km
SO-SFP-MR2D-I	SFP, 100Mbps-2.7Gbps, Multirate, 1310nm, SM, DDM, 8dB, 2km, ind.temp.

Subject to change without notice.

For more information, visit smaroptics.com.

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Storage Temperature	TS	-40	+85	°C
Supply Voltage	VCC	-0.5	4	V
Operating Relative Humidity	RH	5	90	%

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	TA	SO-SFP-MR2D-I	-40	+85	°C
		SO-SFP-MR2D	0	+70	°C
Power Supply Voltage	Vcc	3.135	3.3	3.465	V
Power Supply Current	Icc			300	mA
Data rate		OC-48/STM-16 FEC		2.67	Gbps
		OC-48/STM-16		2.488	
		2FC		2.125	
		GBE		1.25	
		FC		1.063	
		OC-12/STM-4		0.622	
		OC-3/STM-1		0.155	

PERFORMANCE SPECIFICATIONS – ELECTRICAL TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Data Input Swing(Differential)	V _{IN}	500		2400	mVpp	AC coupled inputs
Input Impedance (Differential)	Z _{IN}	85	100	115	ohms	R _{in} > 100 kohms @ DC
TX Disable	Disable	2		Vcc	V	
	Enable	0		0.8		
TX FAULT	Fault	2		Vcc+0.3	V	
	Normal	0		0.8		

PERFORMANCE SPECIFICATIONS – ELECTRICAL RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Data Output Swing(Differential)	V _{out}	370	800	2000	mVpp	AC coupled outputs
Output Impedance (Differential)	Z _{out}	85	100	115	ohms	
Rx_LOS Output Voltage – High		2		Vcc+0.3	V	
Rx_LOS Output Voltage – Low		0		0.8	V	
MOD_DEF (2:0)	VoH	2.5			V	With Serial ID
	VoL	0		0.5	V	

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PERFORMANCE SPECIFICATIONS - OPTICAL

Parameter	Symbol	Min	Typ	Max	Unit
9µm Core Diameter SMF	L		2		km
Data Rate			2.488	2.67	Gbps

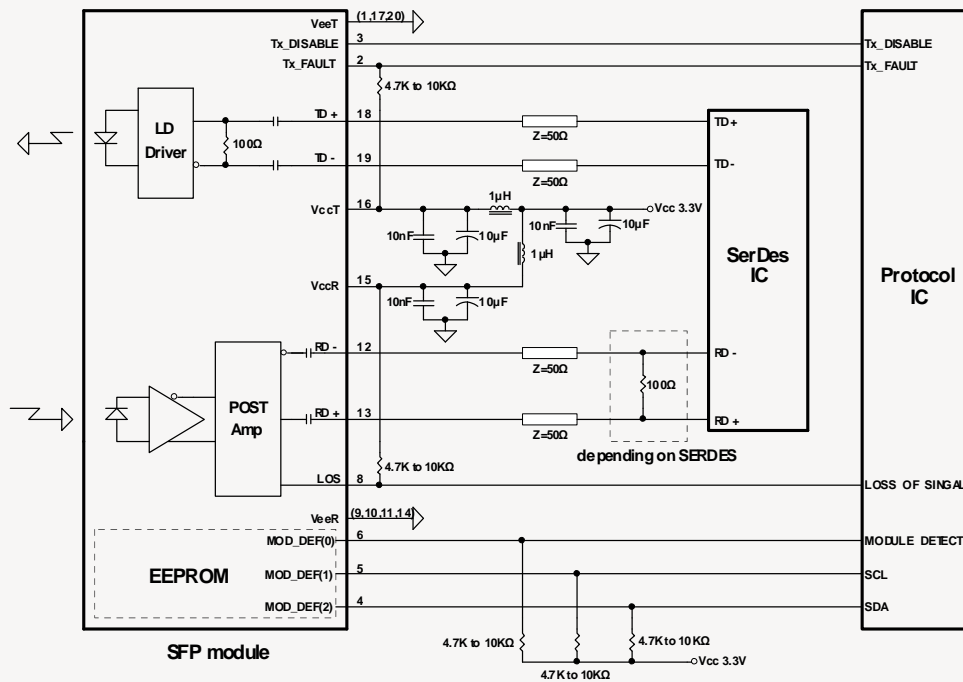
PERFORMANCE SPECIFICATIONS - OPTICAL TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ_c	1266	1310	1360	nm
Spectral Width (RMS)	$\Delta\lambda$			4	nm
Average Output Power	P_{out}	-10/-9		-3	dBm
Extinction Ratio	ER	8.2			dB
Rise/Fall Time(20%~80%)	t_r/t_f			150	Ps
Generated Transmitter Jitter Wide Band(5KHz~20MHz)	JTX_W			0.3	UI (G.783)
Generated Transmitter Jitter High Band(1000KHz~20MHz)	JTX_H			0.1	UI (G.783)
Output Optical Eye		IUT-T G.957			
TX Disable Assert Time	t_{off}			10	us
Pout@TX Disable Asserted	P_{out}			-35	dBm

PERFORMANCE SPECIFICATIONS - OPTICAL RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ	1270		1600	nm
Receiver Sensitivity Multirate	P_{min}			-18/-21	dBm
Receiver Overload	P_{max}			0	dBm
Optical Path Penalty				1	dB
LOS De-Assert	LOS_D			-24	dBm
LOS Assert	LOS_A	-36			dBm
LOS Hysteresis		0.5			dB

RECOMMENDED CIRCUIT SCHEMATIC



PIN FUNCTION DEFINITIONS

PIN	Signal Name	Description	PIN	Signal Name	Description
1	V _{EE} T	Transmitter Signal Ground	11	V _{EE} R	Receiver Signal Ground
2	TX_Fault	Transmitter Fault Indication. Logic "1" Output = Laser Fault. Logic "0" Output = Normal Operation	12	RD-	Inverse Receiver Data Out
3	TX_Disable	Logic "1" Input (or no connection) = Laser off, Logic "0" = Laser on.	13	RD+	Receiver Data Out
4	SDA	Modulation Definition 2 – Two wires serial ID Interface	14	V _{EE} R	Receiver Signal Ground
5	SDL	Modulation Definition 1 – Two wires serial ID Interface	15	V _{CC} R	Receiver Power – 3.3V±5%
6	MOD-ABS	Modulation Definition 0 – Ground in Module	16	V _{CC} T	Transmitter Power – 3.3V±5%
7	RS0	RX Rate Select (LVTTTL). This pin has an internal 30k pulldown to ground. A signal on this pin will not affect module performance.	17	V _{EE} T	Transmitter Signal Ground
8	RX_LOS	Loss of Signal Out (OC).	18	TD+	Transmitter Data In
9	RS1	TX Rate Select (LVTTTL). This pin has an internal 30k pulldown to ground. A signal on this pin will not affect module performance.	19	TD-	Inverse Transmitter Data In
10	V _{EE} R	Receiver Signal Ground	20	V _{EE} T	Transmitter Signal Ground

MECHANICAL DRAWING

